MELSEC-L Dual Channel Isolated High Resolution Analog-Digital Converter Module FB Library Reference Manual

Applicable modules:

L60AD4-2GH

<CONTENTS>

MELSOFT Library

Reference Manual Revision History

Reference Manual Number	Date	Description
FBM-M090-A	2013/05/15	First edition

1. Overview

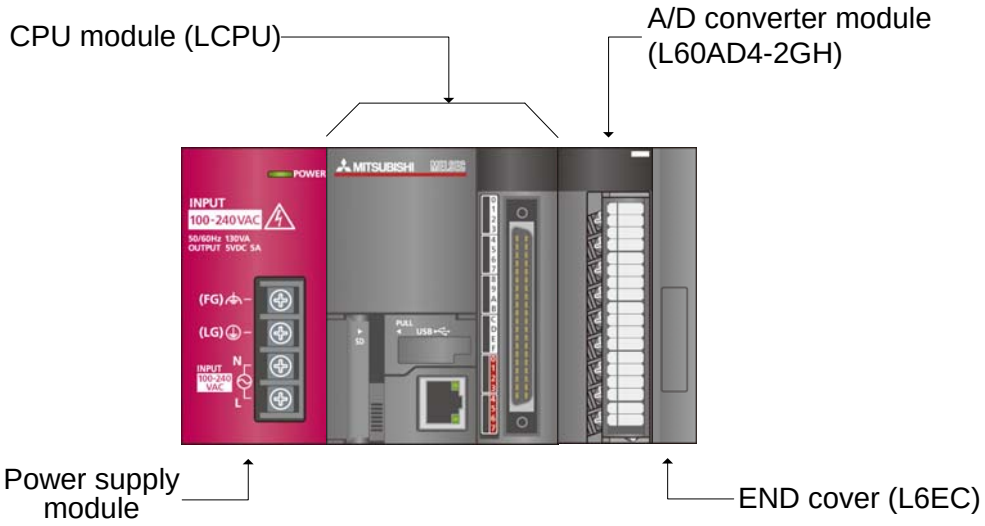
1.1. Overview of the FB Library

This FB Library is for using the L-series Dual Channel Isolated High Resolution Analog-Digital Converter Module L60AD4-2GH (hereinafter L60AD4-2GH).

1.2. Function of the FB Library

Item	Description
M+L60AD4-2GH_ReadADVal	Reads the A/D conversion data of the specified channel.
M+L60AD4-2GH_ReadAllADVal	Reads the A/D conversion data of all channels.
M+L60AD4-2GH_ReadScalingVal	Reads the digital operation value of the specified channel.
M+L60AD4-2GH_ReadAllScalingVal	Reads the digital operation value of all channels.
M+L60AD4-2GH_SetADConversion	Enables or disables A/D conversion for a specified channel or all channels.
M+L60AD4-2GH_SetAverage	Sets the averaging processing, the primary delay filter, and the digital filter of the specified channel.
M+L60AD4-2GH_SetScaling	Sets the scaling of the specified channel.
M+L60AD4-2GH_SetProcessAlarm	Sets the process alarm of the specified channel.
M+L60AD4-2GH_SetRateAlarm	Sets the rate alarm of the specified channel.
M+L60AD4-2GH_SetInputSignalErr	Sets the input signal error detection of the specified channel.
M+L60AD4-2GH_RequestSetting	Validates the settings of each function.
M+L60AD4-2GH_SetOffsetVal	Sets the offset of the specified channel.
M+L60AD4-2GH_SetGainVal	Sets the gain of the specified channel.
M+L60AD4-2GH_ErrorOperation	Monitors error codes and resets errors.
M+L60AD4-2GH_OGBackup	Reads the offset/gain setting value of the user range setting and stores to a file.
M+L60AD4-2GH_OGRestore	Restores the offset/gain setting values of the user range setting that saved in a file to the module.
M+L60AD4-2GH_SetDigitalClip	Enables or disables the digital clipping for the specified channel.
M+L60AD4-2GH_SetShift	Sets the shift function of the specified channel.
M+L60AD4-2GH_SetLoggingPARAM	Sets the logging function of the specified channel.
M+L60AD4-2GH_SaveLogging	Saves the logging data of the specified channel to a file.

1.3. System Configuration Example



1.4. Relevant Manuals

- MELSEC-L Dual Channel Isolated High Resolution Analog-Digital Converter Module User's Manual
- MELSEC-L CPU Module User's Manual (Hardware Design, Maintenance and Inspection)
- MELSEC-L CPU Module User's Manual (Data Logging Function)
- 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.

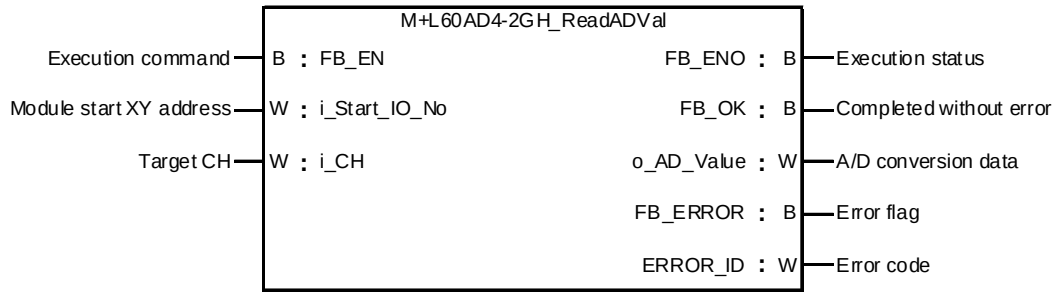
2. Details of the FB Library

2.1. M+L60AD4-2GH_ReadADVal (Read A/D conversion data)

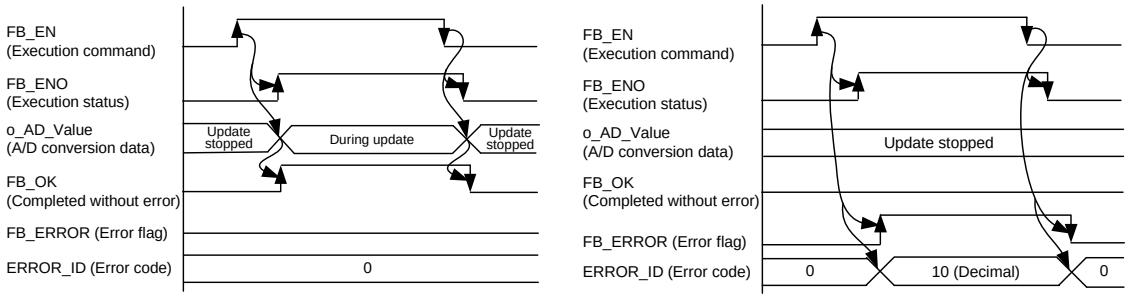
FB Name

M+L60AD4-2GH_ReadADVal

Function Overview

<table>
<tr><td>Item</td><td colspan="2">Description</td></tr>
<tr><td>Function overview</td><td colspan="2">Reads the A/D conversion data of the specified channel.</td></tr>
<tr><td>Symbol</td><td colspan="2"> 
</td></tr>
<tr><td rowspan="3">Applicable hardware and software</td><td>Analog-digital converter module</td><td>L60AD4-2GH</td></tr>
<tr><td>CPU module</td><td><table><tr><th>Series</th><th>Model</th></tr><tr><td>MELSEC-L Series</td><td>LCPU</td></tr></table></td></tr>
<tr><td>Engineering software</td><td>GX Works2 *1<table><tr><th>Language</th><th>Software version</th></tr><tr><td>English version</td><td>Version1.24A or later</td></tr><tr><td>Chinese version</td><td>Version1.49B or later</td></tr></table>*1 For software versions applicable to the modules used, refer to "Relevant manuals".</td></tr>
<tr><td>Programming language</td><td colspan="2">Ladder</td></tr>
<tr><td>Number of steps</td><td colspan="2">305 steps (for MELSEC-L series CPU)
* The number of steps of the FB in a program depends on the CPU model that is used and input and output definition.</td></tr>
</table>

Item	Description
Function description	1) By turning ON FB_EN (Execution command), the A/D conversion data of the specified channel is read. 2) The read A/D conversion data depends on the settings of the input range and the averaging processing function. 3) When the setting value of the target channel is out of range, the FB_ERROR output turns ON and processing is interrupted, and the error code is stored in ERROR_ID (Error code). Refer to the error code explanation section for details. 4) When the digital output value is set in the auto refresh setting of the intelligent function module, this FB is unnecessary.
Compiling method	Macro type
Restrictions and precautions	1) The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation. 2) The FB cannot be used in an interrupt program. 3) Please ensure that the FB_EN signal is capable of being turned OFF by the program. Do not use this FB in programs that are only executed once such as a subroutine, FOR-NEXT loop 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 to 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) To operate the L60AD4-2GH, set the input range according to the device and system to be connected. Configure the setting in Switch Setting of GX Works2 according to the application. For details on how to use the intelligent function module switch setting, refer to GX Works2 Version1 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]



Item	Description
Relevant manuals	•MELSEC-L Dual Channel Isolated High Resolution Analog-Digital Converter Module User's Manual •MELSEC-L CPU 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	Action
10 (Decimal)	The specified channel is not valid. The target channel is not within the range of 1 to 4.	Please try again after confirming the setting.

Labels

●Input labels

Name (Comment)	Label name	Data type	Setting range	Description
Execution command	FB_EN	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
Module start XY address	i_Start_IO_No	Word	Depends on the I/O point range of the CPU. For details, refer to the CPU user's manual.	Specify the starting XY address (in hexadecimal) where the L60AD4-2GH is connected. (For example, enter H10 for X10.)
Target CH	i_CH	Word	1 to 4	Specify the channel number.

●Output labels

Name (Comment)	Label name	Data type	Initial value	Description
Execution status	FB_ENO	Bit	OFF	ON: Execution command is ON. OFF: Execution command is OFF.
Completed without error	FB_OK	Bit	OFF	When ON, it indicates that the A/D conversion value is being read.
A/D conversion data	o_AD_Value	Word	0	The A/D conversion value is stored.
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	2013/05/15	First edition

Note

This chapter includes information related to the function block.

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

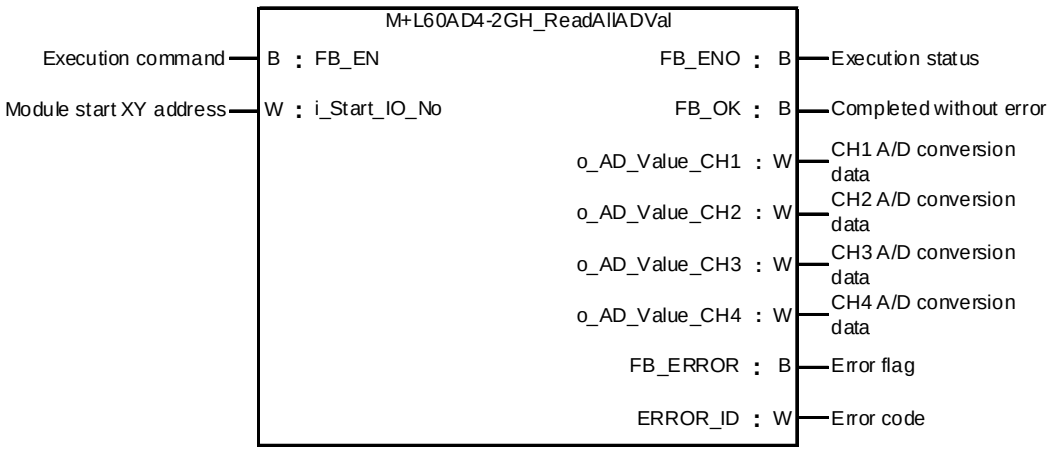
Please make sure to read user's manuals for the corresponding products before using the products.

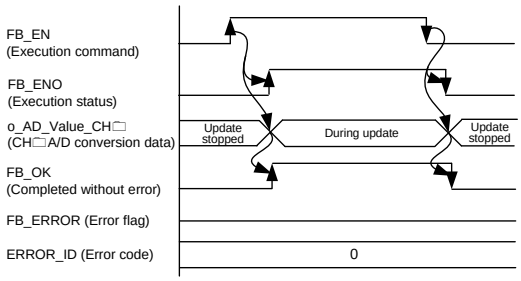
2.2. M+L60AD4-2GH_ReadAllADVal (Read A/D conversion data (all CHs))

FB Name

M+L60AD4-2GH_ReadAllADVal

Function Overview

<table>
<tr><th>Item</th><th colspan="2">Description</th></tr>
<tr><td>Function overview</td><td colspan="2">Reads the A/D conversion data of all channels.</td></tr>
<tr><td>Symbol</td><td colspan="2"> 
</td></tr>
<tr><td rowspan="3">Applicable hardware and software</td><td>Analog-digital converter module</td><td>L60AD4-2GH</td></tr>
<tr><td>CPU module</td><td><table><tr><th>Series</th><th>Model</th></tr><tr><td>MELSEC-L Series</td><td>LCPU</td></tr></table></td></tr>
<tr><td>Engineering software</td><td>GX Works2 *1<table><tr><th>Language</th><th>Software version</th></tr><tr><td>English version</td><td>Version1.24A or later</td></tr><tr><td>Chinese version</td><td>Version1.49B or later</td></tr></table>*1 For software versions applicable to the modules used, refer to "Relevant manuals".</td></tr>
<tr><td>Programming language</td><td colspan="2">Ladder</td></tr>
<tr><td>Number of steps</td><td colspan="2">268 steps (for MELSEC-L series CPU)
* The number of steps of the FB in a program depends on the CPU model that is used and input and output definition.</td></tr>
</table>

Item	Description
Function description	1) By turning ON FB_EN (Execution command), the A/D conversion data of all channels are read. 2) The read A/D conversion data depends on the settings of the input range and the averaging processing function. 3) When the digital output value is set in the auto refresh setting of the intelligent function module, this FB is unnecessary.
Compiling method	Macro type
Restrictions and precautions	1) The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation. 2) The FB cannot be used in an interrupt program. 3) Please ensure that the FB_EN signal is capable of being turned OFF by the program. Do not use this FB in programs that are only executed once such as a subroutine, FOR-NEXT loop 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) To operate the L60AD4-2GH, set the input range according to the device and system to be connected. Configure the setting in Switch Setting of GX Works2 according to the application. For details on how to use the intelligent function module switch setting, refer to GX Works2 Version1 Operating Manual (Common).
FB operation type	Real-time execution
Application example	Refer to "Appendix 1. FB Library Application Examples".
Timing chart	
Relevant manuals	•MELSEC-L Dual Channel Isolated High Resolution Analog-Digital Converter Module User's Manual •MELSEC-L CPU 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)

MELSOFT Library

Error codes

●Error code list

Error code	Description	Action
None	None	None

Labels

●Input labels

Name (Comment)	Label name	Data type	Setting range	Description
Execution command	FB_EN	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
Module start XY address	i_Start_IO_No	Word	Depends on the I/O point range of the CPU. For details, refer to the CPU user's manual.	Specify the starting XY address (in hexadecimal) where the L60AD4-2GH is connected. (For example, enter H10 for X10.)

●Output labels

Name (Comment)	Label name	Data type	Initial value	Description
Execution status	FB_ENO	Bit	OFF	ON: Execution command is ON. OFF: Execution command is OFF.
Completed without error	FB_OK	Bit	OFF	When ON, it indicates that the A/D conversion value is being read.
CH1 A/D conversion data	o_AD_Value_CH1	Word	0	The A/D conversion value of channel 1 is stored.
CH2 A/D conversion data	o_AD_Value_CH2	Word	0	The A/D conversion value of channel 2 is stored.
CH3 A/D conversion data	o_AD_Value_CH3	Word	0	The A/D conversion value of channel 3 is stored.
CH4 A/D conversion data	o_AD_Value_CH4	Word	0	The A/D conversion value of channel 4 is stored.
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	2013/05/15	First edition

Note

This chapter includes information related to the function block.

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

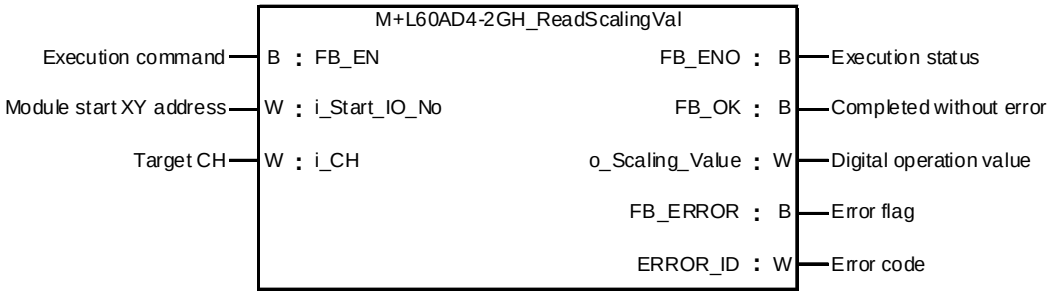
Please make sure to read user's manuals for the corresponding products before using the products.

2.3. M+L60AD4-2GH_ReadScalingVal (Read digital operation value)

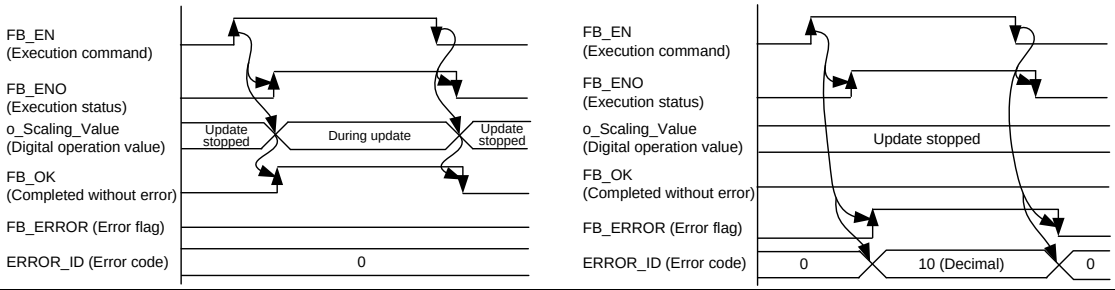
FB Name

M+L60AD4-2GH_ReadScalingVal

Function Overview

<table>
<tr><th>Item</th><th colspan="2">Description</th></tr>
<tr><td>Function overview</td><td colspan="2">Reads the digital operation value of the specified channel.</td></tr>
<tr><td>Symbol</td><td colspan="2"> 
</td></tr>
<tr><td rowspan="3">Applicable hardware and software</td><td>Analog-digital converter module</td><td>L60AD4-2GH</td></tr>
<tr><td>CPU module</td><td><table><tr><th>Series</th><th>Model</th></tr><tr><td>MELSEC-L Series</td><td>LCPU</td></tr></table></td></tr>
<tr><td>Engineering software</td><td>GX Works2 *1<table><tr><th>Language</th><th>Software version</th></tr><tr><td>English version</td><td>Version1.24A or later</td></tr><tr><td>Chinese version</td><td>Version1.49B or later</td></tr></table>*1 For software versions applicable to the modules used, refer to "Relevant manuals".</td></tr>
<tr><td>Programming language</td><td colspan="2">Ladder</td></tr>
<tr><td>Number of steps</td><td colspan="2">310 steps (for MELSEC-L series CPU)
* The number of steps of the FB in a program depends on the CPU model that is used and input and output definition.</td></tr>
</table>

Item	Description
Function description	1) By turning ON FB_EN (Execution command), the digital operation value of the specified channel is read. 2) The read digital operation value depends on the settings of the input range, the averaging processing function, the scaling function, the shift function, digital clipping function, and the differential conversion function. 3) When the setting value of the target channel is out of range, the FB_ERROR output turns ON and processing is interrupted, and the error code is stored in ERROR_ID (Error code). Refer to the error code explanation section for details. 4) When the digital operation value is set in the auto refresh setting of the intelligent function module, this FB is unnecessary.
Compiling method	Macro type
Restrictions and precautions	1) The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation. 2) The FB cannot be used in an interrupt program. 3) Please ensure that the FB_EN signal is capable of being turned OFF by the program. Do not use this FB in programs that are only executed once such as a subroutine, FOR-NEXT loop 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 to 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) To operate the L60AD4-2GH, set the input range according to the device and system to be connected. Configure the setting in Switch Setting of GX Works2 according to the application. For details on how to use the intelligent function module switch setting, refer to GX Works2 Version1 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]



Item	Description
Relevant manuals	•MELSEC-L Dual Channel Isolated High Resolution Analog-Digital Converter Module User's Manual •MELSEC-L CPU 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	Action
10 (Decimal)	The specified channel is not valid. The target channel is not within the range of 1 to 4.	Please try again after confirming the setting.

Labels

●Input labels

Name (Comment)	Label name	Data type	Setting range	Description
Execution command	FB_EN	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
Module start XY address	i_Start_IO_No	Word	Depends on the I/O point range of the CPU. For details, refer to the CPU user's manual.	Specify the starting XY address (in hexadecimal) where the L60AD4-2GH is connected. (For example, enter H10 for X10.)
Target CH	i_CH	Word	1 to 4	Specify the channel number.

●Output labels

Name (Comment)	Label name	Data type	Initial value	Description
Execution status	FB_ENO	Bit	OFF	ON: Execution command is ON. OFF: Execution command is OFF.
Completed without error	FB_OK	Bit	OFF	When ON, it indicates that the digital operation value is being read.
Digital operation value	o_Scaling_Value	Word	0	The digital operation value is stored.
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	2013/05/15	First edition

Note

This chapter includes information related to the function block.

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

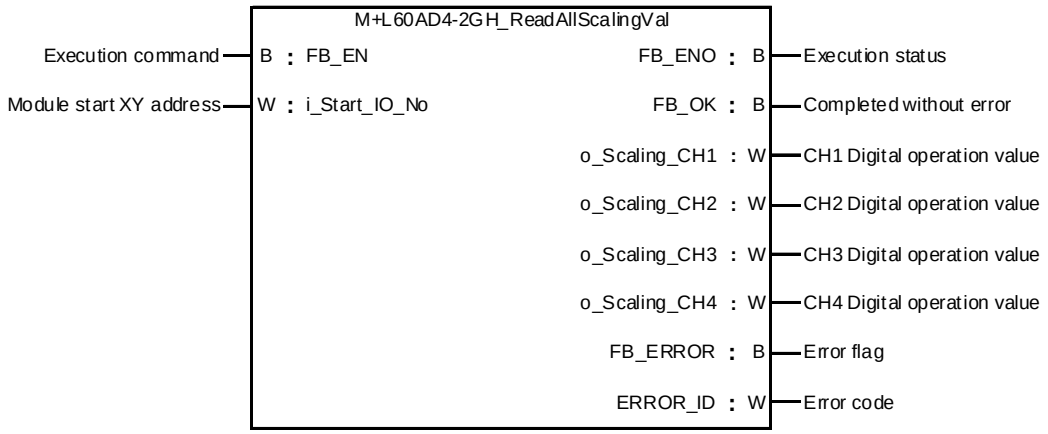
Please make sure to read user's manuals for the corresponding products before using the products.

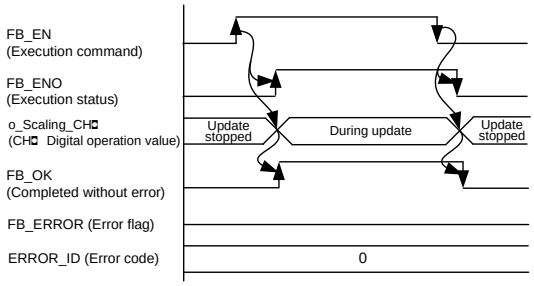
2.4. M+L60AD4-2GH_ReadAllScalingVal (Read digital operation value (all CHs))

FB Name

M+L60AD4-2GH_ReadAllScalingVal

Function Overview

<table>
<tr><th>Item</th><th colspan="2">Description</th></tr>
<tr><td>Function overview</td><td colspan="2">Reads the digital operation value of all channels.</td></tr>
<tr><td>Symbol</td><td colspan="2"> 
</td></tr>
<tr><td rowspan="3">Applicable hardware and software</td><td>Analog-digital converter module</td><td>L60AD4-2GH</td></tr>
<tr><td>CPU module</td><td><table><tr><th>Series</th><th>Model</th></tr><tr><td>MELSEC-L Series</td><td>LCPU</td></tr></table></td></tr>
<tr><td>Engineering software</td><td>GX Works2 *1<table><tr><th>Language</th><th>Software version</th></tr><tr><td>English version</td><td>Version1.24A or later</td></tr><tr><td>Chinese version</td><td>Version1.49B or later</td></tr></table>*1 For software versions applicable to the modules used, refer to "Relevant manuals".</td></tr>
<tr><td>Programming language</td><td colspan="2">Ladder</td></tr>
<tr><td>Number of steps</td><td colspan="2">275 steps (for MELSEC-L series CPU)
* The number of steps of the FB in a program depends on the CPU model that is used and input and output definition.</td></tr>
</table>

Item	Description
Function description	1) By turning ON FB_EN (Execution command), the digital operation values of all channels are read. 2) The read digital operation value depends on the settings of the input range, the averaging processing, the scaling function, the shift function, digital clipping function, and the differential conversion function. 3) When the digital operation value is set in the auto refresh setting of the intelligent function module, this FB is unnecessary.
Compiling method	Macro type
Restrictions and precautions	1) The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation. 2) The FB cannot be used in an interrupt program. 3) Please ensure that the FB_EN signal is capable of being turned OFF by the program. Do not use this FB in programs that are only executed once such as a subroutine, FOR-NEXT loop 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) To operate the L60AD4-2GH, set the input range according to the device and system to be connected. Configure the setting in Switch Setting of GX Works2 according to the application. For details on how to use the intelligent function module switch setting, refer to GX Works2 Version1 Operating Manual (Common).
FB operation type	Real-time execution
Application example	Refer to "Appendix 1. FB Library Application Examples".
Timing chart	
Relevant manuals	•MELSEC-L Dual Channel Isolated High Resolution Analog-Digital Converter Module User's Manual •MELSEC-L CPU 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	Action
None	None	None

Labels

●Input labels

Name (Comment)	Label name	Data type	Setting range	Description
Execution command	FB_EN	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
Module start XY address	i_Start_IO_No	Word	Depends on the I/O point range of the CPU. For details, refer to the CPU user's manual.	Specify the starting XY address (in hexadecimal) where the L60AD4-2GH is connected. (For example, enter H10 for X10.)

●Output labels

Name (Comment)	Label name	Data type	Initial value	Description
Execution status	FB_ENO	Bit	OFF	ON: Execution command is ON. OFF: Execution command is OFF.
Completed without error	FB_OK	Bit	OFF	When ON, it indicates that the digital operation value is being read.
CH1 Digital operation value	o_Scaling_CH1	Word	0	The digital operation value of channel 1 is stored.
CH2 Digital operation value	o_Scaling_CH2	Word	0	The digital operation value of channel 2 is stored.
CH3 Digital operation value	o_Scaling_CH3	Word	0	The digital operation value of channel 3 is stored.
CH4 Digital operation value	o_Scaling_CH4	Word	0	The digital operation value of channel 4 is stored.
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	2013/05/15	First edition

Note

This chapter includes information related to the function block.

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

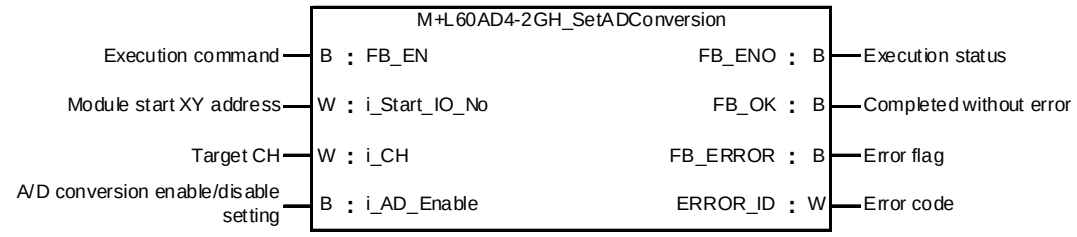
Please make sure to read user's manuals for the corresponding products before using the products.

2.5. M+L60AD4-2GH_SetADConversion (A/D conversion enable/disable setting)

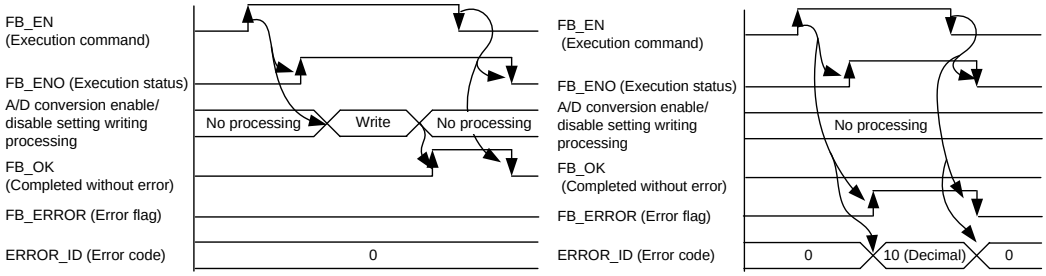
FB Name

M+L60AD4-2GH_SetADConversion

Function Overview

<table>
<tr><th>Item</th><th colspan="2">Description</th></tr>
<tr><td>Function overview</td><td colspan="2">Enables or disables A/D conversion for a specified channel or all channels.</td></tr>
<tr><td>Symbol</td><td colspan="2"> 
</td></tr>
<tr><td rowspan="3">Applicable hardware and software</td><td>Analog-digital converter module</td><td>L60AD4-2GH</td></tr>
<tr><td>CPU module</td><td><table><tr><th>Series</th><th>Model</th></tr><tr><td>MELSEC-L Series</td><td>LCPU</td></tr></table></td></tr>
<tr><td>Engineering software</td><td>GX Works2 *1<table><tr><th>Language</th><th>Software version</th></tr><tr><td>English version</td><td>Version1.24A or later</td></tr><tr><td>Chinese version</td><td>Version1.49B or later</td></tr></table>*1 For software versions applicable to the modules used, refer to "Relevant manuals".</td></tr>
<tr><td>Programming language</td><td colspan="2">Ladder</td></tr>
<tr><td>Number of steps</td><td colspan="2">366 steps (for MELSEC-L series CPU)
* The number of steps of the FB in a program depends on the CPU model that is used and input and output definition.</td></tr>
</table>

Item	Description
Function description	1) By turning ON FB_EN (Execution command), the A/D conversion enable/disable setting for the specified channel or all channels is configured. 2) FB operation is one-shot only, triggered by the FB_EN signal. 3) The setting value is validated when the Operating condition setting request signal (Yn9) is turned OFF → ON → OFF or the Operating condition setting request FB (M+L60AD4-2GH_RequestSetting) is executed. 4) When the setting value of the target channel is out of range, the FB_ERROR output turns ON and processing is interrupted, and the error code is stored in ERROR_ID (Error code). Refer to the error code explanation section for details.
Compiling method	Macro type
Restrictions and precautions	1) The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation. 2) The FB cannot be used in an interrupt program. 3) Please ensure that the FB_EN signal is capable of being turned OFF by the program. Do not use this FB in programs that are only executed once such as a subroutine, FOR-NEXT loop 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 to 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 parameter is set using the configuration function of GX Works2, this FB is unnecessary. 8) To operate the L60AD4-2GH, set the input range according to the device and system to be connected. Configure the setting in Switch Setting of GX Works2 according to the application. For details on how to use the intelligent function module switch setting, refer to GX Works2 Version1 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] 
Relevant manuals	•MELSEC-L Dual Channel Isolated High Resolution Analog-Digital Converter Module User's Manual •MELSEC-L CPU 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	Action
10 (Decimal)	The specified channel is not valid. The target channel is not within the range of 1 to 4 or 15.	Please try again after confirming the setting.

Labels

●Input labels

Name (Comment)	Label name	Data type	Setting range	Description
Execution command	FB_EN	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
Module start XY address	i_Start_IO_No	Word	Depends on the I/O point range of the CPU. For details, refer to the CPU user's manual.	Specify the starting XY address (in hexadecimal) where the L60AD4-2GH is connected. (For example, enter H10 for X10.)
Target CH	i_CH	Word	1 to 4 or 15	1 to 4: Specify the channel number. 15: Specify all the channels.
A/D conversion enable/disable setting	i_AD_Enable	Bit	ON, OFF	ON: A/D conversion enabled OFF: A/D conversion disabled

●Output labels

Name (Comment)	Label name	Data type	Initial value	Description
Execution status	FB_ENO	Bit	OFF	ON: Execution command is ON. OFF: Execution command is OFF.
Completed without error	FB_OK	Bit	OFF	When ON, it indicates that the conversion enable/disable setting is completed.
Error flag	FB_ERROR	Bit	OFF	When ON, it indicates that an error has occurred.
Error code	ERROR_ID	Word	0	FB error code output.

FB Version Upgrade History

Version	Date	Description
1.00A	2013/05/15	First edition

Note

This chapter includes information related to the function block.

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

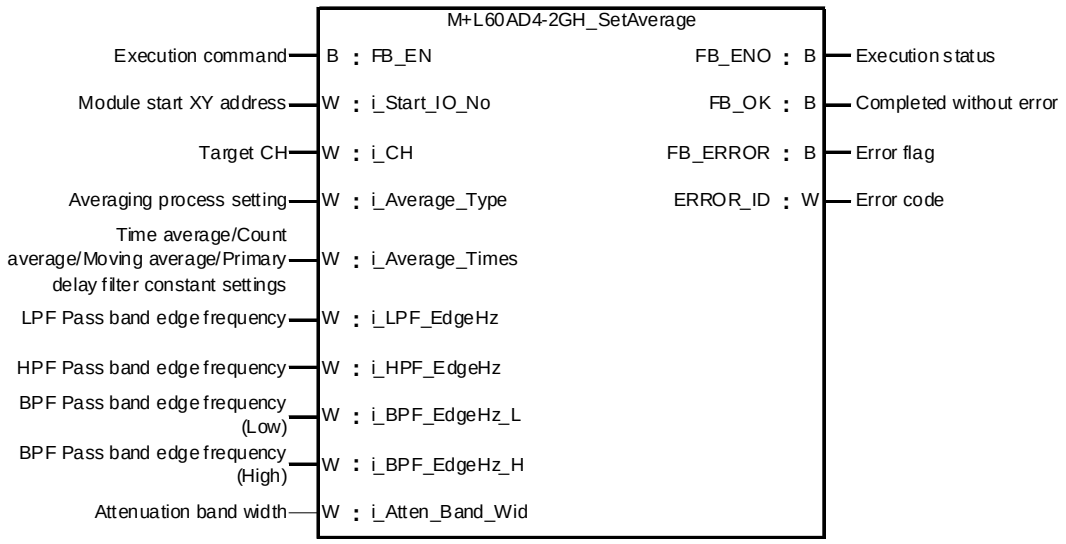
Please make sure to read user's manuals for the corresponding products before using the products.

2.6. M+L60AD4-2GH_SetAverage (Averaging process setting)

FB Name

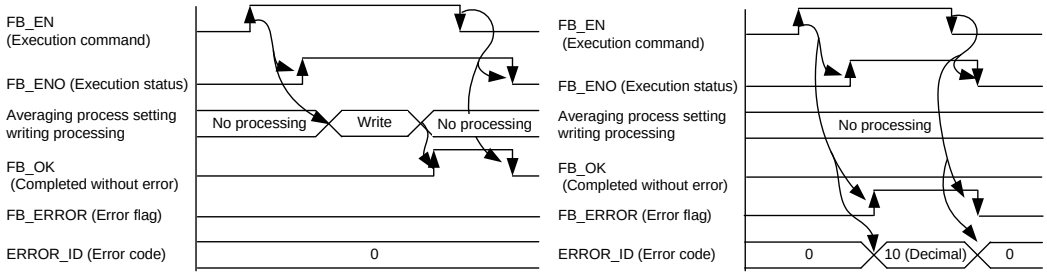
M+L60AD4-2GH_SetAverage

Function Overview

<table>
<tr><th>Item</th><th colspan="2">Description</th></tr>
<tr><td>Function overview</td><td colspan="2">Sets the averaging processing of the specified channel.</td></tr>
<tr><td>Symbol</td><td colspan="2"> 
</td></tr>
<tr><td rowspan="3">Applicable hardware and software</td><td>Analog-digital converter module</td><td>L60AD4-2GH</td></tr>
<tr><td>CPU module</td><td><table><tr><th>Series</th><th>Model</th></tr><tr><td>MELSEC-L Series</td><td>LCPU</td></tr></table></td></tr>
<tr><td>Engineering software</td><td>GX Works2 *1<table><tr><th>Language</th><th>Software version</th></tr><tr><td>English version</td><td>Version1.24A or later</td></tr><tr><td>Chinese version</td><td>Version1.49B or later</td></tr></table>*1 For software versions applicable to the modules used, refer to "Relevant manuals".</td></tr>
<tr><td>Programming language</td><td colspan="2">Ladder</td></tr>
<tr><td>Number of steps</td><td colspan="2">473 steps (for MELSEC-L series CPU)
* The number of steps of the FB in a program depends on the CPU model that is used and input and output definition.</td></tr>
</table>

MELSOFT Library

Item	Description
Function description	1) By turning ON FB_EN (Execution command), the averaging processing of the specified channel is set. 2) FB operation is one-shot only, triggered by the FB_EN signal. 3) The setting value is validated when the Operating condition setting request signal (Yn9) is turned OFF → ON → OFF or the Operating condition setting request FB (M+L60AD4-2GH_RequestSetting) is executed. 4) When the setting value of the target channel is out of range, the FB_ERROR output turns ON and processing is interrupted, and the error code is stored in ERROR_ID (Error code). Refer to the error code explanation section for details.
Compiling method	Macro type
Restrictions and precautions	1) The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation. 2) The FB cannot be used in an interrupt program. 3) Please ensure that the FB_EN signal is capable of being turned OFF by the program. Do not use this FB in programs that are only executed once such as a subroutine, FOR-NEXT loop 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 to 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 parameter is set using the configuration function of GX Works2, this FB is unnecessary. 8) To operate the L60AD4-2GH, set the input range according to the device and system to be connected. Configure the setting in Switch Setting of GX Works2 according to the application. For details on how to use the intelligent function module switch setting, refer to GX Works2 Version1 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] 
Relevant manuals	•MELSEC-L Dual Channel Isolated High Resolution Analog-Digital Converter Module User's Manual •MELSEC-L CPU 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	Action
10 (Decimal)	The specified channel is not valid. The target channel is not within the range of 1 to 4.	Please try again after confirming the setting.
11 (Decimal)	The specified averaging processing type is not valid. The averaging processing type setting is not within the range of 0 to 7_H.	Please try again after confirming the setting.

Labels

●Input labels

Name (Comment)	Label name	Data type	Setting range	Description
Execution command	FB_EN	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
Module start XY address	i_Start_IO_No	Word	Depends on the I/O point range of the CPU. For details, refer to the CPU user's manual.	Specify the starting XY address (in hexadecimal) where the L60AD4-2GH is connected. (For example, enter H10 for X10.)
Target CH	i_CH	Word	1 to 4	Specify the channel number.

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Name (Comment)	Label name	Data type	Setting range	Description
Averaging process setting	i_Average_Type	Word	0 to 7_H	Specify the averaging processing type. 0_H: Sampling processing 1_H: Time average 2_H: Count average 3_H: Moving average 4_H: Primary delay filter 5_H: Low pass filter 6_H: High pass filter 7_H: Band pass filter
Time average/Count average/Moving average/Primary delay filter constant settings	i_Average_Times	Word	Shown on the right.	Time average: 2 to 5,000 (ms) Count average: 4 to 65,000 (times) Moving average: 2 to 1,000 (times) Primary delay filter: 1 to 500 (times)
LPF Pass band edge frequency	i_LPF_EdgeHz	Word	Depends on the usage conditions. For details, refer to the L60AD4-2GH user's manual.	Specify the pass band edge frequency of the low pass filter.
HPF Pass band edge frequency	i_HPF_EdgeHz	Word	Depends on the usage conditions. For details, refer to the L60AD4-2GH user's manual.	Specify the pass band edge frequency of the high pass filter.
BPF Pass band edge frequency (Low)	i_BPF_EdgeHz_L	Word	Depends on the usage conditions. For details, refer to the L60AD4-2GH user's manual.	Specify the pass band edge frequency at the lower area of the band pass filter.
BPF Pass band edge frequency (High)	i_BPF_EdgeHz_H	Word	Depends on the usage conditions. For details, refer to the L60AD4-2GH user's manual.	Specify the pass band edge frequency at the higher area of the band pass filter.

Name (Comment)	Label name	Data type	Setting range	Description
Attenuation band width	i_Atten_Band_Wid	Word	Depends on the usage conditions. For details, refer to the L60AD4-2GH user's manual.	Specify the attenuation band width of each digital filter. Reference attenuation frequency band width

●Output labels

Name (Comment)	Label name	Data type	Initial value	Description
Execution status	FB_ENO	Bit	OFF	ON: Execution command is ON. OFF: Execution command is OFF.
Completed without error	FB_OK	Bit	OFF	When ON, it indicates that the averaging processing 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	2013/05/15	First edition

Note

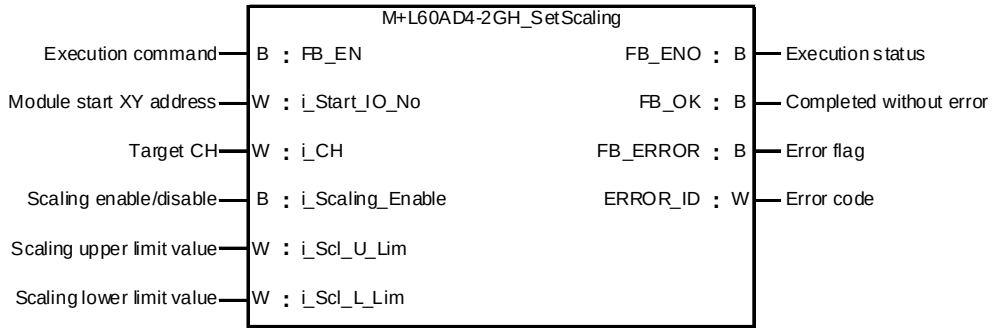
This chapter includes information related to the function block.
It does not include information on restrictions of use such as combination with modules or programmable controller CPUs.
Please make sure to read user's manuals for the corresponding products before using the products.

2.7. M+L60AD4-2GH_SetScaling (Scaling setting)

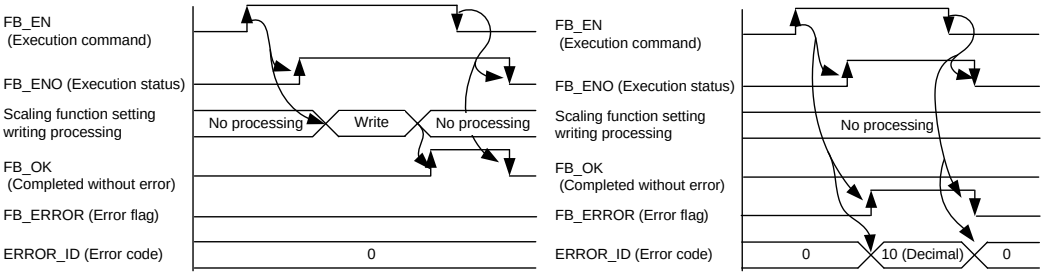
FB Name

M+L60AD4-2GH_SetScaling

Function Overview

<table>
<tr><td>Item</td><td colspan="2">Description</td></tr>
<tr><td>Function overview</td><td colspan="2">Sets the scaling of the specified channel.</td></tr>
<tr><td>Symbol</td><td colspan="2"> 
</td></tr>
<tr><td rowspan="3">Applicable hardware and software</td><td>Analog-digital converter module</td><td>L60AD4-2GH</td></tr>
<tr><td>CPU module</td><td><table><tr><th>Series</th><th>Model</th></tr><tr><td>MELSEC-L Series</td><td>LCPU</td></tr></table></td></tr>
<tr><td>Engineering software</td><td>GX Works2 *1<table><tr><th>Language</th><th>Software version</th></tr><tr><td>English version</td><td>Version1.24A or later</td></tr><tr><td>Chinese version</td><td>Version1.49B or later</td></tr></table>*1 For software versions applicable to the modules used, refer to "Relevant manuals".</td></tr>
<tr><td>Programming language</td><td colspan="2">Ladder</td></tr>
<tr><td>Number of steps</td><td colspan="2">349 steps (for MELSEC-L series CPU)
* The number of steps of the FB in a program depends on the CPU model that is used and input and output definition.</td></tr>
</table>

Item	Description
Function description	1) By turning ON FB_EN (Execution command), the scaling function setting of the specified channel is configured. 2) FB operation is one-shot only, triggered by the FB_EN signal. 3) The setting value is validated when the Operating condition setting request signal (Yn9) is turned OFF → ON →OFF or the Operating condition setting request FB (M+L60AD4-2GH_RequestSetting) is executed. 4) When the setting value of the target channel is out of range, the FB_ERROR output turns ON and processing is interrupted, and the error code is stored in ERROR_ID (Error code). Refer to the error code explanation section for details.
Compiling method	Macro type
Restrictions and precautions	1) The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation. 2) The FB cannot be used in an interrupt program. 3) Please ensure that the FB_EN signal is capable of being turned OFF by the program. Do not use this FB in programs that are only executed once such as a subroutine, FOR-NEXT loop 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 to 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 parameter is set using the configuration function of GX Works2, this FB is unnecessary. 8) To operate the L60AD4-2GH, set the input range according to the device and system to be connected. Configure the setting in Switch Setting of GX Works2 according to the application. For details on how to use the intelligent function module switch setting, refer to GX Works2 Version1 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] 
Relevant manuals	•MELSEC-L Dual Channel Isolated High Resolution Analog-Digital Converter Module User's Manual •MELSEC-L CPU 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	Action
10 (Decimal)	The specified channel is not valid. The target channel is not within the range of 1 to 4.	Please try again after confirming the setting.

MELSOFT Library

Labels

●Input labels

Name (Comment)	Label name	Data type	Setting range	Description
Execution command	FB_EN	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
Module start XY address	i_Start_IO_No	Word	Depends on the I/O point range of the CPU. For details, refer to the CPU user's manual.	Specify the starting XY address (in hexadecimal) where the L60AD4-2GH is connected. (For example, enter H10 for X10.)
Target CH	i_CH	Word	1 to 4	Specify the channel number.
Scaling enable/disable	i_Scaling_Enable	Bit	ON, OFF	ON: Enabled OFF: Disabled
Scaling upper limit value	i_Scl_U_Lim	Word	-32,000 to 32,000	Specify the scaling upper limit value.
Scaling lower limit value	i_Scl_L_Lim	Word	-32,000 to 32,000	Specify the scaling lower limit value.

●Output labels

Name (Comment)	Label name	Data type	Initial value	Description
Execution status	FB_ENO	Bit	OFF	ON: Execution command is ON. OFF: Execution command is OFF.
Completed without error	FB_OK	Bit	OFF	When ON, it indicates that the scaling function 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	2013/05/15	First edition

Note

This chapter includes information related to the function block.

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

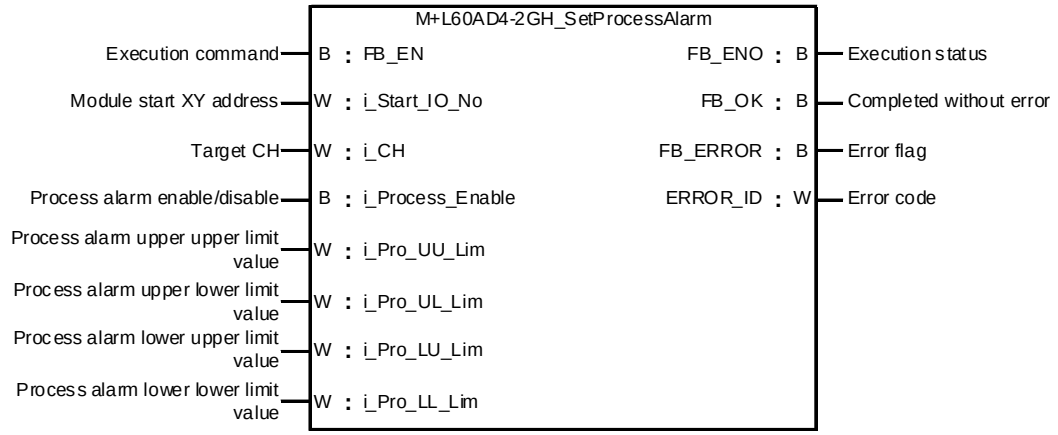
Please make sure to read user's manuals for the corresponding products before using the products.

2.8. M+L60AD4-2GH_SetProcessAlarm (Process alarm setting)

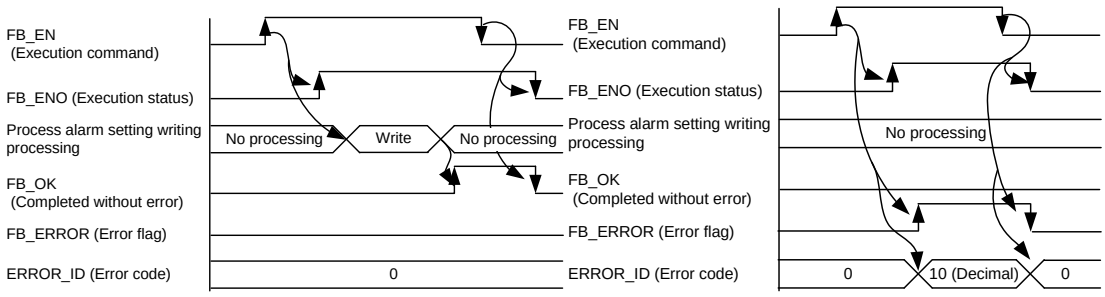
FB Name

M+L60AD4-2GH_SetProcessAlarm

Function Overview

<table>
<tr><th>Item</th><th colspan="2">Description</th></tr>
<tr><td>Function overview</td><td colspan="2">Sets the process alarm of the specified channel.</td></tr>
<tr><td>Symbol</td><td colspan="2"> 
</td></tr>
<tr><td rowspan="3">Applicable hardware and software</td><td>Analog-digital converter module</td><td>L60AD4-2GH</td></tr>
<tr><td>CPU module</td><td><table><tr><th>Series</th><th>Model</th></tr><tr><td>MELSEC-L Series</td><td>LCPU</td></tr></table></td></tr>
<tr><td>Engineering software</td><td>GX Works2 *1<table><tr><th>Language</th><th>Software version</th></tr><tr><td>English version</td><td>Version1.24A or later</td></tr><tr><td>Chinese version</td><td>Version1.49B or later</td></tr></table>*1 For software versions applicable to the modules used, refer to "Relevant manuals".</td></tr>
<tr><td>Programming language</td><td colspan="2">Ladder</td></tr>
<tr><td>Number of steps</td><td colspan="2">343 steps (for MELSEC-L series CPU)
* The number of steps of the FB in a program depends on the CPU model that is used and input and output definition.</td></tr>
</table>

Item	Description
Function description	1) By turning ON FB_EN (Execution command), the process alarm of the specified channel is set. 2) FB operation is one-shot only, triggered by the FB_EN signal. 3) The setting value is validated when the Operating condition setting request signal (Yn9) is turned OFF → ON → OFF or the Operating condition setting request FB (M+L60AD4-2GH_RequestSetting) is executed. 4) When the setting value of the target channel is out of range, the FB_ERROR output turns ON and processing is interrupted, and the error code is stored in ERROR_ID (Error code). Refer to the error code explanation section for details.
Compiling method	Macro type
Restrictions and precautions	1) The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation. 2) The FB cannot be used in an interrupt program. 3) Please ensure that the FB_EN signal is capable of being turned OFF by the program. Do not use this FB in programs that are only executed once such as a subroutine, FOR-NEXT loop 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 to 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 parameter is set using the configuration function of GX Works2, this FB is unnecessary. 8) To operate the L60AD4-2GH, set the input range according to the device and system to be connected. Configure the setting in Switch Setting of GX Works2 according to the application. For details on how to use the intelligent function module switch setting, refer to GX Works2 Version1 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] 
Relevant manuals	•MELSEC-L Dual Channel Isolated High Resolution Analog-Digital Converter Module User's Manual •MELSEC-L CPU 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	Action
10 (Decimal)	The specified channel is not valid. The target channel is not within the range of 1 to 4.	Please try again after confirming the setting.

Labels

●Input labels

Name (Comment)	Label name	Data type	Setting range	Description
Execution command	FB_EN	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
Module start XY address	i_Start_IO_No	Word	Depends on the I/O point range of the CPU. For details, refer to the CPU user's manual.	Specify the starting XY address (in hexadecimal) where the L60AD4-2GH is connected. (For example, enter H10 for X10.)
Target CH	i_CH	Word	1 to 4	Specify the channel number.
Process alarm enable/disable	i_Process_Enable	Bit	ON, OFF	ON: Enabled OFF: Disabled
Process alarm upper upper limit value	i_Pro_UU_Lim	Word	-32,768 to 32,767	Specify the process alarm upper upper limit value.

Name (Comment)	Label name	Data type	Setting range	Description
Process alarm upper lower limit value	i_Pro_UL_Lim	Word	-32,768 to 32,767	Specify the process alarm upper lower limit value.
Process alarm lower upper limit value	i_Pro_LU_Lim	Word	-32,768 to 32,767	Specify the process alarm lower upper limit value.
Process alarm lower lower limit value	i_Pro_LL_Lim	Word	-32,768 to 32,767	Specify the process alarm lower lower limit value.

●Output labels

Name (Comment)	Label name	Data type	Initial value	Description
Execution status	FB_ENO	Bit	OFF	ON: Execution command is ON. OFF: Execution command is OFF.
Completed without error	FB_OK	Bit	OFF	When ON, it indicates that the process alarm 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	2013/05/15	First edition

Note

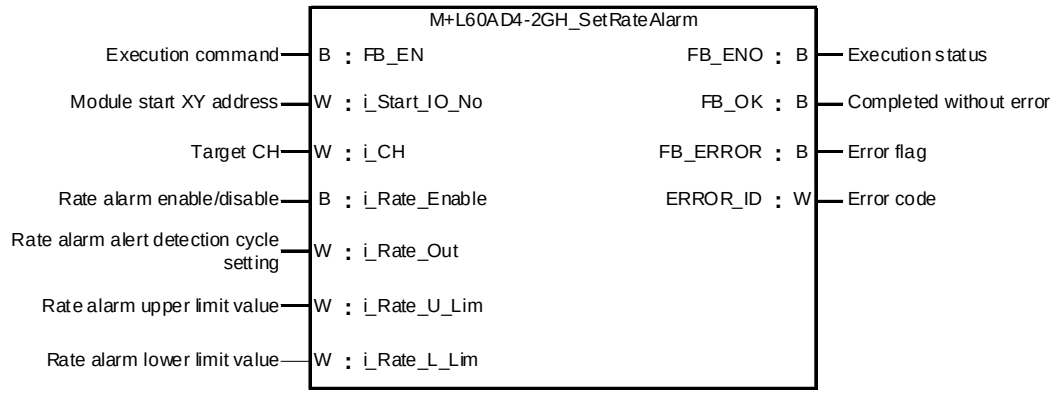
This chapter includes information related to the function block.
It does not include information on restrictions of use such as combination with modules or programmable controller CPUs.
Please make sure to read user's manuals for the corresponding products before using the products.

2.9. M+L60AD4-2GH_SetRateAlarm (Rate alarm setting)

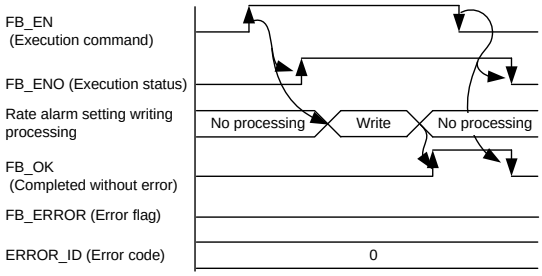
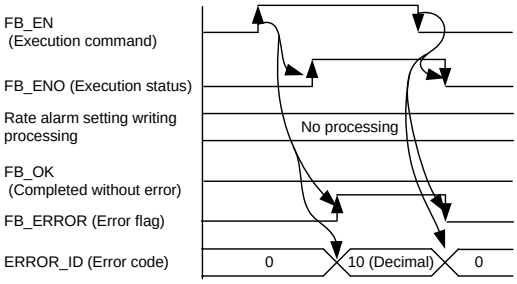
FB Name

M+L60AD4-2GH_SetRateAlarm

Function Overview

<table>
<tr><th>Item</th><th colspan="2">Description</th></tr>
<tr><td>Function overview</td><td colspan="2">Sets the rate alarm of the specified channel.</td></tr>
<tr><td>Symbol</td><td colspan="2"> 
</td></tr>
<tr><td rowspan="3">Applicable hardware and software</td><td>Analog-digital converter module</td><td>L60AD4-2GH</td></tr>
<tr><td>CPU module</td><td><table><tr><th>Series</th><th>Model</th></tr><tr><td>MELSEC-L Series</td><td>LCPU</td></tr></table></td></tr>
<tr><td>Engineering software</td><td>GX Works2 *1<table><tr><th>Language</th><th>Software version</th></tr><tr><td>English version</td><td>Version1.24A or later</td></tr><tr><td>Chinese version</td><td>Version1.49B or later</td></tr></table>*1 For software versions applicable to the modules used, refer to "Relevant manuals".</td></tr>
<tr><td>Programming language</td><td colspan="2">Ladder</td></tr>
<tr><td>Number of steps</td><td colspan="2">337 steps (for MELSEC-L series CPU)
* The number of steps of the FB in a program depends on the CPU model that is used and input and output definition.</td></tr>
</table>

Item	Description
Function description	1) By turning ON FB_EN (Execution command), the rate alarm of the specified channel is set. 2) FB operation is one-shot only, triggered by the FB_EN signal. 3) The setting value is validated when the Operating condition setting request signal (Yn9) is turned OFF → ON → OFF or the Operating condition setting request FB (M+L60AD4-2GH_RequestSetting) is executed. 4) When the setting value of the target channel is out of range, the FB_ERROR output turns ON and processing is interrupted, and the error code is stored in ERROR_ID (Error code). Refer to the error code explanation section for details.
Compiling method	Macro type
Restrictions and precautions	1) The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation. 2) The FB cannot be used in an interrupt program. 3) Please ensure that the FB_EN signal is capable of being turned OFF by the program. Do not use this FB in programs that are only executed once such as a subroutine, FOR-NEXT loop 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 to 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 parameter is set using the configuration function of GX Works2, this FB is unnecessary. 8) To operate the L60AD4-2GH, set the input range according to the device and system to be connected. Configure the setting in Switch Setting of GX Works2 according to the application. For details on how to use the intelligent function module switch setting, refer to GX Works2 Version1 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] 
Relevant manuals	•MELSEC-L Dual Channel Isolated High Resolution Analog-Digital Converter Module User's Manual •MELSEC-L CPU 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	Action
10 (Decimal)	The specified channel is not valid. The target channel is not within the range of 1 to 4.	Please try again after confirming the setting.

Labels

●Input labels

Name (Comment)	Label name	Data type	Setting range	Description
Execution command	FB_EN	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
Module start XY address	i_Start_IO_No	Word	Depends on the I/O point range of the CPU. For details, refer to the CPU user's manual.	Specify the starting XY address (in hexadecimal) where the L60AD4-2GH is connected. (For example, enter H10 for X10.)
Target CH	i_CH	Word	1 to 4	Specify the channel number.
Rate alarm enable/disable	i_Rate_Enable	Bit	ON, OFF	ON: Enabled OFF: Disabled
Rate alarm alert detection cycle setting	i_Rate_Out	Word	1 to 32,000	Specify the rate alarm alert detection cycle setting value.
Rate alarm upper limit value	i_Rate_U_Lim	Word	-32,768 to 32,767	Specify the rate alarm upper limit value.
Rate alarm lower limit value	i_Rate_L_Lim	Word	-32,768 to 32,767	Specify the rate alarm lower limit value.

●Output labels

Name (Comment)	Label name	Data type	Initial value	Description
Execution status	FB_ENO	Bit	OFF	ON: Execution command is ON. OFF: Execution command is OFF.
Completed without error	FB_OK	Bit	OFF	When ON, it indicates that the rate alarm 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	2013/05/15	First edition

Note

This chapter includes information related to the function block.

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

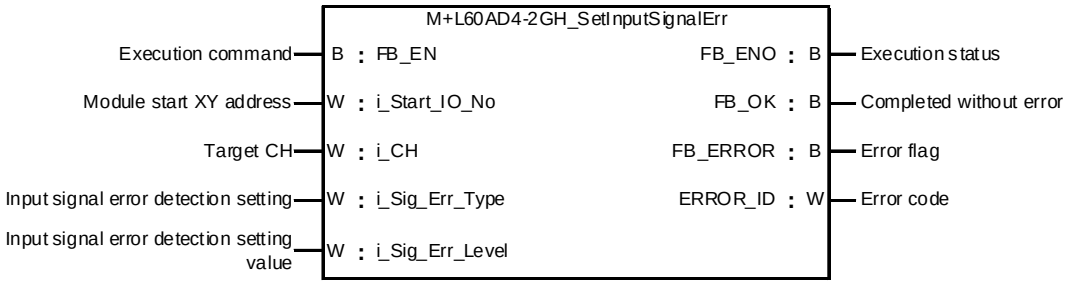
Please make sure to read user's manuals for the corresponding products before using the products.

2.10. M+L60AD4-2GH_SetInputSignalErr (Input signal error detection setting)

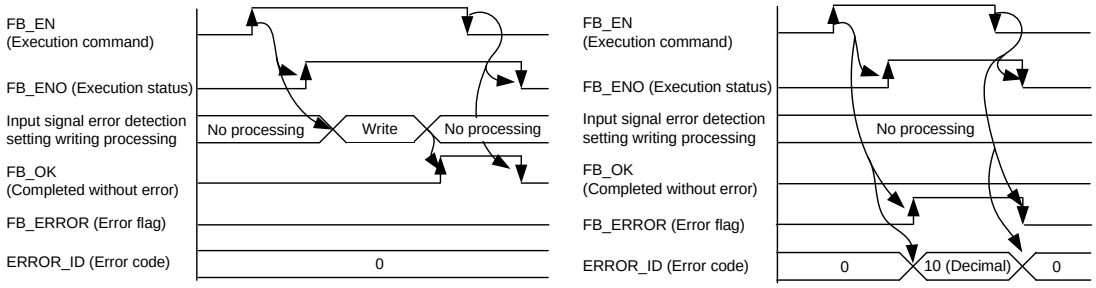
FB Name

M+L60AD4-2GH_SetInputSignalErr

Function Overview

<table>
<tr><th>Item</th><th colspan="2">Description</th></tr>
<tr><td>Function overview</td><td colspan="2">Sets the input signal error detection of the specified channel.</td></tr>
<tr><td>Symbol</td><td colspan="2"> 
</td></tr>
<tr><td rowspan="3">Applicable hardware and software</td><td>Analog-digital converter module</td><td>L60AD4-2GH</td></tr>
<tr><td>CPU module</td><td><table><tr><th>Series</th><th>Model</th></tr><tr><td>MELSEC-L Series</td><td>LCPU</td></tr></table></td></tr>
<tr><td>Engineering software</td><td>GX Works2 *1<table><tr><th>Language</th><th>Software version</th></tr><tr><td>English version</td><td>Version1.24A or later</td></tr><tr><td>Chinese version</td><td>Version1.49B or later</td></tr></table>*1 For software versions applicable to the modules used, refer to "Relevant manuals".</td></tr>
<tr><td>Programming language</td><td colspan="2">Ladder</td></tr>
<tr><td>Number of steps</td><td colspan="2">384 steps (for MELSEC-L series CPU)
* The number of steps of the FB in a program depends on the CPU model that is used and input and output definition.</td></tr>
</table>

Item	Description
Function description	1) By turning ON FB_EN (Execution command), the input signal error detection function setting of the specified channel is configured. 2) FB operation is one-shot only, triggered by the FB_EN signal. 3) The setting value is validated when the Operating condition setting request signal (Yn9) is turned OFF → ON → OFF or the Operating condition setting request FB (M+L60AD4-2GH_RequestSetting) is executed. 4) When the setting value of the target channel is out of range, the FB_ERROR output turns ON and processing is interrupted, and the error code is stored in ERROR_ID (Error code). Refer to the error code explanation section for details.
Compiling method	Macro type
Restrictions and precautions	1) The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation. 2) The FB cannot be used in an interrupt program. 3) Please ensure that the FB_EN signal is capable of being turned OFF by the program. Do not use this FB in programs that are only executed once such as a subroutine, FOR-NEXT loop 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 to 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 parameter is set using the configuration function of GX Works2, this FB is unnecessary. 8) To operate the L60AD4-2GH, set the input range according to the device and system to be connected. Configure the setting in Switch Setting of GX Works2 according to the application. For details on how to use the intelligent function module switch setting, refer to GX Works2 Version1 Operating Manual (Common).
FB operation type	Pulsed execution (1 scan execution type)
Application example	Refer to "Appendix 1. FB Library Application Examples".
Timing chart	[When operation completes without error] [When an error occurs]

Item	Description
	
Relevant manuals	•MELSEC-L Dual Channel Isolated High Resolution Analog-Digital Converter Module User's Manual •MELSEC-L CPU 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	Action
10 (Decimal)	The specified channel is not valid. The target channel is not within the range of 1 to 4.	Please try again after confirming the setting.
11 (Decimal)	The input signal error detection setting is not valid. The input signal error detection setting is not within the range of 0 to 4.	Please try again after confirming the setting.

Labels

●Input labels

Name (Comment)	Label name	Data type	Setting range	Description
Execution command	FB_EN	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
Module start XY address	i_Start_IO_No	Word	Depends on the I/O point range of the CPU. For details, refer to the CPU user's manual.	Specify the starting XY address (in hexadecimal) where the L60AD4-2GH is connected. (For example, enter H10 for X10.)
Target CH	i_CH	Word	1 to 4	Specify the channel number.
Input signal error detection setting	i_Sig_Err_Type	Word	0 to 4	0: Disabled 1: Upper lower limit detection 2: Lower limit detection 3: Upper limit detection 4: Disconnection detection
Input signal error detection setting value	i_Sig_Err_Level	Word	0 to 250	Specify the input signal error detection setting value.

●Output labels

Name (Comment)	Label name	Data type	Initial value	Description
Execution status	FB_ENO	Bit	OFF	ON: Execution command is ON. OFF: Execution command is OFF.
Completed without error	FB_OK	Bit	OFF	When ON, it indicates that the input signal error detection 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	2013/05/15	First edition

Note

This chapter includes information related to the function block.

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

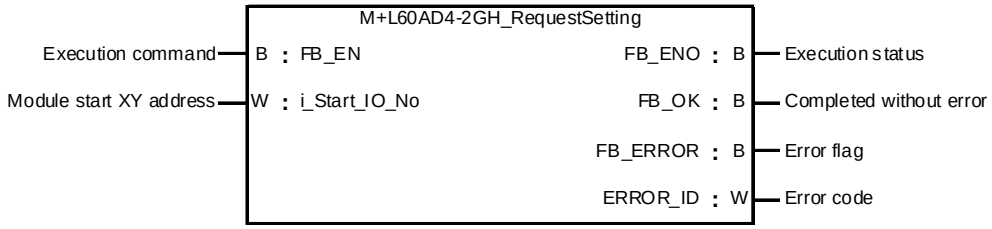
Please make sure to read user's manuals for the corresponding products before using the products.

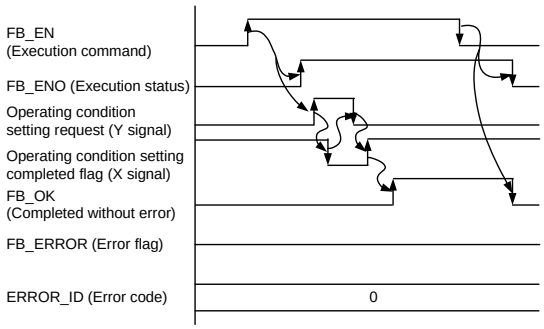
2.11. M+L60AD4-2GH_RequestSetting (Operating condition setting request)

FB Name

M+L60AD4-2GH_RequestSetting

Function Overview

<table>
<tr><th>Item</th><th colspan="2">Description</th></tr>
<tr><td>Function overview</td><td colspan="2">Validates the settings of each function.</td></tr>
<tr><td>Symbol</td><td colspan="2"> 
</td></tr>
<tr><td rowspan="3">Applicable hardware and software</td><td>Analog-digital converter module</td><td>L60AD4-2GH</td></tr>
<tr><td>CPU module</td><td><table><tr><th>Series</th><th>Model</th></tr><tr><td>MELSEC-L Series</td><td>LCPU</td></tr></table></td></tr>
<tr><td>Engineering software</td><td>GX Works2 *1<table><tr><th>Language</th><th>Software version</th></tr><tr><td>English version</td><td>Version1.24A or later</td></tr><tr><td>Chinese version</td><td>Version1.49B or later</td></tr></table>*1 For software versions applicable to the modules used, refer to "Relevant manuals".</td></tr>
<tr><td>Programming language</td><td colspan="2">Ladder</td></tr>
<tr><td>Number of steps</td><td colspan="2">241 steps (for MELSEC-L series CPU)
* The number of steps of the FB in a program depends on the CPU model that is used and input and output definition.</td></tr>
<tr><td>Function description</td><td colspan="2">1) By turning ON FB_EN (Execution command), the setting contents of all channels are validated. For the setting contents to be enabled, refer to MELSEC-L Dual Channel Isolated High Resolution Analog-Digital Converter Module User's Manual.
2) After FB_EN (Execution command) is turned ON, the execution of this FB continues until each function setting is completed.</td></tr>
<tr><td>Compiling method</td><td colspan="2">Macro type</td></tr>
</table>

Item	Description
Restrictions and precautions	1) When this FB is executed, the A/D conversion is stopped. The conversion restarts after FB_OK turns ON. 2) The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation. 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 because it is impossible to turn OFF. 4) The FB cannot be used in an interrupt program. 5) This FB uses index register Z9. Please do not use the index register 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) To operate the L60AD4-2GH, set the input range according to the device and system to be connected. Configure the setting in Switch Setting of GX Works2 according to the application. For details on how to use the intelligent function module switch setting, refer to GX Works2 Version1 Operating Manual (Common).
FB operation type	Pulsed execution (multiple scan execution type)
Application example	Refer to "Appendix 1. FB Library Application Examples".
Timing chart	
Relevant manuals	•MELSEC-L Dual Channel Isolated High Resolution Analog-Digital Converter Module User's Manual •MELSEC-L CPU 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	Action
None	None	None

Labels

●Input labels

Name (Comment)	Label name	Data type	Setting range	Description
Execution command	FB_EN	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
Module start XY address	i_Start_IO_No	Word	Depends on the I/O point range of the CPU. For details, refer to the CPU user's manual.	Specify the starting XY address (in hexadecimal) where the L60AD4-2GH is connected. (For example, enter H10 for X10.)

●Output labels

Name (Comment)	Label name	Data type	Initial value	Description
Execution status	FB_ENO	Bit	OFF	ON: Execution command is ON. OFF: Execution command is OFF.
Completed without error	FB_OK	Bit	OFF	When ON, it indicates that the operating condition 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	2013/05/15	First edition

Note

This chapter includes information related to the function block.

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

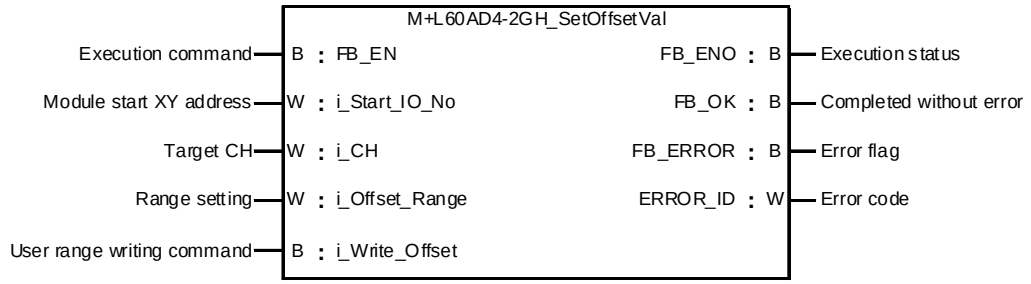
Please make sure to read user's manuals for the corresponding products before using the products.

2.12. M+L60AD4-2GH_SetOffsetVal (Offset setting)

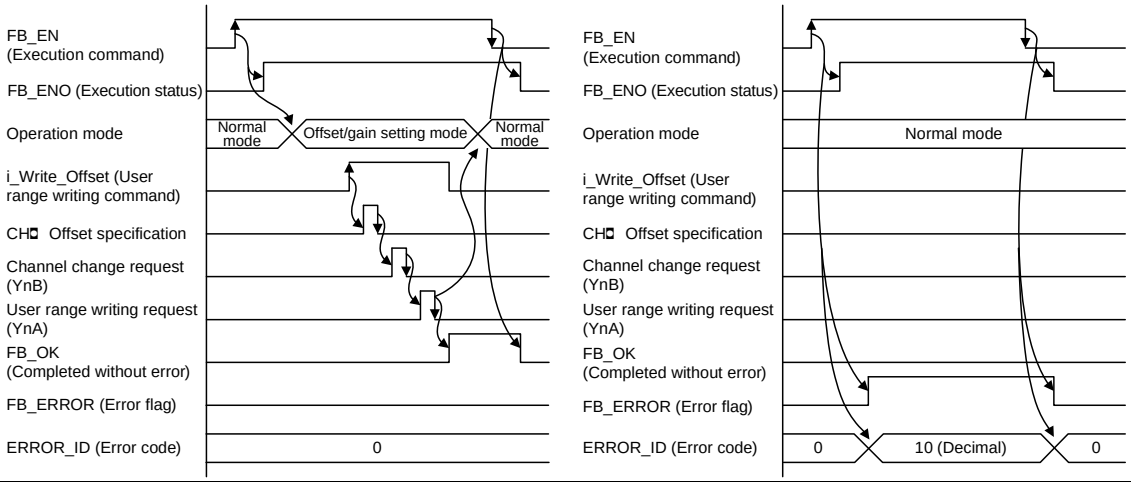
FB Name

M+L60AD4-2GH_SetOffsetVal

Function Overview

<table>
<tr><th>Item</th><th colspan="2">Description</th></tr>
<tr><td>Function overview</td><td colspan="2">Sets the offset of the specified channel.</td></tr>
<tr><td>Symbol</td><td colspan="2"> 
</td></tr>
<tr><td rowspan="3">Applicable hardware and software</td><td>Analog-digital converter module</td><td>L60AD4-2GH</td></tr>
<tr><td>CPU module</td><td><table><tr><th>Series</th><th>Model</th></tr><tr><td>MELSEC-L Series</td><td>LCPU</td></tr></table></td></tr>
<tr><td>Engineering software</td><td>GX Works2 *1<table><tr><th>Language</th><th>Software version</th></tr><tr><td>English version</td><td>Version1.24A or later</td></tr><tr><td>Chinese version</td><td>Version1.49B or later</td></tr></table>*1 For software versions applicable to the modules used, refer to "Relevant manuals".</td></tr>
<tr><td>Programming language</td><td colspan="2">Ladder</td></tr>
<tr><td>Number of steps</td><td colspan="2">469 steps (for MELSEC-L series CPU)
* The number of steps of the FB in a program depends on the CPU model that is used and input and output definition.</td></tr>
</table>

Item	Description
Function description	1) By turning ON FB_EN (Execution command), the offset value of the specified channel is set. 2) By turning ON the user range writing command while FB_EN (Execution command) is ON, the offset value is written. 3) After FB_EN (Execution command) is turned ON, the execution of this FB continues until the setting of the offset value of the specified channel is completed. 4) When the setting value of the target channel is out of range, the FB_ERROR output turns ON and processing is interrupted, and the error code is stored in ERROR_ID (Error code). Refer to the error code explanation section for details.
Compiling method	Macro type
Restrictions and precautions	1) The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation. 2) The FB cannot be used in an interrupt program. 3) Please ensure that the FB_EN signal is capable of being turned OFF by the program. Do not use this FB in programs that are only executed once such as a subroutine, FOR-NEXT loop 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 to 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) To operate the L60AD4-2GH, set the input range according to the device and system to be connected. Configure the setting in Switch Setting of GX Works2 according to the application. For details on how to use the intelligent function module switch setting, refer to GX Works2 Version1 Operating Manual (Common).
FB operation type	Pulsed execution (multiple scan execution type)
Application example	Refer to "Appendix 1. FB Library Application Examples".

Item	Description
Timing chart	[When operation completes without error] [When an error occurs] 
Relevant manuals	•MELSEC-L Dual Channel Isolated High Resolution Analog-Digital Converter Module User's Manual •MELSEC-L CPU 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	Action
10 (Decimal)	The specified channel is not valid. The target channel is not within the range of 1 to 4.	Please try again after confirming the setting.

MELSOFT Library

Labels

●Input labels

Name (Comment)	Label name	Data type	Setting range	Description
Execution command	FB_EN	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
Module start XY address	i_Start_IO_No	Word	Depends on the I/O point range of the CPU. For details, refer to the CPU user's manual.	Specify the starting XY address (in hexadecimal) where the L60AD4-2GH is connected. (For example, enter H10 for X10.)
Target CH	i_CH	Word	1 to 4	Specify the channel number.
Range setting	i_Offset_Range	Word	E_H, F_H	E_H: Unipolar (current) F_H: Bi-polar (voltage)
User range writing command	i_Write_Offset	Bit	ON, OFF	ON: Perform the user range write operation. OFF: Do not perform the user range write operation.

●Output labels

Name (Comment)	Label name	Data type	Initial value	Description
Execution status	FB_ENO	Bit	OFF	ON: Execution command is ON. OFF: Execution command is OFF.
Completed without error	FB_OK	Bit	OFF	When ON, it indicates that the offset 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	2013/05/15	First edition

Note

This chapter includes information related to the function block.

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

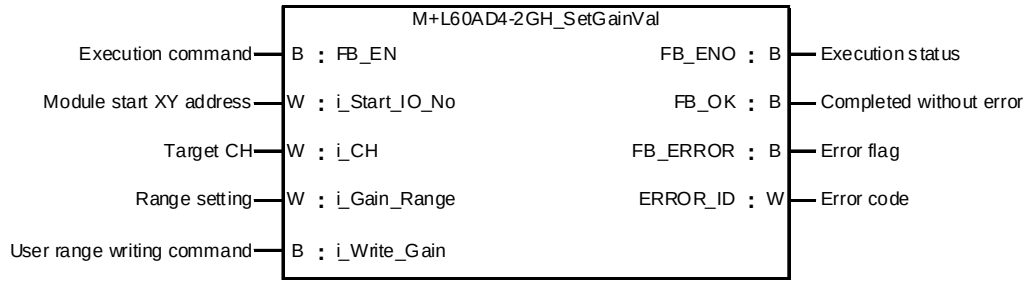
Please make sure to read user's manuals for the corresponding products before using the products.

2.13. M+L60AD4-2GH_SetGainVal (Gain setting)

FB Name

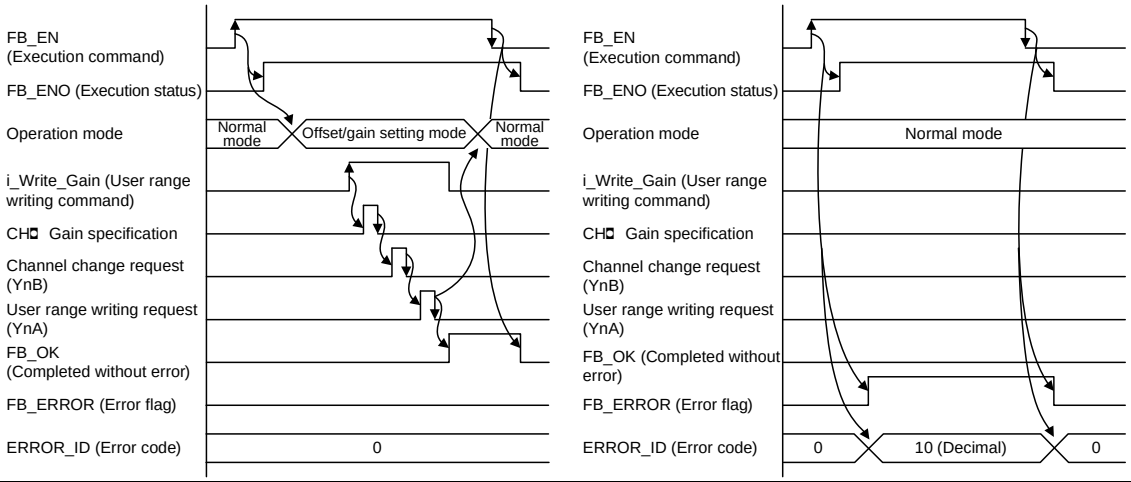
M+L60AD4-2GH_SetGainVal

Function Overview

<table>
<tr><td>Item</td><td colspan="2">Description</td></tr>
<tr><td>Function overview</td><td colspan="2">Sets the gain of the specified channel.</td></tr>
<tr><td>Symbol</td><td colspan="2"> 
</td></tr>
<tr><td rowspan="3">Applicable hardware and software</td><td>Analog-digital converter module</td><td>L60AD4-2GH</td></tr>
<tr><td>CPU module</td><td><table><tr><th>Series</th><th>Model</th></tr><tr><td>MELSEC-L Series</td><td>LCPU</td></tr></table></td></tr>
<tr><td>Engineering software</td><td>GX Works2 *1<table><tr><th>Language</th><th>Software version</th></tr><tr><td>English version</td><td>Version1.24A or later</td></tr><tr><td>Chinese version</td><td>Version1.49B or later</td></tr></table>*1 For software versions applicable to the modules used, refer to "Relevant manuals".</td></tr>
<tr><td>Programming language</td><td colspan="2">Ladder</td></tr>
<tr><td>Number of steps</td><td colspan="2">452 steps (for MELSEC-L series CPU)
* The number of steps of the FB in a program depends on the CPU model that is used and input and output definition.</td></tr>
</table>

Item	Description
Function description	1) By turning ON FB_EN (Execution command), the gain value of the specified channel is set. 2) By turning ON the user range writing command while FB_EN (Execution command) is ON, the gain value is written. 3) After FB_EN (Execution command) is turned ON, the execution of this FB continues until the setting of the gain value of the specified channel is completed. 4) When the setting value of the target channel is out of range, the FB_ERROR output turns ON and processing is interrupted, and the error code is stored in ERROR_ID (Error code). Refer to the error code explanation section for details.
Compiling method	Macro type
Restrictions and precautions	1) The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation. 2) The FB cannot be used in an interrupt program. 3) Please ensure that the FB_EN signal is capable of being turned OFF by the program. Do not use this FB in programs that are only executed once such as a subroutine, FOR-NEXT loop 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 to 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) To operate the L60AD4-2GH, set the input range according to the device and system to be connected. Configure the setting in Switch Setting of GX Works2 according to the application. For details on how to use the intelligent function module switch setting, refer to GX Works2 Version1 Operating Manual (Common).
FB operation type	Pulsed execution (multiple scan execution type)
Application example	Refer to "Appendix 1. FB Library Application Examples".

MELSOFT Library

Item	Description
Timing chart	[When operation completes without error] [When an error occurs] 
Relevant manuals	•MELSEC-L Dual Channel Isolated High Resolution Analog-Digital Converter Module User's Manual •MELSEC-L CPU 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	Action
10 (Decimal)	The specified channel is not valid. The target channel is not within the range of 1 to 4.	Please try again after confirming the setting.

Labels

●Input labels

Name (Comment)	Label name	Data type	Setting range	Description
Execution command	FB_EN	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
Module start XY address	i_Start_IO_No	Word	Depends on the I/O point range of the CPU. For details, refer to the CPU user's manual.	Specify the starting XY address (in hexadecimal) where the L60AD4-2GH is connected. (For example, enter H10 for X10.)
Target CH	i_CH	Word	1 to 4	Specify the channel number.
Range setting	i_Gain_Range	Word	E_H, F_H	E_H: Unipolar (current) F_H: Bi-polar (voltage)

Name (Comment)	Label name	Data type	Setting range	Description
User range writing command	i_Write_Gain	Bit	ON, OFF	ON: Perform the user range write operation. OFF: Do not perform the user range write operation.

●Output labels

Name (Comment)	Label name	Data type	Initial value	Description
Execution status	FB_ENO	Bit	OFF	ON: Execution command is ON. OFF: Execution command is OFF.
Completed without error	FB_OK	Bit	OFF	When ON, it indicates that the gain 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	2013/05/15	First edition

Note

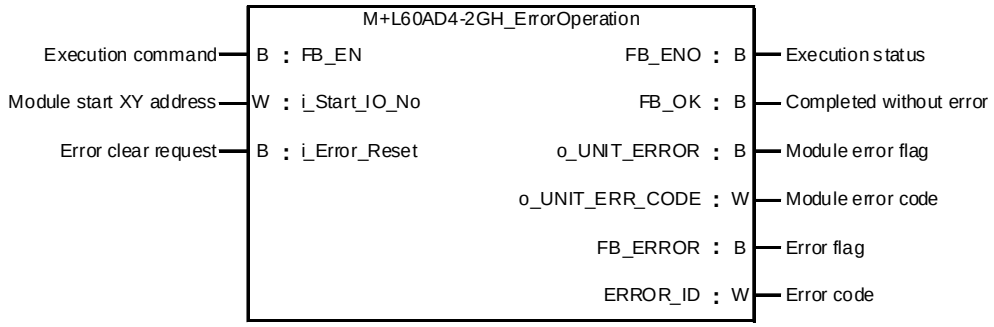
This chapter includes information related to the function block.
It does not include information on restrictions of use such as combination with modules or programmable controller CPUs.
Please make sure to read user's manuals for the corresponding products before using the products.

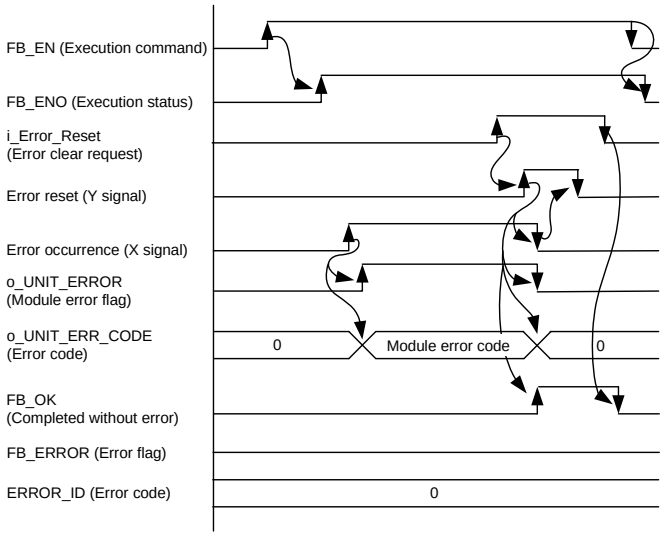
2.14. M+L60AD4-2GH_ErrorOperation (Error operation)

FB Name

M+L60AD4-2GH_ErrorOperation

Function Overview

<table>
<tr><th>Item</th><th colspan="2">Description</th></tr>
<tr><td>Function overview</td><td colspan="2">Monitors error codes and resets errors.</td></tr>
<tr><td>Symbol</td><td colspan="2"> 
</td></tr>
<tr><td rowspan="3">Applicable hardware and software</td><td>Analog-digital converter module</td><td>L60AD4-2GH</td></tr>
<tr><td>CPU module</td><td><table><tr><th>Series</th><th>Model</th></tr><tr><td>MELSEC-L Series</td><td>LCPU</td></tr></table></td></tr>
<tr><td>Engineering software</td><td>GX Works2 *1<table><tr><th>Language</th><th>Software version</th></tr><tr><td>English version</td><td>Version1.24A or later</td></tr><tr><td>Chinese version</td><td>Version1.49B or later</td></tr></table>*1 For software versions applicable to the modules used, refer to "Relevant manuals".</td></tr>
<tr><td>Programming language</td><td colspan="2">Ladder</td></tr>
<tr><td>Number of steps</td><td colspan="2">289 steps (for MELSEC-L series CPU)
* The number of steps of the FB in a program depends on the CPU model that is used and input and output definition.</td></tr>
<tr><td>Function description</td><td colspan="2">1) When FB_EN (Execution command) is turned ON, an error of the target module is monitored.
2) After FB_EN (Execution command) is turned ON, an error is reset when i_Error_Reset (Error clear request) is turned ON during error occurrence.</td></tr>
<tr><td>Compiling method</td><td colspan="2">Macro type</td></tr>
</table>

Item	Description
Restrictions and precautions	1) The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation. 2) The FB cannot be used in an interrupt program. 3) Please ensure that the FB_EN signal is capable of being turned OFF by the program. Do not use this FB in programs that are only executed once such as a subroutine, FOR-NEXT loop 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 may occur during compile operation due to the Y signal being operated by index modification. However this is not a problem and the FB will operate without error. 7) To operate the L60AD4-2GH, set the input range according to the device and system to be connected. Configure the setting in Switch Setting of GX Works2 according to the application. For details on how to use the intelligent function module switch setting, refer to GX Works2 Version1 Operating Manual (Common).
FB operation type	Real-time execution
Application example	Refer to "Appendix 1. FB Library Application Examples".
Timing chart	
Relevant manuals	•MELSEC-L Dual Channel Isolated High Resolution Analog-Digital Converter Module User's Manual •MELSEC-L CPU 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)

MELSOFT Library

Error codes

●Error code list

Error code	Description	Action
None	None	None

Labels

●Input labels

Name (Comment)	Label name	Data type	Setting range	Description
Execution command	FB_EN	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
Module start XY address	i_Start_IO_No	Word	Depends on the I/O point range of the CPU. For details, refer to the CPU user's manual.	Specify the starting XY address (in hexadecimal) where the L60AD4-2GH is connected. (For example, enter H10 for X10.)
Error clear request	i_Error_Reset	Bit	ON, OFF	Turn ON for the error reset. Turn OFF after the error reset.

●Output labels

Name (Comment)	Label name	Data type	Initial value	Description
Execution status	FB_ENO	Bit	OFF	ON: Execution command is ON. (Module errors are being monitored.) OFF: Execution command is OFF.
Completed without error	FB_OK	Bit	OFF	When ON, it indicates that an error reset is completed.
Module error flag	o_UNIT_ERROR	Bit	OFF	When ON, it indicates that a module error has occurred.
Module error code	o_UNIT_ERR_CODE	Word	0	Stores the error code of the current error.
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	2013/05/15	First edition

Note

This chapter includes information related to the function block.

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

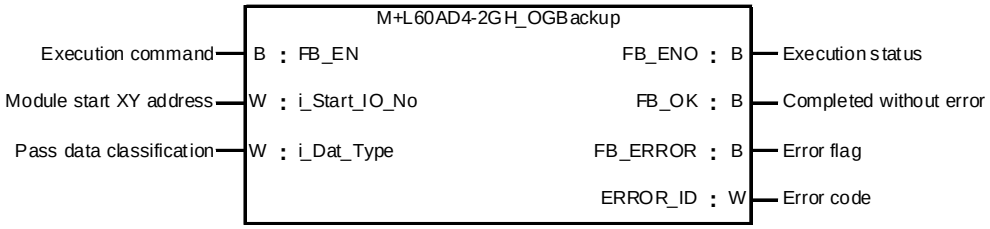
Please make sure to read user's manuals for the corresponding products before using the products.

2.15. M+L60AD4-2GH_OGBackup (Offset/gain value save)

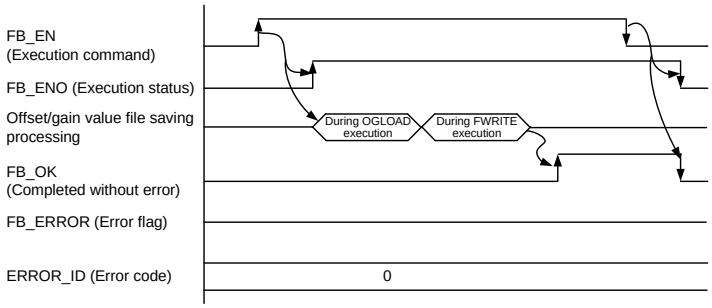
FB Name

M+L60AD4-2GH_OGBackup

Function Overview

<table>
<tr><th>Item</th><th colspan="2">Description</th></tr>
<tr><td>Function overview</td><td colspan="2">Reads the offset/gain setting value of the user range setting and stores to a file.</td></tr>
<tr><td>Symbol</td><td colspan="2"> 
</td></tr>
<tr><td rowspan="3">Applicable hardware and software</td><td>Analog-digital converter module</td><td>L60AD4-2GH</td></tr>
<tr><td>CPU module</td><td><table><tr><th>Series</th><th>Model</th></tr><tr><td>MELSEC-L Series</td><td>LCPU</td></tr></table></td></tr>
<tr><td>Engineering software</td><td>GX Works2 *1<table><tr><th>Language</th><th>Software version</th></tr><tr><td>English version</td><td>Version1.24A or later</td></tr><tr><td>Chinese version</td><td>Version1.49B or later</td></tr></table>*1 For software versions applicable to the modules used, refer to "Relevant manuals".</td></tr>
<tr><td>Programming language</td><td colspan="2">Ladder</td></tr>
<tr><td>Number of steps</td><td colspan="2">504 steps (for MELSEC-L series CPU)
* The number of steps of the FB in a program depends on the CPU model that is used and input and output definition.</td></tr>
</table>

Item	Description
Function description	1) By turning ON FB_EN (Execution command), the offset/gain value of the user range setting is read and saved to an SD memory card inserted into the CPU module. 2) FB operation is one-shot only, triggered by the FB_EN signal. 3) The name of the file which this FB creates is "LAD_" + "Module start XY address" + ".BIN". [File name example] When the module start XY address is H0120, the file name is "LAD_0120.BIN". 4) When a file with the same name exists in the SD memory card, the existing file is replaced with a new BIN file created by this FB. 5) When this FB is executed without the SD memory card installed to the CPU, when the installed SD memory card does not have enough capacity, or when the number of files to be created exceeds the number of storable files *1, a CPU error *2 occurs. *1 For information on the size of SD memory card and the number of files that can be saved, refer to LCPU User's Manual (Hardware Design, Maintenance and Inspection). *2 Setting the operation status of the CPU module (RUN/STOP) when an access error to the SD memory card occurs is available with parameters.
Compiling method	Macro type
Restrictions and precautions	1) The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation. 2) The FB cannot be used in an interrupt program. 3) Please ensure that the FB_EN signal is capable of being turned OFF by the program. Do not use this FB in programs that are only executed once such as a subroutine, FOR-NEXT loop because it is impossible to turn OFF. 4) This FB uses index register Z9. Please do not use the index register in an interrupt program. 5) Every input must be provided with a value for proper FB operation. 6) When processes for accessing the SD memory card, such as the data logging function of the LCPU, are executed simultaneously, the time for completing this FB may extend or an error 40 (timeout) may occur. For details, refer to Section 13.2.4 Troubleshooting on the entire system during operation of the data logging function of MELSEC-L CPU Module User's Manual (Data Logging Function). 7) To operate the L60AD4-2GH, set the input range according to the device and system to be connected. Configure the setting in Switch Setting of GX Works2 according to the application. For details on how to use the intelligent function module switch setting, refer to GX Works2 Version1 Operating Manual (Common).
FB operation type	Pulsed execution (multiple scan execution type)

Item	Description
Application example	Refer to "Appendix 1. FB Library Application Examples".
Timing chart	
Relevant manuals	•MELSEC-L Dual Channel Isolated High Resolution Analog-Digital Converter Module User's Manual •MELSEC-L CPU User's Manual (Hardware Design, Maintenance and Inspection) •MELSEC-L CPU Module User's Manual (Data Logging Function) •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	Action
40 (Decimal)	The offset/gain value file saving processing timeout occurred because accesses to the SD memory card are frequently made in addition to this FB.	Reduce the frequency of the access processing to the SD memory card.

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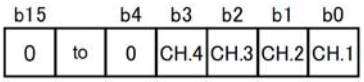
Labels

●Input labels

Name (Comment)	Label name	Data type	Setting range	Description
Execution command	FB_EN	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
Module start XY address	i_Start_IO_No	Word	Depends on the I/O point range of the CPU. For details, refer to the CPU user's manual.	Specify the starting XY address (in hexadecimal) where the L60AD4-2GH is connected. (For example, enter H10 for X10.)
Pass data classification	i_Dat_Type	Word	0 to Fh	Specify the type of the data to be stored for each channel. 0: Voltage, 1: Current 

●Output labels

Name (Comment)	Label name	Data type	Initial value	Description
Execution status	FB_ENO	Bit	OFF	ON: Execution command is ON. OFF: Execution command is OFF.
Completed without error	FB_OK	Bit	OFF	When ON, it indicates that the file save 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	2013/05/15	First edition

Note

This chapter includes information related to the function block.

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

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

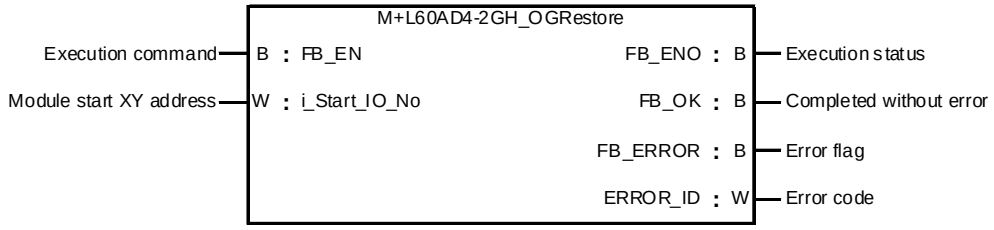
MELSOFT Library

2.16. M+L60AD4-2GH_OGRestore (Offset/gain value restore)

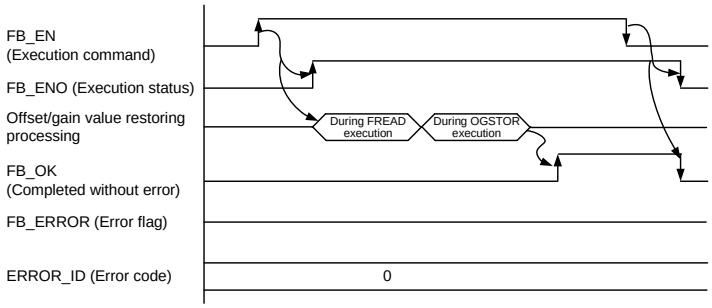
FB Name

M+L60AD4-2GH_OGRestore

Function Overview

<table>
<tr><th>Item</th><th colspan="2">Description</th></tr>
<tr><td>Function overview</td><td colspan="2">Restores the offset/gain setting values of the user range setting that saved in a file to the module.</td></tr>
<tr><td>Symbol</td><td colspan="2"> 
</td></tr>
<tr><td rowspan="3">Applicable hardware and software</td><td>Analog-digital converter module</td><td>L60AD4-2GH</td></tr>
<tr><td>CPU module</td><td><table><tr><th>Series</th><th>Model</th></tr><tr><td>MELSEC-L Series</td><td>LCPU</td></tr></table></td></tr>
<tr><td>Engineering software</td><td>GX Works2 *1<table><tr><th>Language</th><th>Software version</th></tr><tr><td>English version</td><td>Version1.24A or later</td></tr><tr><td>Chinese version</td><td>Version1.49B or later</td></tr></table>*1 For software versions applicable to the modules used, refer to "Relevant manuals".</td></tr>
<tr><td>Programming language</td><td colspan="2">Ladder</td></tr>
<tr><td>Number of steps</td><td colspan="2">534 steps (for MELSEC-L series CPU)
* The number of steps of the FB in a program depends on the CPU model that is used and input and output definition.</td></tr>
</table>

Item	Description
Function description	1) By turning ON FB_EN (Execution command), the offset/gain value in the SD memory card inserted in the CPU module is read and restored to the module. 2) FB operation is one-shot only, triggered by the FB_EN signal. 3) This FB operates only when the A/D conversion is set to "disabled" for all channels. 4) Execute this FB after executing M+L60AD4-2GH_OGBackup. When reading a file created other than by M+L60AD4-2GH_OGBackup, a Module error (Error code: 163) occurs. 5) The name of the file which this FB reads from the memory card is "LAD_" + "Module start XY address" + ".BIN". [File name example] When the module start XY address is H0120, the file name to be read is "LAD_0120.BIN". 6) When this FB is executed without the SD memory card installed to the CPU or when no target file containing the user range setting exist in the installed SD memory card, a CPU error *1 occurs. *1 Setting the operation status of the CPU module (RUN/STOP) when an access error to the SD memory card occurs is available with parameters.
Compiling method	Macro type

Item	Description
Restrictions and precautions	1) Set the A/D conversion to "disabled" for all channels before executing this FB. 2) The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation. 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 because it is impossible to turn OFF. 4) The FB cannot be used in an interrupt program. 5) This FB uses index register Z9. Please do not use the index register in an interrupt program. 6) This FB cannot restore the user range setting from a file created other than by M+L60AD4-2GH_OGBackup. 7) Every input must be provided with a value for proper FB operation. 8) When processes for accessing the SD memory card, such as the data logging function of the LCPU, are executed simultaneously, the time for completing this FB may extend or an error 40 (timeout) may occur. For details, refer to Section 13.2.4 Troubleshooting on the entire system during operation of the data logging function of MELSEC-L CPU Module User's Manual (Data Logging Function). 9) To operate the L60AD4-2GH, set the input range according to the device and system to be connected. Configure the setting in Switch Setting of GX Works2 according to the application. For details on how to use the intelligent function module switch setting, refer to GX Works2 Version1 Operating Manual (Common).
FB operation type	Pulsed execution (multiple scan execution type)
Application example	Refer to "Appendix 1. FB Library Application Examples".
Timing chart	
Relevant manuals	•MELSEC-L Dual Channel Isolated High Resolution Analog-Digital Converter Module User's Manual •MELSEC-L CPU User's Manual (Hardware Design, Maintenance and Inspection) •MELSEC-L CPU Module User's Manual (Data Logging Function) •GX Works2 Version 1 Operating Manual (Common) •GX Works2 Version 1 Operating Manual (Simple Project, Function Block)

MELSOFT Library

Error codes

●Error code list

Error code	Description	Action
40 (Decimal)	The offset/gain value reading processing timeout occurred because accesses to the SD memory card are frequently made in addition to this FB.	Reduce the frequency of the access processing to the SD memory card.
90 (Decimal)	A channel whose A/D conversion is set to "enabled" exists.	Please try again after confirming the setting.

Labels

●Input labels

Name (Comment)	Label name	Data type	Setting range	Description
Execution command	FB_EN	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
Module start XY address	i_Start_IO_No	Word	Depends on the I/O point range of the CPU. For details, refer to the CPU user's manual.	Specify the starting XY address (in hexadecimal) where the L60AD4-2GH is connected. (For example, enter H10 for X10.)

●Output labels

Name (Comment)	Label name	Data type	Initial value	Description
Execution status	FB_ENO	Bit	OFF	ON: Execution command is ON. OFF: Execution command is OFF.
Completed without error	FB_OK	Bit	OFF	When ON, it indicates that the file save 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	2013/05/15	First edition

Note

This chapter includes information related to the function block.

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

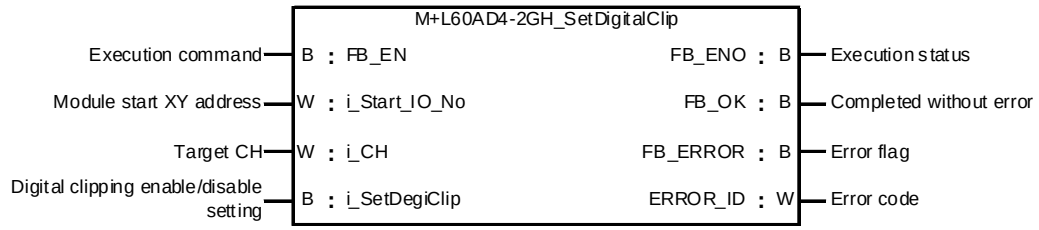
Please make sure to read user's manuals for the corresponding products before using the products.

2.17. M+L60AD4-2GH_SetDigitalClip (Digital clipping setting)

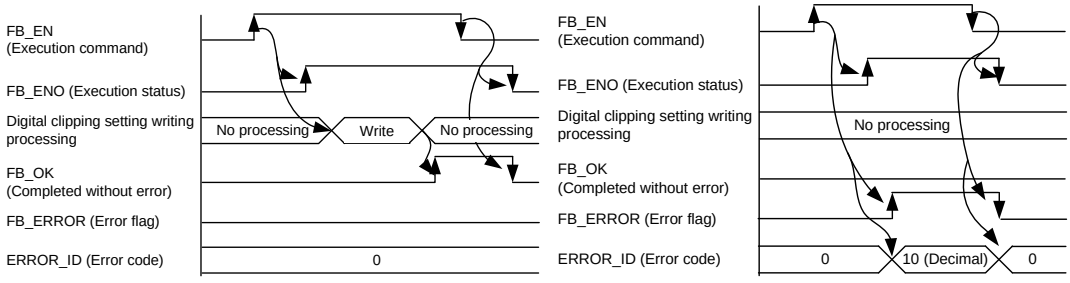
FB Name

M+L60AD4-2GH_SetDigitalClip

Function Overview

<table>
<tr><td>Item</td><td colspan="2">Description</td></tr>
<tr><td>Function overview</td><td colspan="2">Enables or disables the digital clipping for the specified channel.</td></tr>
<tr><td>Symbol</td><td colspan="2"> 
</td></tr>
<tr><td rowspan="3">Applicable hardware and software</td><td>Analog-digital converter module</td><td>L60AD4-2GH</td></tr>
<tr><td>CPU module</td><td><table><tr><th>Series</th><th>Model</th></tr><tr><td>MELSEC-L Series</td><td>LCPU</td></tr></table></td></tr>
<tr><td>Engineering software</td><td>GX Works2 *1<table><tr><th>Language</th><th>Software version</th></tr><tr><td>English version</td><td>Version1.24A or later</td></tr><tr><td>Chinese version</td><td>Version1.49B or later</td></tr></table>*1 For software versions applicable to the modules used, refer to "Relevant manuals".</td></tr>
<tr><td>Programming language</td><td colspan="2">Ladder</td></tr>
<tr><td>Number of steps</td><td colspan="2">321 steps (for MELSEC-L series CPU)
* The number of steps of the FB in a program depends on the CPU model that is used and input and output definition.</td></tr>
</table>

Item	Description
Function description	1) By turning ON FB_EN (Execution command), the digital clipping enable/disable setting for the specified channel is configured. 2) FB operation is one-shot only, triggered by the FB_EN signal. 3) The setting value is validated when the Operating condition setting request signal (Yn9) is turned OFF → ON → OFF or the Operating condition setting request FB (M+L60AD4-2GH_RequestSetting) is executed. 4) When the setting value of the target channel is out of range, the FB_ERROR output turns ON and processing is interrupted, and the error code is stored in ERROR_ID (Error code). Refer to the error code explanation section for details.
Compiling method	Macro type
Restrictions and precautions	1) The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation. 2) The FB cannot be used in an interrupt program. 3) Please ensure that the FB_EN signal is capable of being turned OFF by the program. Do not use this FB in programs that are only executed once such as a subroutine, FOR-NEXT loop because it is impossible to turn OFF. 4) This FB uses index registers Z7 to 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 setting the parameter by Intelligent Function Module of GX Works2, this FB is unnecessary. 7) To operate the L60AD4-2GH, set the input range according to the device and system to be connected. Configure the setting in Switch Setting of GX Works2 according to the application. For details on how to use the intelligent function module switch setting, refer to GX Works2 Version1 Operating Manual (Common).
FB operation type	Pulsed execution (1 scan execution type)
Application example	Refer to "Appendix 1. FB Library Application Examples".
Timing chart	[When operation completes without error] [When an error occurs]



MELSOFT Library

Item	Description
Relevant manuals	•MELSEC-L Dual Channel Isolated High Resolution Analog-Digital Converter Module User's Manual •MELSEC-L CPU 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	Action
10 (Decimal)	The specified channel is not valid. The target channel is not within the range of 1 to 4.	Please try again after confirming the setting.

Labels

●Input labels

Name (Comment)	Label name	Data type	Setting range	Description
Execution command	FB_EN	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
Module start XY address	i_Start_IO_No	Word	Depends on the I/O point range of the CPU. For details, refer to the CPU user's manual.	Specify the starting XY address (in hexadecimal) where the L60AD4-2GH is connected. (For example, enter H10 for X10.)
Target CH	i_CH	Word	1 to 4	Specify the channel number.
Digital clipping enable/disable setting	i_SetDegiClip	Bit	ON, OFF	ON: Enabled OFF: Disabled

●Output labels

Name (Comment)	Label name	Data type	Initial value	Description
Execution status	FB_ENO	Bit	OFF	ON: Execution command is ON. OFF: Execution command is OFF.
Completed without error	FB_OK	Bit	OFF	When ON, it indicates that the digital clipping 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	2013/05/15	First edition

Note

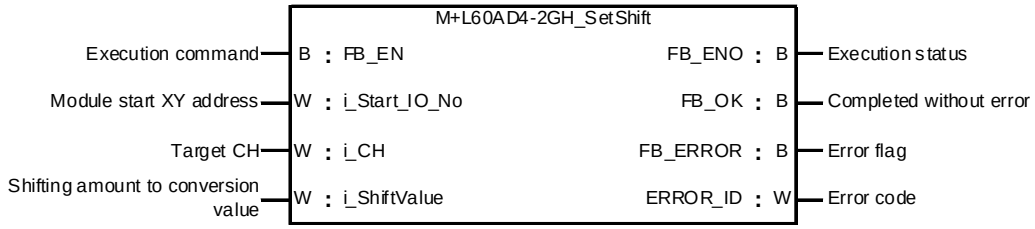
This chapter includes information related to the function block.
It does not include information on restrictions of use such as combination with modules or programmable controller CPUs.
Please make sure to read user's manuals for the corresponding products before using the products.

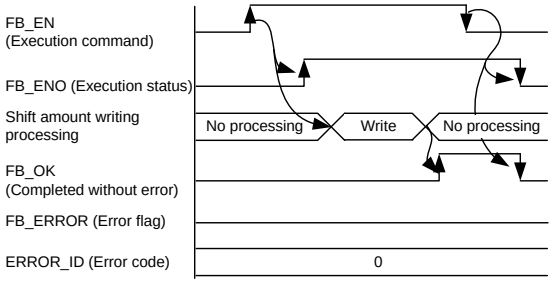
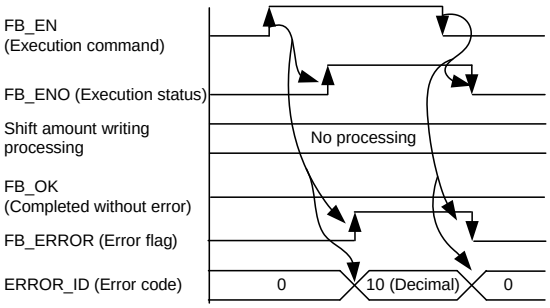
2.18. M+L60AD4-2GH_SetShift (Shift setting)

FB Name

M+L60AD4-2GH_SetShift

Function Overview

<table>
<tr><th>Item</th><th colspan="2">Description</th></tr>
<tr><td>Function overview</td><td colspan="2">Sets the shift function of the specified channel.</td></tr>
<tr><td>Symbol</td><td colspan="2"> 
</td></tr>
<tr><td rowspan="3">Applicable hardware and software</td><td>Analog-digital converter module</td><td>L60AD4-2GH</td></tr>
<tr><td>CPU module</td><td><table><tr><th>Series</th><th>Model</th></tr><tr><td>MELSEC-L Series</td><td>LCPU</td></tr></table></td></tr>
<tr><td>Engineering software</td><td>GX Works2 *1<table><tr><th>Language</th><th>Software version</th></tr><tr><td>English version</td><td>Version1.24A or later</td></tr><tr><td>Chinese version</td><td>Version1.49B or later</td></tr></table>*1 For software versions applicable to the modules used, refer to "Relevant manuals".</td></tr>
<tr><td>Programming language</td><td colspan="2">Ladder</td></tr>
<tr><td>Number of steps</td><td colspan="2">289 steps (for MELSEC-L series CPU)
* The number of steps of the FB in a program depends on the CPU model that is used and input and output definition.</td></tr>
<tr><td>Function description</td><td colspan="2">1) By turning ON FB_EN (Execution command), the shift setting of the specified channel is configured.
2) FB operation is one-shot only, triggered by the FB_EN signal.
3) When the setting value of the target channel is out of range, the FB_ERROR output turns ON and processing is interrupted, and the error code is stored in ERROR_ID (Error code).
Refer to the error code explanation section for details.</td></tr>
</table>

Item	Description
Compiling method	Macro type
Restrictions and precautions	1) The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation. 2) The FB cannot be used in an interrupt program. 3) Please ensure that the FB_EN signal is capable of being turned OFF by the program. Do not use this FB in programs that are only executed once such as a subroutine, FOR-NEXT loop 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 to 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 parameter is set using the configuration function of GX Works2, this FB is unnecessary. 8) To operate the L60AD4-2GH, set the input range according to the device and system to be connected. Configure the setting in Switch Setting of GX Works2 according to the application. For details on how to use the intelligent function module switch setting, refer to GX Works2 Version1 Operating Manual (Common).
FB operation type	Pulsed execution (1 scan execution type)
Application example	Refer to "Appendix 1. FB Library Application Examples".
Timing chart	[When operation completes without error]  [When an error occurs] 
Relevant manuals	•MELSEC-L Dual Channel Isolated High Resolution Analog-Digital Converter Module User's Manual •MELSEC-L CPU 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)

MELSOFT Library

Error codes

●Error code list

Error code	Description	Action
10 (Decimal)	The specified channel is not valid. The target channel is not within the range of 1 to 4.	Please try again after confirming the setting.

Labels

●Input labels

Name (Comment)	Label name	Data type	Setting range	Description
Execution command	FB_EN	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
Module start XY address	i_Start_IO_No	Word	Depends on the I/O point range of the CPU. For details, refer to the CPU user's manual.	Specify the starting XY address (in hexadecimal) where the L60AD4-2GH is connected. (For example, enter H10 for X10.)
Target CH	i_CH	Word	1 to 4	Specify the channel number.
Shifting amount to conversion value	i_ShiftValue	Word	-32,768 to 32,767	Specify the shift amount.

●Output labels

Name (Comment)	Label name	Data type	Initial value	Description
Execution status	FB_ENO	Bit	OFF	ON: Execution command is ON. OFF: Execution command is OFF.
Completed without error	FB_OK	Bit	OFF	When ON, it indicates that the shift 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	2013/05/15	First edition

Note

This chapter includes information related to the function block.

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

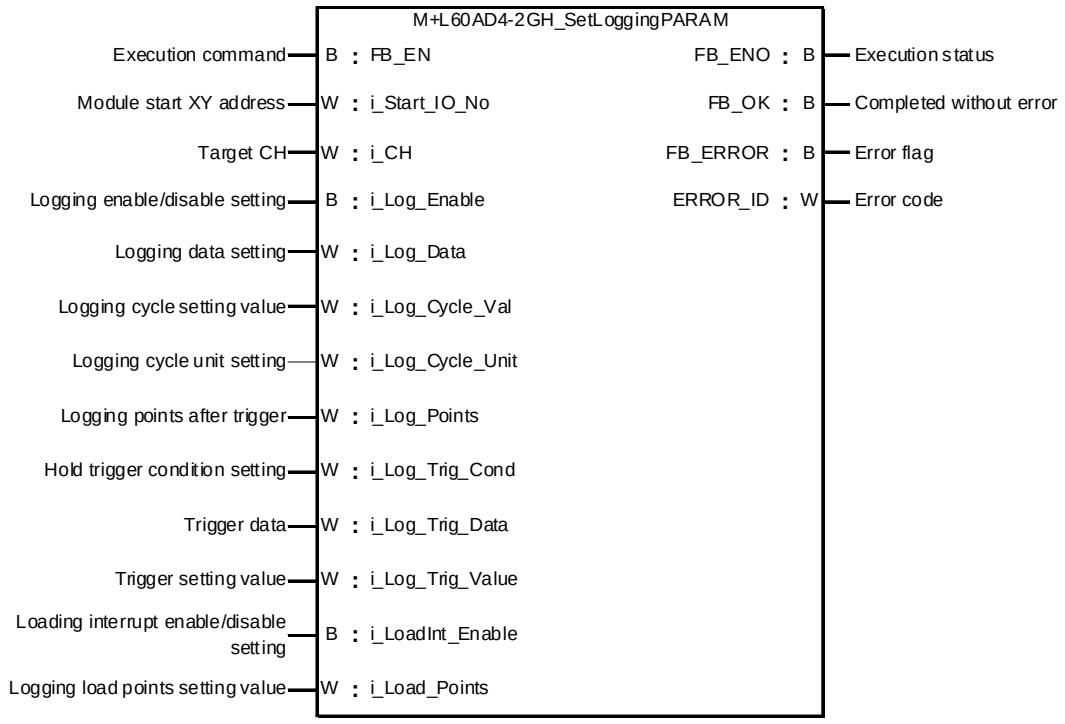
Please make sure to read user's manuals for the corresponding products before using the products.

2.19. M+L60AD4-2GH_SetLoggingPARAM (Logging function parameter setting)

FB Name

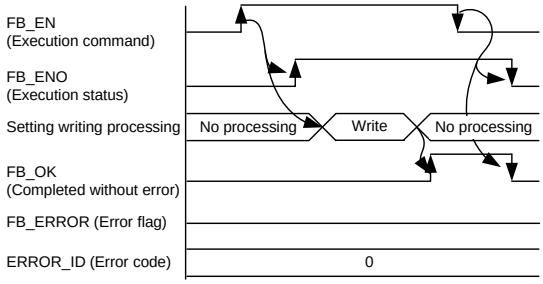
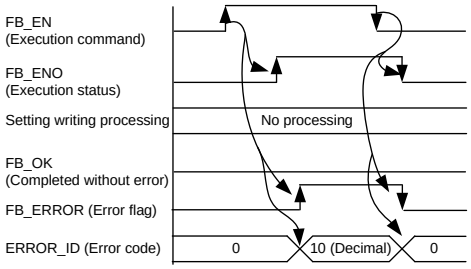
M+L60AD4-2GH_SetLoggingPARAM

Function Overview

<table>
<tr><th>Item</th><th colspan="2">Description</th></tr>
<tr><td>Function overview</td><td colspan="2">Sets the logging function of the specified channel.</td></tr>
<tr><td>Symbol</td><td colspan="2"> 
</td></tr>
<tr><td rowspan="3">Applicable hardware and software</td><td>Analog-digital converter module</td><td>L60AD4-2GH</td></tr>
<tr><td>CPU module</td><td><table><tr><th>Series</th><th>Model</th></tr><tr><td>MELSEC-L Series</td><td>LCPU</td></tr></table></td></tr>
<tr><td>Engineering software</td><td>GX Works2 *1<table><tr><th>Language</th><th>Software version</th></tr><tr><td>English version</td><td>Version1.24A or later</td></tr><tr><td>Chinese version</td><td>Version1.49B or later</td></tr></table>*1 For software versions applicable to the modules used, refer to "Relevant manuals".</td></tr>
</table>

MELSOFT Library

Item	Description
Programming language	Ladder
Number of steps (maximum)	374 steps (for MELSEC-L series 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), the logging function setting of the specified channel is configured. 2) FB operation is one-shot only, triggered by the FB_EN signal. 3) The setting value is validated when the Operating condition setting request signal (Yn9) is turned OFF → ON → OFF or the Operating condition setting request FB (M+L60AD4-2GH_RequestSetting) is executed. 4) When the setting value of the target channel is out of range, the FB_ERROR output turns ON and processing is interrupted, and the error code is stored in ERROR_ID (Error code). Refer to the error code explanation section for details.
Compiling method	Macro type
Restrictions and precautions	1) The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation. 2) The FB cannot be used in an interrupt program. 3) Please ensure that the FB_EN signal is capable of being turned OFF by the program. Do not use this FB in programs that are only executed once such as a subroutine, FOR-NEXT loop 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 to 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 parameter is set using the configuration function of GX Works2, this FB is unnecessary. 8) To operate the L60AD4-2GH, set the input range according to the device and system to be connected. Configure the setting in Switch Setting of GX Works2 according to the application. For details on how to use the intelligent function module switch setting, refer to GX Works2 Version1 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] 
Relevant manuals	•MELSEC-L Dual Channel Isolated High Resolution Analog-Digital Converter Module User's Manual •MELSEC-L CPU 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	Action
10 (Decimal)	The specified channel is not valid. The target channel is not within the range of 1 to 4.	Please try again after confirming the setting.

Labels

●Input labels

Name (Comment)	Label name	Data type	Setting range	Description
Execution command	FB_EN	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
Module start XY address	i_Start_IO_No	Word	Depends on the I/O point range of the CPU. For details, refer to the CPU user's manual.	Specify the starting XY address (in hexadecimal) where the L60AD4-2GH is connected. (For example, enter H10 for X10.)
Target CH	i_CH	Word	1 to 4	Specify the channel number.
Logging enable/disable setting	i_Log_Enable	Bit	ON, OFF	ON: Logging function enabled OFF: Logging function disabled
Logging data setting	i_Log_Data	Word	0, 1	Set the logging target data. 0: Digital output value 1: Digital operation value

Name (Comment)	Label name	Data type	Setting range	Description
Logging cycle setting value	i_Log_Cycle_Val	Word	1) Logging cycle unit setting = 0: 40 to 32,767 2) Logging cycle unit setting = 1: 1 to 32,767 3) Logging cycle unit setting = 2: 1 to 3,600	Set the cycle for storing data.
Logging cycle unit setting	i_Log_Cycle_Unit	Word	0: µs 1: ms 2: s	Set the cycle unit for storing data.
Logging points after trigger	i_Log_Points	Word	1 to 10,000	Set the data points to be collected after the hold trigger is detected.
Hold trigger condition setting	i_Log_Trig_Cond	Word	0: Logging hold request 1: Level trigger (Above) 2: Level trigger (Below) 3: Level trigger (Pass Through) 4: External trigger	Set the hold trigger condition.
Trigger data	i_Log_Trig_Data	Word	0 to 4,999	Set the buffer memory address to be monitored by the level trigger.
Trigger setting value	i_Log_Trig_Value	Word	-32,768 to 32,767	Set a level at which a level trigger is generated.
Loading interrupt enable/disable setting	i_LoadInt_Enable	Bit	ON, OFF	ON: Load interrupt enabled OFF: Load interrupt disabled
Logging load points setting value	i_Load_Points	Word	Depends on the conversion speed setting. The detailed range is shown on the right.	A logging load pointer detection interrupt occurs every logging for set points. High and medium speed: 10 to 10,000 Low speed: 1 to 10,000

●Output labels

Name (Comment)	Label name	Data type	Initial value	Description
Execution status	FB_ENO	Bit	OFF	ON: Execution command is ON. OFF: Execution command is OFF.
Completed without error	FB_OK	Bit	OFF	When ON, it indicates that the logging function parameter 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	2013/05/15	First edition

Note

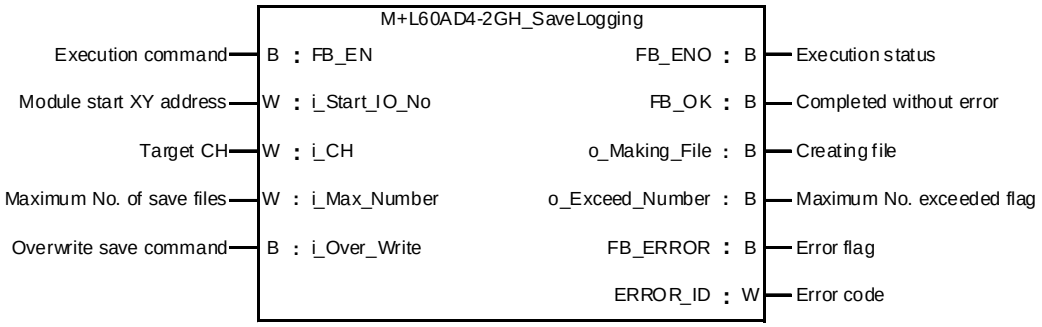
This chapter includes information related to the function block.
It does not include information on restrictions of use such as combination with modules or programmable controller CPUs.
Please make sure to read user's manuals for the corresponding products before using the products.

2.20. M+L60AD4-2GH_SaveLogging (Logging data save)

FB Name

M+L60AD4-2GH_SaveLogging

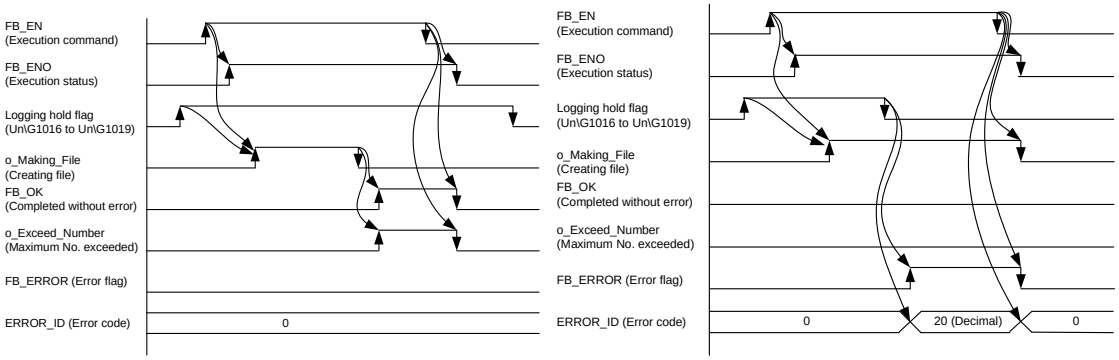
Function Overview

<table>
<tr><td>Item</td><td colspan="2">Description</td></tr>
<tr><td>Function overview</td><td colspan="2">Saves the logging data of the specified channel to a file.</td></tr>
<tr><td>Symbol</td><td colspan="2"> 
</td></tr>
<tr><td rowspan="3">Applicable hardware and software</td><td>Analog-digital converter module</td><td>L60AD4-2GH</td></tr>
<tr><td>CPU module</td><td><table><tr><th>Series</th><th>Model</th></tr><tr><td>MELSEC-L Series</td><td>LCPU</td></tr></table></td></tr>
<tr><td>Engineering software</td><td>GX Works2 *1<table><tr><th>Language</th><th>Software version</th></tr><tr><td>English version</td><td>Version1.24A or later</td></tr><tr><td>Chinese version</td><td>Version1.49B or later</td></tr></table>*1 For software versions applicable to the modules used, refer to "Relevant manuals".</td></tr>
<tr><td>Programming language</td><td colspan="2">Ladder</td></tr>
<tr><td>Number of steps (maximum)</td><td colspan="2">1,782 steps (for MELSEC-L series CPU)
* The number of steps of the FB in a program depends on the CPU model that is used and input and output definition.</td></tr>
</table>

Item	Description
Function description	1) By turning ON FB_EN (Execution command) and the logging hold flag, the logging data is sorted chronologically from the head pointer. Then, the logging data and the trigger occurrence information are saved in CSV format in the SD memory card mounted on the CPU. 2) When FB_EN is ON, the FB starts the save processing of the logging data each time the logging hold flag is turned ON. 3) It requires multiple scans to complete the save processing of the logging data. To check whether it is completed, check FB_OK (Completed without error). 4) The format for the file name that the FB saves in an SD memory card is "AD" + "second and third digits of the module starting XY address that is expressed in 4 digits" + "Target channel" + "serial number" +".CSV". The maximum serial number depends on i_Max_Number (Maximum No. of save files). If FB_EN is turned OFF, the serial number is reset and the serial number starts from 1 again. [File name example] The file name is "AD453006.CSV" in the following case. The module start XY address is H0450, the target channel is 3, i_Max_Number (Maximum No. of save files) is 30, and the number of files this FB created is 6. 5) When a file with the same name exists in the SD memory card, the existing file is replaced with a new CSV file created by this FB. 6) If i_Over_Write (Overwrite save command) is turned ON and the number of files the FB saved in the SD memory card has exceeded i_Max_Number, the serial number returns to 1 and the FB continues to perform the save processing of the logging data. 7) If i_Over_Write is turned OFF and the number of files saved in the SD memory card has reached i_Max_Number, the FB stops the save processing of the logging data. 8) If the number of files the FB saved in the SD memory card has reached i_Max_Number, o_Exceed_Number (Maximum No. exceeded flag) is turned ON regardless of whether i_Over_Write is ON or OFF. 9) If there is an incorrect input in i_CH (Target CH) or i_Max_Number, FB_ERROR (Error flag) is turned ON and the FB processing is aborted. Then an error code is stored in ERROR_ID (Error code). 10) When this FB is executed without the SD memory card installed to the CPU, when the installed SD memory card does not have enough capacity, or when the number of files to be created exceeds the number of storable files *1, a CPU error *2 occurs. When an error causes a stop error in the CPU module, FB_ERROR or ERROR_ID is not updated. When an error causes a continuation error in the CPU module, FB_ERROR is

Item	Description
	turned ON, the processing is interrupted, and an error code is stored in ERROR_ID. 11) For information on the format of the CSV file the FB creates, refer to MELSEC-L Analog-Digital Converter Module User's Manual. *1 For information on the size of SD memory card and the number of files that can be saved, refer to LCPU User's Manual (Hardware Design, Maintenance and Inspection). *2 Setting the operation status of the CPU module (RUN/STOP) when an access error to the SD memory card occurs is available with parameters.
Compiling method	Macro type

Item	Description
Restrictions and precautions	1) The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation. 2) The FB cannot be used in an interrupt program. 3) Please ensure that the FB_EN signal is capable of being turned OFF by the program. Do not use this FB in programs that are only executed once such as a subroutine, FOR-NEXT loop because it is impossible to turn OFF. 4) This FB uses index registers Z6 to Z9. Please do not use these index registers in an interrupt program. 5) In this FB, the logging data can be saved only in the SD memory card. 6) This FB uses the SP.FWRITE command. Thus, when an execution error of the SP.FWRITE command occurs, a CPU error occurs. 7) When two or more of these FBs are used, implement an interlock to prevent them from being executed simultaneously. [Interlock example] When the target channels are set to channels 1 and 2 and their logging data are saved, confirm that FB_OK for channel 1 is turned ON before turning ON FB_EN for channel 2. 8) When SM606 (SD memory card forced disable instruction) is turned ON while the logging data is being saved, the logging data cannot be saved. In this case, FB_ERROR is turned ON and an error code is stored in ERROR_ID. 9) Every input must be provided with a value for proper FB operation. 10) Pay attention to the size of the SD memory card and the number of files that can be saved when determining i_Max_Number (Maximum No. of save files). If the size of the SD memory card or the number of files that can be saved is exceeded when this FB is executed, a CPU error occurs. For information on the size of SD memory card and the number of files that can be saved, refer to LCPU User's Manual (Hardware Design, Maintenance and Inspection). 11) When processes for accessing the SD memory card, such as the data logging function of the LCPU, are executed simultaneously, the time for completing this FB may extend or an error 40 (timeout) may occur. For details, refer to Section 13.2.4 Troubleshooting on the entire system during operation of the data logging function of MELSEC-L CPU Module User's Manual (Data Logging Function). 12) To operate the L60AD4-2GH, set the input range according to the device and system to be connected. Configure the setting in Switch Setting of GX Works2 according to the application. For details on how to use the intelligent function module switch setting, refer to GX Works2 Version1 Operating Manual (Common).

Item	Description
FB operation type	Pulsed execution (multiple scan execution type)
Application example	Refer to "Appendix 1. FB Library Application Examples".
Timing chart	[When operation completes without error] [When an error occurs] 
Relevant manuals	•MELSEC-L Dual Channel Isolated High Resolution Analog-Digital Converter Module User's Manual •MELSEC-L CPU User's Manual (Hardware Design, Maintenance and Inspection) •MELSEC-L CPU Module User's Manual (Data Logging Function) •GX Works2 Version 1 Operating Manual (Common) •GX Works2 Version 1 Operating Manual (Simple Project, Function Block)

MELSOFT Library

Error codes

●Error code list

Error code	Description	Action
10 (Decimal)	The specified channel is not valid. The target channel is not within the range of 1 to 4.	Please try again after confirming the setting.
11 (Decimal)	The maximum number of save files is not valid. The maximum number of save files is not within the range of 1 to 999.	Please try again after confirming the setting.
20 (Decimal)	The processing is aborted because the logging hold flag is turned OFF while the logging data is being saved. An incomplete CSV file is saved in the SD memory card.	Please try again after confirming the setting so that the logging hold flag is not turned OFF while the logging data is being saved.
21 (Decimal)	SM606 (SD memory card forced disable instruction) is ON, and the accessing to the SD memory card is unavailable. If SM606 (SD memory card forced disable instruction) is turned ON while the logging data is being saved, an incomplete CSV file is saved in the SD memory card.	Execute this FB again after turning OFF SM606 to confirm that SM607 (SD memory card use force stop condition flag) is OFF.
40 (Decimal)	The logging data saving processing timeout occurred because accesses to the SD memory card are frequently made in addition to this FB.	Reduce the frequency of the access processing to the SD memory card.
Error codes other than above	-	For details on the error codes for errors occurring, refer to Appendix 1 Error Code List in the MELSEC-L CPU Module User's Manual (Hardware Design, Maintenance and Inspection).

Labels

●Input labels

Name (Comment)	Label name	Data type	Setting range	Description
Execution command	FB_EN	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
Module start XY address	i_Start_IO_No	Word	Depends on the I/O point range of the CPU. For details, refer to the CPU user's manual.	Specify the starting XY address (in hexadecimal) where the L60AD4-2GH is connected. (For example, enter H10 for X10.)
Target CH	i_CH	Word	1 to 4	Specify the channel number.
Maximum No. of save files	i_Max_Number	Word	1 to 999	Specify the maximum number of CSV files the FB saves.
Overwrite save command	i_Over_Write	Bit	ON, OFF	Set whether to overwrite a CSV file with the youngest serial number when the number of CSV files saved by this FB exceeds the maximum number of save files. (When OFF, the save processing of logging data stops.)

●Output labels

Name (Comment)	Label name	Data type	Initial value	Description
Execution status	FB_ENO	Bit	OFF	ON: Execution command is ON. OFF: Execution command is OFF.
Completed without error	FB_OK	Bit	OFF	When ON, it indicates that the file save is completed. Turned OFF when the logging resumes.
Creating file	o_Making_File	Bit	OFF	When ON, it indicates that a file is being created.
Maximum No. exceeded flag	o_Exceed_Number	Bit	OFF	When ON, it indicates that the number of CSV files saved by this FB has reached the maximum number of save files.
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	2013/05/15	First edition

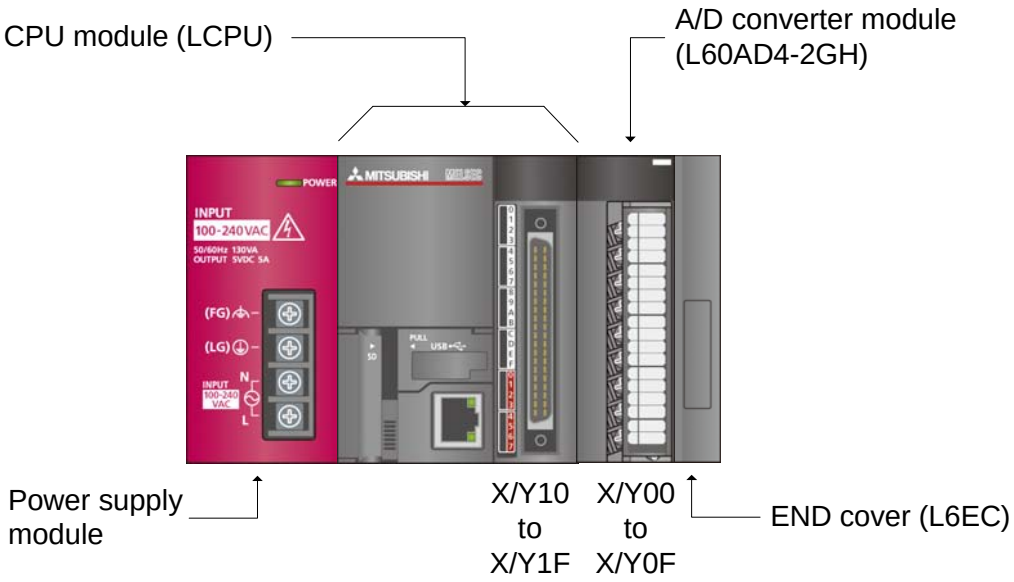
Note

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

Appendix 1. FB Library Application Examples

L60AD4-2GH 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

a) External input (commands)

Device	FB function name	Application (ON details)
M0	Read A/D conversion data	A/D value reading request
M10	Read A/D conversion data (all CHs)	A/D value reading all CHs req.
M20	Read digital operation value	Digital operation value read req
M30	Read digital operation value (all CHs)	Digital value read req all CHs
M40	A/D conversion enable/disable setting	A/D conv enable/disable set req.
M41		A/D conv enable: ON/disable: OFF
M50	Averaging processing setting	Averaging proc setting request
M60	Scaling setting	Scaling setting request
M61		Scaling enable:ON/disable:OFF
M70	Process alarm setting	Process alarm setting request
M71		Process alarm enab:ON/disab:OFF
M80	Rate alarm setting	Rate alarm setting request
M81		Rate alarm enable:ON/disable:OFF
M90	Input signal error detection setting	Input signal error setting req.
M100	Operating condition setting request	Operating condition setting req.
M110	Offset setting	Offset setting request
M111		Offset value writing request
M120	Gain setting	Gain setting request
M121		Gain value writing request
M130	Error operation	Error operation request
M131		Error reset request
M140	Offset/gain value save	Offset/gain save to file req.
M150	Offset/gain value restore	Offset/gain restore request
M160	Digital clipping setting	Digital clipping setting request
M161		Digital clip enabl:ON/disabl:OFF
M170	Shift setting	Shift setting request
M180	Logging function parameter setting	Logging fnc param setting req.
M181		Logging func enabl:ON/disabl:OFF
M182		Read interpt enabl:ON/disabl:OFF
M190	Logging data save	Logging data save request
M191		Log file ovr enabl:ON/disabl:OFF

b) External output (checks)

Device	FB function name	Application (ON details)
M1	Read A/D conversion data	A/D value reading FB ready
M2		A/D value reading completed
F0		A/D value reading FB error
D0		A/D conversion data
D1		A/D value reading FB error code
M11	Read A/D conversion data (all CHs)	A/D value reading FB all ready
M12		A/D value reading completion all
D10		CH1 A/D conversion data
D11		CH2 A/D conversion data
D12		CH3 A/D conversion data
D13		CH4 A/D conversion data
M21	Read digital operation value	Digitl operation val read FB rdy
M22		Digital operation val read comp.
F5		Digitl operation val read FB err
D20		Digital operation value
D21		Digital val read FB error code
M31	Read digital operation value (all CHs)	Digital value read FB all ready
M32		Digital value read complete all
D30		CH1 Digital operation value
D31		CH2 Digital operation value
D32		CH3 Digital operation value
D33		CH4 Digital operation value
M42	A/D conversion enable/disable setting	A/D conv enable/disable FB ready
M43		A/D conv enable/disable set comp
F10		A/D conv enable/disable FB error
D40		A/D enable/disable FB error code
M51	Averaging processing setting	Averaging proc setting FB ready
M52		Averaging proc setting complete
F15		Averaging proc setting FB error
D50		Averaging proc set FB error code
M62	Scaling setting	Scaling setting FB ready
M63		Scaling setting complete
F20		Scaling setting FB error
D60		Scaling setting FB error code

Device	FB function name	Application (ON details)
M72	Process alarm setting	Process alarm setting FB ready
M73		Process alarm setting complete
F25		Process alarm setting FB error
D70		Process alarm set FB error code
M82	Rate alarm setting	Rate alarm setting FB ready
M83		Rate alarm setting complete
F30		Rate alarm setting FB error
D80		Rate alarm setting FB error code
M91	Input signal error detection setting	Input signal error setting ready
M92		Input signal error setting comp.
F35		Input signal err setting FB err
D90		Input signal err set FB err code
M101	Operating condition setting request	Operating condition setting rdy.
M102		Operating condition setting comp
M112	Offset setting	Offset setting FB ready
M113		Offset setting complete
F40		Offset setting FB error
D110		Offset setting FB error code
M122	Gain setting	Gain setting FB ready
M123		Gain setting complete
F45		Gain setting FB error
D120		Gain setting FB error code
M132	Error operation	Error operation FB ready
M133		Error operation complete
M134		Module error flag
D130		Module error code
M141	Offset/gain value save	Offset/gain save to file FB rdy.
M142		Offset/gain save to file comp.
F50		Offset/gain save file FB error
D140		Offset/gain save file FB err cod
M151	Offset/gain value restore	Offset/gain restore FB ready
M152		Offset/gain restore complete
F55		Offset/gain value restore FB err
D150		Offset/gain restore FB err code

Device	FB function name	Application (ON details)
M162	Digital clipping setting	Digital clipping setting FB rdy.
M163		Digital clipping set complete
F60		Digital clipping setting FB err
D160		Digital clip setting FB err code
M171	Shift setting	Shift setting FB ready
M172		Shift setting complete
F65		Shift setting FB error
D170		Shift setting FB error code
M183	Logging function parameter setting	Logging func param set FB ready
M184		Logging fnc param set complete
F70		Logging fnc param setting FB err
D180		Log fnc param set FB err code
M192	Logging data save	Logging data save FB ready
M193		Logging data save complete
M194		Logging data saving
M195		Logging file max No. reached
F75		Logging data save FB error
D190		Logging data save FB error code

3) Global label setting

None

4) Application example settings

a) Common setting

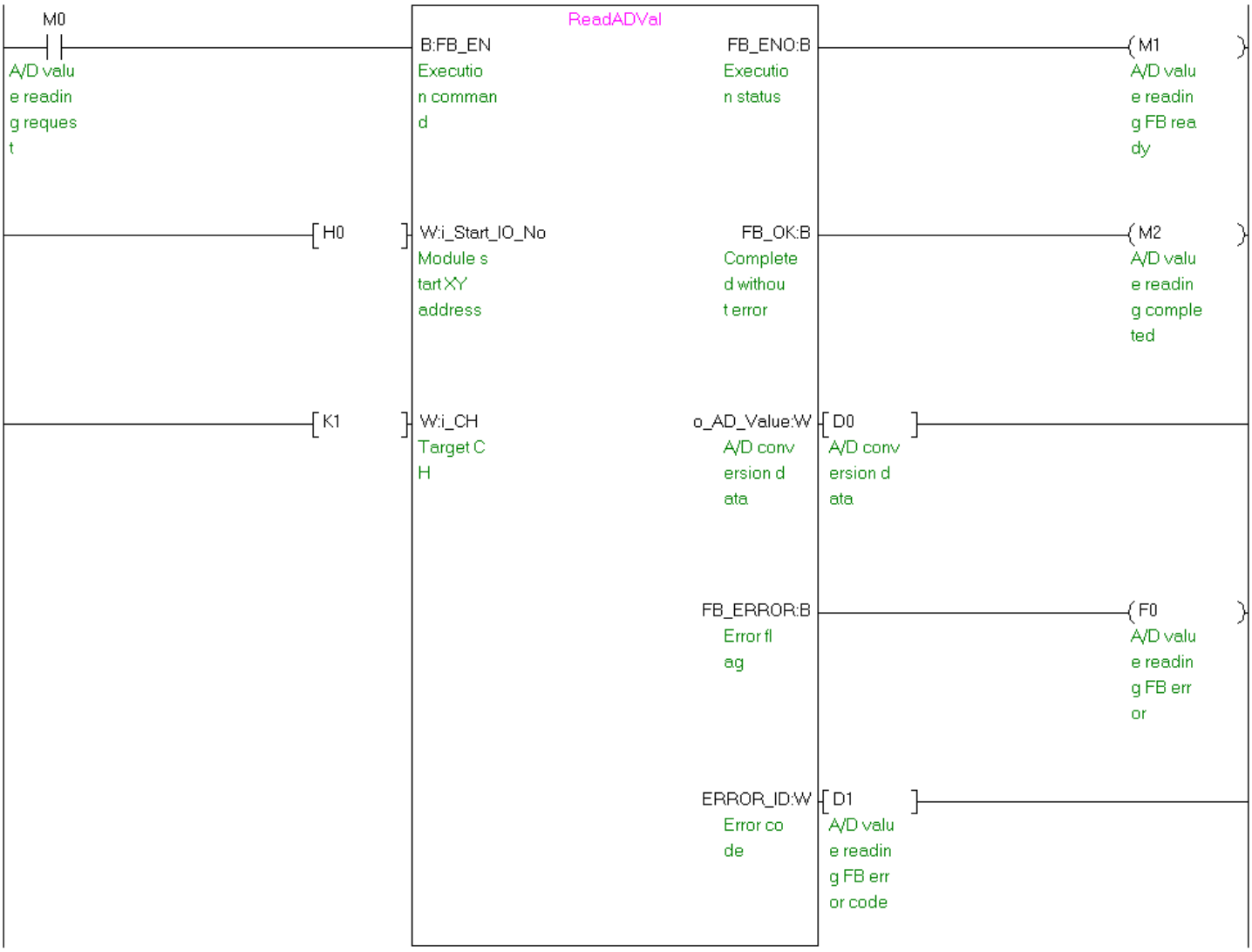
Input and output item	Value	Description
Module start XY address	0	Specify the starting XY address where the L60AD4-2GH is connected.

5) Programs

M+L60AD4-2GH_ReadADVal (Read A/D conversion data)

Label name	Setting value	Description
i_Start_IO_No	H0	Set the starting XY address where the L60AD4-2GH is connected to 0H.
i_CH	K1	Set the target channel to channel 1.

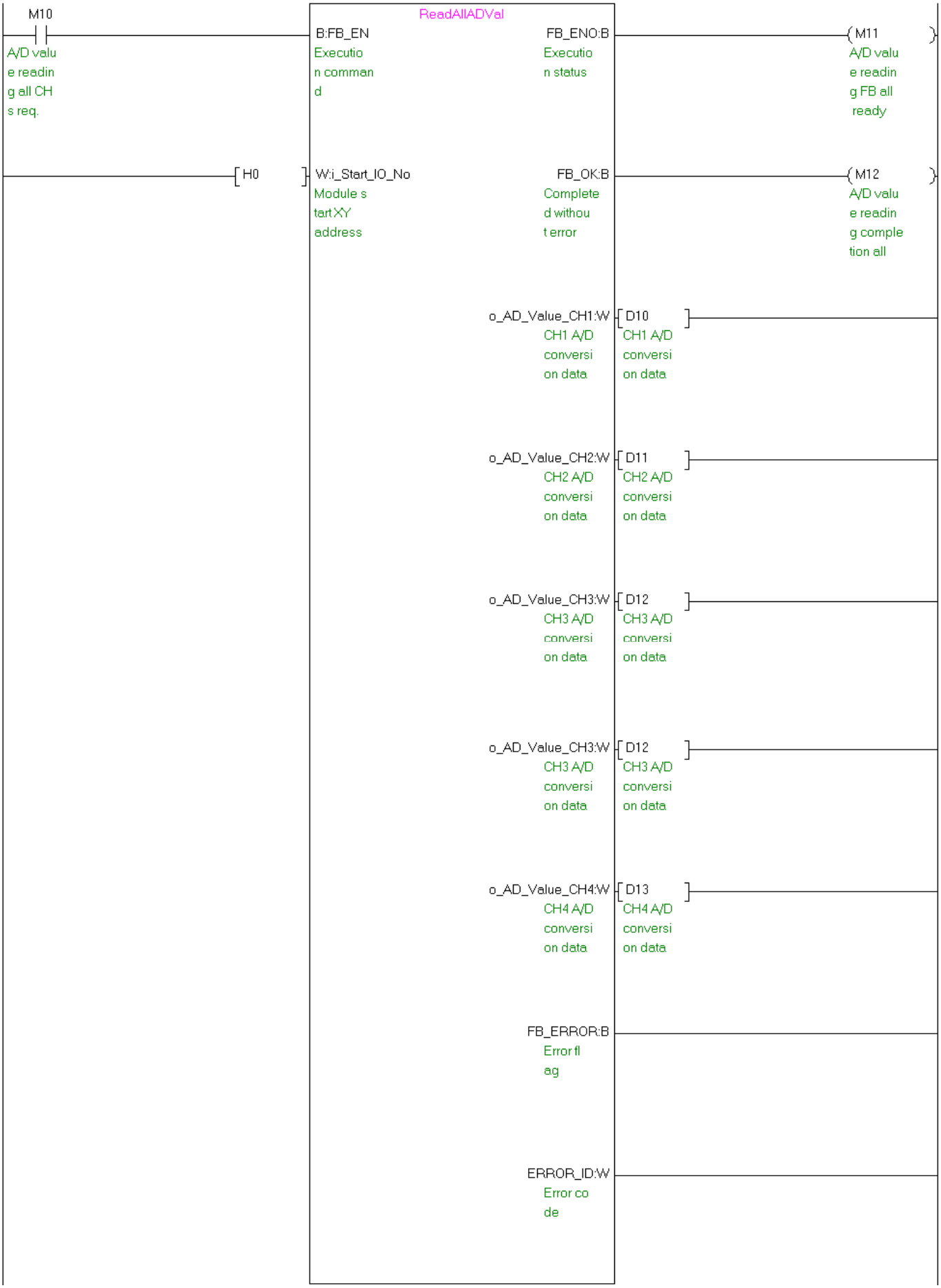
By turning ON M0, the A/D conversion data of channel 1 is read.



M+L60AD4-2GH_ReadAllADVal (Read A/D conversion data (all CHs))

Label name	Setting value	Description
i_Start_IO_No	H0	Set the starting XY address where the L60AD4-2GH is connected to 0H.

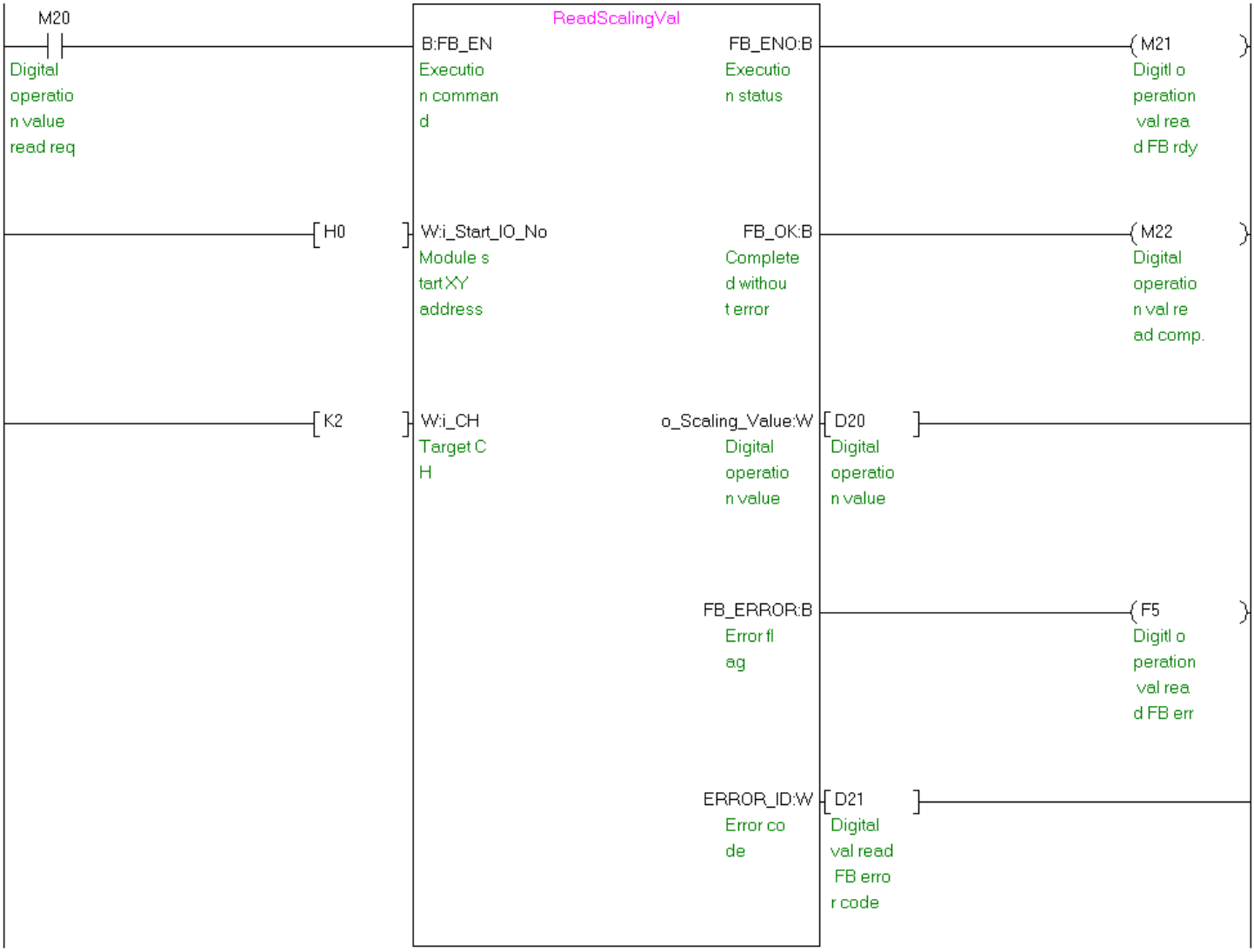
By turning ON M10, the A/D conversion data of all channels are read.


M10
A/D valu
e readin
g all CH
s req.
ReadAllADVal
B:FB_EN
Executio
n comman
d
FB_ENO:B
Executio
n status
M11
A/D valu
e readin
g FB all
ready
H0
W:i_Start_IO_No
Module s
tart XY
address
FB_OK:B
Complete
d withou
t error
M12
A/D valu
e readin
g comple
tion all
o_AD_Value_CH1:W
CH1 A/D
conversi
on data
D10
CH1 A/D
conversi
on data
o_AD_Value_CH2:W
CH2 A/D
conversi
on data
D11
CH2 A/D
conversi
on data
o_AD_Value_CH3:W
CH3 A/D
conversi
on data
D12
CH3 A/D
conversi
on data
o_AD_Value_CH3:W
CH3 A/D
conversi
on data
D12
CH3 A/D
conversi
on data
o_AD_Value_CH4:W
CH4 A/D
conversi
on data
D13
CH4 A/D
conversi
on data
FB_ERROR:B
Error fl
ag
ERROR_ID:W
Error co
de

M+L60AD4-2GH_ReadScalingVal (Read digital operation value)

Label name	Setting value	Description
i_Start_IO_No	H0	Set the starting XY address where the L60AD4-2GH is connected to 0H.
i_CH	K2	Set the target channel to channel 2.

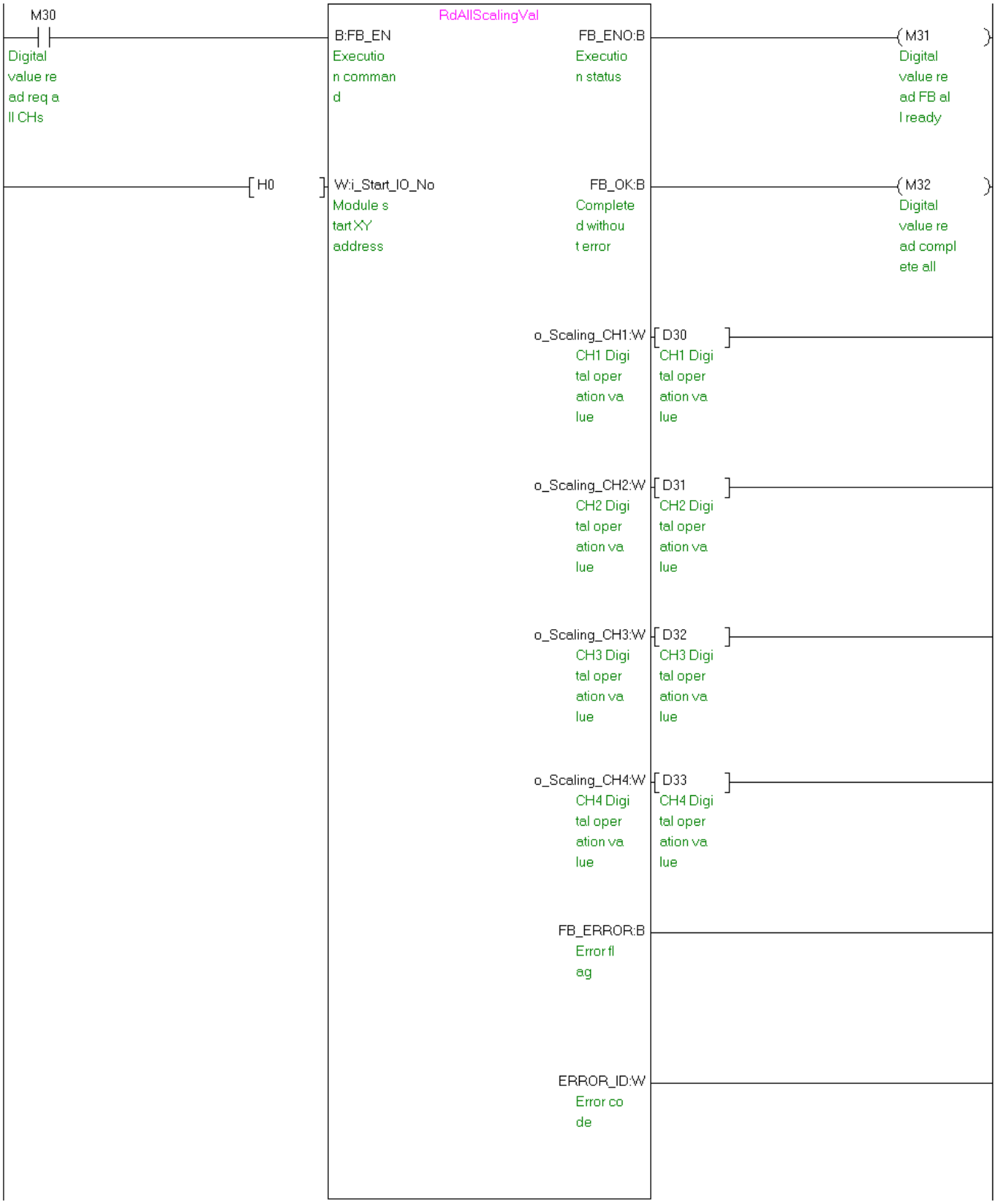
By turning ON M20, the digital operation value of channel 2 is read.



M+L60AD4-2GH_ReadAllScalingVal (Read digital operation value (all CHs))

Label name	Setting value	Description
i_Start_IO_No	H0	Set the starting XY address where the L60AD4-2GH is connected to 0H.

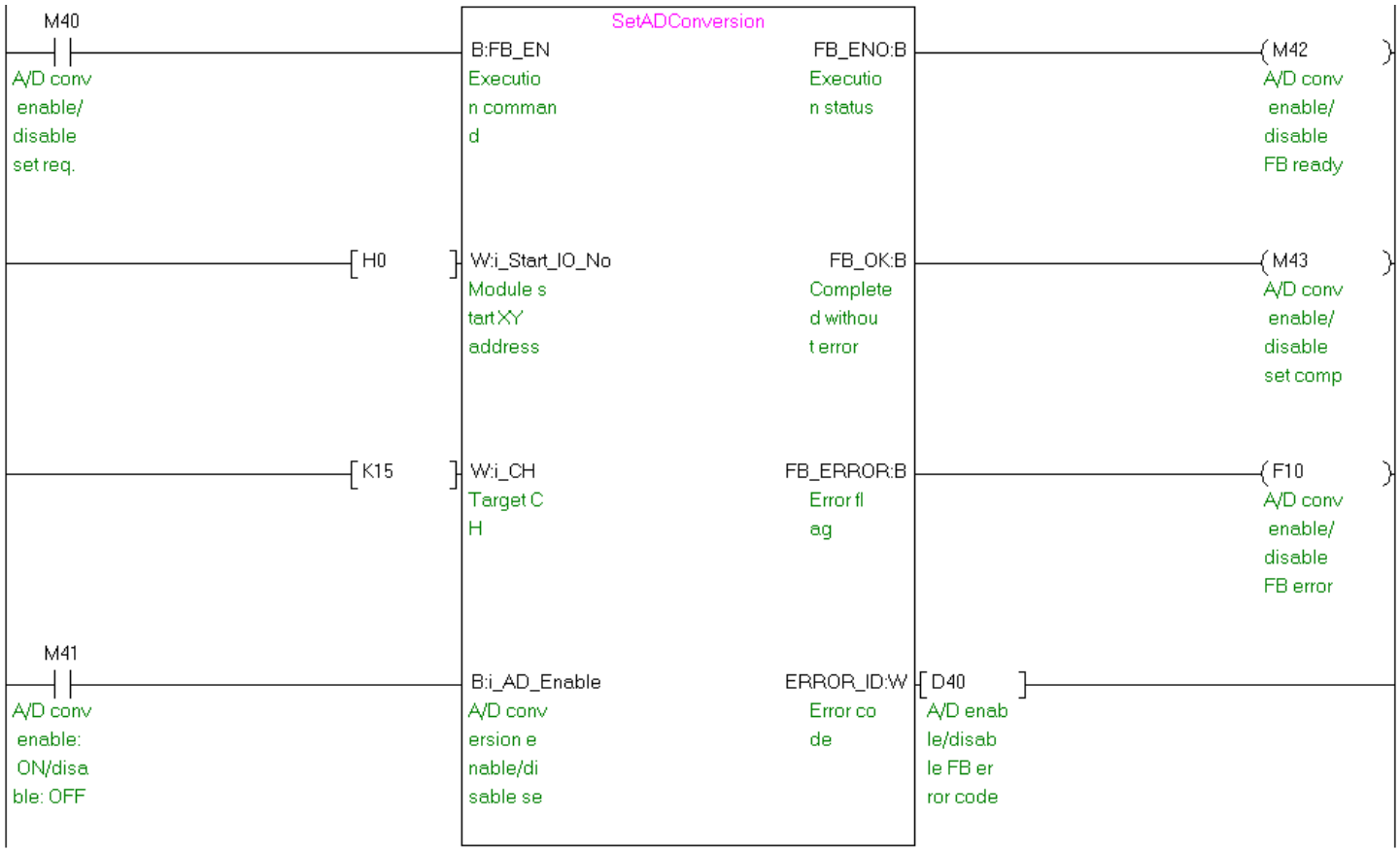
By turning ON M30, the digital operation values of all channels are read.


M30
Digital value read all CHs
RdAllScalingVal
B:FB_EN
Execution command
FB_ENO:B
Execution status
M31
Digital value read FB all ready
H0
W:i_Start_IO_No
Module start XY address
FB_OK:B
Completed without error
M32
Digital value read complete all
o_Scaling_CH1:W
CH1 Digital operation value
D30
CH1 Digital operation value
o_Scaling_CH2:W
CH2 Digital operation value
D31
CH2 Digital operation value
o_Scaling_CH3:W
CH3 Digital operation value
D32
CH3 Digital operation value
o_Scaling_CH4:W
CH4 Digital operation value
D33
CH4 Digital operation value
FB_ERROR:B
Error flag
ERROR_ID:W
Error code

M+L60AD4-2GH_SetADConversion (A/D conversion enable/disable setting)

Label name	Setting value	Description
i_Start_IO_No	H0	Set the starting XY address where the L60AD4-2GH is connected to 0H.
i_CH	K15	Set the target channel to all channels.
i_AD_Enable	ON/OFF	Turn ON this parameter to enable the A/D conversion of the target channel.

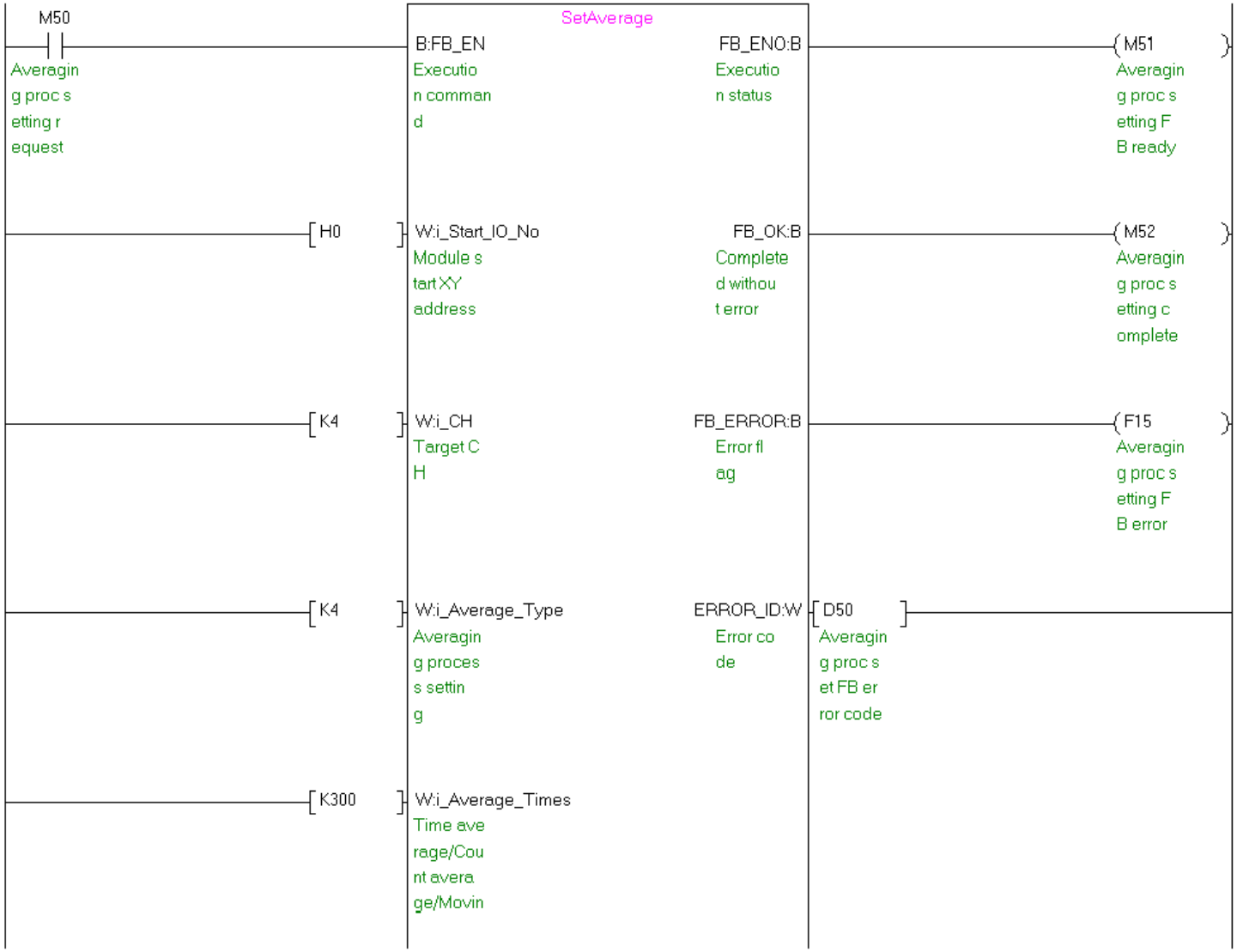
By turning ON M40, the value for the A/D conversion enable/disable setting of all channels are written to the buffer memory.



M+L60AD4-2GH_SetAverage (Averaging process setting)

Label name	Setting value	Description
i_Start_IO_No	H0	Set the starting XY address where the L60AD4-2GH is connected to 0H.
i_CH	K4	Set the target channel to channel 4.
i_Average_Type	K4	Set the averaging processing type to "4: Primary delay filter".
i_Average_Times	K300	Set the setting value for the primary delay filter to 300.
i_LPF_EdgeHz	K0	Set LPF Pass band edge frequency to 0.
i_HPF_EdgeHz	K0	Set HPF Pass band edge frequency to 0.
i_BPF_EdgeHz_L	K0	Set BPF Pass band edge frequency (Low) to 0.
i_BPF_EdgeHz_H	K0	Set BPF Pass band edge frequency (High) to 0.
i_Atten_Band_Wid	K0	Set the attenuation band width to 0.

By turning ON M50, the averaging processing type setting value of channel 4 is written to the buffer memory.



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H0
W:i_LPF_EdgeHz
LPF Pass band edge frequency
H0
W:i_HPF_EdgeHz
HPF Pass band edge frequency
H0
W:i_BPF_EdgeHz_L
BPF Pass band edge frequency (Lo
H0
W:i_BPF_EdgeHz_H
BPF Pass band edge frequency (Hi
H0
W:i_Atten_Band_Wid
Attenuation band width

M+L60AD4-2GH_SetScaling (Scaling setting)

Label name	Setting value	Description
i_Start_IO_No	H0	Set the starting XY address where the L60AD4-2GH is connected to 0H.
i_CH	K1	Set the target channel to channel 1.
i_Scaling_Enable	ON/OFF	Turn ON to enable the scaling.
i_Scl_U_Lim	K30000	Set the scaling upper limit value to 30,000.
i_Scl_L_Lim	K-30000	Set the scaling lower limit value to -30,000.

By turning ON M60, the scaling setting value of channel 1 is written to the buffer memory.

M+L60AD4-2GH_SetProcessAlarm (Process alarm setting)

Label name	Setting value	Description
i_Start_IO_No	H0	Set the starting XY address where the L60AD4-2GH is connected to 0H.
i_CH	K2	Set the target channel to channel 2.
i_Process_Enable	ON/OFF	Turn ON to enable the alert output of the process alarm.
i_Pro_UU_Lim	K30000	Set the process alarm upper upper limit value to 30,000.
i_Pro_UL_Lim	K28000	Set the process alarm upper lower limit value to 28,000.
i_Pro_LU_Lim	K4000	Set the process alarm lower upper limit value to 4,000.
i_Pro_LL_Lim	K2000	Set the process alarm lower lower limit value to 2,000.

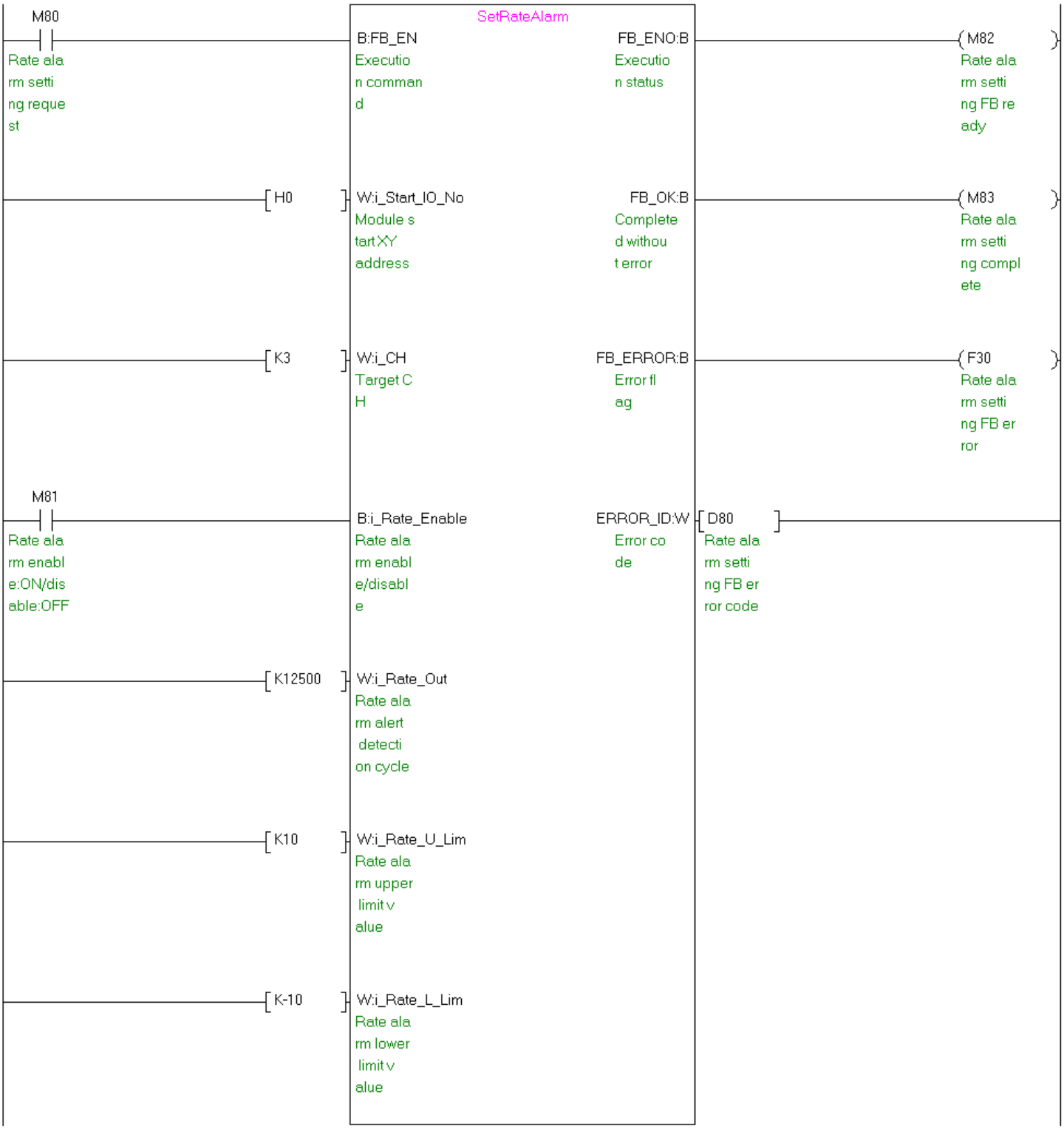
By turning ON M70, the process alarm setting value of channel 2 is written to the buffer memory.


M70
Process alarm setting request
SetProcessAlarm
B:FB_EN
Execution command
FB_ENO:B
Execution status
M72
Process alarm setting FB ready
H0
W:i_Start_IO_No
Module start XY address
FB_OK:B
Completed without error
M73
Process alarm setting complete
K2
W:i_CH
Target CH
FB_ERROR:B
Error flag
F25
Process alarm setting FB error
M71
Process alarm enab:ON/disab:OFF
B:i_Process_Enable
Process alarm enable/disable
ERROR_ID:W
Error code
D70
Process alarm set FB error code
K30000
W:i_Pro_UU_Lim
Process alarm upper upper limit
K28000
W:i_Pro_UL_Lim
Process alarm upper lower limit
K4000
W:i_Pro_LU_Lim
Process alarm lower upper limit
K2000
W:i_Pro_LL_Lim
Process alarm lower lower limit

M+L60AD4-2GH_SetRateAlarm (Rate alarm setting)

Label name	Setting value	Description
i_Start_IO_No	H0	Set the starting XY address where the L60AD4-2GH is connected to 0H.
i_CH	K3	Set the target channel to channel 3.
i_Rate_Enable	ON/OFF	Turn ON to enable the alert output of the rate alarm.
i_Rate_Out	K12500	Set the setting value for the rate alarm alert detection cycle setting to 12,500.
i_Rate_U_Lim	K10	Set the rate alarm upper limit value to 1.0%.
i_Rate_L_Lim	K-10	Set the rate alarm lower limit value to -1.0%.

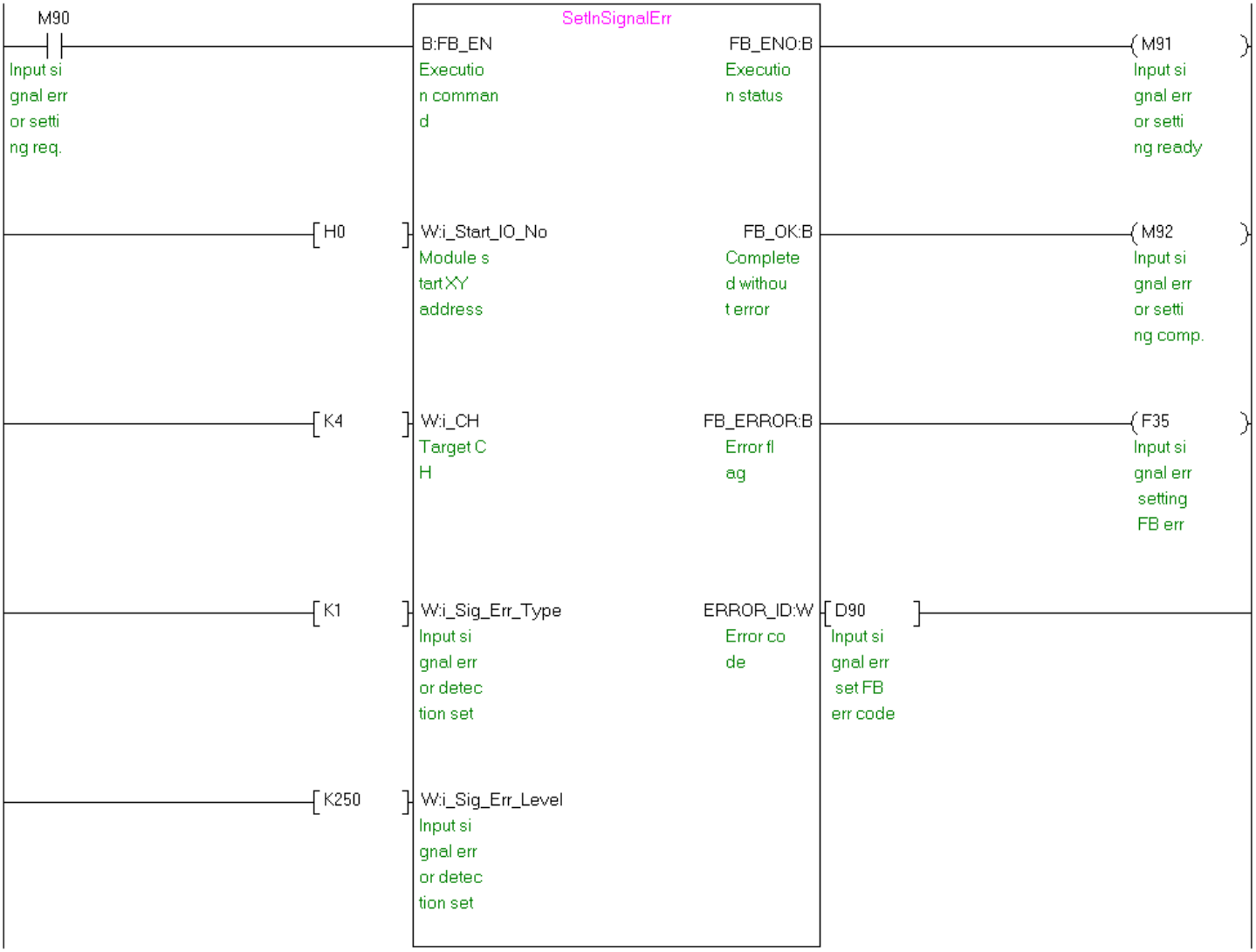
By turning ON M80, the rate alarm setting value of channel 3 is written to the buffer memory.


M80
Rate alarm setting request
SetRateAlarm
B:FB_EN
Execution command
FB_ENO:B
Execution status
M82
Rate alarm setting FB ready
H0
W:i_Start_IO_No
Module start XY address
FB_OK:B
Completed without error
M83
Rate alarm setting complete
K3
W:i_CH
Target CH
FB_ERROR:B
Error flag
F30
Rate alarm setting FB error
M81
Rate alarm enable:ON/disable:OFF
B:i_Rate_Enable
Rate alarm enable/disable
ERROR_ID:W
Error code
D80
Rate alarm setting FB error code
K12500
W:i_Rate_Out
Rate alarm alert detection cycle
K10
W:i_Rate_U_Lim
Rate alarm upper limit value
K-10
W:i_Rate_L_Lim
Rate alarm lower limit value

M+L60AD4-2GH_SetInputSignalErr (Input signal error detection setting)

Label name	Setting value	Description
i_Start_IO_No	H0	Set the starting XY address where the L60AD4-2GH is connected to 0H.
i_CH	K4	Set the target channel to channel 4.
i_Sig_Err_Type	K1	Set the input signal error detection setting to "1: Upper lower limit detection".
i_Sig_Err_Level	K250	Set the setting value for the input signal error detection setting to 25.0%.

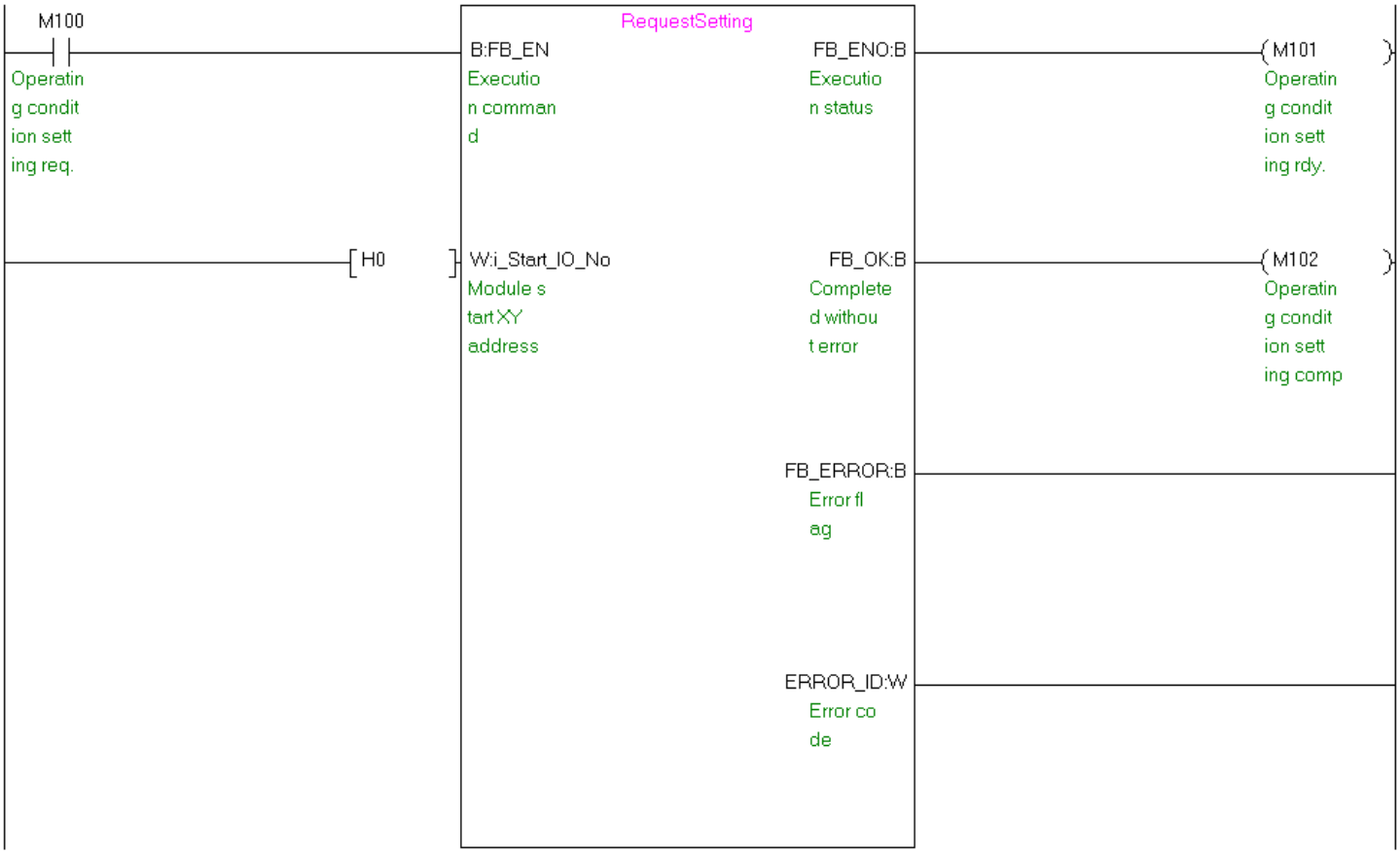
By turning ON M90, the input signal error detection setting value of channel 4 is written to the buffer memory.



M+L60AD4-2GH_RequestSetting (Operating condition setting request)

Label name	Setting value	Description
i_Start_IO_No	H0	Set the starting XY address where the L60AD4-2GH is connected to 0H.

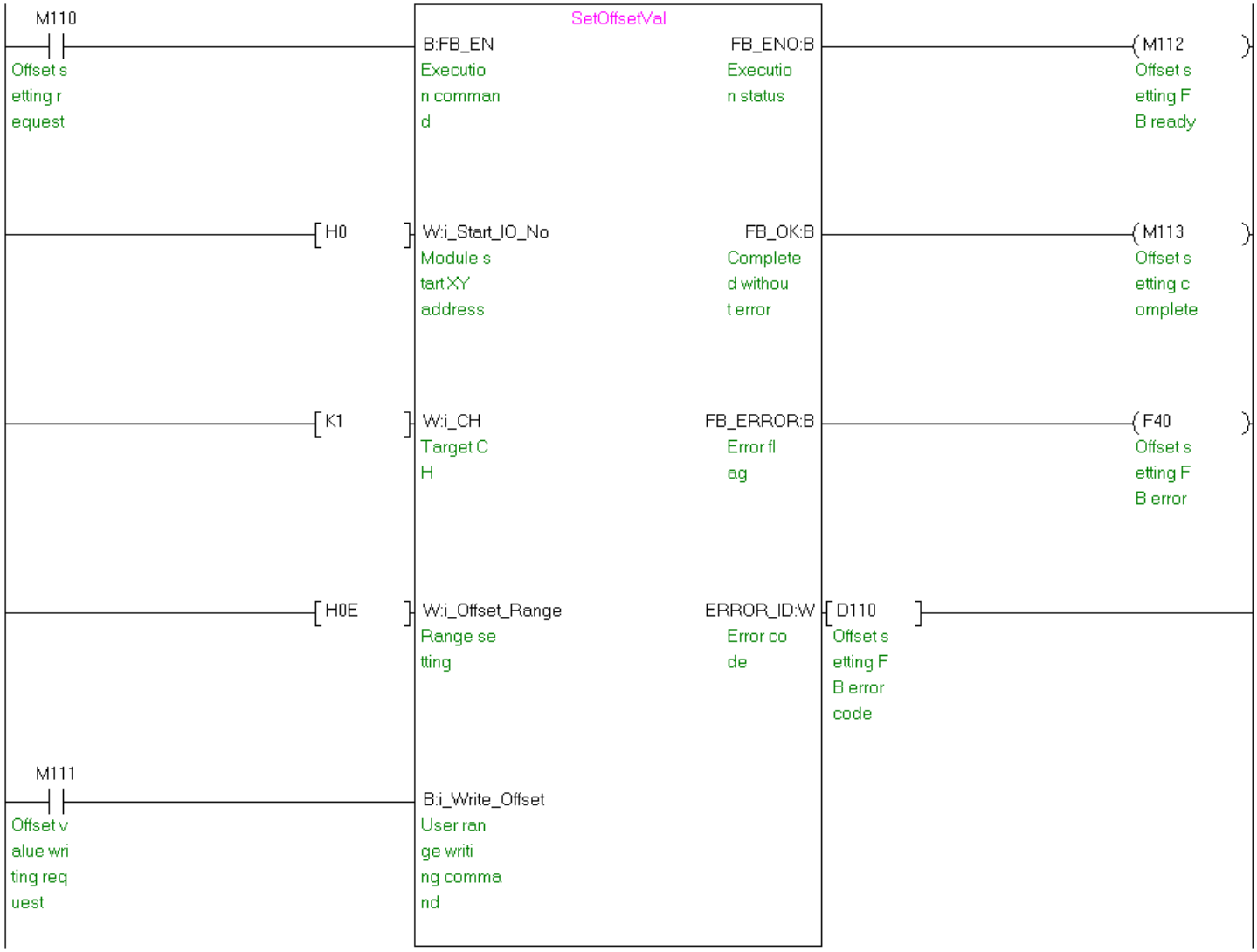
By turning ON M100, the settings of the A/D conversion enable/disable setting, averaging process setting, conversion speed setting, process alarm setting, rate alarm setting, input signal error detection setting, scaling setting, digital clipping setting, logging function setting, and flow amount integration function setting are enabled.



M+L60AD4-2GH_SetOffsetVal (Offset setting)

Label name	Setting value	Description
i_Start_IO_No	H0	Set the starting XY address where the L60AD4-2GH is connected to 0H.
i_CH	K1	Set the target channel to channel 1.
i_Offset_Range	H0E	Set the range setting to "E: Unipolar (current)".
i_Write_Offset	ON/OFF	Turn ON to perform the user range write operation for channel 1.

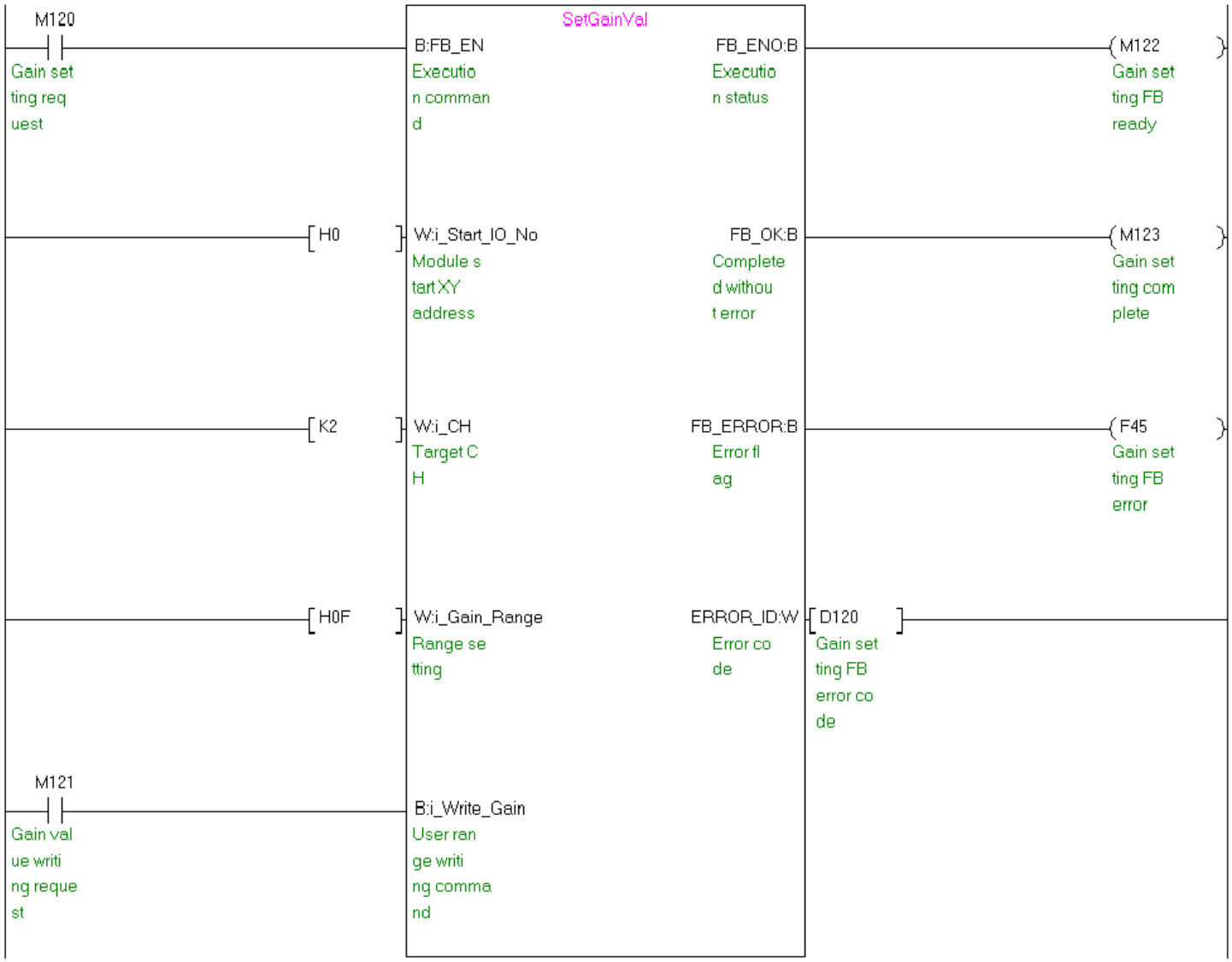
By turning ON M110 and then M111, the offset value of channel 1 (Unipolar (current)) is written.



M+L60AD4-2GH_SetGainVal (Gain setting)

Label name	Setting value	Description
i_Start_IO_No	H0	Set the starting XY address where the L60AD4-2GH is connected to 0H.
i_CH	K2	Set the target channel to channel 2.
i_Gain_Range	H0F	Set the range setting to "F: Bi-polar (voltage)".
i_Write_Gain	ON/OFF	Turn ON to perform the user range write operation for channel 2.

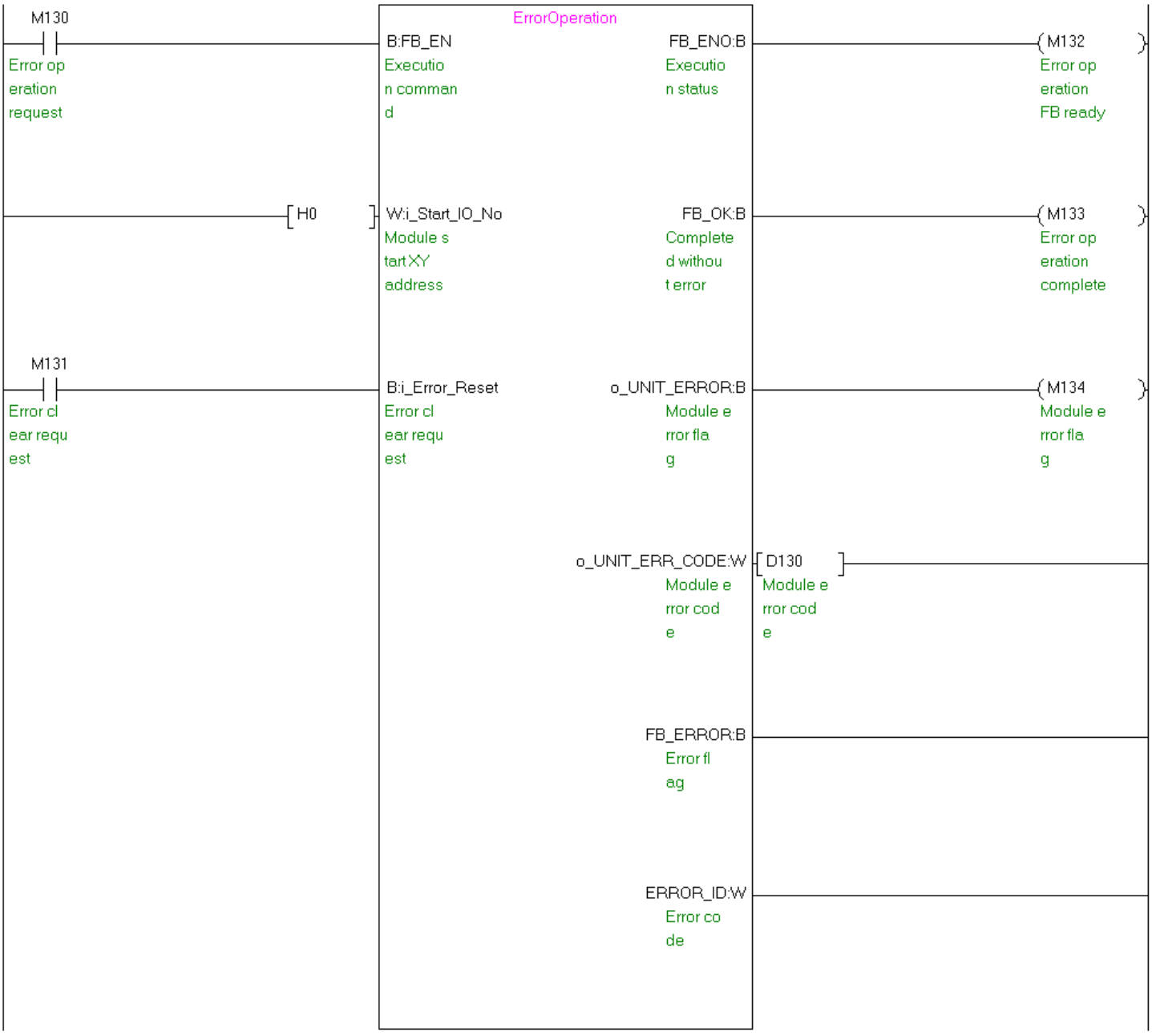
By turning ON M120 and then M121, the gain value of channel 2 (Bi-polar (voltage)) is written.



M+L60AD4-2GH_ErrorOperation (Error operation)

Label name	Setting value	Description
i_Start_IO_No	H0	Set the starting XY address where the L60AD4-2GH is connected to 0H.

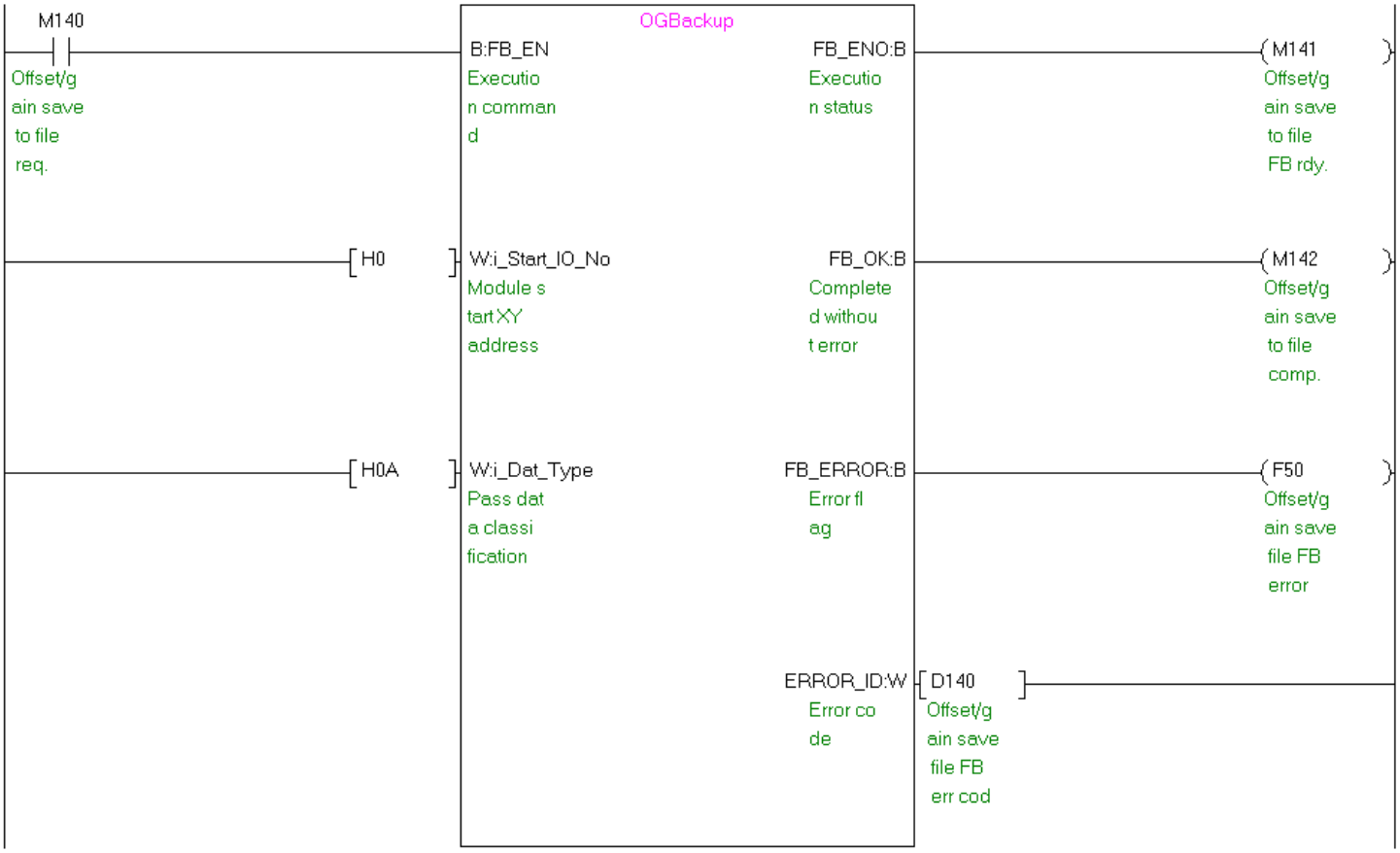
By turning ON M130, the error code is output when an error occurs. By turning ON M131 after the error output, the error is reset.



M+L60AD4-2GH_OGBackup (Offset/gain value save)

Label name	Setting value	Description
i_Start_IO_No	H0	Set the starting XY address where the L60AD4-2GH is connected to 0H.
i_Dat_Type	H0A	Set the pass data classification to "Voltage" for channels 1 and 3 and "Current" for channels 2 and 4.

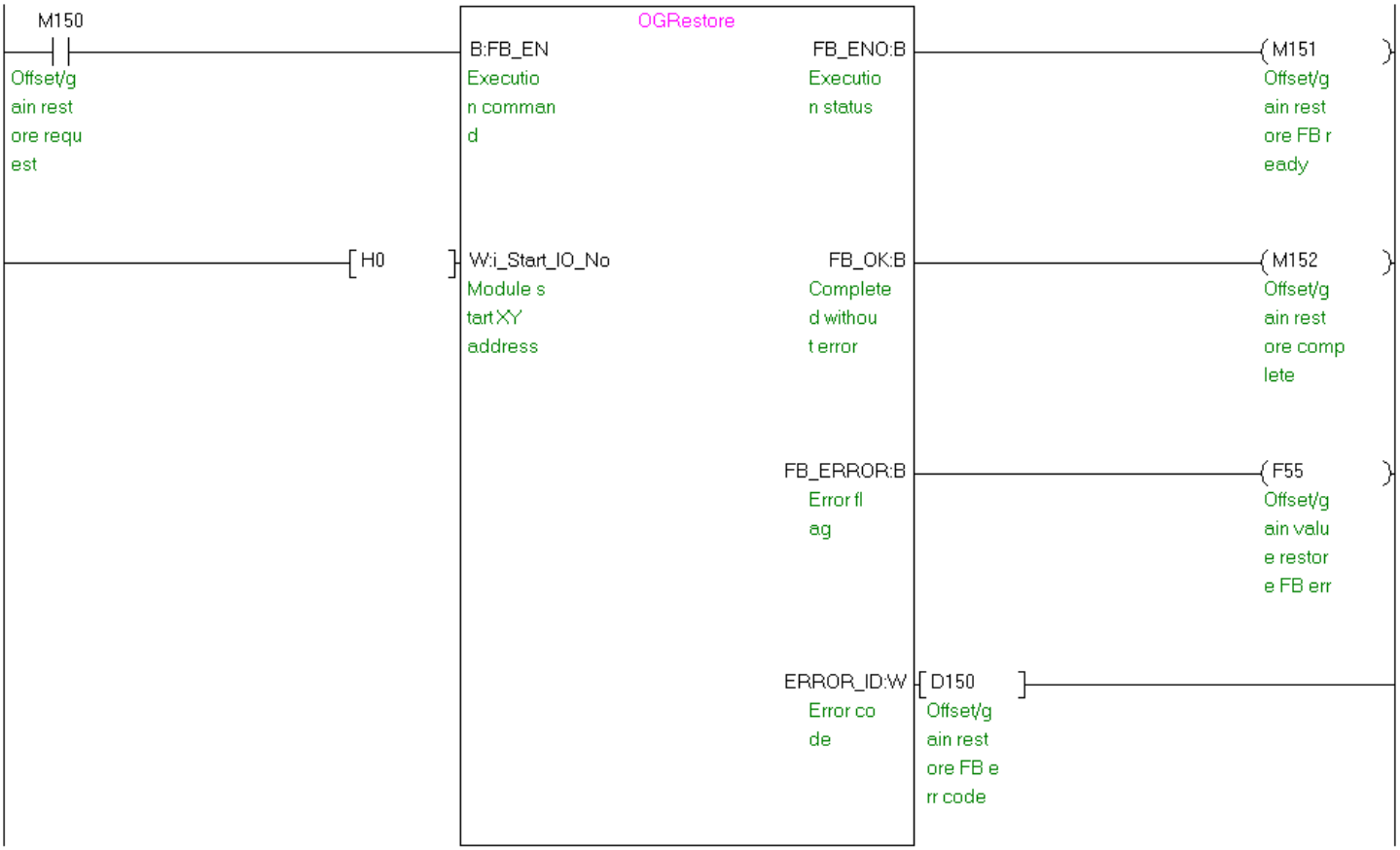
By turning ON M140, the offset/gain value of the user range setting is read and saved in the SD memory card inserted in the CPU module in a file format.



M+L60AD4-2GH_OGRestore (Offset/gain value restore)

Label name	Setting value	Description
i_Start_IO_No	H0	Set the starting XY address where the L60AD4-2GH is connected to 0H.

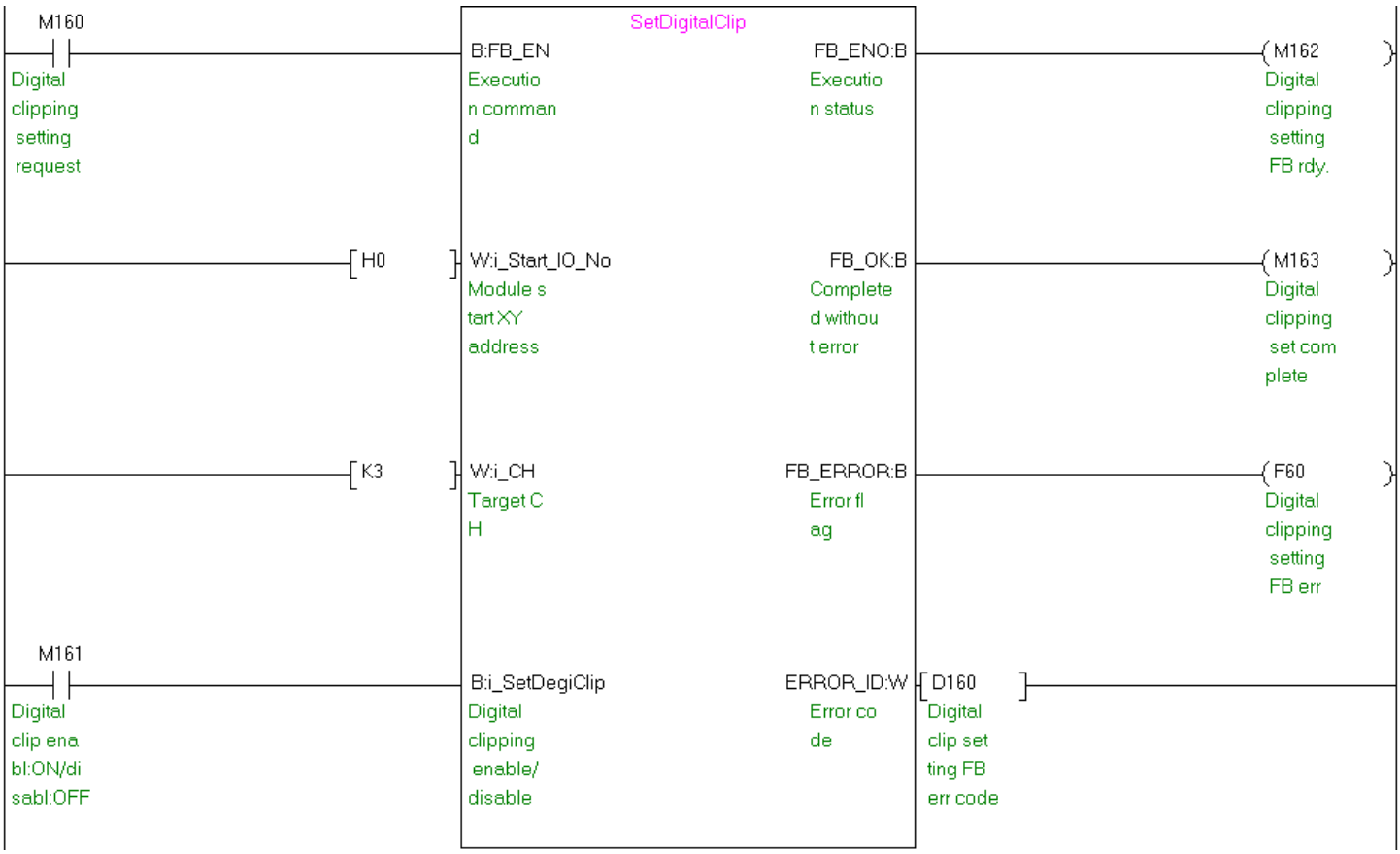
By turning ON M150, the offset/gain setting value of the user range setting is restored from the SD memory card to the module.



M+L60AD4-2GH_SetDigitalClip (Digital clipping setting)

Label name	Setting value	Description
i_Start_IO_No	H0	Set the starting XY address where the L60AD4-2GH is connected to 0H.
i_CH	K3	Set the target channel to channel 3.
i_SetDegiClip	ON/OFF	Turn ON to enable the digital clipping function.

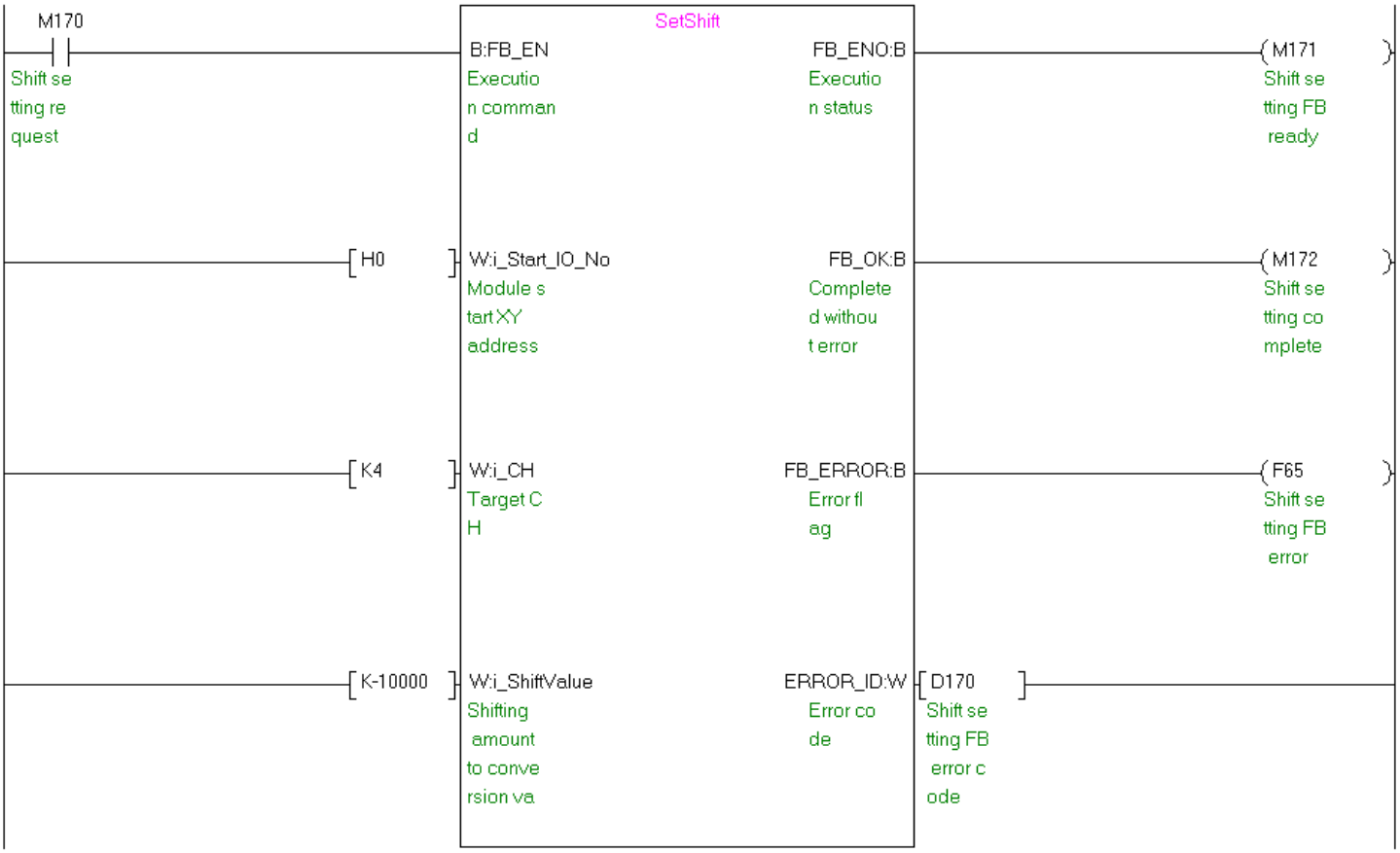
By turning ON M160, the digital clipping setting value of channel 3 is written to the buffer memory.



M+L60AD4-2GH_SetShift (Shift setting)

Label name	Setting value	Description
i_Start_IO_No	H0	Set the starting XY address where the L60AD4-2GH is connected to 0H.
i_CH	K4	Set the target channel to channel 4.
i_ShiftValue	K-10000	Set the shift amount to -10,000.

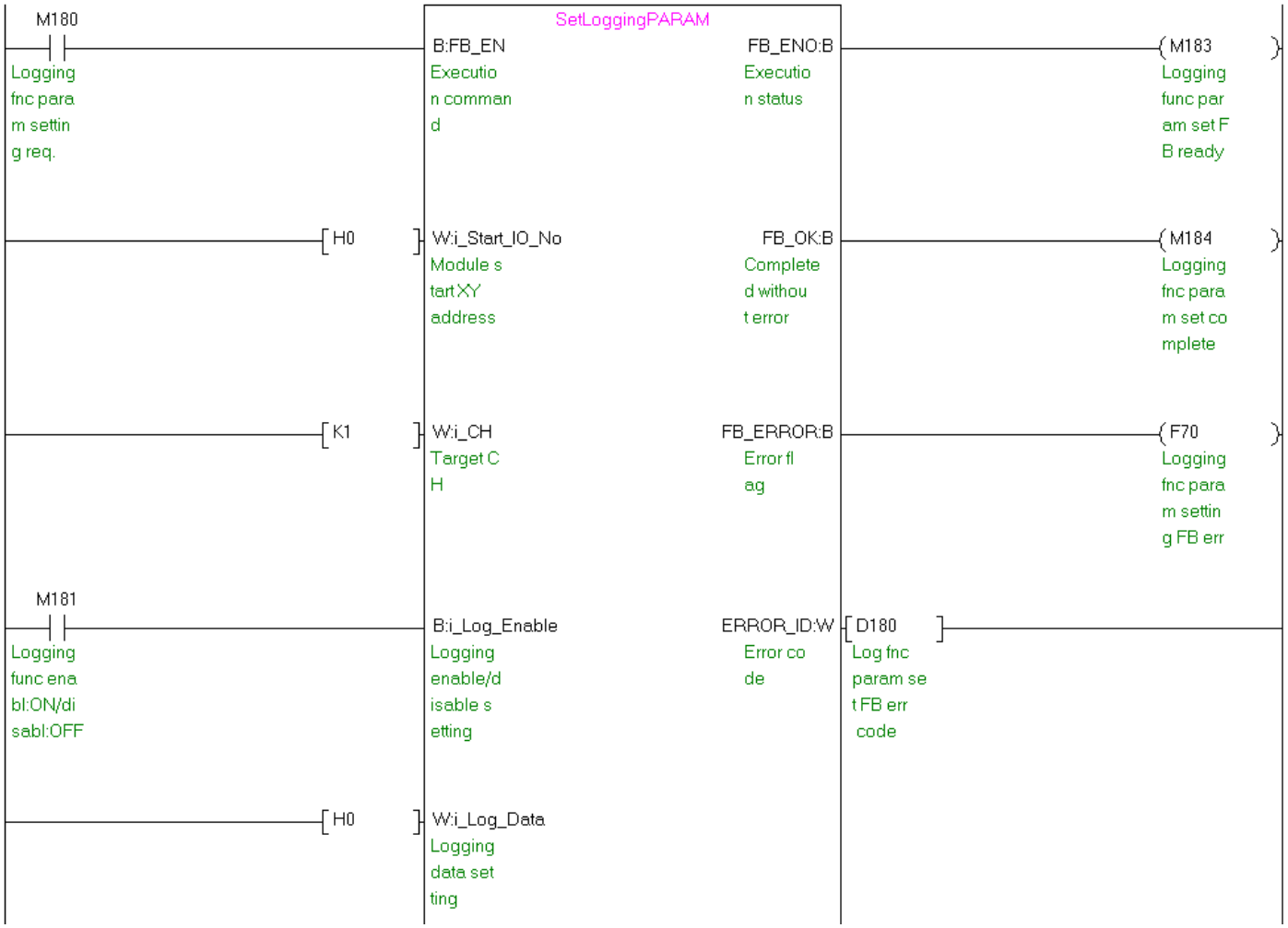
By turning ON M170, the shift setting value of channel 4 is written to the buffer memory.



M+L60AD4-2GH_SetLoggingPARAM (Logging function parameter setting)

Label name	Setting value	Description
i_Start_IO_No	H0	Set the starting XY address where the L60AD4-2GH is connected to 0H.
i_CH	K1	Set the target channel to channel 1.
i_Log_Enable	ON/OFF	Turn ON to enable the logging.
i_Log_Data	H0	Set the logging data to "0: Digital output value".
i_Log_Cycle_Val	K4	Set the logging cycle setting value to 4.
i_Log_Cycle_Unit	H1	Set the logging cycle unit setting to "1: ms".
i_Log_Points	K3000	Set the logging points after trigger to 3,000.
i_Log_Trig_Cond	H1	Set the hold trigger condition setting to "1: Level trigger (Above)".
i_Log_Trig_Data	K11	Set the trigger data to 11 (CH1 Digital output value).
i_Log_Trig_Value	K16000	Set the trigger setting value to 16,000.
i_LoadInt_Enable	ON/OFF	Turn ON to enable the logging load interrupt.
i_Load_Points	K1000	Set the logging load points setting value to 1,000.

By turning ON M180, the logging function parameter setting value of channel 1 is written to the buffer memory.



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K4
W:i_Log_Cycle_Val
Logging cycle setting value
H1
W:i_Log_Cycle_Unit
Logging cycle unit setting
K3000
W:i_Log_Points
Logging points after trigger
H1
W:i_Log_Trig_Cond
Hold trigger condition setting
K11
W:i_Log_Trig_Data
Trigger data
K16000
W:i_Log_Trig_Value
Trigger setting value
M182
Read interpt enabl:ON/disabl:OFF
B:i_LoadInt_Enable
Loading interrupt enable/disable
K1000
W:i_Load_Points
Logging load points setting valu

M+L60AD4-2GH_SaveLogging (Logging data save)

Label name	Setting value	Description
i_Start_IO_No	H0	Set the starting XY address where the L60AD4-2GH is connected to 0H.
i_CH	K2	Set the target channel to channel 2.
i_Max_Number	K10	Set the maximum number of CSV files to be saved to 10.
i_Over_Write	ON/OFF	Set whether to overwrite the file to which the logging data is written.

By turning ON M190, the logging data from the start pointer of channel 2 for the number of the logging data are sorted chronologically. Then, the logging data and the trigger occurrence information are saved in CSV format in the SD memory card mounted on the CPU.