MELSEC-Q QD73A1 Positioning Module FB Library Reference Manual

Applicable modules:
QD73A1

<CONTENTS>

Reference Manual Revision History

Reference Manual Number	Date	Description
FBM-M088-A	2012/12/21	First edition

1. Overview

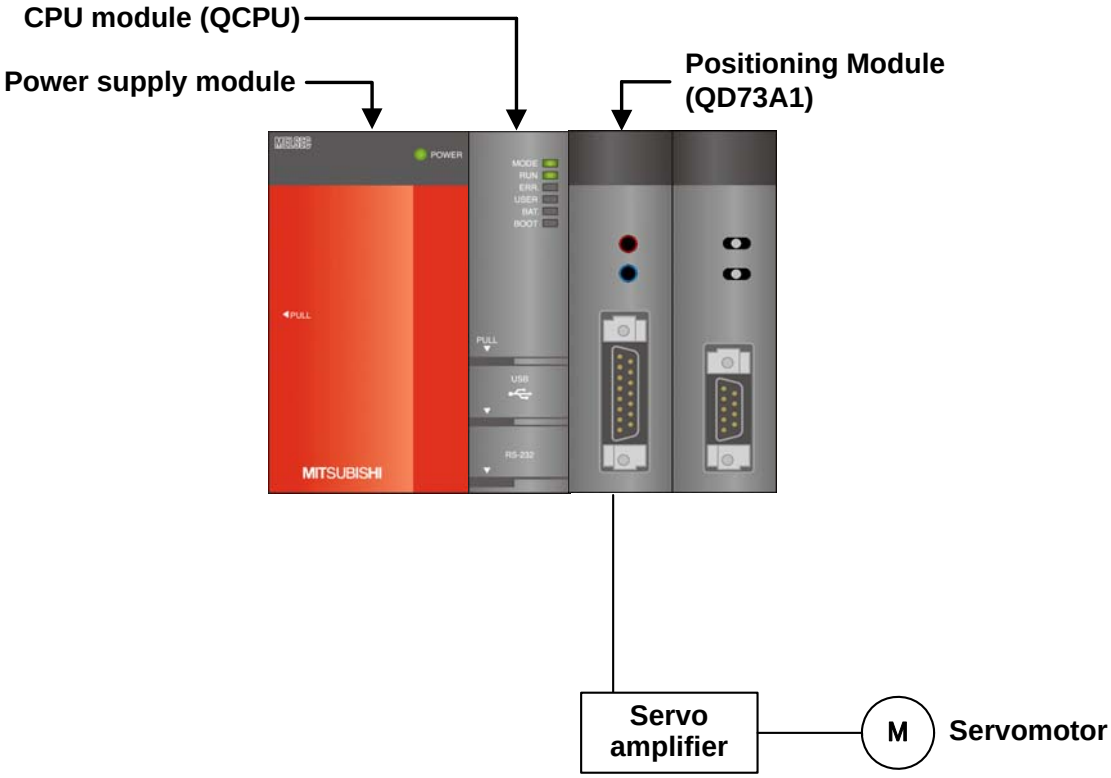
1.1 Overview of the FB Library

This FB Library is for using the MELSEC-Q QD73A1 single-axis positioning module.

1.2 Function of the FB Library

Item	Description
M+QD73A1_SetFPARAM	Sets fixed parameters (Pr.1 to Pr.4).
M+QD73A1_SetVPARAM	Sets variable parameters (Pr.5 to Pr.9).
M+QD73A1_SetZData	Sets OPR parameters (Pr.10 to Pr.13).
M+QD73A1_SetPosiData	Sets positioning data (Da.1 to Da.5).
M+QD73A1_CPUReady	Outputs the PLC READY signal.
M+QD73A1_StartPosi	Starts positioning.
M+QD73A1_JOG	Starts JOG.
M+QD73A1_StartFeed	Starts fixed-feed.
M+QD73A1_ChgCurrentVal	Changes the current value.
M+QD73A1_ChgSpeed	Changes the speed.
M+QD73A1_VPChgDistance	Changes the speed-position movement amount.
M+QD73A1_VPRestart	Restarts the control in the speed-position control switch mode.
M+QD73A1_ClearErrorCounter	Clears the deviation counter.
M+QD73A1_ErrorOperation	Monitors errors and resets errors.
M+QD73A1_SetZeroVal	Sets the zero setting for the analog output value.
M+QD73A1_SetGainVal	Sets the gain setting for the analog output value.

1.3 System Configuration Examples



1.4 Relevant manuals

MELSEC-Q QD73A1 Positioning Module User's Manual

QCPU User's Manual (Hardware Design, Maintenance and Inspection)

GX Works2 Version 1 Operating Manual (Common)

GX Works2 Version 1 Operating Manual (Simple Project, Function Block)

1.5 Note

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

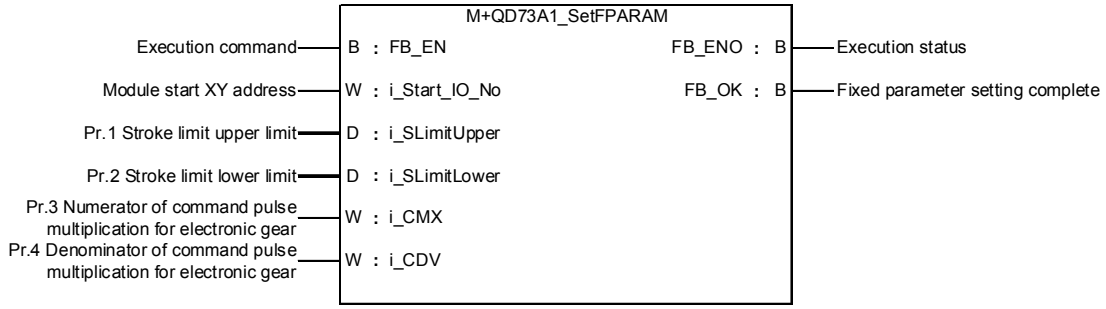
2. Details of the FB Library

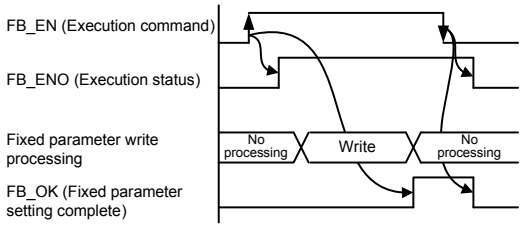
2.1 M+QD73A1_SetFPARAM (Fixed parameter setting)

FB Name

M+QD73A1_SetFPARAM

Function Overview

<table>
<tr><td>Item</td><td colspan="2">Description</td></tr>
<tr><td>Function overview</td><td colspan="2">Sets fixed parameters (Pr.1 to Pr.4).</td></tr>
<tr><td>Symbol</td><td colspan="2"> 
</td></tr>
<tr><td rowspan="3">Applicable hardware and software</td><td>Positioning Module</td><td>QD73A1</td></tr>
<tr><td>CPU module</td><td>
<table>
<tr><th>Series</th><th>Model</th></tr>
<tr><td rowspan="3">MELSEC-Q Series *1</td><td>Basic model QCPU</td></tr>
<tr><td>High performance model QCPU</td></tr>
<tr><td>Universal model QCPU</td></tr>
</table>
*1 Not applicable to QCPU-A (A mode)
</td></tr>
<tr><td>Engineering software</td><td>GX Works2 *1
<table>
<tr><th>Language</th><th>Software version</th></tr>
<tr><td>English version</td><td>Version1.24A or later</td></tr>
<tr><td>Chinese version</td><td>Version1.49B or later</td></tr>
</table>
*1 For software versions applicable to the modules used, refer to "Relevant manuals".
</td></tr>
<tr><td>Programming language</td><td colspan="2">Ladder</td></tr>
<tr><td>Number of steps</td><td colspan="2">196 steps (for MELSEC-Q series universal model CPU)
* The number of steps of the FB in a program depends on the CPU model that is used and input and output definition.</td></tr>
</table>

Item	Description
Function description	1) By turning ON FB_EN (Execution command), the set fixed parameter is written to the buffer memory. 2) After FB_EN (Execution command) is turned ON, the FB is completed by one scan. 3) The fixed parameter written with this FB is validated when the PLC READY signal [Y(n+1)D] turns from OFF to ON.
Compiling method	Macro type
Restrictions and precautions	1) The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation. 2) The FB cannot be used in an interrupt program. 3) Please ensure that the FB_EN signal 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, FOR-NEXT loop, etc. because it is impossible to turn OFF. 4) This FB uses index register Z9. Please do not use the index register in an interrupt program. 5) Every input must be provided with a value for proper FB operation. 6) If the fixed parameter is set using the configuration function of GX Works 2, using this FB is unnecessary. 7) To operate the QD73A1, the intelligent function module switches such as encoder I/F setting and multiplication setting must be properly configured according to the connected devices and systems.
FB operation type	Pulsed execution (1 scan execution type)
Application example	Refer to "Appendix 1 - FB Library Application Examples"
Timing chart	
Relevant manuals	•MELSEC-Q QD73A1 Positioning Module User's Manual •QCPU User's Manual (Hardware Design, Maintenance and Inspection) •GX Works2 Version 1 Operating Manual (Common) •GX Works2 Version 1 Operating Manual (Simple Project, Function Block)

Labels

●Input labels

Name (Comment)	Label name	Data type	Setting range	Description
Execution command	FB_EN	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
Module start XY address	i_Start_IO_No	Word	Depends on the I/O point range. For details, refer to the CPU user's manual.	Specify the starting XY address (in hexadecimal) where the QD73A1 is mounted. (For example, enter H10 for X10.)
Pr.1 Stroke limit upper limit	i_SLimitUpper	Double Word	-2,147,483,648 to 2,147,483,647	Set the upper limit for the machine's movement range during positioning control.
Pr.2 Stroke limit lower limit	i_SLimitLower	Double Word	-2,147,483,648 to 2,147,483,647	Set the lower limit for the machine's movement range during positioning control.
Pr.3 Numerator of command pulse multiplication for electronic gear	i_CMX	Word	1 to 9,999 The following condition must be satisfied. 1/50 ≤ CMX/CDV ≤ 50	Set the numerator of command pulse multiplication for electronic gear (CMX).
Pr.4 Denominator of command pulse multiplication for electronic gear	i_CDV	Word		Set the denominator of command pulse multiplication for electronic gear (CDV).

●Output labels

Name (Comment)	Label name	Data type	Initial value	Description
Execution status	FB_ENO	Bit	OFF	ON: Execution command is ON. OFF: Execution command is OFF.
Fixed parameter setting complete	FB_OK	Bit	OFF	ON: FB is completed without errors. OFF: FB is incomplete.

FB Version Upgrade History

Version	Date	Description
1.00A	2012/12/21	First edition

Note

This chapter includes information related to the function block.
It does not include information on restrictions of use such as combination with positioning modules or programmable controller CPUs.
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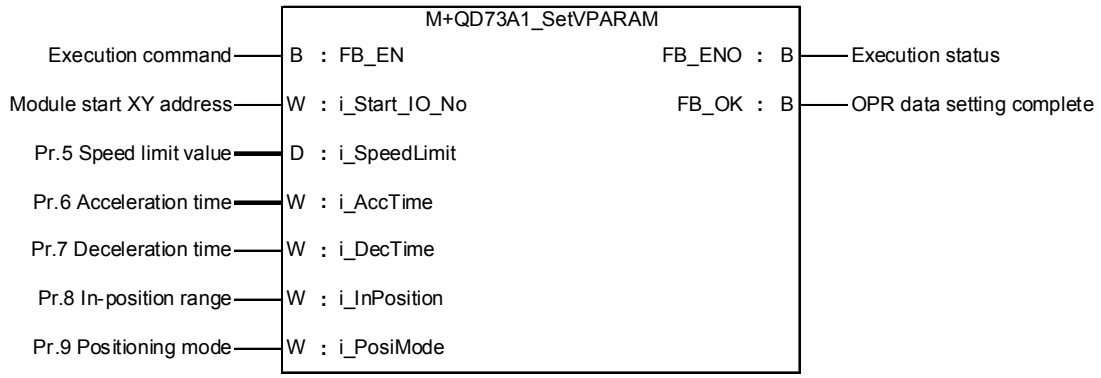
2.2 M+QD73A1_SetVPARAM (Variable parameter setting)

FB Name

M+QD73A1_SetVPARAM

Function Overview

<table>
<tr><th>Item</th><th colspan="2">Description</th></tr>
<tr><td>Function overview</td><td colspan="2">Sets variable parameters (Pr.5 to Pr.9).</td></tr>
<tr><td>Symbol</td><td colspan="2"> 
</td></tr>
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<tr><td>CPU module</td><td>
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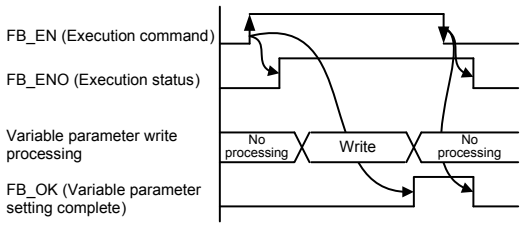
*1 For software versions applicable to the modules used, refer to "Relevant manuals".
</td></tr>
<tr><td>Programming language</td><td colspan="2">Ladder</td></tr>
<tr><td>Number of steps</td><td colspan="2">198 steps (for MELSEC-Q series universal model CPU)
* The number of steps of the FB in a program depends on the CPU model that is used and input and output definition.</td></tr>
</table>

Item	Description
Function description	1) By turning ON FB_EN (Execution command), the set variable parameter is written to the buffer memory. 2) After FB_EN (Execution command) is turned ON, the FB is completed by one scan. 3) The variable parameter written with this FB is validated when the start signal [Y(n+1) 0 to 5] turns from OFF to ON.
Compiling method	Macro type
Restrictions and precautions	1) The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation. 2) The FB cannot be used in an interrupt program. 3) Please ensure that the FB_EN signal 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, FOR-NEXT loop, etc. because it is impossible to turn OFF. 4) This FB uses index register Z9. Please do not use the index register in an interrupt program. 5) Every input must be provided with a value for proper FB operation. 6) If the variable parameter is set using the configuration function of GX Works 2, using this FB is unnecessary. 7) To operate the QD73A1, the intelligent function module switches such as encoder I/F setting and multiplication setting must be properly configured according to the connected devices and systems.
FB operation type	Pulsed execution (1 scan execution type)
Application example	Refer to "Appendix 1 - FB Library Application Examples"
Timing chart	
Relevant manuals	•MELSEC-Q QD73A1 Positioning Module User's Manual •QCPU User's Manual (Hardware Design, Maintenance and Inspection) •GX Works2 Version 1 Operating Manual (Common) •GX Works2 Version 1 Operating Manual (Simple Project, Function Block)

Labels

●Input labels

Name (Comment)	Label name	Data type	Setting range	Description
Execution command	FB_EN	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
Module start XY address	i_Start_IO_No	Word	Depends on the I/O point range. For details, refer to the CPU user's manual.	Specify the starting XY address (in hexadecimal) where the QD73A1 is mounted. (For example, enter H10 for X10.)
Pr.5 Speed limit value	i_SpeedLimit	Double Word	10 to 4,000,000 (pulse/s) (in units of 10 pulse)	Set the upper speed limit during OPR, positioning, and JOG operations.
Pr.6 Acceleration time	i_AccTime	Word	2 to 9,999 (ms)	Specify the time for the speed to increase from zero to the Pr.5: speed limit value.
Pr.7 Deceleration time	i_DecTime	Word		Specify the time for the speed to decrease from the Pr.5: speed limit value to zero.
Pr.8 In-position range	i_InPosition	Word	1 to 20,479 (pulse)	Set the accumulated pulses with which the in-position signal [Xn6] turns ON.
Pr.9 Positioning mode	i_PosiMode	Word	0: Positioning control mode 1: Speed-position switching mode	Set the control mode for positioning.

●Output labels

Name (Comment)	Label name	Data type	Initial value	Description
Execution status	FB_ENO	Bit	OFF	ON: Execution command is ON. OFF: Execution command is OFF.
Variable parameter setting complete	FB_OK	Bit	OFF	ON: FB is completed without errors. OFF: FB is incomplete.

FB Version Upgrade History

Version	Date	Description
1.00A	2012/12/21	First edition

Note

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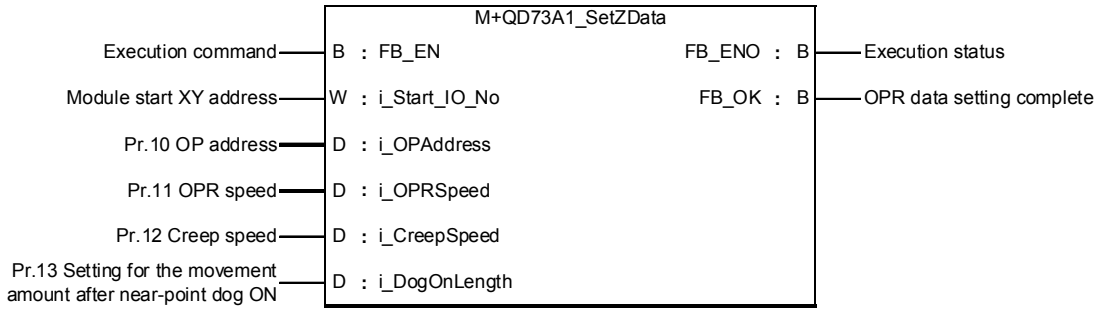
Please make sure to read user's manuals for the corresponding products before using the products.

2.3 M+QD73A1_SetZData (OPR data setting)

FB Name

M+QD73A1_SetZData

Function Overview

<table>
<tr><td>Item</td><td colspan="2">Description</td></tr>
<tr><td>Function overview</td><td colspan="2">Sets OPR parameters (Pr.10 to Pr.13).</td></tr>
<tr><td>Symbol</td><td colspan="2"> 
</td></tr>
<tr><td rowspan="3">Applicable hardware and software</td><td>Positioning Module</td><td>QD73A1</td></tr>
<tr><td>CPU module</td><td>
<table>
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<tr><td rowspan="3">MELSEC-Q Series *1</td><td>Basic model QCPU</td></tr>
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*1 For software versions applicable to the modules used, refer to "Relevant manuals".
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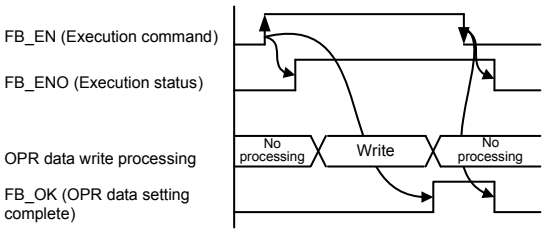
<tr><td>Programming language</td><td colspan="2">Ladder</td></tr>
<tr><td>Number of steps</td><td colspan="2">194 steps (for MELSEC-Q series universal model CPU)
* The number of steps of the FB in a program depends on the CPU model that is used and input and output definition.</td></tr>
</table>

Item	Description
Function description	1) By turning ON FB_EN (Execution command), the set OPR parameter is written to the buffer memory. 2) After FB_EN (Execution command) is turned ON, the FB is completed by one scan. 3) The OPR parameter written with this FB is validated when the PLC READY signal [Y(n+1)D] turns from OFF to ON.
Compiling method	Macro type
Restrictions and precautions	1) The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation. 2) The FB cannot be used in an interrupt program. 3) Please ensure that the FB_EN signal 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, FOR-NEXT loop, etc. because it is impossible to turn OFF. 4) This FB uses index register Z9. Please do not use the index register in an interrupt program. 5) Every input must be provided with a value for proper FB operation. 6) If the OPR parameter is set using the configuration function of GX Works 2, using this FB is unnecessary. 7) To operate the QD73A1, the intelligent function module switches such as encoder I/F setting and multiplication setting must be properly configured according to the connected devices and systems.
FB operation type	Pulsed execution (1 scan execution type)
Application example	Refer to "Appendix 1 - FB Library Application Examples"
Timing chart	
Relevant manuals	•MELSEC-Q QD73A1 Positioning Module User's Manual •QCPU User's Manual (Hardware Design, Maintenance and Inspection) •GX Works2 Version 1 Operating Manual (Common) •GX Works2 Version 1 Operating Manual (Simple Project, Function Block)

Labels

●Input labels

Name (Comment)	Label name	Data type	Setting range	Description
Execution command	FB_EN	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
Module start XY address	i_Start_IO_No	Word	Depends on the I/O point range. For details, refer to the CPU user's manual.	Specify the starting XY address (in hexadecimal) where the QD73A1 is mounted. (For example, enter H10 for X10.)
Pr.10 OP address	i_OPAddress	Double Word	-2,147,483,648 to 2,147,483,647 (pulse/s)	Set the address used as the reference point for positioning control.
Pr.11 OPR speed	i_OPRSpeed	Double Word	1 to 4,000,000 (pulse/s)	Set the speed for OPR.
Pr.12 Creep speed	i_CreepSpeed	Double Word	1 to 4,000,000 (pulse/s)	Set the creep speed after near-point dog ON.
Pr.13 Setting for the movement amount after near-point dog ON	i_DogOnLength	Double Word	0 to 2,147,483,647 (pulse)	When the count method is set for the OPR method, set the movement amount to the OP after the near-point dog signal [XnC] ON.

●Output labels

Name (Comment)	Label name	Data type	Initial value	Description
Execution status	FB_ENO	Bit	OFF	ON: Execution command is ON. OFF: Execution command is OFF.
OPR data setting complete	FB_OK	Bit	OFF	ON: FB is completed without errors. OFF: FM is incomplete.

FB Version Upgrade History

Version	Date	Description
1.00A	2012/12/21	First edition

Note

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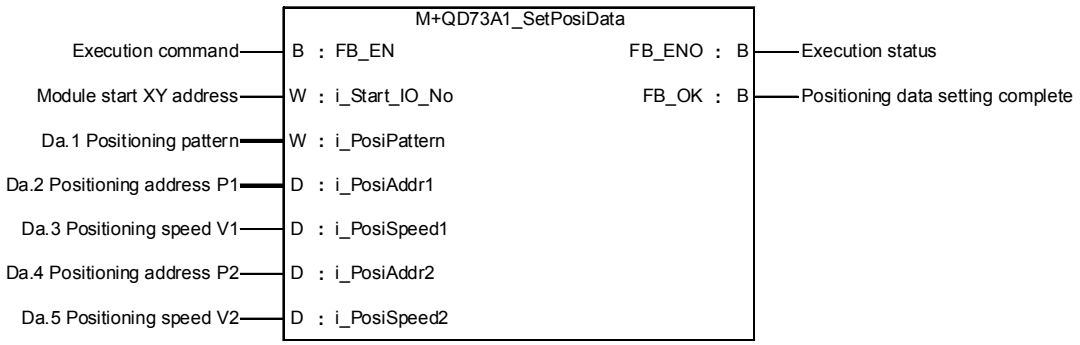
It does not include information on restrictions of use such as combination with positioning modules or programmable controller CPUs.
Please make sure to read user's manuals for the corresponding products before using the products.

2.4 M+QD73A1_SetPosiData (Positioning data setting)

FB Name

M+QD73A1_SetPosiData

Function Overview

<table>
<tr><td>Item</td><td colspan="2">Description</td></tr>
<tr><td>Function overview</td><td colspan="2">Sets positioning data (Da.1 to Da.5).</td></tr>
<tr><td>Symbol</td><td colspan="2"> 
</td></tr>
<tr><td rowspan="3">Applicable hardware and software</td><td>Positioning Module</td><td>QD73A1</td></tr>
<tr><td>CPU module</td><td>
<table>
<tr><th>Series</th><th>Model</th></tr>
<tr><td rowspan="3">MELSEC-Q Series *1</td><td>Basic model QCPU</td></tr>
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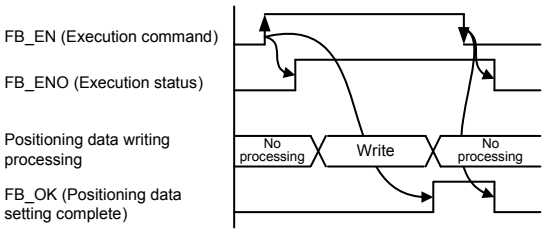
<tr><td>Programming language</td><td colspan="2">Ladder</td></tr>
<tr><td>Number of steps</td><td colspan="2">198 steps (for MELSEC-Q series universal model CPU)
* The number of steps of the FB in a program depends on the CPU model that is used and input and output definition.</td></tr>
</table>

Item	Description
Function description	1) By turning ON FB_EN (Execution command), the set positioning data is written to the buffer memory. 2) After FB_EN (Execution command) is turned ON, the FB is completed by one scan. 3) The positioning data written with this FB is validated when the start signal [Y(n+1) 1 to 3] turns from OFF to ON.
Compiling method	Macro type
Restrictions and precautions	1) The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation. 2) The FB cannot be used in an interrupt program. 3) Please ensure that the FB_EN signal 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, FOR-NEXT loop, etc. because it is impossible to turn OFF. 4) This FB uses index register Z9. Please do not use the index register in an interrupt program. 5) Every input must be provided with a value for proper FB operation. 6) If the positioning data is set using the configuration function of GX Works 2, using this FB is unnecessary. 7) To operate the QD73A1, the intelligent function module switches such as encoder I/F setting and multiplication setting must be properly configured according to the connected devices and systems.
FB operation type	Pulsed execution (1 scan execution type)
Application example	Refer to "Appendix 1 - FB Library Application Examples"
Timing chart	
Relevant manuals	•MELSEC-Q QD73A1 Positioning Module User's Manual •QCPU User's Manual (Hardware Design, Maintenance and Inspection) •GX Works2 Version 1 Operating Manual (Common) •GX Works2 Version 1 Operating Manual (Simple Project, Function Block)

Labels

●Input labels

Name (Comment)	Label name	Data type	Setting range	Description
Execution command	FB_EN	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
Module start XY address	i_Start_IO_No	Word	Depends on the I/O point range. For details, refer to the CPU user's manual.	Specify the starting XY address (in hexadecimal) where the QD73A1 is mounted. (For example, enter H10 for X10.)
Da.1 Positioning pattern	i_PosiPattern	Word	0: Positioning 1: Two-phase trapezoidal positioning control	Set the positioning pattern.
Da.2 Positioning address P1	i_PosiAddr1	Double Word	1) For absolute positioning start -2,147,483,648 to 2,147,483,647 (pulse) 2) For incremental system positioning and speed-position control switch mode 0 to 2,147,483,647 (pulse)	Designate the target position/movement amount for positioning control.
Da.3 Positioning speed V1	i_PosiSpeed1	Double Word	1 to 4,000,000 (pulse/s)	Set the command speed for positioning.
Da.4 Positioning address P2	i_PosiAddr2	Double Word	1) For absolute positioning start -2,147,483,648 to 2,147,483,647 (pulse) 2) For incremental positioning 0 to 2,147,483,647 (pulse)	This label is valid only for the two-phase trapezoidal positioning control. Set the target address after reaching positioning address P1.

Name (Comment)	Label name	Data type	Setting range	Description
Da.5 Positioning speed V2	i_PosiSpeed2	Double Word	1 to 4,000,000 (pulse/s)	This label is valid only for the two-phase trapezoidal positioning control. Set the command speed to positioning address P2.

●Output labels

Name (Comment)	Label name	Data type	Initial value	Description
Execution status	FB_ENO	Bit	OFF	ON: Execution command is ON. OFF: Execution command is OFF.
Positioning data setting complete	FB_OK	Bit	OFF	ON: FB is completed without errors. OFF: FM is incomplete.

FB Version Upgrade History

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1.00A	2012/12/21	First edition

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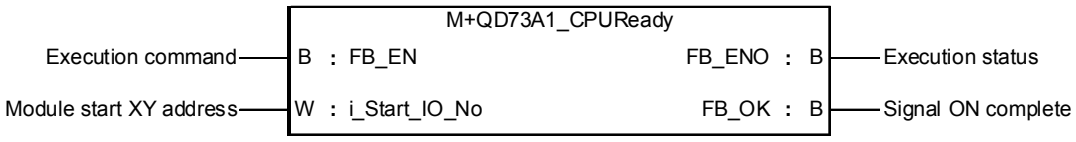
2.5 M+QD73A1_CPUReady (PLC READY signal ON)

FB Name

M+QD73A1_CPUReady

Function Overview

<table>
<tr><th>Item</th><th colspan="2">Description</th></tr>
<tr><td>Function overview</td><td colspan="2">Outputs the PLC READY signal.</td></tr>
<tr><td>Symbol</td><td colspan="2"> 
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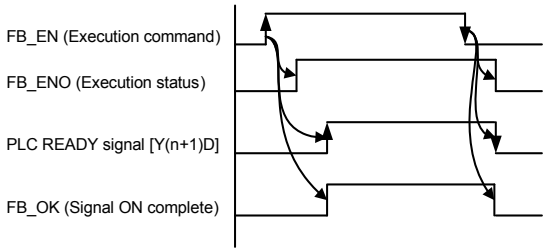
</td></tr>
<tr><td>Programming language</td><td colspan="2">Ladder</td></tr>
<tr><td>Number of steps</td><td colspan="2">207 steps (for MELSEC-Q series universal model CPU)
* The number of steps of the FB in a program depends on the CPU model that is used and input and output definition.</td></tr>
<tr><td>Function description</td><td colspan="2">1) By turning ON FB_EN (Execution command), the PLC ready signal [Y(n+1)D] is turned ON.
2) After FB_EN (Execution command) is turned ON, the FB is completed by one scan.</td></tr>
<tr><td>Compiling method</td><td colspan="2">Macro type</td></tr>
</table>

Item	Description
Restrictions and precautions	1) The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation. 2) The FB cannot be used in an interrupt program. 3) Please ensure that the FB_EN signal 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, FOR-NEXT loop, etc. because it is impossible to turn OFF. 4) This FB uses index register Z9. Please do not use the index register in an interrupt program. 5) Every input must be provided with a value for proper FB operation. 6) To operate the QD73A1, the intelligent function module switches such as encoder I/F setting and multiplication setting must be properly configured according to the connected devices and systems.
FB operation type	Real-time execution
Application example	Refer to "Appendix 1 - FB Library Application Examples"
Timing chart	
Relevant manuals	•MELSEC-Q QD73A1 Positioning Module User's Manual •QCPU User's Manual (Hardware Design, Maintenance and Inspection) •GX Works2 Version 1 Operating Manual (Common) •GX Works2 Version 1 Operating Manual (Simple Project, Function Block)

Labels

●Input labels

Name (Comment)	Label name	Data type	Setting range	Description
Execution command	FB_EN	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
Module start XY address	i_Start_IO_No	Word	Depends on the I/O point range. For details, refer to the CPU user's manual.	Specify the starting XY address (in hexadecimal) where the QD73A1 is mounted. (For example, enter H10 for X10.)

●Output labels

Name (Comment)	Label name	Data type	Initial value	Description
Execution status	FB_ENO	Bit	OFF	ON: Execution command is ON. OFF: Execution command is OFF.
Signal ON complete	FB_OK	Bit	OFF	When ON, it indicates that the PLC READY signal ON is completed.

FB Version Upgrade History

Version	Date	Description
1.00A	2012/12/21	First edition

Note

This chapter includes information related to the function block.

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

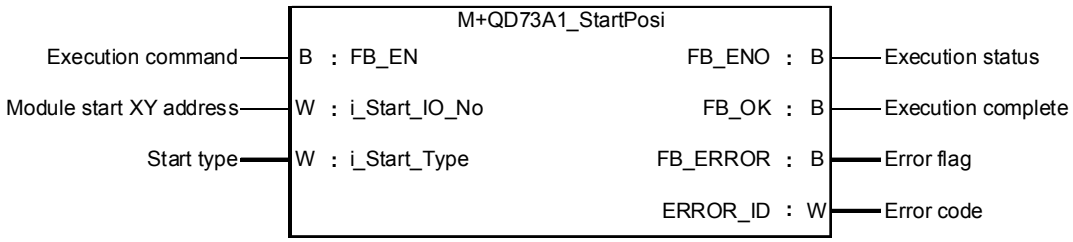
Please make sure to read user's manuals for the corresponding products before using the products.

2.6 M+QD73A1_StartPosi (Positioning start)

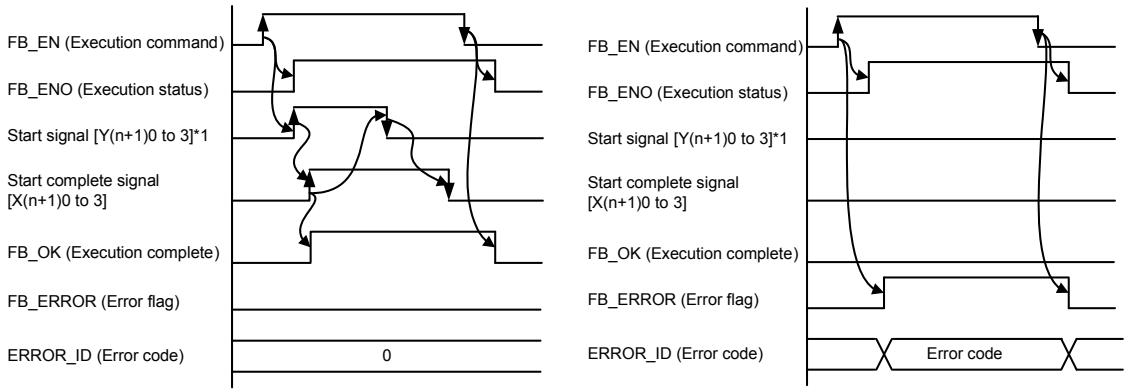
FB Name

M+QD73A1_StartPosi

Function Overview

<table>
<tr><th>Item</th><th colspan="2">Description</th></tr>
<tr><td>Function overview</td><td colspan="2">Starts positioning.</td></tr>
<tr><td>Symbol</td><td colspan="2"> 
</td></tr>
<tr><td rowspan="3">Applicable hardware and software</td><td>Positioning Module</td><td>QD73A1</td></tr>
<tr><td>CPU module</td><td>
<table>
<tr><th>Series</th><th>Model</th></tr>
<tr><td rowspan="3">MELSEC-Q Series *1</td><td>Basic model QCPU</td></tr>
<tr><td>High performance model QCPU</td></tr>
<tr><td>Universal model QCPU</td></tr>
</table>
*1 Not applicable to QCPU-A (A mode)
</td></tr>
<tr><td>Engineering software</td><td>GX Works2 *1
<table>
<tr><th>Language</th><th>Software version</th></tr>
<tr><td>English version</td><td>Version1.24A or later</td></tr>
<tr><td>Chinese version</td><td>Version1.49B or later</td></tr>
</table>
*1 For software versions applicable to the modules used, refer to "Relevant manuals".
</td></tr>
<tr><td>Programming language</td><td colspan="2">Ladder</td></tr>
<tr><td>Number of steps</td><td colspan="2">328 steps (for MELSEC-Q series universal model CPU)
* The number of steps of the FB in a program depends on the CPU model that is used and input and output definition.</td></tr>
</table>

Item	Description
Function description	1) By turning ON FB_EN (Execution command), the positioning required for the start type is started. 2) The FB is started when the start signal [Y(n+1)0 to 3] required for the start type is turned ON. 3) When FB_EN (Execution command) is turned ON, the following conditions must be satisfied to turn ON the start signal [Y(n+1)0 to 3] required for the start type. When the following conditions are not satisfied, the start signal [Y(n+1)0 to 3] is not turned ON, but FB_OK (Execution complete) is turned ON. (In this case, module errors at start will not occur.) [Conditions] QD73A1 READY signal [Xn1]: ON All start signals [Y(n+1)0 to 3]: OFF All start complete signals [X(n+1)0 to 3]: OFF BUSY signal [Xn4]: OFF 4) After FB_EN (Execution command) is turned ON, the FB is completed in multiple scans. 5) When the start complete signal [X(n+1)0 to 3] is ON or FB_EN (Execution command) is OFF, the start signal [Y(n+1)0 to 3] is turned OFF. 6) When the setting value of the start type is out of range, the FB_ERROR output turns ON, processing is interrupted, and the error code is stored in ERROR_ID (Error code). Refer to the error code explanation section for details.
Compiling method	Macro type
Restrictions and precautions	1) The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation. 2) The FB cannot be used in an interrupt program. 3) Please ensure that the FB_EN signal 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, FOR-NEXT loop, etc. because it is impossible to turn OFF. 4) This FB uses index registers Z8 and Z9. Please do not use these index registers in an interrupt program. 5) 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 index modification. However this is not a problem and the FB will operate without error. 6) Every input must be provided with a value for proper FB operation. 7) The data is not set at start in the FB. Data necessary for each control of positioning start No. must be set in the parameters and buffer memory beforehand. 8) To operate the QD73A1, the intelligent function module switches such as encoder I/F setting and multiplication setting must be properly configured according to the connected devices and systems.

Item	Description
FB operation type	Pulsed execution (multiple scan execution type)
Application example	Refer to "Appendix 1 - FB Library Application Examples"
Timing chart	[When operation completes without error] [When an error occurs]  *1: The start signal [Y(n+1)0 to 3] is turned ON or OFF according to the start type. 1) Start type = 0: OPR start signal [Y(n+1)0] 2) Start type = 1: Absolute positioning start signal [Y(n+1)1] 3) Start type = 2: Forward start signal (in incremental system positioning and speed-position control switch mode) [Y(n+1)2] 4) Start type = 3: Reverse start signal (in incremental system positioning and speed-position control switch mode) [Y(n+1)3]
Relevant manuals	•MELSEC-Q QD73A1 Positioning Module User's Manual •QCPU User's Manual (Hardware Design, Maintenance and Inspection) •GX Works2 Version 1 Operating Manual (Common) •GX Works2 Version 1 Operating Manual (Simple Project, Function Block)

Error code

●Error code list

Error code	Description	Action
1000 (Decimal)	The start type is not valid. The start type is not within the range of 0 to 3.	Please try again after confirming the setting.

Labels

●Input labels

Name (Comment)	Label name	Data type	Setting range	Description
Execution command	FB_EN	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.

Name (Comment)	Label name	Data type	Setting range	Description
Module start XY address	i_Start_IO_No	Word	Depends on the I/O point range. For details, refer to the CPU user's manual.	Specify the starting XY address (in hexadecimal) where the QD73A1 is mounted. (For example, enter H10 for X10.)
Start type	i_Start_Type	Word	0: OPR start 1: Absolute positioning start 2: Forward start (in incremental system positioning and speed-position control switch mode) 3: Reverse start (in incremental system positioning and speed-position control switch mode)	Set the start type required for the positioning start control.

●Output labels

Name (Comment)	Label name	Data type	Initial value	Description
Execution status	FB_ENO	Bit	OFF	ON: Execution command is ON. OFF: Execution command is OFF.
Execution complete	FB_OK	Bit	OFF	When ON, it indicates that the execution is completed.
Error flag	FB_ERROR	Bit	OFF	When ON, it indicates that an error has occurred.
Error code	ERROR_ID	Word	0	FB error code output.

FB Version Upgrade History

Version	Date	Description
1.00A	2012/12/21	First edition

Note

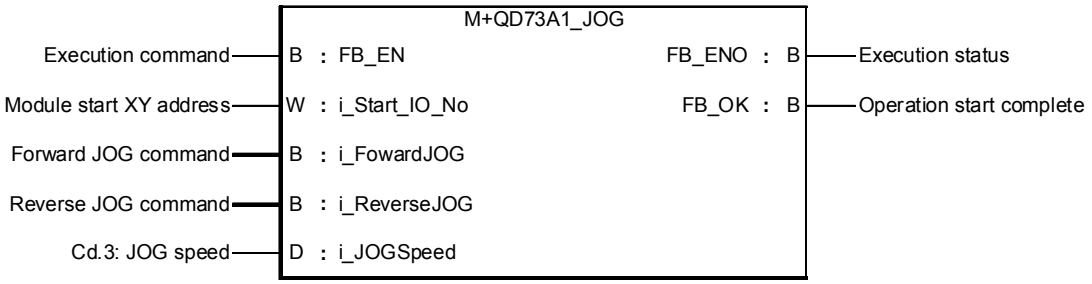
This chapter includes information related to the function block.
It does not include information on restrictions of use such as combination with positioning modules or programmable controller CPUs.
Please make sure to read user's manuals for the corresponding products before using the products.

2.7 M+QD73A1_JOG (JOG start)

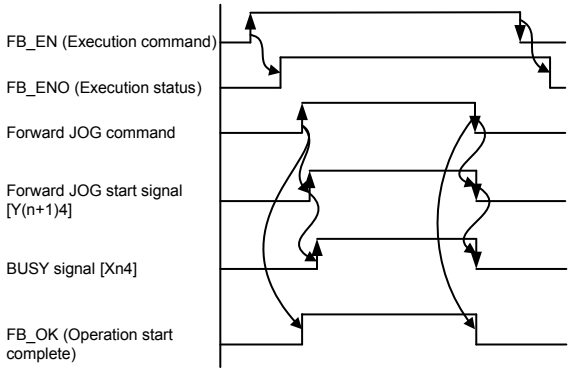
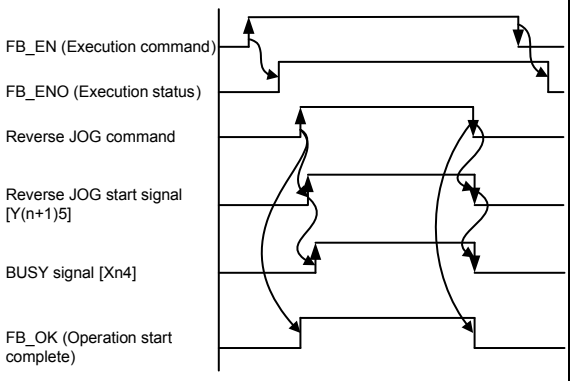
FB Name

M+QD73A1_JOG

Function Overview

<table>
<tr><td>Item</td><td colspan="2">Description</td></tr>
<tr><td>Function overview</td><td colspan="2">Starts JOG.</td></tr>
<tr><td>Symbol</td><td colspan="2"> 
</td></tr>
<tr><td rowspan="3">Applicable hardware and software</td><td>Positioning Module</td><td>QD73A1</td></tr>
<tr><td>CPU module</td><td>
<table>
<tr><th>Series</th><th>Model</th></tr>
<tr><td rowspan="3">MELSEC-Q Series *1</td><td>Basic model QCPU</td></tr>
<tr><td>High performance model QCPU</td></tr>
<tr><td>Universal model QCPU</td></tr>
</table>
*1 Not applicable to QCPU-A (A mode)
</td></tr>
<tr><td>Engineering software</td><td>GX Works2 *1
<table>
<tr><th>Language</th><th>Software version</th></tr>
<tr><td>English version</td><td>Version1.24A or later</td></tr>
<tr><td>Chinese version</td><td>Version1.49B or later</td></tr>
</table>
*1 For software versions applicable to the modules used, refer to "Relevant manuals".
</td></tr>
<tr><td>Programming language</td><td colspan="2">Ladder</td></tr>
<tr><td>Number of steps</td><td colspan="2">269 steps (for MELSEC-Q series universal model CPU)
* The number of steps of the FB in a program depends on the CPU model that is used and input and output definition.</td></tr>
</table>

Item	Description
Function description	1) After FB_EN (Execution command) is turned ON, JOG operation is carried out by turning ON i_FowardJOG (Forward JOG command) or i_ReverseJOG (Reverse JOG command). 2) After FB_EN (Execution command) is turned ON, the FB is always executed. 3) When i_FowardJOG (Forward JOG command) and i_ReverseJOG (Reverse JOG command) are simultaneously turned ON, the operation stops. 4) After FB_EN (Execution command) is turned ON, the operation will stop if FB_EN (Execution command) is turned OFF during i_FowardJOG (Forward JOG command) or i_ReverseJOG (Reverse JOG command) operation. 5) The operation will stop if i_ReverseJOG (Reverse JOG command) is turned ON during the forward JOG operation. When i_ReverseJOG (Reverse JOG command) is turned OFF from ON, the forward JOG operation will start again. (Work in the same way for the opposite operation.)
Compiling method	Macro type
Restrictions and precautions	1) It is dangerous to set the JOG speed to a large value from the beginning. For safety, first set to a smaller value and check the movement. Then, gradually increase the value to an optimum speed for control. 2) The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation. 3) The FB cannot be used in an interrupt program. 4) Please ensure that the FB_EN signal 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, FOR-NEXT loop, etc. because it is impossible to turn OFF. 5) This FB uses index registers Z8 and Z9. Please do not use these index registers in an interrupt program. 6) 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 index modification. However this is not a problem and the FB will operate without error. 7) Every input must be provided with a value for proper FB operation. 8) To operate the QD73A1, the intelligent function module switches such as encoder I/F setting and multiplication setting must be properly configured according to the connected devices and systems.
FB operation type	Real-time execution
Application example	Refer to "Appendix 1 - FB Library Application Examples"

Item	Description
Timing chart	For forward JOG command  For reverse JOG command 
Relevant manuals	•MELSEC-Q QD73A1 Positioning Module User's Manual •QCPU User's Manual (Hardware Design, Maintenance and Inspection) •GX Works2 Version 1 Operating Manual (Common) •GX Works2 Version 1 Operating Manual (Simple Project, Function Block)

Labels

●Input labels

Name (Comment)	Label name	Data type	Setting range	Description
Execution command	FB_EN	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
Module start XY address	i_Start_IO_No	Word	Depends on the I/O point range. For details, refer to the CPU user's manual.	Specify the starting XY address (in hexadecimal) where the QD73A1 is mounted. (For example, enter H10 for X10.)
Forward JOG command	i_FowardJOG	Bit	ON, OFF	Turn ON for forward JOG operation.
Reverse JOG command	i_ReverseJOG	Bit	ON, OFF	Turn ON for reverse JOG operation.
Cd.3 JOG speed	i_JOGSpeed	Double Word	1 to 4,000,000 (pulse/s)	Set the JOG speed.

●Output labels

Name (Comment)	Label name	Data type	Initial value	Description
Execution status	FB_ENO	Bit	OFF	ON: Execution command is ON. OFF: Execution command is OFF.
Operation start complete	FB_OK	Bit	OFF	ON: JOG command is ON. OFF: JOG command is OFF.

FB Version Upgrade History

Version	Date	Description
1.00A	2012/12/21	First edition

Note

This chapter includes information related to the function block.

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

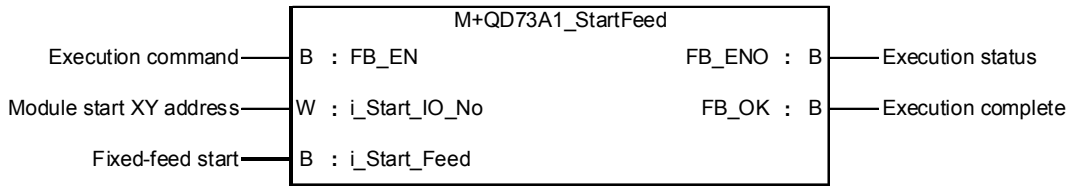
Please make sure to read user's manuals for the corresponding products before using the products.

2.8 M+QD73A1_StartFeed (Fixed-feed start)

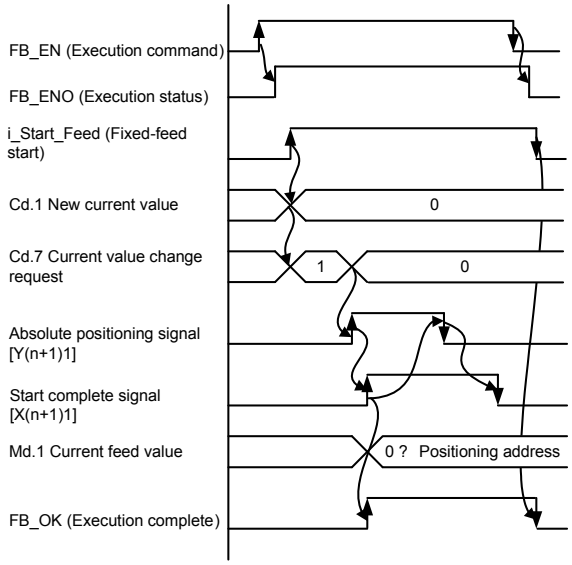
FB Name

M+QD73A1_StartFeed

Function Overview

<table>
<tr><th>Item</th><th colspan="2">Description</th></tr>
<tr><td>Function overview</td><td colspan="2">Starts fixed-feed.</td></tr>
<tr><td>Symbol</td><td colspan="2"> 
</td></tr>
<tr><td rowspan="3">Applicable hardware and software</td><td>Positioning Module</td><td>QD73A1</td></tr>
<tr><td>CPU module</td><td>
<table>
<tr><th>Series</th><th>Model</th></tr>
<tr><td rowspan="3">MELSEC-Q Series *1</td><td>Basic model QCPU</td></tr>
<tr><td>High performance model QCPU</td></tr>
<tr><td>Universal model QCPU</td></tr>
</table>
*1 Not applicable to QCPU-A (A mode)
</td></tr>
<tr><td>Engineering software</td><td>GX Works2 *1
<table>
<tr><th>Language</th><th>Software version</th></tr>
<tr><td>English version</td><td>Version1.24A or later</td></tr>
<tr><td>Chinese version</td><td>Version1.49B or later</td></tr>
</table>
*1 For software versions applicable to the modules used, refer to "Relevant manuals".
</td></tr>
<tr><td>Programming language</td><td colspan="2">Ladder</td></tr>
<tr><td>Number of steps</td><td colspan="2">302 steps (for MELSEC-Q series universal model CPU)
* The number of steps of the FB in a program depends on the CPU model that is used and input and output definition.</td></tr>
</table>

Item	Description
Function description	1) After FB_EN (Execution command) is turned ON, turning on i_Start_Feed (Fixed-feed command) changes the current feed value to 0 and starts the positioning. 2) The FB is started when the absolute positioning start signal [Y(n+1)1] is turned ON. 3) After FB_EN (Execution command) is turned ON, the following conditions must be satisfied to turn ON the absolute positioning start signal [Y(n+1)1] by i_Start_Feed (Fixed-feed command). When the following conditions are not satisfied, the absolute positioning start signal [Y(n+1)1] is not turned ON, but FB_OK (Execution complete) is turned ON. (In this case, module errors at start will not occur.) [Conditions] QD73A1 READY signal [Xn1]: ON Absolute positioning start signal [Y(n+1)1]: OFF Absolute positioning start complete signal [X(n+1)1]: OFF BUSY signal [Xn4]: OFF 4) After FB_EN (Execution command) is turned ON, i_Start_Feed (Fixed-feed command) is turned ON. Then, the FB is completed in multiple scans. 5) When the absolute positioning start complete signal [X(n+1)1] is ON or FB_EN (Execution command) is OFF, the absolute positioning start signal [Y(n+1)1] is turned OFF.
Compiling method	Macro type

Item	Description
Restrictions and precautions	1) The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation. 2) The FB cannot be used in an interrupt program. 3) Please ensure that the FB_EN signal 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, FOR-NEXT loop, etc. because it is impossible to turn OFF. 4) This FB uses index registers Z8 and Z9. Please do not use these index registers in an interrupt program. 5) The data is not set at start in the FB. Data necessary for the fixed-feed start must be set in the parameters and buffer memory beforehand. 6) When this FB is executed with the accumulated pulses in the deviation counter, the actual current value at a current value change may not be 0. To set the actual current value to 0 at the current value change, clear the deviation counter before executing this FB. 7) 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 index modification. However this is not a problem and the FB will operate without error. 8) Every input must be provided with a value for proper FB operation. 9) To operate the QD73A1, the intelligent function module switches such as encoder I/F setting and multiplication setting must be properly configured according to the connected devices and systems.
FB operation type	Pulsed execution (multiple scan execution type)
Application example	Refer to "Appendix 1 - FB Library Application Examples"
Timing chart	

Item	Description
Relevant manuals	•MELSEC-Q QD73A1 Positioning Module User's Manual •QCPU User's Manual (Hardware Design, Maintenance and Inspection) •GX Works2 Version 1 Operating Manual (Common) •GX Works2 Version 1 Operating Manual (Simple Project, Function Block)

Labels

●Input labels

Name (Comment)	Label name	Data type	Setting range	Description
Execution command	FB_EN	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
Module start XY address	i_Start_IO_No	Word	Depends on the I/O point range. For details, refer to the CPU user's manual.	Specify the starting XY address (in hexadecimal) where the QD73A1 is mounted. (For example, enter H10 for X10.)
Fixed-feed start	i_Start_Feed	Bit	ON, OFF	Turn ON for fixed-feed operation.

●Output labels

Name (Comment)	Label name	Data type	Initial value	Description
Execution status	FB_ENO	Bit	OFF	ON: Execution command is ON. OFF: Execution command is OFF.
Execution complete	FB_OK	Bit	OFF	When ON, it indicates that the execution is completed.

FB Version Upgrade History

Version	Date	Description
1.00A	2012/12/21	First edition

Note

This chapter includes information related to the function block.

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

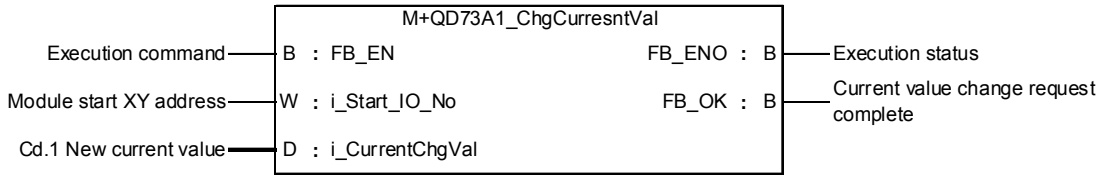
Please make sure to read user's manuals for the corresponding products before using the products.

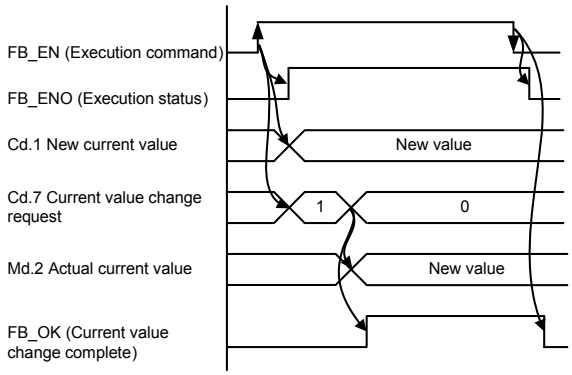
2.9 M+QD73A1_ChgCurrentVal (Current value change)

FB Name

M+QD73A1_ChgCurrentVal

Function Overview

<table>
<tr><td>Item</td><td colspan="2">Description</td></tr>
<tr><td>Function overview</td><td colspan="2">Changes the current value.</td></tr>
<tr><td>Symbol</td><td colspan="2"> 
</td></tr>
<tr><td rowspan="3">Applicable hardware and software</td><td>Positioning Module</td><td>QD73A1</td></tr>
<tr><td>CPU module</td><td>
<table>
<tr><th>Series</th><th>Model</th></tr>
<tr><td rowspan="3">MELSEC-Q Series *1</td><td>Basic model QCPU</td></tr>
<tr><td>High performance model QCPU</td></tr>
<tr><td>Universal model QCPU</td></tr>
</table>
*1 Not applicable to QCPU-A (A mode)
</td></tr>
<tr><td>Engineering software</td><td>GX Works2 *1
<table>
<tr><th>Language</th><th>Software version</th></tr>
<tr><td>English version</td><td>Version1.24A or later</td></tr>
<tr><td>Chinese version</td><td>Version1.49B or later</td></tr>
</table>
*1 For software versions applicable to the modules used, refer to "Relevant manuals".
</td></tr>
<tr><td>Programming language</td><td colspan="2">Ladder</td></tr>
<tr><td>Number of steps</td><td colspan="2">235 steps (for MELSEC-Q series universal model CPU)
* The number of steps of the FB in a program depends on the CPU model that is used and input and output definition.</td></tr>
<tr><td>Function description</td><td colspan="2">1) By turning ON FB_EN (Execution command), the current feed value is changed to the newly specified address.
2) After FB_EN (Execution command) is turned ON, the FB is completed in multiple scans.</td></tr>
<tr><td>Compiling method</td><td colspan="2">Macro type</td></tr>
</table>

Item	Description
Restrictions and precautions	1) The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation. 2) The FB cannot be used in an interrupt program. 3) Please ensure that the FB_EN signal 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, FOR-NEXT loop, etc. because it is impossible to turn OFF. 4) This FB uses index registers Z8 and Z9. Please do not use these index registers in an interrupt program. 5) When this FB is executed with the accumulated pulses in the deviation counter, the actual current value may not be 0. To set the actual current value to 0, clear the deviation counter before executing this FB. 6) If FB_EN (Execution command) is turned ON while the BUSY signal [Xn4] is ON, the request will be ignored. In this case, FB_OK (Current value change complete) is not turned ON. 7) Every input must be provided with a value for proper FB operation. 8) To operate the QD73A1, the intelligent function module switches such as encoder I/F setting and multiplication setting must be properly configured according to the connected devices and systems.
FB operation type	Pulsed execution (multiple scan execution type)
Application example	Refer to "Appendix 1 - FB Library Application Examples"
Timing chart	
Relevant manuals	•MELSEC-Q QD73A1 Positioning Module User's Manual •QCPU User's Manual (Hardware Design, Maintenance and Inspection) •GX Works2 Version 1 Operating Manual (Common) •GX Works2 Version 1 Operating Manual (Simple Project, Function Block)

Labels

●Input labels

Name (Comment)	Label name	Data type	Setting range	Description
Execution command	FB_EN	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
Module start XY address	i_Start_IO_No	Word	Depends on the I/O point range. For details, refer to the CPU user's manual.	Specify the starting XY address (in hexadecimal) where the QD73A1 is mounted. (For example, enter H10 for X10.)
Cd.1 New current value	i_CurrentChgVal	Double Word	-2,147,483,648 to 2,147,483,647	Set the new current value.

●Output labels

Name (Comment)	Label name	Data type	Initial value	Description
Execution status	FB_ENO	Bit	OFF	ON: Execution command is ON. OFF: Execution command is OFF.
Current value change request complete	FB_OK	Bit	OFF	When ON, it indicates that the current value change is completed.

FB Version Upgrade History

Version	Date	Description
1.00A	2012/12/21	First edition

Note

This chapter includes information related to the function block.

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

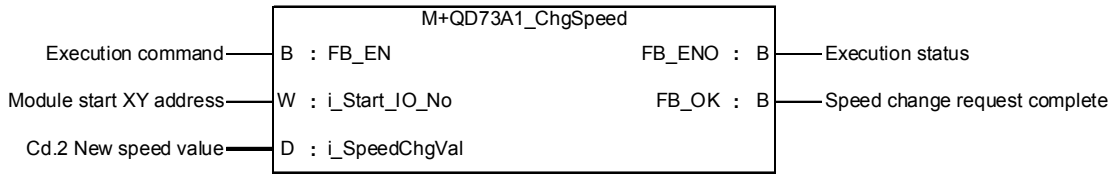
Please make sure to read user's manuals for the corresponding products before using the products.

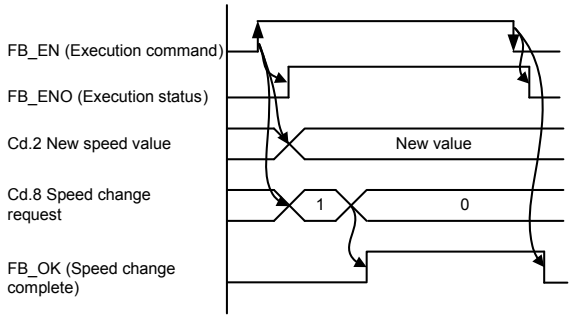
2.10 M+QD73A1_ChgSpeed (Speed change)

FB Name

M+QD73A1_ChgSpeed

Function Overview

<table>
<tr><td>Item</td><td colspan="2">Description</td></tr>
<tr><td>Function overview</td><td colspan="2">Changes the speed.</td></tr>
<tr><td>Symbol</td><td colspan="2"> 
</td></tr>
<tr><td rowspan="3">Applicable hardware and software</td><td>Positioning Module</td><td>QD73A1</td></tr>
<tr><td>CPU module</td><td>
<table>
<tr><th>Series</th><th>Model</th></tr>
<tr><td rowspan="3">MELSEC-Q Series *1</td><td>Basic model QCPU</td></tr>
<tr><td>High performance model QCPU</td></tr>
<tr><td>Universal model QCPU</td></tr>
</table>
*1 Not applicable to QCPU-A (A mode)
</td></tr>
<tr><td>Engineering software</td><td>GX Works2 *1
<table>
<tr><th>Language</th><th>Software version</th></tr>
<tr><td>English version</td><td>Version1.24A or later</td></tr>
<tr><td>Chinese version</td><td>Version1.49B or later</td></tr>
</table>
*1 For software versions applicable to the modules used, refer to "Relevant manuals".
</td></tr>
<tr><td>Programming language</td><td colspan="2">Ladder</td></tr>
<tr><td>Number of steps</td><td colspan="2">224 steps (for MELSEC-Q series universal model CPU)
* The number of steps of the FB in a program depends on the CPU model that is used and input and output definition.</td></tr>
<tr><td>Function description</td><td colspan="2">1) By turning ON FB_EN (Execution command), the speed during control is changed to the newly specified speed.
2) After FB_EN (Execution command) is turned ON, the FB is completed in multiple scans.</td></tr>
<tr><td>Compiling method</td><td colspan="2">Macro type</td></tr>
</table>

Item	Description
Restrictions and precautions	1) The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation. 2) The FB cannot be used in an interrupt program. 3) Please ensure that the FB_EN signal 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, FOR-NEXT loop, etc. because it is impossible to turn OFF. 4) This FB uses index registers Z8 and Z9. Please do not use these index registers in an interrupt program. 5) If FB_EN (Execution command) is turned ON while the BUSY signal [Xn4] is OFF, the request will be ignored. In this case, FB_OK (Speed change complete) is not turned ON. 6) Every input must be provided with a value for proper FB operation. 7) To operate the QD73A1, the intelligent function module switches such as encoder I/F setting and multiplication setting must be properly configured according to the connected devices and systems.
FB operation type	Pulsed execution (multiple scan execution type)
Application example	Refer to "Appendix 1 - FB Library Application Examples"
Timing chart	
Relevant manuals	•MELSEC-Q QD73A1 Positioning Module User's Manual •QCPU User's Manual (Hardware Design, Maintenance and Inspection) •GX Works2 Version 1 Operating Manual (Common) •GX Works2 Version 1 Operating Manual (Simple Project, Function Block)

Labels

●Input labels

Name (Comment)	Label name	Data type	Setting range	Description
Execution command	FB_EN	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
Module start XY address	i_Start_IO_No	Word	Depends on the I/O point range. For details, refer to the CPU user's manual.	Specify the starting XY address (in hexadecimal) where the QD73A1 is mounted. (For example, enter H10 for X10.)
Cd.2 New speed value	i_SpeedChgVal	Double Word	1 to 4,000,000 (pulse/s)	Set the new speed.

●Output labels

Name (Comment)	Label name	Data type	Initial value	Description
Execution status	FB_ENO	Bit	OFF	ON: Execution command is ON. OFF: Execution command is OFF.
Speed change request complete	FB_OK	Bit	OFF	When ON, it indicates that the speed change is completed.

FB Version Upgrade History

Version	Date	Description
1.00A	2012/12/21	First edition

Note

This chapter includes information related to the function block.

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

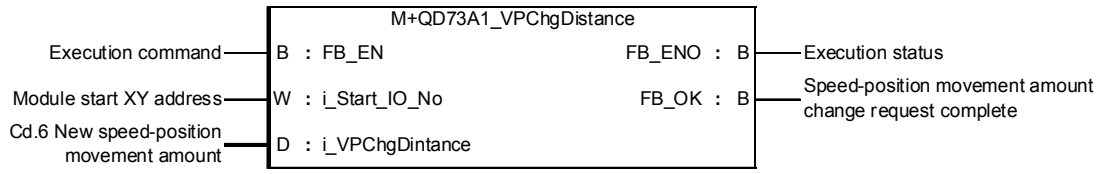
Please make sure to read user's manuals for the corresponding products before using the products.

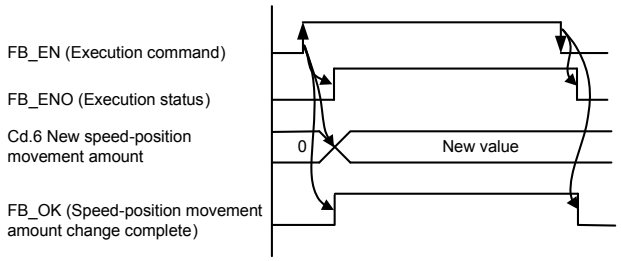
2.11 M+QD73A1_VPChgDistance (Speed-position movement amount change)

FB Name

M+QD73A1_VPChgDistance

Function Overview

<table>
<tr><td>Item</td><td colspan="2">Description</td></tr>
<tr><td>Function overview</td><td colspan="2">Changes the speed-position movement amount.</td></tr>
<tr><td>Symbol</td><td colspan="2"> 
</td></tr>
<tr><td rowspan="3">Applicable hardware and software</td><td>Positioning Module</td><td>QD73A1</td></tr>
<tr><td>CPU module</td><td>
<table>
<tr><th>Series</th><th>Model</th></tr>
<tr><td rowspan="3">MELSEC-Q Series *1</td><td>Basic model QCPU</td></tr>
<tr><td>High performance model QCPU</td></tr>
<tr><td>Universal model QCPU</td></tr>
</table>
*1 Not applicable to QCPU-A (A mode)
</td></tr>
<tr><td>Engineering software</td><td>GX Works2 *1
<table>
<tr><th>Language</th><th>Software version</th></tr>
<tr><td>English version</td><td>Version1.24A or later</td></tr>
<tr><td>Chinese version</td><td>Version1.49B or later</td></tr>
</table>
*1 For software versions applicable to the modules used, refer to "Relevant manuals".
</td></tr>
<tr><td>Programming language</td><td colspan="2">Ladder</td></tr>
<tr><td>Number of steps</td><td colspan="2">229 steps (for MELSEC-Q series universal model CPU)
* The number of steps of the FB in a program depends on the CPU model that is used and input and output definition.</td></tr>
<tr><td>Function description</td><td colspan="2">1) By turning ON FB_EN (Execution command), the positioning address for the positioning control in the speed-position control switch mode is changed.
2) After FB_EN (Execution command) is turned ON, the FB is completed by one scan.</td></tr>
<tr><td>Compiling method</td><td colspan="2">Macro type</td></tr>
</table>

Item	Description
Restrictions and precautions	1) The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation. 2) The FB cannot be used in an interrupt program. 3) Please ensure that the FB_EN signal 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, FOR-NEXT loop, etc. because it is impossible to turn OFF. 4) This FB uses index registers Z8 and Z9. Please do not use these index registers in an interrupt program. 5) If FB_EN (Execution command) is turned ON while the BUSY signal [Xn4] is OFF, the request will be ignored. In this case, FB_OK (Speed-position movement amount change complete) is not turned ON. 6) When this FB is used during the speed control in the speed-position switch mode, the positioning address can be changed. However, during the positioning control, the positioning address cannot be changed with this FB. 7) Every input must be provided with a value for proper FB operation. 8) To operate the QD73A1, the intelligent function module switches such as encoder I/F setting and multiplication setting must be properly configured according to the connected devices and systems.
FB operation type	Pulsed execution (1 scan execution type)
Application example	Refer to "Appendix 1 - FB Library Application Examples"
Timing chart	
Relevant manuals	•MELSEC-Q QD73A1 Positioning Module User's Manual •QCPU User's Manual (Hardware Design, Maintenance and Inspection) •GX Works2 Version 1 Operating Manual (Common) •GX Works2 Version 1 Operating Manual (Simple Project, Function Block)

Labels

●Input labels

Name (Comment)	Label name	Data type	Setting range	Description
Execution command	FB_EN	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
Module start XY address	i_Start_IO_No	Word	Depends on the I/O point range. For details, refer to the CPU user's manual.	Specify the starting XY address (in hexadecimal) where the QD73A1 is mounted. (For example, enter H10 for X10.)
Cd.6 New speed-position movement amount	i_VPChgDistance	Double Word	1 to 2,147,483,647 (pulse)	Set the new movement amount.

●Output labels

Name (Comment)	Label name	Data type	Initial value	Description
Execution status	FB_ENO	Bit	OFF	ON: Execution command is ON. OFF: Execution command is OFF.
Speed-position movement amount change request complete	FB_OK	Bit	OFF	When ON, it indicates that the speed-position movement amount change is completed.

FB Version Upgrade History

Version	Date	Description
1.00A	2012/12/21	First edition

Note

This chapter includes information related to the function block.

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

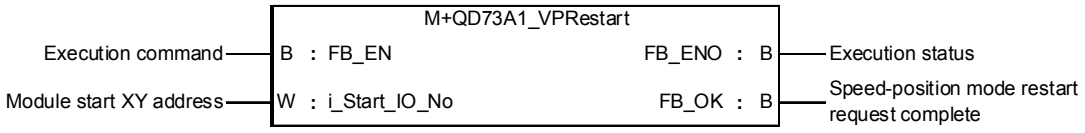
Please make sure to read user's manuals for the corresponding products before using the products.

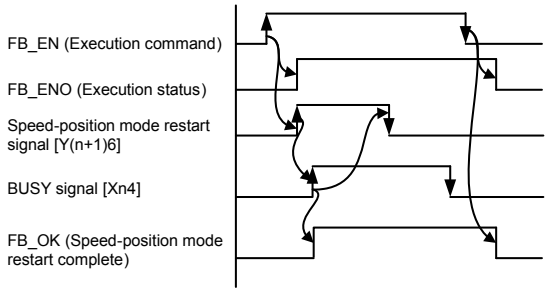
2.12 M+QD73A1_VPRestart (Speed-position mode restart)

FB Name

M+QD73A1_VPRestart

Function Overview

<table>
<tr><td>Item</td><td colspan="2">Description</td></tr>
<tr><td>Function overview</td><td colspan="2">Restarts the control in the speed-position control switch mode.</td></tr>
<tr><td>Symbol</td><td colspan="2"> 
</td></tr>
<tr><td rowspan="3">Applicable hardware and software</td><td>Positioning Module</td><td>QD73A1</td></tr>
<tr><td>CPU module</td><td>
<table>
<tr><td>Series</td><td>Model</td></tr>
<tr><td rowspan="3">MELSEC-Q Series *1</td><td>Basic model QCPU</td></tr>
<tr><td>High performance model QCPU</td></tr>
<tr><td>Universal model QCPU</td></tr>
</table>
*1 Not applicable to QCPU-A (A mode)
</td></tr>
<tr><td>Engineering software</td><td>GX Works2 *1
<table>
<tr><td>Language</td><td>Software version</td></tr>
<tr><td>English version</td><td>Version1.24A or later</td></tr>
<tr><td>Chinese version</td><td>Version1.49B or later</td></tr>
</table>
*1 For software versions applicable to the modules used, refer to "Relevant manuals".
</td></tr>
<tr><td>Programming language</td><td colspan="2">Ladder</td></tr>
<tr><td>Number of steps</td><td colspan="2">213 steps (for MELSEC-Q series universal model CPU)
* The number of steps of the FB in a program depends on the CPU model that is used and input and output definition.</td></tr>
<tr><td>Function description</td><td colspan="2">1) By turning ON FB_EN (Execution command), speed-position switch mode control that stopped when a stop cause has occurred restarts.
2) After FB_EN (Execution command) is turned ON, the FB is completed in multiple scans.
3) When the BUSY signal is ON or FB_EN (Execution command) is OFF, the speed-position mode restart signal [Y(n+1)6] is turned OFF.</td></tr>
<tr><td>Compiling method</td><td colspan="2">Macro type</td></tr>
</table>

Item	Description
Restrictions and precautions	1) The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation. 2) The FB cannot be used in an interrupt program. 3) Please ensure that the FB_EN signal 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, FOR-NEXT loop, etc. because it is impossible to turn OFF. 4) This FB uses index register Z9. Please do not use the index register in an interrupt program. 5) 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 index modification. However this is not a problem and the FB will operate without error. 6) Every input must be provided with a value for proper FB operation. 7) To operate the QD73A1, the intelligent function module switches such as encoder I/F setting and multiplication setting must be properly configured according to the connected devices and systems.
FB operation type	Pulsed execution (multiple scan execution type)
Application example	Refer to "Appendix 1 - FB Library Application Examples"
Timing chart	
Relevant manuals	•MELSEC-Q QD73A1 Positioning Module User's Manual •QCPU User's Manual (Hardware Design, Maintenance and Inspection) •GX Works2 Version 1 Operating Manual (Common) •GX Works2 Version 1 Operating Manual (Simple Project, Function Block)

Labels

●Input labels

Name (Comment)	Label name	Data type	Setting range	Description
Execution command	FB_EN	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
Module start XY address	i_Start_IO_No	Word	Depends on the I/O point range. For details, refer to the CPU user's manual.	Specify the starting XY address (in hexadecimal) where the QD73A1 is mounted. (For example, enter H10 for X10.)

●Output labels

Name (Comment)	Label name	Data type	Initial value	Description
Execution status	FB_ENO	Bit	OFF	ON: Execution command is ON. OFF: Execution command is OFF.
Speed-position mode restart request complete	FB_OK	Bit	OFF	When ON, it indicates that the speed-position mode restart is completed.

FB Version Upgrade History

Version	Date	Description
1.00A	2012/12/21	First edition

Note

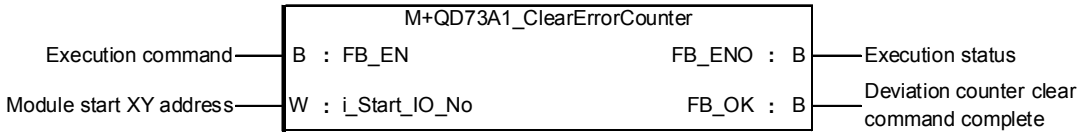
This chapter includes information related to the function block.
It does not include information on restrictions of use such as combination with positioning modules or programmable controller CPUs.
Please make sure to read user's manuals for the corresponding products before using the products.

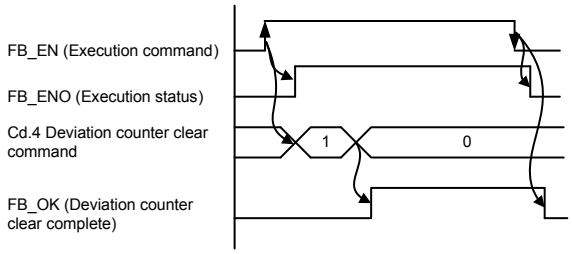
2.13 M+QD73A1_ClearErrorCounter (Deviation counter clear)

FB Name

M+QD73A1_ClearErrorCounter

Function Overview

<table>
<tr><th>Item</th><th colspan="2">Description</th></tr>
<tr><td>Function overview</td><td colspan="2">Clears the deviation counter.</td></tr>
<tr><td>Symbol</td><td colspan="2"> 
</td></tr>
<tr><td rowspan="3">Applicable hardware and software</td><td>Positioning Module</td><td>QD73A1</td></tr>
<tr><td>CPU module</td><td>
<table>
<tr><th>Series</th><th>Model</th></tr>
<tr><td rowspan="3">MELSEC-Q Series *1</td><td>Basic model QCPU</td></tr>
<tr><td>High performance model QCPU</td></tr>
<tr><td>Universal model QCPU</td></tr>
</table>
*1 Not applicable to QCPU-A (A mode)
</td></tr>
<tr><td>Engineering software</td><td>GX Works2 *1
<table>
<tr><th>Language</th><th>Software version</th></tr>
<tr><td>English version</td><td>Version1.24A or later</td></tr>
<tr><td>Chinese version</td><td>Version1.49B or later</td></tr>
</table>
*1 For software versions applicable to the modules used, refer to "Relevant manuals".
</td></tr>
<tr><td>Programming language</td><td colspan="2">Ladder</td></tr>
<tr><td>Number of steps</td><td colspan="2">232 steps (for MELSEC-Q series universal model CPU)
* The number of steps of the FB in a program depends on the CPU model that is used and input and output definition.</td></tr>
<tr><td>Function description</td><td colspan="2">1) By turning ON FB_EN (Execution command), the accumulated pulses in the deviation counter are cleared.
2) After FB_EN (Execution command) is turned ON, the FB is completed in multiple scans.</td></tr>
<tr><td>Compiling method</td><td colspan="2">Macro type</td></tr>
</table>

Item	Description
Restrictions and precautions	1) The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation. 2) The FB cannot be used in an interrupt program. 3) Please ensure that the FB_EN signal 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, FOR-NEXT loop, etc. because it is impossible to turn OFF. 4) This FB uses index registers Z8 and Z9. Please do not use these index registers in an interrupt program. 5) If FB_EN (Execution command) is turned ON while the BUSY signal [Xn4] is ON, the request will be ignored. In this case, FB_OK (Deviation counter clear complete) is not turned ON. 6) Every input must be provided with a value for proper FB operation. 7) To operate the QD73A1, the intelligent function module switches such as encoder I/F setting and multiplication setting must be properly configured according to the connected devices and systems.
FB operation type	Pulsed execution (multiple scan execution type)
Application example	Refer to "Appendix 1 - FB Library Application Examples"
Timing chart	
Relevant manuals	•MELSEC-Q QD73A1 Positioning Module User's Manual •QCPU User's Manual (Hardware Design, Maintenance and Inspection) •GX Works2 Version 1 Operating Manual (Common) •GX Works2 Version 1 Operating Manual (Simple Project, Function Block)

Labels

●Input labels

Name (Comment)	Label name	Data type	Setting range	Description
Execution command	FB_EN	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
Module start XY address	i_Start_IO_No	Word	Depends on the I/O point range. For details, refer to the CPU user's manual.	Specify the starting XY address (in hexadecimal) where the QD73A1 is mounted. (For example, enter H10 for X10.)

●Output labels

Name (Comment)	Label name	Data type	Initial value	Description
Execution status	FB_ENO	Bit	OFF	ON: Execution command is ON. OFF: Execution command is OFF.
Deviation counter clear command complete	FB_OK	Bit	OFF	When ON, it indicates that the deviation counter clear is completed.

FB Version Upgrade History

Version	Date	Description
1.00A	2012/12/21	First edition

Note

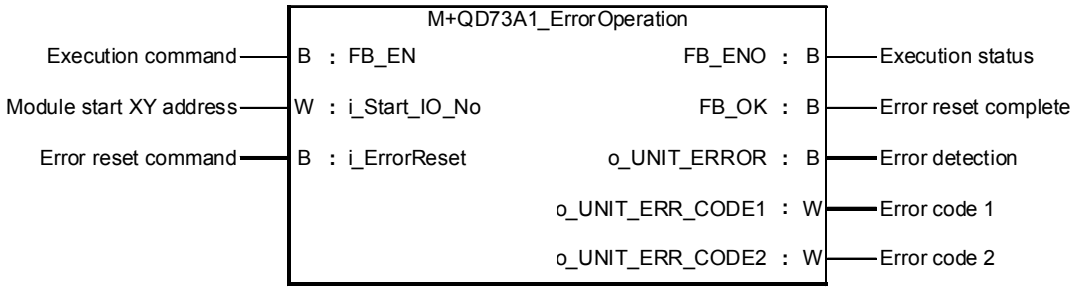
This chapter includes information related to the function block.
It does not include information on restrictions of use such as combination with positioning modules or programmable controller CPUs.
Please make sure to read user's manuals for the corresponding products before using the products.

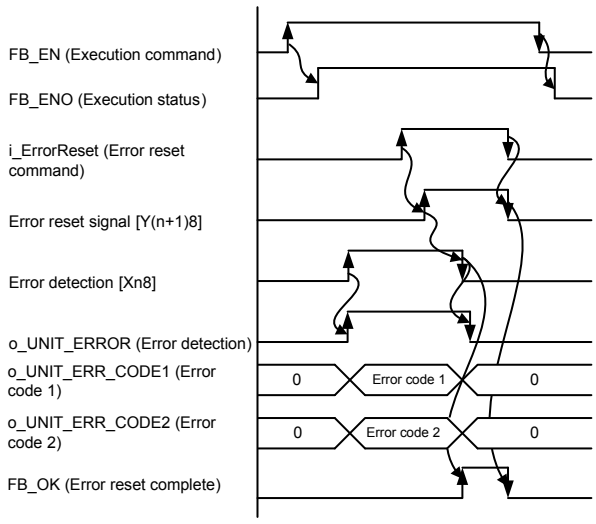
2.14 M+QD73A1_ErrorOperation (Error operation)

FB Name

M+QD73A1_ErrorOperation

Function Overview

<table>
<tr><td>Item</td><td colspan="2">Description</td></tr>
<tr><td>Function overview</td><td colspan="2">Monitors errors and resets errors.</td></tr>
<tr><td>Symbol</td><td colspan="2"> 
</td></tr>
<tr><td rowspan="3">Applicable hardware and software</td><td>Positioning Module</td><td>QD73A1</td></tr>
<tr><td>CPU module</td><td>
<table>
<tr><th>Series</th><th>Model</th></tr>
<tr><td rowspan="3">MELSEC-Q Series *1</td><td>Basic model QCPU</td></tr>
<tr><td>High performance model QCPU</td></tr>
<tr><td>Universal model QCPU</td></tr>
</table>
*1 Not applicable to QCPU-A (A mode)
</td></tr>
<tr><td>Engineering software</td><td>GX Works2 *1
<table>
<tr><th>Language</th><th>Software version</th></tr>
<tr><td>English version</td><td>Version1.24A or later</td></tr>
<tr><td>Chinese version</td><td>Version1.49B or later</td></tr>
</table>
*1 For software versions applicable to the modules used, refer to "Relevant manuals".
</td></tr>
<tr><td>Programming language</td><td colspan="2">Ladder</td></tr>
<tr><td>Number of steps</td><td colspan="2">272 steps (for MELSEC-Q series universal model CPU)
* The number of steps of the FB in a program depends on the CPU model that is used and input and output definition.</td></tr>
</table>

Item	Description
Function description	1) When FB_EN (Execution command) is turned ON, an error is monitored. 2) An error code is stored in o_ErrorCode1 (Error code 1) and o_UNIT_ERR_CODE2 (Error code 2) when a module error occurs. 3) After FB_EN (Execution command) is turned ON, an error is reset when i_ErrorReset (Error reset command) is turned ON during error occurrence. 4) After FB_EN (Execution command) is turned ON, the FB is always executed. 5) When i_ErrorReset (Error reset command) is turned ON without errors, the error reset signal [Y(n+1)8] is not turned ON but FB_OK (Error reset complete) is turned ON.
Compiling method	Macro type
Restrictions and precautions	1) The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation. 2) The FB cannot be used in an interrupt program. 3) Please ensure that the FB_EN signal 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, FOR-NEXT loop, etc. because it is impossible to turn OFF. 4) This FB uses index registers Z8 and Z9. Please do not use these index registers in an interrupt program. 5) 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 index modification. However this is not a problem and the FB will operate without error. 6) Every input must be provided with a value for proper FB operation. 7) To operate the QD73A1, the intelligent function module switches such as encoder I/F setting and multiplication setting must be properly configured according to the connected devices and systems.
FB operation type	Real-time execution
Application example	Refer to "Appendix 1 - FB Library Application Examples"
Timing chart	

Item	Description
Relevant manuals	•MELSEC-Q QD73A1 Positioning Module User's Manual •QCPU User's Manual (Hardware Design, Maintenance and Inspection) •GX Works2 Version 1 Operating Manual (Common) •GX Works2 Version 1 Operating Manual (Simple Project, Function Block)

Labels

●Input labels

Name (Comment)	Label name	Data type	Setting range	Description
Execution command	FB_EN	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
Module start XY address	i_Start_IO_No	Word	Depends on the I/O point range. For details, refer to the CPU user's manual.	Specify the starting XY address (in hexadecimal) where the QD73A1 is mounted. (For example, enter H10 for X10.)
Error reset command	i_ErrorReset	Bit	ON, OFF	ON: An error is reset. OFF: An error is not reset.

●Output labels

Name (Comment)	Label name	Data type	Initial value	Description
Execution status	FB_ENO	Bit	OFF	ON: Execution command is ON. OFF: Execution command is OFF.
Error reset complete	FB_OK	Bit	OFF	When ON, it indicates that an error reset is completed.
Error detection	o_UNIT_ERROR	Bit	OFF	When ON, it indicates that an error has occurred.
Error code 1	o_UNIT_ERR_CODE1	Word	0	Return an error code 1 caused in the module.
Error code 2	o_UNIT_ERR_CODE2	Word	0	Return an error code 2 caused in the module.

FB Version Upgrade History

Version	Date	Description
1.00A	2012/12/21	First edition

Note

This chapter includes information related to the function block.

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

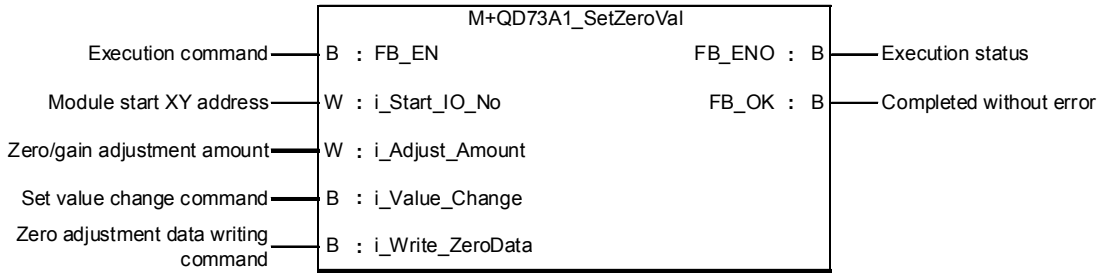
Please make sure to read user's manuals for the corresponding products before using the products.

2.15 M+QD73A1_SetZeroVal (Zero setting)

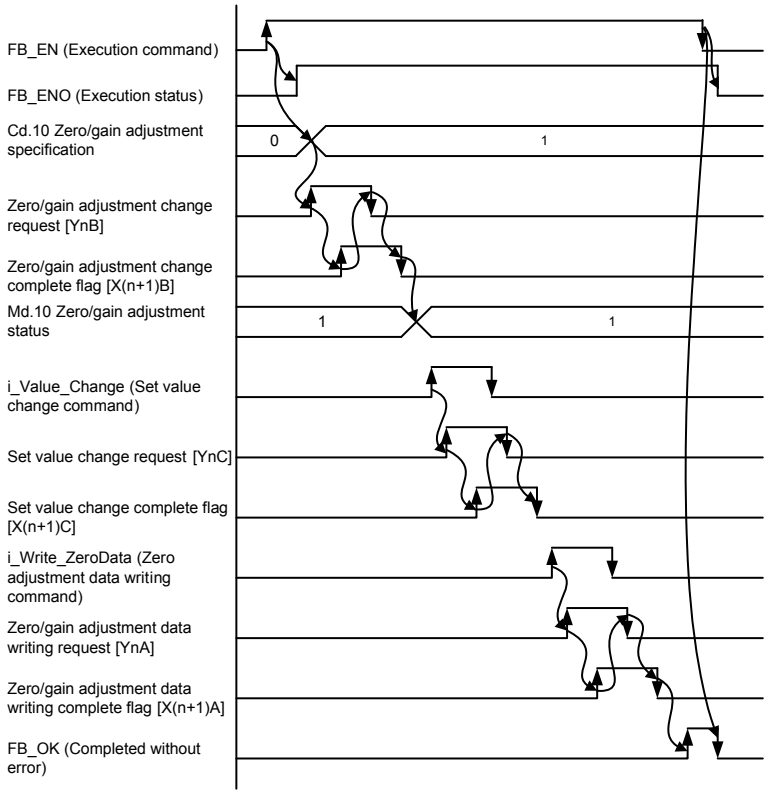
FB Name

M+QD73A1_SetZeroVal

Function Overview

<table>
<tr><td>Item</td><td colspan="2">Description</td></tr>
<tr><td>Function overview</td><td colspan="2">Sets the zero setting for the analog output value.</td></tr>
<tr><td>Symbol</td><td colspan="2"> 
</td></tr>
<tr><td rowspan="3">Applicable hardware and software</td><td>Positioning Module</td><td>QD73A1</td></tr>
<tr><td>CPU module</td><td>
<table>
<tr><th>Series</th><th>Model</th></tr>
<tr><td rowspan="3">MELSEC-Q Series *1</td><td>Basic model QCPU</td></tr>
<tr><td>High performance model QCPU</td></tr>
<tr><td>Universal model QCPU</td></tr>
</table>
*1 Not applicable to QCPU-A (A mode)
</td></tr>
<tr><td>Engineering software</td><td>GX Works2 *1
<table>
<tr><th>Language</th><th>Software version</th></tr>
<tr><td>English version</td><td>Version1.24A or later</td></tr>
<tr><td>Chinese version</td><td>Version1.49B or later</td></tr>
</table>
*1 For software versions applicable to the modules used, refer to "Relevant manuals".
</td></tr>
<tr><td>Programming language</td><td colspan="2">Ladder</td></tr>
<tr><td>Number of steps</td><td colspan="2">392 steps (for MELSEC-Q series universal model CPU)
* The number of steps of the FB in a program depends on the CPU model that is used and input and output definition.</td></tr>
</table>

Item	Description
Function description	1) By turning ON FB_EN (Execution command), the zero setting for the analog output value is set. 2) After FB_EN (Execution command) is turned ON, i_Write_ZeroData (Zero adjustment data writing command) is turned ON. Then, the FB is completed in multiple scans. 3) To adjust the analog output value, set i_Adjust_Amount (Zero/gain adjustment amount) and turn ON from OFF i_Value_Change (Set value change command) during the FB_EN (Execution command) ON. 4) To register the zero setting value to the QD73A1 after the zero setting is completed, turn ON from OFF i_Write_ZeroData (Zero adjustment data writing command) during FB_EN (Execution command) ON. 5) If "In the zero/gain adjustment mode (switch setting)" is not set, the zero setting request after FB_EN (Execution command) is turned ON will be ignored. In this case, i_Write_ZeroData (Zero adjustment data writing command) is turned ON, and FB_OK (Completed without error) is not turned ON.
Compiling method	Macro type
Restrictions and precautions	1) The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation. 2) The FB cannot be used in an interrupt program. 3) Please ensure that the FB_EN signal 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, FOR-NEXT loop, etc. because it is impossible to turn OFF. 4) This FB uses index registers Z8 and Z9. Please do not use these index registers in an interrupt program. 5) 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 index modification. However this is not a problem and the FB will operate without error. 6) Every input must be provided with a value for proper FB operation. 7) Before using this FB, the mode must be shifted to the zero/gain adjustment mode through the intelligent function module switch setting. For the shifting method through the intelligent function module switch setting, please read MELSEC-Q QD73A1 Positioning Module User's Manual.
FB operation type	Pulsed execution (multiple scan execution type)
Application example	Refer to "Appendix 1 - FB Library Application Examples"

Item	Description
Timing chart	
Relevant manuals	•MELSEC-Q QD73A1 Positioning Module User's Manual •QCPU User's Manual (Hardware Design, Maintenance and Inspection) •GX Works2 Version 1 Operating Manual (Common) •GX Works2 Version 1 Operating Manual (Simple Project, Function Block)

Labels

●Input labels

Name (Comment)	Label name	Data type	Setting range	Description
Execution command	FB_EN	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
Module start XY address	i_Start_IO_No	Word	Depends on the I/O point range. For details, refer to the CPU user's manual.	Specify the starting XY address (in hexadecimal) where the QD73A1 is mounted. (For example, enter H10 for X10.)
Zero/gain adjustment amount	i_Adjust_Amount	Word	-3,000 to 3,000	Specify the adjustment amount for the analog output adjustment.
Set value change command	i_Value_Change	Bit	ON, OFF	Turn ON for analog output change. Turn OFF after the analog output change.
Zero adjustment data writing command	i_Write_ZeroData	Bit	ON, OFF	Turn ON for the registration of the adjusted zero adjustment value to the QD73A1. Turn OFF after the registration.

●Output labels

Name (Comment)	Label name	Data type	Initial value	Description
Execution status	FB_ENO	Bit	OFF	ON: Execution command is ON. OFF: Execution command is OFF.
Completed without error	FB_OK	Bit	OFF	When ON, it indicates that the zero adjustment is completed.

FB Version Upgrade History

Version	Date	Description
1.00A	2012/12/21	First edition

Note

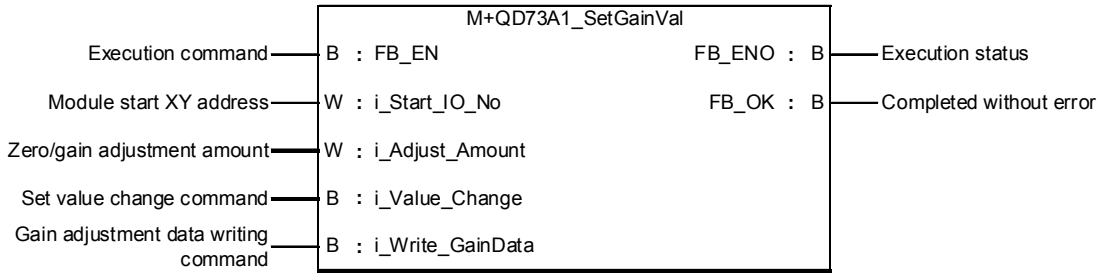
This chapter includes information related to the function block.
It does not include information on restrictions of use such as combination with positioning modules or programmable controller CPUs.
Please make sure to read user's manuals for the corresponding products before using the products.

2.16 M+QD73A1_SetGainVal (Gain setting)

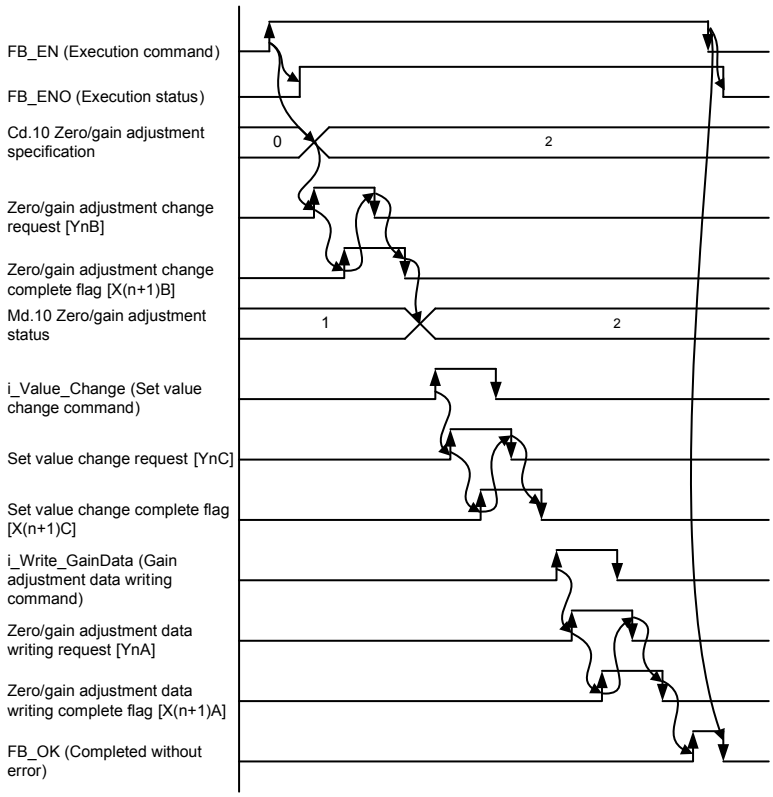
FB Name

M+QD73A1_SetGainVal

Function Overview

<table>
<tr><td>Item</td><td colspan="2">Description</td></tr>
<tr><td>Function overview</td><td colspan="2">Sets the gain setting for the analog output value.</td></tr>
<tr><td>Symbol</td><td colspan="2"> 
</td></tr>
<tr><td rowspan="3">Applicable hardware and software</td><td>Positioning Module</td><td>QD73A1</td></tr>
<tr><td>CPU module</td><td>
<table>
<tr><th>Series</th><th>Model</th></tr>
<tr><td rowspan="3">MELSEC-Q Series *1</td><td>Basic model QCPU</td></tr>
<tr><td>High performance model QCPU</td></tr>
<tr><td>Universal model QCPU</td></tr>
</table>
*1 Not applicable to QCPU-A (A mode)
</td></tr>
<tr><td>Engineering software</td><td>GX Works2 *1
<table>
<tr><th>Language</th><th>Software version</th></tr>
<tr><td>English version</td><td>Version1.24A or later</td></tr>
<tr><td>Chinese version</td><td>Version1.49B or later</td></tr>
</table>
*1 For software versions applicable to the modules used, refer to "Relevant manuals".
</td></tr>
<tr><td>Programming language</td><td colspan="2">Ladder</td></tr>
<tr><td>Number of steps</td><td colspan="2">404 steps (for MELSEC-Q series universal model CPU)
* The number of steps of the FB in a program depends on the CPU model that is used and input and output definition.</td></tr>
</table>

Item	Description
Function description	1) By turning ON FB_EN (Execution command), the gain setting for the analog output value is set. 2) After FB_EN (Execution command) is turned ON, i_Write_GainData (Gain adjustment data writing command) is turned ON. Then, the FB is completed in multiple scans. 3) To adjust the analog output value, set i_Adjust_Amount (Zero/gain adjustment amount) and turn ON from OFF i_Value_Change (Set value change command) during the FB_EN (Execution command) ON. 4) To register the gain setting value to the QD73A1 after the gain setting is completed, turn ON from OFF i_Write_GainData (Gain adjustment data writing command) during FB_EN (Execution command) ON. 5) If "In the zero/gain adjustment mode (switch setting)" is not set, the gain setting request after FB_EN (Execution command) is turned ON will be ignored. In this case, i_Write_GainData (Gain adjustment data writing command) is turned ON, and FB_OK (Completed without error) is not turned ON.
Compiling method	Macro type
Restrictions and precautions	1) The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation. 2) The FB cannot be used in an interrupt program. 3) Please ensure that the FB_EN signal 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, FOR-NEXT loop, etc. because it is impossible to turn OFF. 4) This FB uses index registers Z8 and Z9. Please do not use these index registers in an interrupt program. 5) 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 index modification. However this is not a problem and the FB will operate without error. 6) Every input must be provided with a value for proper FB operation. 7) Before using this FB, the mode must be shifted to the zero/gain adjustment mode through the intelligent function module switch setting. For the shifting method through the intelligent function module switch setting, please read MELSEC-Q QD73A1 Positioning Module User's Manual.
FB operation type	Pulsed execution (multiple scan execution type)
Application example	Refer to "Appendix 1 - FB Library Application Examples"

Item	Description
Timing chart	
Relevant manuals	•MELSEC-Q QD73A1 Positioning Module User's Manual •QCPU User's Manual (Hardware Design, Maintenance and Inspection) •GX Works2 Version 1 Operating Manual (Common) •GX Works2 Version 1 Operating Manual (Simple Project, Function Block)

Labels

●Input labels

Name (Comment)	Label name	Data type	Setting range	Description
Execution command	FB_EN	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
Module start XY address	i_Start_IO_No	Word	Depends on the I/O point range. For details, refer to the CPU user's manual.	Specify the starting XY address (in hexadecimal) where the QD73A1 is mounted. (For example, enter H10 for X10.)
Zero/gain adjustment amount	i_Adjust_Amount	Word	-3,000 to 3,000	Specify the adjustment amount for the analog output adjustment.
Set value change command	i_Value_Change	Bit	ON, OFF	Turn ON for analog output change. Turn OFF after the analog output change.
Gain adjustment data writing command	i_Write_GainData	Bit	ON, OFF	Turn ON for the registration of the adjusted gain adjustment value to the QD73A1. Turn OFF after the registration.

●Output labels

Name (Comment)	Label name	Data type	Initial value	Description
Execution status	FB_ENO	Bit	OFF	ON: Execution command is ON. OFF: Execution command is OFF.
Completed without error	FB_OK	Bit	OFF	When ON, it indicates that the gain adjustment is completed.

FB Version Upgrade History

Version	Date	Description
1.00A	2012/12/21	First edition

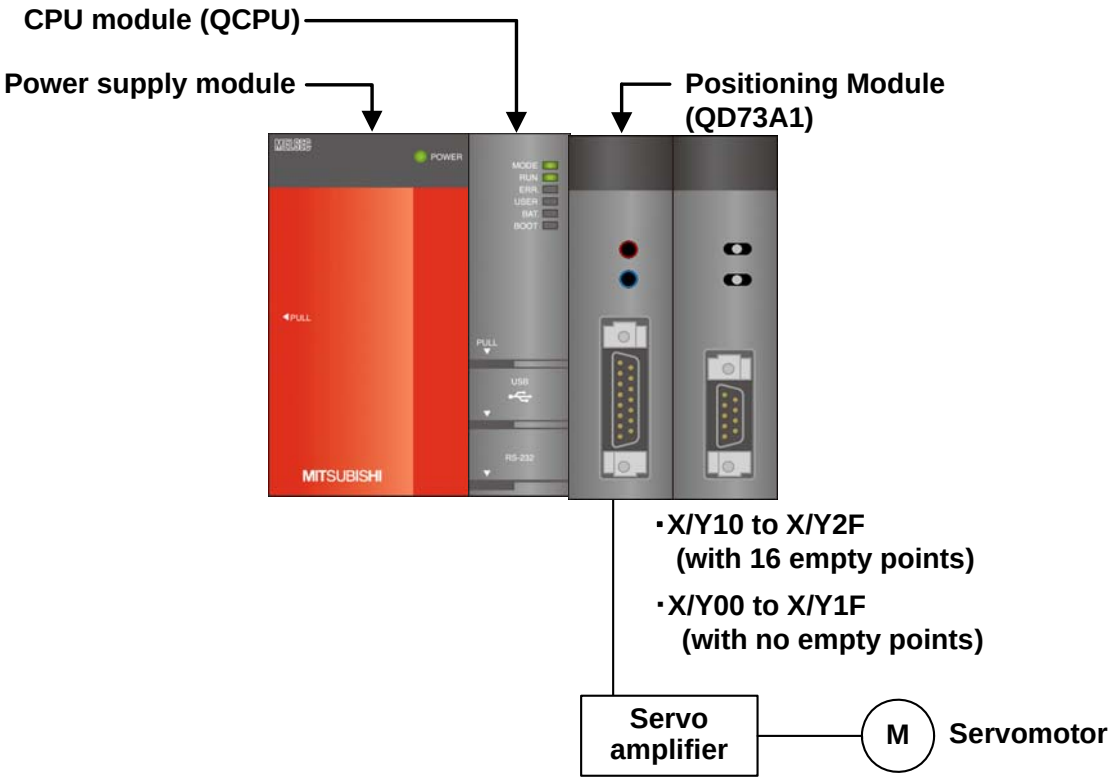
Note

This chapter includes information related to the function block.
It does not include information on restrictions of use such as combination with positioning modules or programmable controller CPUs.
Please make sure to read user's manuals for the corresponding products before using the products.

Appendix 1. FB Library Application Examples

QD73A1 Application examples are as follows.

1) System Configuration Examples



Reminder

- Every input must be provided with a value for proper FB operation.
  If not set, the values will be unspecified.
- Abbreviations may be used in the label comments due to the limitation on the number of the characters to display in GX Works2.

2) List of devices

a) External input (commands)

Device	FB function name	Application (ON details)
M0	M+QD73A1_SetFPARAM	Fixed parameter setting request
M10	M+QD73A1_SetVPARAM	Variable parameter setting req.
M20	M+QD73A1_SetZData	OPR data setting request
M30	M+QD73A1_SetPosiData	Positioning data setting request
M40	M+QD73A1_CPUReady	PLC READY signal ON request
M50	M+QD73A1_StartPosi	Positioning start request
M60	M+QD73A1_JOG	JOG start request
M61		Forward JOG start
M62		Reverse JOG start
M70	M+QD73A1_StartFeed	Fixed-feed start request
M71		Fixed-feed start command
M80	M+QD73A1_ChgCurrentVal	Current value change request
M90	M+QD73A1_ChgSpeed	Speed change request
M100	M+QD73A1_VPChgDistance	Spd-pstn mvmt amt chng request
M110	M+QD73A1_VPRestart	Spd-pstn mode restart request
M120	M+QD73A1_ClearErrorCounter	Deviation counter clear request
M130	M+QD73A1_ErrorOperation	Error operation FB start
M131		Error reset request
M140	M+QD73A1_SetZeroVal	Zero setting request
M141		Zero setting value change cmd
M142		Zero ad. data writing request
M150	M+QD73A1_SetGainVal	Gain setting request
M151		Gain setting value change cmd
M152		Gain ad. data writing request

b) External output (checks)

Device	FB function name	Application (ON details)
M1	M+QD73A1_SetFPARAM	Fixed parameter setting ready
M2		Fixed parameter setting complete
M11	M+QD73A1_SetVPARAM	Variable parameter setting ready
M12		Variable parameter setting comp.

Device	FB function name	Application (ON details)
M21	M+QD73A1_SetZData	OPR data setting ready
M22		OPR data setting complete
M31	M+QD73A1_SetPosiData	Positioning data setting ready
M32		Positioning data setting comp.
M41	M+QD73A1_CPUReady	PLC READY signal ON ready
M42		PLC READY signal ON complete
M51	M+QD73A1_StartPosi	Positioning start ready
M52		Execution complete
F50		Positioning start FB error
D50		Positioning start FB error code
M63	M+QD73A1_JOG	JOG operation ready
M64		JOG operation start complete
M72	M+QD73A1_StartFeed	Fixed-feed ready
M73		Fixed-feed operation start
M81	M+QD73A1_ChgCurrentVal	Current value change ready
M82		Current value change req comp.
M91	M+QD73A1_ChgSpeed	Speed change ready
M92		Speed change request complete
M101	M+QD73A1_VPChgDistance	Spd-pstn mvmt amt chng ready
M102		Spd-pstn mvmt amt chng req comp.
M111	M+QD73A1_VPRestart	Spd-pstn mode restart ready
M112		Spd-pstn mode restart req comp.
M121	M+QD73A1_ClearErrorCounter	Deviation counter clear ready
M122		Deviation counter clear cmd comp
M132	M+QD73A1_ErrorOperation	Error reset ready
M133		Error reset complete
M134		Error detection
D130		Error code 1
D131		Error code 2
M143	M+QD73A1_SetZeroVal	Zero setting FB ready
M144		Zero setting complete
M153	M+QD73A1_SetGainVal	Gain setting FB ready
M154		Gain setting complete

3) Program

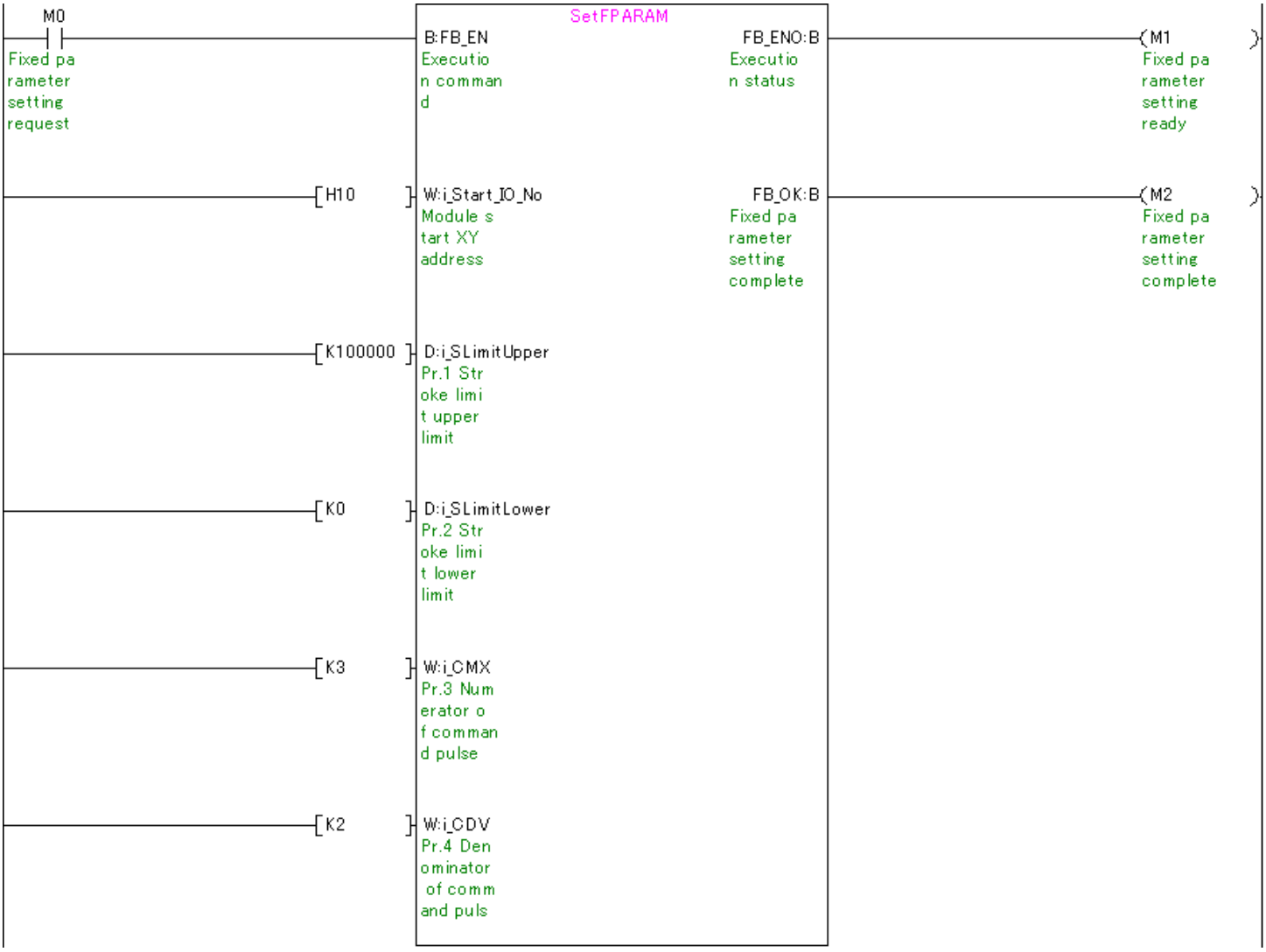
M+QD73A1_SetFPARAM (Fixed parameter setting)

The following shows the example program with the conditions described in the table below.

Label name	Setting value	Description
i_Start_IO_No	H10	Specify the starting XY address of the second slot where the QD73A1 is mounted to 10H.
i_SLimitUpper	K100000	Set the fixed parameter "Pr.1 Stroke limit upper limit" to 100,000 [pulse].
i_SLimitLower	K0	Set the fixed parameter "Pr.2 Stroke limit lower limit" to 0 [pulse].
i_CMX	K3	Set the fixed parameter "Pr.3 Numerator of command pulse multiplication for electronic gear" to 3.
i_CDV	K2	Set the fixed parameter "Pr.4 Denominator of command pulse multiplication for electronic gear" to 2.

By turning ON M0, the fixing parameters are set to the QD73A1.

To enable the setting values, turn ON from OFF the PLC READY signal [Y(n+1)D].

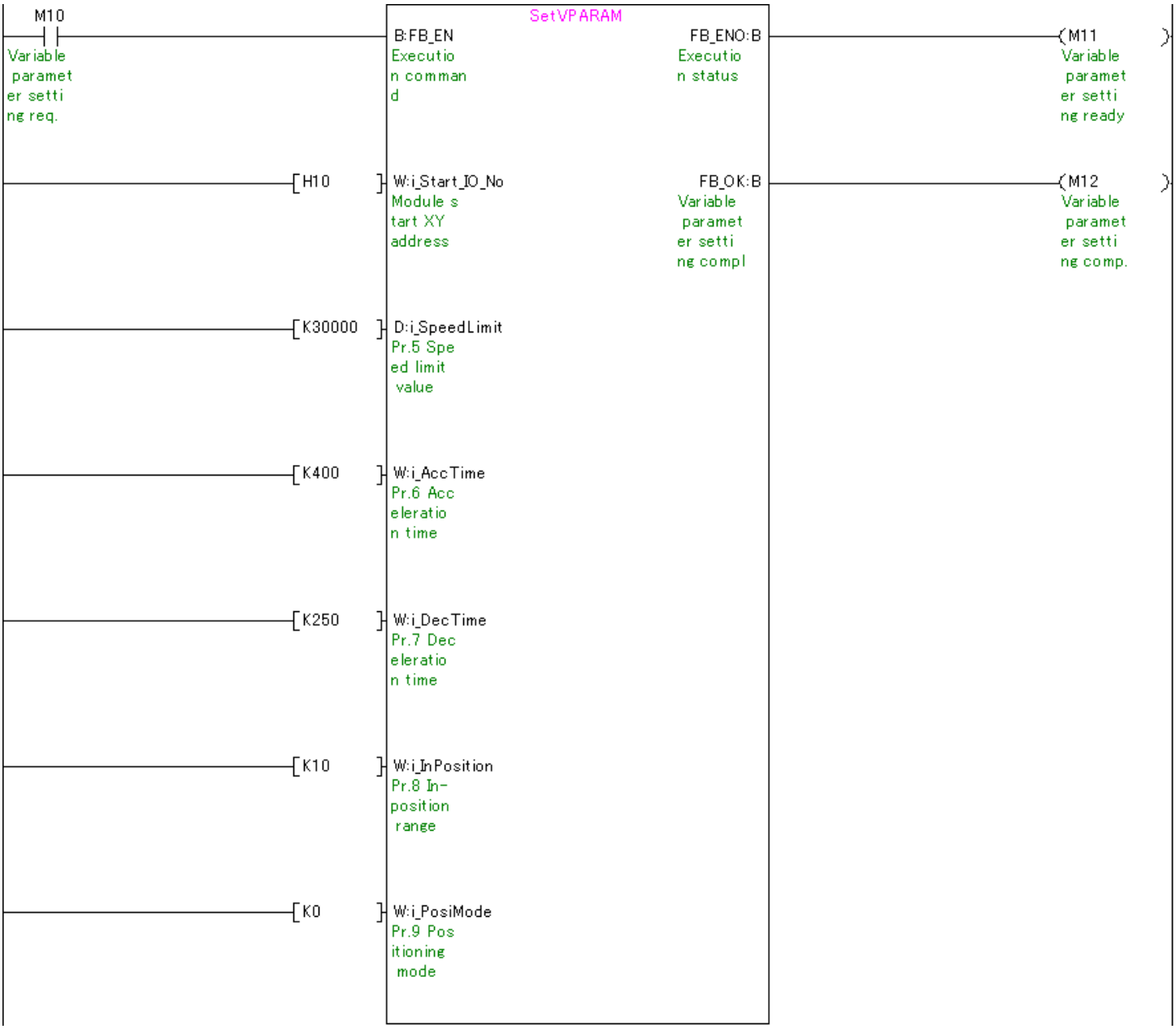


M+QD73A1_SetVPARAM (Variable parameter setting)

The following shows the example program with the conditions described in the table below.

Label name	Setting value	Description
i_Start_IO_No	H10	Specify the starting XY address of the second slot where the QD73A1 is mounted to 10H.
i_SpeedLimit	K30000	Set the variable parameter "Pr.5 Speed limit value" to 30,000 [pulse/s].
i_AccTime	K400	Set the variable parameter "Pr.6 Acceleration time" to 400 [ms].
i_DecTime	K250	Set the variable parameter "Pr.7 Deceleration time" to 250 [ms].
i_InPosition	K10	Set the variable parameter "Pr.8 In-position range" to 10.
i_PosiMode	K0	Set the variable parameter "Pr.9 Positioning mode" to the positioning control mode.

By turning ON M10, the variable parameters are set to the QD73A1.



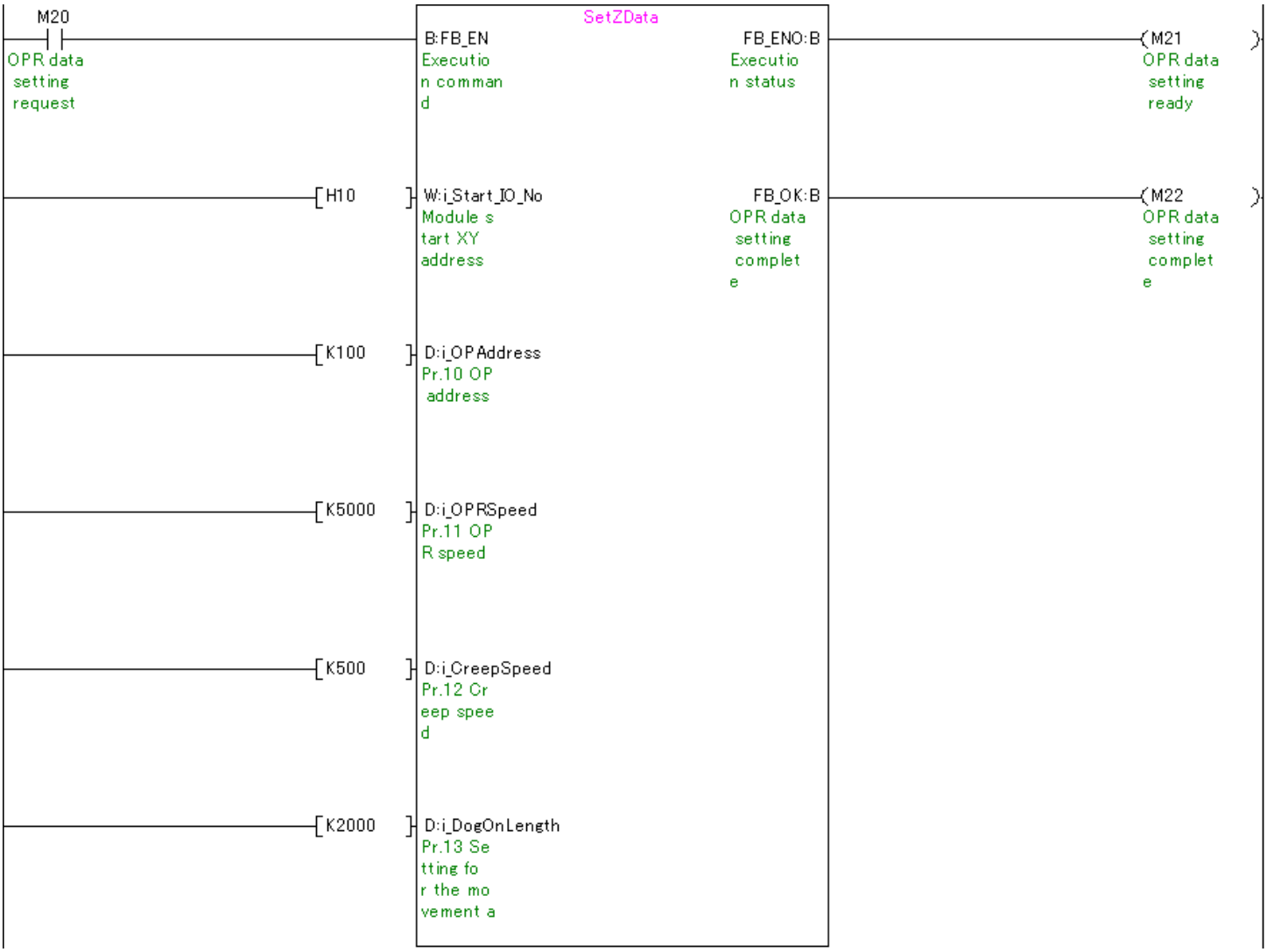
M+QD73A1_SetZData (OPR data setting)

The following shows the example program with the conditions described in the table below.

Label name	Setting value	Description
i_Start_IO_No	H10	Specify the starting XY address of the second slot where the QD73A1 is mounted to 10H.
i_OPAddress	K100	Set the OPR data "Pr.10 OP address" to 100 [pulse].
i_OPRSpeed	K5000	Set the OPR data "Pr.11 OPR speed" to 5,000 [pulse/s].
i_CreepSpeed	K500	Set the OPR data "Pr.12 Creep speed" to 500 [pulse/s].
i_DogOnLength	K2000	Set the OPR data "Pr.13 Setting for the movement amount after near-point dog ON" to 2,000 [pulse].

By turning ON M20, the OPR data is set to the QD73A1.

To enable the setting values, turn ON from OFF the PLC READY signal [Y(n+1)D].

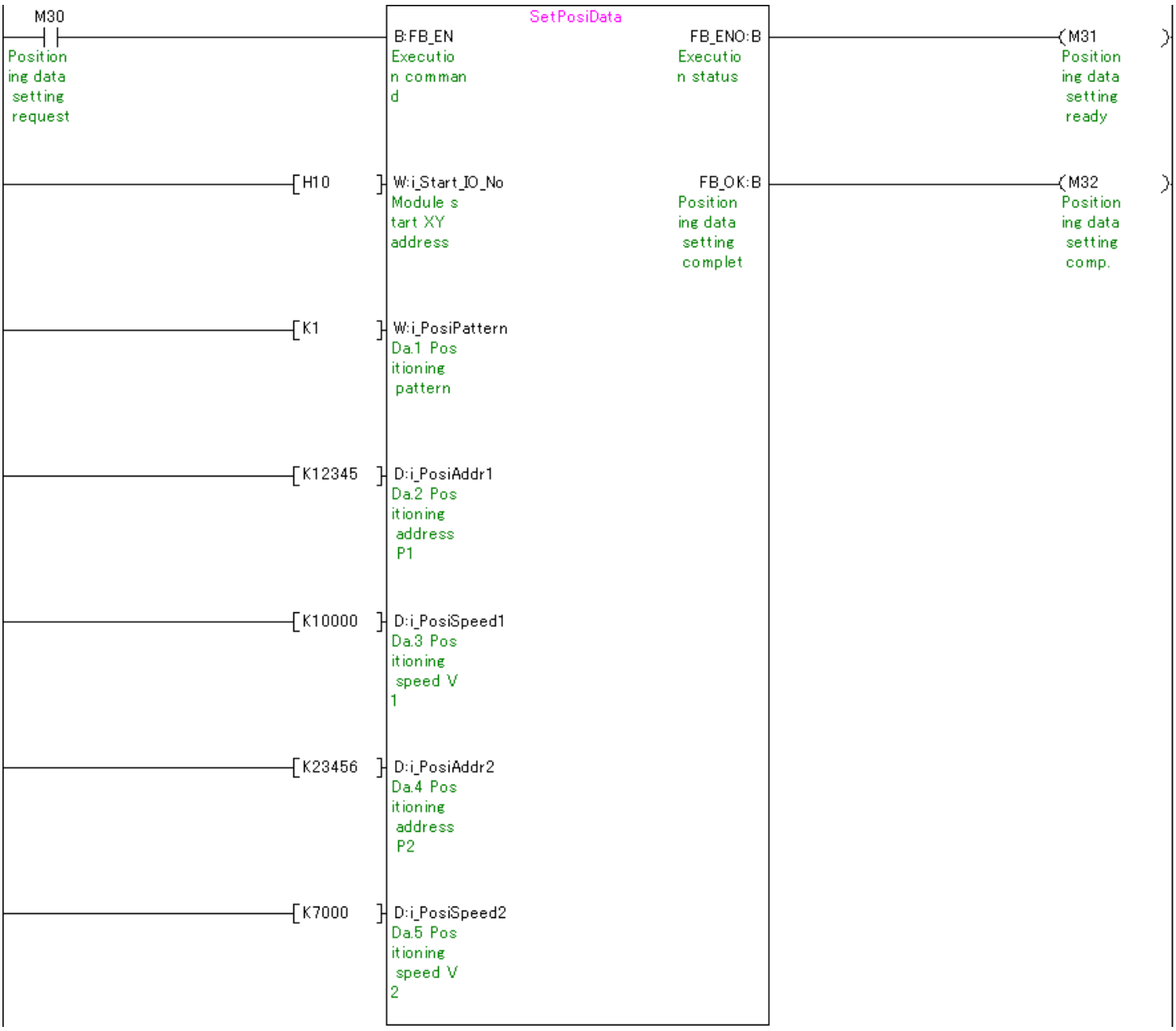


M+QD73A1_SetPosiData (Positioning data setting)

The following shows the example program with the conditions described in the table below.

Label name	Setting value	Description
i_Start_IO_No	H10	Specify the starting XY address of the second slot where the QD73A1 is mounted to 10H.
i_PosiPattern	K1	Set the positioning data "Da.1 Positioning pattern" to "Two-phase trapezoidal positioning control".
i_PosiAddr1	K12345	Set the positioning data "Da.2 Positioning address P1" to 12,345 [pulse].
i_PosiSpeed1	K10000	Set the positioning data "Da.3 Positioning speed V1" to 10,000 [pulse/s].
i_PosiAddr2	K23456	Set the positioning data "Da.4 Positioning address P2" to 23,456 [pulse].
i_PosiSpeed2	K7000	Set the positioning data "Da.5 Positioning speed V2" to 7,000 [pulse/s].

By turning ON M30, the positioning data is set to the QD73A1.

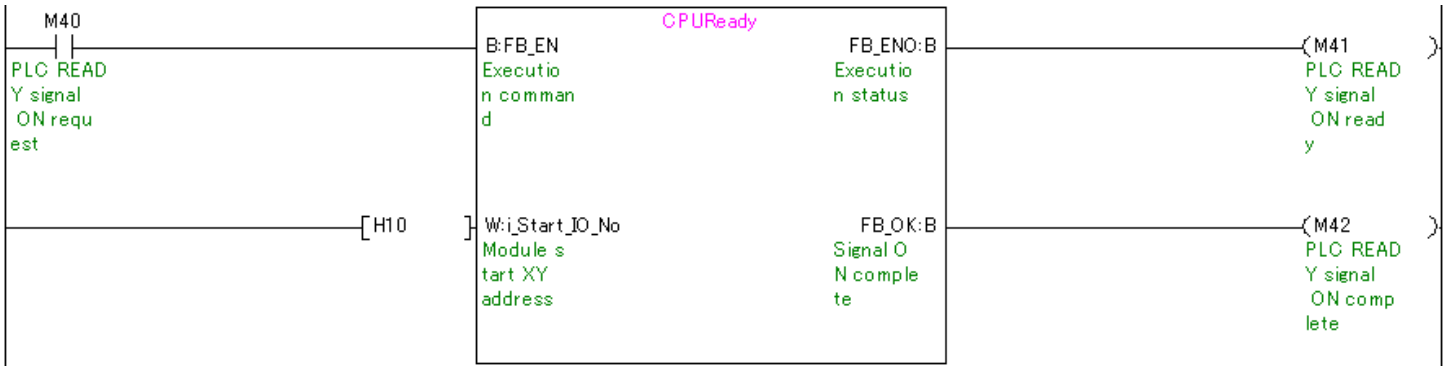


M+QD73A1_CPUReady (PLC READY signal ON)

The following shows the example program with the conditions described in the table below.

Label name	Setting value	Description
i_Start_IO_No	H10	Specify the starting XY address of the second slot where the QD73A1 is mounted to 10H.

By turning ON M40, the PLC READY signal [Y(n+1)D] is turned ON.

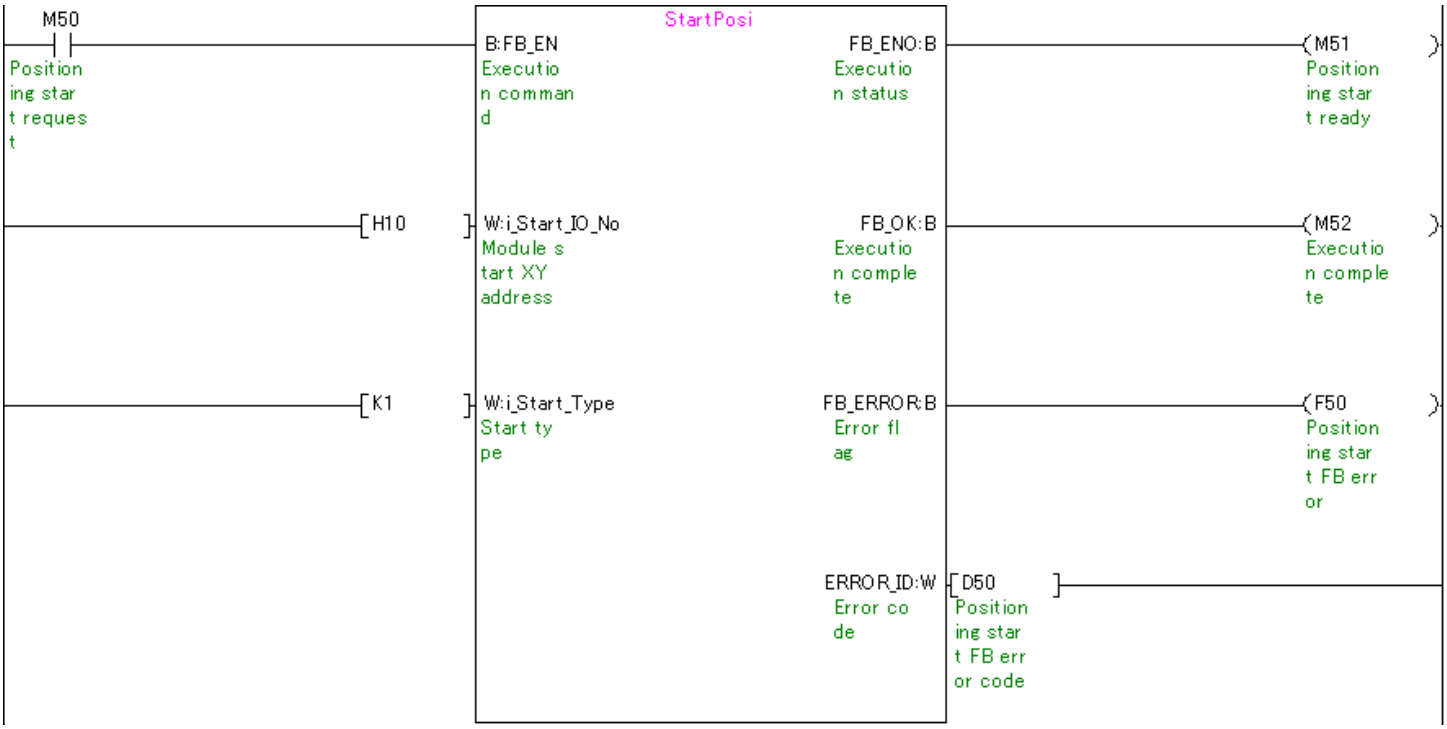


M+QD73A1_StartPosi (Positioning start)

The following shows the example program with the conditions described in the table below.

Label name	Setting value	Description
i_Start_IO_No	H10	Specify the starting XY address of the second slot where the QD73A1 is mounted to 10H.
i_Start_Type	K1	Specify the absolute positioning start.

By turning ON M50, the positioning set by i_Start_Type (start type) is started.



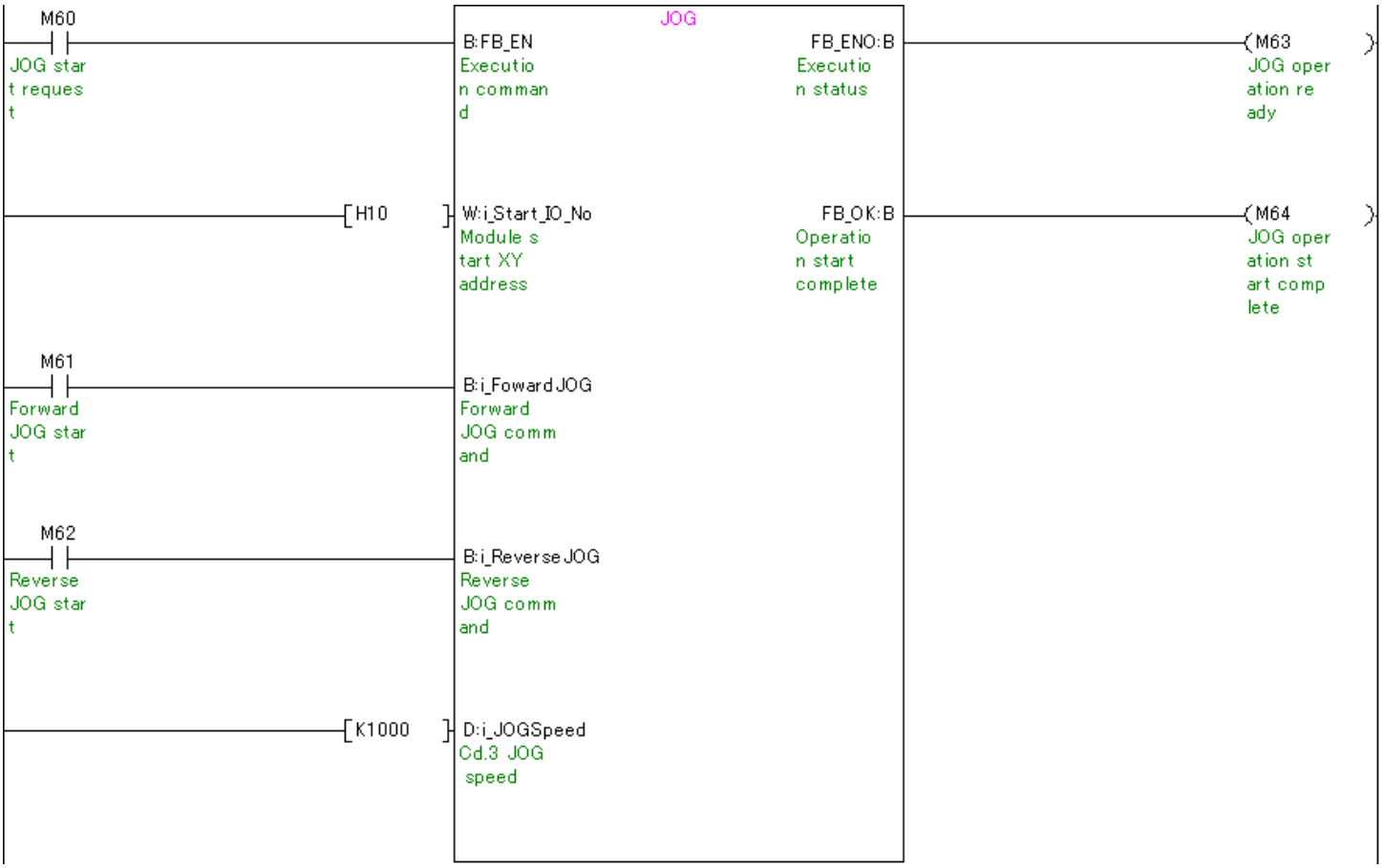
M+QD73A1_JOG (JOG start)

The following shows the example program with the conditions described in the table below.

Label name	Setting value	Description
i_Start_IO_No	H10	Specify the starting XY address of the second slot where the QD73A1 is mounted to 10H.
i_JOGSpeed	K1000	Set the control data "Cd.3 JOG speed" to 1,000 [pulse/s].

By turning ON M60 with M61 ON, the JOG operation is started in the forward direction.

By turning ON M60 with M62 ON, the JOG operation is started in the reverse direction.

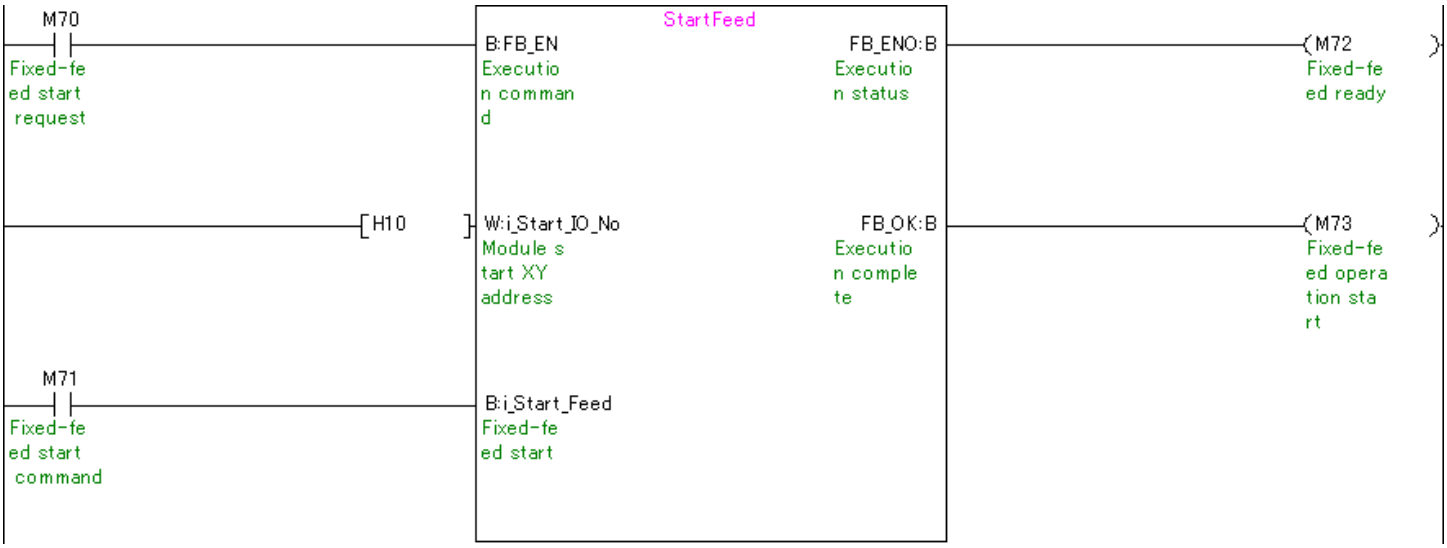


M+QD73A1_StartFeed (Fixed-feed start)

The following shows the example program with the conditions described in the table below.

Label name	Setting value	Description
i_Start_IO_No	H10	Specify the starting XY address of the second slot where the QD73A1 is mounted to 10H.

By turning ON M70 with M71 ON, the fixed-feed is started.

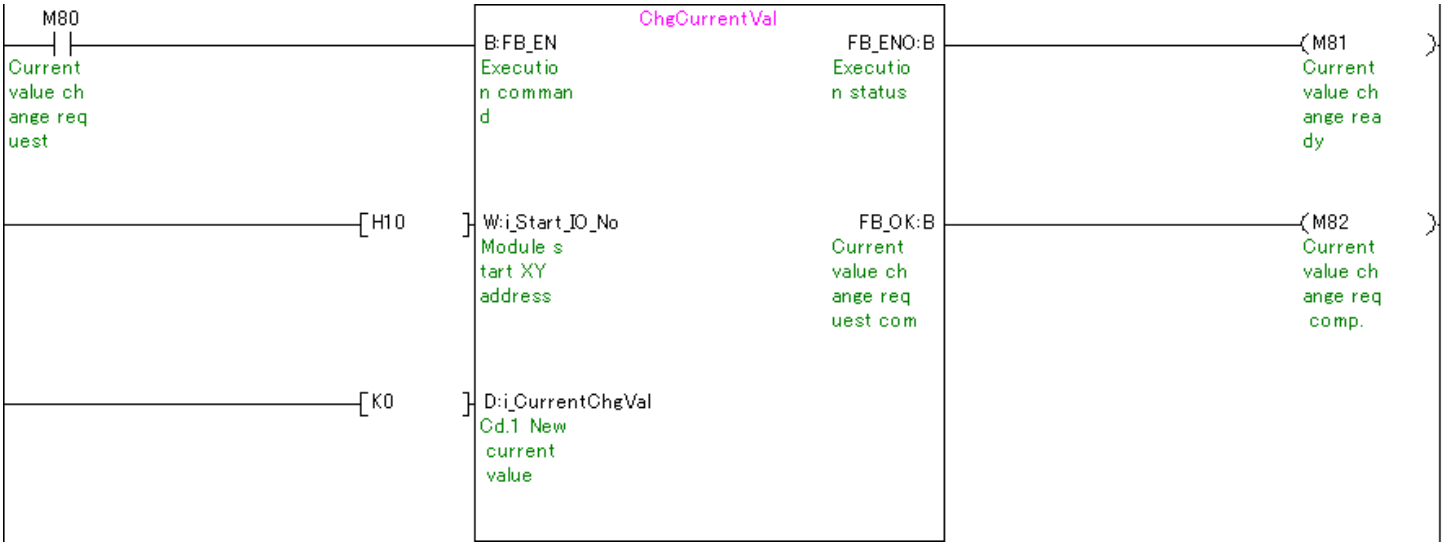


M+QD73A1_ChgCurrentVal (Current value change)

The following shows the example program with the conditions described in the table below.

Label name	Setting value	Description
i_Start_IO_No	H10	Specify the starting XY address of the second slot where the QD73A1 is mounted to 10H.
i_CurrentChgVal	K0	Set the control data "Cd.1 New current value" to 0 [pulse].

By turning ON M80, the value is changed to the new current value set in i_CurrentChgVal (Cd.1 New current value)

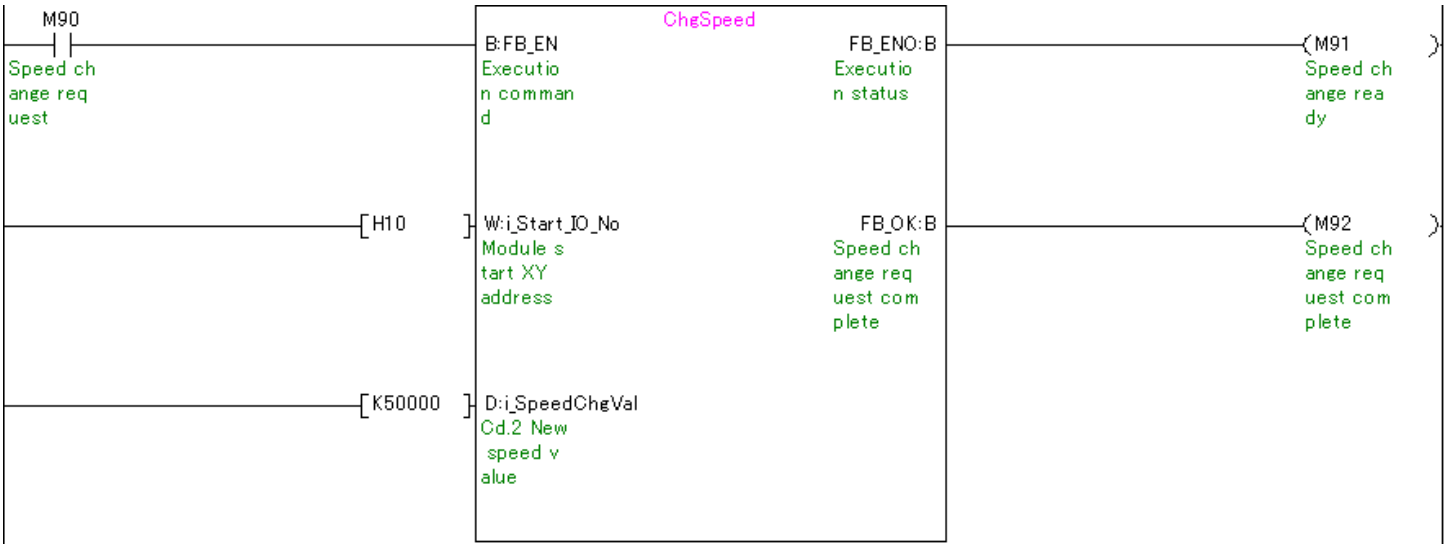


M+QD73A1_ChgSpeed (Speed change)

The following shows the example program with the conditions described in the table below.

Label name	Setting value	Description
i_Start_IO_No	H10	Specify the starting XY address of the second slot where the QD73A1 is mounted to 10H.
i_SpeedChgVal	K50000	Set the control data "Cd.2 New speed value" to 50,000 [pulse/s].

By turning ON M90, the value is changed to the new speed value set in i_SpeedChgVal (Cd.2 New speed value)

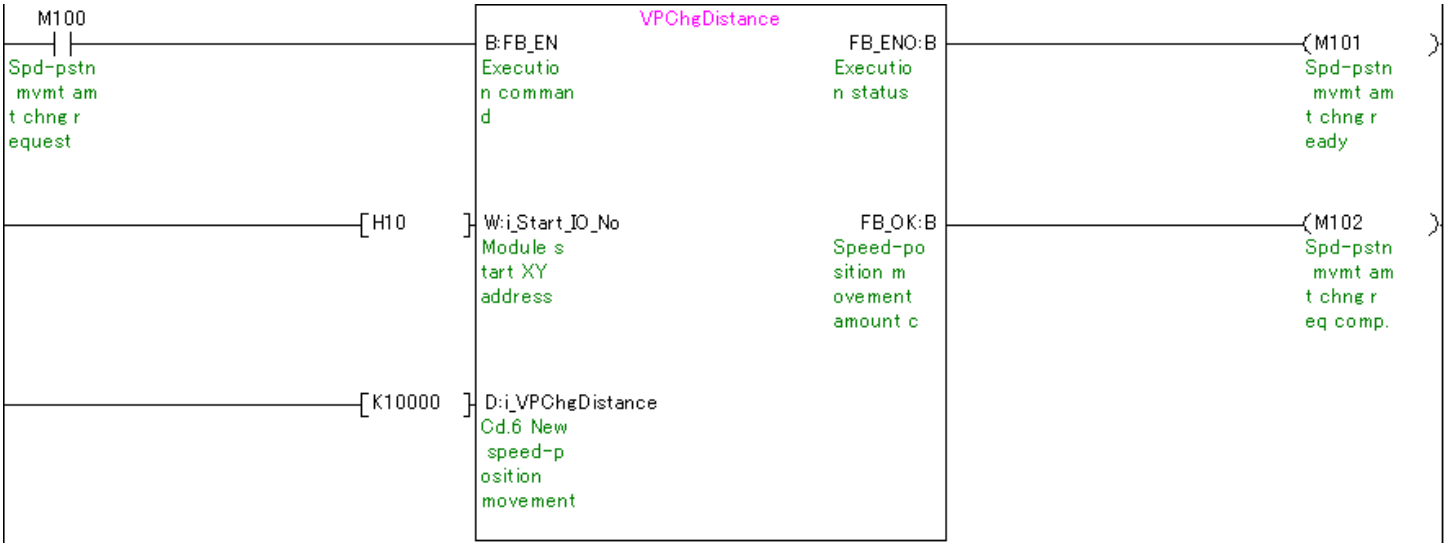


M+QD73A1_VPChgDistance (Speed-position movement amount change)

The following shows the example program with the conditions described in the table below.

Label name	Setting value	Description
i_Start_IO_No	H10	Specify the starting XY address of the second slot where the QD73A1 is mounted to 10H.
i_VPChgDistance	K10000	Set the control data "Cd.6 New speed-position movement amount" to 10,000 [pulse].

By turning ON M100, the value is changed to the value set in i_VPChgDistance (Cd.6 New speed-position movement amount).

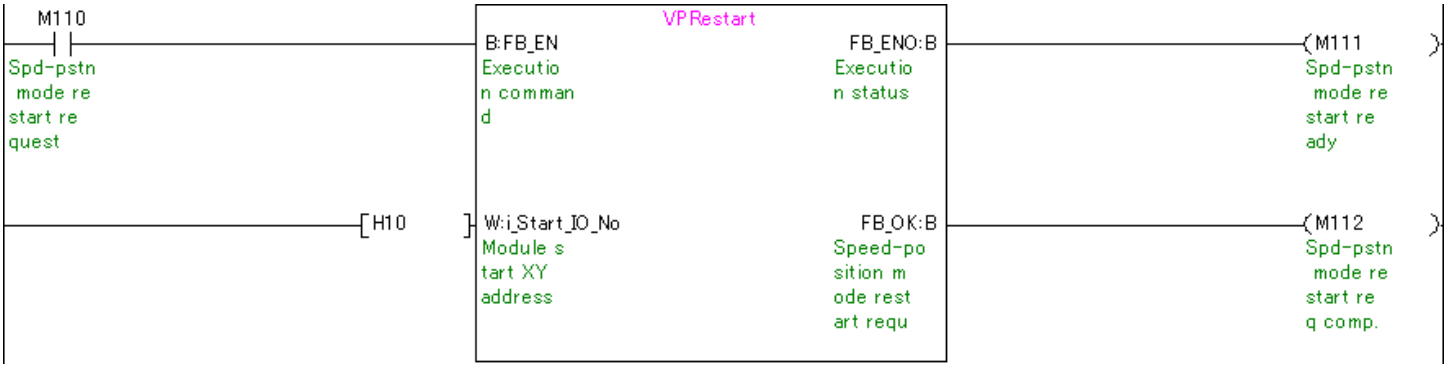


M+QD73A1_VPRestart (Speed-position mode restart)

The following shows the example program with the conditions described in the table below.

Label name	Setting value	Description
i_Start_IO_No	H10	Specify the starting XY address of the second slot where the QD73A1 is mounted to 10H.

By turning ON M110, the positioning control that has stopped during the speed-position control switch mode restarts.

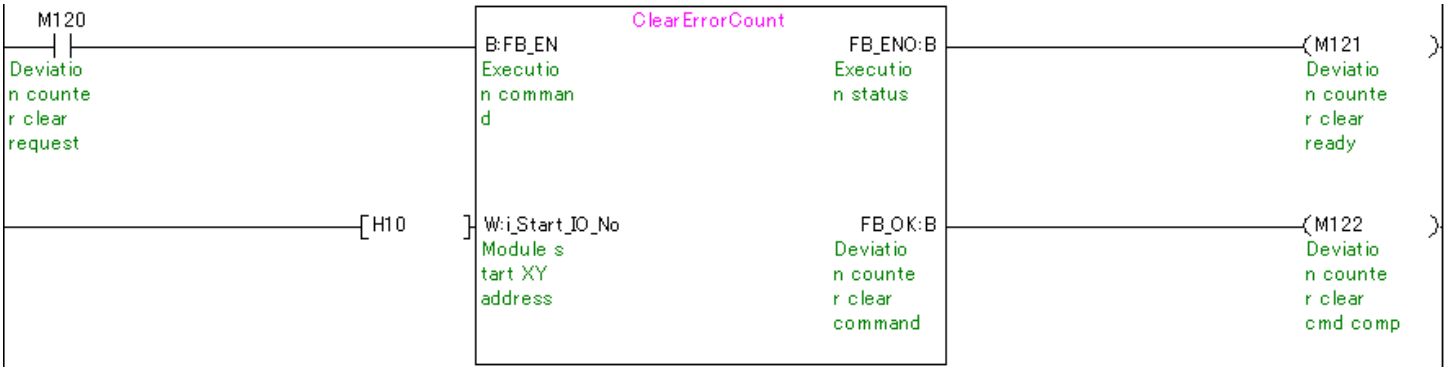


M+QD73A1_ClearErrorCounter (Deviation counter clear)

The following shows the example program with the conditions described in the table below.

Label name	Setting value	Description
i_Start_IO_No	H10	Specify the starting XY address of the second slot where the QD73A1 is mounted to 10H.

By turning ON M120, the accumulated pulses stored in the deviation counter are cleared.

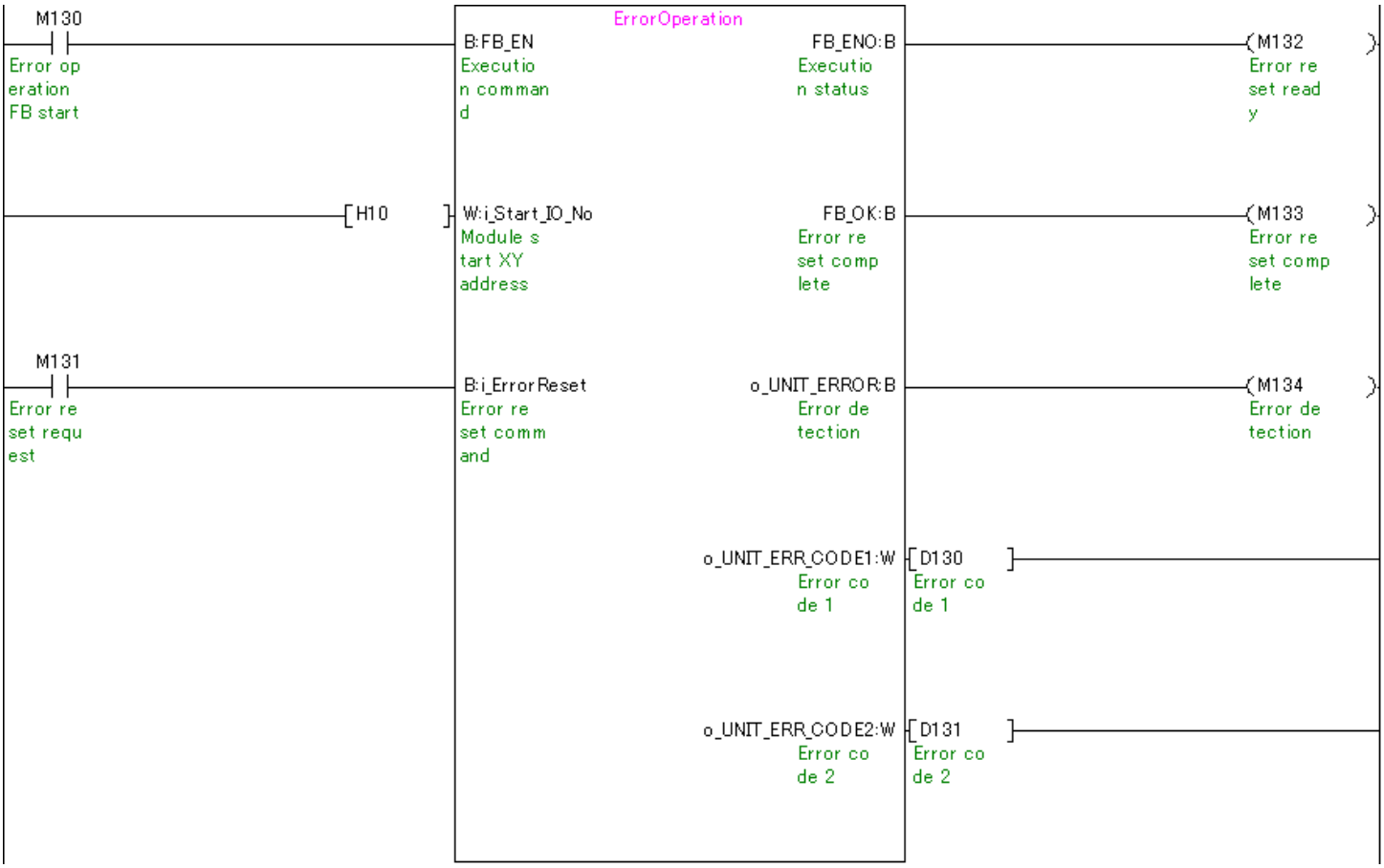


M+QD73A1_ErrorOperation (Error operation)

The following shows the example program with the conditions described in the table below.

Label name	Setting value	Description
i_Start_IO_No	H10	Specify the starting XY address of the second slot where the QD73A1 is mounted to 10H.

By turning ON M130, an error is monitored. By turning ON M131 with M130 ON, an error is reset.

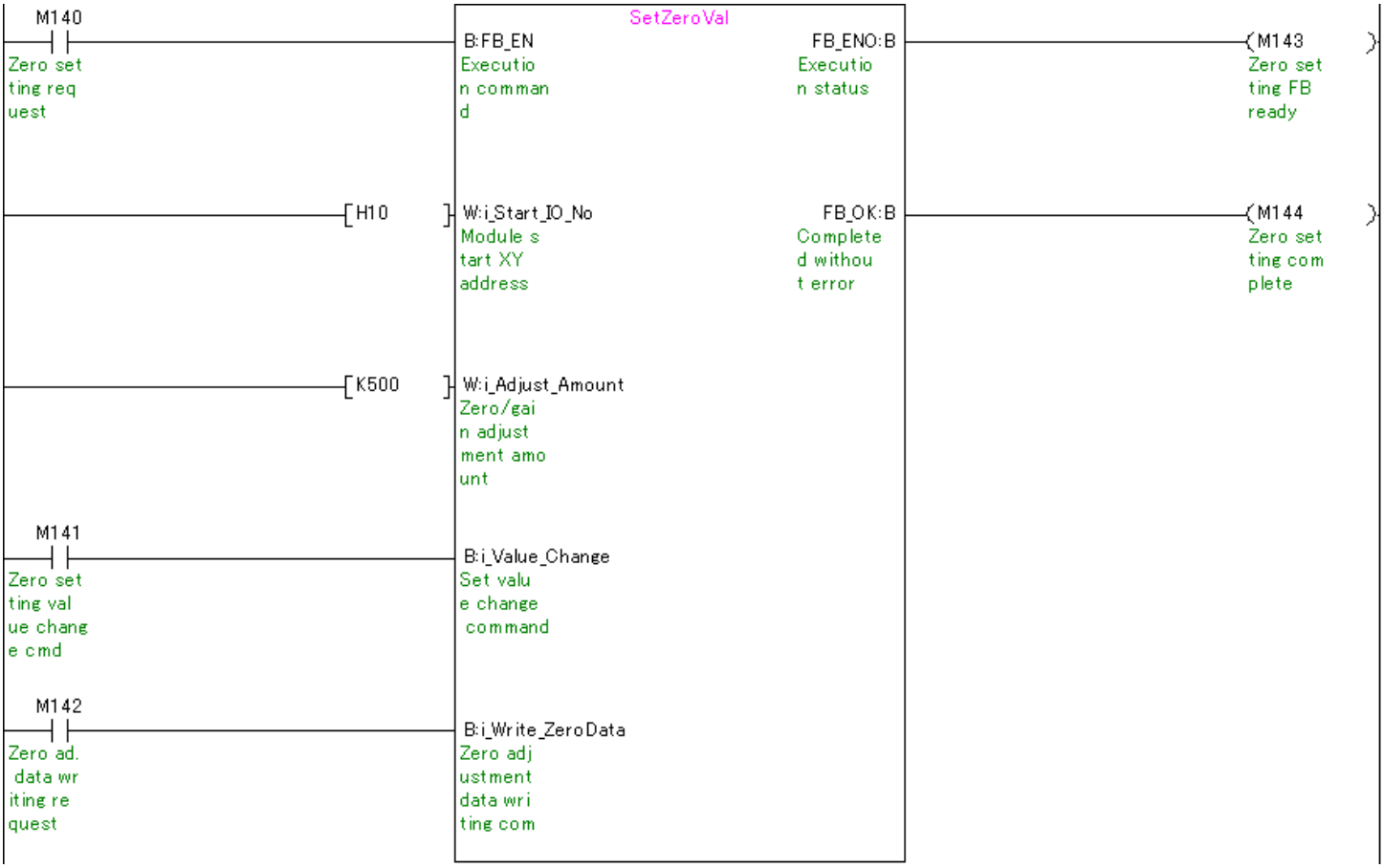


M+QD73A1_SetZeroVal (Zero setting)

The following shows the example program with the conditions described in the table below.

Label name	Setting value	Description
i_Start_IO_No	H10	Specify the starting XY address of the second slot where the QD73A1 is mounted to 10H.
i_Adjust_Amount	K500	Set the zero/gain adjustment amount to 500.

By turning ON M140, the zero adjustment is performed. By setting the adjustment amount to i_Adjust_Amount (zero/gain adjustment amount) and turning ON M141, the analog output value is adjusted.
By turning ON M142, the zero adjustment value is input to the QD73A1.



M+QD73A1_SetGainVal (Gain setting)

The following shows the example program with the conditions described in the table below.

Label name	Setting value	Description
i_Start_IO_No	H10	Specify the starting XY address of the second slot where the QD73A1 is mounted to 10H.
i_Adjust_Amount	K500	Set the zero/gain adjustment amount to 500.

By turning ON M150, the gain adjustment is performed. By setting the adjustment amount to i_Adjust_Amount (zero/gain adjustment amount) and turning ON M151, the analog output value is adjusted.
By turning ON M152, the gain adjustment value is input to the QD73A1.