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

Applicable modules: Q64DA, Q64DAN

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Reference Manual Revision History

Reference Manual Number	Date	Description	
FBM-M042-A	2010/12/10	First edition	
FBM-M042-B	2015/03/27	1) Added applicable GX Works2 Version.	
		•This FB is able to install on GX Works2 of all language versions.	
		2) Added the following "FB Version Upgrade History".	
		•M+Q64DA_SetOffsetVal	
		●M+Q64DA_SetGainVal	



1. Overview

1.1. Overview of the FB Library

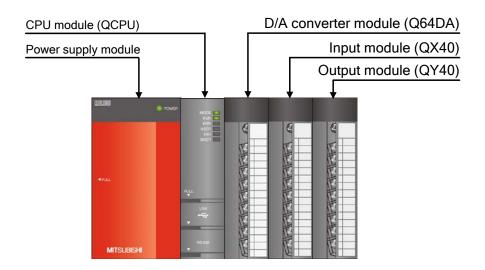
This FB Library is for using the MELSEC-Q Digital-Analog Converter Module.

1.2. Function of the FB Library

Item	Description
M+Q64DA_WriteDAVal	Writes DA conversion data of a specified channel.
M+Q64DA_WriteAllDAVal	Writes DA conversion data of all channels.
M+Q64DA_SetDAConversion	Sets the DA conversion enable/disable setting of a specified channel
	or all channels.
M+Q64DA_SetDAOutput	Sets the DA output enable/disable setting of a specified channel or all
	channels.
M+Q64DA_RequestSetting	Enables settings of each function.
M+Q64DA_SetOffsetVal	Performs offset setting of a specified channel.
M+Q64DA_SetGainVal	Performs gain setting of a specified channel.
M+Q64DA_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+Q64DA_WriteDAVal (DA conversion data write)

FB Name

M+Q64DA_WriteDAVal

Item	Description			
Function overview	Writes DA conversion data of a specified channel.			
Symbol		M+Q64DA_WriteDA	Val	
	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	
Applicable hardware	Digital-analog	Q64DA, Q64DAN		
and software	converter module			
	CPU module			
		Series	Model	
		MELSEC-Q Series*	High performance model	
			Universal model	
		* Not applicable for QCPU (A mode)		
	Engineering software	GX Works2 *1		
		Language	Software version	
		Japanese version	Version1.86Q or later	
		English version	Version1.24A or later	
		Chinese (Simplified) version	on Version1.49B or later	
		Chinese (Traditional) versi	on Version1.49B or later	
		Korean version	Version1.49B or later	
		*1 For software versions applicable to the modules used, refer to		
		"Relevant Manuals".		
Programming	Ladder			
language				
Number of steps	. ,	or MELSEC-Q series universal model CPU)		
	·	eps of the FB in a program depends on the CPU model that is used and		
	input and output defi	nition.		



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	1) The FB does not include error recovery processing. Program the error recovery				
precautions	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 Q64DA 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	[When operation completes without error] [When an error occurs]				
	FB_EN (Execution command) FB_EN (Execution command)				
	FB_ENO (Execution status) (Execution status)				
	CH⊡digital input value (Un\G1 to 4) Refreshing Stop (Un\G1 to 4)				
	FB_OK (Completed without error) FB_OK (Completed without error)				
	FB_ERROR(Error flag) FB_ERROR (Error flag)				
	ERROR_ID(Error code) 0 ERROR_ID (Error code) 0 10(Decimal) 0				



Item	Description	
Relevant manual	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 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	Setting range	Description
		type		
Execution	FB_EN	Bit	ON, OFF	ON: The FB is activated.
command				OFF: The FB is not activated.
Module start XY	i_Start_IO_No	Word	Depends on the I/O point	Specify the starting XY
address			range. For details, refer to	address (in hexadecimal)
			the CPU user's manual.	where the Q64DA module is
				mounted. (For example, enter
				H10 for X10.)
Channel No.	i_CH	Word	1~4	Specify the channel number.
Digital value	i_DA_Value	Word	Depends on the output	For details on the setting
			range setting and resolution	range of the digital value, refer
			setting of the specified	to the relevant manual.
			channel.	

Output labels

- Calpar labolo					
Name (Comment)	Label name	Data	Initial	Description	
		type	value		
Execution status	FB_ENO	Bit	OFF	ON: Execution command is ON	
				OFF: Execution command is OFF.	
Completed without	FB_OK	Bit	OFF	When ON, it indicates that DA conversion value is	
error				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+Q64DA_WriteDAVal function block.

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



2.2. M+Q64DA_WriteAllDAVal (DA conversion data write (All CHs))

FB Name

M+Q64DA_WriteAllDAVal

Item	Description				
Function overview	Writes DA conversion data of all channels.				
Symbol		M+Q64DA_WriteAllDAVal			
	Execution command —	B : FB_EN	FB_EN	NO : B Execution status	
	Module start XY address —	W:i_Start_IO_No	FB_0	OK : B Completed without error	
	Channel 1 digital value —	W : i_DA_ValueCH1	FB_ERR	OR : 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			
Applicable hardware	Digital-analog	Q64DA, Q64DAN			
and software	converter module				
	CPU module				
		Series		Model	
		MELSEC-Q Series*	High perfo	rmance model	
			Universal r	model	
		* Not applicable for QCP	U (A mode)		
	Engineering software	GX Works2 *1			
		Language		Software version	
		Japanese version	Ver	rsion1.86Q or later	
		English version	Ver	rsion1.24A or later	
		Chinese (Simplified) ve	rsion Ver	rsion1.49B or later	
		Chinese (Traditional) ve	ersion Ver	rsion1.49B or later	
		Korean version	Ver	rsion1.49B or later	
		*1 For software versions	applicable to	o the modules used, refer to	
		"Relevant Manuals".			
Programming	Ladder				
language					
Number of steps	177 steps (for MELSE)	EC-Q series universal model CPU)			
	* The number of steps input and output defi	s of the FB in a program depends on the CPU model that is used and efinition.			



Item	Description				
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	1) The FB does not include error recovery processing. Program the error recovery				
precautions	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 Q64DA 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	FB EN				
	(Execution command)				
	FB_ENO (Execution status) CH□ digital input value Refreshing				
	(Un\G1 to 4) stop stop				
	FB_OK (Completed without error)				
	FB_ERROR(Error flag) ERROR_ID(Error code) 0				
Relevant manual	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 code list

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

Labels

●Input labels

Name (Comment)	Label name	Data	Setting range	Description
		type		
Execution	FB_EN	Bit	ON, OFF	ON: The FB is activated.
command				OFF: The FB is not activated.
Module start XY	i_Start_IO_No	Word	Depends on the I/O point	Specify the starting XY
address			range. For details, refer to	address (in hexadecimal)
			the CPU user's manual.	where the Q64DA module is
				mounted. (For example, enter
				H10 for X10.)
Channel 1 digital	i_DA_ValueCH1	Word	Depends on the output	Writes the digital conversion
value			range setting and resolution	value of the channel 1.
			setting of the channel 1.	
Channel 2 digital	i_DA_ValueCH2	Word	Depends on the output	Writes the digital conversion
value			range setting and resolution	value of the channel 2.
			setting of the channel 2.	
Channel 3 digital	i_DA_ValueCH3	Word	Depends on the output	Writes the digital conversion
value			range setting and resolution	value of the channel 3.
			setting of the channel 3.	
Channel 4 digital	i_DA_ValueCH4	Word	Depends on the output	Writes the digital conversion
value			range setting and resolution	value of the channel 4.
			setting of the channel 4.	



Output labels

Name (Comment)	Label name	Data	Initial	Description
		type	value	
Execution status	FB_ENO	Bit	OFF	ON: Execution command is ON.
				OFF: Execution command is OFF.
Completed without	FB_OK	Bit	OFF	When ON, it indicates that DA conversion values of
error				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+Q64DA_WriteAllDAVal function block.

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



2.3. M+Q64DA_SetDAConversion (DA conversion enable/disable setting)

FB Name

M+Q64DA_SetDAConversion

Item	Description				
Function overview	Sets the DA conversion enable/disable setting of a specified channel or all channels.				
Symbol		M+Q64DA_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	Digital-analog	Q64DA, Q64DAN			
and software	converter module				
	CPU module		<u> </u>		
		Series		Model	
		MELSEC-Q Series*	High perfor	mance model	
			Universal model		
		* Not applicable for QCPU	(A mode)		
	Engineering software	GX Works2 *1			
		Language		Software version	
		Japanese version	Versio	Version1.86Q or later	
		English version	Versio	n1.24A or later	
		Chinese (Simplified) version	on Versio	n1.49B or later	
		Chinese (Traditional) vers	ion Versio	n1.49B or later	
		Korean version	Versio	n1.49B or later	
		*1 For software versions ap	plicable to the	e modules used, refer to	
		"Relevant Manuals".			
Programming	Ladder				
language					
Number of steps	245 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 defir	IIIIOII.			



Item	Description				
Function description	1) By turning ON FB_EN (Execution command), the 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+Q64DA_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	1) The FB does not include error recovery processing. Program the error recovery				
precautions	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 Q64DA 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	[When operation completes without error] [When an error occurs]				
	FB_EN (Execution command) FB_ENO (Execution status) DA conversion enable/disable setting write processing FB_OK (Completed without error) FB_ERROR (Error flag) ERROR_ID(Error code) FB_EN (Execution command) FB_EN (Execution status) DA conversion enable/disable setting write processing FB_OK (Completed without error) FB_ERROR (Error flag) ERROR_ID(Error code) FB_ERROR_ID (Error code)				
Relevant manual	 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 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	Setting range	Description
		type		
Execution	FB_EN	Bit	ON, OFF	ON: The FB is activated.
command				OFF: The FB is not activated.
Module start XY	i_Start_IO_No	Word	Depends on the I/O point	Specify the starting XY
address			range. For details, refer to	address (in hexadecimal)
			the CPU user's manual.	where the Q64DA module is
				mounted. (For example, enter
				H10 for X10.)
Channel No.	i_CH	Word	As shown on the right.	Specify the channel number.
				•Q64DA, Q64DAN: 1~4
				•All channels at once: 15(0FH)
DA conversion	i_DA_Enable	Bit	ON, OFF	ON: DA conversion enabled.
enable/disable				OFF: DA conversion disabled.
setting				



Output labels

Name (Comment)	Label name	Data	Initial	Description
		type	value	
Execution status	FB_ENO	Bit	OFF	ON: Execution command is ON.
				OFF: Execution command is OFF.
Completed without	FB_OK	Bit	OFF	When ON, it indicates that DA conversion
error				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+Q64DA_SetDAConversion function block.

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



2.4. M+Q64DA_SetDAOutput (DA output enable/disable setting)

FB Name

M+Q64DA_SetDAOutput

Item	Description				
Function overview	Sets the DA output enable/disable setting of a specified channel or all channels.				
Symbol		M+Q64DA_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	Digital-analog	Q64DA, Q64DAN			
and software	converter module				
	CPU module				
		Series		Model	
		MELSEC-Q Series*	High perforr	mance model	
			Universal model		
		* Not applicable for QCPU (A mode)		
	Engineering software	Compatible software:			
		GX Works2 *1			
		Language	5	Software version	
		Japanese version	Version	11.86Q or later	
		English version	Version	11.24A or later	
		Chinese (Simplified) version	on Version	11.49B or later	
		Chinese (Traditional) versi	on Version	Version1.49B or later	
		Korean version	Version	11.49B or later	
		*1 For software versions app	olicable to the	modules used, refer to	
		"Relevant Manuals".			
Programming	Ladder				
language					
Number of steps	218 steps (for MELSEC	ELSEC-Q series universal model CPU) steps of the FB in a program depends on the CPU model that is used and			
	* The number of steps o				
	input and output defin	ition.			



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	1) The FB does not include error recovery processing. Program the error recovery						
precautions	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 Q64DA 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	[When operation completes without error] [When an error occurs]						
	FB_EN (Execution command)						
	FB_ENO (Execution status) (Execution status)						
	i_DA_Out_Enable (DA output enable/disable i_DA_Out_Enable (DA output enable/disable						
	setting) CH□ output enable/ disable flag (Y signal) setting) CH□ output enable/ disable flag (Y signal)						
	FB_OK (Completed without error) (Completed without error)						
	FB_ERROR (Error flag) FB_ERROR (Error flag)						
	ERROR_ID (Error code) 0 ERROR_ID (Error code) 0 10(Decimal) 0						
	2 (1 (200)						



Item	Description			
Relevant manual	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 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	Setting range	Description
		type		
Execution	FB_EN	Bit	ON, OFF	ON: The FB is activated.
command				OFF: The FB is not activated.
Module start XY	i_Start_IO_No	Word	Depends on the I/O point	Specify the starting XY
address			range. For details, refer to	address (in hexadecimal)
			the CPU user's manual.	where the Q64DA module is
				mounted. (For example, enter
				H10 for X10.)
Channel No.	i_CH	Word	As shown on the right.	Specify the channel number.
				•Q64DA, Q64DAN: 1~4
				•All channels at once: 15(0FH)
DA output	i_DA_Out_Enabl	Bit	ON, OFF	ON: Outputs the D/A
enable/disable	е			conversion value.
setting				OFF: Outputs the offset value.



Output labels

Name (Comment)	Label name	Data	Initial	Description
		type	value	
Execution status	FB_ENO	Bit	OFF	ON: Execution command is ON.
				OFF: Execution command is OFF.
Completed without	FB_OK	Bit	OFF	When ON, it indicates that DA output enable/disable
error				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+Q64DA_SetDAOutput function block.

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



2.5. M+Q64DA_RequestSetting (Operating condition setting request operation)

FB Name

M+Q64DA_RequestSetting

Item	Description				
Function overview	Enables settings of each function.				
Symbol	M+Q64DA_RequestSetting				
	Execution command ——	B : FB_EN	FB_ENO : B Execution	on status	
	Module start XY address	W:i_Start_IO_No	FB_OK : B Complet	ted without error	
			FB_ERROR : B —— Error fla	g	
			ERROR_ID : W Error co	ode	
Applicable hardware and software	Digital-analog converter module	Q64DA, Q64DAN			
	CPU module				
		Series	Model		
		MELSEC-Q Series*	High performance mo	del	
			Universal model	Jniversal model	
		* Not applicable for QCPU (A mode)		
	Engineering software	GX Works2 *1			
		Language	Software v	ersion	
		Japanese version	Version1.86Q or I	later	
		English version	Version1.24A or la	ater	
		Chinese (Simplified) version	n Version1.49B or I	ater	
		Chinese (Traditional) version	on Version1.49B or I	ater	
		Korean version Version1.49B			
		*1 For software versions app "Relevant Manuals".	licable to the modules	used, refer to	
Programming language	Ladder				
Number of steps	173 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), 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	1) The FB does not include error recovery processing. Program the error recovery						
precautions	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 Q64DA 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							
	FB_EN (Execution command) FB_ENO (Execution status)						
	Operating condition setting request (Y signal)						
	Operating condition setting completed flag (X signal)						
	FB_OK (Completed without error)						
	FB_ERROR (Error flag)						
	ERROR_ID(Error code) 0						



Item	Description			
Relevant manual	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 code list

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

Labels

●Input labels

Name (Comment)	Label name	Data	Setting range	Description
		type		
Execution	FB_EN	Bit	ON, OFF	ON: The FB is activated.
command				OFF: The FB is not activated.
Module start XY	i_Start_IO_No	Word	Depends on the I/O point	Specify the starting XY
address			range. For details, refer to	address (in hexadecimal)
			the CPU user's manual.	where the Q64DA module is
				mounted. (For example, enter
				H10 for X10.)

Output labels

Name (Comment)	Label name	Data	Initial	Description
		type	value	
Execution status	FB_ENO	Bit	OFF	ON: Execution command is ON.
				OFF: Execution command is OFF.
Completed without	FB_OK	Bit	OFF	When ON, it indicates that the enabled operation of
error				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+Q64DA_RequestSetting function block.

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



FB Name

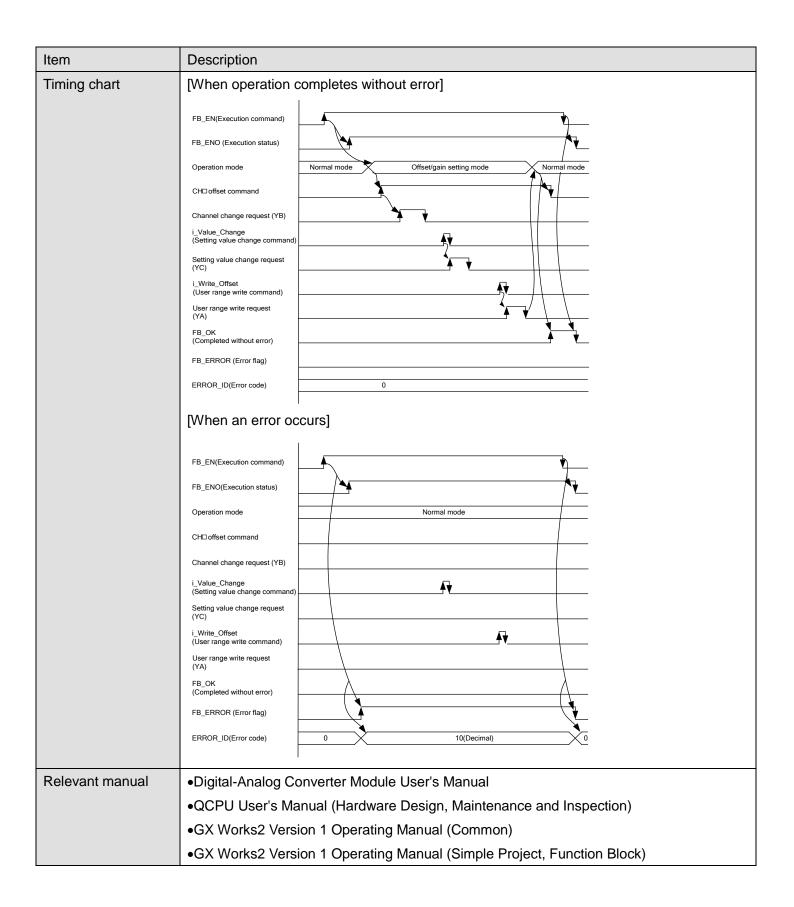
M+Q64DA_SetOffsetVal

Item	Description			
Function overview	Performs offset setting of a specified channel.			
Symbol		M+Q64DA_Set(M+Q64DA_SetOffsetVal	
	Execution comman	nd B : FB_EN	FB_ENO	Execution status
	Module start XY addres	ss	FB_OK	: B —— Completed without error
	Channel N	lo. —— W : i_CH	FB_ERROR	: B Error flag
	Offset adjustment amou	ntW: i_Adjust_Amount	ERROR_ID :	W Error code
	Setting value change comma	nd — B:i_Value_Change		
	User range write comman	nd B: i_Write_Offset		
Applicable hardware	Digital-analog	Q64DA, Q64DAN		
and software	converter module			
	CPU module		_	
		Series		Model
		MELSEC-Q Series*	High perform	nance model
			Universal m	odel
		* Not applicable for QCPL	J (A mode)	
	Engineering software	GX Works2 *1		
		Language		Software version
		Japanese version	Version	on1.86Q or later
		English version	Version	on1.24A or later
		Chinese (Simplified) vers	sion Version	on1.49B or later
		Chinese (Traditional) ver	rsion Version	on1.49B or later
		Korean version	Version	on1.49B or later
		*1 For software versions a	applicable to th	ne modules used, refer to
		"Relevant Manuals".		
Programming	Ladder			
language				
Number of steps	327 steps (for MELSEC-Q series universal model CPU)			
	* The number of steps of input and output definition	f the FB in a program depe ition.	nds on the CP	U model that is used and



Item	Description
Function description	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	The FB does not include error recovery processing. Program the error recovery
precautions	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 Q64DA 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".







●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	FB_EN	Bit	ON, OFF	ON: The FB is activated.
command				OFF: The FB is not activated.
Module start XY	i_Start_IO_No	Word	Depends on the I/O point	Specify the starting XY
address			range. For details, refer to	address (in hexadecimal)
			the CPU user's manual.	where the Q64DA module is
				mounted. (For example, enter
				H10 for X10.)
Channel No.	i_CH	Word	1~4	Specify the channel number.
Offset adjustment	i_Adjust_Amoun	Word	-3000~3000	Set the offset adjustment
amount	t			amount of the specified
				channel.
Setting value	i_Value_Change	Bit	ON, OFF	Turn ON to change the D/A
change command				output.
				Turn OFF after changing the
				output.
User range write	i_Write_Offset	Bit	ON, OFF	Turn ON to write the adjusted
command				offset value to the flash
				memory.
				Turn OFF after writing is
				completed.



Output labels

Name (Comment)	Label name	Data	Initial	Description
		type	value	
Execution status	FB_ENO	Bit	OFF	ON: Execution command is ON.
				OFF: Execution command is OFF.
Completed without	FB_OK	Bit	OFF	When ON, it indicates that the offset setting of the
error				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+Q64DA_SetOffsetVal function block.

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



2.7. M+Q64DA_SetGainVal (Gain setting)

FB Name

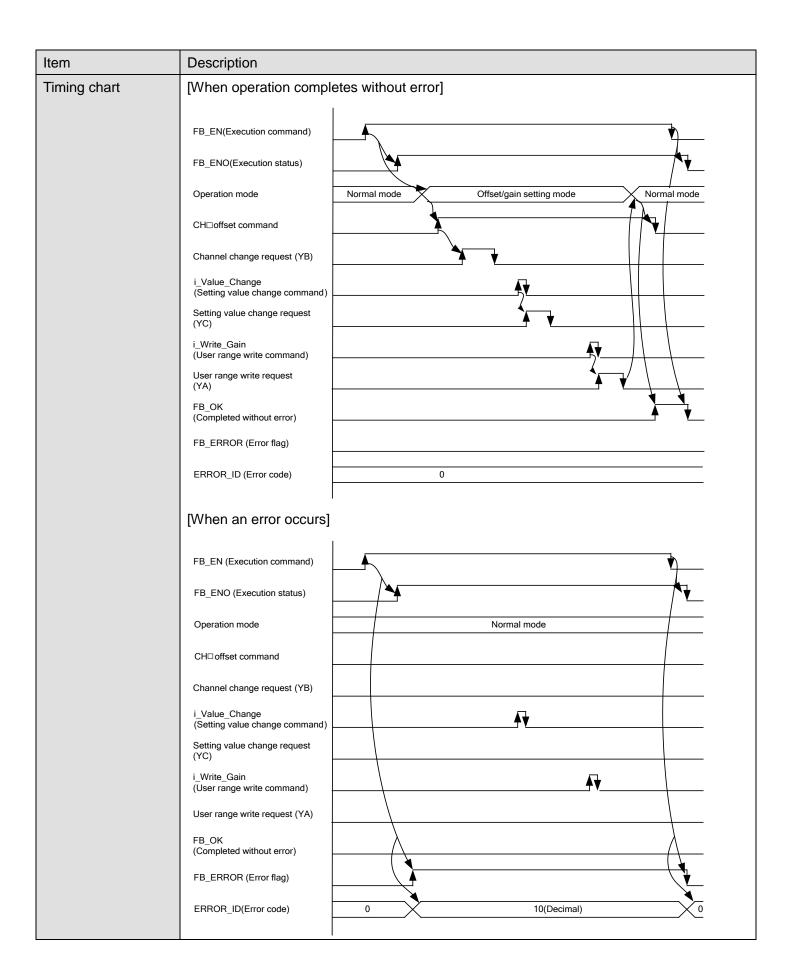
M+Q64DA_SetGainVal

Item	Description					
Function overview	Performs gain setting of a specified channel.					
Symbol			M+Q64DA_SetGainVal			
	Execution command		B : FB_EN	F	B_ENO : B	Execution status
	Module start XY addres	ss ——	W:i_Start_IO_No		FB_OK : B	Completed without error
	Channel No	o. ——	W : i_CH	FB_	ERROR : B	—— Error flag
	Gain adjustment amoun	nt	W:i_Adjust_Amount	ERF	ROR_ID: W	Error code
	Setting value change comman	ıd	B:i_Value_Change			
	User range write comman	ıd ——	B:i_Write_Gain			
Applicable hardware	Digital-analog	Q64	IDA, Q64DAN			
and software	converter module					
	CPU module					
			Series			Model
		ME	ELSEC-Q Series*	High performance model		ince model
				Unive	rsal mod	lel
		* No	ot applicable for QCPU	J (A mode)		
	Engineering software	GX	Works2 *1			
			Language		S	oftware version
		Ja	panese version		Version	1.86Q or later
		En	glish version		Version	1.24A or later
		Ch	inese (Simplified) vers	sion	Version	1.49B or later
		Ch	inese (Traditional) vers	sion	Version	1.49B or later
		Ko	rean version		Version	1.49B or later
			·	pplicab	le to the	modules used, refer to
		"Relevant Manuals".				
Programming	Ladder					
language						
Number of steps	325 steps (for MELSEC-			•		
	* The number of steps of input and output definition		FB in a program deper	nds on t	the CPU	model that is used and



Item	Description
Function description	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	1) The FB does not include error recovery processing. Program the error recovery
precautions	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 Q64DA 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	
Relevant manual	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 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	Setting range	Description
		type		
Execution	FB_EN	Bit	ON, OFF	ON: The FB is activated.
command				OFF: The FB is not activated.
Module start XY	i_Start_IO_No	Word	Depends on the I/O point	Specify the starting XY
address			range. For details, refer to	address (in hexadecimal)
			the CPU user's manual.	where the Q64DA module is
				mounted. (For example, enter
				H10 for X10.)
Channel No.	i_CH	Word	1~4	Specify the channel number.
Gain adjustment	i_Adjust_Amoun	Word	-3000~3000	Specify the gain adjustment
amount	t			amount of the specified
				channel.
Setting value	i_Value_Change	Bit	ON, OFF	Turn ON to change the D/A
change command				output.
				Turn OFF after changing the
				output.
User range write	i_Write_Gain	Bit	ON, OFF	Turn ON to write the adjusted
command				gain value to the flash
				memory.
				Turn OFF after writing is
				completed.



Output labels

Name (Comment)	Label name	Data	Initial	Description
		type	value	
Execution status	FB_ENO	Bit	OFF	ON: Execution command is ON.
				OFF: Execution command is OFF.
Completed without	FB_OK	Bit	OFF	When ON, it indicates that the gain setting of the
error				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+Q64DA_SetGainVal function block.

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



2.8. M+Q64DA_ErrorOperation (Error operation)

FB Name

M+Q64DA_ErrorOperation

Item	Description						
Function overview	Monitors error codes and performs error reset.						
Symbol		M+Q64DA_ErrorOperation					
	Execution command —	B : FB_EN F		FB_ENO : B Execution status			
	Module start XY address —	W : i_Start_IO_No		FB_OK : B Completed without error			
	Error reset request —	B:i_ErrorReset o_UNIT_		ERROR : B Module error			
				R_CODE : W Module error code _ERROR : B Error flag			
	ERRO		ROR_ID: W Error code				
A P 11 1	B	00404 004041					
Applicable hardware	Digital-analog Q64DA, Q64DAN						
and software	converter module						
	CPU module						
		Series MELSEC-Q Series* High pe		Model			
		WELSEC-Q Selles	High performance model Universal model				
		* Not applicable for QCPU (A mode)					
	Engineering software	GX Works2 *1		540)			
		Language		Software version			
		Japanese version		Version1.86Q or later			
		English version		Version1.24A or later			
		Chinese (Simplified) version		Version1.49B or later			
		Chinese (Traditional) version		Version1.49B or later			
		Korean version		Version1.49B or later			
		*1 For software versions applicable to the modules used, refe					
		"Relevant Manuals".					
Programming	Ladder						
language							



Item	Description					
Number of steps	185 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	1) The FB does not include error recovery processing. Program the error recovery					
precautions	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 Q64DA 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						
	FB_EN (Execution command)					
	FB_ENO (Execution status)					
	i_ErrorReset (Error clear request)					
	Error reset (Y signal)					
	Error (X signal) o UNIT_ERROR					
	(Module error)					
	(Module error code)					
	FB_OK (Completed without error)					
	FB_ERROR (Error flag) ERROR_ID(Error code) 0					



Item	Description	
Relevant manual	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	FB_EN	Bit	ON, OFF	ON: The FB is activated.	
command				OFF: The FB is not activated.	
Module start XY	i_Start_IO_No	Word	Depends on the I/O	Specify the starting XY address (in	
address			point range. For	for hexadecimal) where the Q64DA	
			details, refer to the	module is mounted. (For example,	
			CPU user's manual.	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	Initial	Description	
		type	value		
Execution status	FB_ENO	Bit	OFF	ON: Execution command is ON. (Module error	
				being monitored)	
				OFF: Execution command is OFF.	
Completed without	FB_OK	Bit	OFF	When ON, it indicates executing the error reset	
error				command is completed.	
Module error	o_UNIT_ERR	Bit	OFF	When ON, it indicates a module error has occurred.	
	OR				
Module error code	o_UNIT_ERR_	Word	0	Store a code for an error occurring.	
	CODE				
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+Q64DA_ErrorOperation function block.

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

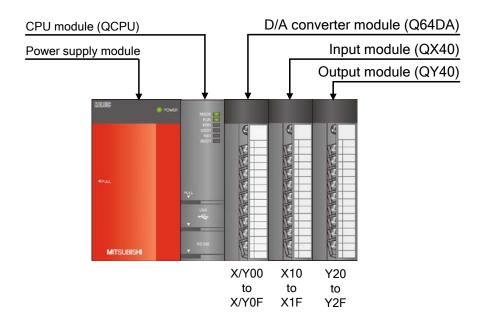
Before using any Mitsubishi products, please read all the relevant manuals.



Appendix 1. FB Library Application Examples

Q64DA 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	e 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	E	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) FB error conversion data write (All CHs) FB			
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	Lifor operation	Module error code		

Relay

Device	FB function name	Application (ON details)		
М0		DA conversion data write request		
M1	DA conversion data write	DA conversion data write FB ready		
M2	1	DA conversion data write complete		
М3		DA conversion data write (All CHs) request		
M4	DA conversion data write (All	DA conversion data write (All CHs) FB ready		
М5	CHs)	DA conversion data write (All CHs) complete		
М6		DA conversion enable/disable setting request		
М7	DA conversion enable/disable	DA conversion enable/disable setting		
М8	secung	DA conversion enable/disable setting FB ready		
М9		DA conversion enable/disable setting complete		
M10		DA output enable/disable setting request		
M11	DA output enable/disable	DA output enable/disable setting		
M12	setting	DA output enable/disable setting FB ready		
M13	1	DA output enable/disable setting complete		
M14		Operating condition setting request		
M15	Operating condition setting	Operating condition setting request FB ready		
M16	request operation	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

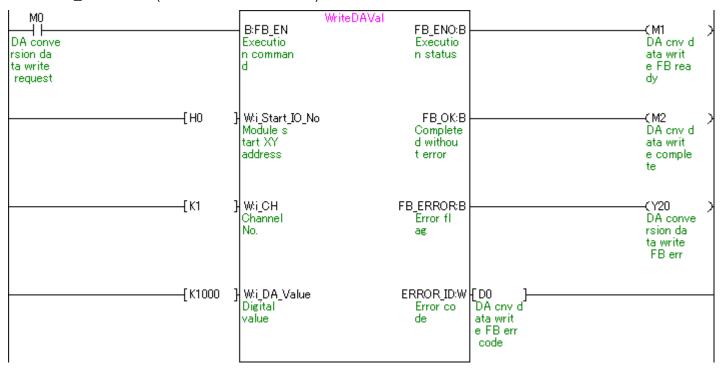
a) Common setting

Input and output item	Value	Description	
Module start XY address 0		Specify the starting XY address where the	
		Q64DA is mounted.	



5) Programs

M+Q64DA_WriteDAVal (DA conversion data write)



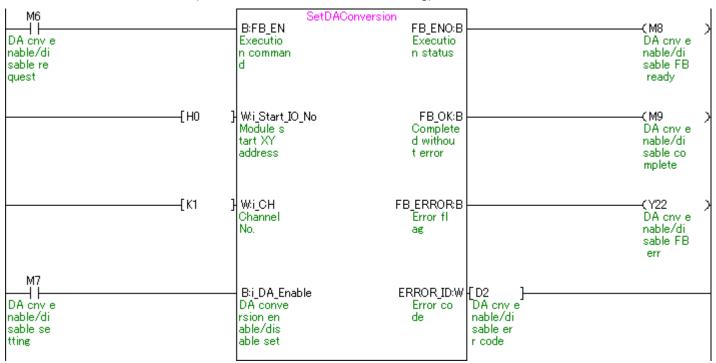


M+Q64DA WriteAllDAVal (DA conversion data write (All CHs))

	Conversion data write (All C	• •	
M3 All CHs batch wr ite requ est	B:FB_EN Executio n comman d	FB_ENO:B Executio n status	(M4 All CHs batch wr ite FB r eady
{F	HO] Wi_Start_IO_No Module s tart XY address	FB_OK:B Complete d withou t error	(M5 All CHs batch wr ite comp lete
(k	(100 } W: DA_ValueCH1 Channel 1 digita I value	FB_ERROR:B Error fl ag	(Y21 All CHs batch wr ite FB e rror
(k	(200] Wi_DA_ValueCH2 Channel 2 digita I value	ERROR_ID:W { D1 Error co All CHs de batch w ite FB or code	vr e
[K	(300 } Wi_DA_ValueCH3 Channel 3 digita I value		
[k	(400] Wi_DA_ValueCH4 Channel 4 digita I value		

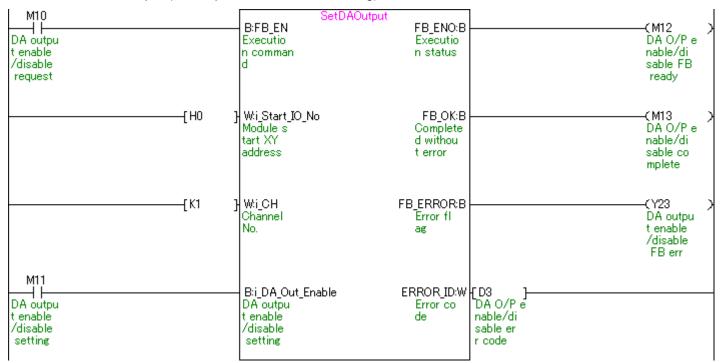


M+Q64DA_SetDAConversion (DA conversion enable/disable setting)



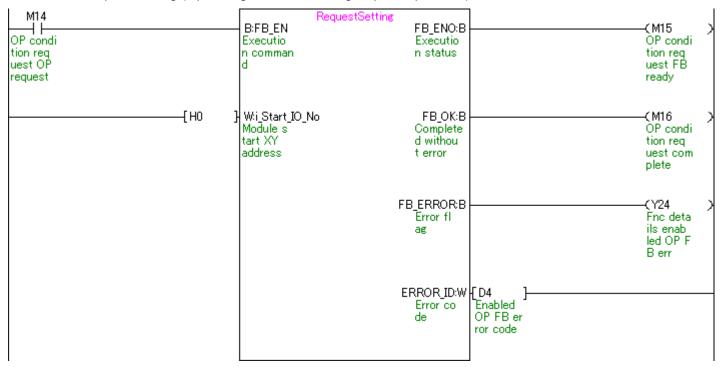


M+Q64DA_SetDAOutput (DA output enable/disable setting)



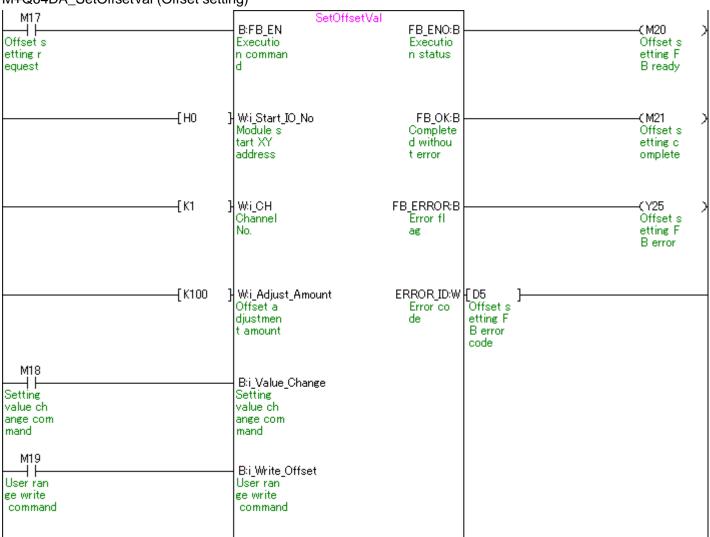


M+Q64DA_RequestSetting (Operating condition setting request operation)



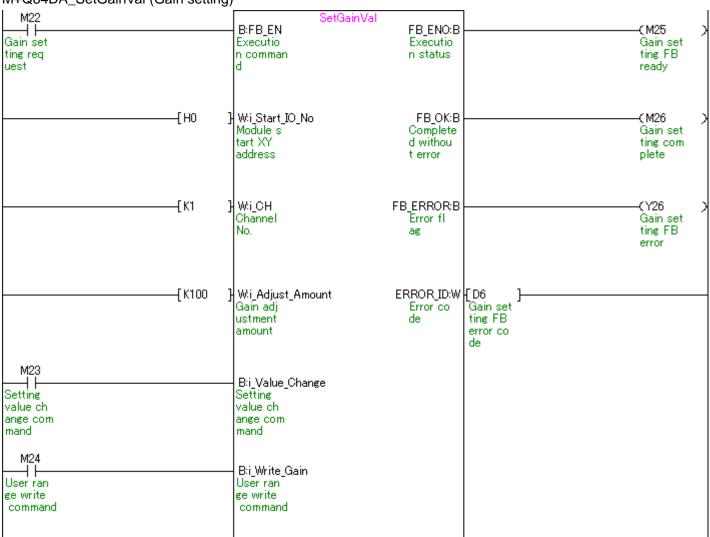


M+Q64DA_SetOffsetVal (Offset setting)





M+Q64DA_SetGainVal (Gain setting)





M+Q64DA_ErrorOperation (Error operation)

