

Programmable Controller

MELSEC iQ-F
series

MELSEC iQ-F

FX5 Analog Input Module/Output Module/

Multiple Input Module Function Block Reference

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1 FUNCTION BLOCK (FB) LIST

This chapter lists the FBs for the MELSEC iQ-F series analog input module (FX5-4AD), multiple input module (FX5-8AD), analog output module (FX5-4DA).

Analog input module, Multiple input module FB

■FX5-4AD

Name*1	Description
M+FX5-4AD_RequestSetting	Enables the settings of each function.
M+FX5-4AD_OperateError	Monitors error codes and resets errors.
M+FX5-4AD_SetLoggingParam	Sets up the logging function of a specified channel.

*1 Note that this reference does not describe the FB version information which is displayed such as "_00A" at the end of FB name.

■FX5-8AD

Name*1	Description
M+FX5-8AD_RequestSetting	Enables the settings of each function.
M+FX5-8AD_OperateError	Monitors error codes and resets errors.
M+FX5-8AD_SetLoggingParam	Sets up the logging function of a specified channel.

*1 Note that this reference does not describe the FB version information which is displayed such as "_00A" at the end of FB name.

Analog output module FB

■FX5-4DA

Name*1	Description
M+FX5-4DA_RequestSetting	Enables the settings of each function.
M+FX5-4DA_OperateError	Monitors error codes and resets errors.
M+FX5-4DA_WaveOutputSetting	Sets the wave output of a specified channel or all channels.
M+FX5-4DA_WaveOutputReqSetting	Specifies whether to start, stop, or pause the wave output of a specified channel or all channels.

*1 Note that this reference does not describe the FB version information which is displayed such as "_00A" at the end of FB name.

2 ANALOG INPUT MODULE, MULTIPLE INPUT MODULE FB

2.1 M+Model_RequestSetting

Name

The module names of the FB are based on the module used and are as follows.

■FX5-4AD

M+FX5-4AD_RequestSetting

■FX5-8AD

M+FX5-8AD_RequestSetting

Overview

Item	Description
Overview	Enables the settings of each function.
Symbol	<pre> graph LR subgraph M+FX5-4AD_RequestSetting B[i_bEN] DUT[i_stModule] o_bENO[o_bENO : B] o_bOK[o_bOK : B] o_bErr[o_bErr : B] o_uErrId[o_uErrId : UW] end B --- o_bENO DUT --- o_bOK DUT --- o_bErr DUT --- o_uErrId </pre>

Labels

■Input label

No.	Variable name	Name	Data type	Range	Description
(1)	i_bEN	Execution command	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
(2)	i_stModule	Module label	Structure	The setting range differs depending on the module label.	Specifies the module label for the analog input/multiple input module.

■Output label

No.	Variable name	Name	Data type	Default value	Description
(3)	o_bENO	Execution status	Bit	OFF	ON: The execution command is ON. OFF: The execution command is OFF.
(4)	o_bOK	Normal completion	Bit	OFF	The on state indicates that the operation to enable each setting is complete.
(5)	o_bErr	Error completion	Bit	OFF	Always OFF
(6)	o_uErrId	Error code	Word [Unsigned]	0	Always 0

FB details

Item	Description
Available device	Target module FX5-4AD, FX5-8AD
	Target CPU FX5U CPU, FX5UC CPU
	Engineering tool GX Works3 Version 1.040S or later
Language	Ladder diagram
Number of basic steps	57 steps The number of FB steps integrated in the program varies depending on the CPU module used, the input/output definition, and the setting options of GX Works3. For the setting options of GX Works3, refer to GX Works3 Operating Manual .
Processing	<ul style="list-style-type: none"> Turning on i_bEN (execution command) allows the settings of all channels to be enabled. For what settings are enabled, refer to MELSEC iQ-F FX5 User's Manual (Analog Control - Intelligent function module). This FB continues its execution until the completion of the settings of each function after i_bEN (execution command) turns on.
FB compilation method	Macro type
FB operation	Pulsed execution (multiple scan execution type)
Timing chart of I/O signals	<p>The timing chart shows the following sequence of events:</p> <ul style="list-style-type: none"> i_bEN (input) is a pulsed signal that starts the execution. o_bENO (output) is a signal that goes high when i_bEN is active. Operating condition setting request (Un\G70.b9) is a pulse that occurs during the execution. Operating condition setting completed (Un\G69.b9) is a pulse that occurs after the request. o_bOK (output) is a signal that goes high after the completion. o_bErr (output) and o_uErrId (output) are signals that remain low throughout the process.
Restrictions or precautions	<ul style="list-style-type: none"> This FB does not include the error recovery processing. Program the error recovery processing separately in accordance with the required system operation. This FB cannot be used in an interrupt program. As this FB is executed, the A/D conversion processing stops, and thereafter when o_bOK (normal completion) turns on, the conversion processing resumes. When operating the analog input module and multiple input module, the input range needs to be set according to the device and system to be connected. Set the GX Works3 module parameters according to the application. Refer to the MELSEC iQ-F FX5 User's Manual (Analog Control - Intelligent function module) for details on setting the module parameters.

Error code

Error code (hexadecimal)	Description	Action
None	None	None

2.2 M+Model_OperateError

Name

The module names of the FB are based on the module used and are as follows.

■FX5-4AD

M+FX5-4AD_OperateError

■FX5-8AD

M+FX5-8AD_OperateError

Overview

Item	Description
Overview	Monitors error codes and resets errors.
Symbol	<p>The symbol diagram for M+FX5-4AD_OperateError shows a rectangular box with the following connections:</p> <ul style="list-style-type: none"> Input (1): B : i_bEN Input (2): DUT: i_stModule Input (3): B : i_bErrReset Output (4): o_bENO : B Output (5): o_bOK : B Output (6): o_bUnitErr : B Output (7): o_uUnitErrCode : UW Output (8): o_uUnitAlarmCode : UW Output (9): o_bErr : B Output (10): o_uErrId : UW

Labels

■Input label

No.	Variable name	Name	Data type	Range	Description
(1)	i_bEN	Execution command	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
(2)	i_stModule	Module label	Structure	The setting range differs depending on the module label.	Specifies the module label for the analog input/multiple input module.
(3)	i_bErrReset	Error reset request	Bit	ON, OFF	Turn on this label to reset errors. After completion of the error reset, turn off the label.

■Output label

No.	Variable name	Name	Data type	Default value	Description
(4)	o_bENO	Execution status	Bit	OFF	ON: The execution command is ON. OFF: The execution command is OFF.
(5)	o_bOK	Normal completion	Bit	OFF	The on state indicates that the error reset is complete.
(6)	o_bUnitErr	Module error outbreak flag	Bit	OFF	The on state indicates that a module error has occurred.
(7)	o_uUnitErrCode	Module error code	Word [Unsigned]	0	The error code of an error occurred is stored.
(8)	o_uUnitAlarmCode	Module alarm code	Word [Unsigned]	0	The alarm code of an alarm occurred is stored.
(9)	o_bErr	Error completion	Bit	OFF	Always OFF
(10)	o_uErrId	Error code	Word [Unsigned]	0	Always 0

FB details

Item	Description	
Available device	Target module	FX5-4AD, FX5-8AD
	Target CPU	FX5U CPU, FX5UC CPU
	Engineering tool	GX Works3 Version 1.040S or later
Language	Ladder diagram	
Number of basic steps	195 steps The number of FB steps integrated in the program varies depending on the CPU module used, the input/output definition, and the setting options of GX Works3. For the setting options of GX Works3, refer to GX Works3 Operating Manual .	
Processing	<ul style="list-style-type: none"> As i_bEN (execution command) turns on, errors in the target module are monitored. After i_bEN (execution command) turns on, turning on i_bErrReset (error reset request) during an error allows the error to be reset. 	
FB compilation method	Macro type	
FB operation	Arbitrary execution type	
Timing chart of I/O signals	<p>The timing chart illustrates the sequence of events for the FB. It shows the following signals and their states:</p> <ul style="list-style-type: none"> i_bEN: Execution command, shown as a pulse. o_bENO: Error output, shown as a pulse. i_bErrReset: Error reset request, shown as a pulse. Error clear request (UnG70.b15): Internal signal, shown as a pulse. Error flag (UnG69.b15): Internal signal, shown as a pulse. o_bUnitErr: Unit error output, shown as a pulse. o_uUnitErrCode: Unit error code, shown as 0. o_uUnitAlarmCode: Unit alarm code, shown as 0. o_bOK: OK output, shown as a pulse. o_bErr: Error output, shown as a pulse. o_uErrId: Error ID, shown as 0. 	
Restrictions or precautions	<ul style="list-style-type: none"> This FB does not include the error recovery processing. Program the error recovery processing separately in accordance with the required system operation. This FB cannot be used in an interrupt program. When operating the analog input module and multiple input module, the input range needs to be set according to the device and system to be connected. Set the GX Works3 module parameters according to the application. Refer to the MELSEC iQ-F FX5 User's Manual (Analog Control - Intelligent function module) for details on setting the module parameters. 	

Error code

Error code (hexadecimal)	Description	Action
None	None	None

2.3 M+Model_SetLoggingParam

Name

The module names of the FB are based on the module used and are as follows.

■FX5-4AD

M+FX5-4AD_SetLoggingParam

■FX5-8AD

M+FX5-8AD_SetLoggingParam

Overview

Item	Description																																																
Overview	Sets up the logging function of a specified channel.																																																
Symbol	<div style="border: 1px solid black; padding: 5px;"> <p style="text-align: center;">M+FX5-4AD_SetLoggingParam</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 5%; text-align: right;">(1)</td> <td style="width: 45%;">B : i_bEN</td> <td style="width: 45%; text-align: right;">o_bENO : B</td> <td style="width: 5%; text-align: left;">(13)</td> </tr> <tr> <td style="text-align: right;">(2)</td> <td>DUT: i_stModule</td> <td style="text-align: right;">o_bOK : B</td> <td style="text-align: left;">(14)</td> </tr> <tr> <td style="text-align: right;">(3)</td> <td>UW : i_uCH</td> <td style="text-align: right;">o_bErr : B</td> <td style="text-align: left;">(15)</td> </tr> <tr> <td style="text-align: right;">(4)</td> <td>B : i_bLogEnable</td> <td style="text-align: right;">o_uErrId : UW</td> <td style="text-align: left;">(16)</td> </tr> <tr> <td style="text-align: right;">(5)</td> <td>UW : i_uLogData</td> <td></td> <td></td> </tr> <tr> <td style="text-align: right;">(6)</td> <td>UW : i_uLogCycleVal</td> <td></td> <td></td> </tr> <tr> <td style="text-align: right;">(7)</td> <td>UW : i_uLogCycleUnit</td> <td></td> <td></td> </tr> <tr> <td style="text-align: right;">(8)</td> <td>UW : i_uLogPoints</td> <td></td> <td></td> </tr> <tr> <td style="text-align: right;">(9)</td> <td>UW : i_uLogTrigCond</td> <td></td> <td></td> </tr> <tr> <td style="text-align: right;">(10)</td> <td>UW : i_uLogTrigData</td> <td></td> <td></td> </tr> <tr> <td style="text-align: right;">(11)</td> <td>W : i_wLogTrigValue</td> <td></td> <td></td> </tr> <tr> <td style="text-align: right;">(12)</td> <td>UW : i_uUnitType</td> <td></td> <td></td> </tr> </table> </div>	(1)	B : i_bEN	o_bENO : B	(13)	(2)	DUT: i_stModule	o_bOK : B	(14)	(3)	UW : i_uCH	o_bErr : B	(15)	(4)	B : i_bLogEnable	o_uErrId : UW	(16)	(5)	UW : i_uLogData			(6)	UW : i_uLogCycleVal			(7)	UW : i_uLogCycleUnit			(8)	UW : i_uLogPoints			(9)	UW : i_uLogTrigCond			(10)	UW : i_uLogTrigData			(11)	W : i_wLogTrigValue			(12)	UW : i_uUnitType		
(1)	B : i_bEN	o_bENO : B	(13)																																														
(2)	DUT: i_stModule	o_bOK : B	(14)																																														
(3)	UW : i_uCH	o_bErr : B	(15)																																														
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(6)	UW : i_uLogCycleVal																																																
(7)	UW : i_uLogCycleUnit																																																
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(9)	UW : i_uLogTrigCond																																																
(10)	UW : i_uLogTrigData																																																
(11)	W : i_wLogTrigValue																																																
(12)	UW : i_uUnitType																																																

Labels

■Input label

No.	Variable name	Name	Data type	Range	Description
(1)	i_bEN	Execution command	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
(2)	i_stModule	Module label	Structure	The setting range differs depending on the module label.	Specifies the module label for the analog input/multiple input module.
(3)	i_uCH	Target channel	Word [Unsigned]	■FX5-4AD 1 to 4 ■FX5-8AD 1 to 8	Specifies a channel number.
(4)	i_bLogEnable	Logging enable/ disable setting	Bit	ON, OFF	ON: Enables the logging function. OFF: Disables the logging function.
(5)	i_uLogData	Logging data setting	Word [Unsigned]	0: Digital output value 1: Digital operation value	Sets the data to be logged.

No.	Variable name	Name	Data type	Range	Description
(6)	i_uLogCycleVal	Logging cycle setting value	Word [Unsigned]	<p>■FX5-4AD When the logging cycle unit setting is 0: 80 to 32767 When the logging cycle unit setting is 1: 1 to 32767 When the logging cycle unit setting is 2: 1 to 3600</p> <p>■FX5-8AD When the logging cycle unit setting is 1 (current/voltage range): 1 to 32767 When the logging cycle unit setting is 1 (resistance temperature detector/thermocouple range): 40 to 32767 When the logging cycle unit setting is 2: 1 to 3600</p>	Sets the interval of cycles at which data is stored.
(7)	i_uLogCycleUnit	Logging cycle unit setting	Word [Unsigned]	<p>■FX5-4AD 0: μs 1: ms 2: s</p> <p>■FX5-8AD 1: ms 2: s</p>	Specifies the unit of cycles at which data is stored.
(8)	i_uLogPoints	Number of posttrigger logging points	Word [Unsigned]	1 to 10000	Specifies the number of data to be logged after a hold trigger occurs by one point.
(9)	i_uLogTrigCond	Level trigger condition setting	Word [Unsigned]	0: Disable 1: Rise 2: Fall 3: Rise and fall	Sets the condition in which a level trigger is to be used. Set 0 if using no lever trigger.
(10)	i_uLogTrigData	Trigger data	Word [Unsigned]	0 to 9999	Specifies a buffer memory address to be monitored by level trigger.
(11)	i_wLogTrigValue	Trigger setting value	Word [Signed]	-32768 to +32767	Sets the level at which a level trigger is generated.
(12)	i_uUnitType	Module type	Word [Unsigned]	<p>■FX5-4AD 0: FX5-4AD</p> <p>■FX5-8AD 0: FX5-8AD</p>	Specifies a module type.

■Output label

No.	Variable name	Name	Data type	Default value	Description
(13)	o_bENO	Execution status	Bit	OFF	ON: The execution command is ON. OFF: The execution command is OFF.
(14)	o_bOK	Normal completion	Bit	OFF	The on state indicates that the setting of the logging function parameters is completed.
(15)	o_bErr	Error completion	Bit	OFF	The on state indicates that an error has occurred in the FB.
(16)	o_uErrId	Error code	Word [Unsigned]	0	The error code of an error occurred in the FB is stored.

FB details

Item	Description
Available device	Target module FX5-4AD, FX5-8AD
	Target CPU FX5U CPU, FX5UC CPU
	Engineering tool GX Works3 Version 1.040S or later
Language	Ladder diagram
Number of basic steps	226 steps The number of FB steps integrated in the program varies depending on the CPU module used, the input/output definition, and the setting options of GX Works3. For the setting options of GX Works3, refer to GX Works3 Operating Manual .
Processing	<ul style="list-style-type: none"> Turning on i_bEN (execution command) allows the logging function of a specified channel to be set. This FB works for only one shot as i_bEN (execution command) turns on. The set value is enabled by turning on and off 'Operating condition setting request' (Un\G70.b9) or executing the operating condition setting request operation FB (M+Model_RequestSetting). When the setting values of target channel are out of range, o_bErr (Error completion) turns on, and the FB processing are stopped. Also, Error code 100 (Hexadecimal) is stored in o_uErrId (Error code). For the error code, refer to Page 11 Error code. When the setting values of module type are out of range, o_bErr (Error completion) turns on, and the FB processing are stopped. Also, Error code 101 (Hexadecimal) is stored in o_uErrId (Error code). For the error code, refer to Page 11 Error code.
FB compilation method	Macro type
FB operation	Pulse execution type (single scan execution type)
Timing chart of I/O signals	<p>[For normal completion]</p> <p>[For error completion]</p>
Restrictions or precautions	<ul style="list-style-type: none"> This FB does not include the error recovery processing. Program the error recovery processing separately in accordance with the required system operation. This FB cannot be used in an interrupt program. Using the FB in a program that is to be executed only once, such as a subroutine program or a FOR-NEXT loop, has a problem that i_bEN (execution command) can no longer be turned off and normal operation is not possible; Always use the FB in a program that is capable of turning off the execution command. To use more than one of this FB, care must be taken to avoid duplication of the target channel. The FB requires the configuration of the ladder for every input label. If the parameters are set by means of the module parameters of GX Works3, this FB is not required. When operating the analog input module and multiple input module, the input range needs to be set according to the device and system to be connected. Set the GX Works3 module parameters according to the application. Refer to the MELSEC IQ-F FX5 User's Manual (Analog Control - Intelligent function module) for details on setting the module parameters.

Error code

Error code (hexadecimal)	Description	Action
100	The target channel is set out of the range. Set the target channel within the following range. <ul style="list-style-type: none">• FX5-4AD: 1 to 4• FX5-8AD: 1 to 8	Review and correct the settings and then execute the FB again.
102	The module type is set out of the range. Set the module type to the following values. <ul style="list-style-type: none">• FX5-4AD: 0• FX5-8AD: 0	Review and correct the settings and then execute the FB again.

3 ANALOG OUTPUT MODULE FB

3.1 M+FX5-4DA_RequestSetting

Name

M+FX5-4DA_RequestSetting

Overview

Item	Description
Overview	Enables the settings of each function.
Symbol	<pre> graph LR subgraph M+FX5-4DA_RequestSetting direction TB i_bEN((1) B : i_bEN) i_stModule[DUT: i_stModule] o_bENO((3) o_bENO : B) o_bOK((4) o_bOK : B) o_bErr((5) o_bErr : B) o_uErrId((6) o_uErrId : UW) end i_bEN --- M+FX5-4DA_RequestSetting i_stModule --- M+FX5-4DA_RequestSetting M+FX5-4DA_RequestSetting --- o_bENO M+FX5-4DA_RequestSetting --- o_bOK M+FX5-4DA_RequestSetting --- o_bErr M+FX5-4DA_RequestSetting --- o_uErrId </pre>

Labels

■Input label

No.	Variable name	Name	Data type	Range	Description
(1)	i_bEN	Execution command	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
(2)	i_stModule	Module label	Structure	The setting range differs depending on the module label.	Specifies the module label for the analog output module.

■Output label

No.	Variable name	Name	Data type	Default value	Description
(3)	o_bENO	Execution status	Bit	OFF	ON: The execution command is ON. OFF: The execution command is OFF.
(4)	o_bOK	Normal completion	Bit	OFF	The on state indicates that the operation to enable each setting is complete.
(5)	o_bErr	Error completion	Bit	OFF	Always OFF
(6)	o_uErrId	Error code	Word [Unsigned]	0	Always 0

FB details

Item	Description	
Available device	Target module	FX5-4DA
	Target CPU	FX5U CPU, FX5UC CPU
	Engineering tool	GX Works3 Version 1.040S or later
Language	Ladder diagram	
Number of basic steps	54 steps The number of FB steps integrated in the program varies depending on the CPU module used, the input/output definition, and the setting options of GX Works3. For the setting options of GX Works3, refer to GX Works3 Operating Manual .	
Processing	<ul style="list-style-type: none"> Turning on i_bEN (execution command) allows the settings of all channels to be enabled. For what settings are enabled, refer to MELSEC iQ-F FX5 User's Manual (Analog Control - Intelligent function module). This FB continues its execution until the completion of the settings of each function after i_bEN (execution command) turns on. 	
FB compilation method	Macro type	
FB operation	Pulsed execution (multiple scan execution type)	
Timing chart of I/O signals		
Restrictions or precautions	<ul style="list-style-type: none"> This FB does not include the error recovery processing. Program the error recovery processing separately in accordance with the required system operation. This FB cannot be used in an interrupt program. This FB turns on or off Operating condition setting request (Un\G70.b9). Attention is required as D/A conversion stops during execution of this FB. When operating the analog output module, the output range setting, and operation mode setting need to be set according to the device and system to be connected. Set the GX Works3 module parameters according to the application. Refer to the MELSEC iQ-F FX5 User's Manual (Analog Control - Intelligent function module) for details on setting the module parameters. 	

Error code

Error code (hexadecimal)	Description	Action
None	None	None

3.2 M+FX5-4DA_OperateError

Name

M+FX5-4DA_OperateError

Overview

Item	Description
Overview	Monitors error codes and resets errors.
Symbol	<p>The diagram shows a rectangular block labeled 'M+FX5-4DA_OperateError'. On the left side, there are three input lines labeled (1), (2), and (3). On the right side, there are six output lines labeled (4) through (9). The connections are as follows:</p> <ul style="list-style-type: none"> (1) B : i_bEN (2) DUT: i_stModule (3) B : i_bErrReset (4) o_bENO : B (5) o_bOK : B (6) o_bUnitErr : B (7) o_uUnitErrCode : UW (8) o_bErr : B (9) o_uErrId : UW

Labels

■Input label

No.	Variable name	Name	Data type	Range	Description
(1)	i_bEN	Execution command	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
(2)	i_stModule	Module label	Structure	The setting range differs depending on the module label.	Specifies the module label for the analog output module.
(3)	i_bErrReset	Error reset request	Bit	ON, OFF	Turn on this label to reset the errors. Turn off this label after the error reset.

■Output label

No.	Variable name	Name	Data type	Default value	Description
(4)	o_bENO	Execution status	Bit	OFF	ON: The execution command is ON.(Module errors are being monitored.) OFF: The execution command is OFF.
(5)	o_bOK	Normal completion	Bit	OFF	The on state indicates that executing the error reset instruction has been completed.
(6)	o_bUnitErr	Module error outbreak flag	Bit	OFF	The on state indicates that a module error has occurred.
(7)	o_uUnitErrCode	Module error code	Word [Unsigned]	0	The error code of an error occurred is stored.
(8)	o_bErr	Error completion	Bit	OFF	Always OFF
(9)	o_uErrId	Error code	Word [Unsigned]	0	Always 0

FB details

Item	Description
Available device	Target module FX5-4DA
	Target CPU FX5U CPU, FX5UC CPU
	Engineering tool GX Works3 Version 1.040S or later
Language	Ladder diagram
Number of basic steps	94 steps The number of FB steps integrated in the program varies depending on the CPU module used, the input/output definition, and the setting options of GX Works3. For the setting options of GX Works3, refer to GX Works3 Operating Manual .
Processing	<ul style="list-style-type: none"> As i_bEN (execution command) turns on, the error information in the target module is monitored. After i_bEN (execution command) turns on, turning on i_bErrReset (error reset request) during an error allows the error to be reset.
FB compilation method	Macro type
FB operation	Always executed
Timing chart of I/O signals	<p>The timing chart illustrates the sequence of events for error monitoring and reset. It shows the following signals and their behavior:</p> <ul style="list-style-type: none"> i_bEN: Execution command, which starts the monitoring process. o_bENO: Error output signal, which becomes active when an error occurs. i_bErrReset: Error reset request, which is used to clear the error. Error clear request (UnlG70.b15): A signal that is active during the reset process. Error flag (UnlG69.b15): A signal that indicates the presence of an error. o_bUnitErr: Unit error output signal, which is active when an error is detected. o_uUnitErrCode: Unit error code output signal, which provides the specific error code (e.g., Module error code). o_bOK: OK output signal, which becomes active after the error is cleared. o_bErr: Error output signal, which is active when an error occurs. o_uErrId: Error ID output signal, which is set to 0.
Restrictions or precautions	<ul style="list-style-type: none"> This FB does not include the error recovery processing. Program the error recovery processing separately in accordance with the required system operation. This FB cannot be used in an interrupt program. When operating the analog output module, the output range setting, and operation mode setting need to be set according to the device and system to be connected. Set the GX Works3 module parameters according to the application. Refer to the MELSEC iQ-F FX5 User's Manual (Analog Control - Intelligent function module) for details on setting the module parameters.

Error code

Error code (hexadecimal)	Description	Action
None	None	None

3.3 M+FX5-4DA_WaveOutputSetting

Name

M+FX5-4DA_WaveOutputSetting

Overview

Item	Description																																								
Overview	Sets the wave output of a specified channel or all channels.																																								
Symbol	<div style="border: 1px solid black; padding: 5px;"> <p style="text-align: center;">M+FX5-4DA_WaveOutputSetting</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%; text-align: right;">(1)</td> <td style="width: 40%;">B : i_bEN</td> <td style="width: 40%; text-align: right;">o_bENO : B</td> <td style="width: 10%; text-align: left;">(11)</td> </tr> <tr> <td style="text-align: right;">(2)</td> <td>DUT: i_stModule</td> <td style="text-align: right;">o_bOK : B</td> <td style="text-align: left;">(12)</td> </tr> <tr> <td style="text-align: right;">(3)</td> <td>UW : i_uCH</td> <td style="text-align: right;">o_bErr : B</td> <td style="text-align: left;">(13)</td> </tr> <tr> <td style="text-align: right;">(4)</td> <td>UW : i_uOutputSelect</td> <td style="text-align: right;">o_uErrId : UW</td> <td style="text-align: left;">(14)</td> </tr> <tr> <td style="text-align: right;">(5)</td> <td>W : i_wOutputValue</td> <td></td> <td></td> </tr> <tr> <td style="text-align: right;">(6)</td> <td>UD : i_udStartingAddr</td> <td></td> <td></td> </tr> <tr> <td style="text-align: right;">(7)</td> <td>UD : i_udPointsSetting</td> <td></td> <td></td> </tr> <tr> <td style="text-align: right;">(8)</td> <td>W : i_wFrequency</td> <td></td> <td></td> </tr> <tr> <td style="text-align: right;">(9)</td> <td>UW : i_uConvSpeed</td> <td></td> <td></td> </tr> <tr> <td style="text-align: right;">(10)</td> <td>UW : i_uUnitType</td> <td></td> <td></td> </tr> </table> </div>	(1)	B : i_bEN	o_bENO : B	(11)	(2)	DUT: i_stModule	o_bOK : B	(12)	(3)	UW : i_uCH	o_bErr : B	(13)	(4)	UW : i_uOutputSelect	o_uErrId : UW	(14)	(5)	W : i_wOutputValue			(6)	UD : i_udStartingAddr			(7)	UD : i_udPointsSetting			(8)	W : i_wFrequency			(9)	UW : i_uConvSpeed			(10)	UW : i_uUnitType		
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(10)	UW : i_uUnitType																																								

Labels

■ Input label

No.	Variable name	Name	Data type	Range	Description
(1)	i_bEN	Execution command	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
(2)	i_stModule	Module label	Structure	The setting range differs depending on the module label.	Specifies the module label for the analog output module.
(3)	i_uCH	Target channel	Word [Unsigned]	1 to 4, 15	<ul style="list-style-type: none"> • 1 to 4: The corresponding channel number is specified. • 15: All channels are specified.
(4)	i_uOutputSelect	Output selection during waveform output stop	Word [Unsigned]	0: 0 V/0 mA 1: Offset value 2: Output setting value during waveform output stop	Specifies the output value during wave output stop.
(5)	i_wOutputValue	Output setting value during waveform output stop	Word [Signed]	<ul style="list-style-type: none"> ■When an output range is 0 to 5 V, 1 to 5 V, 0 to 10 V, 0 to 20 mA, or 4 to 20 mA 0 to 32767 ■When an output range is -10 to 10 V -32768 to +32767 	Sets the value to be output when 2 (Output setting value during waveform output stop) is selected in the output selection during waveform output stop.
(6)	i_udStartingAddr	Waveform pattern start address setting	Double word [Unsigned]	10000 to 89999	Sets the start address of a wave pattern to be output.
(7)	i_udPointsSetting	Number of waveform pattern points setting	Double word [Unsigned]	1 to 80000 (point)	Sets the number of data points of a wave pattern to be output.
(8)	i_wFrequency	Number of waveform outputs setting	Word [Signed]	-1: Infinite repetition output 1 to 32767: Specified number of times output	Sets the number of output times of a wave pattern.

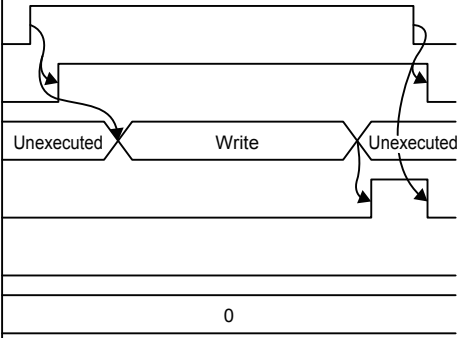
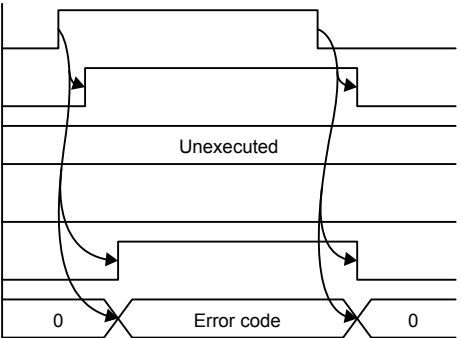
No.	Variable name	Name	Data type	Range	Description
(9)	i_uConvSpeed	Waveform output conversion cycle constant	Word [Unsigned]	1 to 5000	Sets the constant that defines the conversion cycle of wave output.
(10)	i_uUnitType	Module type	Word [Unsigned]	0: FX5-4DA	Specifies a module type.

■Output label

No.	Variable name	Name	Data type	Default value	Description
(11)	o_bENO	Execution status	Bit	OFF	ON: The execution command is ON. OFF: The execution command is OFF.
(12)	o_bOK	Normal completion	Bit	OFF	The on state indicates that setting the wave output has been completed.
(13)	o_bErr	Error completion	Bit	OFF	The on state indicates that an error has occurred in the FB.
(14)	o_uErrId	Error code	Word [Unsigned]	0	The error code of an error occurred in the FB is stored.

FB details

Item	Description	
Available device	Target module	FX5-4DA
	Target CPU	FX5U CPU, FX5UC CPU
	Engineering tool	GX Works3 Version 1.040S or later
Language	Ladder diagram	
Number of basic steps	295 steps The number of FB steps integrated in the program varies depending on the CPU module used, the input/output definition, and the setting options of GX Works3. For the setting options of GX Works3, refer to GX Works3 Operating Manual .	
Processing	<ul style="list-style-type: none"> As i_bEN (execution command) turns on, the wave output settings of a specified channel or all channels are written. The wave output setting is enabled only when the output mode setting is set to the wave output mode. The wave data for analog output is required to be set in advance. The set value is enabled by turning on and off 'Operating condition setting request' (Un\G70.b9) or executing the operating condition setting request operation FB (M+FX5-4DA_RequestSetting). When the setting values of target channel are out of range, o_bErr (Error completion) turns on, and the FB processing are stopped. Also, Error code 100 (Hexadecimal) is stored in o_uErrId (Error code). For the error code, refer to Page 18 Error code. When the setting values of module type are out of range, o_bErr (Error completion) turns on, and the FB processing are stopped. Also, Error code 102 (Hexadecimal) is stored in o_uErrId (Error code). For the error code, refer to Page 18 Error code. 	
FB compilation method	Macro type	
FB operation	Pulsed execution (single scan execution type)	

Item	Description
Timing chart of I/O signals	<p>[For normal completion]</p>  <p>[For error completion]</p> 
Restrictions or precautions	<ul style="list-style-type: none"> • This FB does not include the error recovery processing. Program the error recovery processing separately in accordance with the required system operation. • This FB cannot be used in an interrupt program. • Using the FB in a program that is to be executed only once, such as a subroutine program or a FOR-NEXT loop, has a problem that i_bEN (execution command) can no longer be turned off and normal operation is not possible; Always use the FB in a program that is capable of turning off the execution command. • To use more than one of this FB, care must be taken to avoid duplication of the target channel. • The FB requires the configuration of the ladder for every input label. • When operating the analog output module, the output range setting needs to be set according to the device and system to be connected. Set the GX Works3 module parameters according to the application. Refer to the FX5-4DA User's Manual (Analog Control - Intelligent function module) for details on setting the module parameters.

Error code		
Error code (hexadecimal)	Description	Action
100	The target channel is set out of the range. Set the target channel within the following range. <ul style="list-style-type: none"> • FX5-4DA: 1 to 4, 15 	Review and correct the settings and then execute the FB again.
102	The module type is set out of the range. Set the module type to the following values. <ul style="list-style-type: none"> • FX5-4DA: 0 	Review and correct the settings and then execute the FB again.

3.4 M+FX5-4DA_WaveOutputReqSetting

Name

M+FX5-4DA_WaveOutputReqSetting

Overview

Item	Description																																
Overview	Specifies whether to start, stop, or pause the wave output of a specified channel or all channels.																																
Symbol	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;"> <p style="text-align: center;">M+FX5-4DA_WaveOutputReqSetting</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 15%;">(1) — B : i_bEN</td> <td style="width: 50%;"></td> <td style="width: 15%;">o_bENO : B</td> <td style="width: 10%;">— (6)</td> </tr> <tr> <td>(2) — DUT: i_stModule</td> <td></td> <td>o_bOK : B</td> <td>— (7)</td> </tr> <tr> <td>(3) — UW : i_uCH</td> <td></td> <td>o_uWaveStatusCH1 : UW</td> <td>— (8)</td> </tr> <tr> <td>(4) — UW : i_uStartStopReq</td> <td></td> <td>o_uWaveStatusCH2 : UW</td> <td>— (9)</td> </tr> <tr> <td>(5) — UW : i_uUnitType</td> <td></td> <td>o_uWaveStatusCH3 : UW</td> <td>— (10)</td> </tr> <tr> <td></td> <td></td> <td>o_uWaveStatusCH4 : UW</td> <td>— (11)</td> </tr> <tr> <td></td> <td></td> <td>o_bErr : B</td> <td>— (12)</td> </tr> <tr> <td></td> <td></td> <td>o_uErrId : UW</td> <td>— (13)</td> </tr> </table> </div>	(1) — B : i_bEN		o_bENO : B	— (6)	(2) — DUT: i_stModule		o_bOK : B	— (7)	(3) — UW : i_uCH		o_uWaveStatusCH1 : UW	— (8)	(4) — UW : i_uStartStopReq		o_uWaveStatusCH2 : UW	— (9)	(5) — UW : i_uUnitType		o_uWaveStatusCH3 : UW	— (10)			o_uWaveStatusCH4 : UW	— (11)			o_bErr : B	— (12)			o_uErrId : UW	— (13)
(1) — B : i_bEN		o_bENO : B	— (6)																														
(2) — DUT: i_stModule		o_bOK : B	— (7)																														
(3) — UW : i_uCH		o_uWaveStatusCH1 : UW	— (8)																														
(4) — UW : i_uStartStopReq		o_uWaveStatusCH2 : UW	— (9)																														
(5) — UW : i_uUnitType		o_uWaveStatusCH3 : UW	— (10)																														
		o_uWaveStatusCH4 : UW	— (11)																														
		o_bErr : B	— (12)																														
		o_uErrId : UW	— (13)																														

Labels

Input label

No.	Variable name	Name	Data type	Range	Description
(1)	i_bEN	Execution command	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
(2)	i_stModule	Module label	Structure	The setting range differs depending on the module label.	Specifies the module label for the analog output module.
(3)	i_uCH	Target channel	Word [Unsigned]	1 to 4, 15	<ul style="list-style-type: none"> • 1 to 4: The corresponding channel number is specified. • 15: All channels are specified.
(4)	i_uStartStopReq	Waveform output start/stop request	Word [Unsigned]	0: Waveform output stop request 1: Waveform output start request 2: Waveform output pause request	Specifies a start or stop request for the wave output.
(5)	i_uUnitType	Module type	Word [Unsigned]	0: FX5-4DA	Specifies a module type.

Output label

No.	Variable name	Name	Data type	Default value	Description
(6)	o_bENO	Execution status	Bit	OFF	ON: The execution command is ON. OFF: The execution command is OFF.
(7)	o_bOK	Normal completion	Bit	OFF	The on state indicates that the execution of the FB is normal.
(8)	o_uWaveStatusCH1	CH1 Wave pattern output state monitor	Word [Unsigned]	0	Outputs the value of the wave output status (stopped, output, or paused).
(9)	o_uWaveStatusCH2	CH2 Wave pattern output state monitor	Word [Unsigned]	0	0: Waveform output stopped 1: Waveform output
(10)	o_uWaveStatusCH3	CH3 Wave pattern output state monitor	Word [Unsigned]	0	2: Waveform output paused 3: Waveform output step execution
(11)	o_uWaveStatusCH4	CH4 Wave pattern output state monitor	Word [Unsigned]	0	The FB is not capable of executing the wave output step action function. To execute the function, use the device/buffer memory batch monitor of GX Works3. For details, refer to MELSEC iQ-F FX5 User's Manual (Analog Control - Intelligent function module) .

No.	Variable name	Name	Data type	Default value	Description
(12)	o_bErr	Error completion	Bit	OFF	The on state indicates that an error has occurred in the FB.
(13)	o_uErrId	Error code	Word [Unsigned]	0	The error code of an error occurred in the FB is stored.

FB details

Item	Description	
Available device	Target module	FX5-4DA
	Target CPU	FX5U CPU, FX5UC CPU
	Engineering tool	GX Works3 Version 1.040S or later
Language	Ladder diagram	
Number of basic steps	256 steps The number of FB steps integrated in the program varies depending on the CPU module used, the input/output definition, and the setting options of GX Works3. For the setting options of GX Works3, refer to GX Works3 Operating Manual .	
Processing	<ul style="list-style-type: none"> As i_bEN (execution command) turns on, a start or stop request for the wave output of a specified channel or all channels is written to the buffer memory. As i_bEN (execution command) turns on, the FB outputs the values of 'CH□Waveform output status monitor' (Un\G401, Un\G601, Un\G801, Un\G1001) . When an individual channel is specified in the input label, only this specified channel updates a wave output status monitor value and the other channels output 0. When all channels are specified in the input label, all the channels output wave output status monitor values. The number of channels with all channels specified depends on the module type. As i_bEN (execution command) turns on, the FB always starts its execution. To start wave output once again, after the wave output ends, change i_uStartStopReq (waveform output start/stop request) from 1 (waveform output start request) to 0 (waveform output stop request), and then set 1 (waveform output start request) again. The wave output setting is enabled only when the output mode setting is set to the wave output mode. When the setting values of target channel are out of range, o_bErr (Error completion) turns on, and the FB processing are stopped. Also, Error code 100 (Hexadecimal) is stored in o_uErrId (Error code). For the error code, refer to Page 21 Error code. When the setting values of module type are out of range, o_bErr (Error completion) turns on, and the FB processing are stopped. Also, Error code 102 (Hexadecimal) is stored in o_uErrId (Error code). For the error code, refer to Page 21 Error code. 	
FB compilation method	Macro type	
FB operation	Always executed	
Timing chart of I/O signals	<p>[For normal completion]</p> <p>[For error completion]</p>	

Item	Description
Restrictions or precautions	<ul style="list-style-type: none"> This FB does not include the error recovery processing. Program the error recovery processing separately in accordance with the required system operation. This FB cannot be used in an interrupt program. Using the FB in a program that is to be executed only once, such as a subroutine program or a FOR-NEXT loop, has a problem that i_bEN (execution command) can no longer be turned off and normal operation is not possible; Always use the FB in a program that is capable of turning off the execution command. To use more than one of this FB, care must be taken to avoid duplication of the target channel. The FB requires the configuration of the ladder for every input label. When operating the analog output module, the output range setting needs to be set according to the device and system to be connected. Set the GX Works3 module parameters according to the application. Refer to the MELSEC iQ-F FX5 User's Manual (Analog Control - Intelligent function module) for details on setting the module parameters.

Error code

Error code (hexadecimal)	Description	Action
100	<p>The target channel is set out of the range. Set the target channel within the following range.</p> <ul style="list-style-type: none"> FX5-4DA: 1 to 4, 15 	Review and correct the settings and then execute the FB again.
102	<p>The module type is set out of the range. Set the module type to the following values.</p> <ul style="list-style-type: none"> FX5-4DA: 0 	Review and correct the settings and then execute the FB again.

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MEMO

REVISIONS

Revision date	Revision	Description
October 2017	A	First Edition

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