

MELSEC-Q Digital-Analog Converter Module FB Library Reference Manual

Applicable modules:

Q68DAV, Q68DAVN, Q68DAI, Q68DAIN

<CONTENTS>

Reference Manual Revision History	2
1. Overview	3
1.1. Overview of the FB Library	3
1.2. Function of the FB Library.....	3
1.3. System Configuration Example	4
1.4. Relevant Manuals	4
1.5. Note.....	4
2. Details of the FB Library.....	5
2.1. M+Q68DA_WriteDAVal (DA conversion data write)	5
2.2. M+Q68DA_WriteAllDAVal (DA conversion data write (All CHs)).....	9
2.3. M+Q68DA_SetDAConversion (DA conversion enable/disable setting)	13
2.4. M+Q68DA_SetDAOutput (DA output enable/disable setting)	17
2.5. M+Q68DA_RequestSetting (Operating condition setting request operation)	21
2.6. M+Q68DA_SetOffsetVal (Offset setting)	25
2.7. M+Q68DA_SetGainVal (Gain setting)	30
2.8. M+Q68DA_ErrorOperation (Error operation)	35
Appendix 1. FB Library Application Examples.....	39

Reference Manual Revision History

Reference Manual Number	Date	Description
FBM-M043-A	2010/12/10	First edition
FBM-M043-B	2015/03/27	1) Added applicable GX Works2 Version. <ul style="list-style-type: none">•This FB is able to install on GX Works2 of all language versions. 2) Added the following "FB Version Upgrade History". <ul style="list-style-type: none">•M+Q68DA_SetOffsetVal•M+Q68DA_SetGainVal

1. Overview

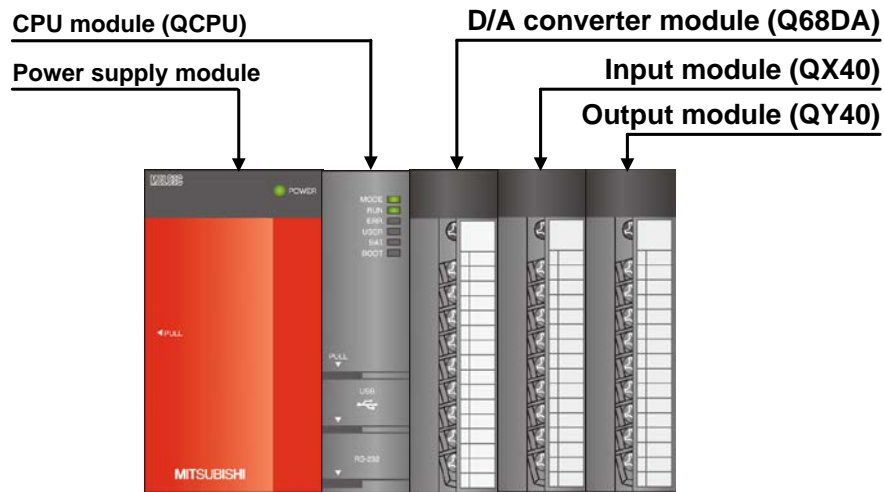
1.1. Overview of the FB Library

This FB Library is for using the MELSEC-Q Digital-Analog Converter Module.

1.2. Function of the FB Library

Item	Description
M+Q68DA_WriteDAVal	Writes DA conversion data of a specified channel.
M+Q68DA_WriteAllDAVal	Writes DA conversion data of all channels.
M+Q68DA_SetDAConversion	Sets the DA conversion enable/disable setting of a specified channel or all channels.
M+Q68DA_SetDAOutput	Sets the DA output enable/disable setting of a specified channel or all channels.
M+Q68DA_RequestSetting	Enables settings of each function.
M+Q68DA_SetOffsetVal	Performs offset setting of a specified channel.
M+Q68DA_SetGainVal	Performs gain setting of a specified channel.
M+Q68DA_ErrorOperation	Monitors error codes and performs error reset.

1.3. System Configuration Example



1.4. Relevant Manuals

- Digital-Analog Converter 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+Q68DA_WriteDAVal (DA conversion data write)

FB Name

M+Q68DA_WriteDAVal

Function Overview

Item	Description																					
Function overview	Writes DA conversion data of a specified channel.																					
Symbol	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="4" style="text-align: center;">M+Q68DA_WriteDAVal</th> </tr> </thead> <tbody> <tr> <td style="width: 30%;">Execution command</td> <td style="width: 30%;">B : FB_EN</td> <td style="width: 30%;">FB_ENO : B</td> <td style="width: 10%;">Execution status</td> </tr> <tr> <td>Module start XY address</td> <td>W : i_Start_IO_No</td> <td>FB_OK : B</td> <td>Completed without error</td> </tr> <tr> <td>Channel No.</td> <td>W : i_CH</td> <td>FB_ERROR : B</td> <td>Error flag</td> </tr> <tr> <td>Digital value</td> <td>W : i_DA_Value</td> <td>ERROR_ID : W</td> <td>Error code</td> </tr> </tbody> </table>		M+Q68DA_WriteDAVal				Execution command	B : FB_EN	FB_ENO : B	Execution status	Module start XY address	W : i_Start_IO_No	FB_OK : B	Completed without error	Channel No.	W : i_CH	FB_ERROR : B	Error flag	Digital value	W : i_DA_Value	ERROR_ID : W	Error code
M+Q68DA_WriteDAVal																						
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Applicable hardware and software	Digital-analog converter module	Q68DAV, Q68DAVN, Q68DAI, Q68DAIN																				
	CPU module	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;">Series</th> <th style="width: 50%;">Model</th> </tr> </thead> <tbody> <tr> <td rowspan="2">MELSEC-Q Series*</td> <td>High performance model</td> </tr> <tr> <td>Universal model</td> </tr> </tbody> </table> <p>* Not applicable to QCPU (A mode)</p>	Series	Model	MELSEC-Q Series*	High performance model	Universal model															
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Engineering software	GX Works2 *1 <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;">Language</th> <th style="width: 50%;">Software version</th> </tr> </thead> <tbody> <tr> <td>Japanese version</td> <td>Version 1.86Q or later</td> </tr> <tr> <td>English version</td> <td>Version 1.24A or later</td> </tr> <tr> <td>Chinese (Simplified) version</td> <td>Version 1.49B or later</td> </tr> <tr> <td>Chinese (Traditional) version</td> <td>Version 1.49B or later</td> </tr> <tr> <td>Korean version</td> <td>Version 1.49B or later</td> </tr> </tbody> </table> <p>*1 For software versions applicable to the modules used, refer to "Relevant manuals".</p>	Language	Software version	Japanese version	Version 1.86Q or later	English version	Version 1.24A or later	Chinese (Simplified) version	Version 1.49B or later	Chinese (Traditional) version	Version 1.49B or later	Korean version	Version 1.49B or later									
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Korean version	Version 1.49B or later																					
Programming language	Ladder																					
Number of steps	182 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.																					

Item	Description	
Function description	1) By turning ON FB_EN (Execution command), DA conversion data is written to the specified channel. 2) The DA conversion data to be written depends on the resolution mode setting. 3) When the input value is invalid, 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) When two or more of these FBs are used, precaution must be taken to avoid repetition of the target channel. 5) This FB uses index registers Z7, Z8 and Z9. Please do not use these index registers in an interrupt program. 6) Every input must be provided with a value for proper FB operation. 7) If the auto refresh is set using GX Configurator-DA or the configuration function of GX Works 2, using this FB is unnecessary. 8) The output range, synchronous output mode, resolution mode, and operation mode must be configured to match devices and systems connected to the Q68DA module. Configure these settings by making the GX Works2 switch setting according to the application. For details on how to use the intelligent function module switch setting, refer to GX Works2 Operating Manual (Common).	
FB operation type	Real-time execution	
Application example	Refer to "Appendix 1. FB Library Application Examples".	
Timing chart	<p>[When operation completes without error]</p>	<p>[When an error occurs]</p>

Item	Description
Relevant manual	<ul style="list-style-type: none"> •Digital-Analog Converter 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 codes

●Error code list

Error code	Description
10 (Decimal)	<p>The specified target channel is not valid. The target channel is not within the range of the number of channels of the mounted module..</p> <p>Please try again after confirming the setting.</p>

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 Q68DA module is mounted. (For example, enter H10 for X10.)
Channel No.	i_CH	Word	1~8	Specify the channel number.
Digital value	i_DA_Value	Word	Depends on the output range setting and resolution setting of the specified channel.	For details on the setting range of the digital value, refer to the relevant manual.

●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 DA conversion value is being written.
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	2010/12/10	First edition

Note

This chapter includes information related to the M+Q68DA_WriteDAVal function block.

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

Before using any Mitsubishi products, please read all the relevant manuals.

2.2. M+Q68DA_WriteAIIDAVal (DA conversion data write (All CHs))

FB Name

M+Q68DA_WriteAIIDAVal

Function Overview

Item	Description																																													
Function overview	Writes DA conversion data of all channels.																																													
Symbol	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="4" style="text-align: center;">M+Q68DA_WriteAIIDAVal</th> </tr> </thead> <tbody> <tr> <td style="width: 30%;">Execution command</td> <td style="width: 10%;">B : FB_EN</td> <td style="width: 10%;"></td> <td style="width: 50%;">FB_ENO : B — Execution status</td> </tr> <tr> <td>Module start XY address</td> <td>W : i_Start_IO_No</td> <td></td> <td>FB_OK : B — Completed without error</td> </tr> <tr> <td>Channel 1 digital value</td> <td>W : i_DA_ValueCH1</td> <td></td> <td>FB_ERROR : B — Error flag</td> </tr> <tr> <td>Channel 2 digital value</td> <td>W : i_DA_ValueCH2</td> <td></td> <td>ERROR_ID : W — Error code</td> </tr> <tr> <td>Channel 3 digital value</td> <td>W : i_DA_ValueCH3</td> <td></td> <td></td> </tr> <tr> <td>Channel 4 digital value</td> <td>W : i_DA_ValueCH4</td> <td></td> <td></td> </tr> <tr> <td>Channel 5 digital value</td> <td>W : i_DA_ValueCH5</td> <td></td> <td></td> </tr> <tr> <td>Channel 6 digital value</td> <td>W : i_DA_ValueCH6</td> <td></td> <td></td> </tr> <tr> <td>Channel 7 digital value</td> <td>W : i_DA_ValueCH7</td> <td></td> <td></td> </tr> <tr> <td>Channel 8 digital value</td> <td>W : i_DA_ValueCH8</td> <td></td> <td></td> </tr> </tbody> </table>		M+Q68DA_WriteAIIDAVal				Execution command	B : FB_EN		FB_ENO : B — Execution status	Module start XY address	W : i_Start_IO_No		FB_OK : B — Completed without error	Channel 1 digital value	W : i_DA_ValueCH1		FB_ERROR : B — Error flag	Channel 2 digital value	W : i_DA_ValueCH2		ERROR_ID : W — Error code	Channel 3 digital value	W : i_DA_ValueCH3			Channel 4 digital value	W : i_DA_ValueCH4			Channel 5 digital value	W : i_DA_ValueCH5			Channel 6 digital value	W : i_DA_ValueCH6			Channel 7 digital value	W : i_DA_ValueCH7			Channel 8 digital value	W : i_DA_ValueCH8		
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Item	Description
Programming language	Ladder
Number of steps	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.
Function description	1) By turning ON FB_EN (Execution command), DA conversion data is written to the all channels. 2) The DA conversion data to be written to the all channels depends on the resolution mode setting.
Compiling method	Macro type
Restrictions and precautions	<ol style="list-style-type: none"> 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) When two or more of these FBs are used, precaution must be taken to avoid repetition of the target channel. 5) This FB uses index registers Z8 and Z9. Please do not use these index registers in an interrupt program. 6) Every input must be provided with a value for proper FB operation. 7) If the auto refresh is set using GX Configurator-DA or the configuration function of GX Works 2, using this FB is unnecessary. 8) The output range, synchronous output mode, resolution mode, and operation mode must be configured to match devices and systems connected to the Q68DA module. Configure these settings by making the GX Works2 switch setting according to the application. For details on how to use the intelligent function module switch setting, refer to GX Works2 Operating Manual (Common).
FB operation type	Real-time execution
Application example	Refer to "Appendix 1. FB Library Application Examples".
Timing chart	<p>The timing chart illustrates the sequence of events for the FB. It shows several signals over time: <ul style="list-style-type: none"> FB_EN (Execution command): A pulse that initiates the process. FB_ENO (Execution status): Becomes active (high) when FB_EN is triggered and remains active during the 'Refreshing' period. CH digital input value (Un\ G1 to 8): The input values are sampled during the 'Refreshing' period. Refreshing stop: The end of the 'Refreshing' period, after which FB_ENO becomes inactive. FB_OK (Completed without error): Becomes active (high) after the 'Refreshing' period has completed. FB_ERROR (Error flag) and ERROR_ID (Error code): Both are shown as inactive (0) throughout the process. </p>

Item	Description
Relevant manual	<ul style="list-style-type: none"> •Digital-Analog Converter 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 codes

●Error code list

Error code	Description
None	No errors are stored for this FB.

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 Q68DA module is mounted. (For example, enter H10 for X10.)
Channel 1 digital value	i_DA_ValueCH1	Word	Depends on the output range setting and resolution setting of the channel 1.	Writes the digital conversion value of the channel 1.
Channel 2 digital value	i_DA_ValueCH2	Word	Depends on the output range setting and resolution setting of the channel 2.	Writes the digital conversion value of the channel 2.
Channel 3 digital value	i_DA_ValueCH3	Word	Depends on the output range setting and resolution setting of the channel 3.	Writes the digital conversion value of the channel 3.
Channel 4 digital value	i_DA_ValueCH4	Word	Depends on the output range setting and resolution setting of the channel 4.	Writes the digital conversion value of the channel 4.
Channel 5 digital value	i_DA_ValueCH5	Word	Depends on the output range setting and resolution setting of the channel 5.	Writes the digital conversion value of the channel 5.

Name (Comment)	Label name	Data type	Setting range	Description
Channel 6 digital value	i_DA_ValueCH6	Word	Depends on the output range setting and resolution setting of the channel 6.	Writes the digital conversion value of the channel 6.
Channel 7 digital value	i_DA_ValueCH7	Word	Depends on the output range setting and resolution setting of the channel 7.	Writes the digital conversion value of the channel 7.
Channel 8 digital value	i_DA_ValueCH8	Word	Depends on the output range setting and resolution setting of the channel 8.	Writes the digital conversion value of the channel 8.

●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 DA conversion values of all channels are being written.
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	2010/12/10	First edition

Note

This chapter includes information related to the M+Q68DA_WriteAllDAVal function block.

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

Before using any Mitsubishi products, please read all the relevant manuals.

2.3. M+Q68DA_SetDAConversion (DA conversion enable/disable setting)

FB Name

M+Q68DA_SetDAConversion

Function Overview

Item	Description																					
Function overview	Sets the DA conversion enable/disable setting of a specified channel or all channels.																					
Symbol	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="4" style="text-align: center;">M+Q68DA_SetDAConversion</th> </tr> </thead> <tbody> <tr> <td style="text-align: right;">Execution command</td> <td>B : FB_EN</td> <td>FB_ENO : B</td> <td>Execution status</td> </tr> <tr> <td style="text-align: right;">Module start XY address</td> <td>W : i_Start_IO_No</td> <td>FB_OK : B</td> <td>Completed without error</td> </tr> <tr> <td style="text-align: right;">Channel No.</td> <td>W : i_CH</td> <td>FB_ERROR : B</td> <td>Error flag</td> </tr> <tr> <td style="text-align: right;">DA conversion enable/disable setting</td> <td>B : i_DA_Enable</td> <td>ERROR_ID : W</td> <td>Error code</td> </tr> </tbody> </table>		M+Q68DA_SetDAConversion				Execution command	B : FB_EN	FB_ENO : B	Execution status	Module start XY address	W : i_Start_IO_No	FB_OK : B	Completed without error	Channel No.	W : i_CH	FB_ERROR : B	Error flag	DA conversion enable/disable setting	B : i_DA_Enable	ERROR_ID : W	Error code
M+Q68DA_SetDAConversion																						
Execution command	B : FB_EN	FB_ENO : B	Execution status																			
Module start XY address	W : i_Start_IO_No	FB_OK : B	Completed without error																			
Channel No.	W : i_CH	FB_ERROR : B	Error flag																			
DA conversion enable/disable setting	B : i_DA_Enable	ERROR_ID : W	Error code																			
Applicable hardware and software	Digital-analog converter module	Q68DAV, Q68DAVN, Q68DAI, Q68DAIN																				
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Chinese (Traditional) version	Version 1.49B or later																					
Korean version	Version 1.49B or later																					
Programming language	Ladder																					
Number of steps	242 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.																					

Item	Description
Function description	<ol style="list-style-type: none"> 1) By turning ON FB_EN (Execution command), DA conversion enable/disable setting of the specified channel is set. 2) FB operation is one-shot only, triggered by the FB_EN signal. 3) The setting value is enabled by turning ON the operating condition setting request signal (Y9) or by executing the operating condition setting request FB (M+Q68DA_RequestSetting). 4) When the input value is invalid, 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	<ol style="list-style-type: none"> 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) When two or more of these FBs are used, precaution must be taken to avoid repetition of the target channel. 5) This FB uses index registers Z7, Z8 and Z9. Please do not use these index registers in an interrupt program. 6) Every input must be provided with a value for proper FB operation. 7) If the auto refresh is set using GX Configurator-DA or the configuration function of GX Works 2, using this FB is unnecessary. 8) The output range, synchronous output mode, resolution mode, and operation mode must be configured to match devices and systems connected to the Q68DA module. Configure these settings by making the GX Works2 switch setting according to the application. For details on how to use the intelligent function module switch setting, refer to GX Works2 Operating Manual (Common).
FB operation type	Pulsed execution (1 scan execution type)
Application example	Refer to "Appendix 1. FB Library Application Examples".

Item	Description
Timing chart	<div style="display: flex; justify-content: space-around;"> <div style="width: 45%;"> <p>[When operation completes without error]</p> </div> <div style="width: 45%;"> <p>[When an error occurs]</p> </div> </div>
Relevant manual	<ul style="list-style-type: none"> •Digital-Analog Converter 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 codes

●Error code list

Error code	Description
10 (Decimal)	<p>The specified target channel is not valid. The target channel is not within the range of the number of channels of the mounted module..</p> <p>Please try again after confirming the setting.</p>

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 Q68DA module is mounted. (For example, enter H10 for X10.)
Channel No.	i_CH	Word	As shown on the right.	Specify the channel number. <ul style="list-style-type: none"> •Q68DAV,Q68DAVN,Q68DAI,Q68DAIN: 1~8 •All channels at once: 15(0FH)

Name (Comment)	Label name	Data type	Setting range	Description
DA conversion enable/disable setting	i_DA_Enable	Bit	ON, OFF	ON: DA conversion enabled. OFF: DA conversion disabled.

●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 DA conversion enable/disable setting 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	2010/12/10	First edition

Note

This chapter includes information related to the M+Q68DA_SetDAConversion function block.

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

Before using any Mitsubishi products, please read all the relevant manuals.

2.4. M+Q68DA_SetDAOutput (DA output enable/disable setting)

FB Name

M+Q68DA_SetDAOutput

Function Overview

Item	Description																					
Function overview	Sets the DA output enable/disable setting of a specified channel or all channels.																					
Symbol	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="4" style="text-align: center;">M+Q68DA_SetDAOutput</th> </tr> </thead> <tbody> <tr> <td style="text-align: right;">Execution command</td> <td style="border-left: 1px solid black;">B : FB_EN</td> <td style="border-right: 1px solid black;">FB_ENO : B</td> <td style="text-align: left;">Execution status</td> </tr> <tr> <td style="text-align: right;">Module start XY address</td> <td style="border-left: 1px solid black;">W : i_Start_IO_No</td> <td style="border-right: 1px solid black;">FB_OK : B</td> <td style="text-align: left;">Completed without error</td> </tr> <tr> <td style="text-align: right;">Channel No.</td> <td style="border-left: 1px solid black;">W : i_CH</td> <td style="border-right: 1px solid black;">FB_ERROR : B</td> <td style="text-align: left;">Error flag</td> </tr> <tr> <td style="text-align: right;">DA output enable/disable setting</td> <td style="border-left: 1px solid black;">B : i_DA_Out_Enable</td> <td style="border-right: 1px solid black;">ERROR_ID : W</td> <td style="text-align: left;">Error code</td> </tr> </tbody> </table>		M+Q68DA_SetDAOutput				Execution command	B : FB_EN	FB_ENO : B	Execution status	Module start XY address	W : i_Start_IO_No	FB_OK : B	Completed without error	Channel No.	W : i_CH	FB_ERROR : B	Error flag	DA output enable/disable setting	B : i_DA_Out_Enable	ERROR_ID : W	Error code
M+Q68DA_SetDAOutput																						
Execution command	B : FB_EN	FB_ENO : B	Execution status																			
Module start XY address	W : i_Start_IO_No	FB_OK : B	Completed without error																			
Channel No.	W : i_CH	FB_ERROR : B	Error flag																			
DA output enable/disable setting	B : i_DA_Out_Enable	ERROR_ID : W	Error code																			
Applicable hardware and software	Digital-analog converter module	Q68DAV, Q68DAVN, Q68DAI, Q68DAIN																				
	CPU module	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;">Series</th> <th style="width: 50%;">Model</th> </tr> </thead> <tbody> <tr> <td rowspan="2">MELSEC-Q Series*</td> <td>High performance model</td> </tr> <tr> <td>Universal model</td> </tr> </tbody> </table> <p>* Not applicable to QCPU (A mode)</p>	Series	Model	MELSEC-Q Series*	High performance model	Universal model															
	Series	Model																				
MELSEC-Q Series*	High performance model																					
	Universal model																					
Engineering software	GX Works2 *1 <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;">Language</th> <th style="width: 50%;">Software version</th> </tr> </thead> <tbody> <tr> <td>Japanese version</td> <td>Version 1.86Q or later</td> </tr> <tr> <td>English version</td> <td>Version 1.24A or later</td> </tr> <tr> <td>Chinese (Simplified) version</td> <td>Version 1.49B or later</td> </tr> <tr> <td>Chinese (Traditional) version</td> <td>Version 1.49B or later</td> </tr> <tr> <td>Korean version</td> <td>Version 1.49B or later</td> </tr> </tbody> </table> <p>*1 For software versions applicable to the modules used, refer to "Relevant manuals".</p>	Language	Software version	Japanese version	Version 1.86Q or later	English version	Version 1.24A or later	Chinese (Simplified) version	Version 1.49B or later	Chinese (Traditional) version	Version 1.49B or later	Korean version	Version 1.49B or later									
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Chinese (Simplified) version	Version 1.49B or later																					
Chinese (Traditional) version	Version 1.49B or later																					
Korean version	Version 1.49B or later																					
Programming language	Ladder																					
Number of steps	217 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.																					

Item	Description
Function description	1) By turning ON FB_EN (Execution command), DA output enable/disable setting of the specified channel or all channels is set. 2) When the input value is invalid, 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) When two or more of these FBs are used, precaution must be taken to avoid repetition of the target channel. 5) This FB uses index registers Z8 and Z9. Please do not use these index registers in an interrupt program. 6) Every input must be provided with a value for proper FB operation. 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) The output range, synchronous output mode, resolution mode, and operation mode must be configured to match devices and systems connected to the Q68DA module. Configure these settings by making the GX Works2 switch setting according to the application. For details on how to use the intelligent function module switch setting, refer to GX Works2 Operating Manual (Common).
FB operation type	Real-time execution
Application example	Refer to "Appendix 1. FB Library Application Examples".
Timing chart	<div style="display: flex; justify-content: space-around;"> <div style="width: 45%;"> <p>[When operation completes without error]</p> </div> <div style="width: 45%;"> <p>[When an error occurs]</p> </div> </div>

Item	Description
Relevant manual	<ul style="list-style-type: none"> •Digital-Analog Converter 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 codes

●Error code list

Error code	Description
10 (Decimal)	<p>The specified target channel is not valid. The target channel is not within the range of the number of channels of the mounted module..</p> <p>Please try again after confirming the setting.</p>

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 Q68DA module is mounted. (For example, enter H10 for X10.)
Channel No.	i_CH	Word	As shown on the right.	Specify the channel number. •Q68DAV,Q68DAVN,Q68DAI, Q68DAIN: 1~8 •All channels at once: 15(0FH)
DA output enable/disable setting	i_DA_Out_Enabl e	Bit	ON, OFF	ON: Outputs the D/A conversion value. OFF: Outputs the offset 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.
Completed without error	FB_OK	Bit	OFF	When ON, it indicates that DA output enable/disable setting 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	2010/12/10	First edition

Note

This chapter includes information related to the M+Q68DA_SetDAOutput function block.
 It does not include information on restrictions of use such as combination with digital-analog converter modules or programmable controller CPUs.
 Before using any Mitsubishi products, please read all the relevant manuals.

2.5. M+Q68DA_RequestSetting (Operating condition setting request operation)

FB Name

M+Q68DA_RequestSetting

Function Overview

Item	Description																					
Function overview	Enables settings of each function.																					
Symbol	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="4" style="text-align: center;">M+Q68DA_RequestSetting</th> </tr> </thead> <tbody> <tr> <td style="width: 30%;">Execution command</td> <td style="width: 30%;">B : FB_EN</td> <td style="width: 30%;">FB_ENO : B</td> <td style="width: 10%;">Execution status</td> </tr> <tr> <td>Module start XY address</td> <td>W : i_Start_IO_No</td> <td>FB_OK : B</td> <td>Completed without error</td> </tr> <tr> <td></td> <td></td> <td>FB_ERROR : B</td> <td>Error flag</td> </tr> <tr> <td></td> <td></td> <td>ERROR_ID : W</td> <td>Error code</td> </tr> </tbody> </table>		M+Q68DA_RequestSetting				Execution command	B : FB_EN	FB_ENO : B	Execution status	Module start XY address	W : i_Start_IO_No	FB_OK : B	Completed without error			FB_ERROR : B	Error flag			ERROR_ID : W	Error code
M+Q68DA_RequestSetting																						
Execution command	B : FB_EN	FB_ENO : B	Execution status																			
Module start XY address	W : i_Start_IO_No	FB_OK : B	Completed without error																			
		FB_ERROR : B	Error flag																			
		ERROR_ID : W	Error code																			
Applicable hardware and software	Digital-analog converter module	Q68DAV, Q68DAVN, Q68DAI, Q68DAIN																				
	CPU module	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;">Series</th> <th style="width: 50%;">Model</th> </tr> </thead> <tbody> <tr> <td rowspan="2">MELSEC-Q Series*</td> <td>High performance model</td> </tr> <tr> <td>Universal model</td> </tr> </tbody> </table> <p>* Not applicable to QCPU (A mode)</p>	Series	Model	MELSEC-Q Series*	High performance model	Universal model															
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MELSEC-Q Series*	High performance model																					
	Universal model																					
Engineering software	<p>GX Works2 *1</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;">Language</th> <th style="width: 50%;">Software version</th> </tr> </thead> <tbody> <tr> <td>Japanese version</td> <td>Version 1.86Q or later</td> </tr> <tr> <td>English version</td> <td>Version 1.24A or later</td> </tr> <tr> <td>Chinese (Simplified) version</td> <td>Version 1.49B or later</td> </tr> <tr> <td>Chinese (Traditional) version</td> <td>Version 1.49B or later</td> </tr> <tr> <td>Korean version</td> <td>Version 1.49B or later</td> </tr> </tbody> </table> <p>*1 For software versions applicable to the modules used, refer to "Relevant manuals".</p>	Language	Software version	Japanese version	Version 1.86Q or later	English version	Version 1.24A or later	Chinese (Simplified) version	Version 1.49B or later	Chinese (Traditional) version	Version 1.49B or later	Korean version	Version 1.49B or later									
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Chinese (Simplified) version	Version 1.49B or later																					
Chinese (Traditional) version	Version 1.49B or later																					
Korean version	Version 1.49B or later																					
Programming language	Ladder																					
Number of steps	<p>172 steps (for MELSEC-Q series universal model CPU)</p> <p>* The number of steps of the FB in a program depends on the CPU model that is used and input and output definition.</p>																					

Item	Description
Function description	1) By turning ON FB_EN (Execution command), settings of each function are enabled. 2) The buffer memory is updated by executing the DA conversion enable/disable setting FB/DA output enable/disable setting FB. The set data, however, is not enabled. Execute this FB to enable the settings.
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) When two or more of these FBs are used, precaution must be taken to avoid repetition of the target channel. 5) This FB turns ON/OFF the operating condition setting request signal. Please note that the DA conversion is stopped during operation of this FB. 6) This FB uses index register Z9. Please do not use this index register in an interrupt program. 7) Every input must be provided with a value for proper FB operation. 8) 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. 9) The output range, synchronous output mode, resolution mode, and operation mode must be configured to match devices and systems connected to the Q68DA module. Configure these settings by making the GX Works2 switch setting according to the application. For details on how to use the intelligent function module switch setting, refer to GX Works2 Operating Manual (Common).
FB operation type	Pulsed execution (multiple scan execution type)
Application example	Refer to "Appendix 1. FB Library Application Examples".
Timing chart	<div style="display: flex; align-items: flex-start;"> <div style="flex: 1;"> <p>FB_EN (Execution command)</p> <p>FB_ENO (Execution status)</p> <p>Operating condition setting request (Y signal)</p> <p>Operating condition setting completed flag (X signal)</p> <p>FB_OK (Completed without error)</p> <p>FB_ERROR (Error flag)</p> <p>ERROR_ID (Error code)</p> </div> <div style="flex: 2;"> </div> </div>

Item	Description
Relevant manual	<ul style="list-style-type: none"> •Digital-Analog Converter 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 codes

●Error code list

Error code	Description
None	No errors are stored for this FB.

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 Q68DA module 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.
Completed without error	FB_OK	Bit	OFF	When ON, it indicates that the enabled operation of each setting 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	2010/12/10	First edition

Note

This chapter includes information related to the M+Q68DA_RequestSetting function block.

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

Before using any Mitsubishi products, please read all the relevant manuals.

2.6. M+Q68DA_SetOffsetVal (Offset setting)

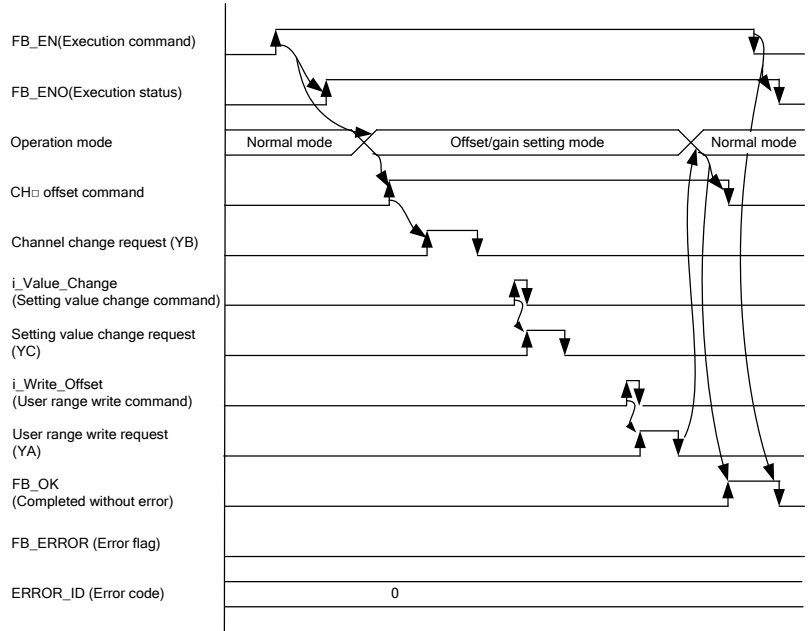
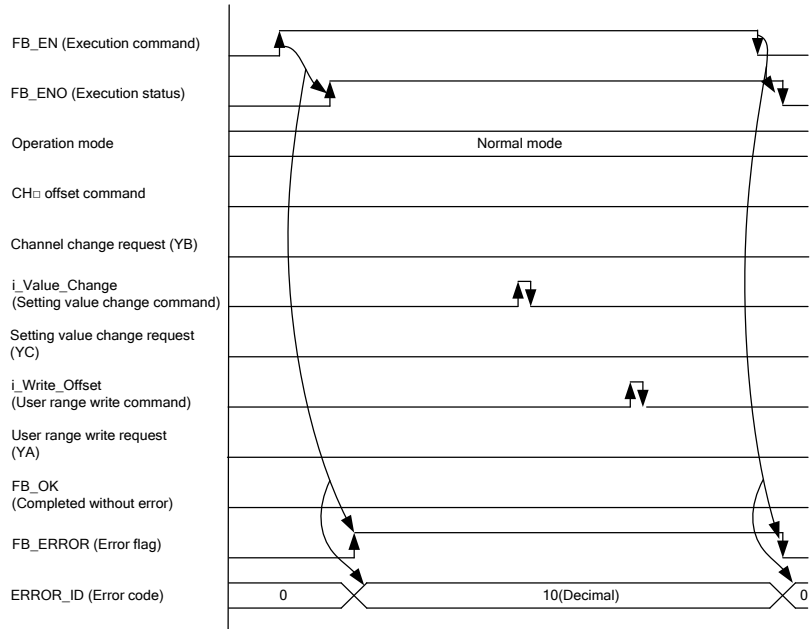
FB Name

M+Q68DA_SetOffsetVal

Function Overview

Item	Description																													
Function overview	Performs offset setting of a specified channel.																													
Symbol	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="4" style="text-align: center;">M+Q68DA_SetOffsetVal</th> </tr> </thead> <tbody> <tr> <td style="text-align: right;">Execution command</td> <td>— B : FB_EN</td> <td style="text-align: right;">FB_ENO : B</td> <td>— Execution status</td> </tr> <tr> <td style="text-align: right;">Module start XY address</td> <td>— W : i_Start_IO_No</td> <td style="text-align: right;">FB_OK : B</td> <td>— Completed without error</td> </tr> <tr> <td style="text-align: right;">Channel No.</td> <td>— W : i_CH</td> <td style="text-align: right;">FB_ERROR : B</td> <td>— Error flag</td> </tr> <tr> <td style="text-align: right;">Offset adjustment amount</td> <td>— W : i_Adjust_Amount</td> <td style="text-align: right;">ERROR_ID : W</td> <td>— Error code</td> </tr> <tr> <td style="text-align: right;">Setting value change command</td> <td>— B : i_Value_Change</td> <td></td> <td></td> </tr> <tr> <td style="text-align: right;">User range write command</td> <td>— B : i_Write_Offset</td> <td></td> <td></td> </tr> </tbody> </table>		M+Q68DA_SetOffsetVal				Execution command	— B : FB_EN	FB_ENO : B	— Execution status	Module start XY address	— W : i_Start_IO_No	FB_OK : B	— Completed without error	Channel No.	— W : i_CH	FB_ERROR : B	— Error flag	Offset adjustment amount	— W : i_Adjust_Amount	ERROR_ID : W	— Error code	Setting value change command	— B : i_Value_Change			User range write command	— B : i_Write_Offset		
M+Q68DA_SetOffsetVal																														
Execution command	— B : FB_EN	FB_ENO : B	— Execution status																											
Module start XY address	— W : i_Start_IO_No	FB_OK : B	— Completed without error																											
Channel No.	— W : i_CH	FB_ERROR : B	— Error flag																											
Offset adjustment amount	— W : i_Adjust_Amount	ERROR_ID : W	— Error code																											
Setting value change command	— B : i_Value_Change																													
User range write command	— B : i_Write_Offset																													
Applicable hardware and software	Digital-analog converter module	Q68DAV, Q68DAVN, Q68DAI, Q68DAIN																												
	CPU module	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;">Series</th> <th style="width: 50%;">Model</th> </tr> </thead> <tbody> <tr> <td rowspan="2">MELSEC-Q Series*</td> <td>High performance model</td> </tr> <tr> <td>Universal model</td> </tr> </tbody> </table> <p>* Not applicable to QCPU (A mode)</p>	Series	Model	MELSEC-Q Series*	High performance model	Universal model																							
	Series	Model																												
MELSEC-Q Series*	High performance model																													
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Engineering software	GX Works2 *1 <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;">Language</th> <th style="width: 50%;">Software version</th> </tr> </thead> <tbody> <tr> <td>Japanese version</td> <td>Version 1.86Q or later</td> </tr> <tr> <td>English version</td> <td>Version 1.24A or later</td> </tr> <tr> <td>Chinese (Simplified) version</td> <td>Version 1.49B or later</td> </tr> <tr> <td>Chinese (Traditional) version</td> <td>Version 1.49B or later</td> </tr> <tr> <td>Korean version</td> <td>Version 1.49B or later</td> </tr> </tbody> </table> <p>*1 For software versions applicable to the modules used, refer to "Relevant manuals".</p>	Language	Software version	Japanese version	Version 1.86Q or later	English version	Version 1.24A or later	Chinese (Simplified) version	Version 1.49B or later	Chinese (Traditional) version	Version 1.49B or later	Korean version	Version 1.49B or later																	
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Chinese (Traditional) version	Version 1.49B or later																													
Korean version	Version 1.49B or later																													
Programming language	Ladder																													
Number of steps	329 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.																													

Item	Description
Function description	<ol style="list-style-type: none"> 1) By turning ON FB_EN (Execution command), the offset value of the specified channel is set. 2) To adjust the D/A output, set i_Adjust_Amount (Offset/gain adjustment amount) and turn OFF i_Value_Change (Setting value change command) and then ON while FB_EN (Execution command) is ON. 3) When the input value is invalid, 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	<ol style="list-style-type: none"> 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) When two or more of these FBs are used, precaution must be taken to avoid repetition of the target channel. 5) This FB uses index registers Z7, Z8 and Z9. Please do not use these index registers in an interrupt program. 6) Every input must be provided with a value for proper FB operation. 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) The output range, synchronous output mode, resolution mode, and operation mode must be configured to match devices and systems connected to the Q68DA module. Configure these settings by making the GX Works2 switch setting according to the application. For details on how to use the intelligent function module switch setting, refer to GX Works2 Operating Manual (Common).
FB operation type	Pulsed execution (multiple scan execution type)
Application example	Refer to "Appendix 1. FB Library Application Examples".

Item	Description
Timing chart	<p>[When operation completes without error]</p>  <p>[When an error occurs]</p> 
Relevant manual	<ul style="list-style-type: none"> •Digital-Analog Converter 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 codes

●Error code list

Error code	Description
10 (Decimal)	The specified target channel is not valid. The target channel is not within the range of the number of channels of the mounted module.. 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.
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 Q68DA module is mounted. (For example, enter H10 for X10.)
Channel No.	i_CH	Word	1~8	Specify the channel number.
Offset adjustment amount	i_Adjust_Amount	Word	-3000~3000	Set the offset adjustment amount of the specified channel.
Setting value change command	i_Value_Change	Bit	ON, OFF	Turn ON to change the D/A output. Turn OFF after changing the output.
User range write command	i_Write_Offset	Bit	ON, OFF	Turn ON to write the adjusted offset value to the flash memory. Turn OFF after writing is completed.

●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 offset setting of the specified channel 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	2010/12/10	First edition
1.01B	2015/03/27	Optimized program (Not change this FB function)

Note

This chapter includes information related to the M+Q68DA_SetOffsetVal function block.

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

Before using any Mitsubishi products, please read all the relevant manuals.

2.7. M+Q68DA_SetGainVal (Gain setting)

FB Name

M+Q68DA_SetGainVal

Function Overview

Item	Description																													
Function overview	Performs gain setting of a specified channel.																													
Symbol	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="4" style="text-align: center;">M+Q68DA_SetGainVal</th> </tr> </thead> <tbody> <tr> <td style="text-align: right;">Execution command</td> <td>— B : FB_EN</td> <td style="text-align: left;">FB_ENO : B</td> <td>— Execution status</td> </tr> <tr> <td style="text-align: right;">Module start XY address</td> <td>— W : i_Start_IO_No</td> <td style="text-align: left;">FB_OK : B</td> <td>— Completed without error</td> </tr> <tr> <td style="text-align: right;">Channel No.</td> <td>— W : i_CH</td> <td style="text-align: left;">FB_ERROR : B</td> <td>— Error flag</td> </tr> <tr> <td style="text-align: right;">Gain adjustment amount</td> <td>— W : i_Adjust_Amount</td> <td style="text-align: left;">ERROR_ID : W</td> <td>— Error code</td> </tr> <tr> <td style="text-align: right;">Setting value change command</td> <td>— B : i_Value_Change</td> <td></td> <td></td> </tr> <tr> <td style="text-align: right;">User range write command</td> <td>— B : i_Write_Gain</td> <td></td> <td></td> </tr> </tbody> </table>		M+Q68DA_SetGainVal				Execution command	— B : FB_EN	FB_ENO : B	— Execution status	Module start XY address	— W : i_Start_IO_No	FB_OK : B	— Completed without error	Channel No.	— W : i_CH	FB_ERROR : B	— Error flag	Gain adjustment amount	— W : i_Adjust_Amount	ERROR_ID : W	— Error code	Setting value change command	— B : i_Value_Change			User range write command	— B : i_Write_Gain		
M+Q68DA_SetGainVal																														
Execution command	— B : FB_EN	FB_ENO : B	— Execution status																											
Module start XY address	— W : i_Start_IO_No	FB_OK : B	— Completed without error																											
Channel No.	— W : i_CH	FB_ERROR : B	— Error flag																											
Gain adjustment amount	— W : i_Adjust_Amount	ERROR_ID : W	— Error code																											
Setting value change command	— B : i_Value_Change																													
User range write command	— B : i_Write_Gain																													
Applicable hardware and software	Digital-analog converter module	Q68DAV, Q68DAVN, Q68DAI, Q68DAIN																												
	CPU module	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;">Series</th> <th style="width: 50%;">Model</th> </tr> </thead> <tbody> <tr> <td rowspan="2">MELSEC-Q Series*</td> <td>High performance model</td> </tr> <tr> <td>Universal model</td> </tr> </tbody> </table> <p>* Not applicable to QCPU (A mode)</p>	Series	Model	MELSEC-Q Series*	High performance model	Universal model																							
	Series	Model																												
MELSEC-Q Series*	High performance model																													
	Universal model																													
Engineering software	GX Works2 *1 <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;">Language</th> <th style="width: 50%;">Software version</th> </tr> </thead> <tbody> <tr> <td>Japanese version</td> <td>Version 1.86Q or later</td> </tr> <tr> <td>English version</td> <td>Version 1.24A or later</td> </tr> <tr> <td>Chinese (Simplified) version</td> <td>Version 1.49B or later</td> </tr> <tr> <td>Chinese (Traditional) version</td> <td>Version 1.49B or later</td> </tr> <tr> <td>Korean version</td> <td>Version 1.49B or later</td> </tr> </tbody> </table> <p>*1 For software versions applicable to the modules used, refer to "Relevant manuals".</p>	Language	Software version	Japanese version	Version 1.86Q or later	English version	Version 1.24A or later	Chinese (Simplified) version	Version 1.49B or later	Chinese (Traditional) version	Version 1.49B or later	Korean version	Version 1.49B or later																	
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Chinese (Simplified) version	Version 1.49B or later																													
Chinese (Traditional) version	Version 1.49B or later																													
Korean version	Version 1.49B or later																													
Programming language	Ladder																													
Number of steps	327 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.																													

Item	Description
Function description	<ol style="list-style-type: none"> 1) By turning ON FB_EN (Execution command), the gain value of the specified channel is set. 2) To adjust the D/A output, set i_Adjust_Amount (Offset/gain adjustment amount) and turn OFF i_Value_Change (Setting value change command) and then ON while FB_EN (Execution command) is ON. 3) When the input value is invalid, 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	<ol style="list-style-type: none"> 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) When two or more of these FBs are used, precaution must be taken to avoid repetition of the target channel. 5) This FB uses index registers Z7, Z8 and Z9. Please do not use these index registers in an interrupt program. 6) Every input must be provided with a value for proper FB operation. 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) The output range, synchronous output mode, resolution mode, and operation mode must be configured to match devices and systems connected to the Q68DA module. Configure these settings by making the GX Works2 switch setting according to the application. For details on how to use the intelligent function module switch setting, refer to GX Works2 Operating Manual (Common).
FB operation type	Pulsed execution (multiple scan execution type)
Application example	Refer to "Appendix 1. FB Library Application Examples".

Item	Description
Timing chart	<p>[When operation completes without error]</p> <p>[When an error occurs]</p>
Relevant manual	<ul style="list-style-type: none"> •Digital-Analog Converter 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 codes

●Error code list

Error code	Description
10 (Decimal)	The specified target channel is not valid. The target channel is not within the range of the number of channels of the mounted module.. 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.
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 Q68DA module is mounted. (For example, enter H10 for X10.)
Channel No.	i_CH	Word	1~8	Specify the channel number.
Gain adjustment amount	i_Adjust_Amount	Word	-3000~3000	Specify the gain adjustment amount of the specified channel.
Setting value change command	i_Value_Change	Bit	ON, OFF	Turn ON to change the D/A output. Turn OFF after changing the output.
User range write command	i_Write_Gain	Bit	ON, OFF	Turn ON to write the adjusted gain value to the flash memory. Turn OFF after writing is completed.

●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 setting of the specified channel 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	2010/12/10	First edition
1.01B	2015/03/27	Optimized program (Not change this FB function)

Note

This chapter includes information related to the M+Q68DA_SetGainVal function block.

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

Before using any Mitsubishi products, please read all the relevant manuals.

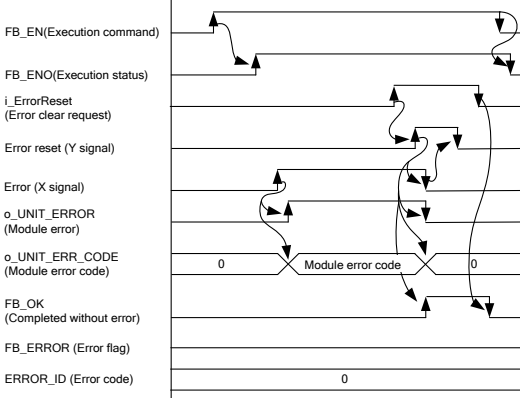
2.8. M+Q68DA_ErrorOperation (Error operation)

FB Name

M+Q68DA_ErrorOperation

Function Overview

Item	Description												
Function overview	Monitors error codes and performs error reset.												
Symbol	<div style="border: 1px solid black; padding: 10px; margin: 10px auto; width: 80%;"> <p style="text-align: center; margin: 0;">M+Q68DA_ErrorOperation</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%; vertical-align: top;"> <p>Execution command — B : FB_EN</p> <p>Module start XY address — W : i_Start_IO_No</p> <p>Error reset request — B : i_ErrorReset</p> </td> <td style="width: 40%; vertical-align: top; text-align: center;"> <p>FB_ENO : B</p> <p>FB_OK : B</p> <p>o_UNIT_ERROR : B</p> <p>o_UNIT_ERR_CODE : W</p> <p>FB_ERROR : B</p> <p>ERROR_ID : W</p> </td> <td style="width: 30%; vertical-align: top;"> <p>Execution status</p> <p>Completed without error</p> <p>Module error</p> <p>Module error code</p> <p>Error flag</p> <p>Error code</p> </td> </tr> </table> </div>		<p>Execution command — B : FB_EN</p> <p>Module start XY address — W : i_Start_IO_No</p> <p>Error reset request — B : i_ErrorReset</p>	<p>FB_ENO : B</p> <p>FB_OK : B</p> <p>o_UNIT_ERROR : B</p> <p>o_UNIT_ERR_CODE : W</p> <p>FB_ERROR : B</p> <p>ERROR_ID : W</p>	<p>Execution status</p> <p>Completed without error</p> <p>Module error</p> <p>Module error code</p> <p>Error flag</p> <p>Error code</p>								
<p>Execution command — B : FB_EN</p> <p>Module start XY address — W : i_Start_IO_No</p> <p>Error reset request — B : i_ErrorReset</p>	<p>FB_ENO : B</p> <p>FB_OK : B</p> <p>o_UNIT_ERROR : B</p> <p>o_UNIT_ERR_CODE : W</p> <p>FB_ERROR : B</p> <p>ERROR_ID : W</p>	<p>Execution status</p> <p>Completed without error</p> <p>Module error</p> <p>Module error code</p> <p>Error flag</p> <p>Error code</p>											
Applicable hardware and software	Digital-analog converter module	Q68DAV, Q68DAVN, Q68DAI, Q68DAIN											
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Chinese (Simplified) version	Version 1.49B or later												
Chinese (Traditional) version	Version 1.49B or later												
Korean version	Version 1.49B or later												
Programming language	Ladder												

Item	Description
Number of steps	187 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.
Function description	1) By turning ON FB_EN (Execution command), error information is read. 2) When the error reset request is ON, error clear is performed.
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) Every input must be provided with a value for proper FB operation. 6) When this FB is used in two or more places, a duplicated coil warning will 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) The output range, synchronous output mode, resolution mode, and operation mode must be configured to match devices and systems connected to the Q68DA module. Configure these settings by making the GX Works2 switch setting according to the application. For details on how to use the intelligent function module switch setting, refer to GX Works2 Operating Manual (Common).
FB operation type	Real-time execution
Application example	Refer to "Appendix 1. FB Library Application Examples".
Timing chart	 <p>The timing chart illustrates the sequence of events for the FB. It shows the following signals and their states over time:</p> <ul style="list-style-type: none"> FB_EN (Execution command): A pulse that starts the execution. FB_ENO (Execution status): A pulse that occurs while the FB is executing. i_ErrorReset (Error clear request): A pulse that triggers the error reset process. Error reset (Y signal): A pulse that occurs after the error reset request is received. Error (X signal): A pulse that occurs when an error is detected. o_UNIT_ERROR (Module error): A pulse that occurs when a module error is detected. o_UNIT_ERR_CODE (Module error code): A signal that outputs the error code (0) when a module error occurs. FB_OK (Completed without error): A pulse that occurs when the FB completes its execution without any errors. FB_ERROR (Error flag): A pulse that occurs when an error is detected. ERROR_ID (Error code): A signal that outputs the error code (0) when an error occurs.

Item	Description
Relevant manual	<ul style="list-style-type: none"> •Digital-Analog Converter 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 codes

●Error code list

Error code	Description
None	No errors are stored for this FB.

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 Q68DA module is mounted. (For example, enter H10 for X10.)
Error reset request	i_ErrorReset	Bit	ON, OFF	Turn ON to perform the error reset. Turn OFF after error reset is completed.

●Output labels

Name (Comment)	Label name	Data type	Initial value	Description
Execution status	FB_ENO	Bit	OFF	ON: Execution command is ON. (Module error being monitored) OFF: Execution command is OFF.
Completed without error	FB_OK	Bit	OFF	When ON, it indicates executing the error reset command is completed.
Module error	o_UNIT_ERR OR	Bit	OFF	When ON, it indicates a module error has occurred.
Module error code	o_UNIT_ERR_CODE	Word	0	Store a code for an error occurring.
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	2010/12/10	First edition

Note

This chapter includes information related to the M+Q68DA_ErrorOperation function block.

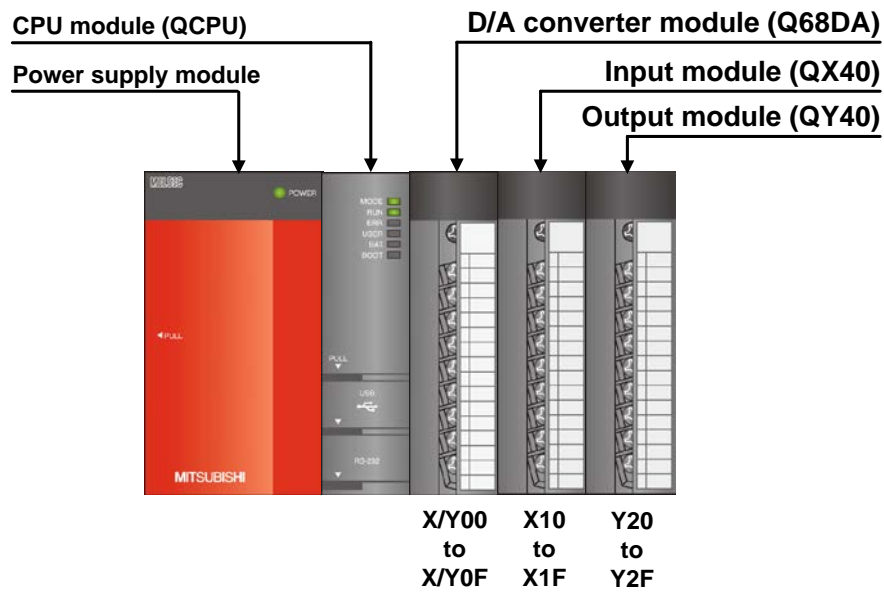
It does not include information on restrictions of use such as combination with digital-analog converter modules or programmable controller CPUs.

Before using any Mitsubishi products, please read all the relevant manuals.

Appendix 1. FB Library Application Examples

Q68DA FB application examples are as follows.

1) System configuration



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

External input (commands)

Device	FB function name	Application (ON details)
X10	Error operation	Error reset request

External output (checks)

Device	FB function name	Application (ON details)
Y20	DA conversion data write	DA conversion data write FB error
Y21	DA conversion data write (All CHs)	DA conversion data write (All CHs) FB error
Y22	DA conversion enable/disable setting	DA conversion enable/disable FB error
Y23	DA output enable/disable setting	DA output enable/disable FB error
Y24	Operating condition setting request operation	Operating condition setting request operation FB error
Y25	Offset setting	Offset setting FB error
Y26	Gain setting	Gain setting FB error
Y27	Error operation	Module error
Y28	Error operation	Error operation FB error

Data register

Device	FB function name	Application (ON details)
D0	DA conversion data write	DA conversion data write FB error code
D1	DA conversion data write (All CHs)	DA conversion data write (All CHs) FB error code
D2	DA conversion enable/disable setting	DA output enable/disable FB error code
D3	DA output enable/disable setting	DA conversion enable/disable FB error code
D4	Operating condition setting request operation	Operating condition setting request operation FB error code
D5	Offset setting	Offset setting FB error code
D6	Gain setting	Gain setting FB error code
D7	Error operation	Error operation FB error code
D8	Error operation	Module error code

Relay

Device	FB function name	Application (ON details)
M0		DA conversion data write request
M1	DA conversion data write	DA conversion data write FB ready
M2		DA conversion data write complete
M3		DA conversion data write (All CHs) request
M4	DA conversion data write (All CHs)	DA conversion data write (All CHs) FB ready
M5		DA conversion data write (All CHs) complete
M6		DA conversion enable/disable setting request
M7	DA conversion enable/disable setting	DA conversion enable/disable setting
M8		DA conversion enable/disable setting FB ready
M9		DA conversion enable/disable setting complete
M10		DA output enable/disable setting request
M11	DA output enable/disable setting	DA output enable/disable setting
M12		DA output enable/disable setting FB ready
M13		DA output enable/disable setting complete
M14		Operating condition setting request
M15	Operating condition setting request operation	Operating condition setting request FB ready
M16		Operating condition setting request operation FB complete
M17		Offset setting request
M18		Setting value change command
M19	Offset setting	User range write command
M20		Offset setting FB ready
M21		Offset setting complete
M22		Gain setting request
M23		Setting value change command
M24	Gain setting	User range write command
M25		Gain setting FB ready
M26		Gain setting complete
M27		Error operation request
M28	Error operation	Error operation ready
M29		Error operation complete

3) Global label setting

None

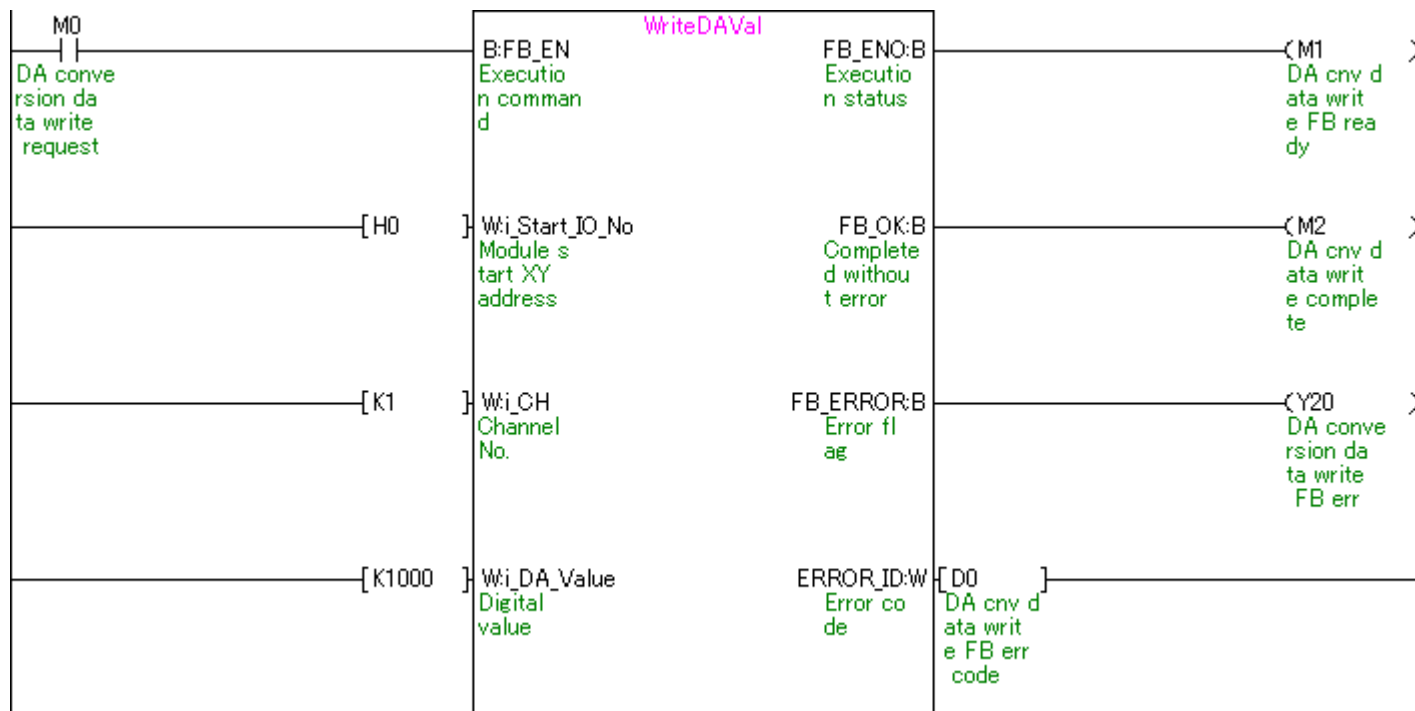
4) Application example settings

a) Common setting

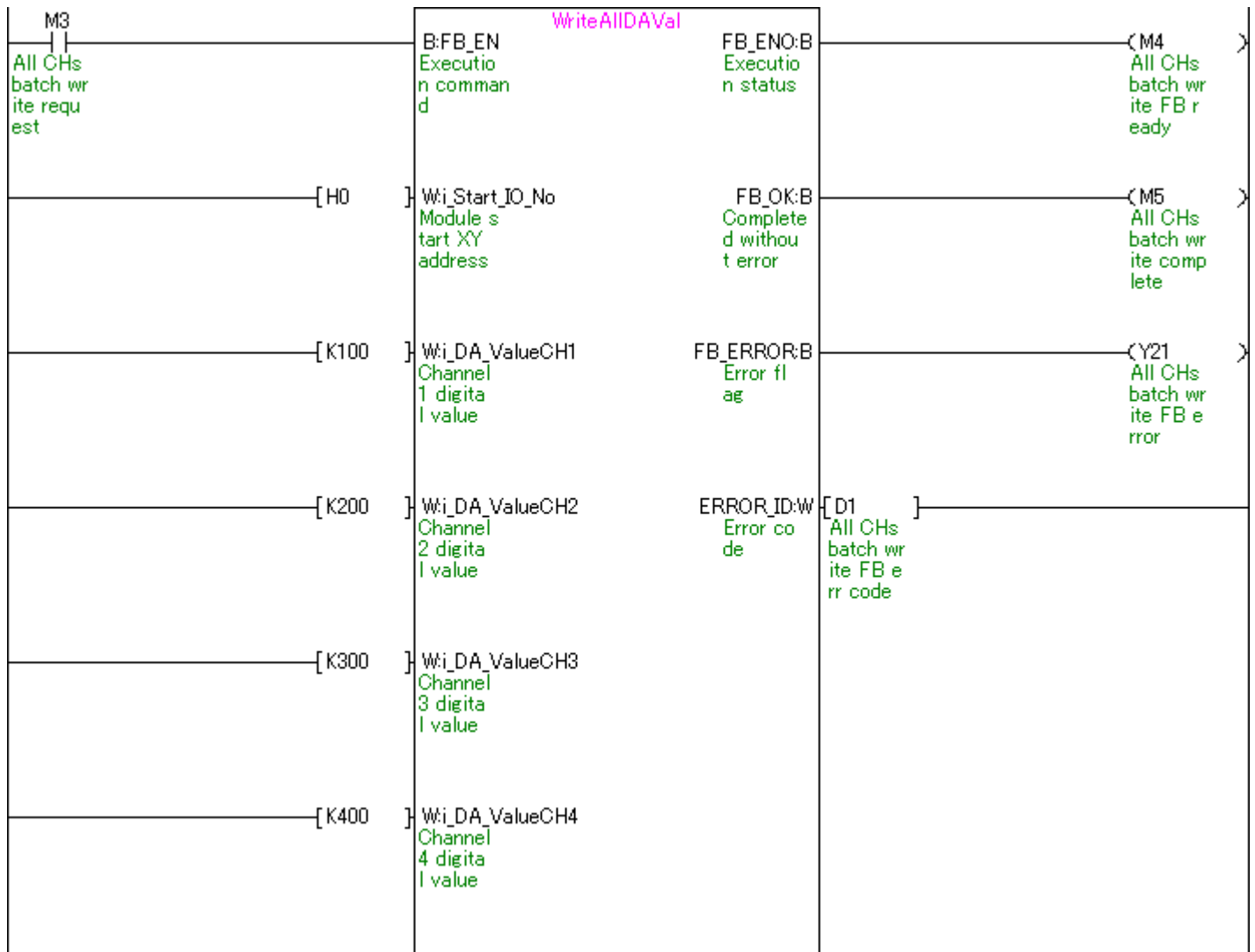
Input and output item	Value	Description
Module start XY address	0	Specify the starting XY address where the Q68DA is mounted.

5) Programs

M+Q68DA_WriteDAVal (DA conversion data write)



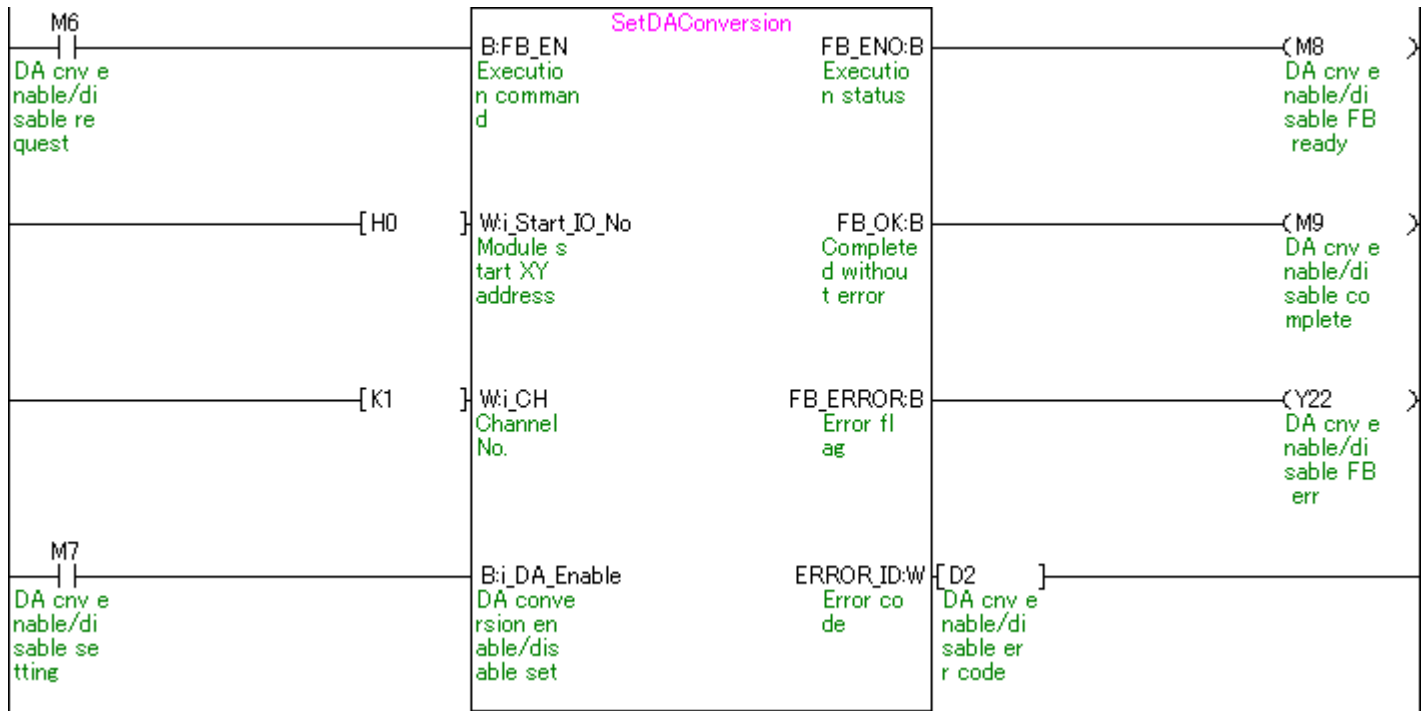
M+Q68DA_WriteAIIDAVal (DA conversion data write (All CHs))



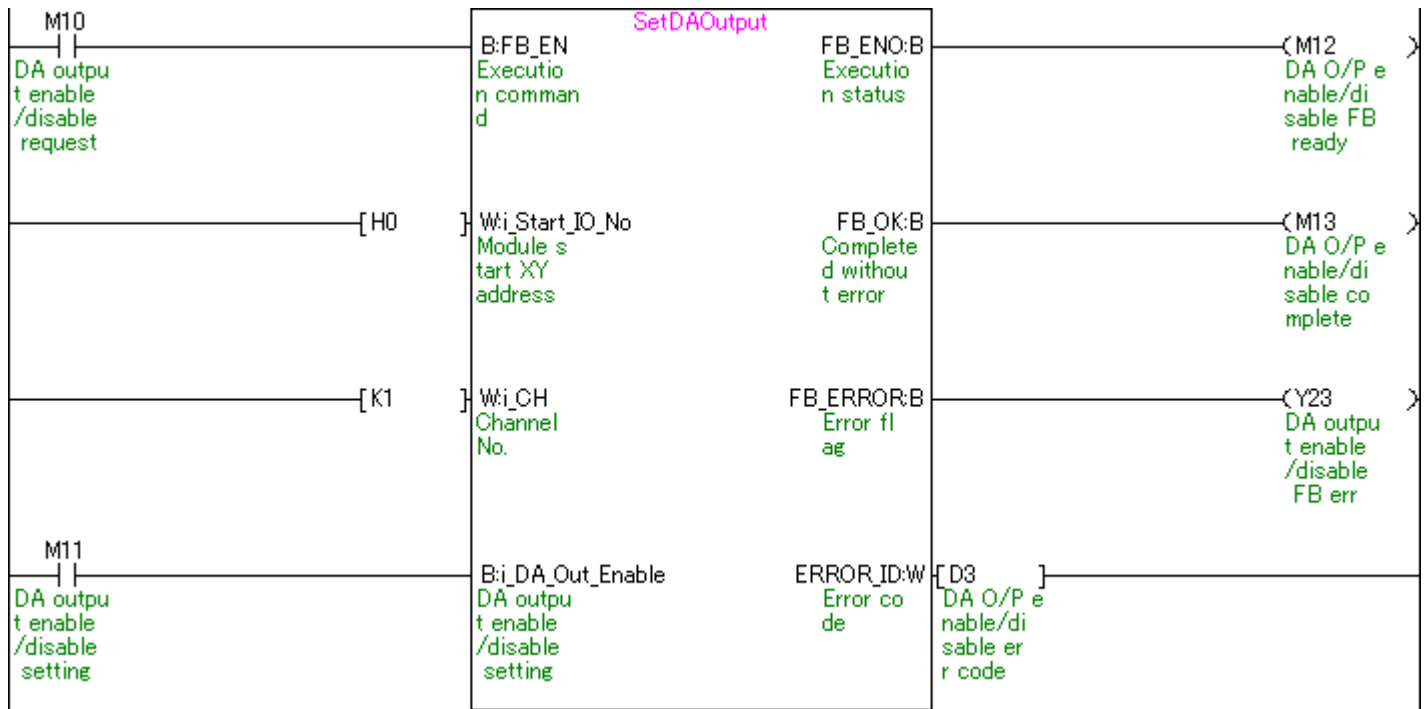
(Continues to the next page)

[K500]	Wi_DA_ValueCH5 Channel 5 digita l value
[K600]	Wi_DA_ValueCH6 Channel 6 digita l value
[K700]	Wi_DA_ValueCH7 Channel 7 digita l value
[K800]	Wi_DA_ValueCH8 Channel 8 digita l value

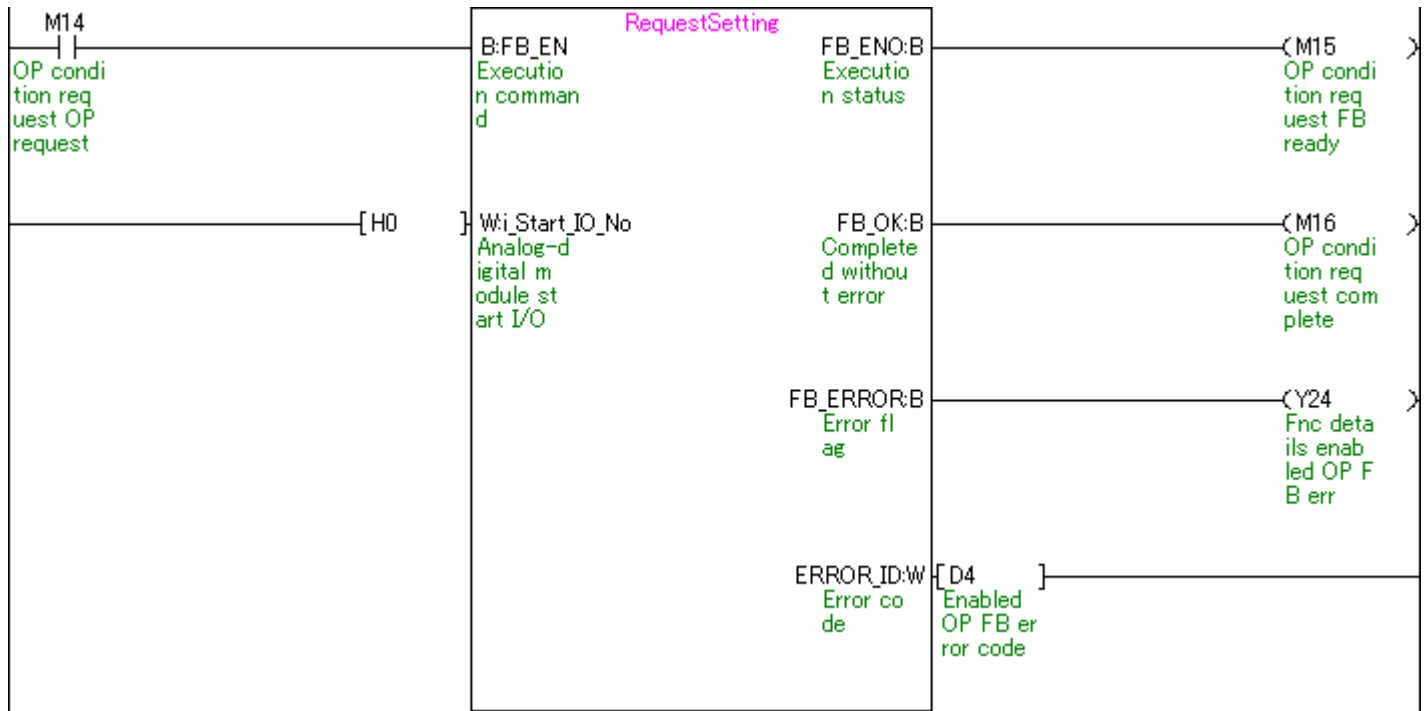
M+Q68DA_SetDAConversion (DA conversion enable/disable setting)



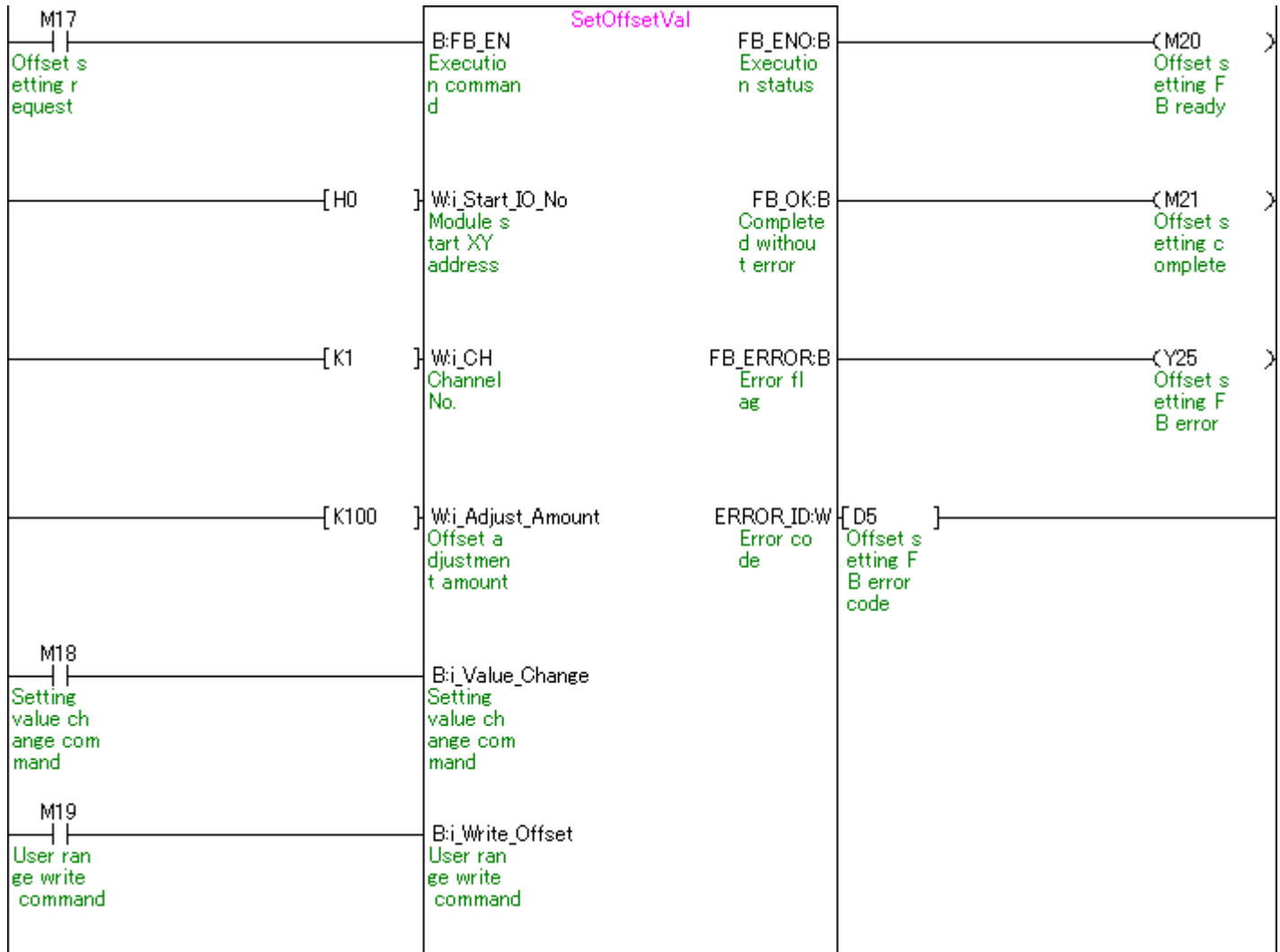
M+Q68DA_SetDAOutput (DA output enable/disable setting)



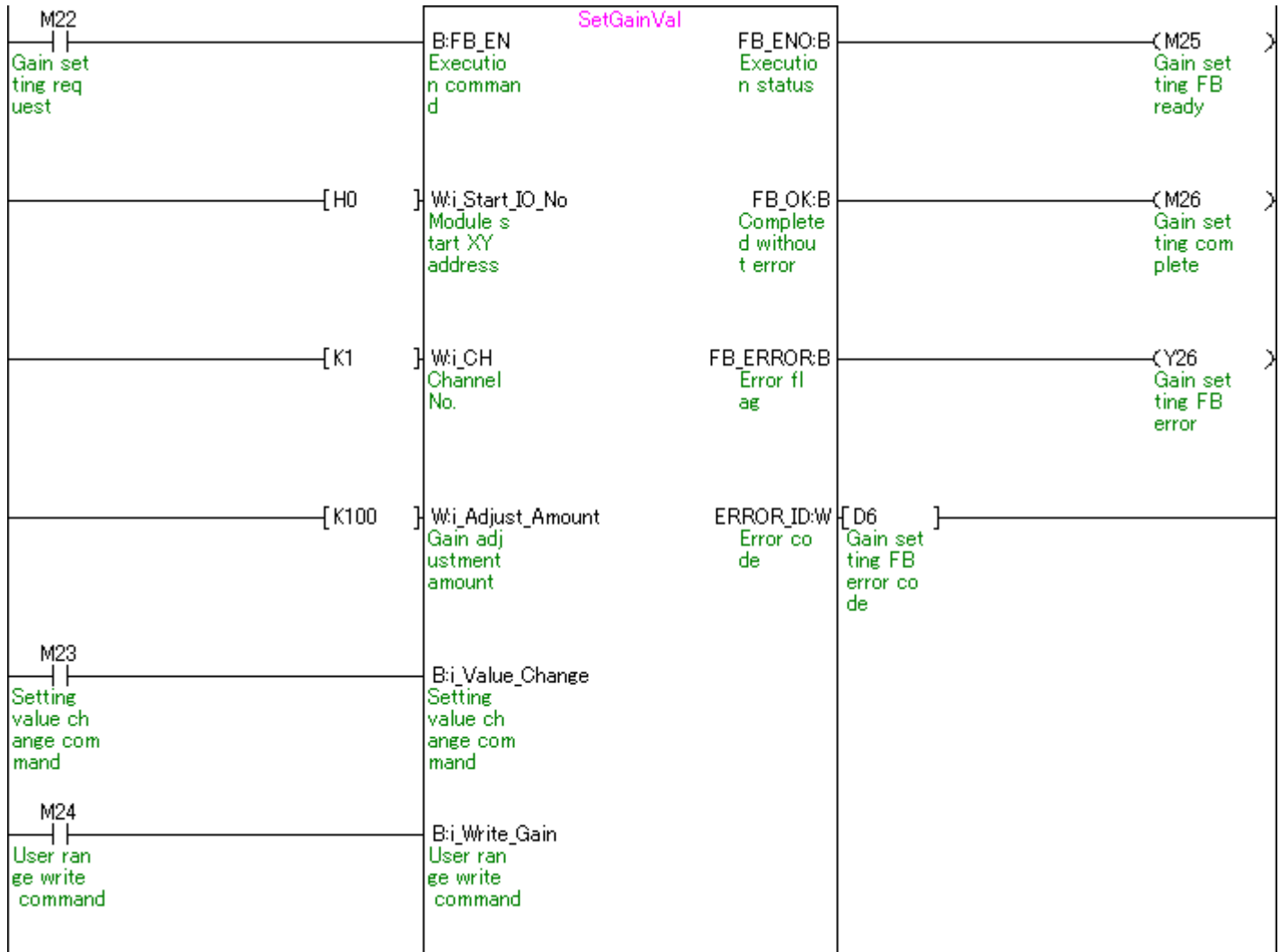
M+Q68DA_RequestSetting (Operating condition setting request operation)



M+Q68DA_SetOffsetVal (Offset setting)



M+Q68DA_SetGainVal (Gain setting)



M+Q68DA_ErrorOperation (Error operation)

