MELSEC-L Digital-Analog Converter Module FB Library (CC-Link IE Field compatible) Reference Manual

Applicable modules:

L60DA4

<CONTENTS>

Reference Manual Revision History

Reference Manual Number	Date	Description
FBM-M072-A	2013/02/22	First edition

1. Overview

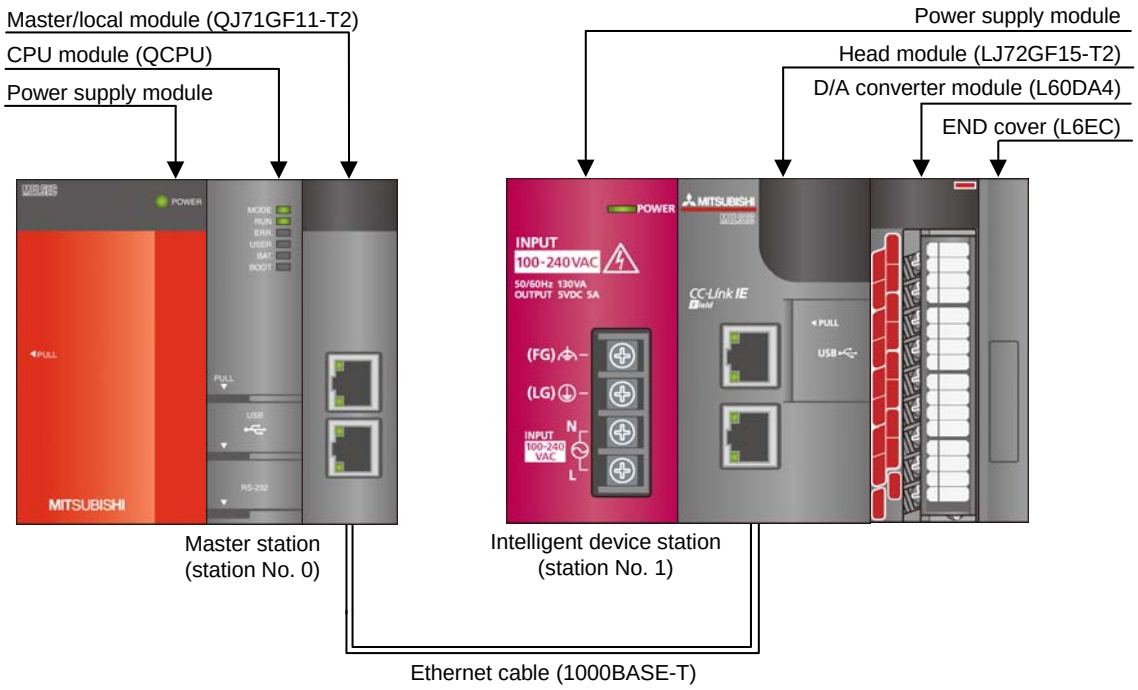
1.1 Overview of the FB Library

This FB Library is for using the MELSEC-L L60DA4 digital-analog converter module with MELSEC CC-Link IE Field.

1.2 Function of the FB Library

Item	Description
M+L60DA4-IEF_WriteDAVal	Writes the D/A conversion data of the specified channel.
M+L60DA4-IEF_WriteAllDAVal	Writes the D/A conversion data of all channels.
M+L60DA4-IEF_SetDAConversion	Enables or disables the D/A conversion for the specified channel or all channels.
M+L60DA4-IEF_SetDAOutput	Enables or disables the D/A output for the specified channel or all channels.
M+L60DA4-IEF_SetScaling	Sets the scaling of the specified channel.
M+L60DA4-IEF_SetAlarm	Sets the alert output of the specified channel.
M+L60DA4-IEF_RequestSetting	Validates the setting contents of each function.
M+L60DA4-IEF_SetOffsetVal	Sets the offset of the specified channel.
M+L60DA4-IEF_SetGainVal	Sets the gain of the specified channel.
M+L60DA4-IEF_ShiftOperation	Adds the input value shift amount to the digital value.
M+L60DA4-IEF_ErrorOperation	Monitors error codes and resets errors.
M+L60DA4-IEF_OGBackup	Reads the offset/gain setting values in the user range setting and saves them to a file.
M+L60DA4-IEF_OGRestore	Restores the offset/gain setting values saved in the file to the module.
M+L60DA4-IEF_WaveDataStoreCsv	Reads data from the CSV file where parameters and wave data (wave data points and wave data) of the wave output function are stored, then writes them to the buffer memory of the D/A converter module.
M+L60DA4-IEF_WaveDataStoreDev	Reads data from the file register (ZR) where parameters and wave data (wave data points and wave data) of the wave output function are stored, then writes them to the buffer memory of the D/A converter module.
M+L60DA4-IEF_WaveOutSetting	Sets the wave output for the specified channel or all channels.
M+L60DA4-IEF_WaveOutReqSetting	Sets the starting, stopping, or pausing of the wave output for the specified channel or all channels.

1.3 System Configuration Example

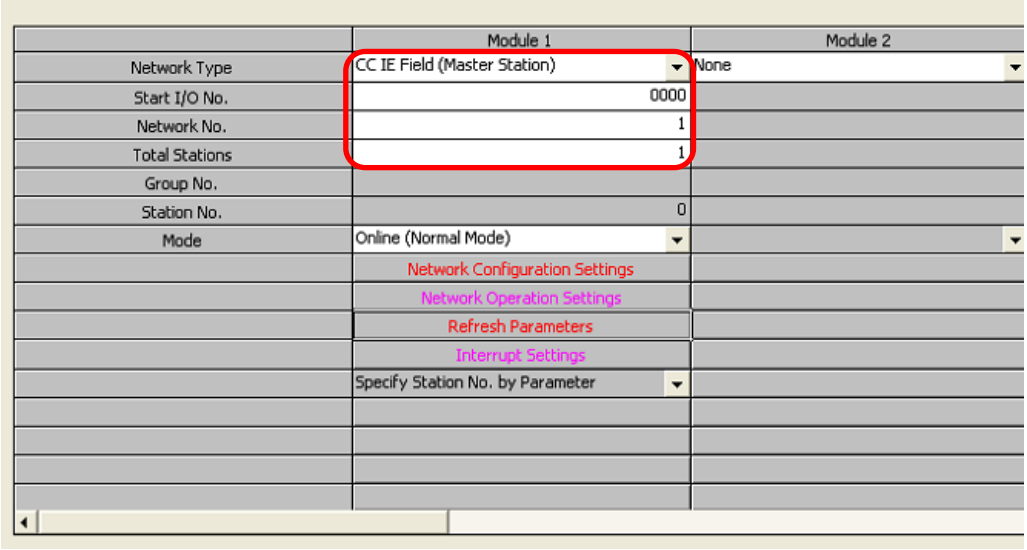


1.4 Setting the CC-Link IE Field Network Master/Local Module

This section explains the settings of CC-Link IE field network master/local module based on Section 1.3 "System Configuration Example". Set the following items using GX Works2.

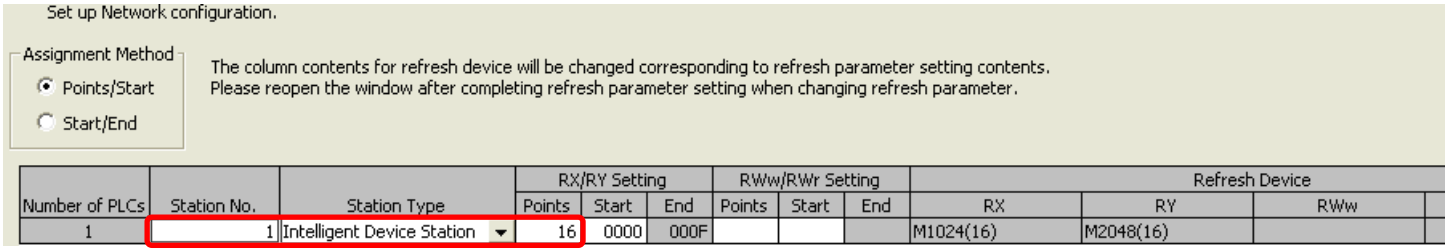
(1) Network parameters

Item	Description
Network Type	Select the CC IE Field (Master Station).
Start I/O No.	Set the start I/O number of the master/local module in increments of 16 points. Set "0000".
Network No.	Set the network number of the master/local module. Set "1".
Total Stations	Set the number of slave stations connected to the master station. Include the number of reserved slave stations. Set "1".



(2) Network configuration setting

Item	Description
Station No.	Set the station number of the slave connected to the master station. Set "1".
Station Type	Set the station type of the slave connected to the master station. Select "Intelligent Device Station".
RX/RY Setting	Set assignment for RX/RY for the slave station connected to the master station. (a) Points Set "16". (b) Start Set "0000".

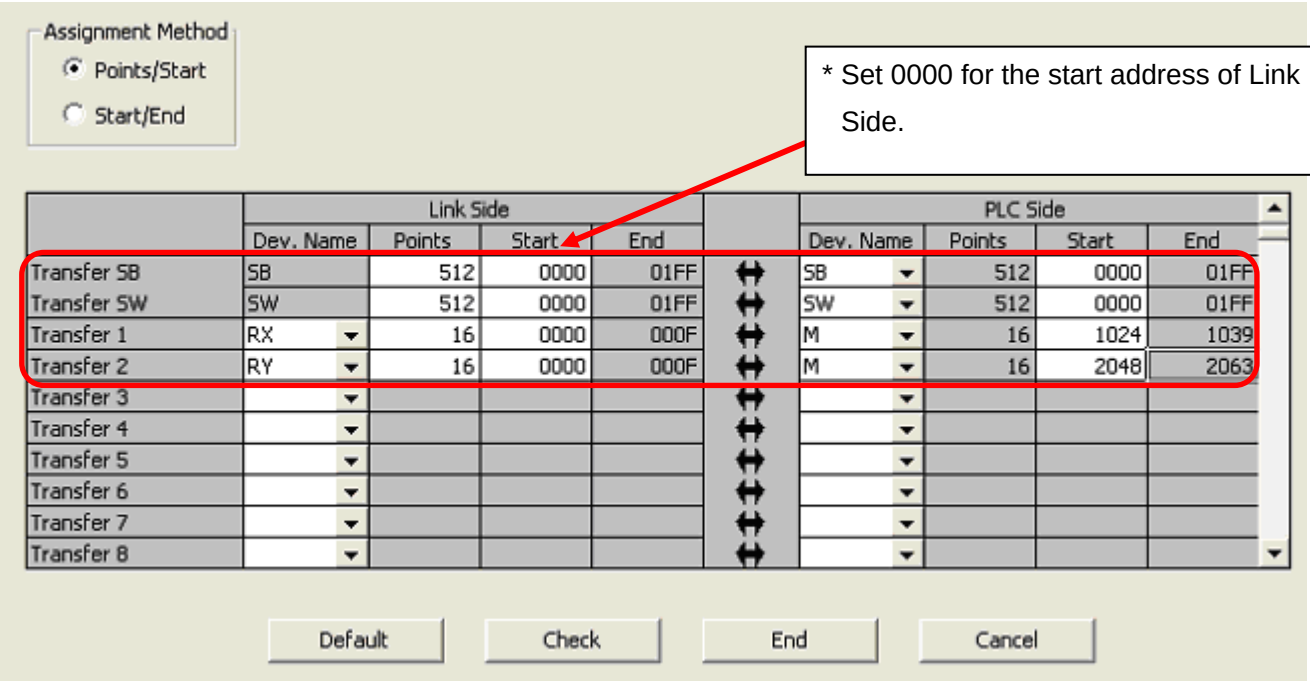


(3) Refresh parameters

Item	Description	Setting value
Transfer SB	Select the link refresh range of SB device.	•"Link Side Points" : 512 •"Link Side Start" : 0000 •"PLC Side Dev. Name" : SB •"PLC Side Start" : 0000
Transfer SW	Select the link refresh range of SW device.	•"Link Side Points" : 512 •"Link Side Start" : 0000 •"PLC Side Dev. Name" : SW •"PLC Side Start" : 0000
Transfer 1	Select the link refresh range of RX device.	•"Link Side Dev. Name" : RX •"Link Side Points" : 16 •"Link Side Start" : 0000 •"PLC Side Dev. Name" : M •"PLC Side Start" : 1024
Transfer 2	Select the link refresh range of RY device.	•"Link Side Dev. Name" : RY •"Link Side Points" : 16 •"Link Side Start" : 0000 •"PLC Side Dev. Name" : M •"PLC Side Start" : 2048

* Make sure to set "0000" for Start of Link Side.

* Change the Points of Link Side and Dev. Name and Start of PLC Side according to the system.
They must be the same as for "M_F_RX" and "M_F_RY" devices of the global label setting.



1.5 Setting Global Labels

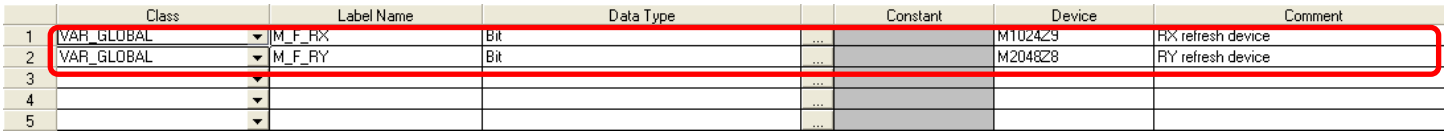
Global labels must be set before using this FB. This section explains global label settings.

(1) M_F_RX Set remote input (RX).

Item	Description
Class	Select "VAR_GLOBAL".
Label Name	Enter "M_F_RX".
Data Type	Enter "Bit".
Device	Enter the refresh device set for the refresh parameter with a "Z9" prefix.

(2) M_F_RY Set remote output (RY).

Item	Description
Class	Select "VAR_GLOBAL".
Label name	Enter "M_F_RY".
Data type	Enter "Bit".
Device	Enter the refresh device set for the refresh parameter with a "Z8" prefix.



	Class	Label Name	Data Type		Constant	Device	Comment
1	VAR_GLOBAL	M_F_RX	Bit	...		M1024Z9	RX refresh device
2	VAR_GLOBAL	M_F_RY	Bit	...		M2048Z8	RY refresh device
3				...			
4				...			
5				...			

1.6 Creating Interlock Programs

Interlock programs must be created for the FBs. The following are examples of interlock programs.

Set one interlock program to each cyclic transmission and transient transmission.

(Set a corresponding FB between MC and MCR instructions.)

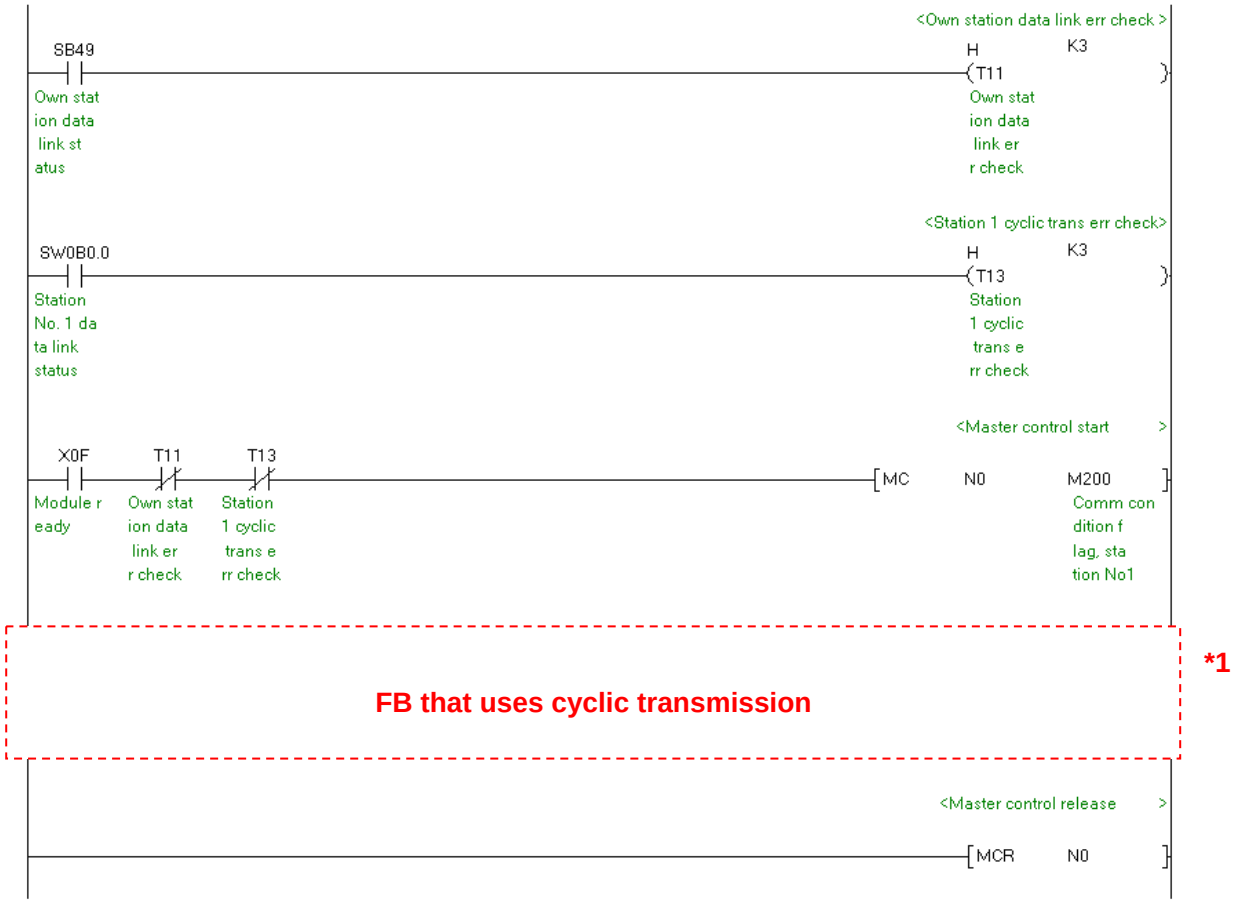
(For FBs that use both cyclic and transient transmission, refer to the application example.)

1.6.1 Cyclic Transmission Program

Use link special relay (SB) and link special register (SW) to create an interlock for cyclic transmission program.

- Own station data link status (SB0049)
- Each station data link status (SW00B0 to SW00B7)

Example: Interlock example (Station No. 1)



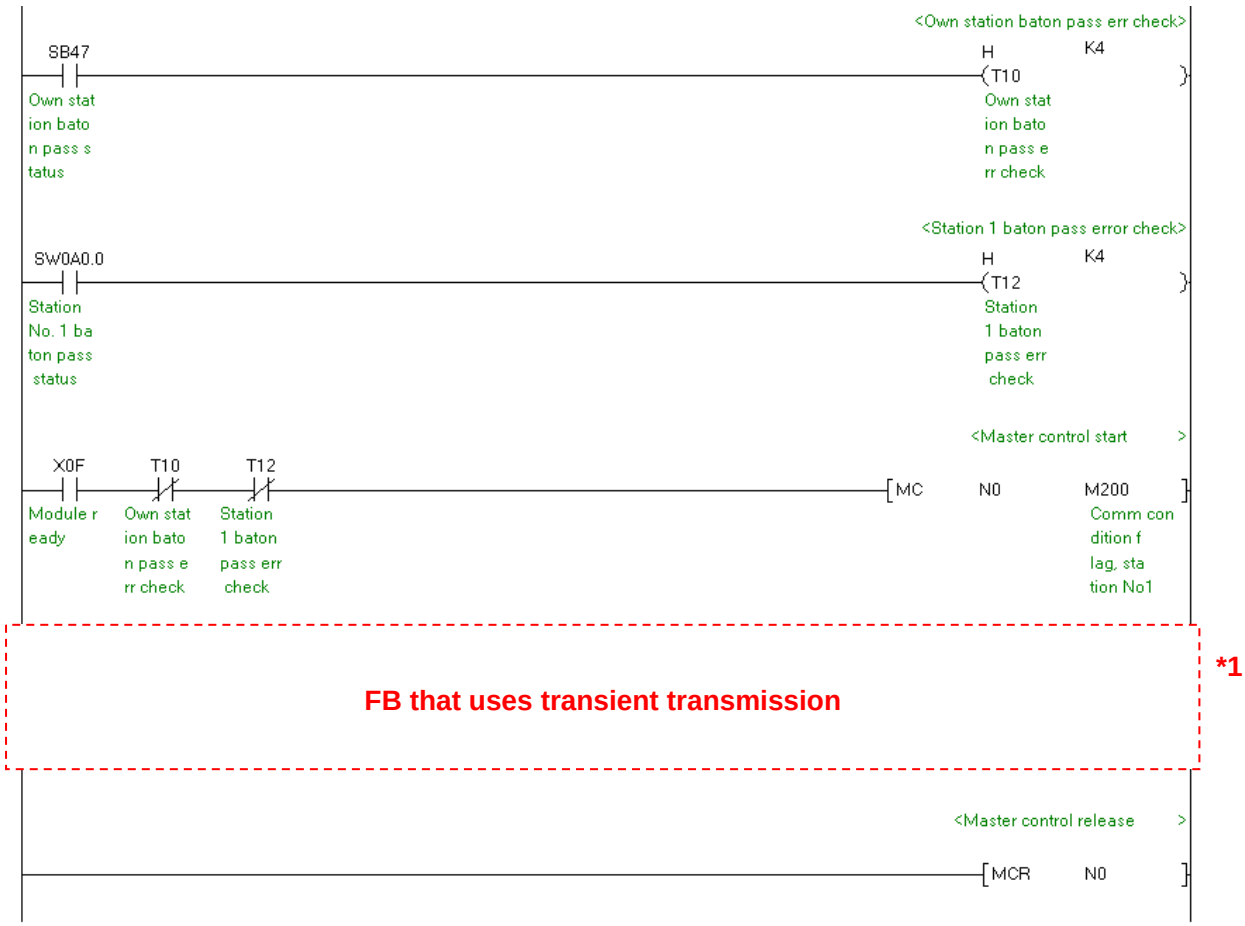
*1 For FB library that uses cyclic transmission, refer to Section 1.6.3 FB Transmission List.

1.6.2 Transient Transmission Program

Use link special relay (SB) and link special register (SW) to create an interlock for transient transmission program.

- Own station baton pass status (SB0047)
- Each station baton pass status (SW00A0 to SW00A7)

Example: Interlock example (Station No. 1)



*1 For FB library that uses transient transmission, refer to Section 1.6.3 FB Transmission List.

1.6.3 FB Transmission List

This table lists transmission types used for FBs.

FB name	Cyclic transmission	Transient transmission
M+L60DA4-IEF_WriteDAVal	○	○
M+L60DA4-IEF_WriteAllDAVal	○	○
M+L60DA4-IEF_SetDAConversion	○	○
M+L60DA4-IEF_SetDAOutput	○	-
M+L60DA4-IEF_SetScaling	○	○
M+L60DA4-IEF_SetAlarm	○	○
M+L60DA4-IEF_RequestSetting	○	-
M+L60DA4-IEF_SetOffsetVal	○	○
M+L60DA4-IEF_SetGainVal	○	○
M+L60DA4-IEF_ShiftOperation	-	-
M+L60DA4-IEF_ErrorOperation	○	○
M+L60DA4-IEF_OGBackup	○	○
M+L60DA4-IEF_OGRestore	○	○
M+L60DA4-IEF_WaveDataStoreCsv	○	○
M+L60DA4-IEF_WaveDataStoreDev	○	○
M+L60DA4-IEF_WaveOutSetting	○	○
M+L60DA4-IEF_WaveOutReqSetting	○	○

-: Not used

○: Used

1.7 Relevant Manuals

MELSEC-L Digital-Analog Converter Module User's Manual

MELSEC-Q CC-Link IE Field Network Master/Local Module User's Manual

MELSEC-L CC-Link IE Field Network Master/Local Module User's Manual

MELSEC-L CC-Link IE Field Network Head Module User's Manual

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

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)

1.8 Note

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

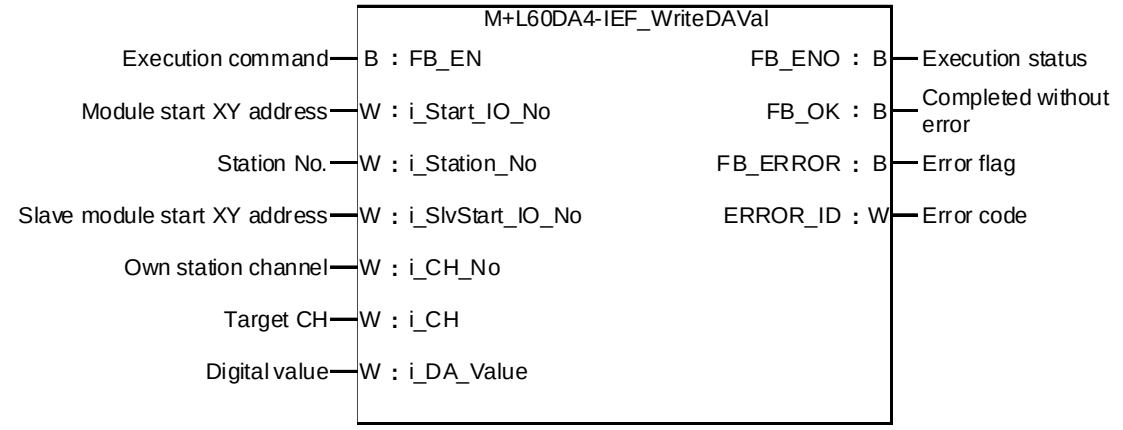
2. Details of the FB Library

2.1 M+L60DA4-IEF_WriteDAVal (Write D/A conversion data)

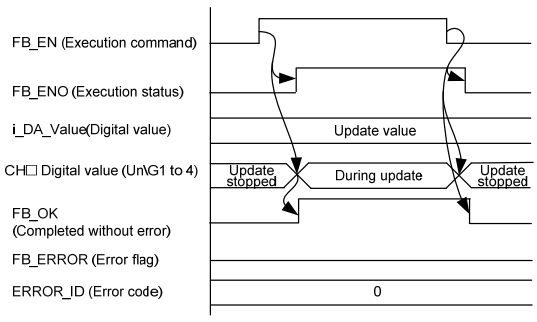
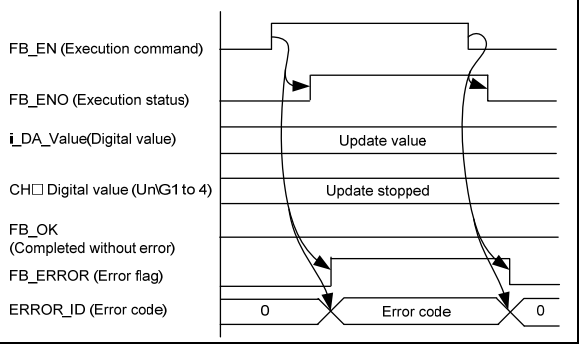
FB Name

M+L60DA4-IEF_WriteDAVal

Function Overview

<table>
<tr><th>Item</th><th colspan="2">Description</th></tr>
<tr><td>Function overview</td><td colspan="2">Writes the D/A 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>Digital-analog converter module</td><td>L60DA4</td></tr>
<tr><td>CC-Link IE Field Network module</td><td>CC-Link IE Field Network master/local module
CC-Link IE Field Network head module</td></tr>
<tr><td>CPU module</td><td>
<table>
<tr><th>Series</th><th>Model</th></tr>
<tr><td>MELSEC-Q Series *1</td><td>Universal model QCPU *2</td></tr>
<tr><td>MELSEC-L Series</td><td>LCPU *3</td></tr>
</table>
*1 Not applicable to QCPU-A (A mode)
*2 The first five digits of the serial number are "12012" or later.
*3 The first five digits of the serial number are "13012" or later.
</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>
</table>

Item	Description
Number of steps	389 steps (for MELSEC-Q series universal model CPU) * The number of steps of the FB in a program depends on the CPU model that is used and input and output definition.
Function description	1) By turning ON FB_EN (Execution command), the digital value of the specified channel is written. 2) The digital value to be written depends on the output range setting. When the scaling function of the L60DA4 is enabled, the digital value is scaled before the D/A conversion. 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 10 (decimal) is stored in ERROR_ID (Error code). Refer to the error code explanation section for details. 4) When the network configuration setting of the station number specified by i_Station_No is incorrect, FB_ERROR is turned ON and the processing is interrupted, and the error code 50 (decimal) is stored in ERROR_ID (Error code). Refer to the error code explanation section for details. 5) When the CC-Link IE field network error occurs, 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. 6) When the digital value is set in the auto refresh setting of the intelligent function module, this FB is unnecessary.
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) When operating this FB together with other FBs, make sure that the channels used by the own station are not duplicated. 5) When two or more of these FBs are used, precaution must be taken to avoid repetition of the target channel. 6) This FB uses index registers Z5 to Z7 and Z9. Please do not use these index registers in an interrupt program. 7) Every input must be provided with a value for proper FB operation. 8) To operate the L60DA4, set the output 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). 9) This FB uses cyclic and transient transmission. Therefore, an interlock program for cyclic and transient transmission is required. 10) Set the refresh device of the network parameter setting according to Section "1.4(3) Refresh parameters". 11) Set the global label setting according to Section "1.5 Setting Global Labels". 12) Only one master/local module can be controlled by the CC-Link IE Field system FB. To control 2 or more master/local modules by the FB, refer to "Appendix 1 When Using the FB for 2 or More Master/Local Modules".
FB operation type	Real-time execution
Application example	Refer to "Appendix 2 FB Library Application Examples".
Timing chart	[When operation completes without error]  [When an error occurs] 

Item	Description
Relevant manuals	•MELSEC-L Digital-Analog Converter Module User's Manual •MELSEC-Q CC-Link IE Field Network Master/Local Module User's Manual •MELSEC-L CC-Link IE Field Network Master/Local Module User's Manual •MELSEC-L CC-Link IE Field Network Head Module User's Manual •QCPU User's Manual (Hardware Design, Maintenance and Inspection) •MELSEC-L CPU Module 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.
50 (Decimal)	The network configuration setting of the station number specified by i_Station_No is incorrect.	Review the following setting. •Network configuration setting Refer to Section 1.4(2) Network configuration setting. •The value entered in i_Station_No
D000 to DAF9 (Hexadecimal)	A CC-Link IE field network error has occurred at the system configuration.	For details, refer to Error Code List of MELSEC-Q/L CC-Link IE Field Network Master/Local Module User's Manual

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 L60DA4 is connected. (For example, enter H10 for X10.)
Station No.	i_Station_No	Word	1 to 120	Specify the target station number.

Name (Comment)	Label name	Data type	Setting range	Description
Slave module start XY address	i_SlvStart_IO_No	Word	Depends on the I/O point range of the head module. For details, refer to the head module user's manual.	Specify the starting XY address (in hexadecimal) where the L60DA4 is connected. (For example, enter H10 for X10.)
Own station channel	i_CH_No	Word	1 to 32	Specify the channel for own station.
Target CH	i_CH	Word	1 to 4	Specify the channel number.
Digital value	i_DA_Value	Word	-32,000 to 32,000	Specify the digital value. The output range and scaling function may decrease the setting range.

● 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 value is being written.
Error flag	FB_ERROR	Bit	OFF	When ON, it indicates that an error has occurred.
Error code	ERROR_ID	Word	0	FB error code output.

FB Version Upgrade History

Version	Date	Description
1.00A	2013/02/22	First edition

Note

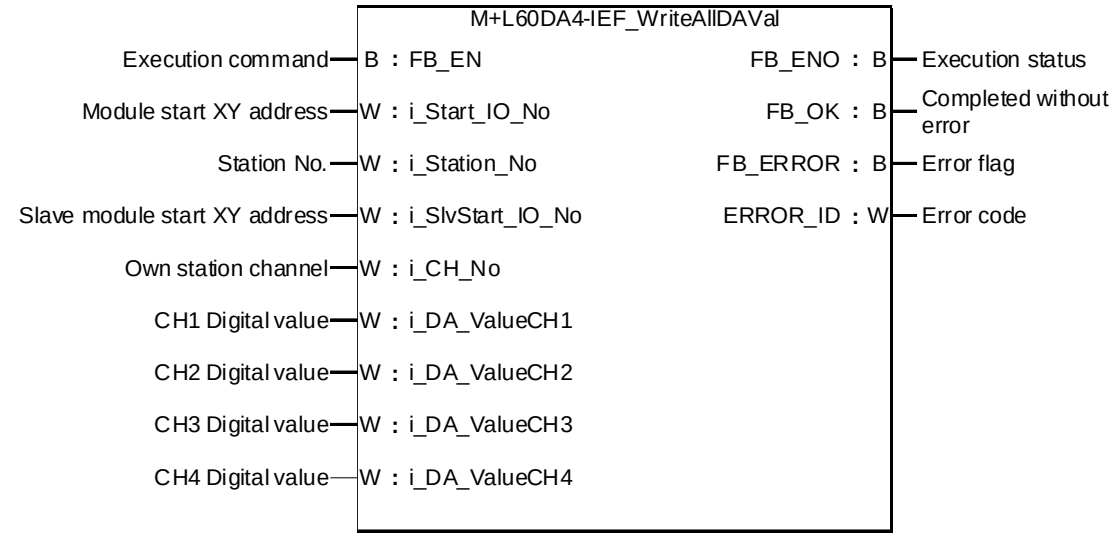
This chapter includes information related to the function block.
It does not include information on restrictions of use such as combination with modules or programmable controller CPUs.
Please make sure to read user's manuals for the corresponding products before using the products.

2.2 M+L60DA4-IEF_WriteAllDAVal (Write D/A conversion data (all CHs))

FB Name

M+L60DA4-IEF_WriteAllDAVal

Function Overview

<table>
<tr><th>Item</th><th colspan="2">Description</th></tr>
<tr><td>Function overview</td><td colspan="2">Writes the D/A conversion data of all channels.</td></tr>
<tr><td>Symbol</td><td colspan="2"> 
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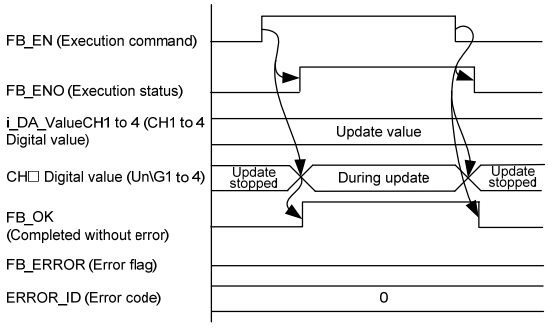
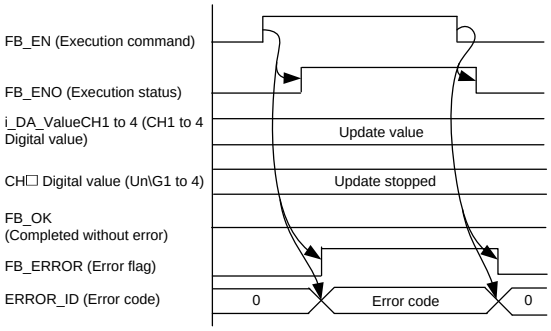
</table>
*1 For software versions applicable to the modules used, refer to "Relevant manuals".</td></tr>
</table>

Item	Description
Programming language	Ladder
Number of steps	368 steps (for MELSEC-Q series universal model CPU) * The number of steps of the FB in a program depends on the CPU model that is used and input and output definition.
Function description	1) By turning ON FB_EN (Execution command), the digital values of all channels are written. 2) The digital value to be written depends on the output range setting. When the scaling function of the L60DA4 is enabled, the digital value is scaled before the D/A conversion. 3) When the network configuration setting of the station number specified by i_Station_No is incorrect, FB_ERROR is turned ON and the processing is interrupted, and the error code 50 (decimal) is stored in ERROR_ID (Error code). Refer to the error code explanation section for details. 4) When the CC-Link IE field network error occurs, 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. 5) When the digital value is set in the auto refresh setting of the intelligent function module, this FB is unnecessary.
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) When operating this FB together with other FBs, make sure that the channels used by the own station are not duplicated. 5) This FB uses index registers Z5 to Z7, and Z9. Please do not use these index registers in an interrupt program. 6) Every input must be provided with a value for proper FB operation. 7) To operate the L60DA4, set the output 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). 8) This FB uses cyclic and transient transmission. Therefore, an interlock program for cyclic and transient transmission is required. 9) Set the refresh device of the network parameter setting according to Section "1.4(3) Refresh parameters". 10) Set the global label setting according to Section "1.5 Setting Global Labels". 11) Only one master/local module can be controlled by the CC-Link IE Field system FB. To control 2 or more master/local modules by the FB, refer to "Appendix 1 When Using the FB for 2 or More Master/Local Modules".
FB operation type	Real-time execution
Application example	Refer to "Appendix 2 FB Library Application Examples".
Timing chart	[When operation completes without error]  [When an error occurs] 

Item	Description
Relevant manuals	•MELSEC-L Digital-Analog Converter Module User's Manual •MELSEC-Q CC-Link IE Field Network Master/Local Module User's Manual •MELSEC-L CC-Link IE Field Network Master/Local Module User's Manual •MELSEC-L CC-Link IE Field Network Head Module User's Manual •QCPU User's Manual (Hardware Design, Maintenance and Inspection) •MELSEC-L CPU Module 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
50 (Decimal)	The network configuration setting of the station number specified by i_Station_No is incorrect.	Review the following setting. •Network configuration setting Refer to Section 1.4(2) Network configuration setting. •The value entered in i_Station_No
D000 to DAF9 (Hexadecimal)	A CC-Link IE field network error has occurred at the system configuration.	For details, refer to Error Code List of MELSEC-Q/L CC-Link IE Field Network Master/Local Module User's Manual

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 L60DA4 is connected. (For example, enter H10 for X10.)
Station No.	i_Station_No	Word	1 to 120	Specify the target station number.
Slave module start XY address	i_SlvStart_IO_No	Word	Depends on the I/O point range of the head module. For details, refer to the head module user's manual.	Specify the starting XY address (in hexadecimal) where the L60DA4 is connected. (For example, enter H10 for X10.)
Own station channel	i_CH_No	Word	1 to 32	Specify the channel for own station.
CH1 Digital value	i_DA_ValueCH1	Word	-32,000 to 32,000 *1	Specify the digital value of channel 1. *1 The available setting range differs depending on the scaling function and output range setting.
CH2 Digital value	i_DA_ValueCH2	Word	-32,000 to 32,000 *1	Specify the digital value of channel 2. *1 The available setting range differs depending on the scaling function and output range setting.
CH3 Digital value	i_DA_ValueCH3	Word	-32,000 to 32,000 *1	Specify the digital value of channel 3. *1 The available setting range differs depending on the scaling function and output range setting.

Name (Comment)	Label name	Data type	Setting range	Description
CH4 Digital value	i_DA_ValueCH4	Word	-32,000 to 32,000 *1	Specify the digital value of channel 4. *1 The available setting range differs depending on the scaling function and output range setting.

● 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 value is being written.
Error flag	FB_ERROR	Bit	OFF	When ON, it indicates that an error has occurred.
Error code	ERROR_ID	Word	0	FB error code output.

FB Version Upgrade History

Version	Date	Description
1.00A	2013/02/22	First edition

Note

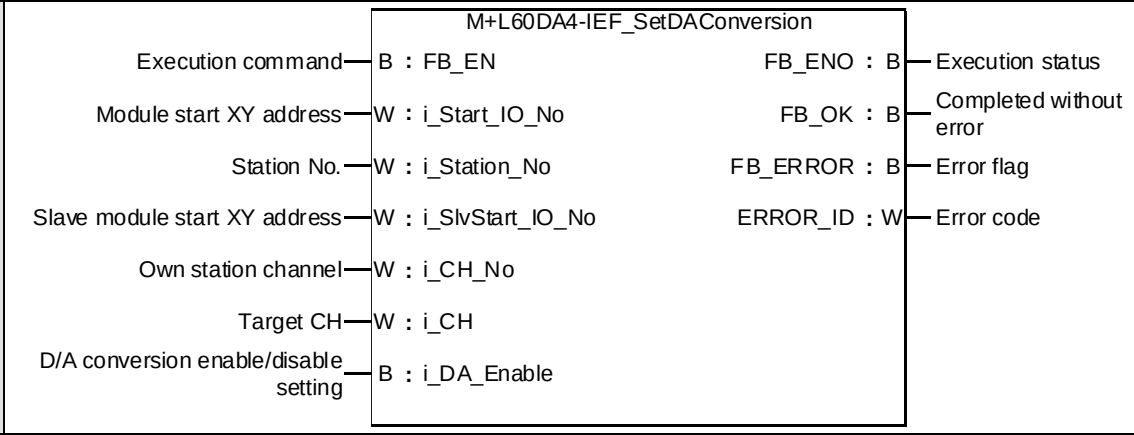
This chapter includes information related to the function block.
It does not include information on restrictions of use such as combination with modules or programmable controller CPUs.
Please make sure to read user's manuals for the corresponding products before using the products.

2.3 M+L60DA4-IEF_SetDAConversion (D/A conversion enable/disable setting)

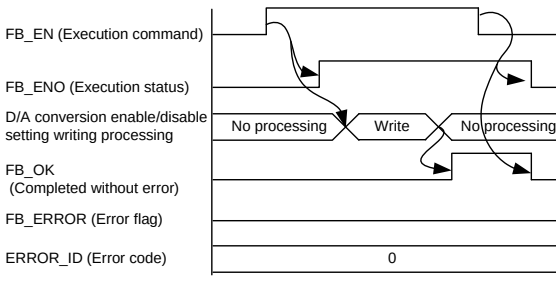
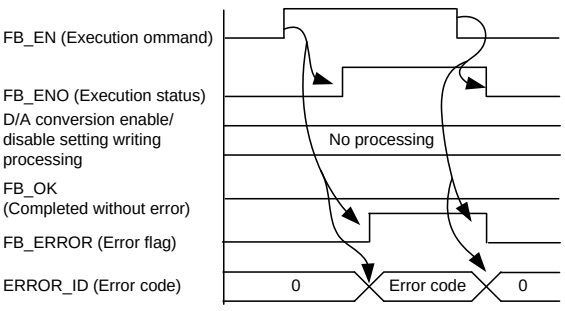
FB Name

M+L60DA4-IEF_SetDAConversion

Function Overview

<table>
<tr><th>Item</th><th colspan="2">Description</th></tr>
<tr><td>Function overview</td><td colspan="2">Enables or disables the D/A conversion for the 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>Digital-analog converter module</td><td>L60DA4</td></tr>
<tr><td>CC-Link IE Field Network module</td><td>CC-Link IE Field Network master/local module
CC-Link IE Field Network head module</td></tr>
<tr><td>CPU module</td><td>
<table>
<tr><th>Series</th><th>Model</th></tr>
<tr><td>MELSEC-Q Series *1</td><td>Universal model QCPU *2</td></tr>
<tr><td>MELSEC-L Series</td><td>LCPU *3</td></tr>
</table>
*1 Not applicable to QCPU-A (A mode)
*2 The first five digits of the serial number are "12012" or later.
*3 The first five digits of the serial number are "13012" or later.
</td></tr>
<tr><td></td><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>
</table>

Item	Description
Number of steps	491 steps (for MELSEC-Q series universal model CPU) * The number of steps of the FB in a program depends on the CPU model that is used and input and output definition.
Function description	1) By turning ON FB_EN (Execution command), the D/A 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 (RYn9) is turned OFF → ON → OFF or the Operating condition setting request FB (M+L60DA4-IEF_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 10 (decimal) is stored in ERROR_ID (Error code). Refer to the error code explanation section for details. 5) When the network configuration setting of the station number specified by i_Station_No is incorrect, FB_ERROR is turned ON and the processing is interrupted, and the error code 50 (decimal) is stored in ERROR_ID (Error code). Refer to the error code explanation section for details. 6) When the CC-Link IE field network error occurs, 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

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) When operating this FB together with other FBs, make sure that the channels used by the own station are not duplicated. 5) When two or more of these FBs are used, precaution must be taken to avoid repetition of the target channel. 6) This FB uses index registers Z4 to Z7 and Z9. Please do not use these index registers in an interrupt program. 7) Every input must be provided with a value for proper FB operation. 8) If the parameter is set using the configuration function of GX Configurator-DA or GX Works2, using this FB is unnecessary. 9) To operate the L60DA4, set the output 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). 10) This FB uses cyclic and transient transmission. Therefore, an interlock program for cyclic and transient transmission is required. 11) Set the refresh device of the network parameter setting according to Section "1.4(3) Refresh parameters". 12) Set the global label setting according to Section "1.5 Setting Global Labels". 13) Only one master/local module can be controlled by the CC-Link IE Field system FB. To control 2 or more master/local modules by the FB, refer to "Appendix 1 When Using the FB for 2 or More Master/Local Modules".
FB operation type	Pulsed execution (multiple scan execution type)
Application example	Refer to "Appendix 2 FB Library Application Examples".
Timing chart	[When operation completes without error]  [When an error occurs] 

Item	Description
Relevant manuals	•MELSEC-L Digital-Analog Converter Module User's Manual •MELSEC-Q CC-Link IE Field Network Master/Local Module User's Manual •MELSEC-L CC-Link IE Field Network Master/Local Module User's Manual •MELSEC-L CC-Link IE Field Network Head Module User's Manual •QCPU User's Manual (Hardware Design, Maintenance and Inspection) •MELSEC-L CPU Module 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.
50 (Decimal)	The network configuration setting of the station number specified by i_Station_No is incorrect.	Review the following setting. •Network configuration setting Refer to Section 1.4(2) Network configuration setting. •The value entered in i_Station_No
D000 to DAF9 (Hexadecimal)	A CC-Link IE field network error has occurred at the system configuration.	For details, refer to Error Code List of MELSEC-Q/L CC-Link IE Field Network Master/Local Module User's Manual

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 L60DA4 is connected. (For example, enter H10 for X10.)
Station No.	i_Station_No	Word	1 to 120	Specify the target station number.
Slave module start XY address	i_SlvStart_IO_No	Word	Depends on the I/O point range of the head module. For details, refer to the head module user's manual.	Specify the starting XY address (in hexadecimal) where the L60DA4 is connected. (For example, enter H10 for X10.)
Own station channel	i_CH_No	Word	1 to 32	Specify the channel for own station.
Target CH	i_CH	Word	1 to 4 and 15	1 to 4: Specify the channel number. 15: Specify all the channels.

Name (Comment)	Label name	Data type	Setting range	Description
D/A conversion enable/disable setting	i_DA_Enable	Bit	ON, OFF	ON: D/A conversion enabled OFF: D/A 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	2013/02/22	First edition

Note

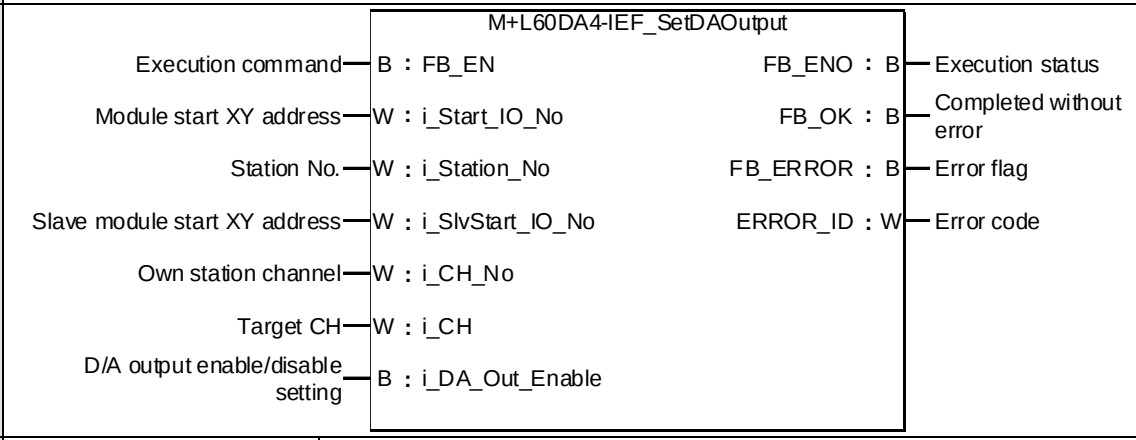
This chapter includes information related to the function block.
It does not include information on restrictions of use such as combination with modules or programmable controller CPUs.
Please make sure to read user's manuals for the corresponding products before using the products.

2.4 M+L60DA4-IEF_SetDAOutput (D/A output enable/disable setting)

FB Name

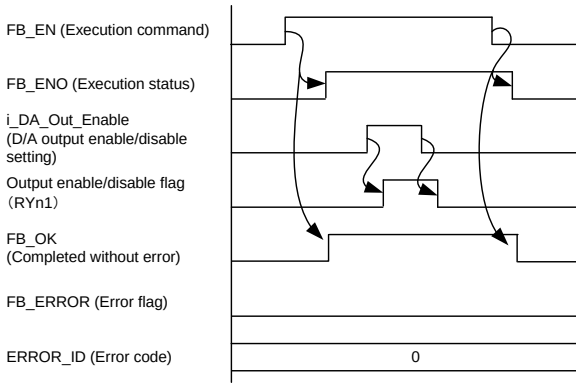
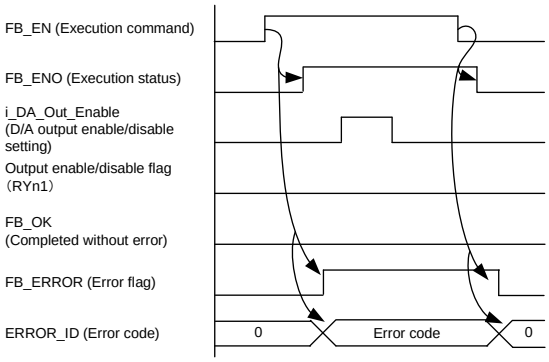
M+L60DA4-IEF_SetDAOutput

Function Overview

<table>
<tr><th>Item</th><th colspan="2">Description</th></tr>
<tr><td>Function overview</td><td colspan="2">Enables or disables the D/A output for the specified channel or all channels.</td></tr>
<tr><td>Symbol</td><td colspan="2"> 
</td></tr>
<tr><td rowspan="4">Applicable hardware and software</td><td>Digital-analog converter module</td><td>L60DA4</td></tr>
<tr><td>CC-Link IE Field Network module</td><td>CC-Link IE Field Network master/local module
CC-Link IE Field Network head module</td></tr>
<tr><td>CPU module</td><td>
<table>
<tr><th>Series</th><th>Model</th></tr>
<tr><td>MELSEC-Q Series *1</td><td>Universal model QCPU *2</td></tr>
<tr><td>MELSEC-L Series</td><td>LCPU *3</td></tr>
</table>
*1 Not applicable to QCPU-A (A mode)
*2 The first five digits of the serial number are "12012" or later.
*3 The first five digits of the serial number are "13012" or later.
</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>
</table>

Item	Description
Number of steps	423 steps (for MELSEC-Q series universal model CPU) * The number of steps of the FB in a program depends on the CPU model that is used and input and output definition.
Function description	1) By turning ON FB_EN (Execution command), the D/A output enable/disable setting for the specified channel or all channels is configured. 2) 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 10 (decimal) is stored in ERROR_ID (Error code). Refer to the error code explanation section for details. 3) When the network configuration setting of the station number specified by i_Station_No is incorrect, FB_ERROR is turned ON and the processing is interrupted, and the error code 50 (decimal) is stored in ERROR_ID (Error code). Refer to the error code explanation section for details.
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) When operating this FB together with other FBs, make sure that the channels used by the own station are not duplicated. 5) When two or more of these FBs are used, precaution must be taken to avoid repetition of the target channel. 6) This FB uses index registers Z4 to Z7 and Z9. Please do not use these index registers in an interrupt program. 7) Every input must be provided with a value for proper FB operation. 8) If the parameter is set using the configuration function of GX Configurator-DA or GX Works2, using this FB is unnecessary. 9) 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. 10) To operate the L60DA4, set the output 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). 11) This FB uses cyclic transmission. Therefore, an interlock program for cyclic transmission is required. 12) Set the refresh device of the network parameter setting according to Section "1.4(3) Refresh parameters". 13) Set the global label setting according to Section "1.5 Setting Global Labels". 14) Only one master/local module can be controlled by the CC-Link IE Field system FB. To control 2 or more master/local modules by the FB, refer to "Appendix 1 When Using the FB for 2 or More Master/Local Modules".
FB operation type	Real-time execution
Application example	Refer to "Appendix 2 FB Library Application Examples".

Item	Description
Timing chart	[When operation completes without error] (CH1)  [When an error occurs] (CH1) 
Relevant manuals	•MELSEC-L Digital-Analog Converter Module User's Manual •MELSEC-Q CC-Link IE Field Network Master/Local Module User's Manual •MELSEC-L CC-Link IE Field Network Master/Local Module User's Manual •MELSEC-L CC-Link IE Field Network Head Module User's Manual •QCPU User's Manual (Hardware Design, Maintenance and Inspection) •MELSEC-L CPU Module 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. Set 1 to 4 or 15 to the target channel.	Please try again after confirming the setting.
50 (Decimal)	The network configuration setting of the station number specified by i_Station_No is incorrect.	Review the following setting. •Network configuration setting Refer to Section 1.4(2) Network configuration setting. •The value entered in i_Station_No

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 L60DA4 is connected. (For example, enter H10 for X10.)
Station No.	i_Station_No	Word	1 to 120	Specify the target station number.
Slave module start XY address	i_SlvStart_IO_No	Word	Depends on the I/O point range. For details, refer to the head module user's manual.	Specify the starting XY address (in hexadecimal) where the L60DA4 is connected. (For example, enter H10 for X10.)
Own station channel	i_CH_No	Word	1 to 32	Specify the channel for own station.
Target CH	i_CH	Word	1 to 4 and 15	1 to 4: Specify the channel number. 15: Specify all the channels.
D/A output enable/disable setting	i_DA_Out_Enable	Bit	ON, OFF	ON: D/A output enabled OFF: D/A output 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 FB is being executed properly.
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	2013/02/22	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.

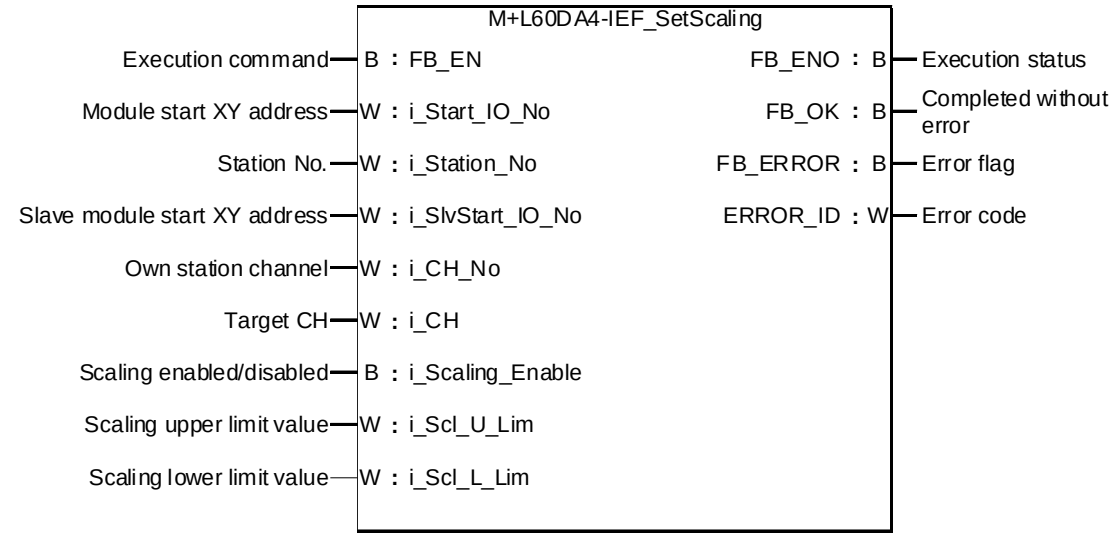
Please make sure to read user's manuals for the corresponding products before using the products.

2.5 M+L60DA4-IEF_SetScaling (Scaling setting)

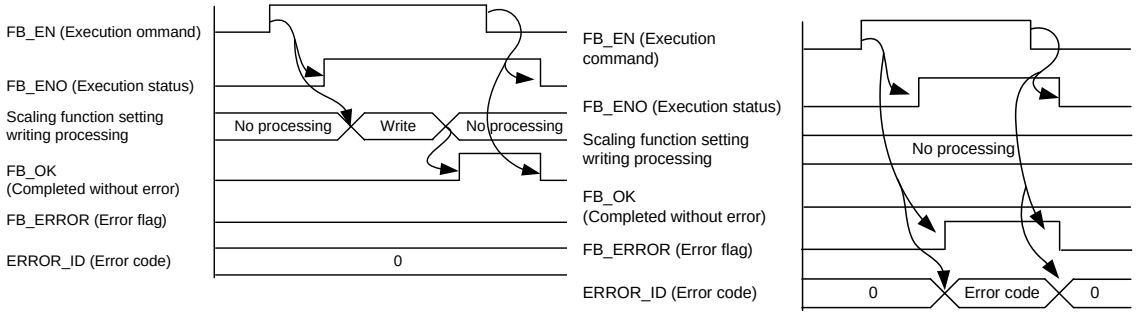
FB Name

M+L60DA4-IEF_SetScaling

Function Overview

<table>
<tr><th>Item</th><th colspan="2">Description</th></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>Digital-analog converter module</td><td>L60DA4</td></tr>
<tr><td>CC-Link IE Field Network module</td><td>CC-Link IE Field Network master/local module
CC-Link IE Field Network head module</td></tr>
<tr><td>CPU module</td><td>
<table>
<tr><th>Series</th><th>Model</th></tr>
<tr><td>MELSEC-Q Series *1</td><td>Universal model QCPU *2</td></tr>
<tr><td>MELSEC-L Series</td><td>LCPU *3</td></tr>
</table>
*1 Not applicable to QCPU-A (A mode)
*2 The first five digits of the serial number are "12012" or later.
*3 The first five digits of the serial number are "13012" or later.</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>

Item	Description
Programming language	Ladder
Number of steps	521 steps (for MELSEC-Q series universal model CPU) * The number of steps of the FB in a program depends on the CPU model that is used and input and output definition.
Function description	1) By turning ON FB_EN (Execution command), 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 (RYn9) is turned OFF → ON → OFF or the Operating condition setting request FB (M+L60DA4-IEF_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 10 (decimal) is stored in ERROR_ID (Error code). Refer to the error code explanation section for details. 5) When the network configuration setting of the station number specified by i_Station_No is incorrect, FB_ERROR is turned ON and the processing is interrupted, and the error code 50 (decimal) is stored in ERROR_ID (Error code). Refer to the error code explanation section for details. 6) When the CC-Link IE field network error occurs, 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

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) When operating this FB together with other FBs, make sure that the channels used by the own station are not duplicated. 5) When two or more of these FBs are used, precaution must be taken to avoid repetition of the target channel. 6) This FB uses index registers Z4 to Z7 and Z9. Please do not use these index registers in an interrupt program. 7) Every input must be provided with a value for proper FB operation. 8) If the parameter is set using the configuration function of GX Configurator-DA or GX Works2, using this FB is unnecessary. 9) To operate the L60DA4, set the output 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). 10) This FB uses cyclic and transient transmission. Therefore, an interlock program for cyclic and transient transmission is required. 11) Set the refresh device of the network parameter setting according to "1.4(3) Refresh parameters". 12) Set the global label setting according to Section "1.5 Setting Global Labels". 13) Only one master/local module can be controlled by the CC-Link IE Field system FB. To control 2 or more master/local modules by the FB, refer to "Appendix 1 When Using the FB for 2 or More Master/Local Modules".
FB operation type	Pulsed execution (multiple scan execution type)
Application example	Refer to "Appendix 2 FB Library Application Examples".
Timing chart	[When operation completes without error] [When an error occurs] 

Item	Description
Relevant manuals	•MELSEC-L Digital-Analog Converter Module User's Manual •MELSEC-Q CC-Link IE Field Network Master/Local Module User's Manual •MELSEC-L CC-Link IE Field Network Master/Local Module User's Manual •MELSEC-L CC-Link IE Field Network Head Module User's Manual •QCPU User's Manual (Hardware Design, Maintenance and Inspection) •MELSEC-L CPU Module 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.
50 (Decimal)	The network configuration setting of the station number specified by i_Station_No is incorrect.	Review the following setting. •Network configuration setting Refer to Section 1.4(2) Network configuration setting. •The value entered in i_Station_No
D000 to DAF9 (Hexadecimal)	A CC-Link IE field network error has occurred at the system configuration.	For details, refer to Error Code List of MELSEC-Q/L CC-Link IE Field Network Master/Local Module User's Manual

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 L60DA4 is connected. (For example, enter H10 for X10.)
Station No.	i_Station_No	Word	1 to 120	Specify the target station number.
Slave module start XY address	i_SlvStart_IO_No	Word	Depends on the I/O point range of the head module. For details, refer to the head module user's manual.	Specify the starting XY address (in hexadecimal) where the L60DA4 is connected. (For example, enter H10 for X10.)
Own station channel	i_CH_No	Word	1 to 32	Specify the channel for own station.
Target CH	i_CH	Word	1 to 4	Specify the channel number.
Scaling enabled/disabled	i_Scaling_Enable	Bit	ON, OFF	ON: Enabled OFF: Disabled

Name (Comment)	Label name	Data type	Setting range	Description
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	2013/02/22	First edition

Note

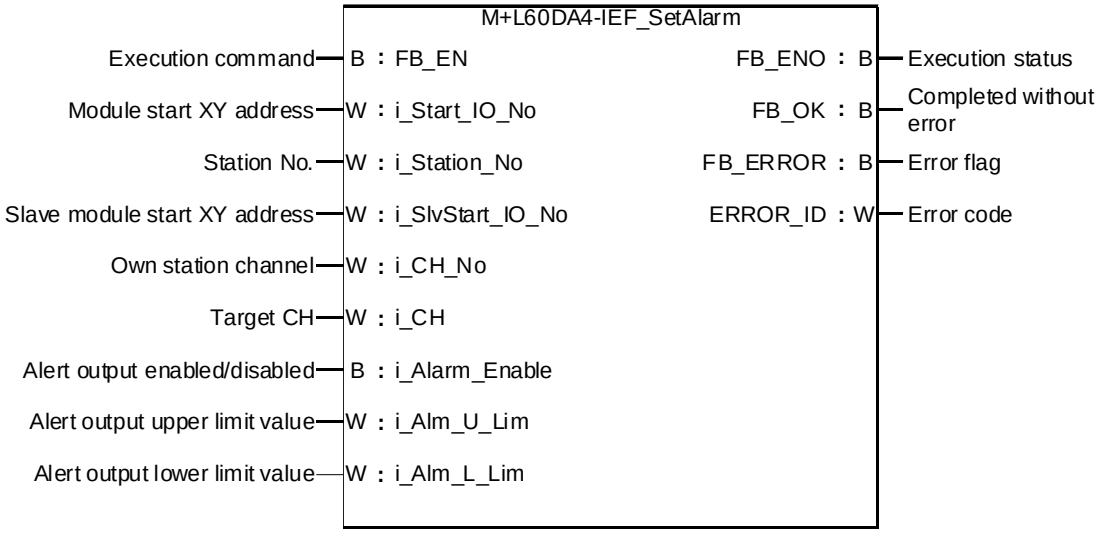
This chapter includes information related to the function block.
It does not include information on restrictions of use such as combination with modules or programmable controller CPUs.
Please make sure to read user's manuals for the corresponding products before using the products.

2.6 M+L60DA4-IEF_SetAlarm (Alert output setting)

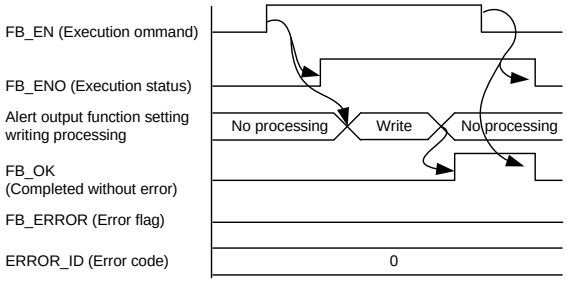
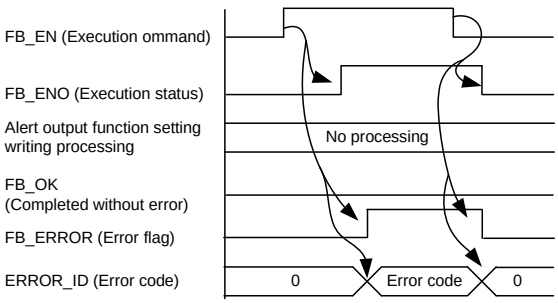
FB Name

M+L60DA4-IEF_SetAlarm

Function Overview

<table>
<tr><th>Item</th><th colspan="2">Description</th></tr>
<tr><td>Function overview</td><td colspan="2">Sets the alert output 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>Digital-analog converter module</td><td>L60DA4</td></tr>
<tr><td>CC-Link IE Field Network module</td><td>CC-Link IE Field Network master/local module
CC-Link IE Field Network head module</td></tr>
<tr><td>CPU module</td><td>
<table>
<tr><th>Series</th><th>Model</th></tr>
<tr><td>MELSEC-Q Series *1</td><td>Universal model QCPU *2</td></tr>
<tr><td>MELSEC-L Series</td><td>LCPU *3</td></tr>
</table>
*1 Not applicable to QCPU-A (A mode)
*2 The first five digits of the serial number are "12012" or later.
*3 The first five digits of the serial number are "13012" or later.</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>

Item	Description
Programming language	Ladder
Number of steps	524 steps (for MELSEC-Q series universal model CPU) * The number of steps of the FB in a program depends on the CPU model that is used and input and output definition.
Function description	1) By turning ON FB_EN (Execution command), the alert output 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 (RYn9) is turned OFF → ON → OFF or the Operating condition setting request FB (M+L60DA4-IEF_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 10 (decimal) is stored in ERROR_ID (Error code). Refer to the error code explanation section for details. 5) When the network configuration setting of the station number specified by i_Station_No is incorrect, FB_ERROR is turned ON and the processing is interrupted, and the error code 50 (decimal) is stored in ERROR_ID (Error code). Refer to the error code explanation section for details. 6) When the CC-Link IE field network error occurs, 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

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) When operating this FB together with other FBs, make sure that the channels used by the own station are not duplicated. 5) When two or more of these FBs are used, precaution must be taken to avoid repetition of the target channel. 6) This FB uses index registers Z4 to Z7 and Z9. Please do not use these index registers in an interrupt program. 7) Every input must be provided with a value for proper FB operation. 8) If the parameter is set using the configuration function of GX Configurator-DA or GX Works2, using this FB is unnecessary. 9) To operate the L60DA4, set the output 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). 10) This FB uses cyclic and transient transmission. Therefore, an interlock program for cyclic and transient transmission is required. 11) Set the refresh device of the network parameter setting according to Section "1.4(3) Refresh parameters". 12) Set the global label setting according to Section "1.5 Setting Global Labels". 13) Only one master/local module can be controlled by the CC-Link IE Field system FB. To control 2 or more master/local modules by the FB, refer to "Appendix 1 When Using the FB for 2 or More Master/Local Modules".
FB operation type	Pulsed execution (multiple scan execution type)
Application example	Refer to "Appendix 2 FB Library Application Examples".
Timing chart	[When operation completes without error]  [When an error occurs] 

Item	Description
Relevant manuals	•MELSEC-L Digital-Analog Converter Module User's Manual •MELSEC-Q CC-Link IE Field Network Master/Local Module User's Manual •MELSEC-L CC-Link IE Field Network Master/Local Module User's Manual •MELSEC-L CC-Link IE Field Network Head Module User's Manual •QCPU User's Manual (Hardware Design, Maintenance and Inspection) •MELSEC-L CPU Module 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.
50 (Decimal)	The network configuration setting of the station number specified by i_Station_No is incorrect.	Review the following setting. •Network configuration setting Refer to Section 1.4(2) Network configuration setting. •The value entered in i_Station_No
D000 to DAF9 (Hexadecimal)	A CC-Link IE field network error has occurred at the system configuration.	For details, refer to Error Code List of MELSEC-Q/L CC-Link IE Field Network Master/Local Module User's Manual

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 L60DA4 is connected. (For example, enter H10 for X10.)
Station No.	i_Station_No	Word	1 to 120	Specify the target station number.
Slave module start XY address	i_SlvStart_IO_No	Word	Depends on the I/O point range of the head module. For details, refer to the head module user's manual.	Specify the starting XY address (in hexadecimal) where the L60DA4 is connected. (For example, enter H10 for X10.)
Own station channel	i_CH_No	Word	1 to 32	Specify the channel for own station.
Target CH	i_CH	Word	1 to 4	Specify the channel number.
Alert output enabled/disabled	i_Alarm_Enable	Bit	ON, OFF	ON: Enabled OFF: Disabled

Name (Comment)	Label name	Data type	Setting range	Description
Alert output upper limit value	i_Alm_U_Lim	Word	-32,768 to 32,767	Specify the alert output upper limit value.
Alert output lower limit value	i_Alm_L_Lim	Word	-32,768 to 32,767	Specify the alert output 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 alert output 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	2013/02/22	First edition

Note

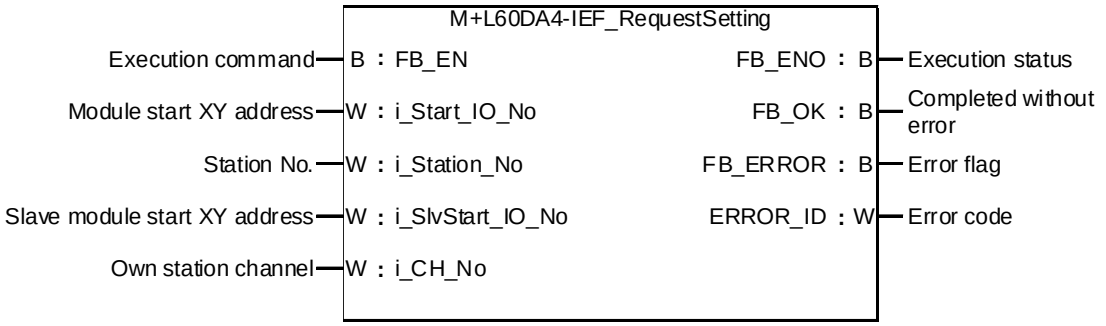
This chapter includes information related to the function block.
It does not include information on restrictions of use such as combination with modules or programmable controller CPUs.
Please make sure to read user's manuals for the corresponding products before using the products.

2.7 M+L60DA4-IEF_RequestSetting (Operating condition setting request)

FB Name

M+L60DA4-IEF_RequestSetting

Function Overview

<table>
<tr><th>Item</th><th colspan="2">Description</th></tr>
<tr><td>Function overview</td><td colspan="2">Validates the setting contents of each function.</td></tr>
<tr><td>Symbol</td><td colspan="2"> 
</td></tr>
<tr><td rowspan="3">Applicable hardware and software</td><td>Digital-analog converter module</td><td>L60DA4</td></tr>
<tr><td>CC-Link IE Field Network module</td><td>CC-Link IE Field Network master/local module
CC-Link IE Field Network head module</td></tr>
<tr><td>CPU module</td><td>
<table>
<tr><th>Series</th><th>Model</th></tr>
<tr><td>MELSEC-Q Series *1</td><td>Universal model QCPU *2</td></tr>
<tr><td>MELSEC-L Series</td><td>LCPU *3</td></tr>
</table>
*1 Not applicable to QCPU-A (A mode)
*2 The first five digits of the serial number are "12012" or later.
*3 The first five digits of the serial number are "13012" or later.
</td></tr>
<tr><td></td><td>Engineering software</td><td>GX Works2 *1
<table>
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<tr><td>English version</td><td>Version1.24A or later</td></tr>
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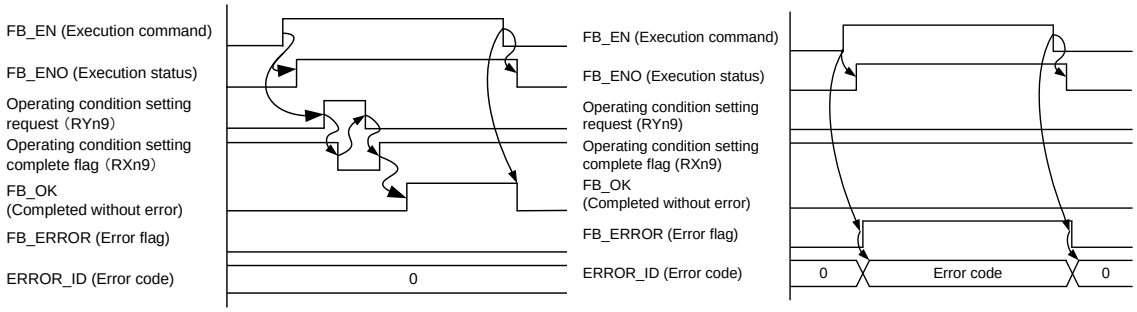
</table>
*1 For software versions applicable to the modules used, refer to "Relevant manuals".
</td></tr>
<tr><td>Programming language</td><td colspan="2">Ladder</td></tr>
<tr><td>Number of steps</td><td colspan="2">321 steps (for MELSEC-Q series universal model CPU)
* The number of steps of the FB in a program depends on the CPU model that is used and input and output definition.</td></tr>
</table>

Item	Description
Function description	1) By turning ON FB_EN (Execution command), the setting contents of all channels are validated. For the setting contents to be validated, refer to MELSEC-L Digital-Analog 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. 3) When the network configuration setting of the station number specified by i_Station_No is incorrect, FB_ERROR is turned ON and the processing is interrupted, and the error code 50 (decimal) is stored in ERROR_ID (Error code). Refer to the error code explanation section for details.
Compiling method	Macro type

Item	Description
Restrictions and precautions	1) When this FB is executed, the D/A conversion is stopped and the D/A output is held. 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) When operating this FB together with other FBs, make sure that the channels used by the own station are not duplicated. 5) The FB cannot be used in an interrupt program. 6) This FB uses index registers Z7 to Z9. Please do not use these index registers in an interrupt program. 7) Every input must be provided with a value for proper FB operation. 8) When this FB is used in two or more places, a duplicated coil warning may occur during compile operation due to the Y signal being operated by index modification. However this is not a problem and the FB will operate without error. 9) To operate the L60DA4, set the output 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). 10) This FB uses cyclic transmission. Therefore, an interlock program for cyclic transmission is required. 11) Set the refresh device of the network parameter setting according to Section "1.4(3) Refresh parameters". 12) Set the global label setting according to Section "1.5 Setting Global Labels". 13) Only one master/local module can be controlled by the CC-Link IE Field system FB. To control 2 or more master/local modules by the FB, refer to "Appendix 1 When Using the FB for 2 or More Master/Local Modules".
FB operation type	Pulsed execution (multiple scan execution type)
Application example	Refer to "Appendix 2 FB Library Application Examples".

Item	Description
Timing chart	[When operation completes without error] [When an error occurs] 
Relevant manuals	•MELSEC-L Digital-Analog Converter Module User's Manual •MELSEC-Q CC-Link IE Field Network Master/Local Module User's Manual •MELSEC-L CC-Link IE Field Network Master/Local Module User's Manual •MELSEC-L CC-Link IE Field Network Head Module User's Manual •QCPU User's Manual (Hardware Design, Maintenance and Inspection) •MELSEC-L CPU Module 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
50 (Decimal)	The network configuration setting of the station number specified by i_Station_No is incorrect.	Review the following setting. •Network configuration setting Refer to Section 1.4(2) Network configuration setting. •The value entered in i_Station_No

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 L60DA4 is connected. (For example, enter H10 for X10.)
Station No.	i_Station_No	Word	1 to 120	Specify the target station number.
Slave module start XY address	i_SlvStart_IO_No	Word	Depends on the I/O point range of the head module. For details, refer to the head module user's manual.	Specify the starting XY address (in hexadecimal) where the L60DA4 is connected. (For example, enter H10 for X10.)
Own station channel	i_CH_No	Word	1 to 32	Specify the channel for own station.

● 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 operation 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	2013/02/22	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.

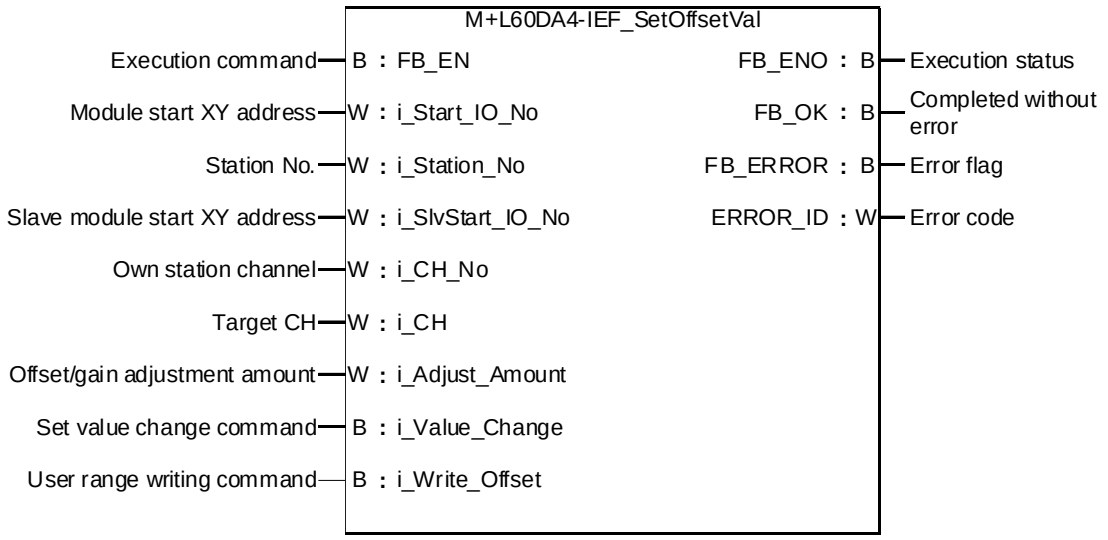
Please make sure to read user's manuals for the corresponding products before using the products.

2.8 M+L60DA4-IEF_SetOffsetVal (Offset setting)

FB Name

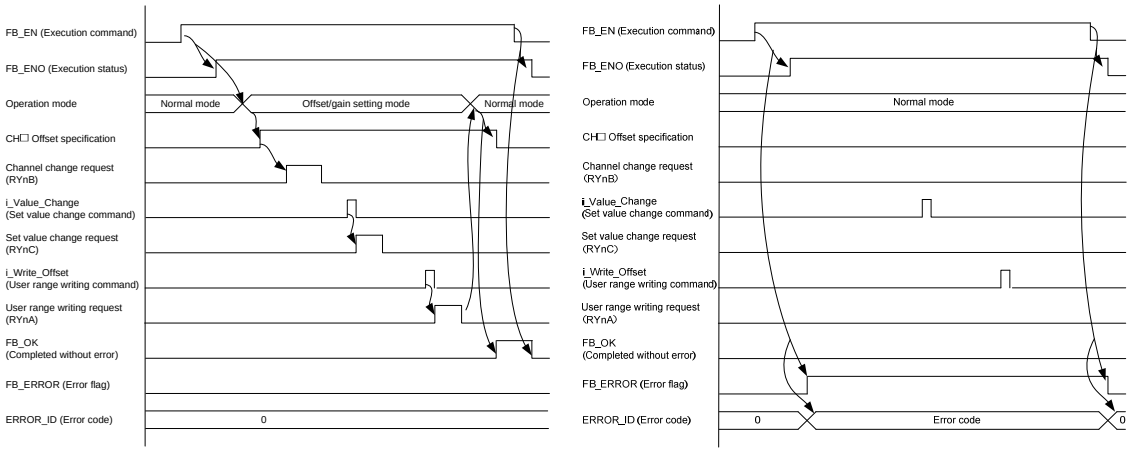
M+L60DA4-IEF_SetOffsetVal

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="4">Applicable hardware and software</td><td>Digital-analog converter module</td><td>L60DA4</td></tr>
<tr><td>CC-Link IE Field Network module</td><td>CC-Link IE Field Network master/local module
CC-Link IE Field Network head module</td></tr>
<tr><td>CPU module</td><td>
<table>
<tr><th>Series</th><th>Model</th></tr>
<tr><td>MELSEC-Q Series *1</td><td>Universal model QCPU *2</td></tr>
<tr><td>MELSEC-L Series</td><td>LCPU *3</td></tr>
</table>
*1 Not applicable to QCPU-A (A mode)
*2 The first five digits of the serial number are "12012" or later.
*3 The first five digits of the serial number are "13012" or later.
</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>

Item	Description
Programming language	Ladder
Number of steps	856 steps (for MELSEC-Q series universal model CPU) * The number of steps of the FB in a program depends on the CPU model that is used and input and output definition.
Function description	1) By turning ON FB_EN (Execution command), the offset value of the specified channel is set. 2) To adjust the D/A output, set i_Adjust_Amount (Offset/gain adjustment amount) and turn ON from OFF i_Value_Change (Set value change command) during the FB_EN (Execution command) ON. 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 10 (decimal) is stored in ERROR_ID (Error code). Refer to the error code explanation section for details. 5) When the network configuration setting of the station number specified by i_Station_No is incorrect, FB_ERROR is turned ON and the processing is interrupted, and the error code 50 (decimal) is stored in ERROR_ID (Error code). Refer to the error code explanation section for details. 6) When the CC-Link IE field network error occurs, 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

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) When operating this FB together with other FBs, make sure that the channels used by the own station are not duplicated. 5) When two or more of these FBs are used, precaution must be taken to avoid repetition of the target channel. 6) This FB uses index registers Z5 to Z9. Please do not use these index registers in an interrupt program. 7) Every input must be provided with a value for proper FB operation. 8) If the offset is set using the configuration function of GX Configurator-DA or GX Works2, using this FB is unnecessary. 9) 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. 10) To operate the L60DA4, set the output 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). 11) This FB uses cyclic and transient transmission. Therefore, an interlock program for cyclic and transient transmission is required. 12) Set the refresh device of the network parameter setting according to Section "1.4(3) Refresh parameters". 13) Set the global label setting according to Section "1.5 Setting Global Labels". 14) Only one master/local module can be controlled by the CC-Link IE Field system FB. To control 2 or more master/local modules by the FB, refer to "Appendix 1 When Using the FB for 2 or More Master/Local Modules".
FB operation type	Pulsed execution (multiple scan execution type)
Application example	Refer to "Appendix 2 FB Library Application Examples".

Item	Description
Timing chart	[When operation completes without error] [When an error occurs] 
Relevant manuals	•MELSEC-L Digital-Analog Converter Module User's Manual •MELSEC-Q CC-Link IE Field Network Master/Local Module User's Manual •MELSEC-L CC-Link IE Field Network Master/Local Module User's Manual •MELSEC-L CC-Link IE Field Network Head Module User's Manual •QCPU User's Manual (Hardware Design, Maintenance and Inspection) •MELSEC-L CPU Module 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.
50 (Decimal)	The network configuration setting of the station number specified by i_Station_No is incorrect.	Review the following setting. •Network configuration setting Refer to Section 1.4(2) Network configuration setting. •The value entered in i_Station_No
D000 to DAF9 (Hexadecimal)	A CC-Link IE field network error has occurred at the system configuration.	For details, refer to Error Code List of MELSEC-Q/L CC-Link IE Field Network Master/Local Module User's Manual

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 L60DA4 is connected. (For example, enter H10 for X10.)
Station No.	i_Station_No	Word	1 to 120	Specify the target station number.
Slave module start XY address	i_SlvStart_IO_No	Word	Depends on the I/O point range of the head module. For details, refer to the head module user's manual.	Specify the starting XY address (in hexadecimal) where the L60DA4 is connected. (For example, enter H10 for X10.)
Own station channel	i_CH_No	Word	1 to 32	Specify the channel for own station.
Target CH	i_CH	Word	1 to 4	Specify the channel number.
Offset/gain adjustment amount	i_Adjust_Amount	Word	-3,000 to 3,000	Specify the adjustment amount for the D/A output adjustment.

Name (Comment)	Label name	Data type	Setting range	Description
Set value change command	i_Value_Change	Bit	ON, OFF	Turn ON for D/A output change. Turn OFF after the D/A output change.
User range writing command	i_Write_Offset	Bit	ON, OFF	Turn ON for the adjusted offset value writing to a flash memory. Turn OFF after the writing.

● 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	2013/02/22	First edition

Note

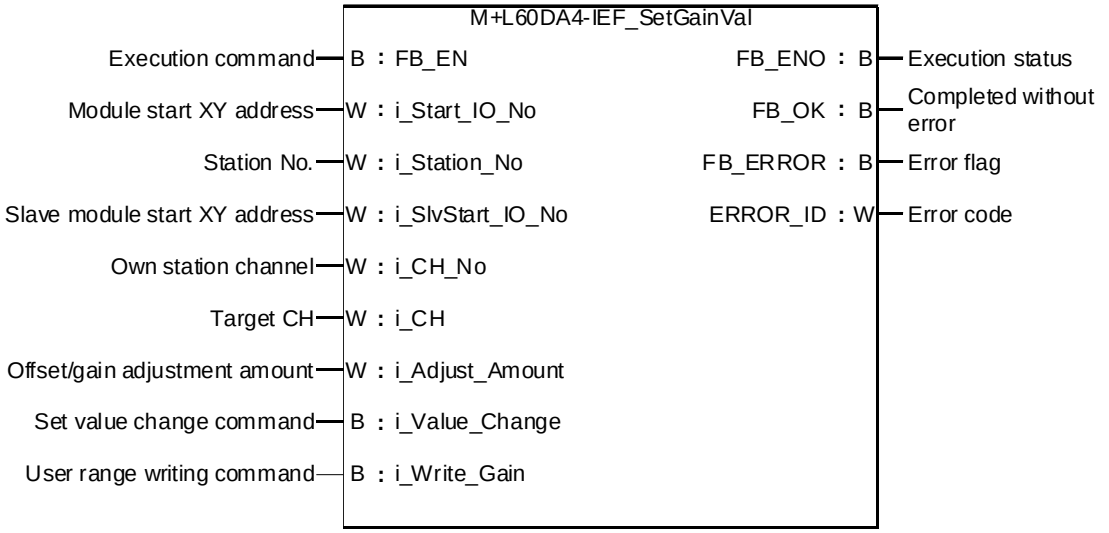
This chapter includes information related to the function block.
It does not include information on restrictions of use such as combination with modules or programmable controller CPUs.
Please make sure to read user's manuals for the corresponding products before using the products.

2.9 M+L60DA4-IEF_SetGainVal (Gain setting)

FB Name

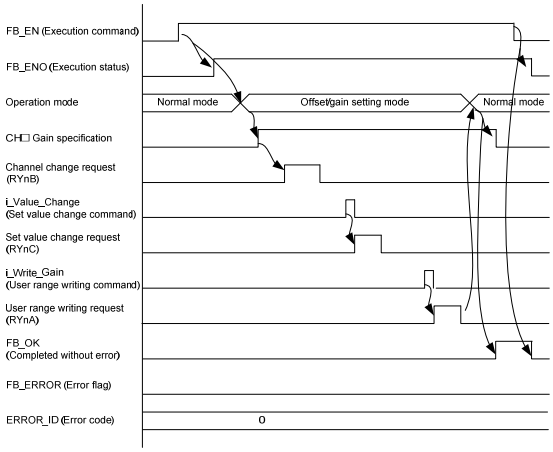
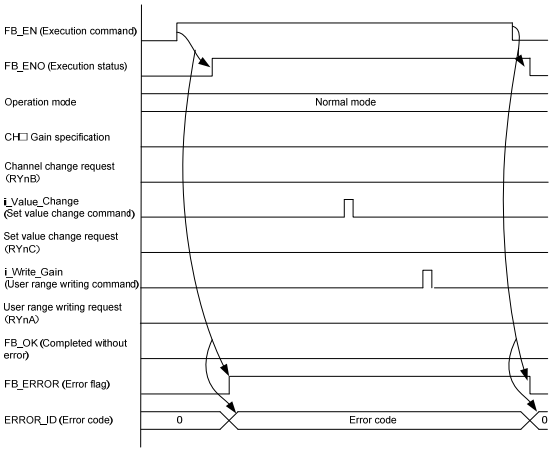
M+L60DA4-IEF_SetGainVal

Function Overview

<table>
<tr><th>Item</th><th colspan="2">Description</th></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="4">Applicable hardware and software</td><td>Digital-analog converter module</td><td>L60DA4</td></tr>
<tr><td>CC-Link IE Field Network module</td><td>CC-Link IE Field Network master/local module
CC-Link IE Field Network head module</td></tr>
<tr><td>CPU module</td><td>
<table>
<tr><th>Series</th><th>Model</th></tr>
<tr><td>MELSEC-Q Series *1</td><td>Universal model QCPU *2</td></tr>
<tr><td>MELSEC-L Series</td><td>LCPU *3</td></tr>
</table>
*1 Not applicable to QCPU-A (A mode)
*2 The first five digits of the serial number are "12012" or later.
*3 The first five digits of the serial number are "13012" or later.
</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>

Item	Description
Programming language	Ladder
Number of steps	854 steps (for MELSEC-Q series universal model CPU) * The number of steps of the FB in a program depends on the CPU model that is used and input and output definition.
Function description	1) By turning ON FB_EN (Execution command), the gain value of the specified channel is set. 2) To adjust the D/A output, set i_Adjust_Amount (Offset/gain adjustment amount) and turn ON from OFF i_Value_Change (Set value change command) during the FB_EN (Execution command) ON. 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 10 (decimal) is stored in ERROR_ID (Error code). Refer to the error code explanation section for details. 5) When the network configuration setting of the station number specified by i_Station_No is incorrect, FB_ERROR is turned ON and the processing is interrupted, and the error code 50 (decimal) is stored in ERROR_ID (Error code). Refer to the error code explanation section for details. 6) When the CC-Link IE field network error occurs, 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

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) When operating this FB together with other FBs, make sure that the channels used by the own station are not duplicated. 5) When two or more of these FBs are used, precaution must be taken to avoid repetition of the target channel. 6) This FB uses index registers Z5 to Z9. Please do not use these index registers in an interrupt program. 7) Every input must be provided with a value for proper FB operation. 8) If the gain is set using the configuration function of GX Configurator-DA or GX Works2, using this FB is unnecessary. 9) 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. 10) To operate the L60DA4, set the output 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). 11) This FB uses cyclic and transient transmission. Therefore, an interlock program for cyclic and transient transmission is required. 12) Set the refresh device of the network parameter setting according to Section "1.4(3) Refresh parameters". 13) Set the global label setting according to Section "1.5 Setting Global Labels". 14) Only one master/local module can be controlled by the CC-Link IE Field system FB. To control 2 or more master/local modules by the FB, refer to "Appendix 1 When Using the FB for 2 or More Master/Local Modules".
FB operation type	Pulsed execution (multiple scan execution type)
Application example	Refer to "Appendix 2 FB Library Application Examples".

Item	Description
Timing chart	[When operation completes without error]  [When an error occurs] 
Relevant manuals	•MELSEC-L Digital-Analog Converter Module User's Manual •MELSEC-Q CC-Link IE Field Network Master/Local Module User's Manual •MELSEC-L CC-Link IE Field Network Master/Local Module User's Manual •MELSEC-L CC-Link IE Field Network Head Module User's Manual •QCPU User's Manual (Hardware Design, Maintenance and Inspection) •MELSEC-L CPU Module 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.
50 (Decimal)	The network configuration setting of the station number specified by i_Station_No is incorrect.	Review the following setting. •Network configuration setting Refer to Section 1.4(2) Network configuration setting. •The value entered in i_Station_No
D000 to DAF9 (Hexadecimal)	A CC-Link IE field network error has occurred at the system configuration.	For details, refer to Error Code List of MELSEC-Q/L CC-Link IE Field Network Master/Local Module User's Manual

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 L60DA4 is connected. (For example, enter H10 for X10.)
Station No.	i_Station_No	Word	1 to 120	Specify the target station number.
Slave module start XY address	i_SlvStart_IO_No	Word	Depends on the I/O point range of the head module. For details, refer to the head module user's manual.	Specify the starting XY address (in hexadecimal) where the L60DA4 is connected. (For example, enter H10 for X10.)
Own station channel	i_CH_No	Word	1 to 32	Specify the channel for own station.
Target CH	i_CH	Word	1 to 4	Specify the channel number.
Offset/gain adjustment amount	i_Adjust_Amount	Word	-3,000 to 3,000	Specify the adjustment amount for the D/A output adjustment.

Name (Comment)	Label name	Data type	Setting range	Description
Set value change command	i_Value_Change	Bit	ON, OFF	Turn ON for D/A output change. Turn OFF after the D/A output change.
User range writing command	i_Write_Gain	Bit	ON, OFF	Turn ON for the adjusted gain value writing to a flash memory. Turn OFF after the writing.

● 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	2013/02/22	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.

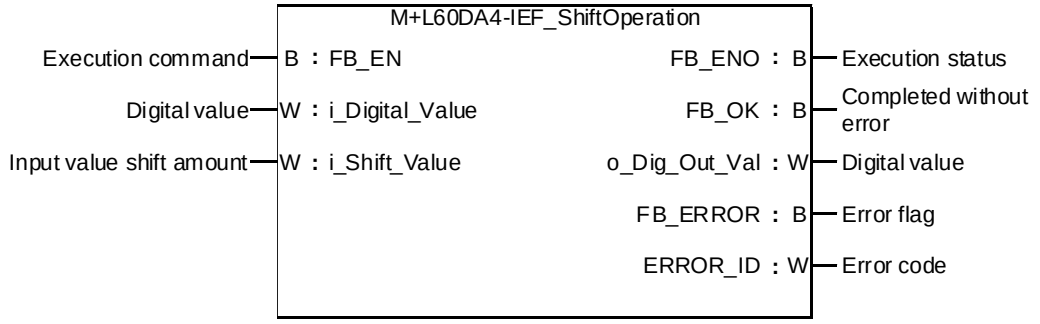
Please make sure to read user's manuals for the corresponding products before using the products.

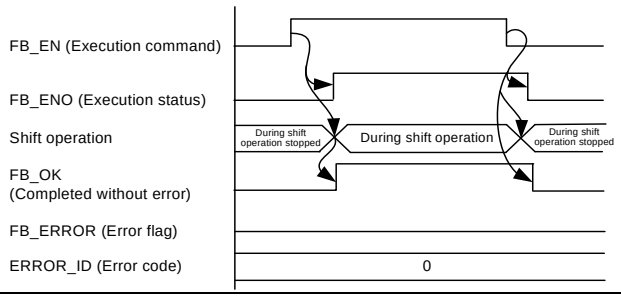
2.10 M+L60DA4-IEF_ShiftOperation (Shift operation)

FB Name

M+L60DA4-IEF_ShiftOperation

Function Overview

<table>
<tr><th>Item</th><th colspan="2">Description</th></tr>
<tr><td>Function overview</td><td colspan="2">Adds the input value shift amount to the digital value.</td></tr>
<tr><td>Symbol</td><td colspan="2"> 
</td></tr>
<tr><td rowspan="3">Applicable hardware and software</td><td>Digital-analog converter module</td><td>L60DA4</td></tr>
<tr><td>CC-Link IE Field Network module</td><td>CC-Link IE Field Network master/local module
CC-Link IE Field Network head module</td></tr>
<tr><td>CPU module</td><td>
<table>
<tr><th>Series</th><th>Model</th></tr>
<tr><td>MELSEC-Q Series *1</td><td>Universal model QCPU *2</td></tr>
<tr><td>MELSEC-L Series</td><td>LCPU *3</td></tr>
</table>
*1 Not applicable to QCPU-A (A mode)
*2 The first five digits of the serial number are "12012" or later.
*3 The first five digits of the serial number are "13012" or later.
</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">199 steps (for MELSEC-Q series universal model CPU)
* The number of steps of the FB in a program depends on the CPU model that is used and input and output definition.</td></tr>
</table>

Item	Description
Function description	1) By turning ON FB_EN (Execution command), i_Shift_Value (Input value shift amount) is added to i_Digital_Value (Digital value). When the addition result falls below -32768 (exceeds 32767), the value is fixed to -32768 (32767).
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 operating this FB together with other FBs, make sure that the channels used by the own station are not duplicated. 5) The D/A converter modules whose first five digits of the product information are "13041" or later has the shift function as a module function. When using the shift function of the module, do not use this FB. 6) Every input must be provided with a value for proper FB operation. 7) To operate the L60DA4, set the output 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). 8) When FB_OK (Normal completion) is ON, o_Dig_Out_Val (Digital output value) is effective. 9) By turning OFF FB_EN, o_Dig_Out_Val (Digital output value) is cleared to 0.
FB operation type	Real-time execution
Application example	Refer to "Appendix 2 FB Library Application Examples".
Timing chart	[When operation completes without error] 

Item	Description
Relevant manuals	•MELSEC-L Digital-Analog Converter Module User's Manual •MELSEC-Q CC-Link IE Field Network Master/Local Module User's Manual •MELSEC-L CC-Link IE Field Network Master/Local Module User's Manual •MELSEC-L CC-Link IE Field Network Head Module User's Manual •QCPU User's Manual (Hardware Design, Maintenance and Inspection) •MELSEC-L CPU Module 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.
Digital value	i_Digital_Value	Word	-32,768 to 32,767	Specify the digital value.
Input value shift amount	i_Shift_Value	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 operation is being executed.
Digital value	o_Dig_Out_Val	Word	0	The digital value to which the input value shift amount is added is stored.
Error flag	FB_ERROR	Bit	OFF	Always OFF
Error code	ERROR_ID	Word	0	Always 0

FB Version Upgrade History

Version	Date	Description
1.00A	2013/02/22	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.

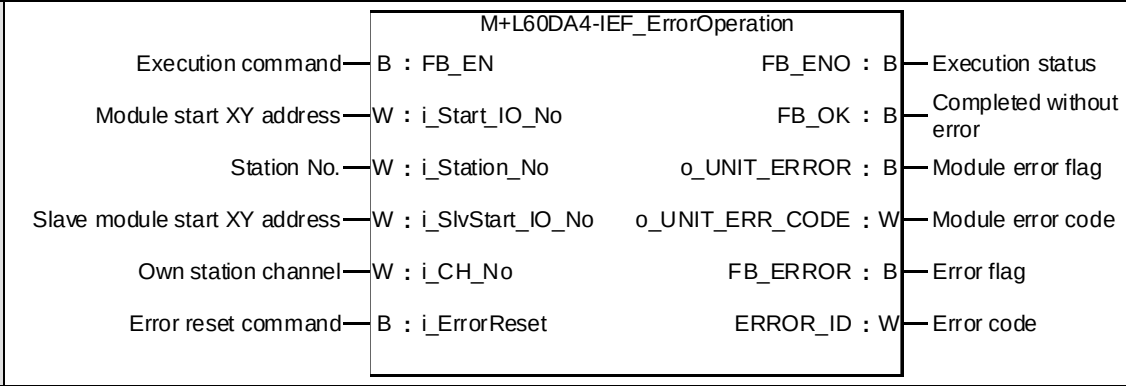
Please make sure to read user's manuals for the corresponding products before using the products.

2.11 M+L60DA4-IEF_ErrorOperation (Error operation)

FB Name

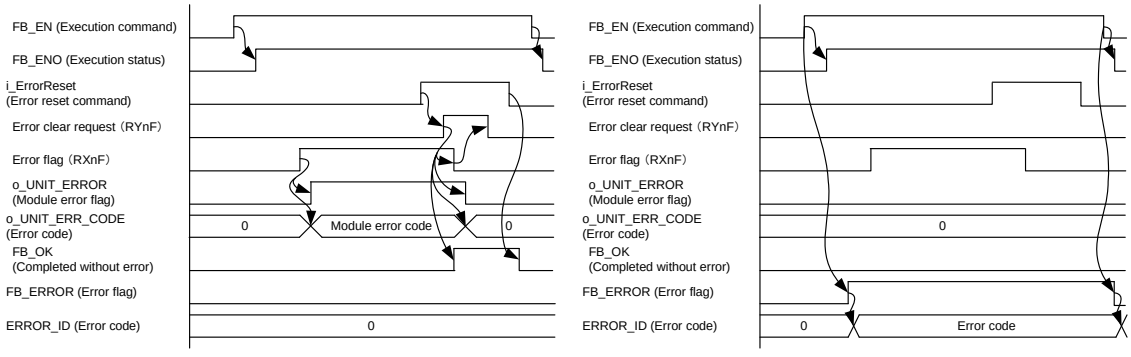
M+L60DA4-IEF_ErrorOperation

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>Digital-analog converter module</td><td>L60DA4</td></tr>
<tr><td>CC-Link IE Field Network module</td><td>CC-Link IE Field Network master/local module
CC-Link IE Field Network head module</td></tr>
<tr><td>CPU module</td><td>
<table>
<tr><th>Series</th><th>Model</th></tr>
<tr><td>MELSEC-Q Series *1</td><td>Universal model QCPU *2</td></tr>
<tr><td>MELSEC-L Series</td><td>LCPU *3</td></tr>
</table>
*1 Not applicable to QCPU-A (A mode)
*2 The first five digits of the serial number are "12012" or later.
*3 The first five digits of the serial number are "13012" or later.
</td></tr>
<tr><td></td><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>
</table>

Item	Description
Number of steps	455 steps (for MELSEC-Q series universal model CPU) * The number of steps of the FB in a program depends on the CPU model that is used and input and output definition.
Function description	1) 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_ErrorReset (Error reset command) is turned ON during error occurrence. 3) When the network configuration setting of the station number specified by i_Station_No is incorrect, FB_ERROR is turned ON and the processing is interrupted, and the error code 50 (decimal) is stored in ERROR_ID (Error code). Refer to the error code explanation section for details. 4) When the CC-Link IE field network error occurs, 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

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) When operating this FB together with other FBs, make sure that the channels used by the own station are not duplicated. 5) This FB uses index registers Z5 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 L60DA4, set the output 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). 9) This FB uses cyclic and transient transmission. Therefore, an interlock program for cyclic and transient transmission is required. 10) Set the refresh device of the network parameter setting according to Section "1.4(3) Refresh parameters". 11) Set the global label setting according to Section "1.5 Setting Global Labels". 12) Only one master/local module can be controlled by the CC-Link IE Field system FB. To control 2 or more master/local modules by the FB, refer to "Appendix 1 When Using the FB for 2 or More Master/Local Modules".
FB operation type	Real-time execution
Application example	Refer to "Appendix 2 FB Library Application Examples".
Timing chart	[When operation completes without error] [When an error occurs]



Item	Description
Relevant manuals	•MELSEC-L Digital-Analog Converter Module User's Manual •MELSEC-Q CC-Link IE Field Network Master/Local Module User's Manual •MELSEC-L CC-Link IE Field Network Master/Local Module User's Manual •MELSEC-L CC-Link IE Field Network Head Module User's Manual •QCPU User's Manual (Hardware Design, Maintenance and Inspection) •MELSEC-L CPU Module 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
50 (Decimal)	The network configuration setting of the station number specified by i_Station_No is incorrect.	Review the following setting. •Network configuration setting Refer to Section 1.4(2) Network configuration setting. •The value entered in i_Station_No
D000 to DAF9 (Hexadecimal)	A CC-Link IE field network error has occurred at the system configuration.	For details, refer to Error Code List of MELSEC-Q/L CC-Link IE Field Network Master/Local Module User's Manual

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 L60DA4 is connected. (For example, enter H10 for X10.)
Station No.	i_Station_No	Word	1 to 120	Specify the target station number.
Slave module start XY address	i_SlvStart_IO_No	Word	Depends on the I/O point range of the head module. For details, refer to the head module user's manual.	Specify the starting XY address (in hexadecimal) where the L60DA4 is connected. (For example, enter H10 for X10.)
Own station channel	i_CH_No	Word	1 to 32	Specify the channel for own station.
Error reset command	i_ErrorReset	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. 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	2013/02/22	First edition

Note

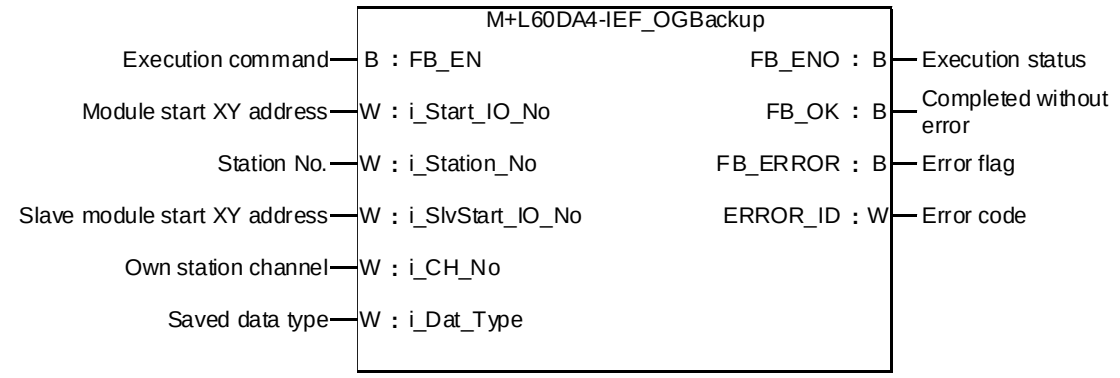
This chapter includes information related to the function block.
It does not include information on restrictions of use such as combination with modules or programmable controller CPUs.
Please make sure to read user's manuals for the corresponding products before using the products.

2.12 M+L60DA4-IEF_OGBackup (Offset/gain value save)

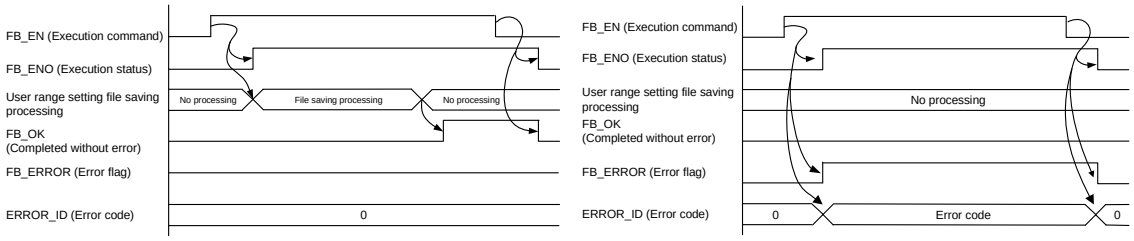
FB Name

M+L60DA4-IEF_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 values in the user range setting and saves them to a file.</td></tr>
<tr><td>Symbol</td><td colspan="2"> 
</td></tr>
<tr><td rowspan="3">Applicable hardware and software</td><td>Digital-analog converter module</td><td>L60DA4</td></tr>
<tr><td>CC-Link IE Field Network module</td><td>CC-Link IE Field Network master/local module
CC-Link IE Field Network head module</td></tr>
<tr><td>CPU module</td><td>
<table>
<tr><th>Series</th><th>Model</th></tr>
<tr><td>MELSEC-Q Series *1</td><td>Universal model QCPU *2</td></tr>
<tr><td>MELSEC-L Series</td><td>LCPU *3</td></tr>
</table>
*1 Not applicable to QCPU-A (A mode)
*2 The first five digits of the serial number are "12012" or later.
*3 The first five digits of the serial number are "13012" or later.
</td></tr>
<tr><td></td><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>
</table>

Item	Description
Number of steps	684 steps (for MELSEC-Q series universal model CPU) * The number of steps of the FB in a program depends on the CPU model that is used and input and output definition.
Function description	1) By turning ON FB_EN (Execution command), the offset/gain value of the user range setting is read and saved in the memory card*1 inserted in the CPU module in a file format. 2) FB operation is one-shot only, triggered by the FB_EN signal. 3) The format for the name of the file that the FB saves in an SD memory card is "LDA_" + "module start XY address" + ".BIN". 4) [File name example] When the module start XY address is "H0120", the file name is "LDA_0120.BIN". 5) When a file with the same name exists in the memory card, the existing file is replaced with a new BIN file created by this FB. 6) When this FB is executed without the memory card installed to the CPU, when the installed memory card does not have enough capacity, or when the number of files to be created exceeds the number of storable files *2, a CPU error *3 occurs. 7) When the network configuration setting of the station number specified by i_Station_No is incorrect, FB_ERROR is turned ON and the processing is interrupted, and the error code 50 (decimal) is stored in ERROR_ID (Error code). Refer to the error code explanation section for details. 8) When the CC-Link IE field network error occurs, 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. *1 For the QCPU, use an ATA memory card, and for the LCPU, use an SD memory card. *2 For the memory card capacity and the number of storable files, refer to QCPU User's Manual (Hardware Design, Maintenance and Inspection) or MELSEC-L CPU Module User's Manual (Hardware Design, Maintenance and Inspection). *3 Setting the operation status of the CPU module (RUN/STOP) when an access error to the 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) When operating this FB together with other FBs, make sure that the channels used by the own station are not duplicated. 5) This FB uses index registers Z5 to Z9. Please do not use these index registers in an interrupt program. 6) In this FB, the user range setting can be saved only in the memory card *1. 7) Every input must be provided with a value for proper FB operation. 8) When this FB is used in two or more places, a duplicated coil warning may occur during compile operation due to the Y signal being operated by index modification. However this is not a problem and the FB will operate without error. 9) To operate the L60DA4, 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). 10) This FB uses cyclic and transient transmission. Therefore, an interlock program for cyclic and transient transmission is required. 11) Set the refresh device of the network parameter setting according to Section "1.4(3) Refresh parameters". 12) Set the global label setting according to Section "1.5 Setting Global Labels". 13) Only one master/local module can be controlled by the CC-Link IE Field system FB. To control 2 or more master/local modules by the FB, refer to "Appendix 1 When Using the FB for 2 or More Master/Local Modules". *1 For the QCPU, use an ATA memory card, and for the LCPU, use an SD memory card.
FB operation type	Pulsed execution (multiple scan execution type)
Application example	Refer to "Appendix 2 FB Library Application Examples".
Timing chart	[When operation completes without error] [When an error occurs] 

Item	Description
Relevant manuals	•MELSEC-L Digital-Analog Converter Module User's Manual •MELSEC-Q CC-Link IE Field Network Master/Local Module User's Manual •MELSEC-L CC-Link IE Field Network Master/Local Module User's Manual •MELSEC-L CC-Link IE Field Network Head Module User's Manual •QCPU User's Manual (Hardware Design, Maintenance and Inspection) •MELSEC-L CPU Module 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

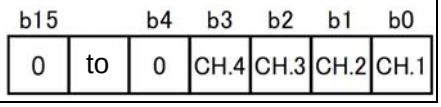
● Error code list

Error code	Description	Action
50 (Decimal)	The network configuration setting of the station number specified by i_Station_No is incorrect.	Review the following setting. •Network configuration setting Refer to Section 1.4(2) Network configuration setting. •The value entered in i_Station_No
D000 to DAF9 (Hexadecimal)	A CC-Link IE field network error has occurred at the system configuration.	For details, refer to Error Code List of MELSEC-Q/L CC-Link IE Field Network Master/Local Module User's Manual

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 L60DA4 is connected. (For example, enter H10 for X10.)
Station No.	i_Station_No	Word	1 to 120	Specify the target station number.

Name (Comment)	Label name	Data type	Setting range	Description
Slave module start XY address	i_SlvStart_IO_No	Word	Depends on the I/O point range of the head module. For details, refer to the head module user's manual.	Specify the starting XY address (in hexadecimal) where the L60DA4 is connected. (For example, enter H10 for X10.)
Own station channel	i_CH_No	Word	1 to 32	Specify the channel for own station.
Saved data type	i_Dat_Type	Word	0 to Fh	Specify the type of the data to be saved 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 saving file 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	2013/02/22	First edition

Note

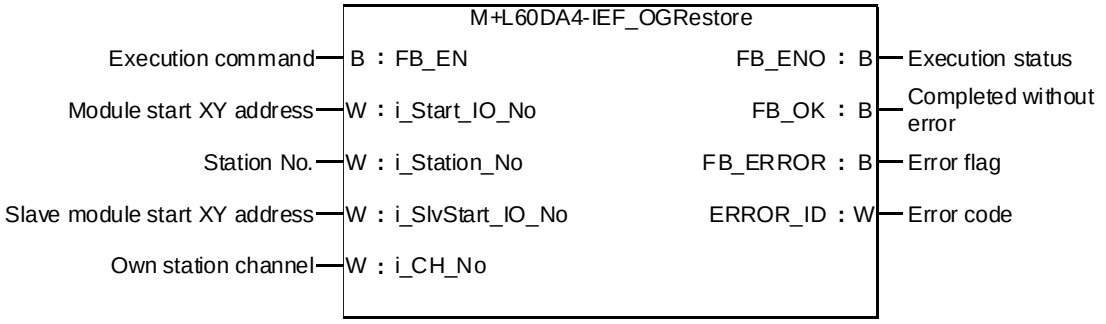
This chapter includes information related to the function block.
It does not include information on restrictions of use such as combination with modules or programmable controller CPUs.
Please make sure to read user's manuals for the corresponding products before using the products.

2.13 M+L60DA4-IEF_OGRestore (Offset/gain value restore)

FB Name

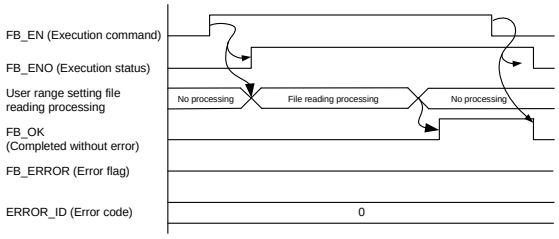
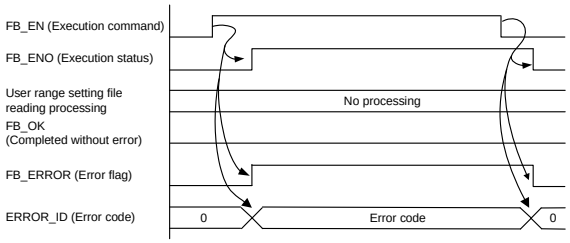
M+L60DA4-IEF_OGRestore

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 saved in the file to the module.</td></tr>
<tr><td>Symbol</td><td colspan="2"> 
</td></tr>
<tr><td rowspan="4">Applicable hardware and software</td><td>Digital-analog converter module</td><td>L60DA4</td></tr>
<tr><td>CC-Link IE Field Network module</td><td>CC-Link IE Field Network master/local module
CC-Link IE Field Network head module</td></tr>
<tr><td>CPU module</td><td>
<table>
<tr><th>Series</th><th>Model</th></tr>
<tr><td>MELSEC-Q Series *1</td><td>Universal model QCPU *2</td></tr>
<tr><td>MELSEC-L Series</td><td>LCPU *3</td></tr>
</table>
*1 Not applicable to QCPU-A (A mode)
*2 The first five digits of the serial number are "12012" or later.
*3 The first five digits of the serial number are "13012" or later.
</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">828 steps (for MELSEC-Q series universal model CPU)
* The number of steps of the FB in a program depends on the CPU model that is used and input and output definition.</td></tr>
</table>

Item	Description
Function description	1) By turning ON FB_EN (Execution command), the offset/gain value in the memory card *1 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 D/A conversion is set to "disabled" for all channels. 4) Execute this FB after executing M+L60DA4-IEF_OGBackup (Offset/gain value save). When reading a file created other than by M+L60DA4-IEF_OGBackup, a Module error (Error code: 163) occurs. 5) The format for the name of the file that the FB reads from an SD memory card is "LDA_" + "module start XY address" + ".BIN". 6) [File name example] When the module start XY address is "H0120", the file name is "LDA_0120.BIN". 7) When this FB is executed without the memory card installed to the CPU or when no target file containing the user range setting exist in the installed memory card, a CPU error *2 occurs. 8) When the network configuration setting of the station number specified by i_Station_No is incorrect, FB_ERROR is turned ON and the processing is interrupted, and the error code 50 (decimal) is stored in ERROR_ID (Error code). Refer to the error code explanation section for details. 9) When the CC-Link IE field network error occurs, 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. *1 For the QCPU, use an ATA memory card, and for the LCPU, use an SD memory card. *2 Setting the operation status of the CPU (RUN/STOP) when an access error to the memory card occurs is available with parameters.
Compiling method	Macro type

Item	Description
Restrictions and precautions	1) Set the D/A conversion to "disabled" for all channels before executing this FB. When executing this FB with the D/A conversion enabled, the digital output value changes significantly. 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) When operating this FB together with other FBs, make sure that the channels used by the own station are not duplicated. 5) The FB cannot be used in an interrupt program. 6) This FB uses index registers Z5 to Z9. Please do not use these index registers in an interrupt program. 7) This FB cannot restore the user range setting from a file created other than by M+L60DA4-IEF_OGBackup. 8) Every input must be provided with a value for proper FB operation. 9) 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. 10) To operate the L60DA4, 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). 11) This FB uses cyclic and transient transmission. Therefore, an interlock program for cyclic and transient transmission is required. 12) Set the refresh device of the network parameter setting according to Section "1.4(3) Refresh parameters". 13) Set the global label setting according to Section "1.5 Setting Global Labels". 14) Only one master/local module can be controlled by the CC-Link IE Field system FB. To control 2 or more master/local modules by the FB, refer to "Appendix 1 When Using the FB for 2 or More Master/Local Modules".
FB operation type	Pulsed execution (multiple scan execution type)
Application example	Refer to "Appendix 2 FB Library Application Examples".

Item	Description
Timing chart	[When operation completes without error]  [When an error occurs] 
Relevant manuals	•MELSEC-L Analog-Digital Converter Module User's Manual •MELSEC-Q CC-Link IE Field Network Master/Local Module User's Manual •MELSEC-L CC-Link IE Field Network Master/Local Module User's Manual •MELSEC-L CC-Link IE Field Network Head Module User's Manual •QCPU User's Manual (Hardware Design, Maintenance and Inspection) •MELSEC-L CPU Module 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
50 (Decimal)	The network configuration setting of the station number specified by i_Station_No is incorrect.	Review the following setting contents. •Network configuration setting Refer to Section 1.4(2) Network configuration setting. •The value entered in i_Station_No
90 (Decimal)	A channel whose D/A conversion is set to "enabled" exists.	Please try again after confirming the setting.
D000 to DAF9 (Hexadecimal)	A CC-Link IE field network error has occurred at the system configuration.	For details, refer to Error Code List of MELSEC-Q/L CC-Link IE Field Network Master/Local Module User's Manual

Labels

● Input labels

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

Name (Comment)	Label name	Data type	Setting range	Description
Module start XY address	i_Start_IO_No	Word	Depends on the I/O point range of the CPU. For details, refer to the CPU user's manual.	Specify the starting XY address (in hexadecimal) where the L60DA4 is connected. (For example, enter H10 for X10.)
Station No.	i_Station_No	Word	1 to 120	Specify the target station number.
Slave module start XY address	i_SlvStart_IO_No	Word	Depends on the I/O point range of the head module. For details, refer to the head module user's manual.	Specify the starting XY address (in hexadecimal) where the L60DA4 is connected. (For example, enter H10 for X10.)
Own station channel	i_CH_No	Word	1 to 32	Specify the channel for own station.

● 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 saving file 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	2013/02/22	First edition

Note

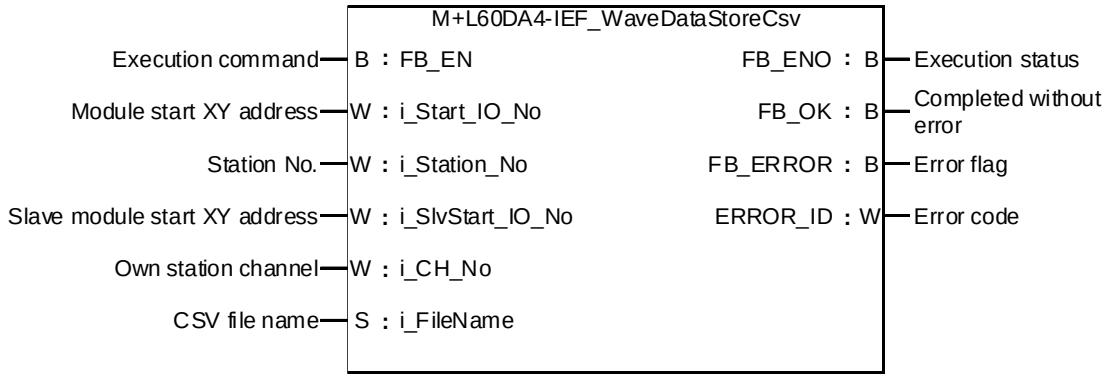
This chapter includes information related to the function block.
It does not include information on restrictions of use such as combination with modules or programmable controller CPUs.
Please make sure to read user's manuals for the corresponding products before using the products.

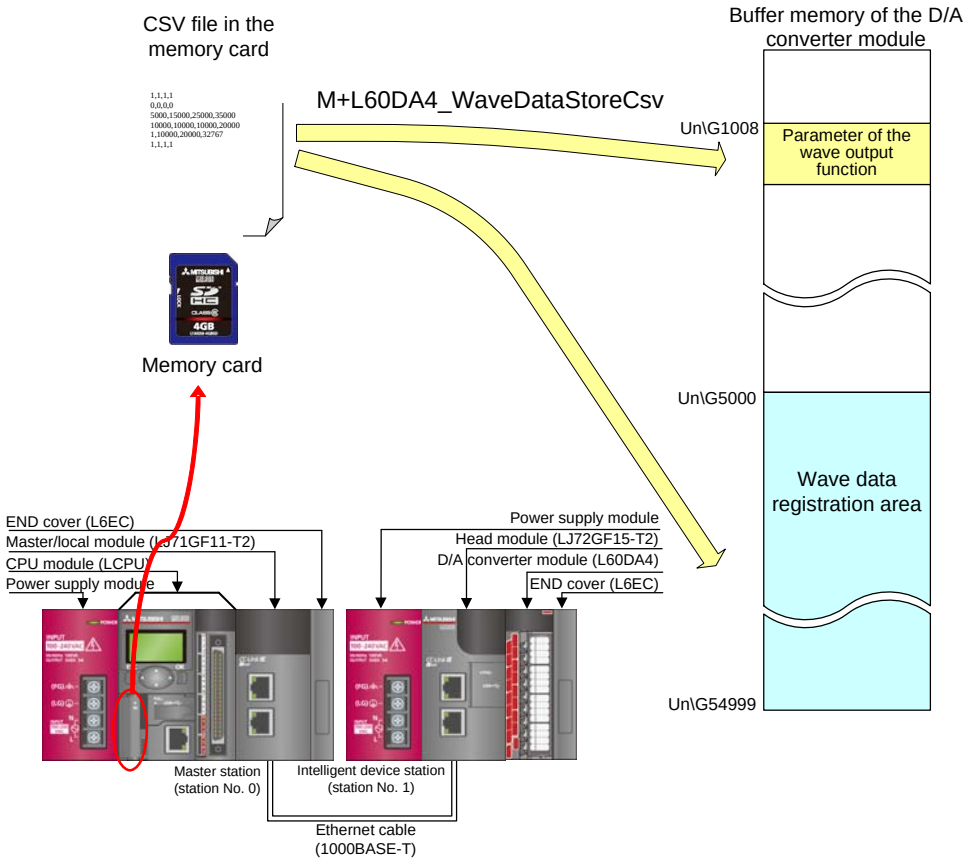
2.14 M+L60DA4-IEF_WaveDataStoreCsv (Read wave data (CSV file))

FB Name

M+L60DA4-IEF_WaveDataStoreCsv

Function Overview

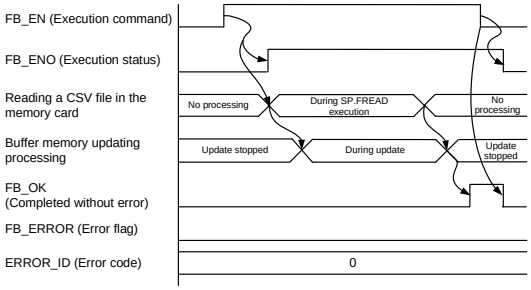
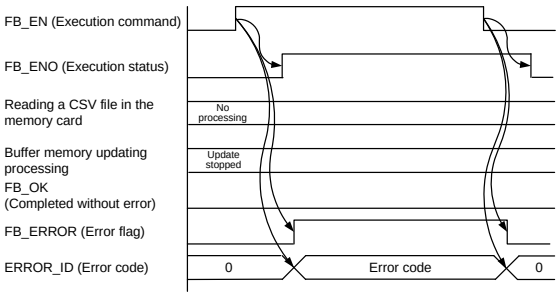
<table>
<tr><th>Item</th><th colspan="2">Description</th></tr>
<tr><td>Function overview</td><td colspan="2">Reads data from the CSV file where parameters and wave data (wave data points and wave data) of the wave output function are stored, then writes them to the buffer memory of the D/A converter module.</td></tr>
<tr><td>Symbol</td><td colspan="2"> 
</td></tr>
<tr><td rowspan="3">Applicable hardware and software</td><td>Digital-analog converter module</td><td>L60DA4
* Applicable to D/A conversion modules whose first five digits of the product information are "14041" or later</td></tr>
<tr><td>CC-Link IE Field Network module</td><td>CC-Link IE Field Network master/local module
CC-Link IE Field Network head module</td></tr>
<tr><td>CPU module</td><td>
<table>
<tr><th>Series</th><th>Model</th></tr>
<tr><td>MELSEC-Q Series *1</td><td>Universal model QCPU *2</td></tr>
<tr><td>MELSEC-L Series</td><td>LCPU *3</td></tr>
</table>
*1 Not applicable to QCPU-A (A mode)
*2 The first five digits of the serial number are "12012" or later.
*3 The first five digits of the serial number are "13012" or later.
</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>

Item	Description
Programming language	Ladder
Number of steps	1335 steps (for MELSEC-Q series universal model CPU) * The number of steps of the FB in a program depends on the CPU model that is used and input and output definition.
Function description	1) By turning ON FB_EN (Execution command), the parameters and wave data of the wave output function is read from the CSV file stored in the memory card *1 inserted in the CPU module and stored in the buffer memory of the D/A converter module. For the wave output function, refer to MELSEC-L Digital-Analog Converter Module User's Manual.  *1 For the QCPU, use an ATA memory card, and for the LCPU, use an SD memory card. 2) "Table 1 Storage Source "Wave Output Function Parameter and Data" and Storage Location Buffer Memory" in Appendix 3 lists "parameters and data of the wave output function" and the storage location buffer memory address that this FB processes. Describe the parameters and data in the list to a file according to "Appendix 4 CSV File Format for Wave Data Reading FB (CSV File)" and save the file in the root folder (directory) of the memory card. This FB reads all the parameters of the wave output function from the CSV file and stores them in the buffer memory areas Un\G1008 or later. Then, this FB reads "Wave

Item	Description
	data" specified in "Number of wave data" of the line 100 in the CSV file from the line 101 in order for the number of specified points, and stores them into the start address (Un\G5000) or later of the wave data registration area of the buffer memory. The CSV file of the wave output function can be created easily with the "Create wave output data" tool of GX Works2. 3) When this FB is executed without inserting the memory card to the CPU module, the FB_ERROR output turns ON and processing is interrupted, and the error code 10 (decimal) is stored in ERROR_ID (Error code). Refer to the error code explanation section for details. 4) When this FB is executed with special relay SM605 (Memory card remove/insert prohibit flag) is OFF, the FB_ERROR output turns ON and processing is interrupted, and the error code 20 (decimal) is stored in ERROR_ID (Error code). Refer to the error code explanation section for details. * Only in the QCPU module whose first five digits of the serial number are "10102" or later (except Q00UJCPU, Q00UCPU, and Q01UCPU) and LCPU module, special relay SM605 is used to prohibit removal and insertion of a memory card. 5) When this FB is executed with special relay SM606 (SD memory card forced disable instruction) is OFF, the FB_ERROR output turns ON and processing is interrupted, and the error code 30 (decimal) is stored in ERROR_ID (Error code). Refer to the error code explanation section for details. * Only in the LCPU module whose first five digits of the serial number are "12022" or later, special relay SM606 is used to forcibly stop the use of an SD memory card. 6) When the network configuration setting of the station number specified by i_Station_No is incorrect, FB_ERROR is turned ON and the processing is interrupted, and the error code 50 (decimal) is stored in ERROR_ID (Error code). Refer to the error code explanation section for details. 7) When the CSV file specified by i_FileName (CSV file name) does not exist in the memory card inserted to the CPU module, a CPU error (Error code: 2410) occurs. * When the CPU is set to stop at the CPU error occurrence, FB_ERROR and ERROR_ID are not updated. The operation status of the CPU module (RUN/STOP) for when the CPU error occurs can be set in [PLC RAS] *1. *1 [Parameter]⇨[PLC Parameter]⇨[PLC RAS]⇨"File Access Error " in "When There is an Error" 8) When the CC-Link IE field network error occurs, 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. 9) When FB_EN (Execution command) is turned OFF before the execution of this FB is completed, the processing is interrupted. At that time, the data stored in the buffer

Item	Description
	memory is not cleared. When the FB is executed again, the reading processing is started from the beginning. 10) Do not remove the memory card during the execution of this FB. For the insertion or removal method of the memory card, refer to QCPU User's Manual (Hardware Design, Maintenance and Inspection) or MELSEC-L CPU Module User's Manual (Hardware Design, Maintenance and Inspection).
Compiling method	Macro type

Item	Description
Restrictions and precautions	1) This FB requires many scans and takes long time to complete the processing. Therefore, this FB should be executed during the warm up of the L60DA4. 2) The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation. 3) The FB cannot be used in an interrupt program. 4) When operating this FB together with other FBs, make sure that the channels used by the own station are not duplicated. 5) 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. 6) This FB uses index registers Z5 to Z7 and Z9. Please do not use these index registers in an interrupt program. 7) This FB uses the SP.FREAD command. Thus, when an execution error of the SP.FREAD command occurs, a CPU error occurs. 8) When processes for accessing the 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 the MELSEC-L CPU Module User's Manual (Data Logging Function). 9) When two or more of these FBs are used, they cannot be used simultaneously. 10) Every input must be provided with a value for proper FB operation. 11) To operate the L60DA4, set the output 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). 12) This FB uses cyclic and transient transmission. Therefore, an interlock program for cyclic and transient transmission is required. 13) Set the refresh device of the network parameter setting according to Section "1.4(3) Refresh parameters". 14) Set the global label setting according to Section "1.5 Setting Global Labels". 15) Only one master/local module can be controlled by the CC-Link IE Field system FB. To control 2 or more master/local modules by the FB, refer to "Appendix 1 When Using the FB for 2 or More Master/Local Modules".
FB operation type	Pulsed execution (multiple scan execution type)
Application example	Refer to "Appendix 2 FB Library Application Examples".

Item	Description
Timing chart	[When operation completes without error]  [When an error occurs] 
Relevant manuals	•MELSEC-L Analog-Digital Converter Module User's Manual •MELSEC-Q CC-Link IE Field Network Master/Local Module User's Manual •MELSEC-L CC-Link IE Field Network Master/Local Module User's Manual •MELSEC-L CC-Link IE Field Network Head Module User's Manual •QCPU User's Manual (Hardware Design, Maintenance and Inspection) •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)

Error codes

● Error code list

Error code	Description	Action
10 (Decimal)	This FB is executed without no memory card inserted to the CPU module.	Execute this FB again after inserting the memory card where the target CSV file is saved to the CPU module. Or execute this FB again after inserting the available memory card and saving the target CSV file to the memory card using "Write PLC User Data" of GX Works2.
20 (Decimal)	SM605 (Memory card remove/insert prohibit flag) is OFF, and the accessing to the memory card is unavailable.	ATA memory card Execute this FB again after turning ON SM605 (Memory card remove/insert prohibit flag). SD memory card Execute this FB again after sliding the SD card disabling switch downward and SM605 (Memory card remove/insert prohibit flag) is turned ON.
30 (Decimal)	SM606 (SD memory card forced disable instruction) is ON, and the accessing to the SD memory card is unavailable.	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 wave data reading processing timeout occurred because accesses to the memory card are frequently made in addition to this FB.	Reduce the frequency of the access processing to the memory card.
50 (Decimal)	The network configuration setting of the station number specified by i_Station_No is incorrect.	Review the following setting. •Network configuration setting Refer to Section 1.4(2) Network configuration setting. •The value entered in i_Station_No
4-digit error code	The error code of the CPU module	For details, refer to "Error Code List" of MELSEC-L CPU/QCPU Module User's Manual (Hardware Design, Maintenance and Inspection).
D000 to DAF9 (Hexadecimal)	A CC-Link IE field network error has occurred at the system configuration.	For details, refer to Error Code List of MELSEC-Q/L CC-Link IE Field Network

Error code	Description	Action
		Master/Local Module User's Manual

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 L60DA4 is connected. (For example, enter H10 for X10.)
Station No.	i_Station_No	Word	1 to 120	Specify the target station number.
Slave module start XY address	i_SlvStart_IO_No	Word	Depends on the I/O point range of the head module. For details, refer to the head module user's manual.	Specify the starting XY address (in hexadecimal) where the L60DA4 is connected. (For example, enter H10 for X10.)
Own station channel	i_CH_No	Word	1 to 32	Specify the channel for own station.
CSV file name	i_FileName	Character string	12 characters or less	Specify the name of the CSV file in which the parameters and the wave data of the wave output function are stored. (Only CSV is valid for a file attribute.) For details of the CSV file format, refer to "Appendix 4 CSV File Format for Wave Data Reading FB (CSV File)".

● 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 writing the parameters and wave data of the wave output function in the CSV file to the buffer memory of the D/A converter module 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	2013/02/22	First edition

Note

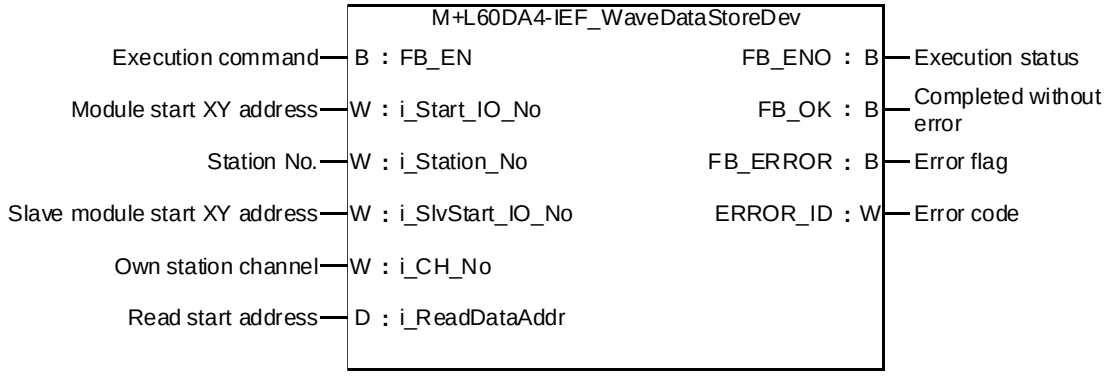
This chapter includes information related to the function block.
It does not include information on restrictions of use such as combination with modules or programmable controller CPUs.
Please make sure to read user's manuals for the corresponding products before using the products.

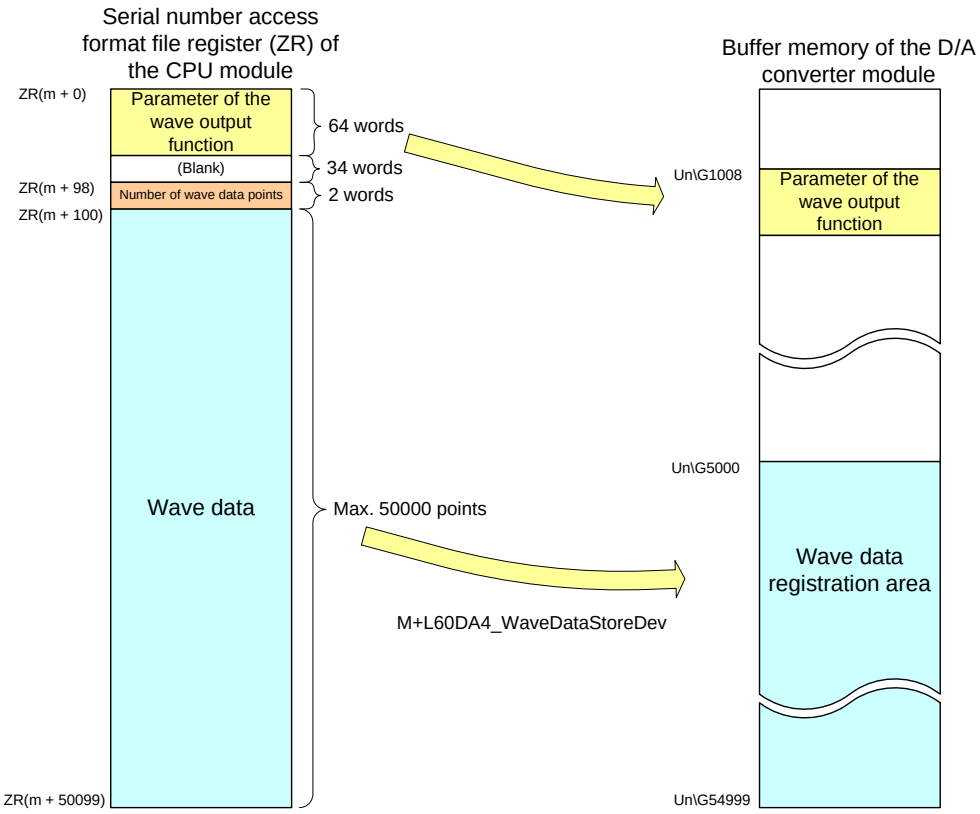
2.15 M+L60DA4-IEF_WaveDataStoreDev (Read wave data (device))

FB Name

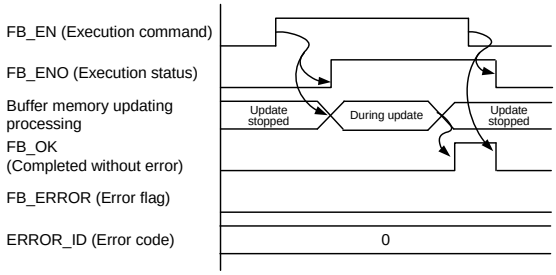
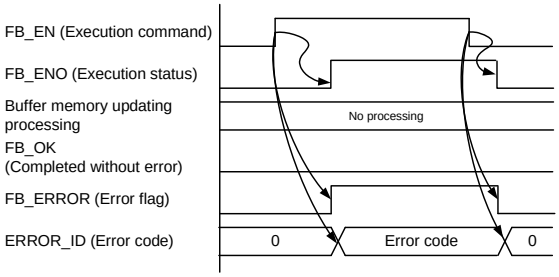
M+L60DA4-IEF_WaveDataStoreDev

Function Overview

<table>
<tr><th>Item</th><th colspan="2">Description</th></tr>
<tr><td>Function overview</td><td colspan="2">Reads data from the file register (ZR) where parameters and wave data (wave data points and wave data) of the wave output function are stored, then writes them to the buffer memory of the D/A converter module.</td></tr>
<tr><td>Symbol</td><td colspan="2"> 
</td></tr>
<tr><td rowspan="3">Applicable hardware and software</td><td>Digital-analog converter module</td><td>L60DA4
* Applicable to D/A conversion modules whose first five digits of the product information are "14041" or later</td></tr>
<tr><td>CC-Link IE Field Network module</td><td>CC-Link IE Field Network master/local module
CC-Link IE Field Network head module</td></tr>
<tr><td>CPU module</td><td><table><tr><th>Series</th><th>Model</th></tr><tr><td>MELSEC-Q Series *1</td><td>Universal model QCPU *2</td></tr><tr><td>MELSEC-L Series</td><td>LCPU *3</td></tr></table>*1 Not applicable to QCPU-A (A mode)
*2 The first five digits of the serial number are "12012" or later.
*3 The first five digits of the serial number are "13012" or later.</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>

Item	Description
Programming language	Ladder
Number of steps	806 steps (for MELSEC-Q series universal model CPU) * The number of steps of the FB in a program depends on the CPU model that is used and input and output definition.
Function description	1) By turning ON FB_EN (Execution command), the parameters and the wave data of the wave output function is read from the serial number access format file register (ZR) and stored in the buffer memory of the D/A converter module.  For the wave output function, refer to MELSEC-L Digital-Analog Converter Module User's Manual. 2) "Table 1 Storage Source "Wave Output Function Parameter and Data" and Storage Location Buffer Memory" in Appendix 3 lists "parameters and data of the wave output function" and the storage location buffer memory address that this FB processes. Save the parameter and the data in the file register (ZR) described in "Storage source" in the table. This FB reads the parameters of the wave output function from ZR(m+0) specified by i_ReadDataAddr (read start address) and stores them in the buffer memory area Un\G1008 or later. Then, this FB reads "Wave data" of specified points specified in "Number of wave data" of ZR(m+98,99) from ZR(m+100) in order, and stores them into the Start address (Un\G5000) or later of the wave data registration area of the buffer memory.

Item	Description
	The file register (ZR) data of the wave output function can be created easily with the "Create wave output data" tool of GX Works2. *m: File register (ZR) read start address Specifying the points to be used in [PLC File]*1 and the device points of the file register (ZR) in [Device]*2 can reserve the points of the file register and arrange the data in the desired address. *1 [Parameter]⇨[PLC Parameter]⇨[PLC File]⇨"File Register" *2 [Parameter]⇨[PLC Parameter]⇨[Device]⇨"File Register Extension Setting" 3) Reserve "Number of wave data" +100 points or more for the file register (ZR) to be used. When this FB is executed with the points specified in i_ReadDataAddr (read start address) less than "Number of wave data" +100 of ZR(m+98,99), the available range of the file register (ZR) is exceeded and a CPU error (Error code: 4101) occurs. 4) When FB_EN (Execution command) is turned OFF before the execution of this FB is completed, the processing is interrupted. At that time, the data stored in the buffer memory is not cleared. When the FB is executed again, the reading processing is started from the beginning. 5) When the network configuration setting of the station number specified by i_Station_No is incorrect, FB_ERROR is turned ON and the processing is interrupted, and the error code 50 (decimal) is stored in ERROR_ID (Error code). Refer to the error code explanation section for details. 6) When the CC-Link IE field network error occurs, 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

Item	Description
Restrictions and precautions	1) This FB requires many scans and takes long time to complete the processing. Therefore, this FB should be executed during the warm up of the L60DA4. 2) The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation. 3) The FB cannot be used in an interrupt program. 4) When operating this FB together with other FBs, make sure that the channels used by the own station are not duplicated. 5) 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. 6) This FB uses index registers Z5 to Z9. Please do not use these index registers in an interrupt program. 7) When two or more of these FBs are used, they cannot be used simultaneously. 8) Every input must be provided with a value for proper FB operation. 9) To operate the L60DA4, set the output 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). 10) This FB uses cyclic and transient transmission. Therefore, an interlock program for cyclic and transient transmission is required. 11) Set the refresh device of the network parameter setting according to Section "1.4(3) Refresh parameters". 12) Set the global label setting according to Section "1.5 Setting Global Labels". 13) Only one master/local module can be controlled by the CC-Link IE Field system FB. To control 2 or more master/local modules by the FB, refer to "Appendix 1 When Using the FB for 2 or More Master/Local Modules".
FB operation type	Pulsed execution (multiple scan execution type)
Application example	Refer to "Appendix 2 FB Library Application Examples".
Timing chart	[When operation completes without error]  [When an error occurs] 

Item	Description
Relevant manuals	•MELSEC-L Analog-Digital Converter Module User's Manual •MELSEC-Q CC-Link IE Field Network Master/Local Module User's Manual •MELSEC-L CC-Link IE Field Network Master/Local Module User's Manual •MELSEC-L CC-Link IE Field Network Head Module User's Manual •QCPU User's Manual (Hardware Design, Maintenance and Inspection) •MELSEC-L CPU Module 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
50 (Decimal)	The network configuration setting of the station number specified by i_Station_No is incorrect.	Review the following setting. •Network configuration setting Refer to Section 1.4(2) Network configuration setting. •The value entered in i_Station_No
D000 to DAF9 (Hexadecimal)	A CC-Link IE field network error has occurred at the system configuration.	For details, refer to Error Code List of MELSEC-Q/L CC-Link IE Field Network Master/Local Module User's Manual

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 L60DA4 is connected. (For example, enter H10 for X10.)
Station No.	i_Station_No	Word	1 to 120	Specify the target station number.
Slave module start XY address	i_SlvStart_IO_No	Word	Depends on the I/O point range of the head module. For details, refer to the head module user's manual.	Specify the starting XY address (in hexadecimal) where the L60DA4 is connected. (For example, enter H10 for X10.)
Own station channel	i_CH_No	Word	1 to 32	Specify the channel for own station.
Read start address	i_ReadDataAddr	Double Word	Effective device range	Specify the start address of the file register (ZR) in which the parameters and the wave data of the wave output function are stored.

● 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 writing the parameters and the wave data of the wave output function in the file register (ZR) to the buffer memory of the D/A converter module 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	2013/02/22	First edition

Note

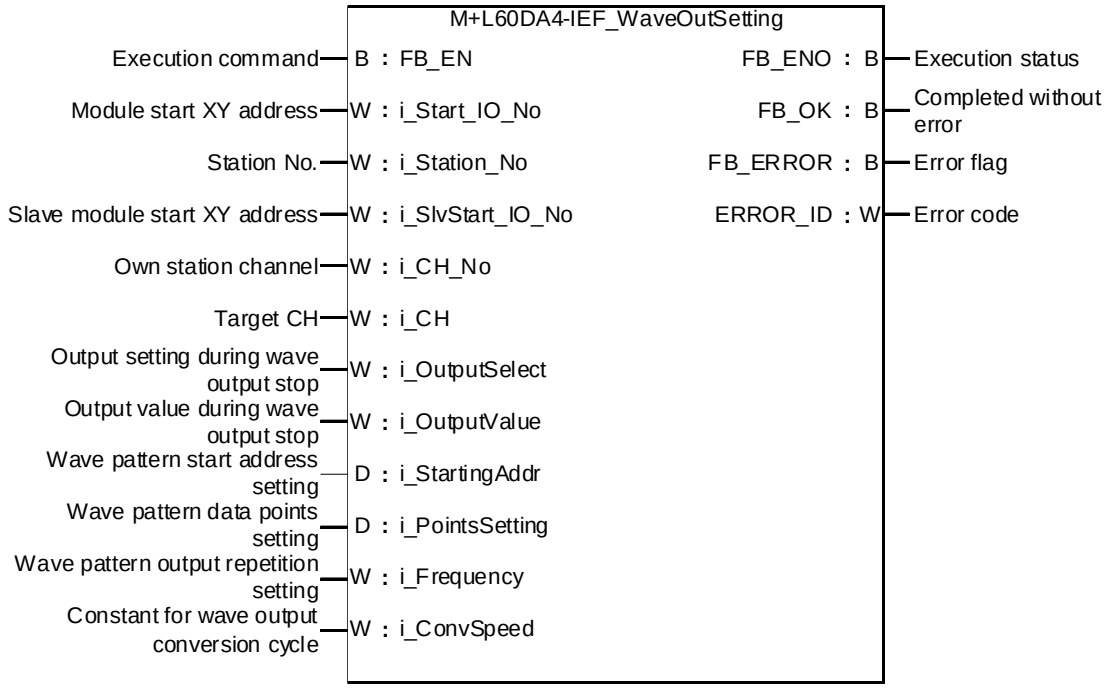
This chapter includes information related to the function block.
It does not include information on restrictions of use such as combination with modules or programmable controller CPUs.
Please make sure to read user's manuals for the corresponding products before using the products.

2.16 M+L60DA4-IEF_WaveOutSetting (Wave output setting)

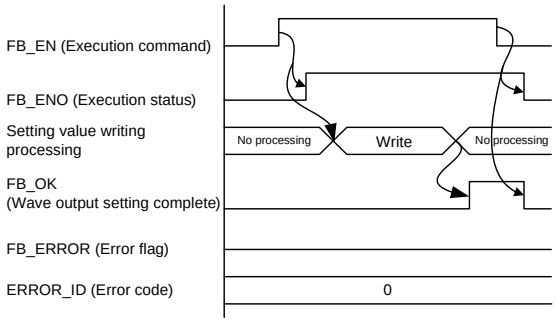
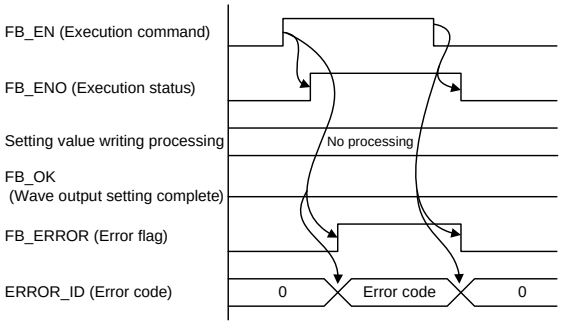
FB Name

M+L60DA4-IEF_WaveOutSetting

Function Overview

<table>
<tr><th>Item</th><th colspan="2">Description</th></tr>
<tr><td>Function overview</td><td colspan="2">Sets the wave output for the 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>Digital-analog converter module</td><td>L60DA4
* Applicable to D/A conversion modules whose first five digits of the product information are "14041" or later</td></tr>
<tr><td>CC-Link IE Field Network module</td><td>CC-Link IE Field Network master/local module
CC-Link IE Field Network head module</td></tr>
<tr><td>CPU module</td><td>
<table>
<tr><th>Series</th><th>Model</th></tr>
<tr><td>MELSEC-Q Series *1</td><td>Universal model QCPU *2</td></tr>
<tr><td>MELSEC-L Series</td><td>LCPU *3</td></tr>
</table>
*1 Not applicable to QCPU-A (A mode)
*2 The first five digits of the serial number are "12012" or later.
*3 The first five digits of the serial number are "13012" or later.
</td></tr>
</table>

<table>
<tr><th>Item</th><th colspan="2">Description</th></tr>
<tr><td></td><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">556 steps (for MELSEC-Q series universal model CPU)
* The number of steps of the FB in a program depends on the CPU model that is used and input and output definition.</td></tr>
<tr><td>Function description</td><td colspan="2">1) By turning ON FB_EN (Execution command), the wave output settings of the specified channel or all the channels are written.
2) The wave output setting is enabled only when the output mode setting is set to "Wave output mode".
Set the wave output data for the analog output in advance.
3) The setting value is validated when the Operating condition setting request (RYn9) is turned OFF → ON → OFF or the Operating condition setting request FB (M+L60DA4-IEF_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 10 (decimal) is stored in ERROR_ID (Error code).
Refer to the error code explanation section for details.
5) When the network configuration setting of the station number specified by i_Station_No is incorrect, FB_ERROR is turned ON and the processing is interrupted, and the error code 50 (decimal) is stored in ERROR_ID (Error code).
Refer to the error code explanation section for details.
6) When the CC-Link IE field network error occurs, 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>
<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) When operating this FB together with other FBs, make sure that the channels used by the own station are not duplicated. 5) When two or more of these FBs are used, precaution must be taken to avoid repetition of the target channel. 6) This FB uses index registers Z4 to Z7 and Z9. Please do not use these index registers in an interrupt program. 7) Every input must be provided with a value for proper FB operation. 8) To operate the L60DA4, set the output 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). 9) This FB uses cyclic and transient transmission. Therefore, an interlock program for cyclic and transient transmission is required. 10) Set the refresh device of the network parameter setting according to Section "1.4(3) Refresh parameters". 11) Set the global label setting according to Section "1.5 Setting Global Labels". 12) Only one master/local module can be controlled by the CC-Link IE Field system FB. To control 2 or more master/local modules by the FB, refer to "Appendix 1 When Using the FB for 2 or More Master/Local Modules".
FB operation type	Pulsed execution (multiple scan execution type)
Application example	Refer to "Appendix 2 FB Library Application Examples".
Timing chart	[When operation completes without error]  [When an error occurs] 

Item	Description
Relevant manuals	•MELSEC-L Analog-Digital Converter Module User's Manual •MELSEC-Q CC-Link IE Field Network Master/Local Module User's Manual •MELSEC-L CC-Link IE Field Network Master/Local Module User's Manual •MELSEC-L CC-Link IE Field Network Head Module User's Manual •QCPU User's Manual (Hardware Design, Maintenance and Inspection) •MELSEC-L CPU Module 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. Set 1 to 4 or 15 to the target channel.	Please try again after confirming the setting.
50 (Decimal)	The network configuration setting of the station number specified by i_Station_No is incorrect.	Review the following setting. •Network configuration setting Refer to Section 1.4(2) Network configuration setting. •The value entered in i_Station_No
D000 to DAF9 (Hexadecimal)	A CC-Link IE field network error has occurred at the system configuration.	For details, refer to Error Code List of MELSEC-Q/L CC-Link IE Field Network Master/Local Module User's Manual

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 L60DA4 is connected. (For example, enter H10 for X10.)
Station No.	i_Station_No	Word	1 to 120	Specify the target station number.
Slave module start XY address	i_SlvStart_IO_No	Word	Depends on the I/O point range of the head module. For details, refer to the head module user's manual.	Specify the starting XY address (in hexadecimal) where the L60DA4 is connected. (For example, enter H10 for X10.)
Own station channel	i_CH_No	Word	1 to 32	Specify the channel for own station.
Target CH	i_CH	Word	1 to 4 and 15	1 to 4: Specify the channel number. 15: Specify all the channels.

Name (Comment)	Label name	Data type	Setting range	Description
Output setting during wave output stop	i_OutputSelect	Word	0: 0V/0mA 1: Offset value 2: Output value during wave output stop	Specify the output value during the wave output stop.
Output value during wave output stop	i_OutputValue	Word	•0 to 20,479: (For range of 0 to 5V, 1 to 5V, 0 to 20mA, and 4 to 20mA) •-20,480 to 20,479: (For range of -10 to 10V)	Set the value to be output when "2: Output value during wave output stop" is selected in "Output setting during wave output stop".
Wave pattern start address setting	i_StartingAddr	Double Word	5,000 to 54,999	Set the start address of the wave pattern to be output.
Wave pattern data points setting	i_PointsSetting	Double Word	1 to 50,000 (points)	Set the data points of the wave pattern to be output.
Wave pattern output repetition setting	i_Frequency	Word	-1: Unlimited repetition 1 to 32,767: Specified number of times	Set the output times of the wave pattern.
Constant for wave output conversion cycle	i_ConvSpeed	Word	1 to 5,000	Set the constant to determine the conversion cycle of the wave output.

● 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 wave output 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	2013/02/22	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.

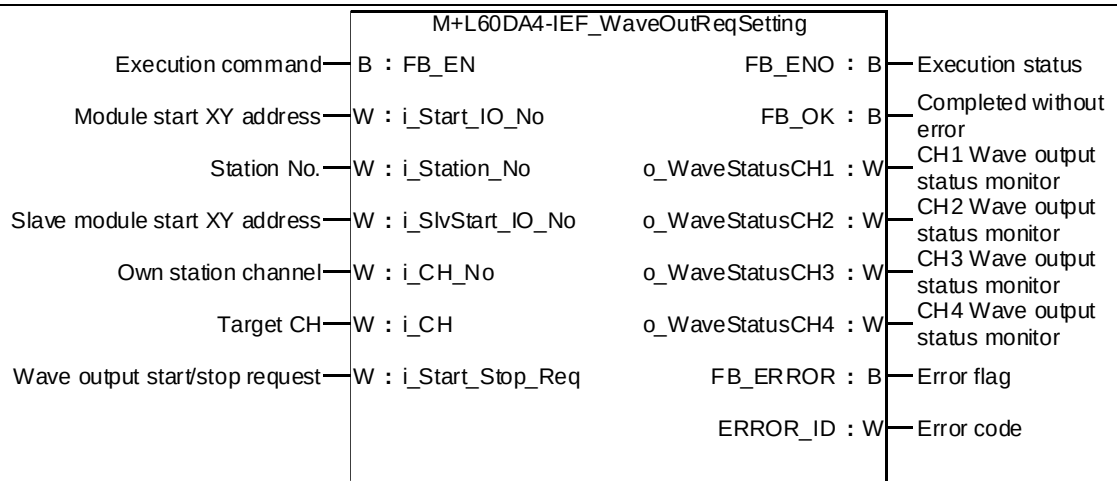
Please make sure to read user's manuals for the corresponding products before using the products.

2.17 M+L60DA4-IEF_WaveOutReqSetting (Wave output start/stop request)

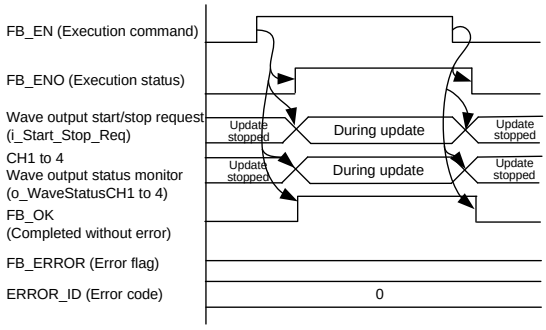
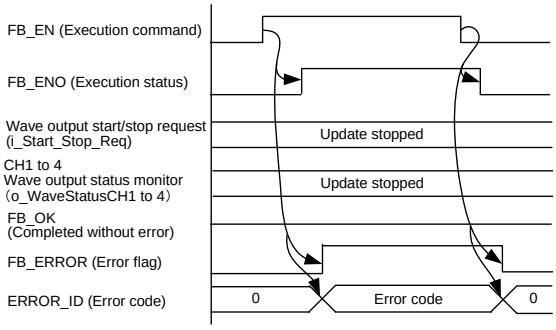
FB Name

M+L60DA4-IEF_WaveOutReqSetting

Function Overview

<table>
<tr><th>Item</th><th colspan="2">Description</th></tr>
<tr><td>Function overview</td><td colspan="2">Sets the starting, stopping, or pausing of the wave output for the specified channel or all channels.</td></tr>
<tr><td>Symbol</td><td colspan="2"> 
</td></tr>
<tr><td rowspan="4">Applicable hardware and software</td><td>Digital-analog converter module</td><td>L60DA4
* Applicable to D/A conversion modules whose first five digits of the product information are "14041" or later</td></tr>
<tr><td>CC-Link IE Field Network module</td><td>CC-Link IE Field Network master/local module
CC-Link IE Field Network head module</td></tr>
<tr><td>CPU module</td><td>
<table>
<tr><th>Series</th><th>Model</th></tr>
<tr><td>MELSEC-Q Series *1</td><td>Universal model QCPU *2</td></tr>
<tr><td>MELSEC-L Series</td><td>LCPU *3</td></tr>
</table>
*1 Not applicable to QCPU-A (A mode)
*2 The first five digits of the serial number are "12012" or later.
*3 The first five digits of the serial number are "13012" or later.
</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>

Item	Description
Programming language	Ladder
Number of steps	509 steps (for MELSEC-Q series universal model CPU) * The number of steps of the FB in a program depends on the CPU model that is used and input and output definition.
Function description	1) By turning ON FB_EN (Execution command), the start or stop request for wave output of the specified channel or all the channels is set. 2) By turning ON FB_EN (Execution command), the value of the wave output status monitor (Un\G1100 to Un\G1103) is output. When a channel is specified in the input label, only the wave output status monitor value of the specified channel is updated. For other channels, "0" is output. When all channels are set in the input label, the wave output status monitor values of all the channels are output. 3) After FB_EN (Execution command) is turned ON, the FB is always executed. 4) To restart the wave output, after the wave output is finished, set i_Start_Stop_Req (Wave output start/stop request) to "1 (Wave output start request)", "0 (Wave output stop request)", then "1 (Wave output start request)". 5) The wave output setting is enabled only when the output mode setting is set to "Wave output mode". 6) 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 10 (decimal) is stored in ERROR_ID (Error code). Refer to the error code explanation section for details. 7) When the network configuration setting of the station number specified by i_Station_No is incorrect, FB_ERROR is turned ON and the processing is interrupted, and the error code 50 (decimal) is stored in ERROR_ID (Error code). Refer to the error code explanation section for details. 8) When the CC-Link IE field network error occurs, 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

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) When operating this FB together with other FBs, make sure that the channels used by the own station are not duplicated. 4) Please ensure that the FB_EN signal is capable of being turned OFF by the program. Do not use this FB in programs that are only executed once such as a subroutine, FOR-NEXT loop because it is impossible to turn OFF. 5) When two or more of these FBs are used, precaution must be taken to avoid repetition of the target channel. 6) This FB uses index registers Z5 to Z7 and Z9. Please do not use these index registers in an interrupt program. 7) Every input must be provided with a value for proper FB operation. 8) To operate the L60DA4, set the output 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). 9) This FB uses cyclic and transient transmission. Therefore, an interlock program for cyclic and transient transmission is required. 10) Set the refresh device of the network parameter setting according to Section "1.4(3) Refresh parameters". 11) Set the global label setting according to Section "1.5 Setting Global Labels". 12) Only one master/local module can be controlled by the CC-Link IE Field system FB. To control 2 or more master/local modules by the FB, refer to "Appendix 1 When Using the FB for 2 or More Master/Local Modules".
FB operation type	Real-time execution
Application example	Refer to "Appendix 2 FB Library Application Examples".
Timing chart	[When operation completes without error]  [When an error occurs] 

Item	Description
Relevant manuals	•MELSEC-L Analog-Digital Converter Module User's Manual •MELSEC-Q CC-Link IE Field Network Master/Local Module User's Manual •MELSEC-L CC-Link IE Field Network Master/Local Module User's Manual •MELSEC-L CC-Link IE Field Network Head Module User's Manual •QCPU User's Manual (Hardware Design, Maintenance and Inspection) •MELSEC-L CPU Module 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. Set 1 to 4 or 15 to the target channel.	Please try again after confirming the setting.
50 (Decimal)	The network configuration setting of the station number specified by i_Station_No is incorrect.	Review the following setting. •Network configuration setting Refer to Section 1.4(2) Network configuration setting. •The value entered in i_Station_No
D000 to DAF9 (Hexadecimal)	A CC-Link IE field network error has occurred at the system configuration.	For details, refer to Error Code List of MELSEC-Q/L CC-Link IE Field Network Master/Local Module User's Manual

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 L60DA4 is connected. (For example, enter H10 for X10.)
Station No.	i_Station_No	Word	1 to 120	Specify the target station number.

Name (Comment)	Label name	Data type	Setting range	Description
Slave module start XY address	i_SlvStart_IO_No	Word	Depends on the I/O point range of the head module. For details, refer to the head module user's manual.	Specify the starting XY address (in hexadecimal) where the L60DA4 is connected. (For example, enter H10 for X10.)
Own station channel	i_CH_No	Word	1 to 32	Specify the channel for own station.
Target CH	i_CH	Word	1 to 4 and 15	1 to 4: Specify the channel number. 15: Specify all the channels.
Wave output start/stop request	i_Start_Stop_Req	Word	0: Wave output stop request 1: Wave output start request 2: Wave output pause request	Specify the request for the wave output start or stop.

● 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 FB is being executed properly.
CH1 Wave output status monitor	o_WaveStatusCH1	Word	0	Outputs the wave output status value (stop, during output, pause). 0: Wave output stop 1: Wave output 2: Wave output pause 3: Wave output step action *1 *1: The wave output step action function is unavailable with the FB. To execute, refer to Section 8.8 Wave Output Function of the MELSEC-L Digital-Analog Converter Module User's Manual and use the device test function of GX Works2.
CH2 Wave output status monitor	o_WaveStatusCH2	Word	0	
CH3 Wave output status monitor	o_WaveStatusCH3	Word	0	
CH4 Wave output status monitor	o_WaveStatusCH4	Word	0	

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	2013/02/22	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. When Using the FB for 2 or More Master/Local Modules

To use 2 or more CC-Link IE field master/local modules and to use an FB for the second and subsequent CC-Link IE field master/local modules, it is necessary to create an FB for the second and subsequent modules from the MELSOFT Library CC-Link IE field master/local module FB using the following procedure.

Four steps are required to create the FB for the second and subsequent modules, and the brief description is given as follows.

(1) Enter network parameters

(2) Set global labels

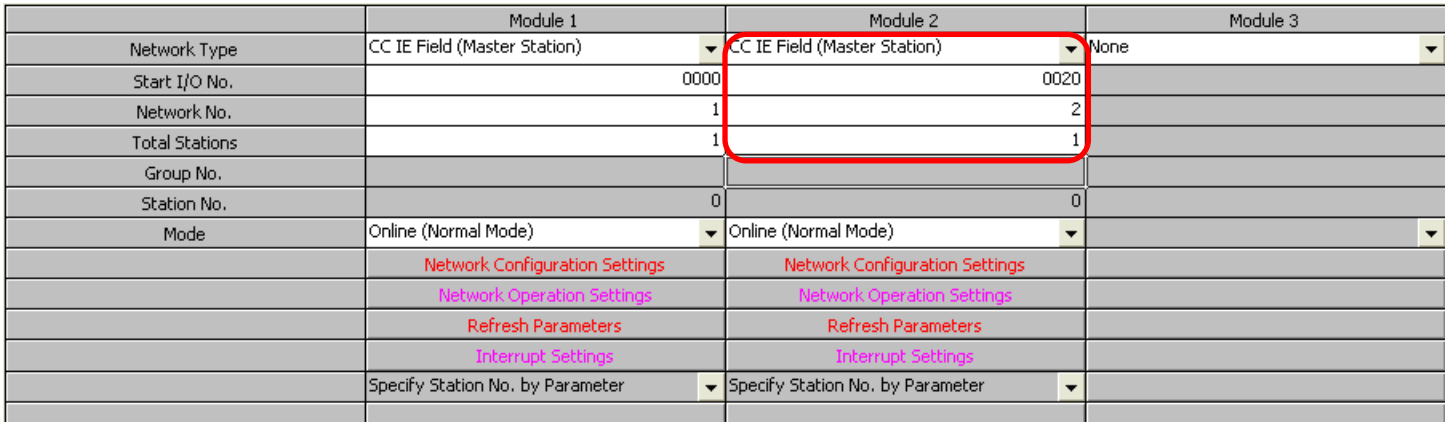
(3) Copy MELSOFT Library to create the FB for the second module

(4) Replace devices to create the FB for the second module

Appendix 1.1 Entering Network Parameters

(1) Enter the network parameters for the second module.

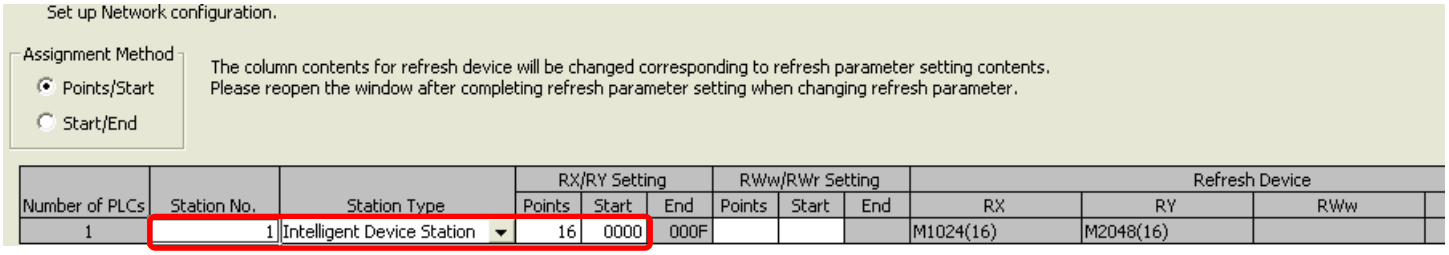
Item	Description
Network Type	Select the CC IE Field (Master Station).
Start I/O No.	Set the start I/O number of the master/local module in increments of 16 points. Set "0020".
Network No.	Set the network number of the master/local module. Set "2".
Total Stations	Set the number of slave stations connected to the master station. Include the number of reserved slave stations. Set "1".



	Module 1	Module 2	Module 3
Network Type	CC IE Field (Master Station)	CC IE Field (Master Station)	None
Start I/O No.	0000	0020	
Network No.	1	2	
Total Stations	1	1	
Group No.			
Station No.	0	0	
Mode	Online (Normal Mode)	Online (Normal Mode)	
	Network Configuration Settings	Network Configuration Settings	
	Network Operation Settings	Network Operation Settings	
	Refresh Parameters	Refresh Parameters	
	Interrupt Settings	Interrupt Settings	
	Specify Station No. by Parameter	Specify Station No. by Parameter	

(2) Set the network configuration setting for the second module.

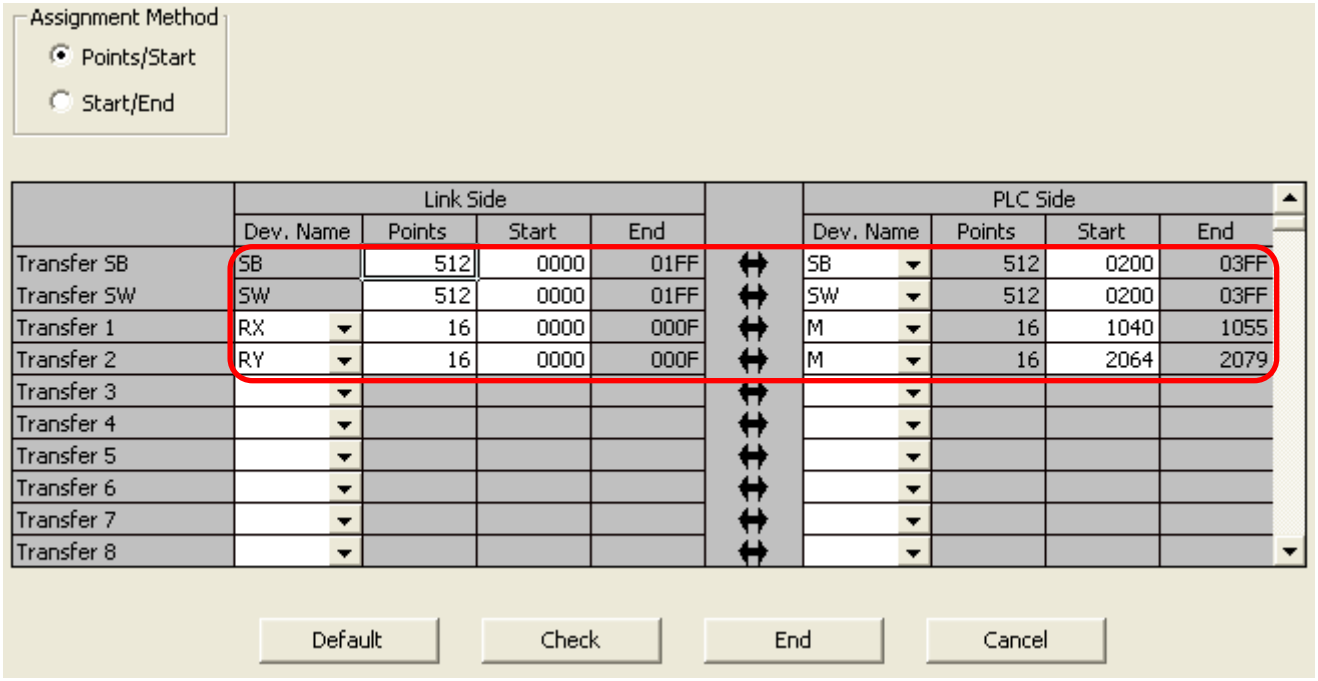
Item	Description
Station No.	Set the station number of the slave connected to the master station. Set "1".
Station Type	Set the station type of the slave connected to the master station. Select "Intelligent Device Station".
RX/RY Setting	Set assignment for RX/RY for the slave station connected to the master station. (a) Points Set "16". (b) Start Set "0000".



(3) Enter the network parameters for the second module.

Item	Description	Setting value
Transfer SB	Select the link refresh range of SB device.	•"Link Side Points" : 512 •"Link Side Start" : 0000 •"PLC Side Dev. Name" : SB •"PLC Side Start" : 0200
Transfer SW	Select the link refresh range of SW device.	•"Link Side Points" : 512 •"Link Side Start" : 0000 •"PLC Side Dev. Name" : SW •"PLC Side Start" : 0200
Transfer 1	Select the link refresh range of RX device.	•"Link Side Dev. Name" : RX •"Link Side Points" : 16 •"Link Side Start" : 0000 •"PLC Side Dev. Name" : M •"PLC Side Start" : 1040
Transfer 2	Select the link refresh range of RY device.	•"Link Side Dev. Name" : RY •"Link Side Points" : 16 •"Link Side Start" : 0000 •"PLC Side Dev. Name" : M •"PLC Side Start" : 2064

* Change the Points of Link Side and Dev. Name and Start of PLC Side according to the system.



Appendix 1.2 Entering Global Labels

Enter the global labels for the second module.

Specify label names for the second module. The names must be different from the label names for the first module.

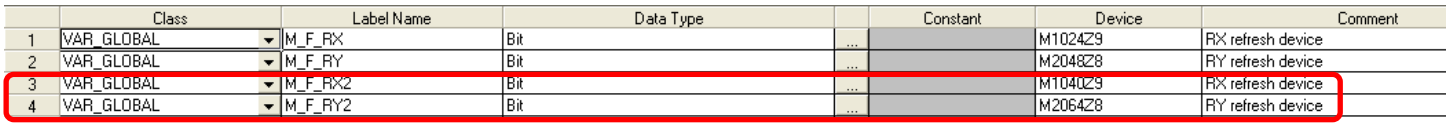
The following explains how to set the global label for the second module.

(1) M_F_RX2 Set for remote input (RX).

Item	Description
Class	Select "VAR_GLOBAL".
Label Name	Enter "M_F_RX2".
Data Type	Select "Bit".
Device	Enter the refresh device set for the refresh parameter with a "Z9" prefix.

(2) M_F_RY2 Set for remote output (RY).

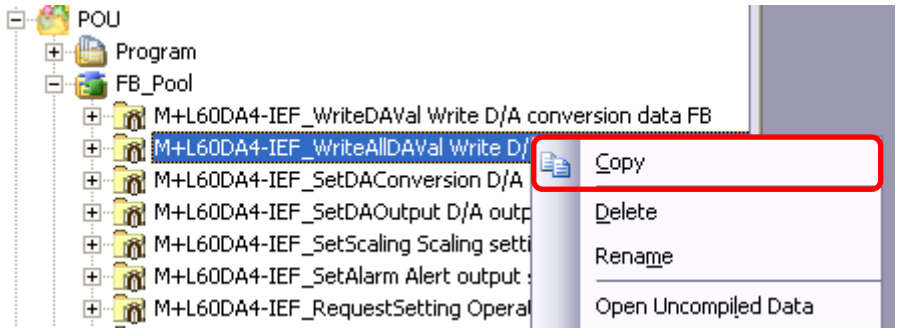
Item	Description
Class	Select "VAR_GLOBAL".
Label Name	Enter "M_F_RY2".
Data Type	Select "Bit".
Device	Enter the refresh device set for the refresh parameter with a "Z8" prefix.



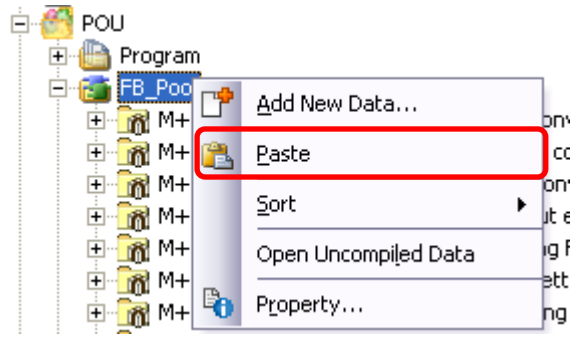
	Class	Label Name	Data Type		Constant	Device	Comment
1	VAR_GLOBAL	M_F_RX	Bit	...		M1024Z9	RX refresh device
2	VAR_GLOBAL	M_F_RY	Bit	...		M2048Z8	RY refresh device
3	VAR_GLOBAL	M_F_RX2	Bit	...		M1040Z9	RX refresh device
4	VAR_GLOBAL	M_F_RY2	Bit	...		M2064Z8	RY refresh device

Appendix 1.3 Copying MELSOFT Library to Create an FB for the Second Module

(1) Select an FB necessary for the second module from the Project tab of the Navigation window. Execute the Copy command.



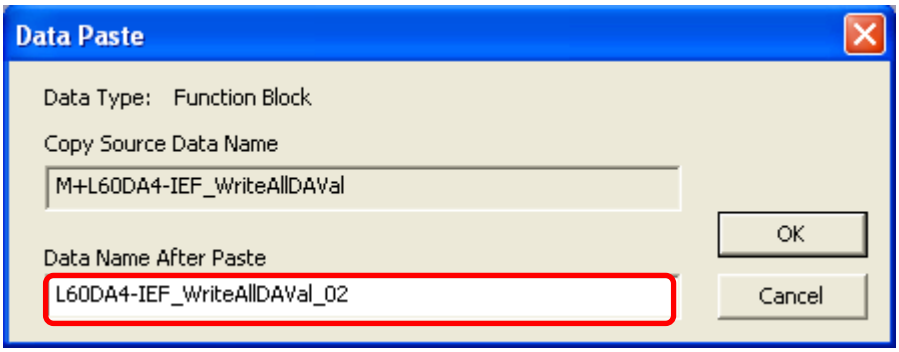
(2) Paste the copied FB to "FB_Pool" on the Project tab of the Navigation window.

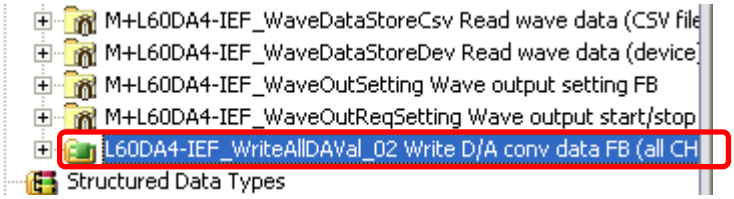


(3) After selecting the paste command, a window appears to enter an FB name. Enter an FB name after paste.

(Example: L60DA4-IEF_WriteAllDAVal_02)

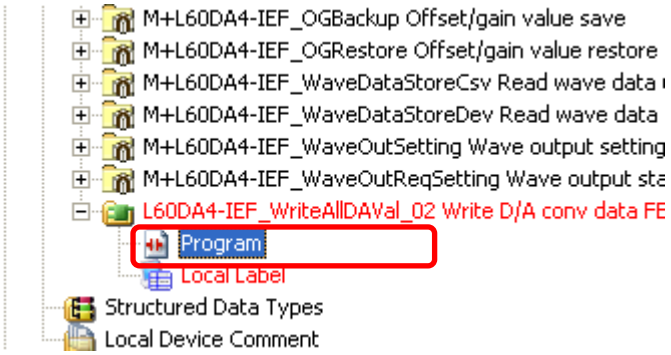
[Note] The character string "+" of M+... cannot be entered.



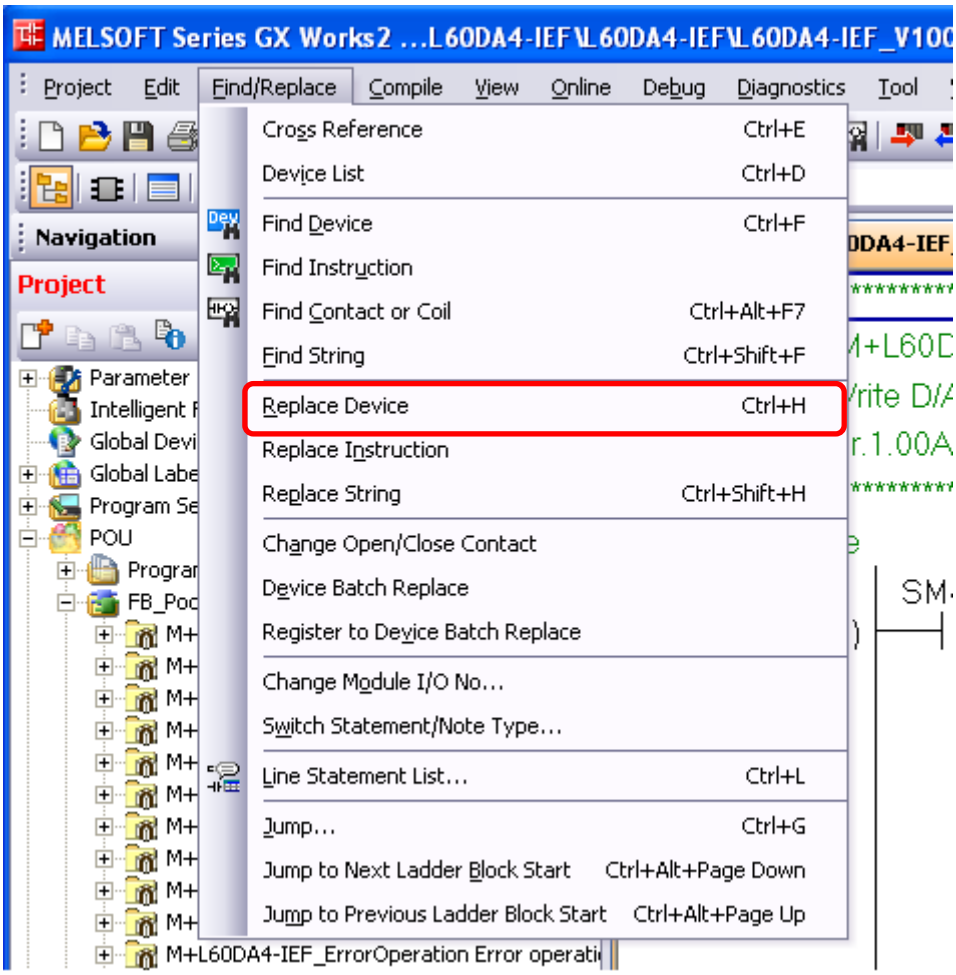


Appendix 1.4 Replacing Devices to Create the FB for the Second Module

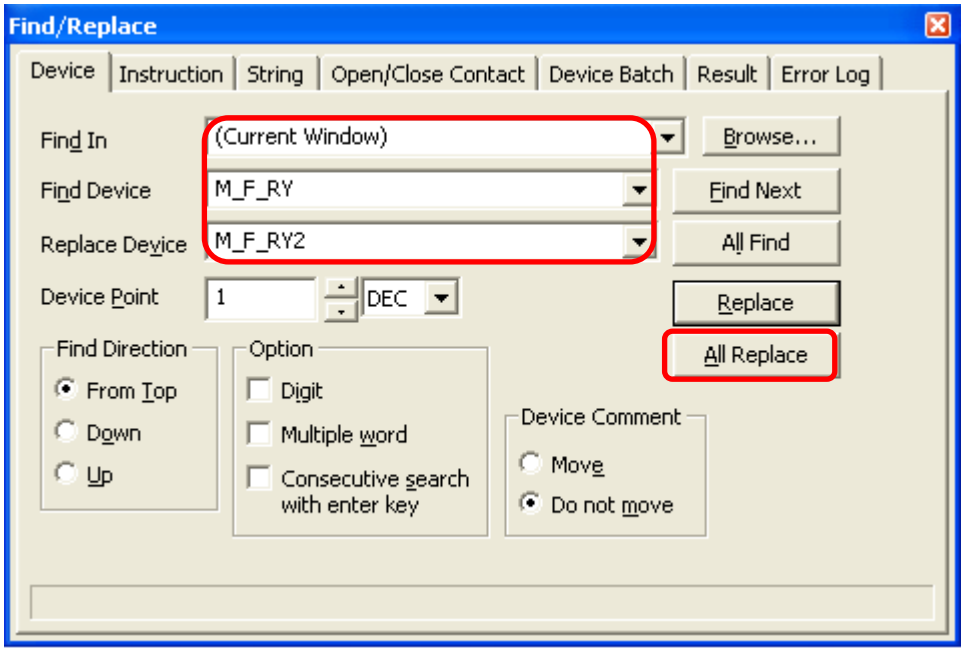
(1) Open "Program" of the added FB.



(2) Select "Find/Replace" menu and then select "Replace Device". "Find/Replace" window appears.



(3) Select "Current Window" from Find In, "M_F_RY" from Find Device, and "M_F_RY2" from Replace Device. Then replace all devices. In the same way, replace "M_F_RX" by "M_F_RX2" all at once.



By performing the steps above, the CC-Link IE field master/local FB can be used for the second module.

[Point]

(1) To use multiple FBs for the second CC-Link IE field master/local module, repeat the step (4).

(2) To use an FB for third or subsequent CC-Link IE field master/local modules, make sure that the preset "Global label name", "Data Name After Paste" that was set when pasting FB data and "Replace Device" that was set when replacing devices are not duplicated for the first and second modules.

[Note]

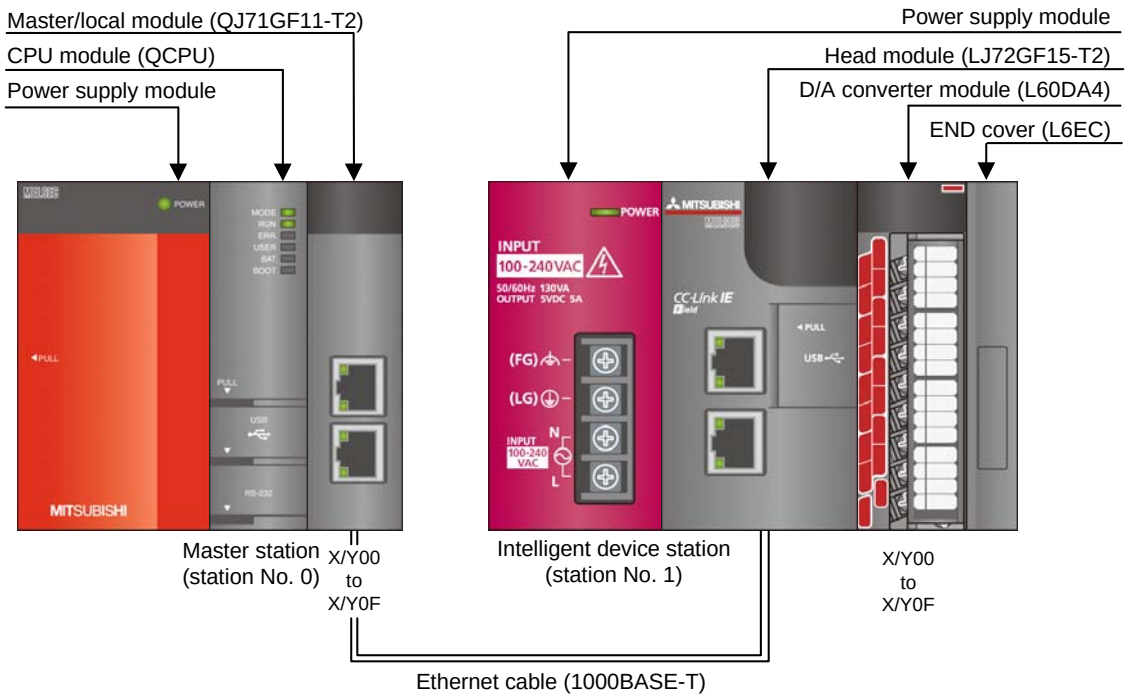
If MELSOFT Library is upgraded, MELSOFT Library FBs can be upgraded by importing them again. However, the FBs that were created by following these procedures for the second and subsequent modules are not upgraded even if the FBs are imported again.

Therefore, to upgrade FBs that were created by following these procedures, after upgrading MELSOFT Library, follow these procedures again.

Appendix 2. FB Library Application Examples

L60DA4-IEF 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 name	Application (ON details)
M0	M+L60DA4-IEF_WriteDAVal	D/A conversion data write req.
M10	M+L60DA4-IEF_WriteAllDAVal	D/A cnv data write req all chnls
M20	M+L60DA4-IEF_SetDAConversion	D/A conv enable/disable set req.
M21		D/A conv enable/disable setting
M30	M+L60DA4-IEF_SetDAOutput	DA output enable/disable set req
M31		DA output enable/disable setting
M40	M+L60DA4-IEF_SetScaling	Scaling setting request
M41		Scaling enabled:ON/disabled:OFF
M50	M+L60DA4-IEF_SetAlarm	Alert output setting request
M51		Alrt outpt enable:ON/disable:OFF
M60	M+L60DA4-IEF_RequestSetting	Operation condition set ctrl req
M70	M+L60DA4-IEF_SetOffsetVal	Offset setting request
M71		Offset value change request
M72		Offset value writing request
M80	M+L60DA4-IEF_SetGainVal	Gain setting request
M81		Gain value change request
M82		Gain value writing request
M90	M+L60DA4-IEF_ShiftOperation	Shift function execution request
D90		Digital value
M100	M+L60DA4-IEF_ErrorOperation	Error operation request
M101		Error reset request
M110	M+L60DA4-IEF_OGBackup	Offset/gain save to file req.
M120	M+L60DA4-IEF_OGRestore	Offset/gain value restore req.
M130	M+L60DA4-IEF_WaveDataStoreCsv	Wave data read (CSV) request
M140	M+L60DA4-IEF_WaveDataStoreDev	Wave data read (dev) request
M150	M+L60DA4-IEF_WaveOutSetting	Wave output setting request
M160	M+L60DA4-IEF_WaveOutReqSetting	Wave output start/stop request

b) External output (checks)

Device	FB name	Application (ON details)
M1	M+L60DA4-IEF_WriteDAVal	D/A conversion data write FB rdy
M2		D/A conversion data write comp.
F0		DA conv data write FB error flag
D0		DA conv data write FB error code
M11	M+L60DA4-IEF_WriteAllDAVal	D/A data write all chnls FB rdy.
M12		D/A data write all chnls comp.
F5		Data write all chnls FB err flag
D10		Data write all chnls FB err code
M22	M+L60DA4-IEF_SetDAConversion	D/A conv enable/disable set rdy.
M23		D/A conv enable/disable set comp
F10		DA conv enable/disable FB er flg
D20		DA conv enable/disable FB er cod
M32	M+L60DA4-IEF_SetDAOutput	D/A output enable/disable FB rdy
M33		DA outpt enable/disable set comp
F15		DA output enable/disable err flg
D30		DA otpt enable/disable FB er cod
M42	M+L60DA4-IEF_SetScaling	Scaling value setting FB ready
M43		Scaling value ave proc set comp.
F20		Scaling value set FB error flag
D40		Scaling function set FB err code
M52	M+L60DA4-IEF_SetAlarm	Alert output setting FB ready
M53		Alert output setting complete
F25		Alert output set FB error flag
D50		Alert output setting FB err code
M61	M+L60DA4-IEF_RequestSetting	Operation condition req ctrl rdy
M62		Operation cndition req ctrl comp
F30		Operatin cond req ctrl FB er flg
D60		Operatin cond req ctrl FB er cod
M73	M+L60DA4-IEF_SetOffsetVal	Offset setting FB ready
M74		Offset setting complete
F35		Offset setting FB error flag
D70		Offset setting FB error code

Device	FB name	Application (ON details)
M83	M+L60DA4-IEF_SetGainVal	Gain setting FB ready
M84		Gain setting complete
F40		Gain setting FB error flag
D80		Gain setting FB error code
M91	M+L60DA4-IEF_ShiftOperation	Shift function FB ready
M92		Shift function complete
D91		Shift conversion value
M102	M+L60DA4-IEF_ErrorOperation	Error operation FB ready
M103		Error operation complete
M104		Module error
D100		Module error code
F45		Error operation FB error flag
D101		Error operation FB error code
M111	M+L60DA4-IEF_OGBackup	Offset/gain save to file FB rdy
M112		Offset/gain save to file comp.
F50		Offset/gain save FB error flag
D110		Offset/gain save FB error code
M121	M+L60DA4-IEF_OGRestore	Offset/gain restore FB ready
M122		Offset/gain restore complete
F55		Offset/gain restore FB err flag
D120		Offset/gain restore FB err code
M131	M+L60DA4-IEF_WaveDataStoreCsv	Wave data read (CSV) ready
M132		Wave data read (CSV) complete
F60		Wave data read (CSV) FB err
D130		Wave data read (CSV) FB err code
M141	M+L60DA4-IEF_WaveDataStoreDev	Wave data read (dev) FB ready
M142		Wave data read (dev) complete
F65		Wave data read (dev) FB err
D140		Wave data read (dev) FB err code
M151	M+L60DA4-IEF_WaveOutSetting	Wave output setting FB ready
M152		Wave output setting complete
F70		Wave output setting FB err flag
D150		Wave output setting FB err code

Device	FB name	Application (ON details)
M161	M+L60DA4-IEF_WaveOutReqSetting	Wave output start/stop FB ready
M162		Wave output start/stop complete
D160		CH1 Wave output status monitor
D161		CH2 Wave output status monitor
D162		CH3 Wave output status monitor
D163		CH4 Wave output status monitor
F75		Wave output start/stop err flag
D164		Wave output start/stop err code
T10	Interlock check	Own station baton pass err check
T11		Own station data link err check
T12		Station 1 baton pass error check
T13		Station 1 cyclic trans err check
M200		Comm condition flag, station No1

3) Global label setting

a) Common setting

Class	Label name	Data type	Device
VAR_GLOBAL	M_F_RX	Bit	M1024Z9
VAR_GLOBAL	M_F_RY	Bit	M2048Z8

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 L60DA4 is connected.

b) Network parameters

Item	Setting value
Network Type	CC IE Field (Master Station)
Start I/O No.	0000
Network No.	1
Total Stations	1
Mode	Online (Normal Mode)

c) Network configuration setting

Item		Setting value
Station No.		1
Station Type		Intelligent Device Station
RX/RY Setting	Points	16
	Start	0000

d) Refresh parameters

Item	Link Side			PLC Side	
	Dev. Name	Points	Start	Dev. Name	Start
Transfer SB	SB	512	0000	SB	0000
Transfer SW	SW	512	0000	SW	0000
Transfer 1	RX	16	0000	M	1024
Transfer 2	RY	16	0000	M	2048

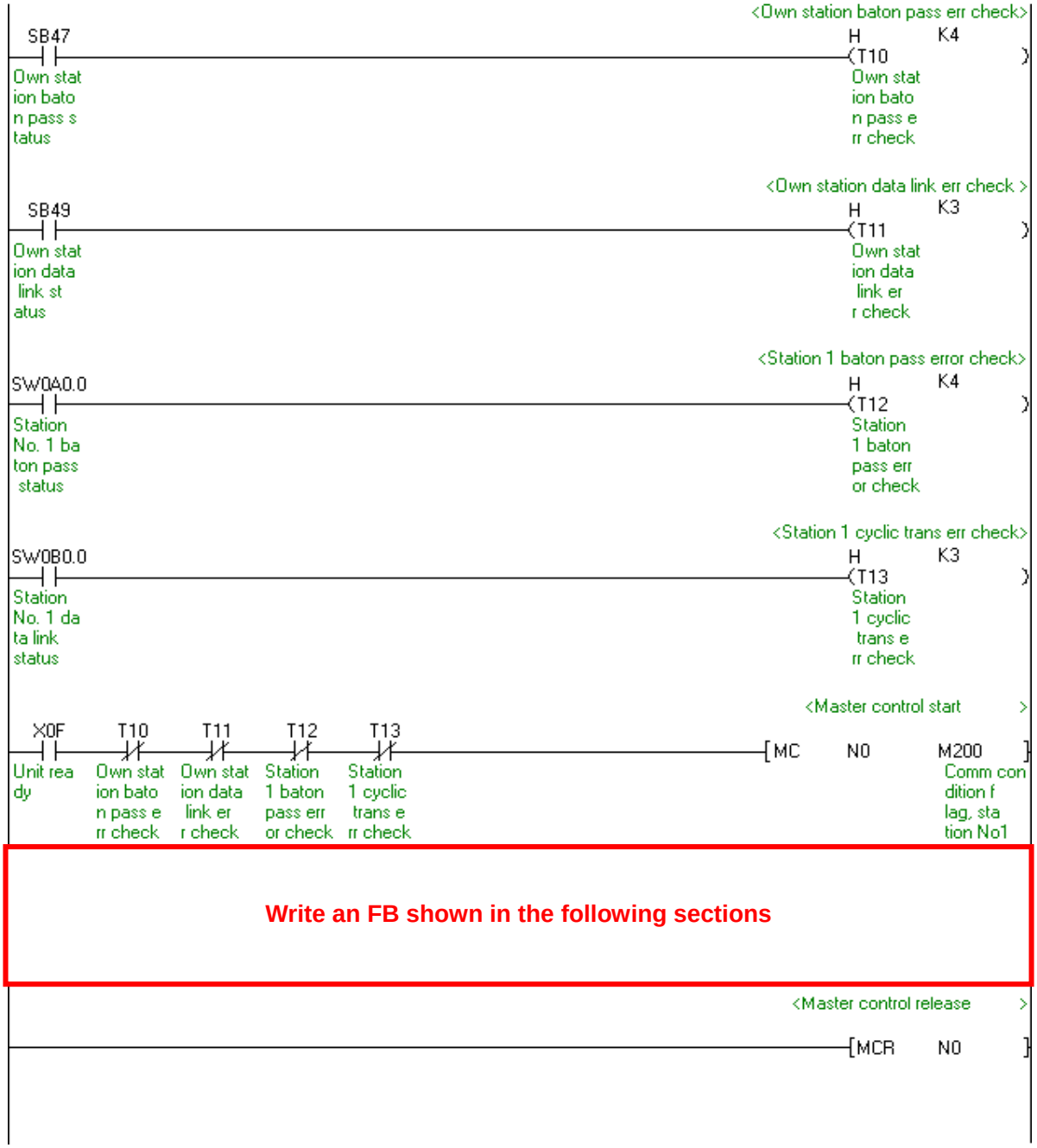
e) Slave station information

Item	Setting value
Mode	Online
Network No.	1
Station No.	1

5) Programs

Interlock program

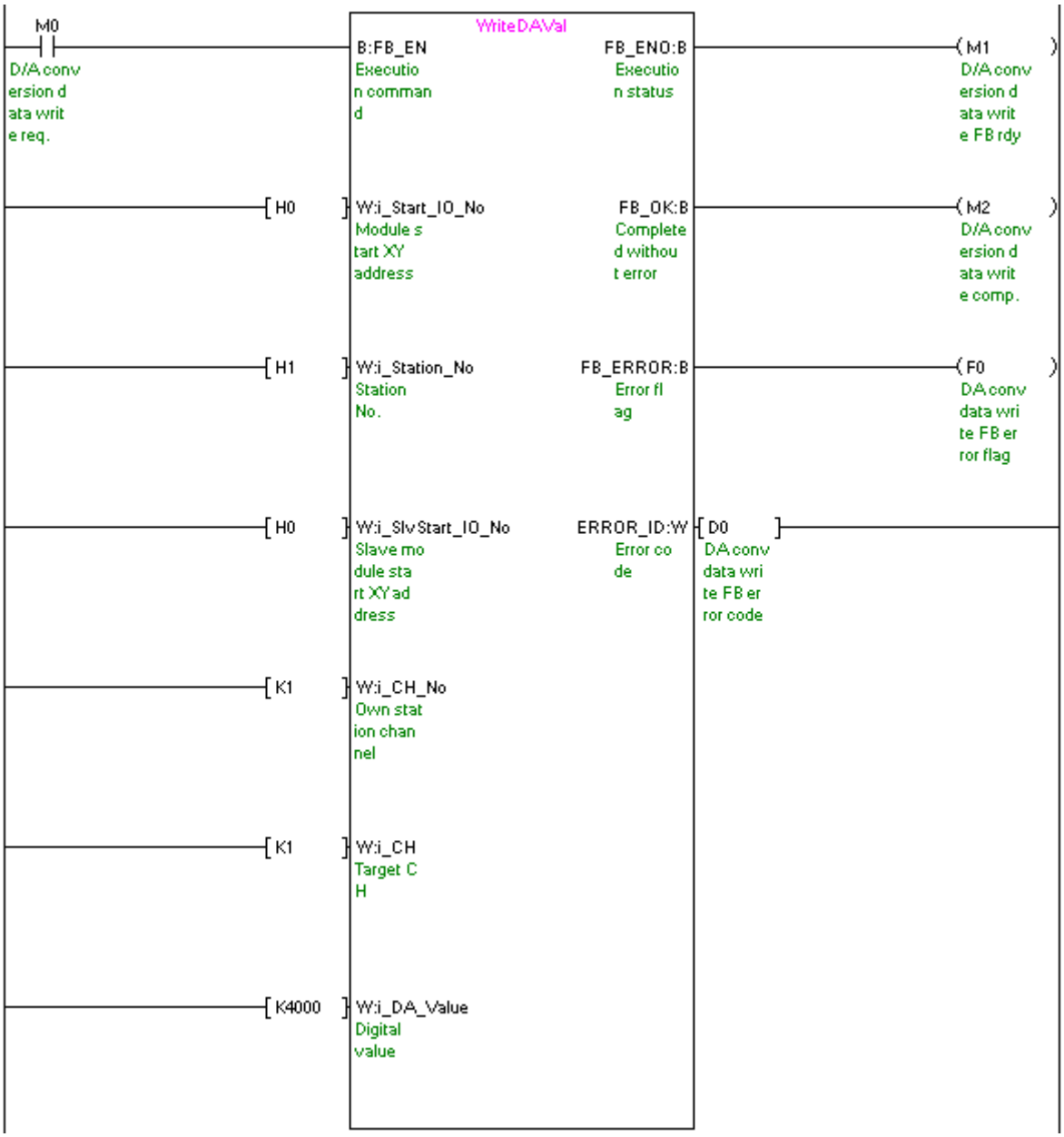
* This is the interlock program for when using both cyclic and transient transmission.



M+L60DA4-IEF_WriteDAVal (Write D/A conversion data)

Label name	Setting value	Description
i_Start_IO_No	H0	Set the starting XY address where the L60DA4 is connected to 0H.
i_Station_No	H1	Set the target station number to 1.
i_SlvStart_IO_No	H0	Set the starting XY address where the L60DA4 is connected to 0H.
i_CH_No	K1	Set the own station channel to channel 1.
i_CH	K1	Set the target channel to channel 1.
i_DA_Value	K4000	Set the digital value to 4,000.

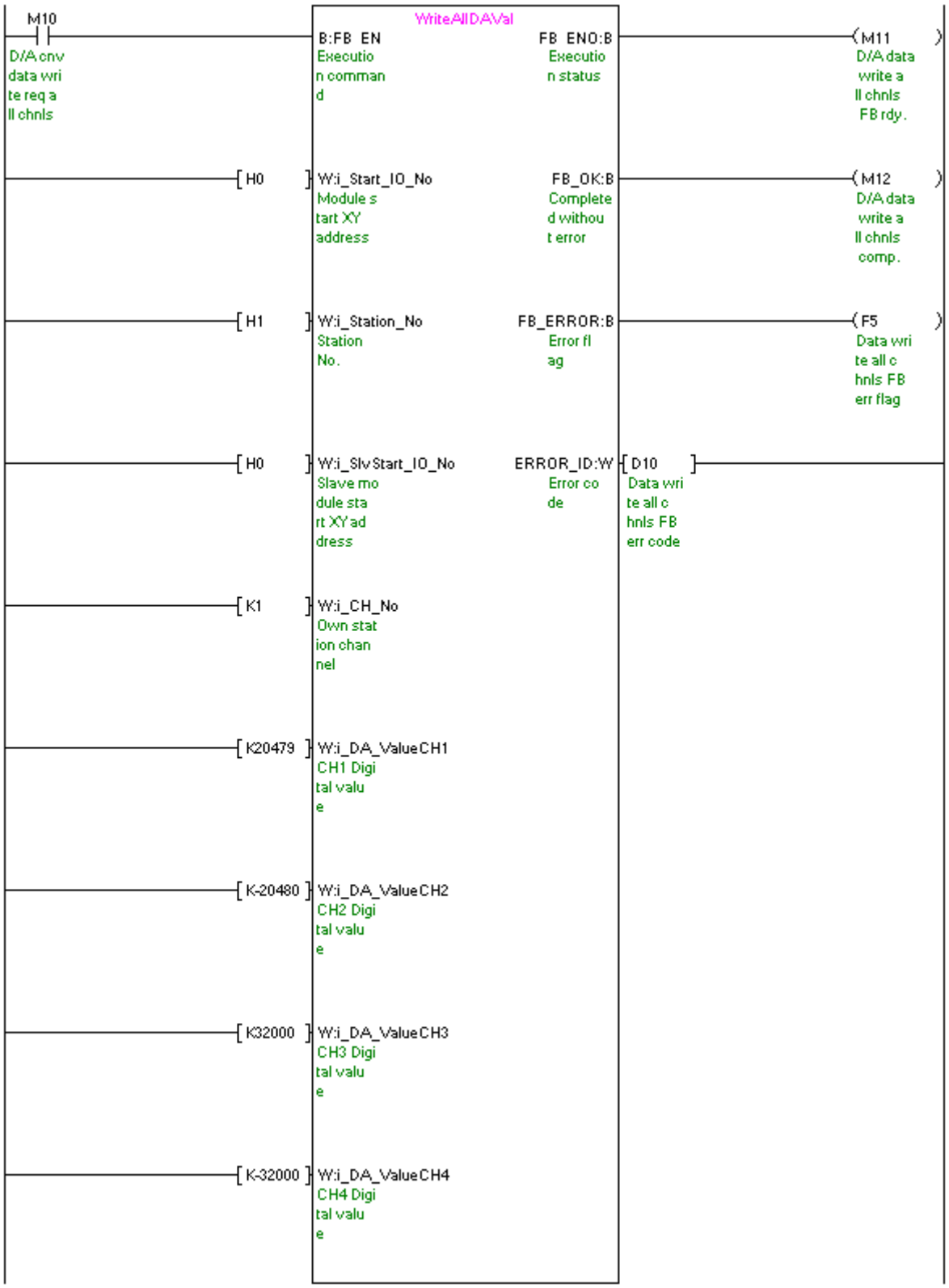
By turning ON M0, the digital value of channel 1 is written to the buffer memory.



M+L60DA4-IEF_WriteAllDAVal (Write D/A conversion data (all CHs))

Label name	Setting value	Description
i_Start_IO_No	H0	Set the starting XY address where the L60DA4 is connected to 0H.
i_Station_No	H1	Set the target station number to 1.
i_SlvStart_IO_No	H0	Set the starting XY address where the L60DA4 is connected to 0H.
i_CH_No	K1	Set the own station channel to channel 1.
i_DA_ValueCH1	K20479	Set the digital value of channel 1 to 20,479.
i_DA_ValueCH2	K-20480	Set the digital value of channel 2 to -20,480.
i_DA_ValueCH3	K32000	Set the digital value of channel 3 to 32,000.
i_DA_ValueCH4	K-32000	Set the digital value of channel 4 to -32,000.

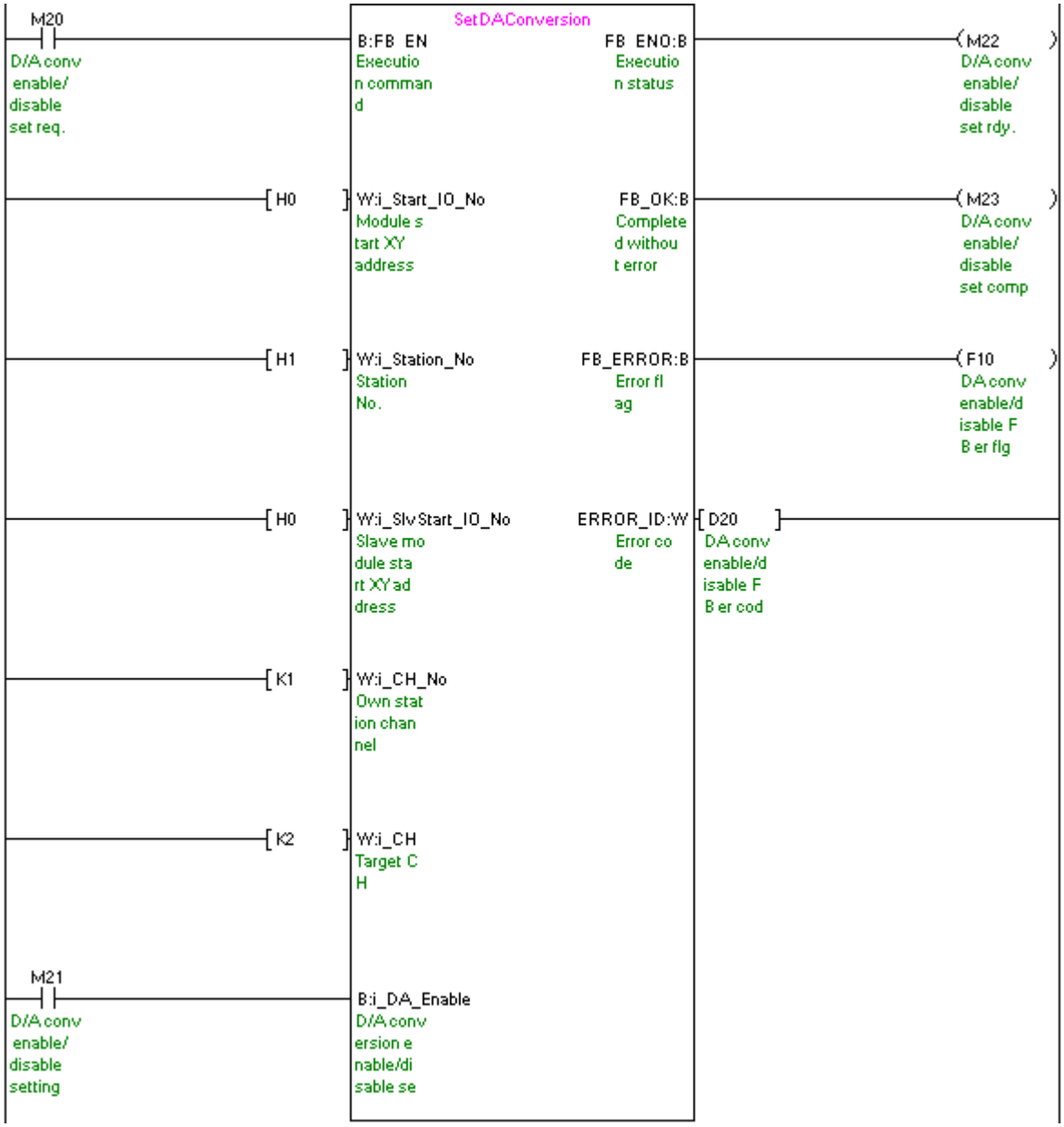
By turning ON M10, the digital values of all the channels are written to the buffer memory.


M10
D/A conv data write req all chnls
WriteAllDAVal
B:FB_EN
Executio n comman d
FB_ENO:B
Executio n status
M11
D/A data write all chnls FB rdy.
H0
W:i_Start_IO_No
Module start XY address
FB_OK:B
Completed without error
M12
D/A data write all chnls comp.
H1
W:i_Station_No
Station No.
FB_ERROR:B
Error flag
F5
Data write all chnls FB err flag
H0
W:i_Slv Start_IO_No
Slave module start XY address
ERROR_ID:W
Error code
D10
Data write all chnls FB err code
K1
W:i_CH_No
Own station channel
K20479
W:i_DA_Value CH1
CH1 Digital value
K-20480
W:i_DA_Value CH2
CH2 Digital value
K32000
W:i_DA_Value CH3
CH3 Digital value
K-32000
W:i_DA_Value CH4
CH4 Digital value

M+L60DA4-IEF_SetDAConversion (D/A conversion enable/disable setting)

Label name	Setting value	Description
i_Start_IO_No	H0	Set the starting XY address where the L60DA4 is connected to 0H.
i_Station_No	H1	Set the target station number to 1.
i_SlvStart_IO_No	H0	Set the starting XY address where the L60DA4 is connected to 0H.
i_CH_No	K1	Set the own station channel to channel 1.
i_CH	K2	Set the target channel to channel 2.
i_DA_Enable	ON/OFF	By turning ON, the D/A conversion of the target channel is set to "Enabled".

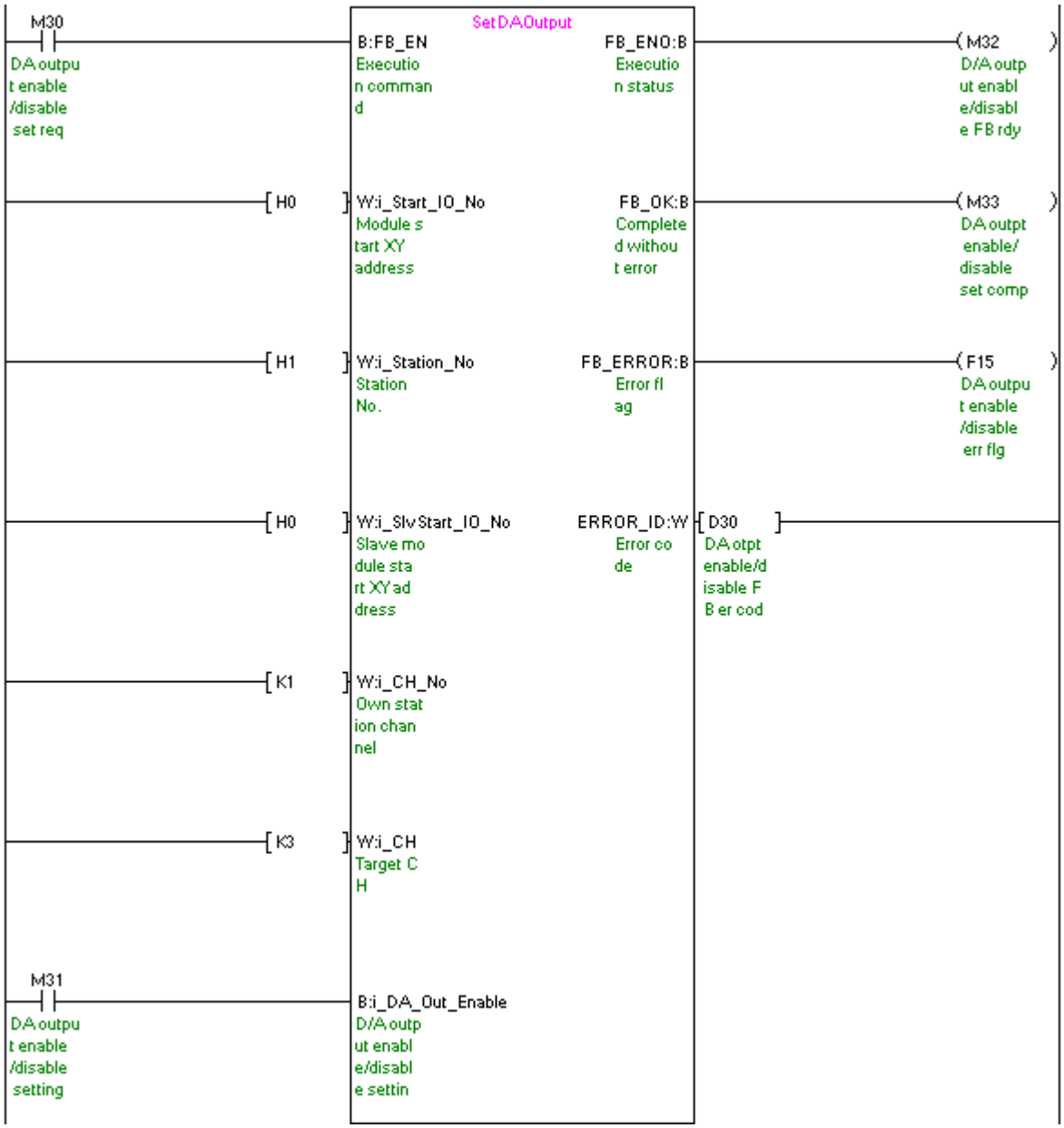
By turning ON M20, the value for the D/A conversion enable/disable setting of channel 2 is written to the buffer memory.



M+L60DA4-IEF_SetDAOutput (D/A output enable/disable setting)

Label name	Setting value	Description
i_Start_IO_No	H0	Set the starting XY address where the L60DA4 is connected to 0H.
i_Station_No	H1	Set the target station number to 1.
i_SlvStart_IO_No	H0	Set the starting XY address where the L60DA4 is connected to 0H.
i_CH_No	K1	Set the own station channel to channel 1.
i_CH	K3	Set the target channel to channel 3.
i_DA_Out_Enable	ON/OFF	By turning ON, the D/A output of the target channel is set to "Enabled".

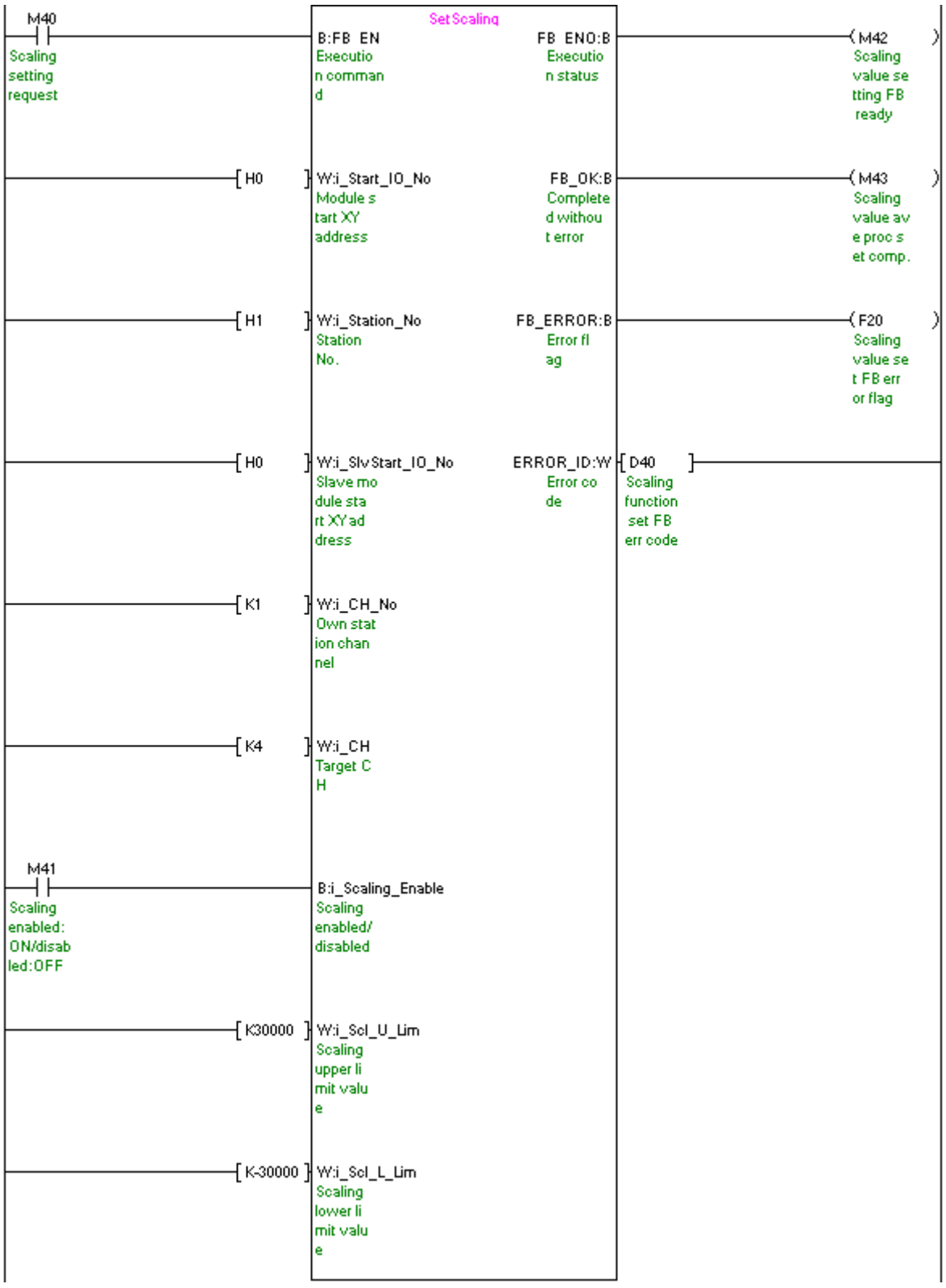
By turning ON M30, the D/A output of channel 3 is enabled.



M+L60DA4-IEF_SetScaling (Scaling setting)

Label name	Setting value	Description
i_Start_IO_No	H0	Set the starting XY address where the L60DA4 is connected to 0H.
i_Station_No	H1	Set the target station number to 1.
i_SlvStart_IO_No	H0	Set the starting XY address where the L60DA4 is connected to 0H.
i_CH_No	K1	Set the own station channel to channel 1.
i_CH	K4	Set the target channel to channel 4.
i_Scaling_Enable	ON/OFF	By turning ON, the scaling is enabled.
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.

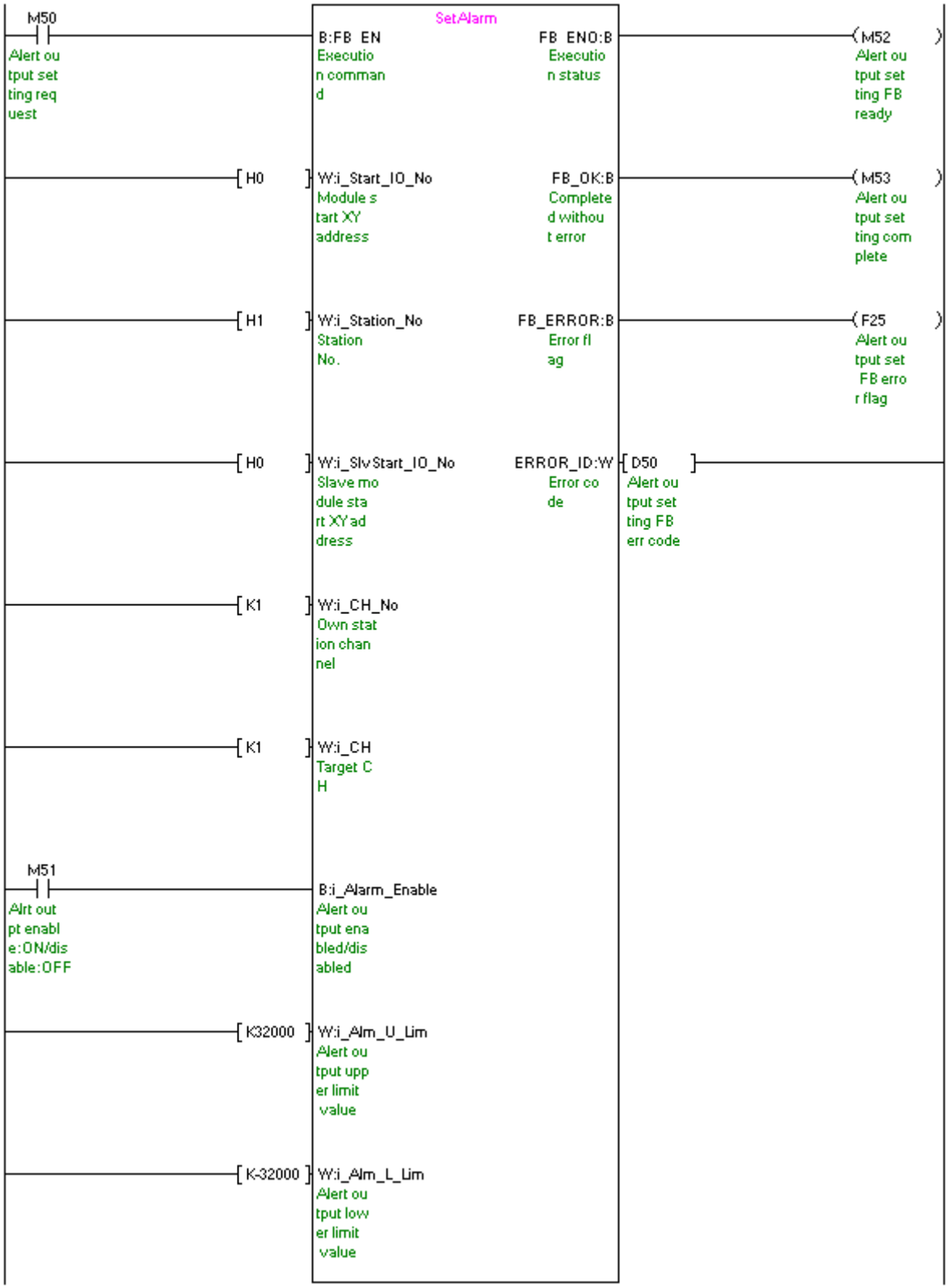
By turning ON M40, the value for the scaling setting of channel 4 is written to the buffer memory.


M40
Scaling setting request
Set Scaling
B:FB_EN
Execution command
FB_ENO:B
Execution status
M42
Scaling value setting FB ready
H0
W:i_Start_IO_No
Module start XY address
FB_OK:B
Completed without error
M43
Scaling value ave proc set comp.
H1
W:i_Station_No
Station No.
FB_ERROR:B
Error flag
F20
Scaling value set FB error flag
H0
W:i_SlvStart_IO_No
Slave module start XY address
ERROR_ID:W
Error code
D40
Scaling function set FB err code
K1
W:i_CH_No
Own station channel
K4
W:i_CH
Target CH
M41
Scaling enabled: ON/disabled:OFF
B:i_Scaling_Enable
Scaling enabled/ disabled
K30000
W:i_Scl_U_Lim
Scaling upper limit value
K-30000
W:i_Scl_L_Lim
Scaling lower limit value

M+L60DA4-IEF_SetAlarm (Alert output setting)

Label name	Setting value	Description
i_Start_IO_No	H0	Set the starting XY address where the L60DA4 is connected to 0H.
i_Station_No	H1	Set the target station number to 1.
i_SlvStart_IO_No	H0	Set the starting XY address where the L60DA4 is connected to 0H.
i_CH_No	K1	Set the own station channel to channel 1.
i_CH	K1	Set the target channel to channel 1.
i_Alarm_Enable	ON/OFF	By turning ON, the alert output is enabled.
i_Alm_U_Lim	K32000	Set the alert output upper limit value to 32,000.
i_Alm_L_Lim	K-32000	Set the alert output lower limit value to -32,000.

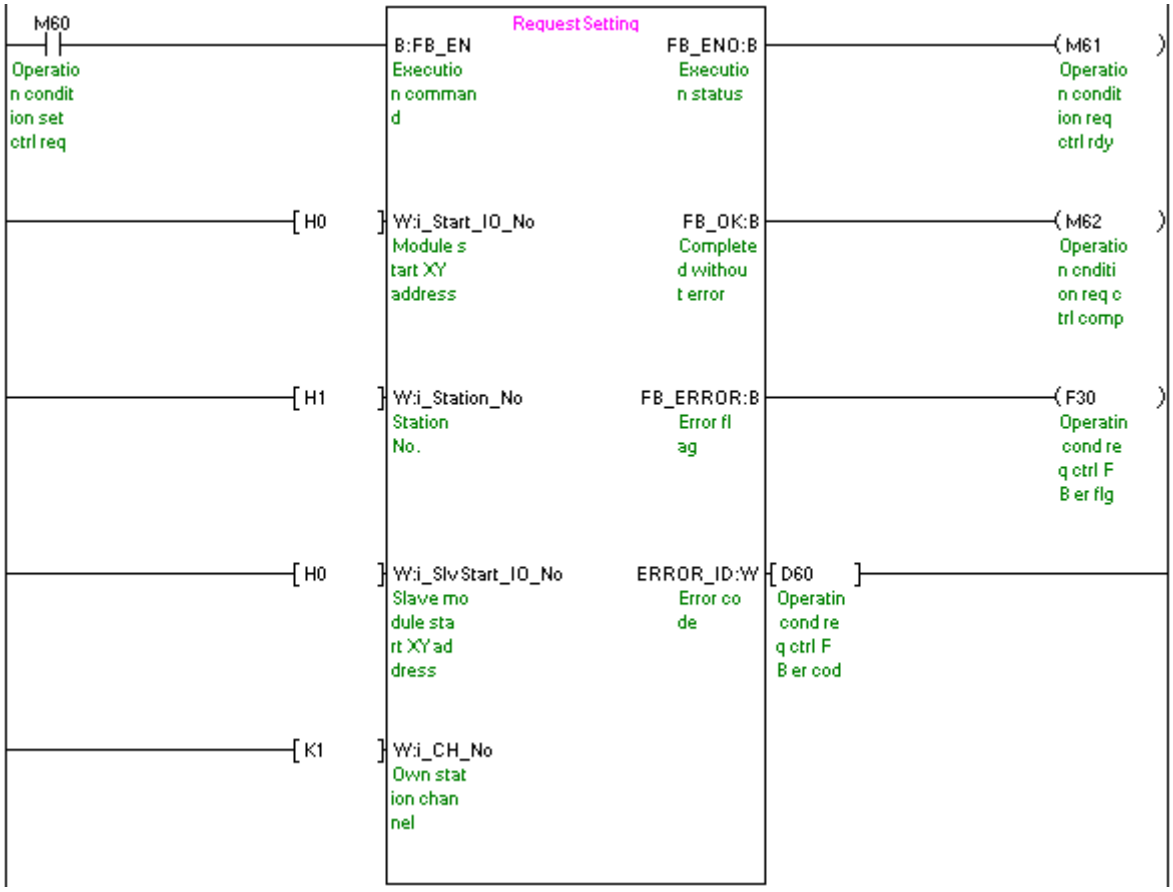
By turning ON M50, the value for the alert output setting of channel 1 is written to the buffer memory.


M50
Alert output setting request
SetAlarm
B:FB_EN
Execution command
FB_ENO:B
Execution status
M52
Alert output setting FB ready
H0
W:i_Start_IO_No
Module start XY address
FB_OK:B
Completed without error
M53
Alert output setting complete
H1
W:i_Station_No
Station No.
FB_ERROR:B
Error flag
F25
Alert output FB error flag
H0
W:i_Slv Start_IO_No
Slave module start XY address
ERROR_ID:W
Error code
D50
Alert output setting FB err code
K1
W:i_CH_No
Own station channel
K1
W:i_CH
Target CH
M51
Alrt output enable:ON/disable:OFF
B:i_Alarm_Enable
Alert output enabled/disabled
K32000
W:i_Alm_U_Lim
Alert output upper limit value
K-32000
W:i_Alm_L_Lim
Alert output lower limit value

M+L60DA4-IEF_RequestSetting (Operating condition setting request)

Label name	Setting value	Description
i_Start_IO_No	H0	Set the starting XY address where the L60DA4 is connected to 0H.
i_Station_No	H1	Set the target station number to 1.
i_SlvStart_IO_No	H0	Set the starting XY address where the L60DA4 is connected to 0H.
i_CH_No	K1	Set the own station channel to channel 1.

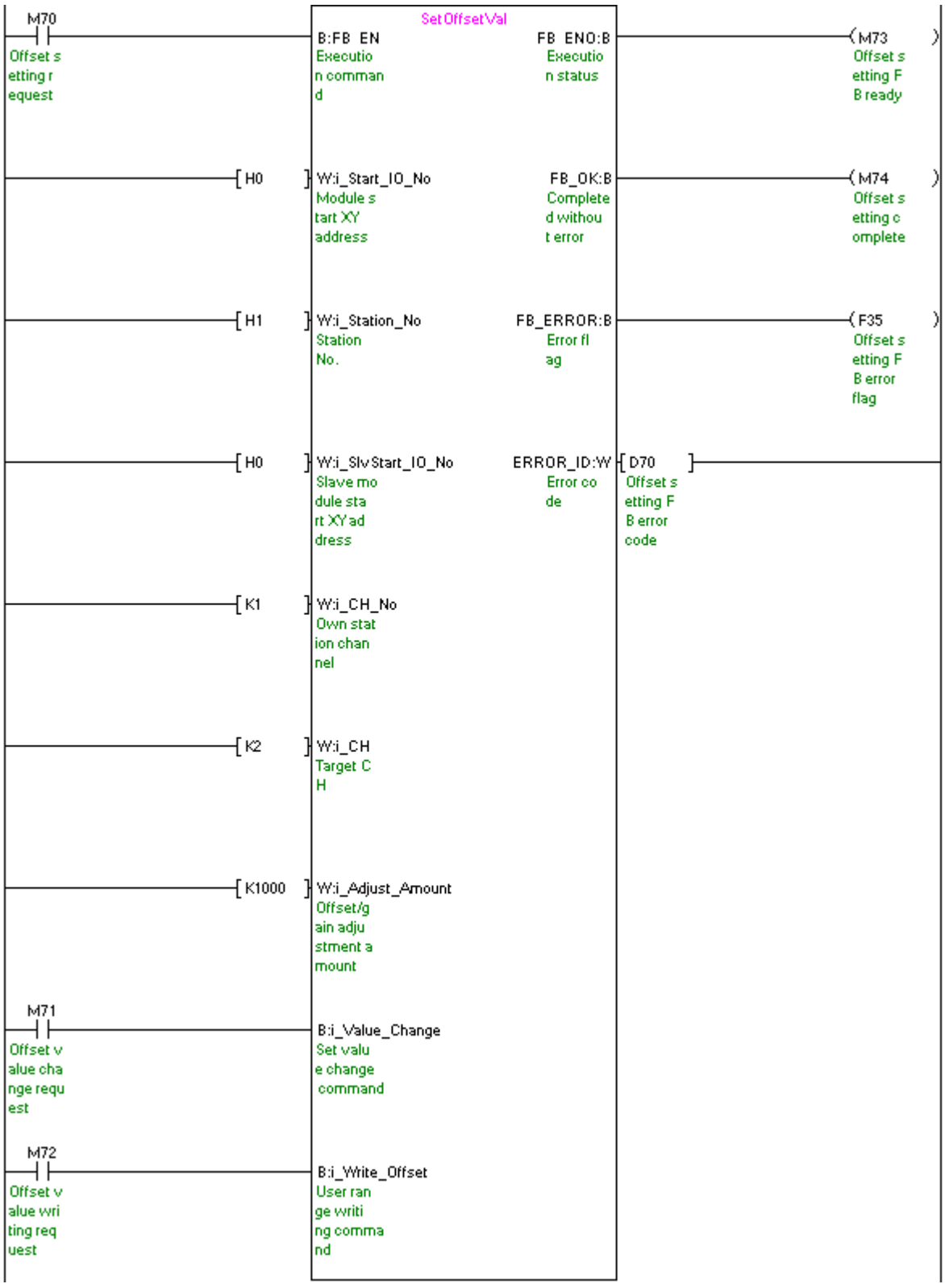
By turning ON M60, the setting contents of the D/A conversion enable/disable setting, alert output setting, scaling function setting, and wave output function setting are enabled.



M+L60DA4-IEF_SetOffsetVal (Offset setting)

Label name	Setting value	Description
i_Start_IO_No	H0	Set the starting XY address where the L60DA4 is connected to 0H.
i_Station_No	H1	Set the target station number to 1.
i_SlvStart_IO_No	H0	Set the starting XY address where the L60DA4 is connected to 0H.
i_CH_No	K1	Set the own station channel to channel 1.
i_CH	K2	Set the target channel to channel 2.
i_Adjust_Amount	K1000	Set the offset/gain adjustment amount to 1,000.
i_Value_Change	ON/OFF	By turning ON, the offset value is changed.
i_Write_Offset	ON/OFF	By turning ON, the user range is written.

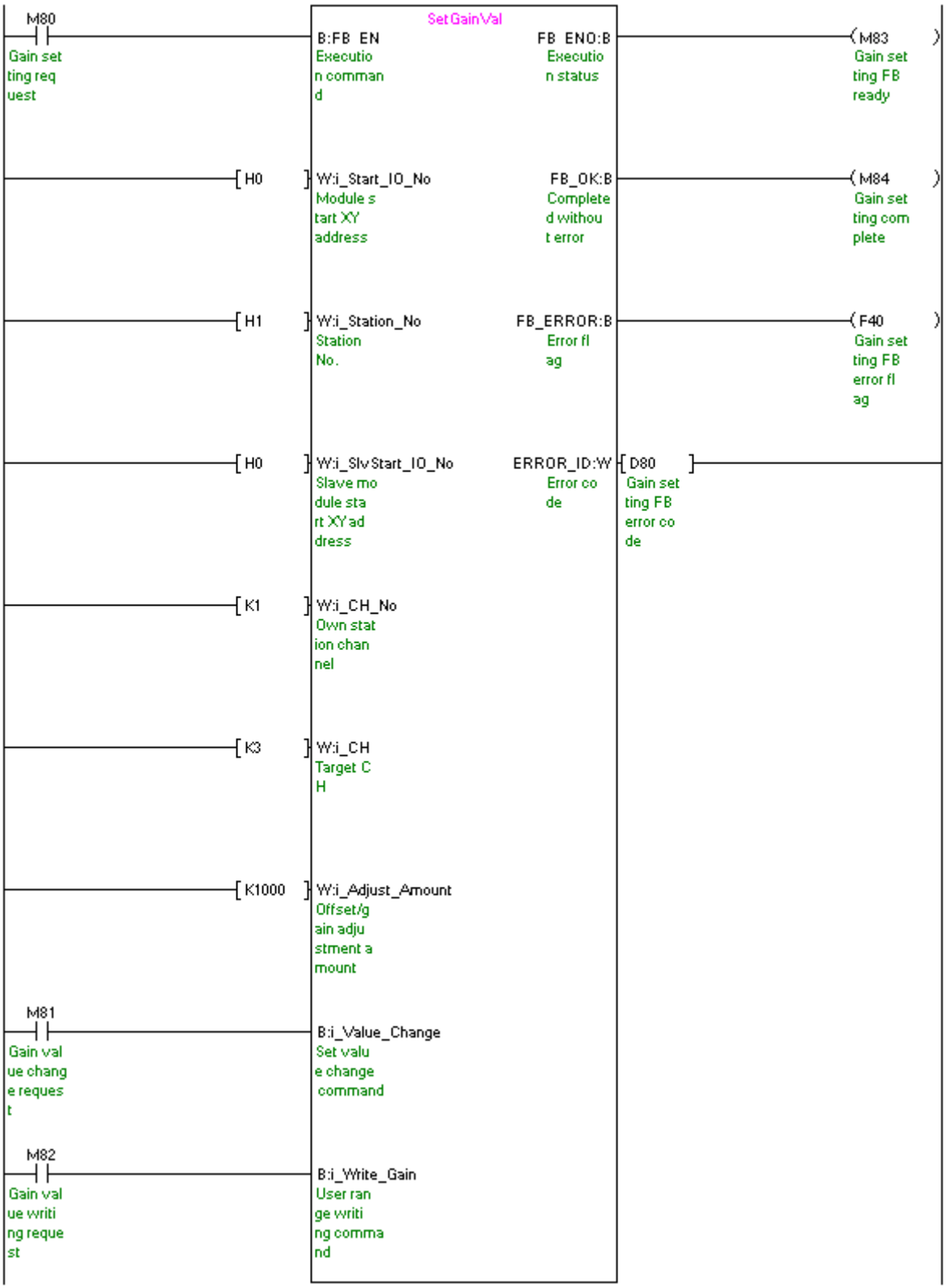
By turning ON M71 after turning ON M70, the offset value of channel 2 is changed. By turning ON M72, the user range is written.


M70
Offset setting request
SetOffsetVal
B:FB_EN
Execution command
FB_ENO:B
Execution status
M73
Offset setting FB ready
H0
W:i_Start_IO_No
Module start XY address
FB_OK:B
Completed without error
M74
Offset setting complete
H1
W:i_Station_No
Station No.
FB_ERROR:B
Error flag
F35
Offset setting FB error flag
H0
W:i_SlvStart_IO_No
Slave module start XY address
ERROR_ID:W
Error code
D70
Offset setting FB error code
K1
W:i_CH_No
Own station channel
K2
W:i_CH
Target CH
K1000
W:i_Adjust_Amount
Offset/gain adjustment amount
M71
Offset value change request
B:i_Value_Change
Set value change command
M72
Offset value writing request
B:i_Write_Offset
User range writing command

M+L60DA4-IEF_SetGainVal (Gain setting)

Label name	Setting value	Description
i_Start_IO_No	H0	Set the starting XY address where the L60DA4 is connected to 0H.
i_Station_No	H1	Set the target station number to 1.
i_SlvStart_IO_No	H0	Set the starting XY address where the L60DA4 is connected to 0H.
i_CH_No	K1	Set the own station channel to channel 1.
i_CH	K3	Set the target channel to channel 3.
i_Adjust_Amount	K1000	Set the offset/gain adjustment amount to 1,000.
i_Value_Change	ON/OFF	By turning ON, the gain value is changed.
i_Write_Gain	ON/OFF	By turning ON, the user range is written.

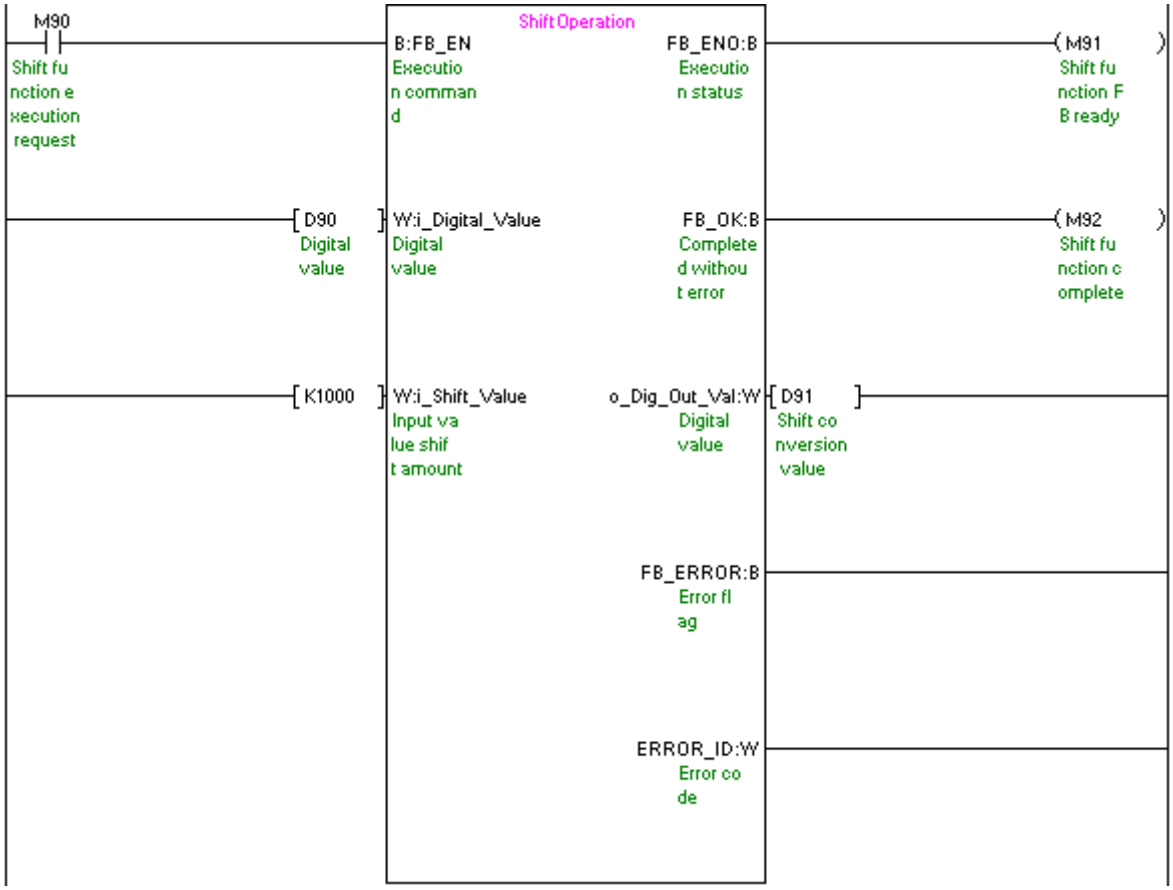
By turning ON M81 after turning ON M80, the gain value of channel 3 is changed. By turning ON M82, the user range is written.


M80
Gain set ting req uest
SetGainVal
B:FB_EN
Executio n comman d
FB_ENO:B
Executio n status
M83
Gain set ting FB ready
H0
W:i_Start_IO_No
Module s tart XY address
FB_OK:B
Complete d withou t error
M84
Gain set ting com plete
H1
W:i_Station_No
Station No.
FB_ERROR:B
Error fl ag
F40
Gain set ting FB error fl ag
H0
W:i_SlvStart_IO_No
Slave mo dule sta rt XY ad dress
ERROR_ID:W
Error co de
D80
Gain set ting FB error co de
K1
W:i_CH_No
Own stat ion chan nel
K3
W:i_CH
Target C H
K1000
W:i_Adjust_Amount
Offset/g ain adju stment a mount
M81
Gain val ue chang e reques t
B:i_Value_Change
Set valu e change command
M82
Gain val ue writi ng reque st
B:i_Write_Gain
User ran ge writi ng comma nd

M+L60DA4-IEF_ShiftOperation (Shift operation)

Label name	Setting value	Description
i_Digital_Value	-	Set the digital value.
i_Shift_Value	K1000	Set the shift amount to 1,000.

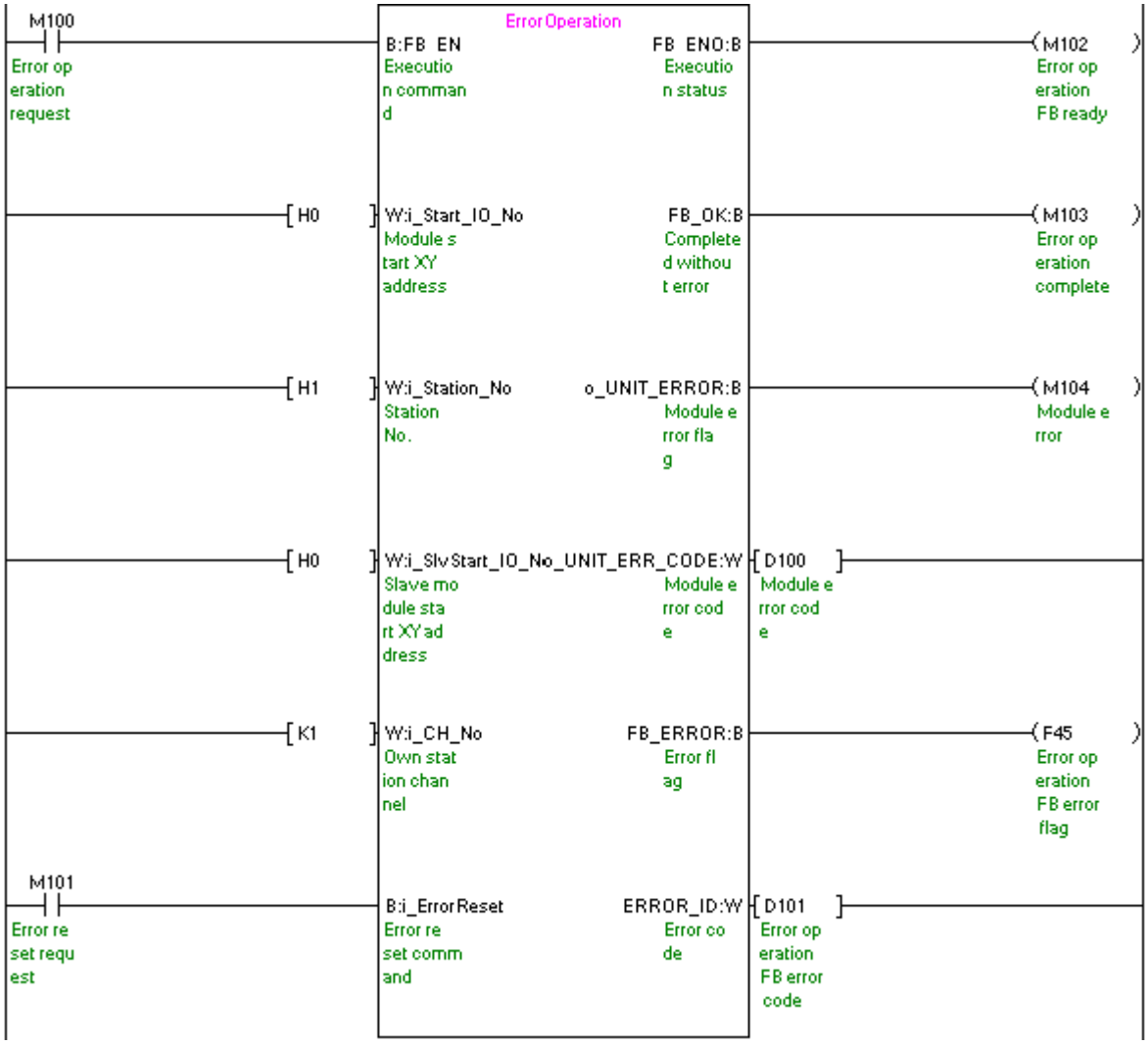
By turning ON M90, the digital value to which the input value shift amount is added is output.



M+L60DA4-IEF_ErrorOperation (Error operation)

Label name	Setting value	Description
i_Start_IO_No	H0	Set the starting XY address where the L60DA4 is connected to 0H.
i_Station_No	H1	Set the target station number to 1.
i_SlvStart_IO_No	H0	Set the starting XY address where the L60DA4 is connected to 0H.
i_CH_No	K1	Set the own station channel to channel 1.
i_ErrorReset	ON/OFF	Turn ON for the error reset.

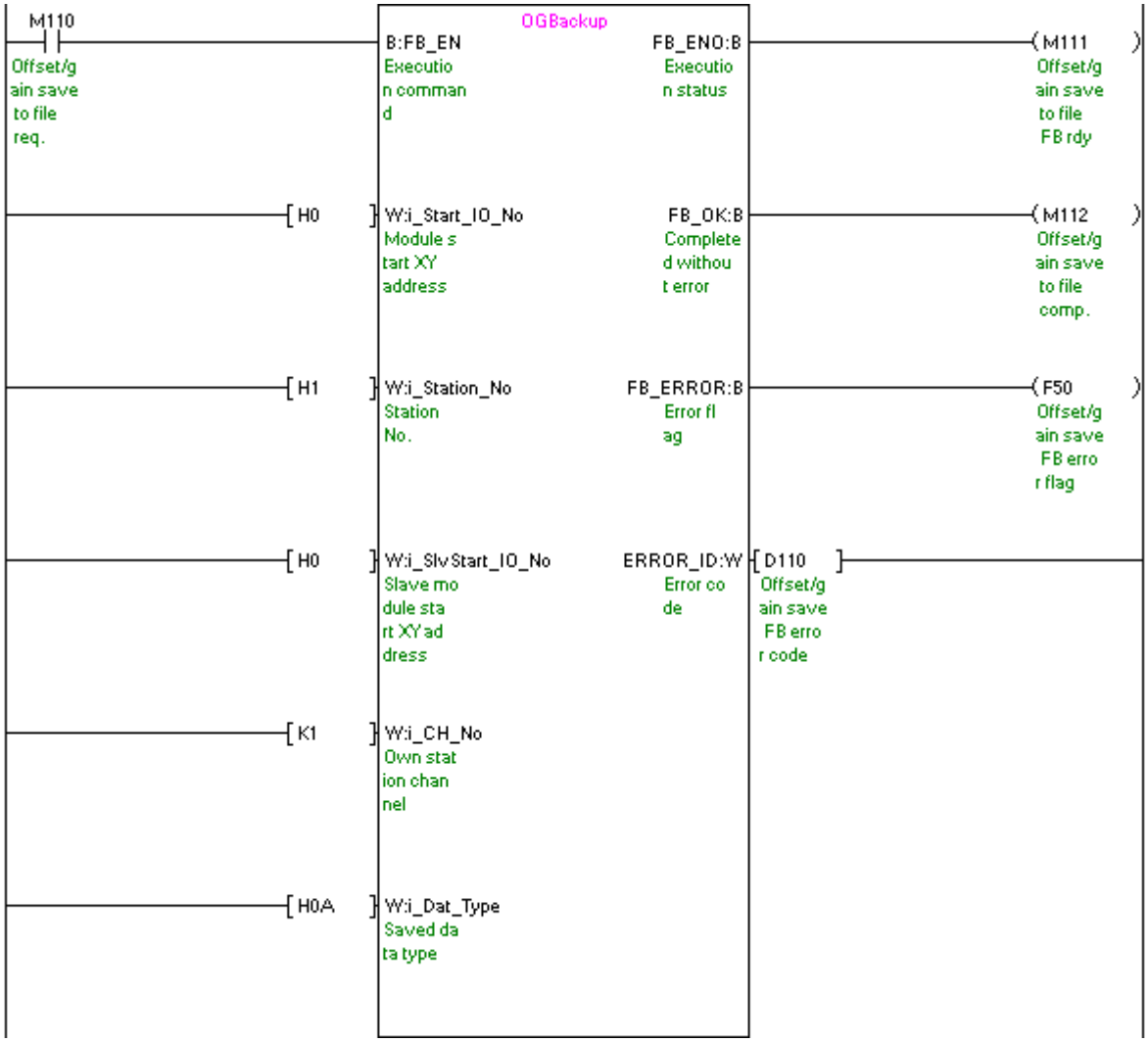
By turning ON M100, the error code is output when an error occurs. By turning ON M101 after the error output, the error is reset.



M+L60DA4-IEF_OGBackup (Offset/gain value save)

Label name	Setting value	Description
i_Start_IO_No	H0	Set the starting XY address where the L60DA4 is connected to 0H.
i_Station_No	H1	Set the target station number to 1.
i_SlvStart_IO_No	H0	Set the starting XY address where the L60DA4 is connected to 0H.
i_CH_No	K1	Set the own station channel to channel 1.
i_Dat_Type	H0A	Set "voltage" to channel 1 and 3, "current" to channel 2 and 4 for the saved data type.

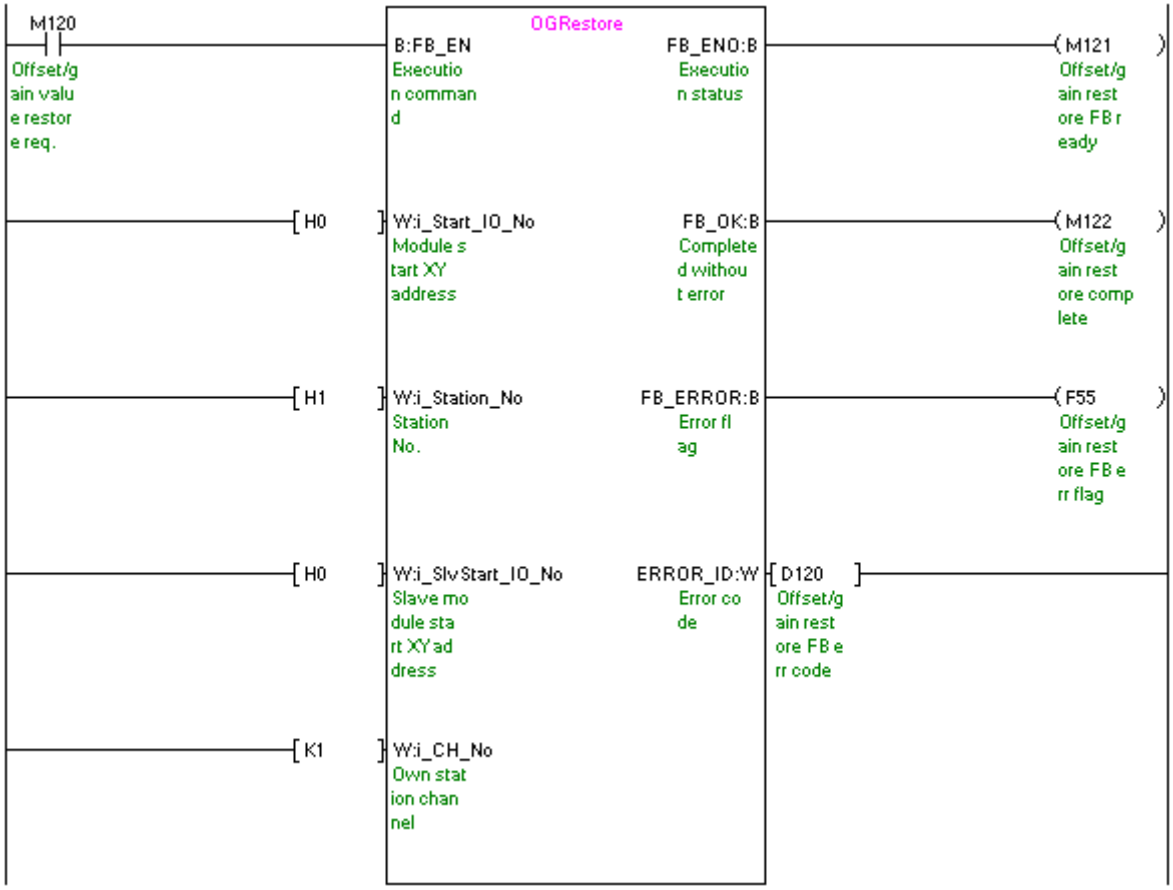
By turning ON M110, the offset/gain value of the user range setting is read and saved in the memory card inserted in the CPU module in a file format.



M+L60DA4-IEF_OGRestore (Offset/gain value restore)

Label name	Setting value	Description
i_Start_IO_No	H0	Set the starting XY address where the L60DA4 is connected to 0H.
i_Station_No	H1	Set the target station number to 1.
i_SlvStart_IO_No	H0	Set the starting XY address where the L60DA4 is connected to 0H.
i_CH_No	K1	Set the own station channel to channel 1.

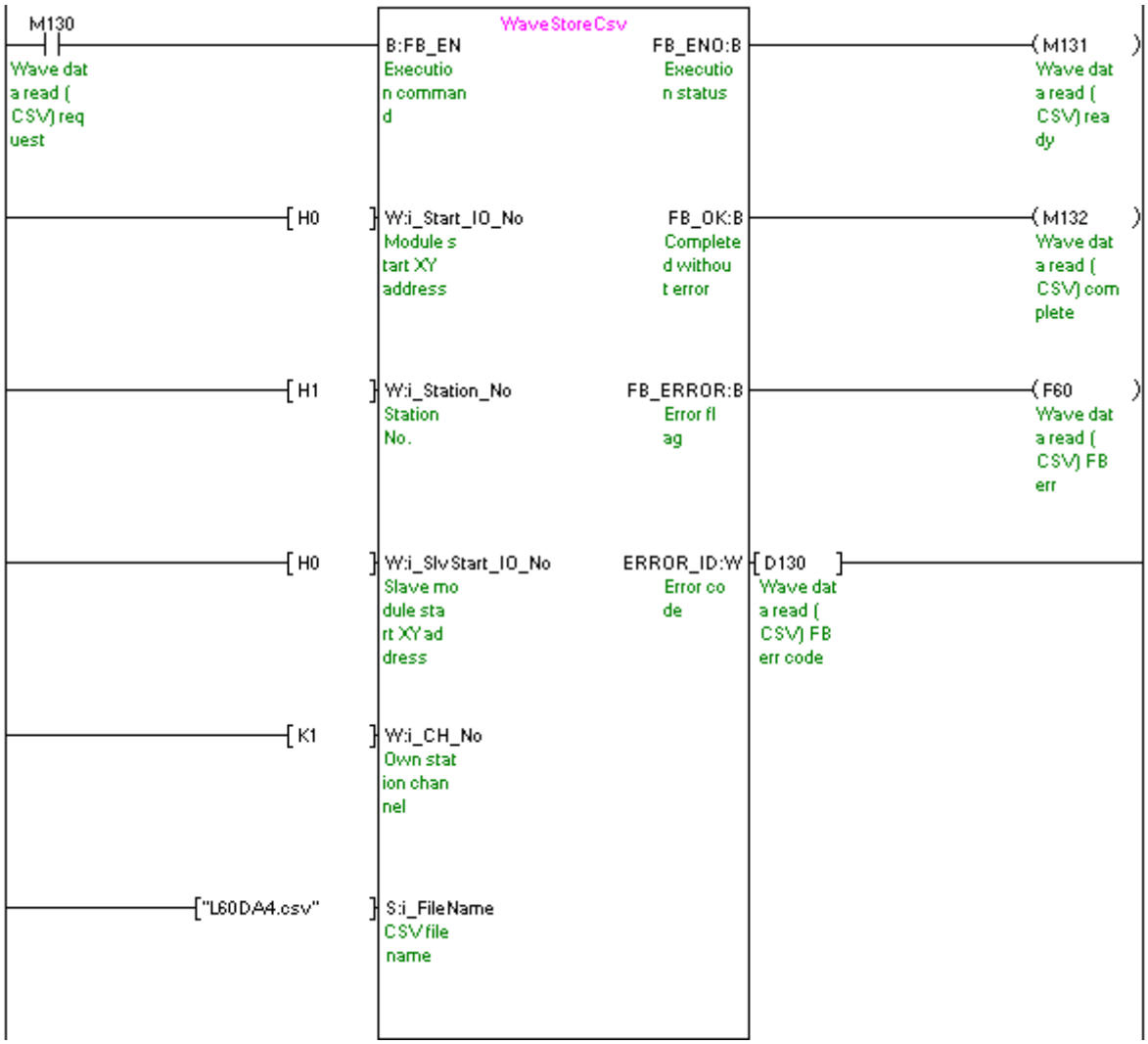
By turning ON M120, the offset/gain setting value saved in the file is restored to the module.



M+L60DA4-IEF_WaveDataStoreCsv (Read wave data (CSV file))

Label name	Setting value	Description
i_Start_IO_No	H0	Set the starting XY address where the L60DA4 is connected to 0H.
i_Station_No	H1	Set the target station number to 1.
i_SlvStart_IO_No	H0	Set the starting XY address where the L60DA4 is connected to 0H.
i_CH_No	K1	Set the own station channel to channel 1.
i_FileName	"L60DA4.csv"	Set "L60DA4.csv" as the name of the CSV file to where the parameters and the wave data of the wave output function are stored.

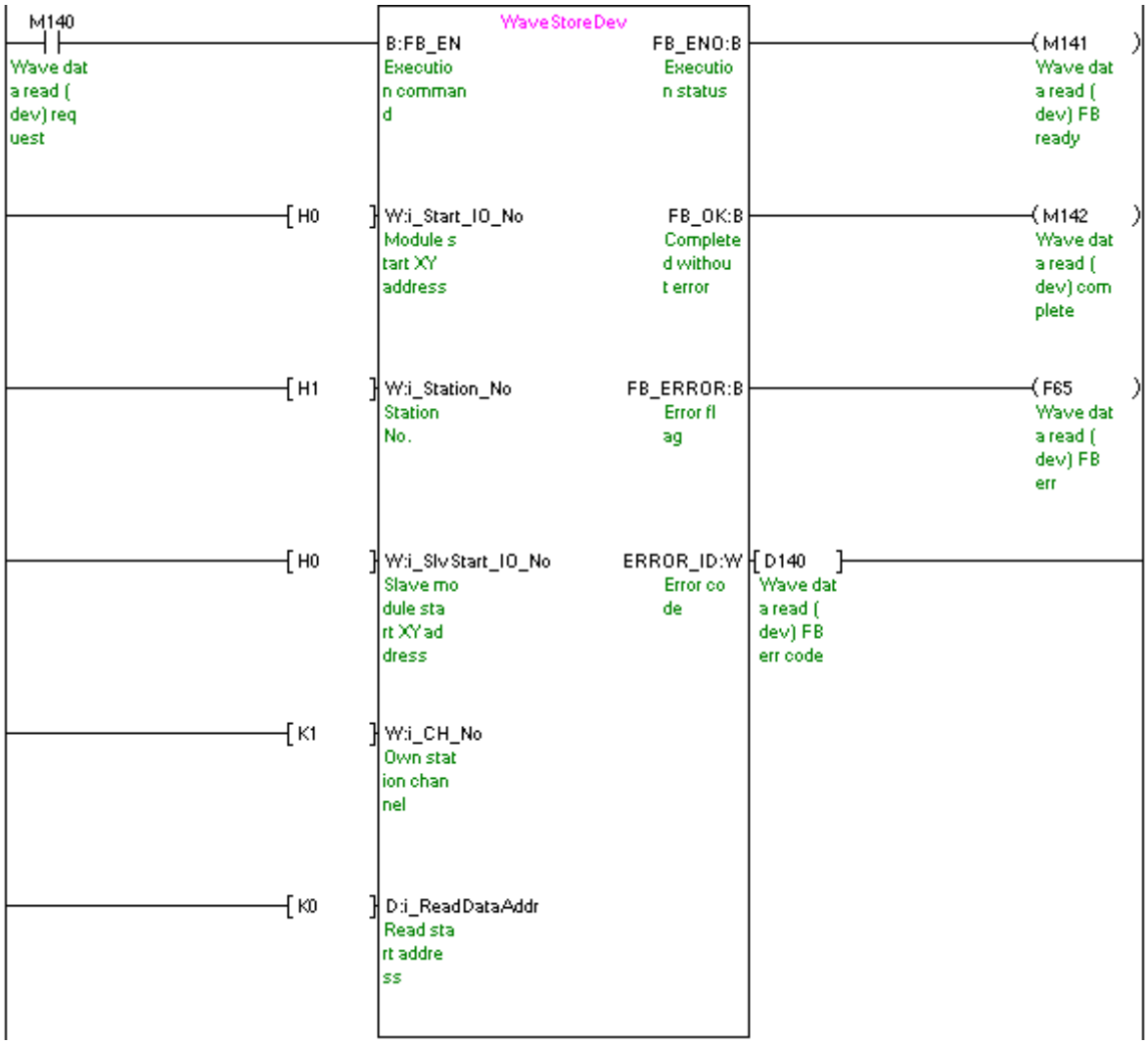
By turning ON M130, the parameters and wave data of the wave output function are read from "L60DA4.csv" and stored in the buffer memory.



M+L60DA4-IEF_WaveDataStoreDev (Read wave data (device))

Label name	Setting value	Description
i_Start_IO_No	H0	Set the starting XY address where the L60DA4 is connected to 0H.
i_Station_No	H1	Set the target station number to 1.
i_SlvStart_IO_No	H0	Set the starting XY address where the L60DA4 is connected to 0H.
i_CH_No	K1	Set the own station channel to channel 1.
i_ReadDataAddr	K0	Set ZR0 as the read start address where the parameters and the wave data of the wave output function are stored.

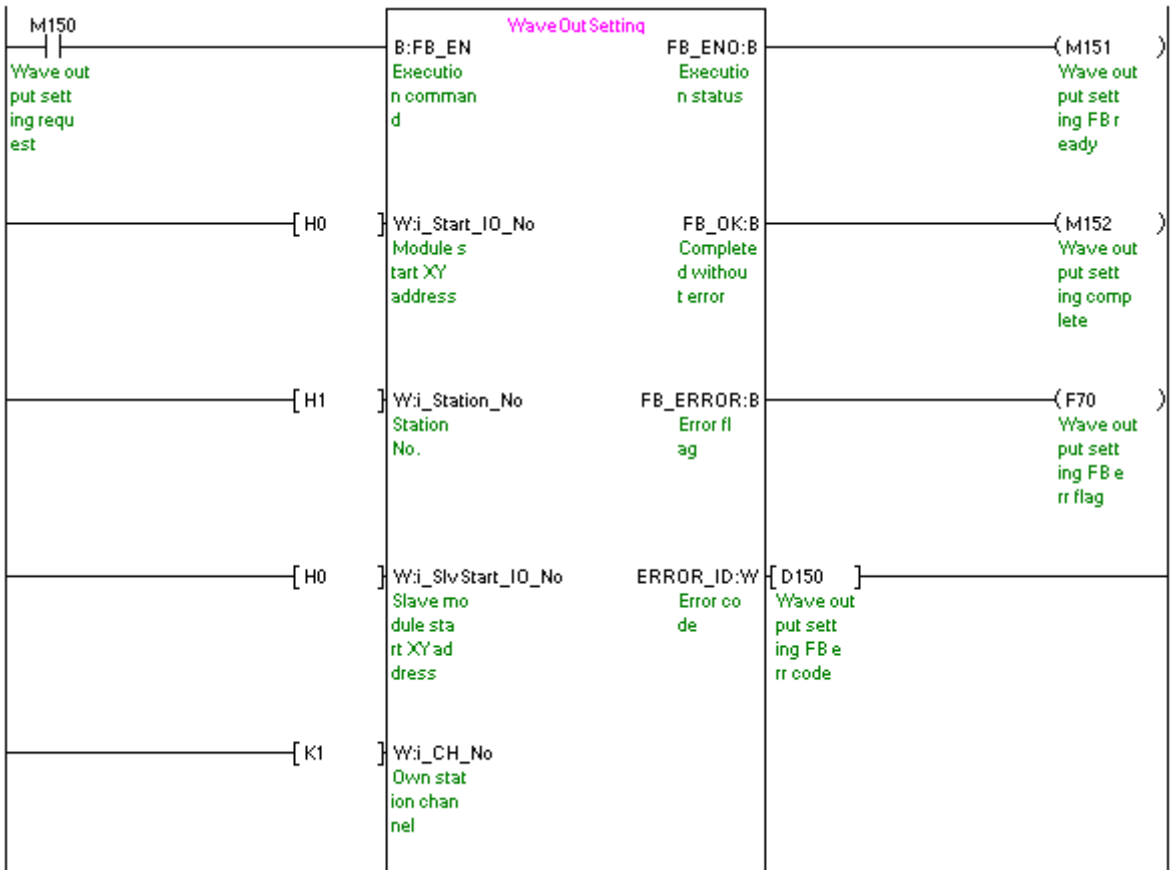
By turning ON M140, the parameters and wave data of the wave output function are read from the file register ZR0 or later, and stored in the buffer memory.



M+L60DA4-IEF_WaveOutSetting (Wave output setting)

Label name	Setting value	Description
i_Start_IO_No	H0	Set the starting XY address where the L60DA4 is connected to 0H.
i_Station_No	H1	Set the target station number to 1.
i_SlvStart_IO_No	H0	Set the starting XY address where the L60DA4 is connected to 0H.
i_CH_No	K1	Set the own station channel to channel 1.
i_CH	K1	Set the target channel to channel 1.
i_OutputSelect	K2	Set "Output setting during wave output stop" to 2 (Output value during wave output stop).
i_OutputValue	K4000	Set the output setting value during the wave output stop to 4,000.
i_StartingAddr	K5000	Set the start address of the wave pattern to be output to 5,000.
i_PointsSetting	K10000	Set the data points of the wave pattern to be output to 10,000.
i_Frequency	K2000	Set the wave output times to 2,000.
i_ConvSpeed	K1	Set the constant for wave output conversion cycle to 1.

By turning ON M150, the wave output setting of channel 1 is performed.



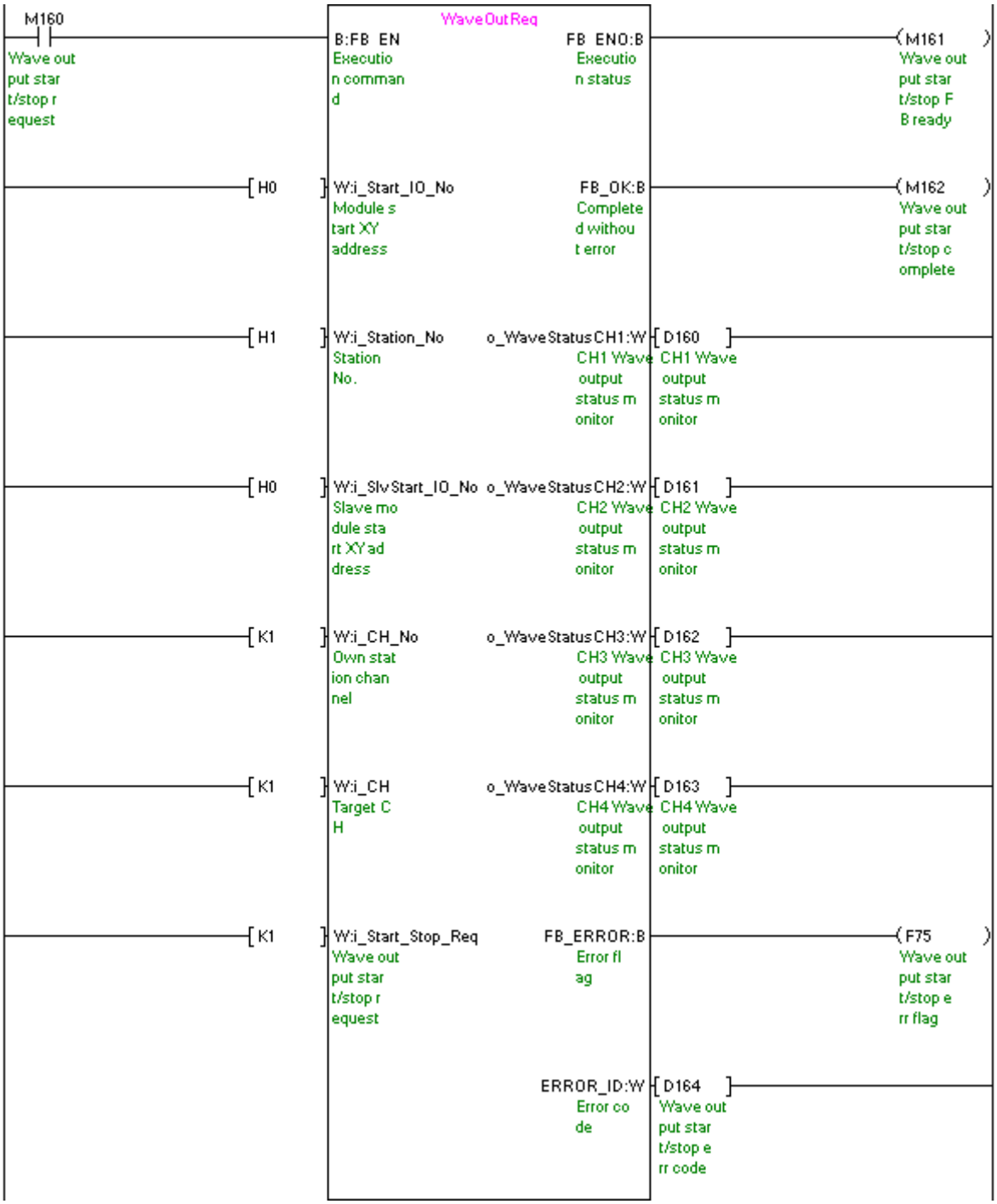
(Continues to the next page)


K1
W:i_CH
Target C
H
K2
W:i_Output Select
Output s
etting d
uring wa
ve outpu
K4000
W:i_Output Value
Output v
alue dur
ing wave
output
K5000
D:i_StartingAddr
Wave pat
tern sta
rt addre
ss setti
K10000
D:i_Points Setting
Wave pat
tern dat
a points
setting
K2000
W:i_Frequency
Wave pat
tern out
put repe
tition s
K1
W:i_Conv Speed
Constant
for wav
e output
convers

M+L60DA4-IEF_WaveOutReqSetting (Wave output start/stop request)

Label name	Setting value	Description
i_Start_IO_No	H0	Set the starting XY address where the L60DA4 is connected to 0H.
i_Station_No	H1	Set the target station number to 1.
i_SlvStart_IO_No	H0	Set the starting XY address where the L60DA4 is connected to 0H.
i_CH_No	K1	Set the own station channel to channel 1.
i_CH	K1	Set the target channel to channel 1.
i_Start_Stop_Req	K1	Set Wave output start/stop request to "1: Wave output start request".

By turning ON M160, the wave output of channel 1 is started.


M160
Wave out put star t/stop r equest
Wave Out Req
B:FB_EN
Executio n comman d
FB_ENO:B
Executio n status
M161
Wave out put star t/stop F B ready
H0
W:i_Start_IO_No
Module s tart XY address
FB_OK:B
Complete d withou t error
M162
Wave out put star t/stop c omplete
H1
W:i_Station_No
Station No.
o_WaveStatusCH1:W
CH1 Wave output status m onitor
D160
CH1 Wave output status m onitor
H0
W:i_SlvStart_IO_No
Slave mo dule sta rt XY ad dress
o_WaveStatusCH2:W
CH2 Wave output status m onitor
D161
CH2 Wave output status m onitor
K1
W:i_CH_No
Own stat ion chan nel
o_WaveStatusCH3:W
CH3 Wave output status m onitor
D162
CH3 Wave output status m onitor
K1
W:i_CH
Target C H
o_WaveStatusCH4:W
CH4 Wave output status m onitor
D163
CH4 Wave output status m onitor
K1
W:i_Start_Stop_Req
Wave out put star t/stop r equest
FB_ERROR:B
Error fl ag
F75
Wave out put star t/stop e rr flag
ERROR_ID:W
Error co de
D164
Wave out put star t/stop e rr code

Appendix 3. Storage Source "Wave Output Function Parameter and Data" and Storage Location Buffer Memory

The following table lists the relation between the storage source "Wave output function parameter and data" and the storage location buffer memory handled by M+L60DA4-IEF_WaveDataStoreCsv (Read wave data (CSV file)) and M+L60DA4-IEF_WaveDataStoreDev (Read wave data (device)).

Table 1 Storage Source "Wave Output Function Parameter and Data" and Storage Location Buffer Memory

No.	Parameter/data of the wave output function	Setting range (decimal)		CH	Storage source			Storage location
					CSV file in the memory card		Serial number access format file register (ZR) (m: Reading start address)	Buffer memory of the D/A converter module (n: Module start XY address upper)
					Row	Column		
1)	Output setting during wave output stop Select the output during the wave output stop for each channel.	0: 0V/0mA 1: Offset value 2: Output value during wave output stop		1	1	1	ZR (m + 0)	Un\G1008
				2	1	2	ZR (m + 1)	Un\G1009
				3	1	3	ZR (m + 2)	Un\G1010
				4	1	4	ZR (m + 3)	Un\G1011
2)	Output value during wave output stop Set the value to be output for each channel when "2: Output value during wave output stop" is selected in "Output setting during wave output stop".	(*1)	0 to 20,479 (practical range: 0 to 20,000)	1	2	1	ZR (m + 8)	Un\G1016
				2	2	2	ZR (m + 9)	Un\G1017
				3	2	3	ZR (m + 10)	Un\G1018
		(*2)	-20,480 to 20,479 (practical range: -20,000 to 20,000)	4	2	4	ZR (m + 11)	Un\G1019
3)	Wave pattern start address setting Set the start address of the wave pattern to be output for each channel.	5,000 to 54,999		1	3	1	ZR (m + 16 and 17)	Un\G1024 and 1025
				2	3	2	ZR (m + 18 and 19)	Un\G1026 and 1027
				3	3	3	ZR (m + 20 and 21)	Un\G1028 and 1029
				4	3	4	ZR (m + 22 and 23)	Un\G1030 and 1031
4)	Wave pattern data points setting Set the data points of the wave pattern to be output for each channel.	1 to 50,000 (points)		1	4	1	ZR (m + 32 and 33)	Un\G1040 and 1041
				2	4	2	ZR (m + 34 and 35)	Un\G1042 and 1043
				3	4	3	ZR (m + 36 and 37)	Un\G1044 and 1045
				4	4	4	ZR (m + 38 and 39)	Un\G1046 and 1047
5)	Wave pattern output repetition setting Set the output times of the wave pattern for each channel.	-1: Unlimited repetition 1 to 32,767: Specified number of times		1	5	1	ZR (m + 48)	Un\G1056
				2	5	2	ZR (m + 49)	Un\G1057
				3	5	3	ZR (m + 50)	Un\G1058
				4	5	4	ZR (m + 51)	Un\G1059
6)	Constant for wave output conversion cycle Set the constant to determine the conversion cycle (multiple of the conversion speed) for each channel.	1 to 5,000		1	6	1	ZR (m + 56)	Un\G1064
				2	6	2	ZR (m + 57)	Un\G1065
				3	6	3	ZR (m + 58)	Un\G1066
				4	6	4	ZR (m + 59)	Un\G1067
7)	Number of wave data points Set the total points of the wave data.	0 to 50,000 (points)			100	1	ZR (m + 98,99)	-
8)	Wave data	-20,480 to 20,479 (practical range: -20,000 to 20,000)			101 to 50,100	1	ZR (m + 100) to ZR (m + 50099)	Un\G5000 to Un\54999

*1: When the output range of the D/A converter module is 0 to 5V, 1 to 5V, 0 to 20mA, or 4 to 20mA

*2: When the output range of the D/A converter module is -10 to 10V

* The number 1) to 8) in the table corresponds to the number in the row and column example of a CSV file in Appendix 4.

Appendix 4. CSV File Format for Wave Data Reading FB (CSV File)

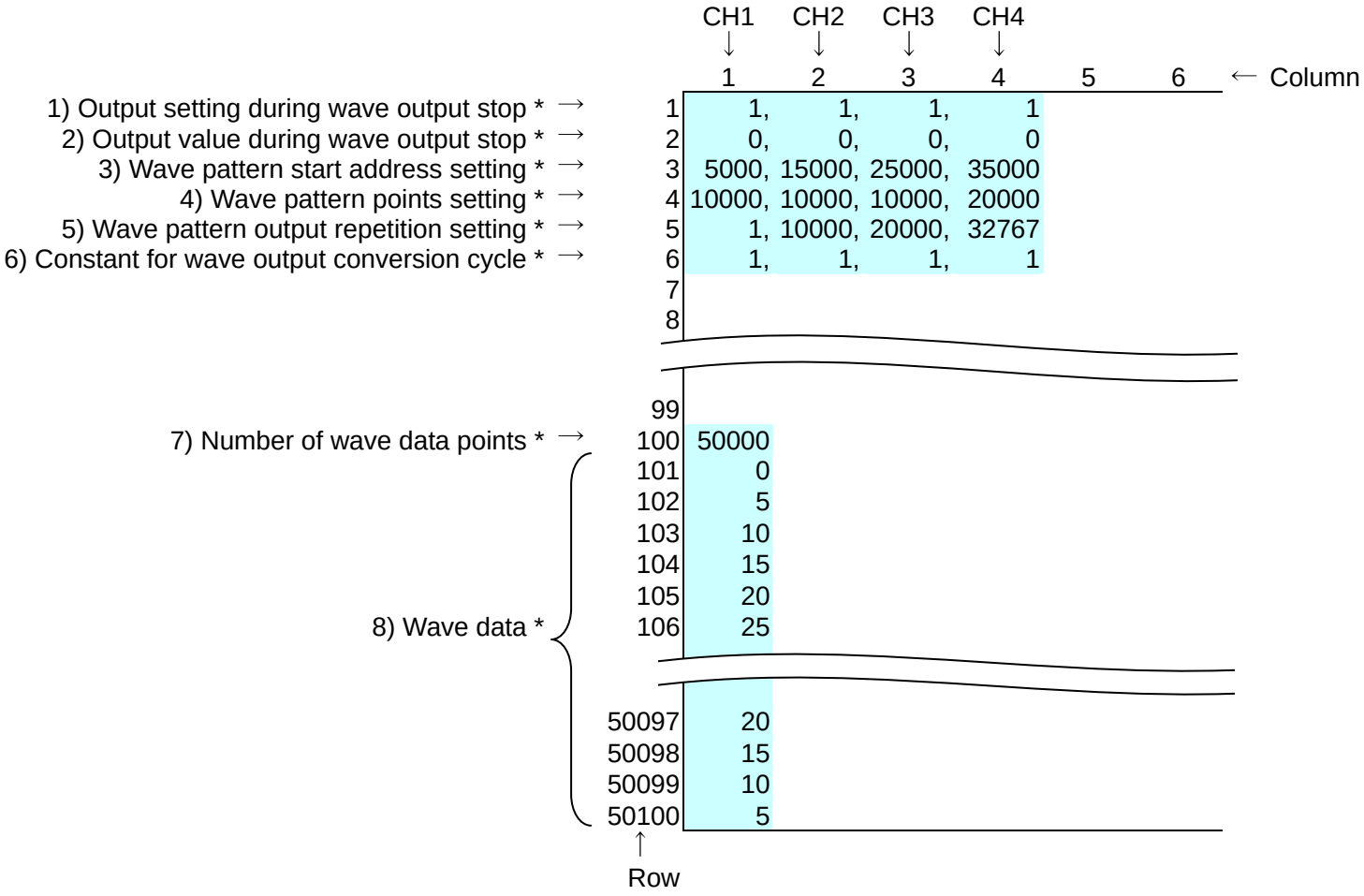
This section shows the CSV file format that M+L60DA4-IEF_WaveDataStoreCsv (Read wave data (CSV file)) handles. (A CSV file has an extension ".csv" and can be opened in general applications such as Microsoft Excel and Notepad.)

The following table lists the CSV format specification.

Item	Description
Delimiter	Comma (,)
Linefeed code	CRLF (0x0D, 0x0A)
Character code	ASCII or Shift JIS

The number of characters for the CSV file name must be within 12 including the extension ".csv". (Two-byte characters can be used. One two-byte character equals to two one-byte characters.)
(Example) L60DA4_1.csv, wd000001.csv, WaveData.csv

The following figure shows a row and column example of a CSV file. In this example, the number of wave data points is 50000 (points) (maximum).



* The number 1) to 8) corresponds to each item of "Table 1 Storage Source "Wave Output Function Parameter and Data" and Storage Location Buffer Memory" in Appendix 3. For details on the items, refer to the table.