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

Applicable module: L60ADIL8, L60ADVL8

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Reference Manual Revision History

Reference Manual Number	Date	Description	
FBM-M117-A	2014/7/31	First edition	
FBM-M117-B	2015/9/25	1) Added applicable GX Works2 Version.	
		 This FB is able to install on GX Works2 of all language versions. 	



1. Overview

1.1. Overview of the FB Library

This FB library is for using the MELSEC-L analog-digital converter module L60ADIL8 and L60ADVL8 (hereinafter L60ADIL8 and L60ADVL8).

1.2. Function of the FB Library

Item	Description
M+L60ADL8_ReadADVal	Reads the A/D conversion data of the specified channel.
M+L60ADL8_ReadAllADVal	Reads the A/D conversion data of all channels.
M+L60ADL8_ReadScalingVal	Reads the scaling value of the specified channel.
M+L60ADL8_ReadAllScalingVal	Reads the scaling values of all channels.
M+L60ADL8_SetADConversion	Enables or disables the A/D conversion for a specified channel or all
	channels.
M+L60ADL8_SetAverage	Sets the averaging processing of the specified channel.
M+L60ADL8_SetScaling	Sets the scaling of the specified channel.
M+L60ADL8_SetProcessAlarm	Sets the process alarm of the specified channel.
M+L60ADL8_SetInputSignalErr	Sets the input signal error detection of the specified channel.
M+L60ADL8_SetInputSignalErrExp	Sets the input signal error detection extension of the specified channel.
M+L60ADL8_RequestSetting	Validates the settings of each function.
M+L60ADL8_SetOffsetVal	Sets the offset of the specified channel.
M+L60ADL8_SetGainVal	Sets the gain of the specified channel.
M+L60ADL8_ErrorOperation	Monitors error codes and resets errors.
	Reads the offset/gain setting values of the user range and save them to a
	file.
	Restores the offset/gain setting values of the user range setting that are
M+LOUADLO_OGRESIOIE	saved in a file to the module.
M+L60ADL8_ShiftOperation	Adds the shift amount to the digital value.
M+L60ADL8_DiffOperation	Outputs the difference obtained by subtracting the standard value from the
	digital value.
M+L60ADL8_DigitalClipOperation	Limits a digital value at the digital clipping upper and lower limit values.





- 1.4. Relevant Manuals
- MELSEC-L Analog-Digital Converter Module User's Manual
- MELSEC-L CPU Module User's Manual (Hardware Design, Maintenance and Inspection)
- MELSEC-L CPU Module User's Manual (Data Logging Function)
- GX Works2 Version 1 Operating Manual (Common)
- GX Works2 Version 1 Operating Manual (Simple Project, Function Block)

1.5. Note



2. Details of the FB Library

2.1. M+L60ADL8_ReadADVal (Read A/D conversion data)

FB Name

M+L60ADL8_ReadADVal

Item	Description				
Function overview	Reads the A/D conversion data of the specified channel.				
Symbol	Execution command — B : Module start XY address — W : Target CH — W :	M+L60ADL8_ReadADVal FB_EN i_Start_IO_No i_CH	FB_ENO : B Execution status FB_OK : B Completed without error o_AD_Value : W A/D conversion data FB_ERROR : B Error flag ERROR_ID : W Error code		
Applicable	Analog-digital converter	L60ADIL8, L60ADVL8			
hardware and	module				
software	CPU module				
		Series	Model		
		MELSEC-L Series	LCPU		
	Engineering software	GX Works2 *1			
		Language	Software version		
		Japanese version	Version1.86Q or later		
		English version	Version1.24A or later		
		Chinese (Simplified) version	Version1.49B or later		
		Chinese (Traditional) version	Version1.49B or later		
		Korean version	Version1.49B or later		
		*1 For software versions applica	ble to the modules used, refer to		
		"Relevant manuals".			
Programming	Ladder				
language					
Number of steps	303 steps (for MELSEC-L series CPU)				
	*The number of steps of the FB in a program depends on the CPU model that is used and				
	input and output definition.				



Item	Description
Function	1) By turning ON FB_EN (Execution command), the A/D conversion data of the specified
description	channel is read.
	2) The read o_AD_Value (A/D conversion data) depends on the settings of the input range
	and averaging processing function.
	3) When the setting value of i_CH (Target CH) is out of range, the FB_ERROR (Error flag)
	output turns ON, the 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 digital output value is set in the auto refresh setting of the intelligent function
	module, this FB is unnecessary.
Compiling method	Macro type
Restrictions and	1) The FB does not include error recovery processing. Program the error recovery
precautions	processing separately in accordance with the required system operation.
	2) The FB cannot be used in an interrupt program.
	3) Please ensure that the FB_EN signal is capable of being turned OFF by the program. Do
	not use this FB in programs that are only executed once such as a subroutine,
	FOR-NEXT loop because it is impossible to turn OFF.
	4) When two or more of these FBs are used, precaution must be taken to avoid repetition of
	i_CH (Target CH).
	5) This FB uses index registers Z7 to Z9. Please do not use these index registers in an
	interrupt program.
	6) Every input must be provided with a value for proper FB operation.
	7) To operate the L60ADIL8 or L60ADVL8, 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 Version 1 Operating Manual (Common).
FB operation type	Real-time execution
Application	Refer to "Appendix 1. FB Library Application Examples".
example	



Item	Description			
Timing chart	[When operation completes without error]	[When an error occurs]		
	FB_EN (Execution command) FB_ENO (Execution status) o_AD_Value (A/D conversion data) FB_OK (Completed without error) FB_ERROR (Error flag) ERROR_ID (Error code) 0	FB_EN (Execution command) FB_ENO (Execution status) o_AD_Value (A/D conversion data) FB_OK (Completed without error) FB_ERROR (Error flag) ERROR_ID (Error code) 0 Error code 0		
Relevant manuals	MELSEC-L Analog-Digital Converter Module User's Manual			
	• 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 code list

Error code	Description	Action
10 (Decimal)	The specified channel is not valid. i_CH	Please try again after confirming the setting.
	(Target CH) is not within the range of 1 to	
	8.	

Labels

Input labels

Name (comment)	Label name	Data	Setting range	Description
		type		
Execution command	FB_EN		ON, OFF	ON: The FB is activated.
		Bit		OFF: The FB is not
				activated.
Module start XY	i_Start_IO_No		Depends on the I/O point	Specify the starting XY
address			range of the CPU.	address (in hexadecimal)
		Word	For details, refer to the	where the L60ADIL8 or
		vvoru	CPU user's manual.	L60ADVL8 is connected.
				(For example, enter H10
				for X10.)
Target CH	i_CH	Word	1 to 8	Specify the channel
		vvora		number.



Output labels

Name (comment)	Label name	Data	Initial	Description
		type	value	
Execution status	FB_ENO			ON: Execution command is ON.
		BI	OFF	OFF: Execution command is OFF.
Completed without	FB_OK	Dit		When ON, it indicates that the A/D
error				conversion value is being read.
A/D conversion data	o_AD_Value	Word	Vord 0 The A/D conversion value is s	
Error flag	FB_ERROR	Dit		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	2014/7/31	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.



2.2. M+L60ADL8_ReadAllADVal (Read all A/D conversion data)

FB Name

M+L60ADL8_ReadAllADVal

Item	Description			
Function overview	Reads the A/D conversion data of all channels.			
Symbol	Execution command — Module start XY address —	M+L60ADL8_ReadAllADVal B : FB_EN W : i_Start_IO_No 0 0 0 0 0 0 0 0 0 0 0	FB_ENO : B Execution status FB_OK : B Completed without error AD_ValueCH1 : W CH1 A/D conversion data AD_ValueCH2 : W CH2 A/D conversion data AD_ValueCH3 : W CH3 A/D conversion data AD_ValueCH4 : W CH4 A/D conversion data AD_ValueCH5 : W CH5 A/D conversion data AD_ValueCH6 : W CH6 A/D conversion data AD_ValueCH6 : W CH7 A/D conversion data AD_ValueCH8 : W CH8 A/D conversion data FB_ERROR : B Error flag ERROR_ID : W Error code	
Applicable hardware and software	Analog-digital converter module CPU module	L60ADIL8, L60ADVL8 Series MELSEC-L Series	Model LCPU	
	Engineering software	GX Works2 *1 Language Japanese version English version Chinese (Simplified) version Chinese (Traditional) version Korean version *1 For software versions applica "Relevant manuals".	Software versionVersion1.86Q or laterVersion1.24A or laterVersion1.49B or laterVersion1.49B or laterVersion1.49B or laterVersion1.49B or laterble to the modules used, refer to	
Programming language	Ladder	· ·		



Item	Description			
Number of steps	280 steps (for MELSEC-L series CPU)			
	*The number of steps of the FB in a program depends on the CPU model that is used and			
	input and output definition.			
Function description	1) By turning ON FB_EN (Execution command), the A/D conversion data of all channels are			
	read.			
	2) The read o_AD_ValueCH1 (CH1 A/D conversion data) to o_AD_ValueCH8 (CH8 A/D			
	conversion data) depend on the settings of the input range and averaging processing			
	function.			
	3) When the digital output value is set in the auto refresh setting of the intelligent function			
	module, this FB is unnecessary.			
Compiling method	Macro type			
Restrictions and	1) The FB does not include error recovery processing. Program the error recovery			
precautions	processing separately in accordance with the required system operation.			
	2) The FB cannot be used in an interrupt program.			
	3) Please ensure that the FB_EN signal is capable of being turned OFF by the program. Do			
	not use this FB in programs that are only executed once such as a subroutine,			
	FOR-NEXT loop because it is impossible to turn OFF.			
	4) This FB uses index registers Z8 and Z9. Please do not use these index registers in an			
	interrupt program.			
	5) Every input must be provided with a value for proper FB operation.			
	6) To operate the L60ADIL8 or L60ADVL8, 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 Version 1 Operating Manual (Common).			
FB operation type	Real-time execution			
Application example	Refer to "Appendix 1. FB Library Application Examples".			
Timing chart	[When operation completes without error]			
	FB_EN			
	(Execution status)			
	o_AD_Value_CH□ (CH□ A/D conversion data)			
	FB_OK (Completed without error)			
	FB_ERROR (Error flag)			
	ERROR_ID (Error code) 0			



Item	Description			
Relevant manuals	MELSEC-L Analog-Digital Converter Module User's Manual			
	• 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 code list

Error code	Description	Action
None	None	None

Labels

Input labels

Name (comment)	Label name	Data	Setting range	Description
		type		
Execution command	FB_EN	Bit	ON, OFF	ON: The FB is activated.
		DIL		OFF: The FB is not activated.
Module start XY	i_Start_IO_No		Depends on the	Specify the starting XY address (in
address			I/O point range	hexadecimal) where the L60ADIL8
		Mord	of the CPU.	or L60ADVL8 is connected. (For
		vvoru	For details, refer	example, enter H10 for X10.)
			to the CPU	
			user's manual.	



Output labels

Name (comment)	Label name	Data	Initial	Description
		type	value	
Execution status	FB_ENO	Dit	OFF	ON: Execution command is ON.
		ы	OFF	OFF: Execution command is OFF.
Completed without error	FB_OK	Dit	OFF	When ON, it indicates that the A/D conversion
		DIL		value is being read.
CH1 A/D conversion data	o_AD_ValueCH1	Word	0	The A/D conversion value of channel 1 is stored.
CH2 A/D conversion data	o_AD_ValueCH2	Word	0	The A/D conversion value of channel 2 is stored.
CH3 A/D conversion data	o_AD_ValueCH3	Word	0	The A/D conversion value of channel 3 is stored.
CH4 A/D conversion data	o_AD_ValueCH4	Word	0	The A/D conversion value of channel 4 is stored.
CH5 A/D conversion data	o_AD_ValueCH5	Word	0	The A/D conversion value of channel 5 is stored.
CH6 A/D conversion data	o_AD_ValueCH6	Word	0	The A/D conversion value of channel 6 is stored.
CH7 A/D conversion data	o_AD_ValueCH7	Word	0	The A/D conversion value of channel 7 is stored.
CH8 A/D conversion data	o_AD_ValueCH8	Word	0	The A/D conversion value of channel 8 is stored.
Error flag FE	FB_ERROR	Dit	055	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	2014/7/31	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.



2.3. M+L60ADL8_ReadScalingVal (Read scaling value)

FB Name

M+L60ADL8_ReadScalingVal

Item	Description			
Function overview	Reads the scaling value of the specified channel.			
Symbol	Execution command B : FB_EN Module start XY address W : i_Start_IO_No Target CH W : i_CH o_Scal FI E E		FB_ENO : B Execution status FB_OK : B Completed without error aling_Value : W Scaling value FB_ERROR : B Error flag ERROR_ID : W Error code	
Applicable hardware and software	Analog-digital converter module	L60ADIL8, L60ADVL8		
	CPU module	Series MELSEC-L Series	Model LCPU	
	Engineering software	GX Works2 *1 Language Japanese version English version Chinese (Simplified) version Chinese (Traditional) version Korean version *1 For software versions application "Relevant manuals".	Software version Version1.86Q or later Version1.24A or later Version1.49B or later Version1.49B or later Version1.49B or later ble to the modules used, refer to	
Programming	Ladder			
language				
Number of steps	299 steps (for MELSEC-L series CPU) *The number of steps of the FB in a program depends on the CPU model that is used and input and output definition.			



Item	Description					
Function description	1) By turning ON FB_EN (Execution command), the scaling value of the specified channel					
	is read.					
	2) The read o_Scaling_Value (Scaling value) depends on the settings of the input range,					
	averaging processing function, and scaling function.					
	3) When the setting value of i_CH (Target CH) is out of range, the FB_ERROR (Error flag)					
	output turns ON, the 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 scaling value is set in the auto refresh setting of the intelligent function					
	module, this FB is unnecessary.					
Compiling method	Macro type					
Restrictions and	1) The FB does not include error recovery processing. Program the error recovery					
precautions	processing separately in accordance with the required system operation.					
	2) The FB cannot be used in an interrupt program.					
	3) Please ensure that the FB_EN signal is capable of being turned OFF by the program. Do					
	not use this FB in programs that are only executed once such as a subroutine,					
	FOR-NEXT loop because it is impossible to turn OFF.					
	i CH (Torget CH)					
	I_CH (larget CH).					
	5) This FB uses index registers 27 to 29. 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 L60ADIL8 or L60ADVL8, 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 now to use the intelligent function module switch setting, refer to GX					
	vvorks2 version 1 Operating Manual (Common).					
FB operation type	Real-time execution					
Application example	Refer to Appendix 1. FB Library Application Examples .					
Timing chart	[When operation completes without error] [When an error occurs]					
	FB_EN (Execution command)					
	FB_ENO (Execution status) FB_ENO (Execution status)					
	o_Scaling_Value (Scaling value) Refreshing Refreshing Refreshing (Scaling value) Refreshing stop (Scaling value)					
	FB_OK (Completed without error) FB_OK (Completed without error)					
	FB_ERROR (Error flag)					
	ERROR_ID (Error code) 0 ERROR_ID (Error code) 0 Error code 0					



Item	Description
Relevant manuals	MELSEC-L Analog-Digital Converter Module User's Manual
	• 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 code list

Error code	Description	Action
10 (Decimal)	The specified channel is not valid. i_CH	Please try again after confirming the setting.
	(Target CH) is not within the range of 1 to	
	8.	

Labels

●Input labels

Name (comment)	Label name	Data	Setting range	Description
		type		
Execution command	FB_EN	Bit	ON, OFF	ON: The FB is activated.
		DIL		OFF: The FB is not activated.
Module start XY	i_Start_IO_No		Depends on the	Specify the starting XY address (in
address			I/O point range	hexadecimal) where the L60ADIL8
		Word	of the CPU.	or L60ADVL8 is connected. (For
		vvoru	For details, refer	example, enter H10 for X10.)
			to the CPU	
			user's manual.	
Target CH	i_CH	Word	1 to 8	Specify the channel number.

Output labels

Name (comment)	Label name	Data	Initial	Description
		type	value	
Execution status	FB_ENO	Bit OFF		ON: Execution command is ON.
				OFF: Execution command is OFF.
Completed without	FB_OK	Dit	OFF	When ON, it indicates that the scaling value
error		ы	OFF	is being read.
Scaling value	o_Scaling_Value	Word	0	The scaling value is stored.
Error flag	FB_ERROR			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	2014/7/31	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.



2.4. M+L60ADL8_ReadAllScalingVal (Read all scaling values)

FB Name

M+L60ADL8_ReadAllScalingVal

Item	Description		
Function overview	Reads the scaling values of all channels.		
Symbol			
	Execution command — B	: FB_EN	FB_ENO : B Execution status
	Module start XY address — W	: i_Start_IO_No	FB_OK : B Completed without error
		o_Sc	aling_CH1 : W CH1 Scaling value
		o_Sc	aling_CH2 : W CH2 Scaling value
		o_Sc	aling_CH3 : W CH3 Scaling value
		o_Sc	aling_CH4 : W CH4 Scaling value
		0_SC	aling_CH5 : W CH5 Scaling value
		0_00 0 Sc	aling CH7 : W CH7 Scaling value
		- o_Sc	aling_CH8 : W CH8 Scaling value
		F	B_ERROR : B Error flag
		E	ERROR_ID : W Error code
Applicable	Analog-digital converter	L60ADIL8, L60ADVL8	
hardware and	module		
software	CPU module		
		Series	Model
		MELSEC-L Series	LCPU
	Engineering software	GX VVOrKS2 "1	
		Language	Software version
		Japanese version Version1.86Q or later	
		English version	Version1.24A or later
		Chinese (Simplified) version	Version1.49B or later
		Chinese (Traditional) version	Version1.49B or later
		Korean version	Version1.49B or later
		*1 For software versions applicable to the modules used, refer to	
		"Relevant manuals".	
Programming	Ladder		
language			



Item	Description				
Number of steps	277 steps (for MELSEC-L series CPU)				
	*The number of steps of the FB in a program depends on the CPU model that is used and				
	input and output definition.				
Function	1) By turning ON FB_EN (Execution command), the scaling values of channel 1 to channel				
description	8 are read.				
	2) The read o_Scaling_CH1 (CH1 Scaling value) to o_Scaling_CH8 (CH8 scaling value)				
	depend on the settings of the input range, averaging processing function, and scaling				
	function.				
	3) When the scaling value is set in the auto refresh setting of the intelligent function				
	module, this FB is unnecessary.				
Compiling method	Macro type				
Restrictions and	1) The FB does not include error recovery processing. Program the error recovery				
precautions	processing separately in accordance with the required system operation.				
	2) The FB cannot be used in an interrupt program.				
	3) Please ensure that the FB_EN signal is capable of being turned OFF by the program. Do				
	not use this FB in programs that are only executed once such as a subroutine,				
	FOR-NEXT loop because it is impossible to turn OFF.				
	4) I HIS FB USES INDEX REGISTERS Z8 and Z9. Please do not use these index registers in an interrupt program				
	5) Every input must be provided with a value for proper FB operation				
	6) To operate the 60ADII 8 or 60ADVI 8 set the input range according to the device and				
	6) To operate the L60ADIL8 or L60ADVL8, 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 now to use the intelligent function module switch setting, refer to GX				
	Works2 Version 1 Operating Manual (Common).				
	Real-time execution				
Application	Refer to Appendix 1.1 B Library Application Examples .				
Timing chart	When operation completes without error				
	(Execution command)				
	(Execution status)				
	(CHI Scaling value) Refreshing Refreshing stop				
	(Completed without error)				
	ERROR_ID (Error code) 0				



Item	Description	
Relevant manuals	MELSEC-L Analog-Digital Converter Module User's Manual	
	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 code list

Error code	Description	Action
None	None	None

Labels

Input labels

Name (comment)	Label name	Data	Setting range	Description
		type		
Execution command	FB_EN	Dit	ON, OFF	ON: The FB is activated.
		DIL		OFF: The FB is not activated.
Module start XY	i_Start_IO_No		Depends on the	Specify the starting XY address (in
address			I/O point range	hexadecimal) where the L60ADIL8
		Mord	of the CPU.	or L60ADVL8 is connected. (For
		vvora	For details, refer	example, enter H10 for X10.)
			to the CPU	
			user's manual.	

Output labels

Name (comment)	Label name	Data	Initial	Description
		type	value	
Execution status	FB_ENO	Dit	OFF	ON: Execution command is ON.
		DIL	OFF	OFF: Execution command is OFF.
Completed without	FB_OK	Dit	OFF	When ON, it indicates that the scaling value
error		DIL	OFF	is being read.
CH1 Scaling value	o_Scaling_CH1	Word	0	The scaling value of channel 1 is stored.
CH2 Scaling value	o_Scaling_CH2	Word	0	The scaling value of channel 2 is stored.
CH3 Scaling value	o_Scaling_CH3	Word	0	The scaling value of channel 3 is stored.
CH4 Scaling value	o_Scaling_CH4	Word	0	The scaling value of channel 4 is stored.
CH5 Scaling value	o_Scaling_CH5	Word	0	The scaling value of channel 5 is stored.
CH6 Scaling value	o_Scaling_CH6	Word	0	The scaling value of channel 6 is stored.
CH7 Scaling value	o_Scaling_CH7	Word	0	The scaling value of channel 7 is stored.



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Name (comment)	Label name	Data	Initial	Description
		type	value	
CH8 Scaling value	o_Scaling_CH8	Word	0	The scaling value of channel 8 is stored.
Error flag	FB_ERROR	Dit	OFF	When ON, it indicates that an error has
		DIL		occurred.
Error code	ERROR_ID	Word	0	FB error code output.

FB Version Upgrade History

Version	Date	Description
1.00A	2014/7/31	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.



2.5. M+L60ADL8_SetADConversion (A/D conversion enable/disable setting)

FB Name

M+L60ADL8_SetADConversion

Description		
Enables or disables the A/D conversion for a specified channel or all channels.		
Execution command B : FB_EN Module start XY address W : i_Start_IO_No Target CH W : i_CH F A/D conversion enable/ disable setting B : i_AD_Enable F		FB_ENO : B Execution status FB_OK : B Completed without error FB_ERROR : B Error flag ERROR_ID : W Error code
Analog-digital converter module	L60ADIL8, L60ADVL8	
CPU module	Series MELSEC-L Series	Model LCPU
Engineering software GX Works2 *1		
	Language	Software version
	Japanese version	Version1.86Q or later
	English version	Version1.24A or later
	Chinese (Simplified) version	Version1.49B or later
	Chinese (Traditional) version	Version1.49B or later
Korean version		Version1.49B or later
	*1 For software versions applica "Relevant manuals".	ble to the modules used, refer to
Ladder		
364 steps (for MELSEC-L series CPU)		
*The number of steps of the FB in a program depends on the CPU model that is used and input and output definition		
	Enables or disables the Execution command B Module start XY address Target CH A/D conversion enable/ disable setting B Analog-digital converter module CPU module Engineering software Ladder 364 steps (for MELSEC *The number of steps of input and output definit	Description Enables or disables the A/D conversion for a specified ch M+L60ADL8_SetADConversion Module start XY address W : LStart_IO_No Target CH W : LStart_IO_No AD conversion enable/ disable setting L60ADIL8, L60ADVL8 CPU module Engineering software CPU module GX Works2 *1 Engineering software GX Works2 *1 Language Japanese version English version Chinese (Simplified) version Chinese (Traditional) version Korean version *1 For software versions applica "Relevant manuals". Ladder 364 steps (for MELSEC-L series CPU) *The number of steps of the FB in a program depends on input and output definition.



Item	Description			
Function description	1) By turning ON FB_EN (Execution command), the A/D conversion for the specified			
	channel or all channels is enabled or disabled.			
	2) FB operation is one-shot only, triggered by the FB_EN signal.			
	3) The setting value is validated when the Operating condition setting request signal (Yn9)			
	is turned OFF \rightarrow ON \rightarrow OFF or the Operating condition setting request function FB			
	(M+L60ADL8_RequestSetting) is executed.			
	4) When the setting value of i_CH (Target CH) is out of range, the FB_ERROR (Error flag)			
	output turns ON, the 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.			
Compiling method	Macro type			
Restrictions and	1) The FB does not include error recovery processing. Program the error recovery			
precautions	processing separately in accordance with the required system operation.			
	2) The FB cannot be used in an interrupt program.			
	3) Please ensure that the FB_EN signal is capable of being turned OFF by the program. Do			
	not use this FB in programs that are only executed once such as a subroutine,			
	FOR-NEXT loop because it is impossible to turn OFF.			
	4) When two or more of these FBs are used, precaution must be taken to avoid repetition of			
	i_CH (Target CH).			
	5) This FB uses index registers Z7 to Z9. Please do not use these index registers in an			
	interrupt program.			
	6) Every input must be provided with a value for proper FB operation.			
	7) To operate the L60ADIL8 or L60ADVL8, 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 Version 1 Operating Manual (Common).			
FB operation type	Pulsed execution (1 scan execution type)			
Application example	Refer to "Appendix 1. FB Library Application Examples".			
Timing chart	[When operation completes without error] [When an error occurs]			
	FB_EN (Execution command)			
	FB_ENO (Execution status)			
	A/D conversion enable/disable No processing Write No processing A/D conversion enable/disable setting write processing Virte			
	FB_OK (Completed without error) FB_OK (Completed without error)			
	FB_ERROR (Error flag)			



Item	Description	
Relevant manuals	MELSEC-L Analog-Digital Converter Module User's Manual	
	• 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 code list

Error code	Description	Action
10 (Decimal)	The specified channel is not valid. i_CH (Target	Please try again after confirming the setting.
	CH) is not within the range of 1 to 8 or 15.	

Labels

●Input labels

Name (comment)	Label name	Data type	Setting range	Description
Execution command	FB_EN	Di+	ON, OFF	ON: The FB is activated.
		DIL		OFF: The FB is not activated.
Module start XY	i_Start_IO_No		Depends on the	Specify the starting XY address (in
address			I/O point range of	hexadecimal) where the L60ADIL8
		Mord	the CPU.	or L60ADVL8 is connected. (For
		vvoru	For details, refer	example, enter H10 for X10.)
			to the CPU user's	
			manual.	
Target CH	i_CH	Word	1 to 8 or 15	1 to 8: Specify the channel number.
		vvoru		15: Specify all the channels.
A/D conversion	i_AD_Enable	Dit	ON, OFF	ON: Enable the A/D conversion.
enable/disable setting		DIL		OFF: Disable the A/D conversion.

Output labels

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



FB Version Upgrade History

Version	Date	Description
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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.



2.6. M+L60ADL8_SetAverage (Averaging process setting)

FB Name

M+L60ADL8_SetAverage

Item		Description	
Function overview	Sets the averaging processing of the specified channel.		
Symbol	Execution command — Module start XY address — Target CH — Averaging processing type setting — Time average/Count average/ Moving average settings	M+L60ADL8_SetAverage B : FB_EN W : i_Start_IO_No W : i_CH W : i_Average_Type W : i_Average_Times	FB_ENO : B Execution status FB_OK : B Completed without error FB_ERROR : B Fror flag ERROR_ID : W Fror code
Applicable hardware and software	Analog-digital converter module	L60ADIL8, L60ADVL8	
	CPU module	Sorios	Model
		MELSEC-L Series	LCPU
	Engineering software	GX Works2 *1	
		Language	Software version
		Japanese version	Version1.86Q or later
		English version	Version1.24A or later
		Chinese (Simplified) version	Version1.49B or later
		Chinese (Traditional) version	Version1.49B or later
		Korean version	Version1.49B or later
		*1 For software versions applical	ble to the modules used, refer to
		"Relevant manuals".	
Programming language	Ladder		
Number of steps	510 steps (for MELSEC-L series CPU)		
	*The number of steps of the FB in a program depends on the CPU model that is used and		
	input and output defini	tion.	



ltem	Description		
Function description	1) By turning ON FB_EN (Execution command), the averaging processing of the		
	specified channel is set.		
	2) FB operation is one-shot only, triggered by the FB_EN signal.		
	3) The setting value is validated when the Operating condition setting request signal		
	(Yn9) is turned OFF \rightarrow ON \rightarrow OFF or the Operating condition setting request		
	function FB (M+L60ADL8_RequestSetting) is executed.		
	4) When the setting value of i_CH (Target CH) is out of range, the FB_ERROR output		
	turns ON, the processing is interrupted, and the error code is stored in ERROR_ID		
	(Error code).		
	Refer to the error code explanation section for details.		
Compiling method	Macro type		
Restrictions and	1) The FB does not include error recovery processing. Program the error recovery		
precautions	processing separately in accordance with the required system operation.		
	2) The FB cannot be used in an interrupt program.		
	3) Please ensure that the FB_EN signal is capable of being turned OFF by the program.		
	Do not use this FB in programs that are only executed once such as a subroutine,		
	FOR-NEXT loop because it is impossible to turn OFF.		
	4) When two or more of these FBs are used, precaution must be taken to avoid repetition		
	of i_CH (Target CH).		
	5) This FB uses index registers Z7 to Z9. Please do not use these index registers in an		
	interrupt program.		
	6) Every input must be provided with a value for proper FB operation.		
	7) To operate the L60ADIL8 or L60ADVL8, 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 Version 1 Operating Manual (Common).		
	8) When a value set for i_Average_Type (Averaging processing type setting) or		
	i_Average_Times (Time average/Count average/Moving average settings) is out of the		
	setting range, no errors occur in this FB; however an error occurs in the module at an		
	operating condition setting. Please read the MELSEC-L Analog-Digital Converter		
	Module User's Manual.		
FB operation type	Pulsed execution (1 scan execution type)		
Application example	Refer to "Appendix 1. FB Library Application Examples".		



Item	Description		
Timing chart	[When operation completes without error]	[When an error occurs]	
	FB_EN (Execution command) FB_ENO (Execution status) Averaging process setting write processing FB_OK (Completed without error) FB_ERROR (Error flag) ERROR ID (Error code) 0	FB_EN (Execution command) FB_ENO (Execution status) Averaging process setting write processing FB_OK (Completed without error) FB_ERROR (Error flag) ERROR ID (Error code)	
Relevant manuals	 MELSEC-L Analog-Digital Converter Module MELSEC-L CPU Module User's Manual (Harris Inspection) GX Works2 Version 1 Operating Manual (Garris Converted Additional Convertion) 	Jule User's Manual Jardware Design, Maintenance and Common) Simple Project, Function Block)	

Error codes Error code list Error code list

Error code	Description	Action
10 (Decimal)	The specified channel is not valid. i_CH	Please try again after confirming the
	(Target CH) is not within the range of 1 to 8.	setting.



Labels

●Input labels

Name (comment)	Label name	Data type	Setting range	Description
Execution command	FB_EN	i	ON, OFF	ON: The FB is activated.
		Bit		OFF: The FB is not activated.
Module start XY	i_Start_IO_No		Depends on the I/O	Specify the starting XY address
address			point range of the	(in hexadecimal) where the
		Word	CPU.	L60ADIL8 or L60ADVL8 is
		vvora	For details, refer to	connected. (For example, enter
			the CPU user's	H10 for X10.)
			manual.	
Target CH	i_CH	Word	1 to 8	Specify the channel number.
Averaging	i_Average_Type		0 _H : Sampling	Specify the averaging processing
processing type			processing	type.
setting		Word	1 _H : Time average	
			2 _H : Count average	
			3 _H : Moving average	
Time average/Count	i_Average_Times		Time average	Set the time average, count
average/Moving			4 to 5000 (ms)	average, and moving average of
average settings		Mord	Count average	the specified channel.
		vvoru	4 to 62500 (times)	
			Moving average	
			2 to 1000 (times)	

Output labels

Name (comment)	Label name	Data	Initial	Description
		type	value	
Execution status	FB_ENO	Bit OFF		ON: Execution command is ON.
				OFF: Execution command is OFF.
Completed without	FB_OK	Dit	OFF	When ON, it indicates that the averaging
error				processing 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
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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.



2.7. M+L60ADL8_SetScaling (Scaling setting)

FB Name

M+L60ADL8_SetScaling

Item		Description		
Function overview	Sets the scaling of the sp	Sets the scaling of the specified channel.		
Symbol	Execution command — Module start XY address — Target CH — Scaling enable/disable — Scaling upper limit value — Scaling lower limit value —	M+L60ADL8_SetScaling B : FB_EN W : i_Start_IO_No W : i_CH B : i_Scaling_Enable W : i_Scl_U_Lim W : i_Scl_L_Lim	FB_ENO : B Execution status FB_OK : B Completed without error FB_ERROR : B Error flag ERROR_ID : W Error code	
Applicable hardware	Analog-digital converter	L60ADIL8, L60ADVL8		
and software	module			
	CPU module			
		Series	Model	
		MELSEC-L Series	LCPU	
	Engineering software	GX Works2 *1		
		Language	Software version	
		Japanese version	Version1.86Q or later	
		English version	Version1.24A or later	
		Chinese (Simplified) version	Version1.49B or later	
		Chinese (Traditional) version	Version1.49B or later	
		Korean version	Version1.49B or later	
		*1 For software versions applical "Relevant manuals".	ble to the modules used, refer to	
Programming	Ladder			
language				
Number of steps	348 steps (for MELSEC-L series CPU)			
	*The number of steps of the FB in a program depends on the CPU model that is used and			
	input and output definition	on		



Item	Description
Function description	1) By turning ON FB_EN (Execution command), the scaling setting of the specified channel
	is configured.
	2) FB operation is one-shot only, triggered by the FB_EN signal.
	3) The setting value is validated when the Operating condition setting request signal (Yn9)
	is turned OFF \rightarrow ON \rightarrow OFF or the Operating condition setting request function FB
	(M+L60ADL8_RequestSetting) is executed.
	4) When the setting value of i_CH (Target CH) is out of range, the FB_ERROR output turns
	ON, the processing is interrupted, and the error code is stored in ERROR_ID (Error
	code).
	Refer to the error code explanation section for details.
Compiling method	Macro type
Restrictions and	1) The FB does not include error recovery processing. Program the error recovery
precautions	processing separately in accordance with the required system operation.
	2) The FB cannot be used in an interrupt program.
	3) Please ensure that the FB_EN signal is capable of being turned OFF by the program. Do
	not use this FB in programs that are only executed once such as a subroutine,
	FOR-NEXT loop because it is impossible to turn OFF.
	4) When two or more of these FBs are used, precaution must be taken to avoid repetition of
	i_CH (Target CH).
	5) This FB uses index registers Z7 to Z9. Please do not use these index registers in an
	interrupt program.
	6) Every input must be provided with a value for proper FB operation.
	7) To operate the L60ADIL8 or L60ADVL8, 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 Version 1 Operating Manual (Common).
	8) In either of the following cases 1) and 2), no errors occur in this FB; however an error
	occurs in the module at an operating condition setting. Please read the MELSEC-L
	Analog-Digital Converter Module User's Manual.
	1) When a value set for i_Scl_U_Lim (Scaling upper limit value) or i_Scl_L_Lim (Scaling
	lower limit value) is out of the setting range
	When a value equal to or greater than the value set for i_Scl_U_Lim (Scaling upper
	limit value) is set for i_Scl_L_Lim (Scaling lower limit value)
FB operation type	Pulsed execution (1 scan execution type)
Application example	Refer to "Appendix 1. FB Library Application Examples".



Item	Description			
Timing chart	[When operation completes without error] [When an error occurs] FB_EN (Execution command) FB_ENO (Execution status) Scaling setting write processing No processing FB_OK (Careful withert and) Write FB_OK No processing			
	(Completed without error) (Completed without error) FB_ERROR (Error flag) FB_ERROR (Error flag) ERROR_ID (Error code) 0 ERROR_ID (Error code) 0			
Relevant manuals	MELSEC-L Analog-Digital Converter Module User's Manual			
	• 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 code list

Error code	Description	Action	
10 (Decimal)	The specified channel is not valid. i_CH	Please try again after confirming the	
	(Target CH) is not within the range of 1 to 8.	setting.	

Labels

Input labels

Name (comment)	Label name	Data type	Setting range	Description
Execution command	FB_EN	Dit	ON, OFF	ON: The FB is activated.
		DIL		OFF: The FB is not activated.
Module start XY	i_Start_IO_No		Depends on the	Specify the starting XY address (in
address			I/O point range of	hexadecimal) where the L60ADIL8
		Mord	the CPU.	or L60ADVL8 is connected. (For
		vvoru	For details, refer	example, enter H10 for X10.)
			to the CPU user's	
			manual.	
Target CH	i_CH	Word	1 to 8	Specify the channel number.
Scaling	i_Scaling_Enable	Dit	ON, OFF	ON: Enabled
enable/disable		DIL		OFF: Disabled
Scaling upper limit	i_Scl_U_Lim	Word	-32,000 to 32,000	Specify the scaling upper limit value.
value		word		
Scaling lower limit	i_Scl_L_Lim	Word	-32,000 to 32,000	Specify the scaling lower limit value.
value		word		



Output labels

Name (comment)	Label name	Data	Initial	Description
		type	value	
Execution status	FB_ENO	Dit	OFF	ON: Execution command is ON.
		DIL	OFF	OFF: Execution command is OFF.
Completed without	FB_OK	Dit	OFF	When ON, it indicates that the scaling
error				setting is completed.
Error flag	FB_ERROR	Dit		When ON, it indicates that an error has
		ы	OFF	occurred.
Error code	ERROR_ID	Word	0	FB error code output.

FB Version Upgrade History

Version	Date	Description
1.00A	2014/7/31	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.



2.8. M+L60ADL8_SetProcessAlarm (Process alarm setting)

FB Name

M+L60ADL8_SetProcessAlarm

Item	Description				
Function overview	Sets the process alarm of the specified channel.				
Symbol	Execution command — Module start XY address — Target CH — Process alarm enable/disable — Process alarm upper upper limit value — Process alarm upper lower limit value — Process alarm lower upper limit value —	M+L60ADL8_SetProcessAlarm B : FB_EN W : i_Start_IO_No W : i_CH B : i_Process_Enable W : i_Pro_UU_Lim W : i_Pro_UL_Lim W : i_Pro_LU_Lim W : i_Pro_LU_Lim	FB_ENO : B Execution status FB_OK : B Completed without error FB_ERROR : B Error flag ERROR_ID : W Error code		
Applicable hardware and software	Analog-digital converter module	L60ADIL8, L60ADVL8			
	CPU module	Series MELSEC-L Series	Model LCPU		
	Engineering software	are GX Works2 *1 Language Software ve Japanese version Version1.86Q or la English version Version1.24A or la Chinese (Simplified) version Version1.49B or la Chinese (Traditional) version Version1.49B or la Korean version Version1.49B or la *1 For software versions applicable to the modules u "Relevant manuals".			
Programming language	Ladder				
Number of steps	 263 steps (for MELSEC-L series CPU) *The number of steps of the FB in a program depends on the CPU model that is used and input and output definition. 				



Item	Description			
Function description	1) By turning ON FB_EN (Execution command), the process alarm of the specified			
	channel is set.			
	2) FB operation is one-shot only, triggered by the FB_EN signal.			
	3) The setting value is validated when the Operating condition setting request signal (Yn9)			
	is turned OFF \rightarrow ON \rightarrow OFF or the Operating condition setting request function FB			
	(M+L60ADL8_RequestSetting) is executed.			
	4) When the setting value of i_CH (Target CH) is out of range, the FB_ERROR output			
	turns ON, the processing is interrupted, and the error code is stored in ERROR_ID			
	(Error code).			
	Refer to the error code explanation section for details.			
Compiling method	Macro type			
Restrictions and	1) The FB does not include error recovery processing. Program the error recovery			
precautions	processing separately in accordance with the required system operation.			
	2) The FB cannot be used in an interrupt program.			
	3) Please ensure that the FB_EN signal is capable of being turned OFF by the program.			
	Do not use this FB in programs that are only executed once such as a subroutine,			
	FOR-NEXT loop because it is impossible to turn OFF.			
	4) When two or more of these FBs are used, precaution must be taken to avoid repetition			
	of i_CH (Target CH).			
	5) This FB uses index registers Z7 to Z9. Please do not use these index registers in an			
	interrupt program.			
	6) Every input must be provided with a value for proper FB operation.			
	7) To operate the L60ADIL8 or L60ADVL8, 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 device and system connected.			
	For details on how to use the intelligent function module switch setting, refer to GX			
	Works2 Version 1 Operating Manual (Common).			
	9) In any of the following cases 1) to 3), no errors occur in this FB; however an error			
	occurs in the module at an operating condition setting. Please read the MELSEC-L			
	Analog-Digital Converter Module User's Manual.			
	1) When a value greater than the value set for i_Pro_LU_Lim (Process alarm lower			
	upper limit value) is set for i_Pro_LL_Lim (Process alarm lower lower limit value)			
	2) When a value that exceeds i_Pro_UL_Lim (Process alarm upper lower limit value) is			
	set for i_Pro_LU_Lim (Process alarm lower upper limit value)			
	3) When a value that exceeds i_Pro_UU_Lim (Process alarm upper upper limit value) is			
	set for i_Pro_UL_Lim (Process alarm upper lower limit value)			
FB operation type	Pulsed execution (1 scan execution type)			



Item	Description			
Application example	Refer to "Appendix 1. FB Library Application Examples".			
Timing chart	[When operation completes without error] [When an error occurs]			
	FB_EN (Execution command) FB_ENO (Execution status) Process alarm setting write processing No processing FB_OK (Completed without error) No processing FB_EROR (Error flag) FB_EROR (Error flag) ERROR_ID (Error code) 0			
Relevant manuals	MELSEC-L Analog-Digital Converter Module User's Manual			
	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)			

Labels

●Error code list

Error code	Description	Action
10 (Decimal)	The specified channel is not valid. i_CH	Please try again after confirming the setting.
	(Target CH) is not within the range of 1 to 8.	

●Input labels				
Name (comment)	Label name	Data	Setting range	Description
		type		
Execution command	FB_EN	Dit	ON, OFF	ON: The FB is activated.
		DIL		OFF: The FB is not activated.
Module start XY	i_Start_IO_No		Depends on the I/O	Specify the starting XY
address			point range of the CPU.	address (in hexadecimal)
		Word	For details, refer to the	where the L60ADIL8 or
			CPU user's manual.	L60ADVL8 is connected. (For
				example, enter H10 for X10.)
Target CH	i_CH	Word	1 to 8	Specify the channel number.
Process alarm	i_Process_Enable		ON, OFF	ON: Enable the warning
enable/disable				output of the process
		Dit		alarm.
				OFF: Disable the warning
				output of the process
				alarm.


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

Name (comment)	Label name	Data	Initial	Description
		type	value	
Execution status	FB_ENO	Rit.	OFF	ON: Execution command is ON.
		DIL	OFF	OFF: Execution command is OFF.
Completed without	FB_OK	Dit	OFF	When ON, it indicates that the process
error		DIL	OFF	alarm setting is completed.
Error flag	FB_ERROR	Dit	OFF	When ON, it indicates that an error has
		DIL	OFF	occurred.
Error code	ERROR_ID	Word	0	FB error code output.

FB Version Upgrade History

Version	Date	Description
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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.



2.9. M+L60ADL8_SetInputSignalErr (Input signal error detection setting)

FB Name

M+L60ADL8_SetInputSignalErr

Item	Description			
Function overview	Sets the input signal error detection of the specified channel.			
Symbol	Execution command — Module start XY address — Target CH — Input signal error detection setting — Input signal error detection setting value	M+L60ADL8_SetInputSignalErr B : FB_EN W : i_Start_IO_No W : i_CH B : i_Sig_Err_Enable W : i_Sig_Err_Level	FB_ENO : B Execution status FB_OK : B Completed without error FB_ERROR : B Error flag ERROR_ID : W Error code	
Applicable hardware	Analog-digital	L60ADIL8, L60ADVL8		
and software	converter module			
	CPU module			
		Series	Model	
		MELSEC-L Series LCPU		
	Engineering software	GX Works2 *1		
		Language	Software version	
		Japanese version	Version1.86Q or later	
		English version	Version1.24A or later	
		Chinese (Simplified) version	Version1.49B or later	
		Chinese (Traditional) version	Version1.49B or later	
		Korean version	Version1.49B or later	
		*1 For software versions applical	ble to the modules used, refer to	
		"Relevant manuals".		
Programming	Ladder			
language				
Number of steps	244 steps (for MELSEC-L series CPU)			
	*The number of steps of the FB in a program depends on the CPU model that is used and			
	input and output definiti	on.		



Item	Description
Function description	1) By turning ON FB_EN (Execution command), the input signal error detection setting of
	the specified channel is configured.
	2) FB operation is one-shot only, triggered by the FB_EN signal.
	3) The setting value is validated when the Operating condition setting request signal (Yn9)
	is turned OFF \rightarrow ON \rightarrow OFF or the Operating condition setting request function FB
	(M+L60ADL8_RequestSetting) is executed.
	4) When the setting value of the target channel is out of range, the FB_ERROR output
	turns ON, the processing is interrupted, and the error code is stored in ERROR_ID
	(Error code).
	Refer to the error code explanation section for details.
Compiling method	Macro type
Restrictions and	1) The FB does not include error recovery processing. Program the error recovery
precautions	processing separately in accordance with the required system operation.
	2) The FB cannot be used in an interrupt program.
	3) Please ensure that the FB_EN signal is capable of being turned OFF by the program.
	Do not use this FB in programs that are only executed once such as a subroutine,
	FOR-NEXT loop because it is impossible to turn OFF.
	4) When two or more of these FBs are used, precaution must be taken to avoid repetition
	of i_CH (Target CH).
	5) This FB uses index registers Z7 to Z9. Please do not use these index registers in an
	interrupt program.
	6) Every input must be provided with a value for proper FB operation.
	7) To operate the L60ADIL8 or L60ADVL8, 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 Version 1 Operating Manual (Common).
	8) When a value set for i_Sig_Err_Level (Input signal error detection setting value) is out
	of the setting range, no errors occur in this FB; however an error occurs in the module
	at an operating condition setting request. Please read the MELSEC-L Analog-Digital
	Converter Module User's Manual.
FB operation type	Pulsed execution (1 scan execution type)
Application example	Refer to "Appendix 1. FB Library Application Examples".



Item	Description				
Timing chart	[When operation completes without error] [When an error occurs]				
	FB_EN (Execution command) FB_ENO (Execution status) Input signal error detection setting write processing No processing Write No processing				
	FB_OK (Completed without error) FB_OK (Completed without error) FB_OK (Completed without error) FB_RROR (Error flag) FB_ERROR (Error flag) ERROR_ID (Error code) 0				
Relevant manuals	MELSEC-L Analog-Digital Converter Module User's Manual				
	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 code list

Error code	Description	Action
10 (Decimal)	The specified channel is not valid. The	Please try again after confirming the setting.
	target channel is not within the range of 1	
	to 8.	

Labels

Input labels

Name (comment)	Label name	Data	Setting range	Description
		type		
Execution command	FB_EN		ON, OFF	ON: The FB is activated.
		Bit		OFF: The FB is not
				activated.
Module start XY	i_Start_IO_No		Depends on the I/O	Specify the starting XY
address			point range of the CPU.	address (in hexadecimal)
		Mord	For details, refer to the	where the L60ADIL8 or
		vvoru	CPU user's manual.	L60ADVL8 is connected.
				(For example, enter H10 for
				X10.)
Target CH	i_CH	Word	1 to 8	Specify the channel number.



Name (comment)	Label name	Data	Setting range	Description
		type		
Input signal error	i_Sig_Err_Enable		ON, OFF	ON: Enable the input signal
detection setting				error detection setting.
		Bit		OFF: Disable the input
				signal error detection
				setting.
Input signal error	i_Sig_Err_Level		0 to 250	Specify the input signal error
detection setting		Word	(Unit: 0.1%)	detection setting value.
value				

Name (comment)	Label name	Data	Initial	Description
		type	value	
Execution status	FB_ENO	Rit.	OFF	ON: Execution command is ON.
		DIL	OFF	OFF: Execution command is OFF.
Completed without	FB_OK	Dit	OFF	When ON, it indicates that the input signal
error		DIL	OFF	error detection setting is completed.
Error flag	FB_ERROR	Dit	OFF	When ON, it indicates that an error has
		DIL	OFF	occurred.
Error code	ERROR_ID	Word	0	FB error code output.

FB Version Upgrade History

Version	Date	Description
1.00A	2014/7/31	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.



2.10. M+L60ADL8_SetInputSignalErrExp (Input signal error detection extension setting)

FB Name

M+L60ADL8_SetInputSignalErrExp

Item	Description			
Function overview	Sets the input signal error detection extension of the specified channel.			
Symbol	Execution command — Module start XY address — Target CH — Input signal error detection extension setting Input signal error detection setting value	M+L60ADL8_SetInputSignalErrExp B : FB_EN W : i_Start_IO_No W : i_CH W : i_SigErrEnhance W : i_Sig_Err_Level	FB_ENO : B Execution status FB_OK : B Completed without error FB_ERROR : B Error flag ERROR_ID : W Error code	
Applicable hardware and	Analog-digital converter module	L60ADIL8, L60ADVL8		
software	CPU module	Series MELSEC-L Series	Model LCPU	
	Engineering software	GX Works2 *1	Software version	
		Japanese version	Version1.86Q or later	
		English version	Version1.24A or later	
		Chinese (Simplified) version	Version1.49B or later	
		Chinese (Traditional) version	Version1.49B or later	
		Korean version	Version1.49B or later	
		*1 For software versions applica "Relevant manuals".	ble to the modules used, refer to	
Programming language	Ladder			
Number of steps	466 steps (for MELSEC-L series CPU)			
	*The number of steps of the FB in a program depends on the CPU model that is used and			
	input and output definition	on.		



Item	Description
Function	1) By turning ON FB_EN (Execution command), the input signal error detection extension
description	setting of the specified channel is configured.
	2) FB operation is one-shot only, triggered by the FB_EN signal.
	3) The setting value is validated when the Operating condition setting request signal (Yn9) is
	turned OFF \rightarrow ON \rightarrow OFF or the Operating condition setting request function FB
	(M+L60ADL8_RequestSetting) is executed.
	4) When the setting value of i_CH (Target CH) is out of range, the FB_ERROR output turns
	ON, the 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 setting value of i_SigErrEnhance (Input signal error detection extension setting)
	is out of range, the FB_ERROR output turns ON, the 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	1) The FB does not include error recovery processing. Program the error recovery				
precautions	processing separately in accordance with the required system operation.				
	2) The FB cannot be used in an interrupt program.				
	3) Please ensure that the FB_EN signal is capable of being turned OFF by the program. Do				
	not use this FB in programs that are only executed once such as a subroutine,				
	FOR-NEXT loop because it is impossible to turn OFF.				
	4) When two or more of these FBs are used, precaution must be taken to avoid repetition of				
	i_CH (Target CH).				
	5) This FB uses index registers Z7 to Z9. Please do not use these index registers in an				
	interrupt program.				
	6) Every input must be provided with a value for proper FB operation.				
	7) To operate the L60ADIL8 or L60ADVL8, 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 Version 1 Operating Manual (Common).				
	8) In either of the following cases 1) to 2), no errors occur in this FB; however an error				
	occurs in the module at an operating condition setting. Please read the MELSEC-L				
	Analog-Digital Converter Module User's Manual.				
	1) When i_SigErrEnhance (Input signal error detection extension setting) is set to " $4_{\rm H}$:				
	Disconnection detection" while either of "4 to 20 mA (Expansion)" or "0 to 5 V				
	(Expansion) is not selected in the input range setting of I_CH (larget CH)				
	2) when a value set for I_SIG_Err_Level (Input signal error detection setting value) is out of the setting range				
	of the setting range				
FB operation type	Pulsed execution (1 scan execution type)				
Application	Refer to "Appendix 1. FB Library Application Examples".				
Timing chart					
nming chan	[vvnen operation completes without error] [When an error occurs]				
	FB_EN (Execution command) FB_EN (Execution command)				
	FB_ENO (Execution status) Input signal error detection				
	extension setting write processing No processing Write No processing extension setting write processing No processing FB_OK				
	(Completed without error) FB_ERROR (Error flag) FB_ERROR (Error flag)				
	ERROR_ID (Error code) 0 ERROR_ID (Error code) 0 Error code				



Item	Description		
Relevant manuals	MELSEC-L Analog-Digital Converter Module User's Manual		
	• 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 code list

Error code	Description	Action
10 (Decimal)	The specified channel is not valid. i_CH	Please try again after confirming the
	(Target CH) is not within the range of 1 to 8.	setting.
11 (Decimal)	The input signal error detection extension	Please try again after confirming the
	setting is not valid. i_SigErrEnhance (Input	setting.
	signal error detection extension setting) is not	
	within the range of $0_{\rm H}$ to $4_{\rm H}$.	



Labels

●Input labels

Name (comment)	Label name	Data type	Setting range	Description
Execution command	FB_EN	Dit	ON, OFF	ON: The FB is activated.
		DIL		OFF: The FB is not activated.
Module start XY	i_Start_IO_No		Depends on the I/O	Specify the starting XY address (in
address			point range of the	hexadecimal) where the L60ADIL8
		\\/ord	CPU.	or L60ADVL8 is connected. (For
		vvoru	For details, refer to	example, enter H10 for X10.)
			the CPU user's	
			manual.	
Target CH	i_CH	Word	1 to 8	Specify the channel number.
Input signal error	i_SigErrEnhance		0 _H : Disable	Set the input signal error detection
detection extension			1 _H : Upper and lower	extension setting.
setting			limit detection	
			2 _H : Lower limit	
		Word	detection	
			3 _H : Upper limit	
			detection	
			4 _H : Disconnection	
			detection	
Input signal error	i_Sig_Err_Level		0 to 250	Specify the input signal error
detection setting		Word	(Unit: 0.1%)	detection setting value.
value				

Output labels

Name (comment)	Label name	Data type	Initial	Description
			value	
Execution status	FB_ENO	Dit	OFF	ON: Execution command is ON.
		DIL	OFF	OFF: Execution command is OFF.
Completed without	FB_OK			When ON, it indicates that the input signal error
error		DIL	OFF	detection extension 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	2014/7/31	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.



2.11. M+L60ADL8_RequestSetting (Operating condition setting request)

FB Name

M+L60ADL8_RequestSetting

Item	Description			
Function overview	Validates the settings of each function.			
Symbol	Execution command ——— Module start XY address ———	M+L60ADL8_RequestSetting B : FB_EN W : i_Start_IO_No	FB_ENO : B Execution status FB_OK : B Completed without error FB_ERROR : B Error flag ERROR_ID : W Error code	
Applicable hardware and software	Analog-digital converter module	L60ADIL8, L60ADVL8		
	CPU module			
		Series	Model	
		MELSEC-L Series LCPU		
	Engineering software	GX Works2 *1		
		Language Software version		
		Japanese version Version1.86Q or later		
		English version Version1.24A or later		
		Chinese (Simplified) version	Version1.49B or later	
		Chinese (Traditional) version	Version1.49B or later	
		Korean version	Version1.49B or later	
		*1 For software versions applicable to the modules used, refer to		
Programming	Ladder			
language				
Number of steps	275 steps (for MELSEC-L series CPU)			
	*The number of steps of the FB in a program depends on the CPU model that is used and			
	input and output definition	n.		



Item	Description				
Function description	1) By turning ON FB_EN (Execution command), the settings of all channels (channel 1 to				
	channel 8) are enabled. For the setting contents to be enabled, refer to MELSEC-L				
	Analog-Digital Converter Module User's Manual.				
	2) After FB_EN (Execution command) is turned ON, the execution of this FB continues until				
	each function setting is completed.				
Compiling method	Macro type				
Restrictions and	1) When this FB is executed while the L60ADIL8 or L60ADVL8 is being operated, the A/D				
precautions	conversion is stopped.				
	The conversion restarts after FB_OK turns ON.				
	2) The FB does not include error recovery processing. Program the error recovery				
	processing separately in accordance with the required system operation.				
	3) Please ensure that the FB_EN signal is capable of being turned OFF by the program. Do				
	not use this FB in programs that are only executed once such as a subroutine,				
	FOR-NEXT loop because it is impossible to turn OFF.				
	4) The FB cannot be used in an interrupt program.				
	5) This FB uses index register Z9. Please do not use the index register in an interrupt				
	program.				
	6) Every input must be provided with a value for proper FB operation.				
	7) When this FB is used in two or more places, a duplicated coil warning may occur during				
	compile operation due to the Y signal being operated by index modification. However this				
	is not a problem and the FB will operate without error.				
	8) To operate the L60ADIL8 or L60ADVL8, 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 Version 1 Operating Manual (Common).				
FB operation type	Pulsed execution (multiple scan execution type)				
Application example	Refer to "Appendix 1. FB Library Application Examples".				
Timing chart	[When operation completes without error]				
	FB_EN (Execution command)				
	FB_ENO (Execution status)				
	Operating condition setting request (Yn9)				
	completed flag (Xn9)				
	FB_ERROR (Error flag)				
	ERROR_ID (Error code) 0				



Item	Description	
Relevant manuals	MELSEC-L Analog-Digital Converter Module User's Manual	
	• MELSEC-L CPU Module User's Manual (Hardware Design, Maintenance and Inspectio	
	GX Works2 Version 1 Operating Manual (Common)	
	GX Works2 Version 1 Operating Manual (Simple Project, Function Block)	

●Error code list

Error code	Description	Action	
None	None	None	

Labels

Input labels

Name (comment)	Label name	Data	Setting range	Description
		type		
Execution command	FB_EN	Dit	ON, OFF	ON: The FB is activated.
		DIL		OFF: The FB is not activated.
Module start XY	i_Start_IO_No		Depends on the	Specify the starting XY address (in
address			I/O point range	hexadecimal) where the L60ADIL8
		Word	of the CPU.	or L60ADVL8 is connected. (For
		vvora	For details, refer	example, enter H10 for X10.)
			to the CPU	
			user's manual.	

Output labels

Name (comment)	Label name	Data	Initial	Description
		type	value	
Execution status	FB_ENO	Dit	OFF	ON: Execution command is ON.
		DIL	OFF	OFF: Execution command is OFF.
Completed without	FB_OK	Dit	OFF	When ON, it indicates that the operating
error				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	2014/7/31	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.



2.12. M+L60ADL8_SetOffsetVal (Offset setting)

FB Name

M+L60ADL8_SetOffsetVal

Item		Description	
Function overview	Sets the offset of the spe	ecified channel.	
Symbol	Execution command — B Module start XY address — W Target CH — W User range write _ B	M+L60ADL8_SetOffsetVal : FB_EN : i_Start_IO_No : i_CH : i_Write_Offset	FB_ENO : B Execution status FB_OK : B Completed without error FB_ERROR : B Frror flag ERROR_ID : W Frror code
Applicable hardware	Analog-digital	L60ADIL8, L60ADVL8	
and software	converter module		
	CPU module		
		Series	Model
		MELSEC-L Series	LCPU
	Engineering software	GX Works2 *1	
		Language	Software version
		Japanese version	Version1.86Q or later
		English version	Version1.24A or later
		Chinese (Simplified) version	Version1.49B or later
		Chinese (Traditional) version	Version1.49B or later
		Korean version	Version1.49B or later
		*1 For software versions applical	ble to the modules used, refer to
		"Relevant manuals".	
Programming	Ladder		
language			
Number of steps	463 steps (for MELSEC-	L series CPU)	
	*The number of steps of	the FB in a program depends on	the CPU model that is used and
	input and output definit	ion.	



Item	Description
Function description	1) By turning ON FB_EN (Execution command), the offset value of the specified channel is
	set.
	2) By turning ON the user range write command while FB_EN (Execution command) is ON,
	the offset value is written.
	3) After FB_EN (Execution command) is turned ON, the execution of this FB continues until
	the setting of the offset value of the specified channel is completed.
	4) When the setting value of i_CH (Target CH) is out of range, the FB_ERROR output turns
	ON, the processing is interrupted, and the error code is stored in ERROR_ID (Error
	code).
	Refer to the error code explanation section for details.
Compiling method	Macro type
Restrictions and	1) The FB does not include error recovery processing. Program the error recovery
precautions	processing separately in accordance with the required system operation.
	2) The FB cannot be used in an interrupt program.
	3) Please ensure that the FB_EN signal is capable of being turned OFF by the program. Do
	not use this FB in programs that are only executed once such as a subroutine,
	FOR-NEXT loop because it is impossible to turn OFF.
	4) Externally implement an interlock to prevent the following FBs from being executed
	simultaneously. Do not use two or more of this FB simultaneously. When these FBs are
	executed simultaneously, the offset or gain cannot be set properly.
	M+L60ADL8_SetOffsetVal
	• M+L60ADL8_SetGainVal
	5) This FB cannot set the offset and gain of channel 1 to channel 8 simultaneously. To set
	the offset and gain simultaneously, create a program without using this FB.
	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 L60ADIL8 or L60ADVL8, 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 Version 1 Operating Manual (Common).
FB operation type	Pulsed execution (multiple scan execution type)
Application example	Refer to "Appendix 1. FB Library Application Examples".



Item	De	scription
Item Timing chart	FB_EN (Execution command) FB_ENO (Execution status) Operation mode i_Write_Offset (User range write command) CH□ Offset specification Channel change request (YnB)	Scription [When an error occurs] - FB_EN (Execution command) - FB_ENO (Execution status) - Normal mode - i_Write_Offset (User range write command) - CHI Offset specification - Channel change request (YnB)
	User range write request (YnA) FB_OK (Completed without error) FB_ERROR (Error flag) ERROR_ID (Error code) 0	User range write request (YnA) FB_OK (Completed without error) FB_ERROR (Error flag) ERROR_ID (Error code) 0 Error code 0
Relevant manuals	 MELSEC-L Analog-Digital Converter Module MELSEC-L CPU Module User's Manual (For the second seco	ule User's Manual lardware Design, Maintenance and Inspection) Common) Simple Project, Function Block)

•Error code list

Error code	Description	Action
10 (Decimal)	The specified channel is not valid. i_CH	Please try again after confirming the setting.
	(Target CH) is not within the range of 1 to 8.	

Labels

Input labels

Name (comment)	Label name	Data type	Setting range	Description
Execution	FB_EN	Dit	ON, OFF	ON: The FB is activated.
command		DIL		OFF: The FB is not activated.
Module start XY	i_Start_IO_No		Depends on the I/O	Specify the starting XY address
address			point range of the	(in hexadecimal) where the
		Word	CPU.	L60ADIL8 or L60ADVL8 is
			For details, refer to the	connected. (For example, enter
			CPU user's manual.	H10 for X10.)
Target CH	i_CH	Word	1 to 8	Specify the channel number.



Name (comment)	Label name	Data type	Setting range	Description
User range write	i_Write_Offset		ON, OFF	Turn ON this label to write the
command				adjusted offset value to a flash
		Bit		memory device.
				Turn OFF this label after writing
				the value.

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

FB Version Upgrade History

Version	Date	Description
1.00A	2014/7/31	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.



2.13. M+L60ADL8_SetGainVal (Gain setting)

FB Name

M+L60ADL8_SetGainVal

Item		Description	
Function overview	Sets the gain of the spe	cified channel.	
Symbol	Execution command B Module start XY address W Target CH W User range write B	M+L60ADL8_SetGainVal : FB_EN : i_Start_IO_No : i_CH : i_Write_Gain	FB_ENO : B Execution status FB_OK : B Completed without error FB_ERROR : B Error flag ERROR_ID : W Error code
Applicable hardware	Analog-digital	L60ADIL8, L60ADVL8	
and software	converter module		
	CPU module		
		Series	Model
		MELSEC-L Series	LCPU
	Engineering software	GX Works2 *1	
		Language	Software version
		Japanese version	Version1.86Q or later
		English version	Version1.24A or later
		Chinese (Simplified) version	Version1.49B or later
		Chinese (Traditional) version	Version1.49B or later
		Korean version	Version1.49B or later
		*1 For software versions applical	ble to the modules used, refer to
		"Relevant manuals".	
Programming	Ladder		
language			
Number of steps	446 steps (for MELSEC	L series CPU)	
	*The number of steps of	the FB in a program depends on	the CPU model that is used and
	input and output definit	ion.	



Item	Description
Function description	1) By turning ON FB_EN (Execution command), the gain value of the specified channel is
	set.
	2) By turning ON the user range write command while FB_EN (Execution command) is ON,
	the gain value is written.
	3) After FB_EN (Execution command) is turned ON, the execution of this FB continues until
	the setting of the gain value of the specified channel is completed.
	4) When the setting value of i_CH (Target CH) is out of range, the FB_ERROR output turns
	ON, the processing is interrupted, and the error code is stored in ERROR_ID (Error code).
	Refer to the error code explanation section for details.
Compiling method	Macro type
Restrictions and	1) The FB does not include error recovery processing. Program the error recovery
precautions	processing separately in accordance with the required system operation.
	2) The FB cannot be used in an interrupt program.
	3) Please ensure that the FB_EN signal is capable of being turned OFF by the program. Do
	not use this FB in programs that are only executed once such as a subroutine,
	FOR-NEXT loop because it is impossible to turn OFF.
	4) Externally implement an interlock to prevent the following FBs from being executed
	simultaneously. Do not use two or more of this FB simultaneously. When these FBs are
	executed simultaneously, the offset or gain cannot be set properly.
	M+L60ADL8_SetOffsetVal
	M+L60ADL8_SetGainVal
	5) This FB cannot set the offset and gain of channel 1 to channel 8 simultaneously. To set the
	offset and gain simultaneously, create a program without using this FB.
	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 L60ADIL8 or L60ADVL8, 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 Version 1 Operating Manual (Common).
FB operation type	Pulsed execution (multiple scan execution type)
Application example	Refer to "Appendix 1. FB Library Application Examples".



Item	Des	scription				
Timing chart	[When operation completes without error]	[When an error occurs]				
	FB_EN (Execution command) FB_ENO (Execution status) Operation mode i_Write_Gain (User range write command) CH_I Gain specification Channel change request (YnB) User range write request (YnA) FB_OK (Completed without error) FB_ERROR (Error flag) ERROR_ID (Error code) 0	FB_EN (Execution command) FB_ENO (Execution status) Operation mode i_Write_Gain (User range write command) CH□ Gain specification Channel change request (YnB) User range write request (YnA) FB_OK (Completed without error) FB_ERROR (Error flag) ERROR_ID (Error code)				
Delevent menuele		a Llaada Manual				
Relevant manuals	• MELSEC-L Analog-Digital Converter Modul	MELSEC-L Analog-Digital Converter Module User's Manual				
	MELSEC-L CPU Module User's Manual (Hardware Design, Maintenance and Inspection)					
	• GX Works2 Version 1 Operating Manual (C	ommon)				
	• GX Works2 Version 1 Operating Manual (S	imple Project, Function Block)				

•Error code list

Error code	Description	Action
10 (Decimal)	The specified channel is not valid. i_CH	Please try again after confirming the setting.
	(Target CH) is not within the range of 1 to	
	8.	

Labels

Input labels

Name (comment)	Label name	Data type	Setting range	Description
Execution	FB_EN	Dit	ON, OFF	ON: The FB is activated.
command		DIL		OFF: The FB is not activated.
Module start XY	i_Start_IO_No		Depends on the I/O	Specify the starting XY address (in
address		Mord	point range of the CPU.	hexadecimal) where the L60ADIL8
		vvoru	For details, refer to the	or L60ADVL8 is connected. (For
			CPU user's manual.	example, enter H10 for X10.)
Target CH	i_CH	Word	1 to 8	Specify the channel number.



Name (comment)	Label name	Data type	Setting range	Description
User range write	i_Write_Gain		ON, OFF	Turn ON this label to write the
command				adjusted gain value to a flash
		Bit		memory device.
				Turn OFF this label after writing the
				value.

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

FB Version Upgrade History

Version	Date	Description
1.00A	2014/7/31	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.



2.14. M+L60ADL8_ErrorOperation (Error operation)

FB Name

M+L60ADL8_ErrorOperation

Item		Description		
Function overview	Monitors error codes and resets errors.			
Symbol	Execution command — B Module start XY address — W Error reset command — B	M+L60ADL8_ErrorOperation : FB_EN : i_Start_IO_No : i_ErrorReset o_U o_UNIT_ER FE E	FB_ENO : B Execution status FB_OK : B Completed without error NIT_ERR : B Module error flag R_CODE : W Module error code B_ERROR : B Error flag RROR_ID : W Error code	
Applicable hardware	Analog-digital converter	L60ADIL8, L60ADVL8		
and software	module			
	CPU module			
		Series	Model	
		MELSEC-L Series	LCPU	
	Engineering software	GX Works2 ^1		
		Language	Software version	
		Japanese version	Version1.86Q or later	
		English version	Version1.24A or later	
		Chinese (Simplified) version	Version1.49B or later	
		Chinese (Traditional) version	Version1.49B or later	
		Korean version	Version1.49B or later	
		*1 For software versions applical	ble to the modules used, refer to	
		"Relevant manuals".		
Programming	Ladder			
language				
Number of steps	288 steps (for MELSEC-L series CPU)			
	*The number of steps of	the FB in a program depends on th	e CPU model that is used and	
	input and output definiti	on.		



Item	Description
Function description	1) By turning ON FB_EN (Execution command), the current error code in the target
	intelligent function module is output.
	2) After FB_EN (Execution command) is turned ON, the error is reset when i_Error_Reset
	(Error reset command) is turned ON during error occurrence.
Compiling method	Macro type
Restrictions and	1) The FB does not include error recovery processing. Program the error recovery
precautions	processing separately in accordance with the required system operation.
	2) The FB cannot be used in an interrupt program.
	3) Please ensure that the FB_EN signal is capable of being turned OFF by the program. Do
	not use this FB in programs that are only executed once such as a subroutine,
	FOR-NEXT loop because it is impossible to turn OFF.
	4) This FB uses index registers Z8 and Z9. Please do not use these index registers in an
	interrupt program.
	5) Every input must be provided with a value for proper FB operation.
	6) When this FB is used in two or more places, a duplicated coil warning may occur during
	compile operation due to the Y signal being operated by index modification. However
	this is not a problem and the FB will operate without error.
	7) To operate the L60ADIL8 and L60ADVL8, set the required settings 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 Version 1 Operating Manual (Common).
FB operation type	Real-time execution
Application example	Refer to "Appendix 1. FB Library Application Examples".
Timing chart	[When operation completes without error]
	FB_EN (Execution command)
	FB_ENO (Execution status)
	i_ErrorReset (Error reset command)
	Error clear (YnF)
	Error (XnF)
	o_UNIT_ERR (Module error flag)
	o_UNIT_ERR_CODE (Error code) 0 Module error code 0
	FB_OK (Completed without error)
	FB_ERROR (Error flag)
	ERROR_ID (Error code) 0



Item	Description			
Relevant manuals	MELSEC-L Analog-Digital Converter Module User's Manual			
	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 code list

Error code	Description	Action
None	None	None

Labels

Input labels

Name (comment)	Label name	Data	Setting range	Description
		type		
Execution	FB_EN	Bit	ON, OFF	ON: The FB is activated.
command		DIL		OFF: The FB is not activated.
Module start XY	i_Start_IO_No		Depends on the	Specify the starting XY address (in
address			I/O point range	hexadecimal) where the L60ADIL8
		Word	of the CPU.	or L60ADVL8 is connected. (For
		vvoru	For details, refer	example, enter H10 for X10.)
			to the CPU	
			user's manual.	
Error reset	i_ErrorReset	Bit	ON, OFF	Turn ON for the error reset.
command		טונ		Turn OFF after the error reset.



Name (comment)	Label name	Data	Initial	Description
		type	value	
Execution status	FB_ENO			ON: Execution command is ON (Module
		Bit	OFF	errors are being monitored).
				OFF: Execution command is OFF.
Completed without	FB_OK	Dit	OFF	When ON, it indicates that an error reset is
error		DIL	OFF	completed.
Module error flag	o_UNIT_ERR	Dit		When ON, it indicates that a module error
		DIL	OFF	has occurred.
Module error code	o_UNIT_ERR_CODE	Word	0	Stores the error code of the current error.
Error flag	FB_ERROR		OFF	When ON, it indicates that an error has
		ы	OFF	occurred.
Error code	ERROR_ID	Word	0	FB error code output.

FB Version Upgrade History

Version	Date	Description
1.00A	2014/7/31	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.



2.15. M+L60ADL8_OGBackup (Offset/gain value save)

FB Name

M+L60ADL8_OGBackup

Item	Description		
Function overview	Reads the offset/gain setting values of the user range and save them to a file.		
Symbol	M+L60ADL8_OGBackup Execution command — B : FB_EN Module start XY address — W : i_Start_IO_No F		FB_ENO : B Execution status FB_OK : B Completed without error FB_ERROR : B Error flag ERROR_ID : W Error code
Applicable	Analog-digital converter	L60ADIL8, L60ADVL8	
hardware and	module		
software	CPU module		
		Series	Model
		MELSEC-L Series	LCPU
	*Only the model that has the SD memory card slot is applicable		memory card slot is applicable.
	Engineering software GX Works2 *1		
		Language	Software version
		Japanese version	Version1.86Q or later
		English version	Version1.24A or later
		Chinese (Simplified) version	Version1.49B or later
		Chinese (Traditional) version	Version1.49B or later
		Korean version	Version1.49B or later
		*1 For software versions applica	ble to the modules used, refer to
		"Relevant manuals".	
Programming	Ladder		
language			
Number of steps	552 steps (for MELSEC-L series CPU)		
	*The number of steps of the FB in a program depends on the CPU model that is used and		
	input and output definition	on.	



Item	Description	
Function description	1) By turning ON FB_EN (Execution command), the offset/gain value of the user range is	
	read and saved to an SD memory card inserted into the CPU module.	
	2) FB operation is one-shot only, triggered by the FB_EN signal.	
	3) The name of the file which this FB creates is "LADL" + "Module start XY address" +	
	".BIN".	
	[File name example]	
	When the module start XY address is H0120, the file name is "LADL0120.BIN".	
	4) When a file with the same name exists in the SD memory card, the existing file is	
	replaced with a new BIN file created by this FB.	
	5) When the installed SD memory card does not have enough capacity or when the number	
	of files to be created exceeds the number of storable files *1, a CPU error *2 occurs.	
	*1 For information on the size of SD memory card and the number of files that can be	
	saved, refer to MELSEC-L CPU Module User's Manual (Hardware Design,	
	Maintenance and Inspection).	
	*2 Setting the operation status of the CPU module (RUN/STOP) when an access error to	
	the SD memory card occurs is available with parameters.	
Compiling method	Macro type	
Restrictions and	1) The FB does not include error recovery processing. Program the error recovery	
precautions	processing separately in accordance with the required system operation.	
	2) The FB cannot be used in an interrupt program.	
	3) Please ensure that the FB_EN signal is capable of being turned OFF by the program. Do	
	not use this FB in programs that are only executed once such as a subroutine,	
	FOR-NEXT loop because it is impossible to turn OFF.	
	4) This FB uses index register Z9. Please do not use the index register in an interrupt	
	program.	
	5) Every input must be provided with a value for proper FB operation.	
	6) Do not use this FB with the CPU module that does not have the SD memory card slot. If	
	used with such a CPU module, this FB cannot be executed.	
	7) If this FB is executed while the protect switch of the SD memory card is set to ON, the	
	offset/gain value cannot be saved. In this case, the FB_ERROR output turns ON, the	
	processing is interrupted, and the error code 31 (Decimal) is stored in ERROR_ID (Error	
	code). Refer to the error code explanation section for details.	
	8) When this FB is executed without the SD memory card inserted to the CPU module, the	
	FB_ERROR output turns ON, processing is interrupted, and the error code 33 (Decimal)	
	is stored in ERROR_ID (Error code). Refer to the error code explanation section for	
	details.	



Item	Description		
Restrictions and	9) When this FB is executed with SM605 (Memory card remove/insert prohibit flag) OFF,		
precautions	which can be set by sliding the SD memory card disabling switch upward, FB_ERROR		
	(Error flag) turns ON, the processing is interrupted, and the error code 35 (Decimal) is		
	stored in ERROR_ID (Error code). Refer to the error code explanation section for details.		
	10) When this FB is executed with SM606 (SD memory card forced disable instruction) ON,		
	the SP.FWRITE instruction is not processed and the offset/gain value cannot be read. In		
	this case, the FB_ERROR output turns ON, the processing is interrupted, and the error		
	code 36 (Decimal) is stored in ERROR_ID (Error code).		
	Refer to the error code explanation section for details.		
	11) When this FB is executed with the SD memory card accessed by, for example, the data		
	logging function of the LCPU, the time for completing this FB may extend or a timeout		
	error (Error code 40 (Decimal)) may occur. For details, refer to Section 13.2.4		
	Troubleshooting on the entire system during operation of the data logging function of		
	MELSEC-L CPU Module User's Manual (Data Logging Function).		
	12) To operate the L60ADIL8 or L60ADVL8, 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 Version 1 Operating Manual (Common).		
FB operation type	Pulsed execution (multiple scan execution type)		
Application example	Refer to "Appendix 1. FB Library Application Examples".		
Timing chart	[When operation completes without error] [When an error occurs]		
	FB_EN (Execution command)		
	FB_ENO (Execution status) FB_ENO (Execution status) User range setting file No processing View non-period No processing		
	save processing FB_OK (Completed without error) FB_OK (Completed without error) FB_OK (Completed without error)		
	FB_ERROR (Error flag)		
	ERROR_ID (Error code) 0 Error code 0 Error code 0 Error code 0		
Relevant manuals	MELSEC-L Analog-Digital Converter Module User's Manual		
	• MELSEC-L CPU Module User's Manual (Hardware Design, Maintenance and Inspection)		
	MELSEC-L CPU Module User's Manual (Data Logging Function)		
	GX Works2 Version 1 Operating Manual (Common)		
	• GX Works2 Version 1 Operating Manual (Simple Project, Function Block)		



•Error code list

Error code	Description	Action
31 (Decimal)	No data can be written to the SD memory	Execute the FB again after turning OFF the
	card because SM601 (Memory card	protect switch of the SD memory card and
	protect flag) is ON (Write prohibited).	confirming that SM601 is OFF (Write
		permitted).
33 (Decimal)	This FB is executed with no SD memory	Execute this FB again after mounting the SD
	card on the CPU module.	memory card to which the target file is saved
		on the CPU module.
35 (Decimal)	The SD memory card cannot be	Execute the FB again after turning ON
	accessed because SM605 (Memory card	SM605 (Memory card remove/insert prohibit
	remove/insert prohibit flag) is turned OFF.	flag) by sliding the SD memory card disabling
		switch downward.
36 (Decimal)	SM606 (SD memory card forced disable	Execute the FB again after disabling the SD
	instruction) is ON, and access to the SD	memory card forced disable instruction by
	memory card is unavailable.	turning OFF SM606 and confirming that
		SM607 (SD memory card use force stop
		condition flag) is OFF.
40 (Decimal)	The offset/gain value file saving	Reduce the frequency of the access
	processing timeout occurred because	processing to the SD memory card.
	accesses to the SD memory card were	
	frequently made in addition to this FB.	



Labels

●Input labels

Name (comment)	Label name	Data	Setting range	Description
		type		
Execution command	FB_EN	Dit	ON, OFF	ON: The FB is activated.
		DIL		OFF: The FB is not activated.
Module start XY	i_Start_IO_No		Depends on the	Specify the starting XY address (in
address			I/O point range	hexadecimal) where the L60ADIL8
		Word	of the CPU.	or L60ADVL8 is connected. (For
		vvoru	For details, refer	example, enter H10 for X10.)
			to the CPU	
			user's manual.	

•Output labels

Name (comment)	Label name	Data	Initial	Description
		type	value	
Execution status	FB_ENO	Bit	OFF	ON: Execution command is ON.
				OFF: Execution command is OFF.
Completed without	FB_OK	Dit	OFF	When ON, it indicates that the file save is
error		DIL	OFF	completed.
Error flag	FB_ERROR	Dit	OFF	When ON, it indicates that an error has
		BIL OFF		occurred.
Error code	ERROR_ID	Word	0	FB error code output.

FB Version Upgrade History

Version	Date	Description
1.00A	2014/7/31	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.



2.16. M+L60ADL8_OGRestore (Offset/gain value restore)

FB Name

M+L60ADL8_OGRestore

Item	Description		
Function overview	Restores the offset/gain setting values of the user range setting that are saved in a file to the		
	module.		
Symbol			
	Execution command — B	M+L60ADL8_OGRestore : FB EN	FB ENO : B Execution status
	Module start XY address W	 : i_Start_IO_No	FB_OK : B Completed without error
			FB_ERROR : B Error flag
			ERROR_ID : W Error code
Applicable hardware	Analog-digital	L60ADIL8, L60ADVL8	
and software	converter module		
	CPU module		
		Series	Model
		MELSEC-L Series	LCPU
		*Only the model that has the SD	memory card slot is applicable.
	Engineering software	GX Works2 *1	
		Language	Software version
		Japanese version	Version1.86Q or later
		English version	Version1.24A or later
		Chinese (Simplified) version	Version1.49B or later
		Chinese (Traditional) version	Version1.49B or later
		Korean version	Version1.49B or later
		*1 For software versions applica	ble to the modules used, refer to
		"Relevant manuals".	
Programming	Ladder		
language			
Number of steps	572 steps (for MELSEC	C-L series CPU)	
	*The number of steps of the FB in a program depends on the CPU model that is used and		
	input and output definit	tion.	



Item	Description
Function description	1) By turning ON FB_EN (Execution command), the offset/gain value of the user range in
	the SD memory card inserted in the CPU module is read and restored to the module.
	2) FB operation is one-shot only, triggered by the FB_EN signal.
	3) This FB operates only when the A/D conversion is set to "disabled" for all channels.
	4) Execute this FB after executing M+L60ADL8_OGBackup.
	When reading a file created other than by M+L60ADL8_OGBackup, a module error
	(Error code: 163) occurs.
	5) The name of the file which this FB reads from the memory card is "LADL" + "Module start
	XY address" + ".BIN".
	[File name example]
	When the module start XY address is H0120, the file name to be read is
	"LADL0120.BIN".
	6) When no target file containing the user range setting exists in the installed SD memory
	card, a CPU error *1 occurs.
	*1 Setting the operation status of the CPU module (RUN/STOP) when an access error to
	the SD memory card occurs is available with parameters.
Compiling method	Macro type



Item	Description
Restrictions and	1) Set the A/D conversion to "disabled" for all channels before executing this FB.
precautions	2) The FB does not include error recovery processing. Program the error recovery
	processing separately in accordance with the required system operation.
	3) Please ensure that the FB_EN signal is capable of being turned OFF by the program. Do
	not use this FB in programs that are only executed once such as a subroutine,
	FOR-NEXT loop because it is impossible to turn OFF.
	4) The FB cannot be used in an interrupt program.
	5) This FB uses index register Z9. Please do not use the index register in an interrupt
	program.
	6) This FB cannot restore the user range setting from a file created other than by M+I 60ADI 8, OGBackup
	7) Every input must be provided with a value for proper FB operation
	8) Do not use this FB with the CPU module that does not have the SD memory card slot. If
	used with such a CPU module, this FB cannot be executed.
	9) When this FB is executed without the SD memory card inserted to the CPU module, the
	FB_ERROR output turns ON, processing is interrupted, and the error code 33 (Decimal)
	is stored in ERROR_ID (Error code).
	Refer to the error code explanation section for details.
	10) When this FB is executed with SM605 (Memory card remove/insert prohibit flag) OFF,
	which can be set by sliding the SD memory card disabling switch upward, FB_ERROR
	(Error flag) turns ON, the processing is interrupted, and the error code 35 (Decimal) is
	stored in ERROR_ID (Error code).
	Refer to the error code explanation section for details.
	11) When this FB is executed with SM606 (SD memory card forced disable instruction) ON,
	the SP.FREAD instruction is not processed and the offset/gain value cannot be restored.
	In this case, the FB_ERROR output turns ON, the processing is interrupted, and the error
	code 36 (Decimal) is stored in ERROR_ID (Error code).
	Refer to the error code explanation section for details.
	12) When this FB is executed with the SD memory card accessed by, for example, the data
	logging function of the LCPU, the time for completing this FB may extend or a timeout
	error (Error code 40 (Decimal)) may occur.
	For details, refer to Section 13.2.4 Troubleshooting on the entire system during operation
	of the data logging function of MELSEC-L CPU Module User's Manual (Data Logging
	13) To operate the L60ADIL8 or L60ADVL8, 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 Version 1 Operating Manual (Common).



Item	Description		
FB operation type	Pulsed execution (multiple scan execution type)		
Application example	Refer to "Appendix 1. FB Library Application Examples".		
Timing chart	[When operation completes without error] [When an error occurs] FB_EN (Execution command) FB_ENO (Execution status) FB_ENO (Execution status)		
	User range setting file read processing FB_OK (Completed without error) FB_RROR (Error flag) ERROR_ID (Error code) 0 Error code 0 Error code 0 Error code 0		
Relevant manuals	 MELSEC-L Analog-Digital Converter Module User's Manual MELSEC-L CPU Module User's Manual (Hardware Design, Maintenance and Inspection) MELSEC-L CPU Module User's Manual (Data Logging Function) GX Works2 Version 1 Operating Manual (Common) GX Works2 Version 1 Operating Manual (Simple Project, Function Block) 		

•Error code list

Error code	Description	Action
33 (Decimal)	This FB is executed with no SD memory	Execute this FB again after mounting the SD
	card on the CPU module.	memory card that contains the target file on
		the CPU module.
35 (Decimal)	The SD memory card cannot be	Execute the FB again after turning ON
	accessed because SM605 (Memory card	SM605 (Memory card remove/insert prohibit
	remove/insert prohibit flag) is turned OFF.	flag) by sliding the SD memory card disabling
		switch downward.
36 (Decimal)	SM606 (SD memory card forced disable	Execute the FB again after disabling the SD
	instruction) is ON, and access to the SD	memory card forced disable instruction by
	memory card is unavailable.	turning OFF SM606 and confirming that
		SM607 (SD memory card use force stop
		condition flag) is OFF.
40 (Decimal)	The offset/gain value reading processing	Reduce the frequency of the access
	timeout occurred because accesses to	processing to the SD memory card.
	the SD memory card were frequently	
	made in addition to this FB.	
90 (Decimal)	A channel whose A/D conversion is set to	Please try again after confirming the setting.
	"enabled" exists.	


Labels

●Input labels

Name (comment)	Label name	Data	Setting range	Description
		type		
Execution command	FB_EN	Dit	ON, OFF	ON: The FB is activated.
		DIL		OFF: The FB is not activated.
Module start XY	i_Start_IO_No		Depends on the	Specify the starting XY address (in
address			I/O point range	hexadecimal) where the L60ADIL8
		Mord	of the CPU.	or L60ADVL8 is connected. (For
		vvoru	For details, refer	example, enter H10 for X10.)
			to the CPU	
			user's manual.	

•Output labels

Name (comment)	Label name	Data	Initial	Description
		type	value	
Execution status	FB_ENO	Bit	OFF	ON: Execution command is ON.
		DIL	OFF	OFF: Execution command is OFF.
Completed without	FB_OK	Dit	OFF	When ON, it indicates that the restoration is
error		DIL	OFF	completed.
Error flag	FB_ERROR	Dit	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	2014/7/31	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+L60ADL8_ShiftOperation (Shift operation)

FB Name

M+L60ADL8_ShiftOperation

Function Overview

Item	Description				
Function overview	Adds the shift amount to the digital value.				
Symbol	Execution command —— Digital value —— Shift amount ——	M+L60ADL8_ShiftOperation B : FB_EN W : i_Digital_Value W : i_Shift_Value	FB_ENO : B Execution status FB_OK : B Completed without error o_Dig_Out_Val : W Digital output value FB_ERROR : B Error flag ERROR_ID : W Error code		
Applicable hardware	Analog-digital	L60ADIL8, L60ADVL8			
and software	converter module				
	CPU module				
		Series	Model		
		MELSEC-L Series	LCPU		
	Engineering software	GX Works2 *1			
		Language	Software version		
		Japanese version	Version1.86Q or later		
		English version	Version1.24A or later		
		Chinese (Simplified) version	Version1.49B or later		
		Chinese (Traditional) version	Version1.49B or later		
		Korean version	Version1.49B or later		
		*1 For software versions applica	ble to the modules used, refer to		
		"Relevant manuals".			
Programming	Ladder				
language					
Number of steps	166 steps (for MELSEC-L series CPU)				
	*The number of steps of the FB in a program depends on the CPU model that is used and				
	input and output definition	on.			



Item	Description			
Function description	1) By turning ON FB_EN (Execution command), the shift amount is added to a digital			
	value*1.			
	*1 Input the A/D conversion data read from the L60ADIL8 or L60ADVL8 with			
	M+L60ADL8_ReadADVal or others as the digital value.			
	2) If the value after the addition is out of the range from -32,768 to 32,767, the value is fixed			
	to -32,768 or 32,767.			
Compiling method	Macro type			
Restrictions and	1) The FB does not include error recovery processing. Program the error recovery			
precautions	processing separately in accordance with the required system operation.			
	2) The FB cannot be used in an interrupt program.			
	3) Please ensure that the FB_EN signal is capable of being turned OFF by the program. Do			
	not use this FB in programs that are only executed once such as a subroutine,			
	FOR-NEXT loop because it is impossible to turn OFF.			
	4) Every input must be provided with a value for proper FB operation.			
	5) To operate the L60ADIL8 or L60ADVL8, 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			
	When EB_OK (Completed without error) is ON_o_Dig_Out_Val (Digital output value) is			
	6) When FB_OK (Completed without error) is ON, o_Dig_Out_val (Digital output value) is			
	enabled.			
	7) By turning OFF FB_EN, o_Dig_Out_val (Digital output value) is cleared to 0.			
Application system	Real-time execution			
	Refer to Appendix 1. FB Library Application Examples .			
nming chan				
	FB_EN (Execution command)			
	FB_ENO (Execution status)			
	Shift operation			
	FB_OK (Completed without error)			
	FB_ERROR (Error flag)			
	ERROR_ID (Error code) 0			



Item	Description
Relevant manuals	MELSEC-L Analog-Digital Converter Module User's Manual
	• 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	Setting range	Description
		type		
Execution command	FB_EN	Dit	ON, OFF	ON: The FB is activated.
		DIL		OFF: The FB is not activated.
Digital value	i_Digital_Value	Word	-32,768 to	Specify a digital value.
		vvoru	32,767	
Shift amount	i_Shift_Value	Word	-32,768 to	Specify the shift amount.
		vvora	32,767	

Output labels

Name (comment)	Label name	Data	Initial	Description
		type	value	
Execution status	FB_ENO	Rit.	OFF	ON: Execution command is ON.
		Dit	011	OFF: Execution command is OFF.
Completed without	FB_OK	Bit OFF		When ON, it indicates that the shift
error				operation is being executed.
Digital output value	o_Dig_Out_Val	Word 0		The digital value after the shift amount is
		vvoru	0	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	2014/7/31	First edition



Note

This chapter includes information related to the function block.

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

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



2.18. M+L60ADL8_DiffOperation (Differential conversion process)

FB Name

M+L60ADL8_DiffOperation

Function Overview

Item		Description	
Function	Outputs the difference obtained by subtracting the standard value from the digital value.		
overview			
Symbol	MH 604DL8. DiffOneration		
	Execution command — B Digital value — W	: FB_EN ' : i_Digital_Value o_S	FB_ENO : B Execution status FB_OK : B Completed without error Dig_Out_Val : W Digital output value Standard_Val : W Differential conversion standard FB_ERROR : B Error flag ERROR_ID : W Error code
Applicable	Analog-digital converter	L60ADIL8, L60ADVL8	
hardware and	module		
software	CPU module		
		Series	Model
		MELSEC-L Series	LCPU
	Engineering software	GX Works2 *1	0.4
			Software version
			Version 1.86Q or later
		English version	Version1.24A or later
		Chinese (Simplified) version	Version1.49B of later
		Chinese (Traditional) version	Version1.49B or later
		*1 For coftware versions applied	ble to the medules used refer to
		"Relevant manuals"	
Programming	Ladder	Relevant manuals .	
language			
Number of	182 steps (for MELSEC-L set	ries CPU)	
steps	*The number of steps of the I	FB in a program depends on the (CPU model that is used and input
	and output definition.		· · · · · · · · · · · · · · · · · · ·



Item	Description
Function	1) By turning ON FB_EN (Execution command), the differential conversion process is executed.
description	2) The remaining value after subtraction of o_Standard_Val (Differential conversion standard)
	from i_Digital_Value (Digital value) is output while FB_EN (Execution command) is ON.
	o_Standard_Val (Differential conversion standard) is i_Digital_Value (Digital value)*1 of when
	FB_EN (Execution command) is turned ON.
	*1 Input the A/D conversion data read from the L60ADIL8 or L60ADVL8 with
	M+L60ADL8_ReadADVal or others as the digital value.
Compiling	Macro type
method	
Restrictions	1) The FB does not include error recovery processing. Program the error recovery processing
and	separately in accordance with the required system operation.
precautions	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) Every input must be provided with a value for proper FB operation.
	5) To operate the L60ADIL8 or L60ADVL8, 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
	Version 1 Operating Manual (Common).
	6) When FB_OK (Completed without error) is ON, o_Dig_Out_Val (Digital output value) and
	o_Standard_Val (Differential conversion standard) are enabled.
	7) By turning OFF FB_EN, o_Dig_Out_Val (Digital output value) and o_Standard_Val
	(Differential conversion standard) are cleared to 0.
FB operation	Real-time execution
type	
Application	Refer to "Appendix 1. FB Library Application Examples".
example	



Item	Description		
Timing chart	[When operation completes without error] FB_EN (Execution command) FB_ENO (Execution status) Differential conversion standard FB_CK (Completed without error) FB_ERROR (Error flag) ERROR_ID (Error code)		
Relevant	MELSEC-L Analog-Digital Converter Module User's Manual		
manuals	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	Setting range	Description
		type		
Execution command	FB_EN	Dit	ON, OFF	ON: The FB is activated.
		DIL		OFF: The FB is not activated.
Digital value	i_Digital_Value		-32,768 to	Specify a digital value for which the
		Word	32,767	differential conversion is to be
				executed.



Output labels

Name (comment)	Label name	Data	Initial	Description
		type	value	
Execution status	FB_ENO	Dit	OFF	ON: Execution command is ON.
		DIL	OFF	OFF: Execution command is OFF.
Completed without	FB_OK	Dit	OFF	When ON, it indicates that the differential
error		DIL	OFF	conversion is being executed.
Digital output value	o_Dig_Out_Val	Word	0	The digital value for which the differential
		vvora	0	conversion has been executed is stored.
Differential	o_Standard_Val			The differential conversion standard (a
conversion standard		Word	0	digital value when FB_EN is turned ON) 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	2014/7/31	First edition

Note

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

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2.19. M+L60ADL8_DigitalClipOperation (Digital clipping operation)

FB Name

M+L60ADL8_DigitalClipOperation

Function Overview

Item	Description					
Function overview	Limits a digital value at th	Limits a digital value at the digital clipping upper and lower limit values.				
Symbol	Execution command Digital value — Digital clipping upper limit value — Digital clipping lower limit value ——	M+L60ADL8_DigitalClipOperation B : FB_EN W : i_Digital_Value W : i_Clip_U_Lim W : i_Clip_L_Lim	FB_ENO : B Execution status FB_OK : B Completed without error o_Dig_Out_Val : W Digital output value FB_ERROR : B Error flag ERROR_ID : W Error code			
Applicable hardware and software	Analog-digital converter module	L60ADIL8, L60ADVL8				
	CPU module	Series MELSEC-L Series	Model LCPU			
	Engineering software	GX Works2 *1 Language Japanese version English version Chinese (Simplified) version	Software version Version1.86Q or later Version1.24A or later Version1.49B or later			
		Chinese (Traditional) version Korean version *1 For software versions applica "Relevant manuals".	Version1.49B or later Version1.49B or later ble to the modules used, refer to			
Programming language	Ladder					
Number of steps	 178 steps (for MELSEC-L series CPU) *The number of steps of the FB in a program depends on the CPU model that is used and input and output definition. 					



Item	Description					
Function description	1) By turning ON FB_EN (Execution command), the digital clipping operation is started.					
	2) If i_Digital_Value (Digital value)*1 exceeds i_Clip_U_Lim (Digital clipping upper limit					
	value) or falls below i_Clip_L_Lim (Digital clipping lower limit value) while FB_EN					
	(Execution command) is ON, i_Digital_Value (Digital value) is limited at the upper or					
	lower limit value.					
	*1 Input the A/D conversion data read from the L60ADIL8 or L60ADVL8 with					
	M+L60ADL8_ReadADVal or others as the digital value.					
	3) If i_Clip_U_Lim (Digital clipping upper limit value) is equal to or less than i_Clip_L_Lim					
	(Digital clipping lower limit value), the FB_ERROR output turns ON, the processing is					
	interrupted, and the error code is stored in ERROR_ID (Error code).					
	Refer to the error code explanation section for details.					
Compiling method	Macro type					
Restrictions and	1) The FB does not include error recovery processing. Program the error recovery					
precautions	processing separately in accordance with the required system operation.					
	2) The FB cannot be used in an interrupt program.					
	3) Please ensure that the FB_EN signal is capable of being turned OFF by the program. Do					
	not use this FB in programs that are only executed once such as a subroutine,					
	FOR-NEXT loop because it is impossible to turn OFF.					
	4) Every input must be provided with a value for proper FB operation.					
	5) To operate the L60ADIL8 or L60ADVL8, 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 Version 1 Operating Manual (Common).					
	6) When FB_OK (Completed without error) is ON, o_Dig_Out_Val (Digital output value) is					
	enabled.					
	7) 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 1. FB Library Application Examples".					
Timing chart	[When operation completes without error] [When an error occurs]					
	FB_EN (Execution command)					
	FB_ENO (Execution status)					
	Digital clipping operation Processing Processing Digital clipping setting write Processing Digital clipping settin					
	(Completed without error)					
	FB_ERROR (Error flag) FB_ERROR (Error flag) FB_ERROR (Error flag)					
	ERROR_ID (Error code) 0 K Error code					



Item	Description	
Relevant manuals	 MELSEC-L Analog-Digital Converter Module User's Manual 	
	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
11 (Decimal)	i_Clip_U_Lim (Digital clipping upper limit	Please try again after confirming the setting.
	value) is equal to or less than	
	i_Clip_L_Lim (Digital clipping lower limit	
	value).	

Labels

●Input labels

Name (comment)	Label name	Data type	Setting range	Description
Execution command	FB_EN	Dit	ON, OFF	ON: The FB is activated.
		DIL		OFF: The FB is not activated.
Digital value	i_Digital_Value	Word	-32,768 to	Specify a digital value for which the digital
		vvoru	32,767	clipping operation is to be executed.
Digital clipping upper	i_Clip_U_Lim	Word	-32,768 to	Specify the digital clipping upper limit
limit value		vvoru	32,767	value.
Digital clipping lower	i_Clip_L_Lim	\\/ord	-32,768 to	Specify the digital clipping lower limit
limit value		vvora	32,767	value.

Output labels

Name (comment)	Label name	Data type	Initial value	Description
Execution status	FB_ENO			ON: Execution command is ON.
		DIL	OFF	OFF: Execution command is OFF.
Completed without	FB_OK	Di+		When ON, it indicates that the digital
error		DIL	OFF	clipping operation is being executed.
Digital output value	o_Dig_Out_Val			The digital value for which the digital
		Word	0	clipping operation has been executed is
				stored.
Error flag	FB_ERROR	Dit		When ON, it indicates that an error has
		DIL	OFF	occurred.
Error code	ERROR_ID	Word	0	FB error code output.



FB Version Upgrade History

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Note

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Appendix 1. FB Library Application Examples

L60ADL8 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) Global label setting

None

3) Application example settings

a) Common setting

Input and output item	Value	Description
Module start XY address	0	Specify the starting XY address where the
		L60ADIL8 or L60ADVL8 is connected.



a) External input (command)

Device	FB name	Application (ON details)
MO	M+L60ADL8_ReadADVal	A/D value reading request
M10	M+L60ADL8_ReadAllADVal	AD value reading all CHs request
M20	M+L60ADL8_ReadScalingVal	Scaling value reading request
M30	M+L60ADL8_ReadAllScalingVal	All scaling value reading req.
M40	M+L60ADL8_SetADConversion	A/D enable/disable request
M41		A/D conv enable: ON/disable: OFF
M50	M+L60ADL8_SetAverage	Averaging specification request
M60	M+L60ADL8_SetScaling	Scaling setting request
M61		Scaling enable:ON/disable:OFF
M70	M+L60ADL8_SetProcessAlarm	Process alarm setting request
M71		Process alarm enable/disable
M80	M+L60ADL8_SetInputSignalErr	Input signal error setting req.
M81		Input signal error enable/disabl
M84	M+L60ADL8_SetInputSignalErrExp	Input signal err ext setting req
M90	M+L60ADL8_RequestSetting	Operating condition setting req.
M100	M+L60ADL8_SetOffsetVal	Offset setting request
M101		Offset value writing request
M110	M+L60ADL8_SetGainVal	Gain setting request
M111		Gain value writing request
M120	M+L60ADL8_ErrorOperation	Error operation request
M121		Error reset request
M130	M+L60ADL8_OGBackup	Offset/gain save to file request
M140	M+L60ADL8_OGRestore	Offset/gain restore request
M150	M+L60ADL8_ShiftOperation	Shift operation request
D150		Digital value
M160	M+L60ADL8_DiffOperation	Diff conversion proc start req
D160		Digital value
M170	M+L60ADL8_DigitalClipOperation	Digital clipping request
D170		Digital value



b) External output (check)

Device	FB name	Application (ON details)
M1	M+L60ADL8_ReadADVal	A/D value reading FB ready
M2		A/D value reading complete
F0		A/D value reading FB error
D0		A/D conversion data
D1		A/D value reading FB error code
M11	M+L60ADL8_ReadAllADVal	A/D value all reading FB ready
M12		A/D value reading complete all
D10		CH1 A/D conversion data
D11		CH2 A/D conversion data
D12		CH3 A/D conversion data
D13		CH4 A/D conversion data
D14		CH5 A/D conversion data
D15		CH6 A/D conversion data
D16		CH7 A/D conversion data
D17		CH8 A/D conversion data
M21	M+L60ADL8_ReadScalingVal	Scaling value reading FB ready
M22		Scaling value reading complete
F5		Scaling value reading FB error
D20		Scaling value
D21		Scaling value read FB error code
M31	M+L60ADL8_ReadAllScalingVal	Scaling value all read FB ready
M32		Scaling value all read complete
D30		CH1 Scaling value
D31		CH2 Scaling value
D32		CH3 Scaling value
D33		CH4 Scaling value
D34		CH5 Scaling value
D35		CH6 Scaling value
D36		CH7 Scaling value
D37		CH8 Scaling value
M42	M+L60ADL8_SetADConversion	A/D enable/disable FB ready
M43		A/D enable/disable set complete
F10		A/D enable/disable FB error
D40		A/D enable/disable FB error code
M51	M+L60ADL8_SetAverage	Averaging proc setting FB ready



Device	FB name	Application (ON details)
M52		Averaging proc setting complete
F15		Averaging proc setting FB error
D50		Averaging proc set FB error code
M62	M+L60ADL8_SetScaling	Scaling setting FB ready
M63		Scaling setting complete
F20		Scaling setting FB error
D60		Scaling setting FB error code
M72	M+L60ADL8_SetProcessAlarm	Process alarm setting FB ready
M73		Process alarm setting complete
F25		Process alarm setting FB error
D70		Process alarm set FB error code
M82	M+L60ADL8_SetInputSignalErr	Input signal error set FB ready
M83		Input signal error setting comp.
F30		Input signal err setting FB err
D80		Input signal err set FB err code
M85	M+L60ADL8_SetInputSignalErrExp	Input signal err ext set FB rdy
M86		Input signal error ext set comp
F75		Input signal ext set FB error
D81		Input signal ext set FB err code
M91	M+L60ADL8_RequestSetting	Operate condition set req FB rdy
M92		Operating condition set req comp
M102	M+L60ADL8_SetOffsetVal	Offset setting FB ready
M103		Offset setting complete
F35		Offset setting FB error
D100		Offset setting FB error code
M112	M+L60ADL8_SetGainVal	Gain setting FB ready
M113		Gain setting complete
F40		Gain setting FB error
D110		Gain setting FB error code
M122	M+L60ADL8_ErrorOperation	Error operation FB ready
M123		Error operation complete
F45		Module error flag
D120		Module error code
M131	M+L60ADL8_OGBackup	Offset/gain save to file FB rdy.
M132		Offset/gain save to file comp.
F50		Offset/gain save file FB error



Device	FB name	Application (ON details)
D130		Offset/gain save file FB err cod
M141	M+L60ADL8_OGRestore	Offset/gain restore FB ready
M142		Offset/gain restore complete
F55		Offset/gain restore FB error
D140		Offset/gain restore FB err code
M151	M+L60ADL8_ShiftOperation	Shift operation FB ready
M152		Shift operation complete
D151		Shift conversion value
M161	M+L60ADL8_DiffOperation	Diff conversion proc FB ready
M162		Diff conversion process complete
D161		Differential conversion value
D162		Differential conversion standard
M171	M+L60ADL8_DigitalClipOperation	Digital clipping operate FB rdy.
M172		Digital clipping operation comp.
F60		Digital clipping operate FB err.
D171		Digital output value
D172		Digital clip operate FB err code



Label name	Setting value	Description
i_Start_IO_No	H0	Set the starting XY address where the L60ADIL8 or L60ADVL8 is connected to 0H.
i_CH	K1	Set the target channel to channel 1.

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





M+L60ADL8_ReadAllADVal (Read all A/D conversion data)

Label name	Setting value	Description
i_Start_IO_No	HO	Set the starting XY address where the L60ADIL8 or L60ADVL8 is connected to 0H.

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

м10	ReadAllADVa			
AD value reading all CHs request	B:FB_EN Executio n comman d	FB_ENO:B - Executio n status		—(M11) A/D valu e all re ading FB ready
[но]	W:i_Start_IO_No Module s tart XY address	FB_OK:B Complete d withou t error		(M12) A/D valu e readin g comple te all
	o <u>.</u>	_AD_ValueCH1:W CH1 A/D conversi on data	[D10] CH1 A/D conversi on data	
	o <u>.</u>	_AD_ValueCH2:W CH2 A/D conversi on data	[D11] CH2 A/D conversi on data	
	0 <u>.</u>	_AD_ValueCH3:W CH3 A/D conversi on data	[D12] CH3 A/D conversi on data	
	0 <u>.</u>	_AD_ValueCH4:W CH4 A/D conversi on data	[D13] CH4 A/D conversi on data	







M+L60ADL8_ReadScalingVal (Read scaling value)

Label name	Setting value	Description
i_Start_IO_No	H0	Set the starting XY address where the L60ADIL8 or L60ADVL8 is connected to 0H.
i_CH	K2	Set the target channel to channel 2.

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

M20	ReadScalingVal]	
┝──┥┝──────┥	B:FB_EN	FB_ENO:B		(M21)
Scaling	Executio	Executio		Scaling
value re	n comman	n status		value re
ading re	d			ading FB
quest				ready
{H0 }	W:i_Start_IO_No Module s tart XY address	FB_OK:B Complete d withou t error		(M22) Scaling value re ading co
[к2]	W:i_CH o_So Target C H	aling_Value:W Scaling value	[D20] Scaling value	mplete
		FB_ERROR:B Error fl ag		(F5) Scaling value re ading FB error
		ERROR_ID:W Error co de	[D21] Scaling value re ad FB er ror code	



M+L60ADL8_ReadAllScalingVal (Read all scaling values)

Label name	Setting value	Description
i_Start_IO_No	HO	Set the starting XY address where the L60ADIL8 or L60ADVL8 is connected to 0H.

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

M30	ReadAllScalingVa			
All scal ing valu e readin g req.	B:FB_EN Executio n comman d	FB_ENO:B - Executio n status		M31) icaling alue al read F i ready
[H0]	W:i_Start_IO_No Module s tart XY address	FB_OK:B - Complete d withou t error		M32) caling alue al read c mplete
	o_Sca	aling_CH1:W CH1 Scal ing valu e	[D30] CH1 Scal ing valu e	
	o_Sca	aling_CH2:W CH2 Scal ing valu e	[D31] CH2 Scal ing valu e	
	o_Sca	aling_CH3:W CH3 Scal ing valu e	[D32] CH3 Scal ing valu e	
	o_Sca	aling_CH4:W CH4 Scal ing valu e	[D33] CH4 Scal ing valu e	







M+L60ADL8_SetADConversion (Enable/disable A/D conversion)

Label name	Setting value	Description
i_Start_IO_No	HO	Set the starting XY address where the L60ADIL8 or L60ADVL8 is connected to 0H.
i_CH	K15	Set the target channel to all channels.
i_AD_Enable	ON/OFF	Turn ON to enable the A/D conversion of the target channel.

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





Label name	Setting value	Description
i_Start_IO_No	HO	Set the starting XY address where the L60ADIL8 or L60ADVL8 is connected to
		0Н.
i_CH	K3	Set the target channel to channel 3.
i_Average_Type	H1	Set the averaging processing type to "Time average".
i_Average_Times	K100	Set the average time to 100.

M+L60ADL8_SetAverage (Averaging process setting)

By turning ON M50, the averaging processing type setting value of channel 3 is written to the buffer memory.





Label name	Setting value	Description
i_Start_IO_No	HO	Set the starting XY address where the L60ADIL8 or L60ADVL8 is connected to
		0Н.
i_CH	K4	Set the target channel to channel 4.
i_Scaling_Enable	ON/OFF	Turn ON to enable the scaling.
i_Scl_U_Lim	K30000	Set the scaling upper limit value to 30,000.
i_Scl_L_Lim	K-30000	Set the scaling lower limit value to -30,000.

M+L60ADL8_SetScaling (Scaling setting)

By turning ON M60, the scaling setting value of channel 4 is written to the buffer memory.





M+L60ADL8	SetProcessAlarm (Process	alarm	settina)

Label name	Setting value	Description
i_Start_IO_No	H0	Set the starting XY address where the L60ADIL8 or L60ADVL8 is connected to
		0Н.
i_CH	K5	Set the target channel to channel 5.
i_Process_Enable	ON/OFF	Turn ON to enable the process alarm.
i_Pro_UU_Lim	K3000	Set the process alarm upper upper limit value of channel 5 to 3000.
i_Pro_UL_Lim	K2950	Set the process alarm upper lower limit value of channel 5 to 2950.
i_Pro_LU_Lim	K2050	Set the process alarm lower upper limit value of channel 5 to 2050.
i_Pro_LL_Lim	K2000	Set the process alarm lower lower limit value of channel 5 to 2000.

By turning ON M70, the process alarm setting value of channel 5 is written to the buffer memory.







M+L60ADL8_SetInputSignalErr (Input signal error detection setting)

Label name	Setting value	Description
i_Start_IO_No	HO	Set the starting XY address where the L60ADIL8 or L60ADVL8 is connected to
		0Н.
i_CH	K6	Set the target channel to channel 6.
i_Sig_Err_Enable	ON/OFF	Turn ON to enable the input signal error detection setting of channel 6.
i_Sig_Err_Level	K100	Set the input signal error detection setting value to 10.0%.

By turning ON M80, the input signal error detection setting value of channel 6 is written to the buffer memory.





Label name	Setting value	Description
i_Start_IO_No	H0	Set the starting XY address where the L60ADIL8 or L60ADVL8 is connected to 0H.
i_CH	K7	Set the target channel to channel 7.
i_SigErrEnhance	H1	Set the input signal error detection extension setting of channel 7 to "Upper and
		lower limit detection".
i_Sig_Err_Level	K100	Set the input signal error detection setting value to 10.0%.

M+L60ADL8_SetInputSignalErrExp (Input signal error detection extension setting)

By turning ON M84, the input signal error detection extension setting value of channel 7 is written to the buffer memory.





M+L60ADL8_RequestSetting (Operating condition setting request)

Label name	Setting value	Description
i_Start_IO_No	H0	Set the starting XY address where the L60ADIL8 or L60ADVL8 is connected
		to 0H.

By turning ON M90, the following settings are enabled.

- A/D conversion enable/disable setting
- Averaging processing setting
- Process alarm function setting
- Input signal error detection function setting
- Input signal error detection extension function setting
- Scaling function setting





M+L60ADL8_SetOffsetVal (Offset setting)

Label name	Setting value	Description
i_Start_IO_No	H0	Set the starting XY address where the L60ADIL8 or L60ADVL8 is connected to 0H.
i_CH	K8	Set the target channel to channel 8.
i_Write_Offset	ON/OFF	Turn ON to written the offset value of channel 8.

By turning ON M100 and then M101, the offset value of channel 8 is written.





M+L60ADL8_SetGainVal (Gain setting)

Label name	Setting value	Description
i_Start_IO_No	HO	Set the starting XY address where the L60ADIL8 or L60ADVL8 is connected to
		0Н.
i_CH	K1	Set the target channel to channel 1.
i_Write_Gain	ON/OFF	Turn ON to write the gain value of channel 1.

By turning ON M110 and then M111, the gain value of channel 1 is written.





 Label name
 Setting value
 Description

 i_Start_IO_No
 H0
 Set the starting XY address where the L60ADIL8 or L60ADVL8 is connected to 0H.

 i_ErrorReset
 ON/OFF
 Turn ON for the error reset.

M+L60ADL8_ErrorOperation (Error operation)

By turning ON M120, the error code is output when an error occurs. By turning ON M121 after the error output, the error is reset.





M+L60ADL8_OGBackup (Offset/gain value save)

Label name	Setting value	Description
i_Start_IO_No	HO	Set the starting XY address where the L60ADIL8 or L60ADVL8 is connected to
		0Н.

By turning ON M130, the offset/gain value of the user range is read and saved in the SD memory card inserted in the CPU module in a file format.




M+L60ADL8_OGRestore (Offset/gain value restore)

Label name	Setting value	Description
i_Start_IO_No	HO	Set the starting XY address where the L60ADIL8 or L60ADVL8 is connected to
		0Н.

By turning ON M140, the offset/gain setting values of the user range is restored from a file to the module.

M140	OGRestore]	
	B:FB_EN	FB_ENO:B		-(M141)
Offset/g	Executio	Executio		Offset/g
ain rest	n comman	n status		ain rest
ore requ	d			ore FB r
est				eady
[un]	We Shart IO No	ER OK R		(M1/2
luo	Madula a	Complete		0#
	Module s	Complete		Onsel/g
		d withou		ain rest
	address	renor		ore comp
				lete
				(555
		FD_ERROR:D		(F55 /
		Error II		Onsel/g
		ay		am rest
				ore r b e
				iioi
			[D140]	
		ERROR_ID.W		
		Lifor co	Diseby	
		ue	an FB a	
			r code	
			ii code	
]	



M+L60ADL8_ShiftOperation (Shift operation)

Label name	Setting value	Description
i_Digital_Value	-	Store a digital output value for which the shift amount is to be added.
i_Shift_Value	K1000	Set the shift amount to 1,000.

By turning ON M150, the digital value after the shift amount is added is output.

M150	ShiftOperation]	
	B:FB_EN	FB_ENO:B		(M151)
Shift op	Executio	Executio		Shift op
eration	n comman	n status		eration
request	d			FB ready
D150 Digital value	} W:i_Digital_Value Digital value	FB_OK:B Complete d withou t error		(M152) Shift op eration complete
[К1000	} W:i_Shift_Value o_Dig Shift am ount	g_Out_Val:W Digital output v alue	[D151] Shift co nversion value	
	F	B_ERROR:B		
		Error fl		
		ag		
	_			
	E	RROR_ID:W		
		Error co de		



M+L60ADL8_DiffOperation (Differential conversion process)

Label name	Setting value	Description
i_Digital_Value	-	Store a digital value for which the differential conversion is to be executed.

By turning ON M160, the difference obtained by subtracting the standard value from the digital value is output.





Label name	Setting value	Description	
i_Digital_Value	-	Store a digital value for which the digital clipping operation is executed.	
i_Clip_U_Lim	K8000	Set the digital clipping upper limit value to 8000.	
i_Clip_L_Lim	K0	Set the digital clipping lower limit value to 0.	

M+L60ADL8_DigitalClipOperation (Digital clipping operation)

By turning ON M170, if the input digital value exceeds the digital clipping upper limit value or falls below the lower limit value, the value is limited at the upper or lower limit value and then output.



