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

Applicable module:
L60AD4

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Reference Manual Revision History

Reference Manual Number	Date	Description
FBM-M030-A	2010/06/28	First edition
FBM-M030-B	2011/04/30	Added "Reference Manual Revision History", "Overview", "Chinese
		version of GX Works2".
FBM-M030-C	2012/03/16	Added the "FB Version Upgrade History" except for the following
		FBs.
		2.14 M+L60AD4_ShiftOperation
		2.15 M+L60AD4_DiffOperation
		2.19 M+L60AD4_SetInputSignalErrExp
		2.20 M+L60AD4_SetDigitalClip
		2.21 M+L60AD4_SetShift
		2.22 M+L60AD4_SetLoggingPARAM
		2.23 M+L60AD4_SetFlowRatePARAM
		2.24 M+L60AD4_SaveLogging
		2.25 M+L60AD4_MakeFlowRateDailyReport
		Changed the project name of 2.4 M+L60AD4_ReadAllScalingVal.
		Added the following FBs.
		2.19 M+L60AD4_SetInputSignalErrExp
		2.20 M+L60AD4_SetDigitalClip
		2.21 M+L60AD4_SetShift
		2.22 M+L60AD4_SetLoggingPARAM
		2.23 M+L60AD4_SetFlowRatePARAM
		2.24 M+L60AD4_SaveLogging
		2.25 M+L60AD4_MakeFlowRateDailyReport
		Added an applicable module list to the contents.
		Added application examples of the FBs that were added.

1. Overview

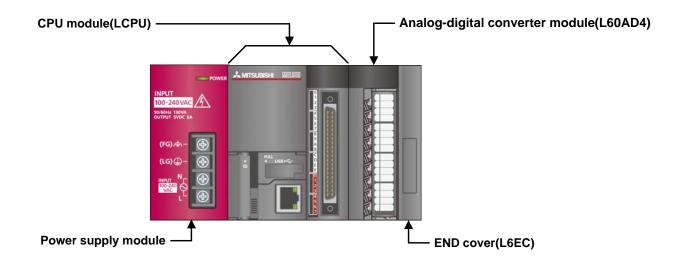
1.1 Overview of the FB Library

This FB library is for using the MELSEC-L L60AD4 analog-digital converter module.

1.2 Function of the FB Library

Item	Description
M+L60AD4_ReadADVal	Read the AD conversion data of a specified channel.
M+L60AD4_ReadAllADVal	Read the AD conversion data of all channels.
M+L60AD4_ReadScalingVal	Read the scaling value (digital operation value) of a specified channel.
M+L60AD4_ReadAllScalingVal	Read the scaling values (digital operation values) of all channels.
M+L60AD4_SetConvertSpeed	Set the conversion speed of a specified module.
M+L60AD4_SetADConversion	Enable or disable AD conversion for a specified channel or all channels.
M+L60AD4_SetAverage	Configure a specified channel for the Averaging processing A/D
	conversion method.
M+L60AD4_SetScaling	Configure a specified channel's Scaling value output settings.
M+L60AD4_SetProcessAlarm	Configure a specified channel's process alarm settings.
M+L60AD4_SetInputSignalErr	Configure a specified channel's Input signal error detection settings.
M+L60AD4_RequestSetting	Apply changes made to each function's operational condition settings.
M+L60AD4_SetOffsetVal	Set the offset value of a specified channel to the current analog value.
M+L60AD4_SetGainVal	Set the gain value of a specified channel to the current analog value.
M+L60AD4_ShiftOperation	Add the shift amount to the digital value that was input.
M+L60AD4_DiffOperation	Output the difference obtained by subtracting the standard value from
	the digital value that was input.
M+L60AD4_ErrorOperation	Perform monitoring and reset of intelligent function module error codes
M+L60AD4_OGBackup	Read the offset and gain values from the user range setting, and save to
	file.
M+L60AD4_OGRestore	Restore the user range offset / gain settings of a module from a file
	created with M+L60AD4_OGBackup.
M+L60AD4_SetInputSignalErrExp	Set the input signal error detection extension setting of a specified
	channel.
M+L60AD4_SetDigitalClip	Enable or disable the digital clipping of a specified channel.
M+L60AD4_SetShift	Perform the shift setting of a specified channel.
M+L60AD4_SetLoggingPARAM	Perform the logging function of a specified channel.
M+L60AD4_SetFlowRatePARAM	Set the flow amount integration function of a specified channel.
M+L60AD4_SaveLogging	Save the logging data of a specified channel in a file.
M+L60AD4_MakeFlowRateDailyReport	Save the flow amount daily report data of all channels in a file.

1.3 System Configuration Example



1.4 Relevant manual

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)

1.5 Note

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

- 2. Details of the FB Library
- 2.1 M+L60AD4_ReadADVal (Read AD conversion data)

FB Name

M+L60AD4_ReadADVal

Item	Description			
Function overview	Read the AD conversion data of a specified channel.			
Symbol				
	Execution command—	M+L60AD4 B:FB_EN	4_ReadADVal FB_ENO : B ——Execution status	
	Module start XY address ——	W: i_Start_IO_No	FB_OK : B ——Completed without error	
	Target CH—	W:i_CH	o_AD_Value : W ——AD conversion data	
			FB_ERROR : B ——Error flag	
			ERROR_ID : W Error code	
		I		
Applicable hardware	Analog-Digital	L60AD4		
and software	converter module			
	CPU module			
		Series	Model	
		MELSEC-L Series	LCPU	
	Engineering	GX Works2 *1		
	software	Language	Software version	
		English version	Version1.24A or later	
		Chinese version	Version1.49B or later	
		*1 For software versions	applicable to the modules used, refer to	
		"Relevant manuals".		
Programming	Ladder			
language				
Number of steps	215 steps (for MELS	SEC-L series CPU)		
	* The number of ste	steps of the FB in a program depends on the CPU model that is used and		
	input and output o			

Item	Description			
Function description	1) Reads the AD conversion data of a specified channel when the FB_EN (Execution			
	command) signal is turned ON.			
	2) The resulting AD conversion data depends on the input range setting.			
	3) When the target CH setting value is out of range, the FB_ERROR output turns on,			
	processing is interrupted, and the error code is stored in ERROR_ID.			
	Refer to the error code explanation section for details.			
	4) If the A/D converter module buffer memory is set to auto refresh the digital output value,			
	it is unnecessary to use this FB.			
Compiling method	Macro type			
Restrictions and	1) The FB does not include error recovery processing. Program the error recovery			
precautions	processing separately in accordance with the required system operation.			
	2) The FB cannot be used in an interrupt program.			
	3) Please ensure that the FB_EN signal is capable of being turned OFF by the program. Do			
	not use this FB in programs that are only executed once such as a subroutine,			
	FOR-NEXT loop, etc. because it is impossible to turn OFF.			
	4) When two or more of these FBs are used, precaution must be taken to avoid repetition of			
	the target CH.			
	5) This FB uses index registers Z7, Z8, and Z9. Please do not use these index registers in			
	an interrupt program.			
	6) Every input must be provided a value for proper FB operation.			
	7) The input range settings must be properly configured to match devices connected to the			
	L60AD4 module. For information about intelligent function module switch settings, refer			
	to the GX Works2 Version1 Operation Manual (Common).			
FB operation	Real-time 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 FB_EN(Execution			
	command) FB_ENO(Execution FB_ENO(Execut			
	status) o_AD_Value(AD conversion data) Refreshing stop			
	FB_OK(Completed without error) FB_OK(Completed without error)			
	FB_ERROR(Error flag) FB_ERROR(Error flag)			
	ERRORJD(Error code) 0 ERRORJD(Error code) 0 Error code			
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 target channel is not valid.	Please try again after confirming the setting.
	The target channel is not within the	
	range of 1 to 4.	

Labels

●Input labels

Name (comment)	Label name	Data	Setting range	Description
		type		
Execution command	FB_EN	D:t	ON,OFF	ON: The FB is activated.
		Bit		OFF: The FB is not activated.
Module start	i_Start_IO_No		Depends on the	Specify the starting XY address (in
XY address			I/O point range.	hexadecimal) where the L60AD4
		Word	For details,	module is mounted.
			refer to the CPU	
			user's manual.	
Target CH	i_CH	Word	1~4	Specify the CH number.

Name (comment)	Label name	Data	Initial value	Description
		type		
Execution status	FB_ENO	Bit	OFF	ON: Execution command is ON.
		DIL	OFF	OFF: Execution command is OFF.
Completed	FB_OK			When ON, it indicates that the AD
without error		Bit	OFF	conversion value read operation
				was successful.
AD conversion data	o_AD_Value	Word	0	AD conversion data output
Error flag	FB_ERROR	D:4	OFF	When ON, it indicates that an error
		Bit	OFF	has occurred.
Error code	ERROR_ID	Word	0	FB error code output.

Version	Date	Description	
1.00A	2010/06/28	First edition	
1.01B	2012/03/16	Solved the problem that causes the OPERATION ERROR	
		(error code: 4101) when using an index register number that	
		is used by the FB.	

Note

This chapter includes information related to the M+L60AD4_ReadADVal function block.

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

2.2 M+L60AD4_ReadAllADVal (Read all AD conversion data)

FB Name

M+L60AD4_ReadAllADVal

Item	Description			
Function overview	Read the AD conversion data of all channels.			
Symbol		M+L60AD4	ReadAllADVal	
	Execution command —	B : FB_EN	FB_ENO : B	Execution status
	Module start XY address —	── W : i_StartJO_No	FB_OK : B	Completed without error
			o_AD_ValueCH1 : W	——CH1 AD conversion data
			o_AD_ValueCH2 : W	——CH2 AD conversion data
			o_AD_ValueCH3 : W	——CH3 AD conversion data
			o_AD_ValueCH4 : W	——CH4 AD conversion data
			FB_ERROR : B	——Error flag
			ERRORJD : W	——Error code
Applicable hardware	Analog-Digital	L60AD4		
and software	converter module.			
	CPU module			
		Series Model		
		MELSEC-L Series LCPU		
	Engineering	GX Works2 *1		
	software	Language	Software	version
		English version	Version1.24A or later	
		Chinese version	Version1.49B or later	
		*1 For software versions	applicable to the modu	lles used, refer to
		"Relevant manuals".		
Programming	Ladder			
language				
Number of steps	192 steps (for MELS	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 d	and output definition.		
	וווייים מווט טענייטני ט			

Item	Description				
Function description	1) Reads the AD conversion data of all channels when the FB_EN (Execution command)				
	signal is turned ON.				
	2) The resulting AD conversion data depends on the input range setting.				
	3) If the A/D converter module buffer memory is set to auto refresh the digital output value,				
	it is unnecessary to use this FB.				
Compiling method	Macro type				
Restrictions and	The FB does not include error recovery processing. Program the error recovery				
precautions	processing separately in accordance with the required system operation.				
	2) The FB cannot be used in an interrupt program.				
	3) Please ensure that the FB_EN signal is capable of being turned OFF by the program. Do				
	not use this FB in programs that are only executed once such as a subroutine,				
	FOR-NEXT loop, etc. because it is impossible to turn OFF.				
	4) 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 a value for proper FB operation.				
	6) The input range settings must be properly configured to match devices connected to the				
	L60AD4 module. For information about intelligent function module switch settings, refer				
	to the GX Works2 Version1 Operation 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) o_AD_ValueCH□ (CH□ AD conversion data) FB_OK(Completed without error) FB_ERROR(Error flag) ERRORJD(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
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 L60AD4
		Word	For details,	module is mounted.
			refer to the CPU	
			user's manual.	

Name (comment)	Label name	Data type	Initial value	Description
Execution status	FB_ENO	Bit	OFF	ON: Execution command is ON. OFF: Execution command is OFF.
Completed without error	FB_OK	Bit	OFF	When ON, it indicates that the AD conversion value read operation was successful.
CH1 AD conversion data	o_AD_ValueCH1	Word	0	CH1 AD conversion data output
CH2 AD conversion data	o_AD_ValueCH2	Word	0	CH2 AD conversion data output
CH3 AD conversion data	o_AD_ValueCH3	Word	0	CH3 AD conversion data output
CH4 AD conversion data	o_AD_ValueCH4	Word	0	CH4 AD conversion data output
Error flag	FB_ERROR	Bit	OFF	Always OFF
Error code	ERROR_ID	Word	0	Always 0

Version	Date	Description
1.00A	2010/06/28	First edition
1.01B	2012/03/16	Solved the problem that causes the OPERATION ERROR
		(error code: 4101) when using an index register number that
		is used by the FB.

Note

This chapter includes information related to the M+L60AD4_ReadAllADVal function block.

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

2.3 M+L60AD4_ReadScalingVal (Read scaling value)

FB Name

M+L60AD4_ReadScalingVal

Item	Description				
Function overview	Read the scaling value (digital operation value) of a specified channel.				
Symbol					
	Execution command ——	M+L60AD4_ReadScalingVal B:FB_ENO:B			
	Module start XY address ——	W: i_Start_IO_No	FB_OK : B	——Completed without error	
	Target CH	W:i_CH	o_Scaling_Value : W -		
			FB_ERROR : B	——Error flag	
			ERROR_ID : W	Error code	
Applicable hardware	Analog-Digital	L60AD4			
and software	converter module.				
	CPU module				
		Series Model			
		MELSEC-L Series	LCPU		
	Engineering	GX Works2 *1			
	software	Language	Software ver	rsion	
		English version	Version1.24A or later		
		Chinese version	Version1.49B or later		
		*1 For software versions	applicable to the modules	used, refer to	
		"Relevant manuals".			
Programming	Ladder				
language					
Number of steps	213 steps (for MELS	SEC-L series CPU)			
	* The number of step	os of the FB in a program	depends on the CPU mod	lel that is used and	
	input and output d	efinition.			

Item	Description			
Function description	1) Reads the Scaling value (digital operation value) of a specified channel when the FB_EN			
	(Execution command) signal is turned ON.			
	2) When the target CH setting value is out of range, the FB_ERROR output turns on,			
	processing is interrupted, and the error code is stored in ERROR_ID.			
	Refer to the error code explanation section for details.			
	3) If the A/D converter module buffer memory is set to auto refresh the scaling value (digital			
	operation value), it is unnecessary to use this FB.			
Compiling method	Macro type			
Restrictions and	1) The FB does not include error recovery processing. Program the error recovery			
precautions	processing separately in accordance with the required system operation.			
	2) The FB cannot be used in an interrupt program.			
	3) Please ensure that the FB_EN signal is capable of being turned OFF by the program. Do			
	not use this FB in programs that are only executed once such as a subroutine,			
	FOR-NEXT loop, etc. because it is impossible to turn OFF.			
	4) When two or more of these FBs are used, precaution must be taken to avoid repetition of			
	the target CH.			
	5) This FB uses index registers Z7, Z8, and Z9. Please do not use these index registers in			
	an interrupt program.			
	6) Every input must be provided a value for proper FB operation.			
	7) The input range settings must be properly configured to match devices connected to the			
	L60AD4 module. For information about intelligent function module switch settings, refer			
	to the GX Works2 Version1 Operation Manual (Common).			
FB operation type	Real-time execution			
Application example	Refer to "Appendix 1 - FB Library Application examples"			
Timing chart	[When operation completes without error] [When an error occurs]			
	FB_EN(Execution command) FB_EN(Execution			
	FB_ENO(Execution status)			
	o_Scaling_Value(Scalin Refreshing Stop Refreshing stop Status) O_Scaling_Value(Sca			
	FB_OK(Completed FB_OK(Complete			
	without error) FB_ERROR(Error flag) FB_ERROR(Error flag)			
	ERROR_ID (Error code) 0 ERROR_ID (Error code) 0 Error code			
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 target channel is not valid.	Please try again after confirming the setting.
	The target channel is not within the	
	range of 1 to 4.	

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 L60AD4
		Word	For details,	module is mounted.
			refer to the CPU	
			user's manual.	
Target CH	i_CH	Word	1~4	Specify the CH number.

Name (comment)	Label name	Data	Initial value	Description
		type		
Execution status	FB_ENO	Bit	OFF	ON: Execution command is ON.
		Dit	Oll	OFF: Execution command is OFF.
Completed without	FB_OK			When ON, it indicates that the
error	error Bit OFF	OFF	scaling value (digital operation	
		OFF	value) read operation was	
				successful.
Scaling value	o_Scaling_Value	Word	0	Scaling value (digital operation
		vvoid		value) output
Error flag	FB_ERROR	Bit	OFF	When ON, it indicates that an error
			OIF	has occurred.
Error code	ERROR_ID	Word	0	FB error code output.

Version	Date	Description
1.00A	2010/06/28	First edition
1.01B	2012/03/16	Solved the problem that causes the OPERATION ERROR
		(error code: 4101) when using an index register number that
		is used by the FB.

Note

This chapter includes information related to the M+L60AD4_ReadScalingVal function block.

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

2.4 M+L60AD4_ReadAllScalingVal (Read all scaling values)

FB Name

M+L60AD4_ReadAllScalingVal

Item	Description			
Function overview	Read the scaling values (digital operation values) of all channels.			
Symbol		M+L60AD4_ReadAllScalingVal		
	Execution command	B : FB_EN	-	Execution status
	Module start XY address ——	W: i_Start_IO_No	FB_OK : B	——Completed without error
			o_Scaling_CH1 : W	——CH1 Scaling value
			o_Scaling_CH2: W	CH2 Scaling value
			o_Scaling_CH3: W	CH3 Scaling value
			o_Scaling_CH4: W	CH4 Scaling value
			FB_ERROR : B	——Error flag
			ERROR_ID : W	Error code
Applicable hardware	Analog-Digital	L60AD4		
and software	converter module.			
	CPU module		T	
		Series	Model	
		MELSEC-L Series	LCPU	
	Engineering	GX Works2 *1		
	software	Language	Software ve	rsion
		English version	Version1.24A or later	
		Chinese version	Version1.49B or later	
		*1 For software versions	s applicable to the modules	used, refer to
		"Relevant manuals".		
Programming	Ladder			
language				
Number of steps	193 steps (for MELS	EC-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 d	efinition.		

Item	Description			
Function description	1) Reads the scaling values (digital operation values) of all channels when the FB_EN			
	(Execution command) signal is turned ON.			
	2) If the A/D converter module buffer memory is set to auto refresh the scaling values			
	(digital operation values), it is unnecessary to use this FB.			
Compiling method	Macro type			
Restrictions and	1) The FB does not include error recovery processing. Program the error recovery			
precautions	processing separately in accordance with the required system operation.			
	2) The FB cannot be used in an interrupt program.			
	3) Please ensure that the FB_EN signal is capable of being turned OFF by the program. Do			
	not use this FB in programs that are only executed once such as a subroutine,			
	FOR-NEXT loop, etc. because it is impossible to turn OFF.			
	4) This FB uses index registers Z7, Z8, and Z9. Please do not use these index registers in			
	an interrupt program.			
	5) Every input must be provided a value for proper FB operation.			
	6) The input range settings must be properly configured to match devices connected to the			
	L60AD4 module. For information about intelligent function module switch settings, refer			
	to the GX Works2 Version1 Operation 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)			
	o.Scaling.CH—(CH—S caling value) Refreshing sop Refreshing stop			
	FB_OK (Completed without error)			
	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
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 L60AD4
		Word	For details,	module is mounted.
			refer to the CPU	
			user's manual.	

Name (comment)	Label name	Data type	Initial value	Description
Execution status	FB_ENO	Bit	OFF	ON: Execution command is ON. OFF: Execution command is OFF.
Completed without error	FB_OK	Bit	OFF	When ON, it indicates that the scaling value (digital operation value) read operation was successful.
CH1 Scaling value	o_Scaling_CH1	Word	0	CH1 Scaling value (digital operation value) output
CH2 Scaling value	o_Scaling_CH2	Word	0	CH2 Scaling value (digital operation value) output
CH3 Scaling value	o_Scaling_CH3	Word	0	CH3 Scaling value (digital operation value) output
CH4 Scaling value	o_Scaling_CH4	Word	0	CH4 Scaling value (digital operation value) output
Error flag	FB_ERROR	Bit	OFF	Always OFF
Error code	ERROR_ID	Word	0	Always 0

Version	Date	Description
1.00A	2010/06/28	First edition
1.01B	2012/03/16	Solved the problem that causes the OPERATION ERROR (error code:
		4101) when using an index register number that is used by the FB.
		Changed the project name from M+L60AD4_ReadAllScalingIVal to
		M+L60AD4_ReadAllScalingVal.

Note

This chapter includes information related to the M+L60AD4_ReadAllScalingVal function block.

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

2.5 M+L60AD4_SetConvertSpeed (Conversion speed setting)

FB Name

M+L60AD4_SetConvertSpeed

Item	Description				
Function overview	Set the conversion speed of a specified module.				
Symbol	Execution command — Module start XY address — Conversion speed setting —	M+L60AD4_: B:FB_EN W:i_Start_IO_No W:i_Convert_Speed	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. CPU module	L60AD4			
		Series	Model		
		MELSEC-L Series	LCPU		
	Engineering software	GX Works2 *1	Software version		
	Software	Language English version	Version1.24A or later		
		Chinese version	Version1.49B or later		
			s applicable to the modules used, refer to		
Programming	Ladder				
language					
Number of steps	184 steps (for MELS	SEC-L series CPU)			
	* The number of ste	ps of the FB in a program	n depends on the CPU model that is used and		
	input and output o	lefinition.			
Function description	,	•	EN (Execution command) signal is turned ON.		
	2) FB operation is one-shot only, triggered by the FB_EN signal.				
	3) The new setting value will not take effect until the 'operation condition setting request'				
	signal (Yn9) is turned (OFF->ON->OFF) or the Operation condition setting request FB				
Compiling	(M+L60AD4_RequestSetting) is executed.				
Compiling method	Macro type				

Item	Description			
Restrictions and	The FB does not include error recovery processing. Program the error recovery			
precautions	processing separately in accordance with the required system operation.			
	2) The FB cannot be used in an interrupt program.			
	3) Please ensure that the FB_EN signal is capable of being turned OFF by the program. Do			
	not use this FB in programs that are only executed once such as a subroutine,			
	FOR-NEXT loop, etc. because it is impossible to turn OFF.			
	4) This FB uses index registers Z7, Z8, and Z9. Please do not use these index registers in			
	an interrupt program.			
	5) Every input must be provided a value for proper FB operation.			
	6) If the parameter is set using GX Configurator-AD or the configuration function of GX			
	Works 2, using this FB is unnecessary.			
	7) The input range settings must be properly configured to match devices connected to the			
	L60AD4 module. For information about intelligent function module switch settings, refer			
	to the GX Works2 Version1 Operation 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]			
	FB.EN(Execution command)			
	FB_ENO(Execution status)			
	Conversion speed setting write processing No processing Writing No processing			
	FB_OK(Completed without error)			
	error) FB_ERROR(Error flag) ———————————————————————————————————			
	ERRORJD(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
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 L60AD4
		Word	For details,	module is mounted.
			refer to the CPU	
			user's manual.	
Conversion speed	i_Convert_Speed		0H: 20 μs	Specify the conversion speed.
setting		Word	1H: 80 μs	
			2H: 1 ms	

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

Version	Date	Description
1.00A	2010/06/28	First edition
1.01B	2012/03/16	Solved the problem that causes the OPERATION ERROR
		(error code: 4101) when using an index register number that
		is used by the FB.

Note

This chapter includes information related to the M+L60AD4_SetConvertSpeed function block.

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

2.6 M+L60AD4_SetADConversion (Enable/disable AD conversion)

FB Name

M+L60AD4_SetADConversion

Item	Description			
Function overview	Enable or disable AD conversion for a specified channel or all channels.			
Symbol	M+L60AD4_SetADConversion			
	Execution comr	mand——B:FB_EN	FB_ENO : B —— Execution status	
	Module start XY add	dress——W: i_Start_IO_No	FB_OK: B Completed without error	
	Target cha	annel — W: i_CH	FB_ERROR : B ——Error flag	
	AD conversion enable/disable se	etting—— B : i_AD_Enable	ERROR_ID : WError code	
Applicable hardware	Analog-Digital	L60AD4		
and software	converter module.			
	CPU module			
		Series	Model	
		MELSEC-L Series	LCPU	
	Engineering	GX Works2 *1		
	software	Language	Software version	
		English version	Version1.24A or later	
		Chinese version	Version1.49B or later	
		*1 For software versions	applicable to the modules used, refer to	
		"Relevant manuals".		
Programming	Ladder			
language				
Number of steps	264 steps (for MELS	SEC-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 o	definition.		

Item	Description			
Function description	1) Enable or disable AD conversion for a specified channel or all channels by turning on			
	FB_EN (Execution command).			
	2) FB operation is one-shot only, triggered by the FB_EN signal.			
	3) The new setting will not take effect until the 'operation condition setting request' signal			
	(Yn9) is turned (OFF->ON->OFF) or the Operation condition setting request FB			
	(M+L60AD4_RequestSetting) is executed.			
	4) When the target CH setting value is out of range, the FB_ERROR output turns on,			
	processing is interrupted, and the error code is stored in ERROR_ID.			
	Refer to the error code explanation section for details.			
Compiling method	Macro type			
Restrictions and	1) The FB does not include error recovery processing. Program the error recovery			
precautions	processing separately in accordance with the required system operation.			
	2) The FB cannot be used in an interrupt program.			
	3) Please ensure that the FB_EN signal is capable of being turned OFF by the program. Do			
	not use this FB in programs that are only executed once such as a subroutine,			
	FOR-NEXT loop, etc. because it is impossible to turn OFF.			
	4) When two or more of these FBs are used, precaution must be taken to avoid repetition of			
	the target CH.			
	5) This FB uses index registers Z7, Z8, and Z9. Please do not use these index registers in			
	an interrupt program.			
	6) Every input must be provided a value for proper FB operation.			
	7) If the parameter is set using GX Configurator-AD or the configuration function of GX			
	Works 2, using this FB is unnecessary.			
	8) The input range settings must be properly configured to match devices connected to the			
	L60AD4 module. For information about intelligent function module switch settings, refer			
	to the GX Works2 Version1 Operation Manual (Common).			
FB operation type	Pulse execution type (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_EN(Execution command)			
	FB_ENO(Execution status) FB_ENO(Execution status)			
	AD conversion enable/disable setting write processing No processing			
	FB_OK(Completed without error) FB_OK(Completed without error)			
	FB_ERROR(Error flag) FB_ERROR(Error flag)			
	ERROR ID (Error code) 0 ERROR ID (Error code) 0 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 target channel is not valid.	Please try again after confirming the setting.
	The target channel is not within the	
	range of 1 to 4.	

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 L60AD4
		Word	For details,	module is mounted.
			refer to the CPU	
			user's manual.	
Target CH	i_CH	Word	1~4 or 15	Specify a CH number, 1 to 4 or 15.
		vvoid		Use 15 to specify all CH.
AD conversion	i_AD_Enable		ON, OFF	ON: Enable the AD conversion value
enable/disable		Bit		output.
setting		DIL		OFF: Disable the AD conversion
				value output.

Output labels

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

FB Version Upgrade History

Version	Date	Description
1.00A	2010/06/28	First edition
1.01B	2012/03/16	Solved the problem that causes the OPERATION ERROR
		(error code: 4101) when using an index register number that
		is used by the FB.

Note

This chapter includes information related to the M+L60AD4_SetADConversion function block.

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

2.7 M+L60AD4_SetAverage (Averaging process setting)

FB Name

M+L60AD4_SetAverage

Item	Description				
Function overview	Configure a specified channel for the Averaging processing A/D conversion method.				
Symbol	M+L60AD4_SetAverage				
	Execution comman		FB_ENO : B ——Execution status		
	Module start XY addres	s W : i_Start_IO_No	FB_OK: B —— Completed without error		
	Target C	Hw:i_cH	FB_ERROR: B Error flag		
	Averaging processing type settin	g	ERROR_ID : W Error code		
	Time average/Count average Moving average settings	/			
Applicable hardware	Analog-Digital	L60AD4			
and software	converter module.				
	CPU module				
		Series	Model		
		MELSEC-L Series	LCPU		
	Engineering	GX Works2 *1			
	software	Language	Software version		
		English version	Version1.24A or later		
		Chinese version	Version1.49B or later		
		*1 For software versions	applicable to the modules used, refer to		
		"Relevant manuals".			
Programming	Ladder				
language					
Number of steps	323 steps (for MELS	SEC-L series CPU)			
	* The number of step	ps of the FB in a program	depends on the CPU model that is used and		
	input and output d	lefinition.			

Item	Description						
Function description	1) Configure a specified channel for the Averaging processing conversion method by						
	turning on FB_EN (Execution command).						
	2) FB operation is one-shot only, triggered by the FB_EN signal.						
	3) The new setting will not take effect until the 'operation condition setting request' signal						
	(Yn9) is turned (OFF->ON->OFF) or the Operation condition setting request FB						
	(M+L60AD4_RequestSetting) is executed.						
	4) When the target CH setting value is out of range, the FB_ERROR output turns on,						
	processing is interrupted, and the error code is stored in ERROR_ID.						
	Refer to the error code explanation section for details.						
Compiling method	Macro type						
Restrictions and	1) The FB does not include error recovery processing. Program the error recovery						
precautions	processing separately in accordance with the required system operation.						
	2) The FB cannot be used in an interrupt program.						
	3) Please ensure that the FB_EN signal is capable of being turned OFF by the program. Do						
	not use this FB in programs that are only executed once such as a subroutine,						
	FOR-NEXT loop, etc. because it is impossible to turn OFF.						
	4) When two or more of these FBs are used, precaution must be taken to avoid repetition of						
	the target CH.						
	5) This FB uses index registers Z7, Z8, and Z9. Please do not use these index registers in						
	an interrupt program.						
	6) Every input must be provided a value for proper FB operation.						
	7) If the parameter is set using GX Configurator-AD or the configuration function of GX						
	Works 2, using this FB is unnecessary.						
	8) The input range settings must be properly configured to match devices connected to the						
	L60AD4 module. For information about intelligent function module switch settings, refer						
	to the GX Works2 Version1 Operation Manual (Common).						
FB operation type	Pulsed execution (1 scan execution type)						
FB Operating	Refer to "Appendix 1 - FB Library Application examples"						
Timing chart	[When operation completes without error] [When an error occurs]						
	FB_EN(Execution command) FB_EN(Execution command)						
	EB_ENO(Execution status)						
	Averaging process setting write processing Writing No processing Averaging process setting write processing pr						
	FB_OK(Completed without error) FB_OK(Completed without error)						
	FB_ERROR(Error flag) FB_ERROR(Error flag)						
	ERROR_ID(Error code) 0 ERROR_ID(Error code) 0 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 target channel is not valid.	Please try again after confirming the setting.
	The target channel is not within the	
	range of 1 to 4.	

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		Word	range. For details, refer to	address (in hexadecimal)
		vvoid	the CPU user's manual.	where the L60AD4 module
				is mounted.
Target CH	i_CH	Word	1~4	Specify the CH number.
Averaging	i_Average_Type		0H: Sampling processing	Specify the averaging
processing type		Word	1H: Time average	processing type.
setting		vvoid	2H: Count average	
			3H: Moving average	

Name (comment)	Label name	Data	Setting range	Description
		type		
Time average/Count	i_Average_Times		Time average:	Set the time average,
average/Moving			Conversion speed	count average and moving
average settings			setting: 20 (µs)	average of the specified
			2~1500 (ms)	channel.
			Conversion speed	
		Word	setting: 80 (µs) /1 (ms)	
			2~5000 (ms)	
			Count average:	
			4~62500 (times)	
			Moving average:	
			2~1000 (times)	

Name (comment)	Label name	Data	Initial value	Description
		type		
Execution status	FB_ENO	Bit	OFF	ON: Execution command is ON.
		DIL	OFF	OFF: Execution command is OFF.
Completed without	FB_OK			When ON, it indicates that the AD
error		Bit	OFF	averaging processing settings have
				been completed.
Error flag	FB_ERROR	D:4	OFF	When ON, it indicates that an error
		Bit	OFF	has occurred.
Error code	ERROR_ID	Word	0	FB error code output.

Version	Date	Description
1.00A	2010/06/28	First edition
1.01B	2012/03/16	Solved the problem that causes the OPERATION ERROR
		(error code: 4101) when using an index register number that
		is used by the FB.

Note

This chapter includes information related to the M+L60AD4_SetAverage function block.

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

2.8 M+L60AD4_SetScaling (Scaling setting)

FB Name

M+L60AD4_SetScaling

Item	Description				
Function overview	Configure a specified channel's Scaling value output settings.				
Symbol					
		M+L60 AD4_SetScaling			
	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		
	Target CH——	W:i_CH	FB_ERROR: B —— Error flag		
	Scaling enable/disable——	B:i_Scaling_Enable	ERROR_ID: W Error code		
	Scaling upper limit value	W:i_Scl_U_Lim			
	Scaling lower limit value	-W:i_Scl_L_Lim			
Applicable hardware	Analog-Digital	L60AD4			
and software	converter module.				
	CPU module				
		Series	Model		
		MELSEC-L Series	LCPU		
	Engineering	GX Works2 *1			
	software	Language	Software version		
		English version	Version1.24A or later		
		Chinese version	Version1.49B or later		
		*1 For software versions	applicable to the modules used, refer to		
		"Relevant manuals".			
Programming	Ladder				
language					
Number of steps	259 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.				
	1				

Item	Description			
Function description	1) Configure a specified channel's Scaling value output settings by turning on FB_EN			
	(Execution command).			
	2) FB operation is one-shot only, triggered by the FB_EN signal.			
	3) The new setting will not take effect until the 'operation condition setting request' signal			
	(Yn9) is turned (OFF->ON->OFF) or the Operation condition setting request FB			
	(M+L60AD4_RequestSetting) is executed.			
	4) When the target CH setting value is out of range, the FB_ERROR output turns on,			
	processing is interrupted, and the error code is stored in ERROR_ID.			
	Refer to the error code explanation section for details.			
Compiling method	Macro type			
Restrictions and	1) The FB does not include error recovery processing. Program the error recovery			
precautions	processing separately in accordance with the required system operation.			
	2) The FB cannot be used in an interrupt program.			
	3) Please ensure that the FB_EN signal is capable of being turned OFF by the program. Do			
	not use this FB in programs that are only executed once such as a subroutine,			
	FOR-NEXT loop, etc. because it is impossible to turn OFF.			
	4) When two or more of these FBs are used, precaution must be taken to avoid repetition of			
	the target CH.			
	5) This FB uses index registers Z7, Z8, and Z9. Please do not use these index registers in			
	an interrupt program.			
	6) Every input must be provided a value for proper FB operation.			
	7) If the parameter is set using GX Configurator-AD or the configuration function of GX			
	Works 2, using this FB is unnecessary.			
	8) The input range settings must be properly configured to match devices connected to the			
	L60AD4 module. For information about intelligent function module switch settings, refer			
ED aparation type	to the GX Works2 Version1 Operation Manual (Common).			
FB operation type	Pulsed execution (1 scan execution type)			
Application example Timing chart	Refer to "Appendix 1 - FB Library Application examples"			
Tilling Chart	[When operation completes without error] [When an error occurs]			
	FB_EN(Execution command) FB_EN(Execution command)			
	FB_ENO(Execution status)			
	Scaling setting write processing Writing No processing Scaling setting write processing No processing Processing No processing No processing Pr			
	FB_OK(Completed without error) FB_OR(Completed without error) FB_OR(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 target channel is not valid.	Please try again after confirming the setting.
	The target channel is not within the	
	range of 1 to 4.	

Labels

●Input labels

Name (comment)	Label name	Data	Setting range	Description
		type		
Execution command	FB_EN	Bit	ON, OFF	ON: The FB is activated.
		Dit		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 L60AD4
		Word	For details,	module is mounted.
			refer to the CPU	
			user's manual.	
Target CH	i_CH	Word	1~4	Specify the CH number.
Scaling	i_Scaling_Enable	Bit	ON, OFF	ON: Enable the scaling.
enable/disable		DIL		OFF: Disable the scaling.
Scaling upper limit	i_Scl_U_Lim	Word	-32,000~32,000	Specify the scaling upper limit value.
value		vvoid		
Scaling lower limit	i_Scl_L_Lim	\\/a = d	-32,000~32,000	Specify the scaling lower limit value.
value		Word		

Output labels

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

FB Version Upgrade History

Version	Date	Description
1.00A	2010/06/28	First edition
1.01B	2012/03/16	Solved the problem that causes the OPERATION ERROR
		(error code: 4101) when using an index register number that
		is used by the FB.

Note

This chapter includes information related to the M+L60AD4_SetScaling function block.

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

2.9 M+L60AD4_SetProcessAlarm (Process alarm setting)

FB Name

M+L60AD4_SetProcessAlarm

Item	Description				
Function overview	Configure a specified channel's process alarm settings.				
Symbol	Execution com	mand————————————————————————————————————	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	L60AD4			
and software	converter module.				
	CPU module				
		Series	Model		
		MELSEC-L Series	LCPU		
	Engineering	GX Works2 *1			
	software	Language	Software version		
		English version	Version1.24A or later		
		Chinese version	Version1.49B or later		
		*1 For software versions "Relevant manuals".	applicable to the modules used, refer to		
Programming	Ladder				
language					
Number of steps	254 steps (for MELSEC-L series CPU)				
	* The number of ste	ps of the FB in a program	depends on the CPU model that is used and		
	input and output d	definition.			

Item	Description						
Function description	1) Configure a specified channel's process alarm settings by turning on FB_EN (Execution						
	command).						
	2) FB operation is one-shot only, triggered by the FB_EN signal.						
	3) The new setting will not take effect until the 'operation condition setting request' signal						
	(Yn9) is turned (OFF->ON->OFF) or the Operation condition setting request FB						
	(M+L60AD4_RequestSetting) is executed.						
	4) When the target CH setting value is out of range, the FB_ERROR output turns on,						
	processing is interrupted, and the error code is stored in ERROR_ID.						
	Refer to the error code explanation section for details.						
Compiling method	Macro type						
Restrictions and	1) The FB does not include error recovery processing. Program the error recovery						
precautions	processing separately in accordance with the required system operation.						
	2) The FB cannot be used in an interrupt program.						
	3) Please ensure that the FB_EN signal is capable of being turned OFF by the program. Do						
	not use this FB in programs that are only executed once such as a subroutine,						
	FOR-NEXT loop, etc. because it is impossible to turn OFF.						
	4) When two or more of these FBs are used, precaution must be taken to avoid repetition of						
	the target CH.						
	5) This FB uses index registers Z7, Z8, and Z9. Please do not use these index registers in						
	an interrupt program.						
	6) Every input must be provided a value for proper FB operation.						
	7) If the parameter is set using GX Configurator-AD or the configuration function of GX						
	Works 2, using this FB is unnecessary.						
	8) The input range settings must be properly configured to match devices connected to the						
	L60AD4 module. For information about intelligent function module switch setting, refer to						
	the GX Works2 Version 1 Operation 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) FB_ENO(Execution status)						
	Process alarm setting write processing Writing No processing Processing Processing Processing Processing Processing No processing Pr						
	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 target channel is not valid.	Please try again after confirming the setting.
	The target channel is not within the	
	range of 1 to 4.	

Labels

●Input labels

Name (comment)	Label name	Data	Setting range	Description
		type		
Execution command	FB_EN	D:+	ON, OFF	ON: The FB is activated.
		Bit		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 L60AD4
		Word	For details,	module is mounted.
			refer to the CPU	
			user's manual.	
Target CH	i_CH	Word	1~4	Specify the CH number.
Process alarm	i_Process_Enable		ON, OFF	ON: Enable the warning output of the
enable/disable		Bit		process alarm.
		DIL		OFF: Disable the warning output of
				the process alarm.
Process alarm upper	i_Pro_UU_Lim	Word	-32,768~32,767	Specify the process alarm upper
upper limit value				upper limit value.
Process alarm upper	i_Pro_UL_Lim	Word	-32,768~32,767	Specify the process alarm upper
lower limit value		vvoid		lower limit value.
Process alarm lower	i_Pro_LU_Lim	Word	-32,768~32,767	Specify the process alarm lower
upper limit value		vvoid		upper limit value.
Process alarm lower	i_Pro_LL_Lim	Word	-32,768~32,767	Specify the process alarm lower
lower limit value		VVOIG		lower limit value.

Output labels

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

FB Version Upgrade History

Version	Date	Description
1.00A	2010/06/28	First edition
1.01B	2012/03/16	Solved the problem that causes the OPERATION ERROR
		(error code: 4101) when using an index register number that
		is used by the FB.

Note

This chapter includes information related to the M+L60AD4_SetProcessAlarm function block.

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

2.10 M+L60AD4_SetInputSignalErr (Input signal error detection setting)

FB name

M+L60AD4_SetInputSignalErr

Item	Description					
Function overview	Configure a specified channel's Input signal error detection settings.					
Symbol	M+L60AD4_SetInputSignalErr					
	Execution co					
	Module start XY a	w : i_Start_IO_No	FB_OK : B ——Completed without error			
	Tai	rget CH W: i_CH	FB_ERROR : B ——Error flag			
	Input signal error detection	setting — B : i_Sig_Err_Enable	ERROR_ID: WError code			
	Input signal error detection settin	g value — W : i_Sig_Err_Level				
Applicable hardware	Analog-Digital	L60AD4				
and software	converter module.					
	CPU module					
		Series	Model			
		MELSEC-L Series	LCPU			
	Engineering	GX Works2 *1				
	software	Language	Software version			
		English version	Version1.24A or later			
		Chinese version	Version1.49B or later			
		*1 For software versions	s applicable to the modules used, refer to			
		"Relevant manuals".				
Programming	Ladder	Ladder				
language						
Number of steps	262 steps (for MELS	SEC-L series CPU)				
	* The number of ste	ps of the FB in a program	n depends on the CPU model that is used and			
	input and output d	lefinition.				

Item	Description					
Function description	1) Configure a specified channel's Input signal error detection settings by turning on FB_EN					
	(Execution command).					
	2) FB operation is one-shot only, triggered by the FB_EN signal.					
	3) The new setting will not take effect until the 'operation condition setting request' signal					
	(Yn9) is turned (OFF->ON->OFF) or the Operation condition setting request FB					
	(M+L60AD4_RequestSetting) is executed.					
	4) When the target CH setting value is out of range, the FB_ERROR output turns on,					
	processing is interrupted, and the error code is stored in ERROR_ID.					
	Refer to the error code explanation section for details.					
Compiling method	Macro type					
Restrictions and	1) The FB does not include error recovery processing. Program the error recovery					
precautions	processing separately in accordance with the required system operation.					
	2) The FB cannot be used in an interrupt program.					
	3) Please ensure that the FB_EN signal is capable of being turned OFF by the program. Do					
	not use this FB in programs that are only executed once such as a subroutine,					
	FOR-NEXT loop, etc. because it is impossible to turn OFF.					
	4) When two or more of these FBs are used, precaution must be taken to avoid repetition of					
	the target CH.					
	5) This FB uses index registers Z7, Z8, and Z9. Please do not use these index registers in					
	an interrupt program.					
	6) Every input must be provided a value for proper FB operation.					
	7) If the parameter is set using GX Configurator-AD or the configuration function of GX					
	Works 2, using this FB is unnecessary.					
	8) The input range settings must be properly configured to match devices connected to the					
	L60AD4 module. For information about intelligent function module switch settings, refer					
	to the GX Works2 Version1 Operation 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_EN(Execution command)					
	FB_ENO(Execution status) FB_ENO(Execution status)					
	Input signal error detection setting write processing No processing No processing setting write					
	FB_OK(Completed without error) FB_OK(Completed without error)					
	FB_ERROR(Error flag) FB_ERROR(Error flag)					
	ERRORJD(Error code) 0 ERRORJD(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 target channel is not valid.	Please try again after confirming the setting.
	The target channel is not within the	
	range of 1 to 4.	

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 L60AD4
		Word	For details,	module is mounted.
			refer to the CPU	
			user's manual.	
Target CH	i_CH	Word	1~4	Specify the CH number.
Input signal error	i_Sig_Err_Enable		ON, OFF	ON: Enable the input signal error
detection setting		Bit		detection setting.
		DIL		OFF: Disable the input signal error
				detection setting.
Input signal error	i_Sig_Err_Level		0~250	Specify the input signal error
detection setting		Word	(Unit: 0.1%)	detection setting value.
value				

Output labels

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

FB Version Upgrade History

Version	Date	Description	
1.00A	2010/06/28	First edition	
1.01B	2012/03/16	Solved the problem that causes the OPERATION ERROR	
		(error code: 4101) when using an index register number that	
		is used by the FB.	

Note

This chapter includes information related to the M+L60AD4_SetInputSignalErr function block.

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

2.11 M+L60AD4_RequestSetting (Operation condition setting request)

FB Name

M+L60AD4_RequestSetting

Item	Description					
Function overview	Apply changes made to each function's operational condition settings.					
Symbol	Execution command ————————————————————————————————————	M+L60AD4_RequestSetting B:FB_ENO: B				
Applicable hardware and software	Analog-Digital converter module. CPU module	L60AD4				
		Series	Model			
		MELSEC-L Series	LCPU			
	Engineering	GX Works2 *1				
	software	Language	Software version			
		English version Version1.24A or later				
		Chinese version	Version1.49B or later			
		*1 For software versions applicable to the modules used, refer to				
Programming	Ladder	"Relevant manuals".				
language	Laddoi					
Number of steps	176 steps (for MELS	EC-L series CPU)				
·	* The number of step	os of the FB in a program	n depends on the CPU model that is used and			
	input and output d	efinition.				
Function description	Enables settings of all channels by turning on FB_EN (Execution command).					
	For information on the settings that are enabled, refer to the MELSEC-L Analog-Digital					
	Converter Module	Converter Module User's Manual.				
	2) When FB_EN is to	2) When FB_EN is turned ON, the FB will continue to execute until the settings for each				
	function are completed.					
Compiling method	Macro type					

Item	Description					
Restrictions and	1) The AD conversion process is interrupted by executing this FB. After the FB execution is					
precautions	complete and FB_OK turns ON, the AD conversion process will resume.					
	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, etc. 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 Z9 in an interrupt program.					
	6) Every input must be provided a value for proper FB operation.					
	7) When this FB is used in two or more places, a duplicated coil warning will occur during					
	compile operation due to the Y signal being operated by index modification. However					
	this is not a problem and the FB will operate without error.					
	8) The input range settings must be properly configured to match devices connected to the					
	L60AD4 module. For information about intelligent function module switch settings, refer					
	to the GX Works2 Version1 Operation Manual (Common).					
FB operation type	Pulse execution type (multiple scan execution type)					
Application example	Refer to "Appendix 1 - FB Library Application examples"					
Timing chart	[When operation completes without error]					
	FB_ENO(Execution command) FB_ENO(Execution status) Operation condition setting request (Yrp9) Operation condition setting completed flag (Xrp9) FB_CK(Completed without error) FB_ERROR(Error flag) ERROR_ID(Error code)					
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 L60AD4
		Word	For details,	module is mounted.
			refer to the CPU	
			user's manual.	

Name (comment)	Label name	Data	Initial value	Description
		type		
Execution status	FB_ENO	Bit	OFF	ON: Execution command is ON.
		DIL	OFF	OFF: Execution command is OFF.
Completed without	FB_OK			When ON, it indicates that the
error		Bit	OFF	operational condition settings have
				been completed.
Error flag	FB_ERROR	Bit	OFF	Always OFF
Error code	ERROR_ID	Word	0	Always 0

Version	Date	Description
1.00A	2010/06/28	First edition
1.01B	2012/03/16	Solved the problem that causes the OPERATION ERROR
		(error code: 4101) when using an index register number that
		is used by the FB.

Note

This chapter includes information related to the M+L60AD4_RequestSetting function block.

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

2.12 M+L60AD4_SetOffsetVal (Offset setting)

FB Name

M+L60AD4_SetOffsetVal

Item	Description				
Function overview	Set the offset value of a specified channel to the current analog value.				
Symbol					
	Execution command -	M+L60AD4_SetOffset Val B: FB_ENO: B ——Execution status			
	Module start XY address –		FB_OK: B ——Completed without error		
	Target CH —	W:i_CH	FB_ERROR: B ——Error flag		
	User range write command —	B : i_Write_Offset	ERROR_ID : W ——Error code		
Applicable hardware	Analog-Digital	L60AD4			
and software	converter module.				
	CPU module				
		Series	Model		
		MELSEC-L Series LCPU			
	Engineering	GX Works2 *1			
	software	Language	Software version		
		English version	Version1.24A or later		
		Chinese version	Version1.49B or later		
		*1 For software versions	applicable to the modules used, refer to		
		"Relevant manuals".			
Programming	Ladder				
language					
Number of steps	375 steps (for MELS	SEC-L series CPU)			
	* The number of ste	ps of the FB in a program	depends on the CPU model that is used and		
	input and output o	definition.			

Item	Description	
Function description	1) Set the offset value of a specified channel to the current analog value by turning on	
	FB_EN (Execution command).	
	2) To write the offset value, both FB_EN and the User range write command must be ON.	
	3) If the User range write command is ON when FB_EN is turned ON, the FB will continue	
	to execute until the offset value of the specified channel is written.	
	4) When the target CH setting value is out of range, the FB_ERROR output turns on,	
	processing is interrupted, and the error code is stored in ERROR_ID.	
	Refer to the error code explanation section for details.	
Compiling method	Macro type	
Restrictions and	1) The AD conversion process is interrupted by executing this FB. After the FB execution is	
precautions	complete and FB_OK turns ON, the AD conversion process will resume.	
	2) The FB cannot be used in an interrupt program.	
	3) Please ensure that the FB_EN signal is capable of being turned OFF by the program. Do	
	not use this FB in programs that are only executed once such as a subroutine,	
	FOR-NEXT loop, etc. because it is impossible to turn OFF.	
	4) When two or more of these FBs are used, precaution must be taken to avoid repetition of	
	the target CH.	
	5) This FB uses index registers Z7, Z8, and Z9. Please do not use these index registers in	
	an interrupt program.	
	6) Every input must be provided a value for proper FB operation.	
	7) If the parameter is set using GX Configurator-AD or the configuration function of GX	
	Works 2, using this FB is unnecessary.	
	8) When this FB is used in two or more places, a duplicated coil warning will occur during	
	compile operation due to the Y signal being operated by index modification. However	
	this is not a problem and the FB will operate without error.	
	9) The input range settings must be properly configured to match devices connected to the	
	L60AD4 module. For information about intelligent function module switch settings, refer	
	to the GX Works2 Version1 Operation Manual (Common).	
FB operation type	Pulse execution type (multiple scan execution type)	
Application example	Refer to "Appendix 1 - FB Library Application examples"	

Item	Description				
Timing chart	[When operation completes without error] FB_EN(Execution command) FB_ENO (Execution status) Operation mode i_Write_Offset(User range write command) CHID Offset specification Channel change request(YnB) User range write request (YnA) FB_OK(Completed without error) FB_ERROR(Error flag) ERROR_ID(Error code) [When an error occurs] FB_EN(Execution command) Channel change request(YnB) User range write request (YnA) FB_OK(Completed without error) FB_ERROR(Error flag) ERROR_ID(Error code) 0 ERROR_ID(Error code) O ERROR_ID(Error code)				
Relevant manuals	MELSEC-L Analog-Digital Converter Module User's Manual				
Rolovalit 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 code list

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

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 L60AD4
		Word	For details,	module is mounted.
			refer to the CPU	
			user's manual.	
Target CH	i_CH	Word	1~4	Specify the CH number.
User range write	i_Write_Offset		ON, OFF	ON: Perform the user range write
command		Bit		operation.
		DIL		OFF: Do not perform the user range
				write operation.

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

Version	Date	Description	
1.00A	2010/06/28	First edition	
1.01B	2012/03/16	Solved the problem that causes the OPERATION ERROR	
		(error code: 4101) when using an index register number that	
		is used by the FB.	

Note

This chapter includes information related to the M+L60AD4_SetOffestVal function block.

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

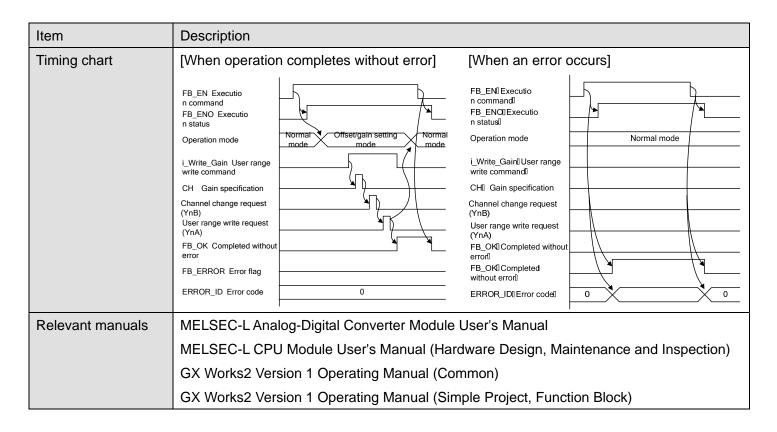
2.13 M+L60AD4_SetGainVal (Gain setting)

FB Name

M+L60AD4_SetGainVal

Item	Description			
Function overview	Set the gain value of a specified channel to the current analog value.			
Symbol				
	Execution command		D4_SetGainVal	Execution status
	Module start XY address		FB_OK : B —	— Completed without error
	Target CH		FB_ERROR : B	·
	User range write command		ERROR_ID : W —	— Error code
Applicable hardware	Analog-Digital	L60AD4		
and software	converter module.			
	CPU module			
		Series	Model	
		MELSEC-L Series	LCPU	
	Engineering	GX Works2 *1		
	software	Language	Software ve	rsion
		English version	Version1.24A or later	
		Chinese version	Version1.49B or later	
		*1 For software versions	applicable to the modules	used, refer to
		"Relevant manuals".		
Programming	Ladder			
language				
Number of steps	362 steps (for MELS	SEC-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 d	lefinition.		

Item	Description	
Function description	1) Set the gain value of a specified channel to the current analog value by turning on	
	FB_EN (Execution command).	
	2) To write the gain value, both FB_EN and the User range write command must be ON.	
	3) If the User range write command is ON when FB_EN is turned ON, the FB will continue	
	to execute until the gain value of the specified channel is written.	
	4) When the target CH setting value is out of range, the FB_ERROR output turns on,	
	processing is interrupted, and the error code is stored in ERROR_ID.	
	Refer to the error code explanation section for details.	
Compiling method	Macro type	
Restrictions and	The FB does not include error recovery processing. Program the error recovery	
precautions	processing separately in accordance with the required system operation.	
	2) The FB cannot be used in an interrupt program.	
	3) Please ensure that the FB_EN signal is capable of being turned OFF by the program. Do	
	not use this FB in programs that are only executed once such as a subroutine,	
	FOR-NEXT loop, etc. because it is impossible to turn OFF.	
	4) The When two or more of these FBs are used, precaution must be taken to avoid	
	repetition of the target CH.	
	5) This FB uses index registers Z7, Z8, and Z9. Please do not use these index registers i	
	an interrupt program.	
	6) Every input must be provided a value for proper FB operation.	
	7) If the parameter is set using GX Configurator-AD or the configuration function of GX	
	Works 2, using this FB is unnecessary.	
	8) When this FB is used in two or more places, a duplicated coil warning will occur during	
	compile operation due to the Y signal being operated by index modification. However	
	this is not a problem and the FB will operate without error.	
	9) The input range settings must be properly configured to match devices connected to the	
	L60AD4 module. For information about intelligent function module switch settings, refer	
	to the GX Works2 Version1 Operation Manual (Common).	
FB operation type	Pulse execution type (multiple scan execution type)	
Application example	Refer to "Appendix 1 - FB Library Application examples"	



Error code list

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

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 L60AD4
		Word	For details,	module is mounted.
			refer to the CPU	
			user's manual.	
Target CH	i_CH	Word	1~4	Specify the CH number.
User range write	i_Write_Gain		ON, OFF	ON: Perform the user range write
command		Di4		operation.
		Bit		OFF: Do not perform the user range
				write operation.

Name (comment)	Label name	Data	Initial value	Description
		type		
Execution status	FB_ENO	Bit	OFF	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
error		DIL	OFF	setting is completed.
Error flag	FB_ERROR	D:4	OFF	When ON, it indicates that an error
		Bit	OFF	has occurred.
Error code	ERROR_ID	Word	0	FB error code output.

Version	Date	Description
1.00A	2010/06/28	First edition
1.01B	2012/03/16	Solved the problem that causes the OPERATION ERROR
		(error code: 4101) when using an index register number that
		is used by the FB.

Note

This chapter includes information related to the M+L60AD4_SetGainVal function block.

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

2.14 M+L60AD4_ShiftOperation (Shift operation)

FB Name

M+L60AD4_ShiftOperation

Item	Description			
Function overview	Add the shift amount to the digital value that was input.			
Symbol		M+L60AD4_Sh : FB_EN ': i_Digital_Value ': i_Shift_Value	FB_ENO : B FB_OK : B O_Dig_Out_Val : W FB_ERROR : B ERROR_ID : W	Error flag
Applicable hardware and software	Analog-Digital converter module. CPU module	L60AD4 Series	Model	
		MELSEC-L Series	LCPU	
	Engineering software	Chinese version *1 For software versions "Relevant manuals".	Software ve Version1.24A or later Version1.49B or later s applicable to the modules	
Programming language	Ladder			
Number of steps	183 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	 i_Shift_Value(Shift amount) is added to i_Digital_Value (digital value) by turning on FB_EN (Execution command). When the result is less than -32768, the digital output value will be -32768. When the result is greater than 32767, the digital output value will be 32767. 			
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, etc. because it is impossible to turn OFF.
	4) A/D converter modules whose first five digits of serial number are 13041 or later have a
	shift function as a module function. When using the shift function of the module function,
	do not use this FB.
	5) Every input must be provided a value for proper FB operation.
	6) The input range settings must be properly configured to match devices connected to the
	L60AD4 module. For information about intelligent function module switch settings, refer
	to the GX Works2 Version1 Operation Manual (Common).
	7) When FB_OK (Completed without error) is turns ON, the o_Dig_Out_Val (Digital output
	value) becomes valid.
	8) When FB_EN turns OFF, o_Dig_Out_Val (Digital output value) is cleared to zero.
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) EB_ENC(Execution
	status) Shift operation During shift stop Shift operating During shift stop
	FB_OK(Completed without error)
	FB_ERROR(Error flag)
	ERROR IDE (Fror 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
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.
Digital value	i_Digital_Value	Word	-32,768~32,767	Specify the digital value to which to
		vvora		add the shift amount that was read.
Shift amount	i_Shift_Value	Word	-32,768~32,767	Specify the shift amount.

Name (comment)	Label name	Data	Initial value	Description
		type		
Execution status	FB_ENO	Bit	OFF	ON: Execution command is ON.
		DIL	OFF	OFF: Execution command is OFF.
Completed without	FB_OK	Bit	OFF	When ON, it indicates that the
error		DIL	OFF	shifted value has been calculated.
Digital output value	o_Dig_Out_Val	Word	0	Storage location for the sum of the
		vvord	0	Digital value and the Shift amount.
Error flag	FB_ERROR	Bit	OFF	Always OFF
Error code	ERROR_ID	Word	0	Always ON

Version	Date	Description
1.00A	2010/06/28	First edition

Note

This chapter includes information related to the M+L60AD4_ShiftOperation function block.

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

2.15 M+L60AD4_DiffOperation (Differential conversion process)

FB Name

M+L60AD4_DiffOperation

Item	Description			
Function overview	Output the difference	e obtained by subtracting	the standard value f	rom the digital value that
	was input.			
Symbol		M+L60AD4_DiffOp	eration	
	Execution command B	: FB_EN	FB_ENO : B	Execution status
	Digital value W	: i_Digital_Value	FB_OK : B	Completed without error
			o_Dig_Out_Val : W	——Digital output value
			o_Standard_Val : W -	——Differential conversion standard
			FB_ERROR : B	Error flag
			ERROR_ID : W	Error code
Applicable hardware	Analog-Digital	L60AD4		
and software	converter module.			
	CPU module			
		Series	N	Model
		MELSEC-L Series	LCPU	
	Engineering	GX Works2 *1		
	software	Language	Softwa	are version
		English version	Version1.24A or lat	er
		Chinese version	Version1.49B or lat	er
		*1 For software versions	applicable to the mo	odules used, refer to
		"Relevant manuals".		
Programming	Ladder	1		
language				
Number of steps	200 steps (for MELS	SEC-L series CPU)		
	* The number of ste	ps of the FB in a program	depends on the CP	U model that is used and
	input and output o			

Item	Description		
Function description	1) When FB_EN (Execution command) is turned ON, the Digital value (i_Digital_Value)		
	input at the time of turning ON is saved as the Differential conversion standard.		
	2) i_Digital_Value (Digital value) when FB_EN (Execution command) changes from OFF to		
	ON is o_Standard_Val (Differential conversion standard). As long as FB_EN (Execution		
	command) remains ON, the difference obtained by subtracting o_Standard_Val		
	(Differential conversion standard) from i_Digital_Value (Digital value) is output.		
Compiling method	Macro type		
Restrictions and	1) The FB does not include error recovery processing. Program the error recovery		
precautions	processing separately in accordance with the required system operation.		
	2) The FB cannot be used in an interrupt program.		
	3) Please ensure that the FB_EN signal is capable of being turned OFF by the program. Do		
	not use this FB in programs that are only executed once such as a subroutine,		
	FOR-NEXT loop, etc. because it is impossible to turn OFF.		
	4) A/D converter modules whose first five digits of serial number are 13041 or later have a		
	shift function as a module function. When using the shift function of the module function,		
	do not use this FB.		
	5) Every input must be provided a value for proper FB operation.		
	6) The input range settings must be properly configured to match devices connected to the		
	L60AD4 module. For information about intelligent function module switch settings, refer		
	to the GX Works2 Version1 Operation Manual (Common).		
	7) When FB_OK (Completed without error) is ON, o_Dig_Out_Val (Digital output value) and		
	o_Standard_Val (Differential conversion standard) are valid.		
	8) Turning off FB_EN clears o_Dig_Out_Val (Digital output value) and o_Standard_Val		
	(Differential conversion standard) to zero.		
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)		
	EB_ENO(Execution status)		
	Differential conversion status No conversion Difference conversion No conversion		
	Differential conversion standard 0 Differential conversion 0 Standard 0		
	FB.OK(Completed without error)		
	FB_ERROR(Error flag)		
	ERROR_IDXError 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	D:4	ON, OFF	ON: The FB is activated.
		Bit		OFF: The FB is not activated.
Digital value	i_Digital_Value	Mord	-32,768~32,767	Specify the digital value for which to
		Word		perform the differential conversion.

Name (comment)	Label name	Data type	Initial value	Description	
Execution status	FB_ENO	Bit	OFF	ON: Execution command is ON. OFF: Execution command is OFF.	
Completed without error	FB_OK	Bit	OFF	When ON, it indicates that the differential conversion process is taking place.	
Digital output value	o_Dig_Out_Val	Word	0	The result of subtracting the Differential conversion standard from the current Digital value.	
Differential conversion standard	o_Standard_Val	Word	0	The basis of comparison for differential processing. This value is equal to the Digital value when FB_EN changes from OFF to ON.	
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.	

Version	Date	Description
1.00A	2010/06/28	First edition

Note

This chapter includes information related to the M+L60AD4_DiffOperation function block.

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

FB Name

M+L60AD4_ErrorOperation

Item	Description				
Function overview	Perform monitoring and reset of intelligent function module error codes				
Symbol		M+L60AD4_ErrorOperation			
	Execution command——	B : FB_EN	Execution status		
	Module start XY address ——	W:i_Start_IO_No FB_OK: B —		——Completed without error	
	Error reset command——	B:i_ErrorReset	Module error flag		
			Module error code		
			Error flag		
			ERROR_ID : W	Error code	
Applicable hardware	Analog-Digital	L60AD4			
and software	converter module.	200/10-1			
	CPU module				
		Series	Model		
		MELSEC-L Series LCPU			
	Engineering	GX Works2 *1			
	software	Language Software version English version Version1.24A or later		rsion	
		Chinese version Version1.49B or later			
		*1 For software versions	applicable to the modules	s used, refer to	
		"Relevant manuals".			
Programming	Ladder				
language					
Number of steps	230 steps (for MELS	,			
		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 current error code in the target			n the target	
	intelligent function module is output.				
	2) After turning ON FB_EN, the error may be reset by turning ON i_ErrorReset (Error reset				
	command) during the error occurrence.				
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, etc. because it is impossible to turn OFF.					
	4) This FB uses index registers Z7, Z8, and Z9. Please do not use these index registers in					
	an interrupt program.					
	5) Every input must be provided a value for proper FB operation.					
	6) When this FB is used in two or more places, a duplicated coil warning will occur during					
	compile operation due to the Y signal being operated by index modification. However					
	this is not a problem and the FB will operate without error.					
	7) The input range settings must be properly configured to match devices connected to the					
	L60AD4 module. For information about intelligent function module switch settings, refer					
	to the GX Works2 Version1 Operation 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_ENIExecution FB_COMPRISED					
	commandi FB_ENCIExecution statusii					
	i_ErrorReset(Error reset request)					
	Error clear (YnF)					
	Error occurrence (XnF) o_UNIT_ERR(Module error					
	o_UNIT_ERR_CODE(Error					
	FB_OKIICompleted without errorii					
	FB_ERRORILError flagil					
	ERROR_IDIError codel) 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
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 L60AD4
		Word	For details,	module is mounted.
	refer to th		refer to the CPU	
			user's manual.	
Error reset	i_ErrorReset		ON, OFF	ON: Turn ON the error clear
command				request of the module.
		Bit		OFF: Turn OFF the error clear
				request of the module.
				*After error reset is completed,
				please turn this input OFF.

Name (comment)	Label name	Data	Initial value	Description
		type		
Execution status	FB_ENO	Dit	OFF	ON: Execution command is ON.
		Bit OFF	OFF: Execution command is OFF.	
Completed without	FB_OK	Bit	OFF	When ON, it indicates that the error
error		Bit OFF		reset is completed.
Module error flag	o_UNIT_ERR	Bit OFF	OFF	When ON, it indicates the presence
			of a module error.	
Module error code	o_UNIT_ERR_COD	Word 0	Specified module error code output	
	E	Word 0		
Error flag	FB_ERROR	Bit	OFF	Always OFF
Error code	ERROR_ID	Word	0	Always 0

Version	Date	Description
1.00A	2010/06/28	First edition
1.01B	2012/03/16	Solved the problem that causes the OPERATION ERROR
		(error code: 4101) when using an index register number that
		is used by the FB.

Note

This chapter includes information related to the M+L60AD4_ErrorOperation function block.

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

2.17 M+L60AD4_OGBackup (Offset/gain value save)

FB name

M+L60AD4_OGBackup

Item	Description					
Function overview	Read the offset and gain values from the user range setting, and save to file.					
Symbol	M+L60AD4_OGBackup					
	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			
	Saved data type		FB_ERROR : B Error flag			
			ERROR_ID : WError code			
Applicable hardware	Analog-Digital	L60AD4				
and software	converter module.					
	CPU module	_				
		Series Model				
		MELSEC-L Series LCPU				
	Engineering	GX Works2 *1				
	software	Language	Software version			
		English version	Version1.24A or later			
		Chinese version	Version1.49B or later			
		*1 For software versions	s applicable to the modules used, refer to			
		"Relevant manuals".				
Programming	Ladder	dder				
language						
Number of steps	452 steps (for MELSEC-L series CPU)					
	* The number of steps of the FB in a program depends on the CPU model that is used and					
	input and output d	efinition.				

Item	Description		
Function description	1) By turning on FB_EN (Execution command), the offset and gain user range settings are		
	read from the CPU module and saved to a file on the SD card.		
	2) FB operation is one-shot only, triggered by the FB_EN signal.		
	3) The format for the file name that the FB saves in an SD memory card is "LAD" + "module starting XY address" + ".BIN".		
	[File name example]		
	If the module starting XY address is H0120, the file name is "LAD_0120.BIN".		
	4) When the FB creates a BIN file in an SD memory card, if the same file is already in the		
	SD memory card, the existing file is replaced by a new file.		
	5) If the FB is executed without mounting an SD memory card, if the mounted SD memory		
	card does not have sufficient space, or if the number of files that can be saved is		
	exceeded *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 the LCPU User's Manual (Hardware Design, Maintenance and		
	Inspection).		
	*2 The parameter can be used to set the CPU operation state (continue/stop) for when an		
	access error to SD memory card occurs.		
Compiling method	Macro type		
Restrictions and	1) The FB does not include error recovery processing. Program the error recovery		
precautions	processing separately in accordance with the required system operation.		
	2) The FB cannot be used in an interrupt program.		
	3) Please ensure that the FB_EN signal is capable of being turned OFF by the program. Do		
	not use this FB in programs that are only executed once such as a subroutine,		
	FOR-NEXT loop, etc. because it is impossible to turn OFF.		
	4) This FB uses index register Z9. Please do not use Z9 in an interrupt program.		
	5) With this FB, the user range setting can be saved in an SD memory card only		
	6) Every input must be provided a value for proper FB operation.		
	7) The input range settings must be properly configured to match devices connected to the		
	L60AD4 module. For information about intelligent function module switch settings, refer		
	to the GX Works2 Version1 Operation Manual (Common).		
FB operation type	Pulsed execution (multiple scan execution type)		
Application example	Refer to "Appendix 1 - FB Library Application examples"		

Item	Description
Timing chart	[When operation completes without error] FB_EN(Execution command) FB_ENO(Execution status) User range setting file save processing FB_OK (Completed without error) FB_ERROR(Error flag) ERRORJD(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
None	None	None

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 L60AD4
		Word	For details,	module is mounted.
			refer to the CPU	
			user's manual.	
Saved data type	i_Dat_Type		0~FH	Please specify each channels data
				type.
		Word		0: Voltage, 1: Current
				b15 b4 b3 b2 b1 b0 0 ~ 0 CH.4 CH.3 CH.2 CH.1

Name (comment)	Label name	Data	Initial value	Description
		type		
Execution status	FB_ENO	Bit	OFF	ON: Execution command is ON.
		DIL	OFF	OFF: Execution command is OFF.
Completed without	FB_OK	Bit	OFF	When ON, it indicates that the file
error		DIL	OFF	save is completed.
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	2010/06/28	First edition
1.01B	2012/03/16	Solved the problem that causes the OPERATION ERROR
		(error code: 4101) when using an index register number that
		is used by the FB.

Note

This chapter includes information related to the M+L60AD4_OGBackup function block.

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

FB Name

M+L60AD4_OGRestore

Item	Description				
Function overview	Restore the user range offset / gain settings of a module from a file created with				
	M+L60AD4_OGBackup.				
Symbol		Mal COADA OCEDantors			
	Execution command ——	M+L60AD4_OGRestore B:FB_ENO:B === Execution status			
	Module start XY address ——	W: i_Start_IO_No	Completed without error		
		FB_ERROR : B ——Error flag			
			ERROR_ID : W	Error code	
Applicable hardware	Analog-Digital	L60AD4			
and software	converter module.				
	CPU module				
		Series Model			
		MELSEC-L Series LCPU			
	F	0)//// 1 0 *4			
	Engineering	GX Works2 *1			
	software	Language	Software ver	rsion	
		English version	Version1.24A or later		
		Chinese version	Version1.49B or later		
		*1 For software versions	applicable to the modules	used, refer to	
		"Relevant manuals".			
Programming	Ladder				
language					
Number of steps	434 steps (for MELSEC-L series CPU)				
	* The number of step	os of the FB in a program	depends on the CPU mod	lel that is used and	
	input and output d	lefinition.			

Item	Description
Function description	1) By turning on FB_EN (Execution command), the offset and gain user range settings are
	read from the CPU module SD memory card and restored to the module.
	2) FB operation is one-shot only, triggered by the FB_EN signal.
	3) This FB can only be operated when the conversion enable/disable settings of all CH are
	disabled.
	4) Only execute this FB after the M+L60AD4_OGBackup FB has been executed.
	If a file created with other than M+L60AD4_OGBackup is read, a module error (error
	code: 163) occurs.
	5) The format for the file name that the FB reads from an SD memory card is "LAD" +
	"module starting XY address" + ".BIN".
	[File name example]
	When the module starting XY address is H0120, the file name that is read is
	"LAD_0120.BIN".
	6) If the FB is executed without mounting an SD memory card or if the corresponding user
	range setting file is not in the SD memory card that is mounted, a CPU error *1 occurs.
	*1 The parameter can be used to set the CPU operation state (continue/stop) for when an
	access error to SD memory card occurs.
Compiling method	Macro type
Restrictions and	1) Please only execute this FB after all CH are disabled.
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, etc. 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 Z9 in an interrupt program.
	6) With this FB, a user range setting cannot be restored from a file that is created with other
	than M+L60AD4_OGBackup.
	7) Every input must be provided a value for proper FB operation.
	8) The input range settings must be properly configured to match devices connected to the
	L60AD4 module. For information about intelligent function module switch settings, refer
	to the GX Works2 Version1 Operation Manual (Common).
FB operation type	Pulsed execution (multiple scan execution type)
Application example	Refer to "Appendix 1 - FB Library Application examples"

Item	Description			
Timing chart	[When operation completes without error] [When an error occurs]			
	FB_EN(Execution command) FB_ENO (Execution status) User range setting file read processing FB_ENK (Completed without error) FB_ERROR(Error flag) ERROR (Defror code) FB_ERROR (Defror code)			
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	
90(Decimal)	The conversion setting of at least one	Please try again after confirming the setting.	
	channel is still enabled.		

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 L60AD4
		Word	For details,	module is mounted.
			refer to the CPU	
			user's manual.	

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

FB Version Upgrade History

Version	Date	Description
1.00A	2010/06/28	First edition
1.01B	2012/03/16	Solved the problem that causes the OPERATION ERROR
		(error code: 4101) when using an index register number that
		is used by the FB.

Note

This chapter includes information related to the M+L60AD4_OGRestore function block.

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

2.19 M+L60AD4_SetInputSignalErrExp (Input signal error detection extension setting)

FB Name

M+L60AD4_SetInputSignalErrExp

Item	Description			
Function overview	Set the input signal error detection extension setting of a specified channel.			
Symbol	Execution command — Module start XY address— Target CH— Input signal error detection extension setting— Input signal error detection setting value	M+L60AD4_SetIn B: FB_EN W: i_Start_JO_No W: i_CH W: i_SigErrEnhance W: i_SigErrLevel	FB_ENO: B ——Execution status FB_OK: B ——Completed without error FB_ERROR: B ——Error flag ERRORJD: W ——Error code	r
Applicable hardware	Analog-Digital	L60AD4		
and software	converter module	* Applicable to A/D conv	verter modules whose first five digits of seria	al
		number is 13041 or la	ater only	
	CPU module			
		Series	Model	
		MELSEC-L Series	LCPU	
	Engineering	GX Works2 *1		_
	software	Language	Software version	
		English version	Version1.24A or later	
		Chinese version	Version1.49B or later	
		*1 For software versions	applicable to the modules used, refer to	
		"Relevant manuals".		
Programming	Ladder			
language				
Number of steps	294 steps (for MELS	SEC-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 o	definition.		

Item	Description				
Function description	1) Performs the input signal error detection extension setting of a specified channel when				
	the FB_EN (Execution command) signal is turned ON.				
	2) FB operation is one-shot only, triggered by the FB_EN signal.				
	3) The new setting value will not take effect until the 'operation condition setting request'				
	signal (Yn9) is turned (OFF->ON->OFF) or the Operation condition setting request FB				
	(M+L60AD4_RequestSetting) is executed.				
	4) When the target CH setting value is out of range, the FB_ERROR output turns on,				
	processing is interrupted, and the error code is stored in ERROR_ID.				
	Refer to the error code explanation section for details.				
Compiling method	Macro type				
Restrictions and	1) The FB does not include error recovery processing. Program the error recovery				
precautions	processing separately in accordance with the required system operation.				
	2) The FB cannot be used in an interrupt program.				
	3) Please ensure that the FB_EN signal is capable of being turned OFF by the program. Do				
	not use this FB in programs that are only executed once such as a subroutine,				
	FOR-NEXT loop, etc. because it is impossible to turn OFF.				
	4) When two or more of these FBs are used, precaution must be taken to avoid repetition of				
	the target CH.				
	5) This FB uses index registers Z7, Z8, and Z9. Please do not use these index registers in				
	an interrupt program.				
	6) Every input must be provided a value for proper FB operation.				
	7) If the parameter is set using the configuration function of GX Works 2, using this FB is				
	unnecessary.				
	8) The input range settings must be properly configured to match devices connected to the				
	L60AD4 module. Configure the settings according to the application by using the switch				
	settings of GX Works2. For information about intelligent function module switch settings,				
	refer to the GX Works2 Version1 Operation Manual (Common).				
FB operation	Pulsed execution (1 scan execution type)				
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_EN(Execution command)				
	FB_ENO (Execution status) Input signal error detection extension setting write No processing Writing No processing No processing				
	processing FB_OK(Completed without FB_OK(Completed without				
	error) FB_ERROR(Error flag) FB_ERROR(Error flag)				
	ERROR ID (Error code) 0 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
10(Decimal)	The specified target channel is not valid.	Please try again after confirming the setting.
	The target channel is not within the	
	range of 1 to 4.	
11(Decimal)	The input signal error detection	Please try again after confirming the setting.
	extension setting is not valid.	
	The input signal error detection	
	extension setting is not within the range	
	of 0 to 4.	

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. For details, refer to	address (in hexadecimal)
		Word	the CPU user's manual.	where the L60AD4
		vvoid		module is mounted. (For
				example, enter H10 for
				X10.)
Target CH	i_CH	Word	1~4	Specify the CH number.
Input signal error	i_SigErrEnhance		0H: Disable	Set the input signal error
detection extension			1H: Upper lower limit	detection extension
setting			detection	setting.
		Word	2H: lower limit detection	
			3H: Upper limit detection	
			4H: Disconnection	
			detection	

Name (comment)	Label name	Data	Setting range	Description
		type		
Input signal error	i_SigErrLevel		0~250	Set the input signal error
detection setting		Word	(Unit: 0.1%)	detection setting value.
value				

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

FB Version Upgrade History

Version	Date	Description
1.00A	2012/03/16	First edition

Note

 $This \ chapter \ includes \ information \ related \ to \ the \ M+L60AD4_SetInputSignalErrExp \ function \ block.$

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

FB Name

M+L60AD4_SetDigitalClip

Enable or disable the			
Enable or disable the digital clipping of a specified channel.			
	M+L60AE	04_SetDigitalClip	
Execution comman	d B : FBEN	FB_ENO : B	Execution status
Module start XY addres	s—— W : i_StartJO_No	FB_OK : B	——Completed without error
Target Cl	Н—— w : i_CH	FB_ERROR : B	——Error flag
Digital clipping enable/disable	B : i_SetDegiClip	ERRORJD : W	Error code
		,	
Analog-Digital	 L60AD4		
3 3 3		erter modules whose fir	st five digits of serial
			or more angles or come
CPU module			
	Series	Mod	el
	WEEGEG E GONGS	2010	
Engineering	GX Works2 *1		
software	Language	Software	version
	English version	Version1.24A or later	
	Chinese version	Version1.49B or later	
	*1 For software versions	applicable to the modu	les used, refer to
	"Relevant manuals".		
_adder			
221 steps (for MELSI	EC-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 de	efinition.		
	Module start XY addres Target Ci Digital clipping enable/disable setting nalog-Digital converter module PU module adder 21 steps (for MELSI) The number of step	Execution command B : FB_EN Module start XY address W : i_Start_JO_No Target CH W : i_CH Digital clipping enable/disable Setting Digital clipping enable/disable Setting Digital clipping enable/disable Setting Digital clipping enable/disable Setting Applicable to A/D convenumber is 13041 or lated PU module Series MELSEC-L Series MELSEC-L Series Digital clipping enable/disable Setting Series MELSEC-L Series Digital clipping enable/disable Setting Series MELSEC-L Series Digital clipping enable/disable Setting Setting Setting Series MELSEC-L Series Digital clipping enable/disable Setting Setting Setting Setting Setting Series MELSEC-L Series Digital clipping enable/disable Setting Setting Setting Setting Setting Series MELSEC-L Series Digital clipping enable/disable Setting Setting Setting Setting	Module start XY address Target CH W: LStartJO,No FB,OK: B

Item	Description				
Function description	1) Enable or disable the digital clipping of a specified channel when the FB_EN (Execution				
	command) signal is turned ON.				
	2) FB operation is one-shot only, triggered by the FB_EN signal.				
	3) The new setting value will not take effect until the 'operation condition setting request'				
	signal (Yn9) is turned (OFF->ON->OFF) or the Operation condition setting request FB				
	(M+L60AD4_RequestSetting) is executed.				
	4) When the target CH setting value is out of range, the FB_ERROR output turns on,				
	processing is interrupted, and the error code is stored in ERROR_ID.				
	Refer to the error code explanation section for details.				
Compiling method	Macro type				
Restrictions and	1) The FB does not include error recovery processing. Program the error recovery				
precautions	processing separately in accordance with the required system operation.				
	2) The FB cannot be used in an interrupt program.				
	3) Please ensure that the FB_EN signal is capable of being turned OFF by the program. Do				
	not use this FB in programs that are only executed once such as a subroutine,				
	FOR-NEXT loop, etc. because it is impossible to turn OFF.				
	4) This FB uses index registers Z7, Z8, and Z9. Please do not use these index registers in				
	an interrupt program.				
	5) Every input must be provided a value for proper FB operation.				
	6) If the parameter is set using GX Configurator-AD or the configuration function of GX				
	Works 2, using this FB is unnecessary.				
	7) The input range settings must be properly configured to match devices connected to the				
	L60AD4 module. Configure the settings according to the application by using the switch settings of GX Works2. For information about intelligent function module switch settings,				
CD energtion	refer to the GX Works2 Version1 Operation Manual (Common).				
FB operation	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]				
Tilling onait	[vviien operation completes without error] [vviien air error cocars]				
	FB_EN(Execution command) FB_EN(Execution command)				
	FB_ENO(Execution status) Disital clipping setting write Digital clipping setting write				
	Digital clipping setting write processing No processing Writing No processing FB_OK(Completed without FB_OK(Completed without				
	error) FB_ERROR(Error flag) FB_ERROR(Error flag)				
	ERRORID(Error code) 0 ERRORID(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 target channel is not valid.	Please try again after confirming the setting.
	The target channel is not within the	
	range of 1 to 4.	

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 L6		hexadecimal) where the L60AD4
	Word For details,		module is mounted. (For example,	
			refer to the CPU	enter H10 for X10.)
			user's manual.	
Target CH	i_CH	Word	1~4	Specify the CH number.
Digital clipping	i_SetDegiClip		ON, OFF	ON: Enable the digital clipping
enable/disable		Di4		function.
setting		Bit		OFF: Disable the digital clipping
				function.

Name (comment)	Label name	Data	Initial value	Description
		type		
Execution status	FB_ENO	Dit	OFF	ON: Execution command is ON.
		Bit OFF C		OFF: Execution command is OFF.
Completed without	FB_OK			When ON, it indicates that the
error		Bit	OFF	digital clipping enable/disable
				setting is completed.
Error flag	FB_ERROR	Di4	OFF	When ON, it indicates that an error
		Bit OFF		has occurred.
Error code	ERROR_ID	Word	0 FB error code output.	

FB Version Upgrade History

Version	Date	Description
1.00A	2012/03/16	First edition

Note

This chapter includes information related to the M+L60AD4_SetDigitalClip function block.

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

2.21 M+L60AD4_SetShift (Shift setting)

FB Name

M+L60AD4_SetShift

Item	Description						
Function overview	Perform the shift setting of a specified channel.						
Symbol							
	M+L60AD4_SetShift						
	Execution command —	ution command — B : FB_EN FB_ENO : B — Execution					
	Module start XY address—	W : i_StartJO_No	FB_OK : B	Completed without error			
	Target CH-	W : i_OH	FB_ERROR : B	Error flag			
	Shift amount—	W : i_ShiftValue	ERRORJD : W	Error code			
		T					
Applicable hardware	Analog-Digital	L60AD4					
and software	converter module		* Applicable to A/D converter modules whose first five digits of serial				
		number is 13041 or later only					
	CPU module						
		Series		lodel			
		MELSEC-L Series	LCPU				
	Engineering	GX Works2 *1					
	software	Language	Softwa	ire version			
	Soliware	English version	Version1.24A or late				
		Chinese version	Version1.49B or lat				
		*1 For software versions					
		"Relevant manuals".					
Programming	Ladder	. to.o . at mandalo .					
language							
Number of steps	204 steps (for MELS	SEC-L series CPU)					
		ps of the FB in a program	n depends on the CPI	J model that is used and			
	input and output of						

Item	Description					
Function description	1) Performs the shift setting of a specified channel when the FB_EN (Execution command)					
	signal is turned ON.					
	2) FB operation is one-shot only, triggered by the FB_EN signal.					
	3) When the target CH setting value is out of range, the FB_ERROR output turns on,					
	processing is interrupted, and the error code is stored in ERROR_ID.					
	Refer to the error code explanation section for details.					
Compiling method	Macro type					
Restrictions and	1) The FB does not include error recovery processing. Program the error recovery					
precautions	processing separately in accordance with the required system operation.					
	2) The FB cannot be used in an interrupt program.					
	3) Please ensure that the FB_EN signal is capable of being turned OFF by the program. Do					
	not use this FB in programs that are only executed once such as a subroutine,					
	FOR-NEXT loop, etc. because it is impossible to turn OFF.					
	4) When two or more of these FBs are used, precaution must be taken to avoid repetition of					
	the target CH.					
	5) This FB uses index registers Z7, Z8, and Z9. Please do not use these index registers in					
	an interrupt program.					
	6) Every input must be provided a value for proper FB operation.					
	7) If the parameter is set using the configuration function of GX Works 2, using this FB is					
	unnecessary.					
	8) The input range settings must be properly configured to match devices connected to the					
	L60AD4 module. Configure the settings according to the application by using the switch					
	settings of GX Works2. For information about intelligent function module switch settings,					
	refer to the GX Works2 Version1 Operation Manual (Common).					
FB operation	Pulsed execution (1 scan execution type)					
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_EN(Execution command)					
	1 D_CREASEDUOT COMMISSION					
	EB_ENC(Execution status) Shift amount write processing No processing Writing Np processing Shift amount write processing No pro					
	FB_OK(Completed without 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					
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 target channel is not valid.	Please try again after confirming the setting.	
	The target channel is not within the		
	range of 1 to 4.		

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 L60AD4
		Word For details, r		module is mounted. (For example,
			refer to the CPU	enter H10 for X10.)
			user's manual.	
Target CH	i_CH	Word	1~4	Specify the CH number.
Shift amount	i_ShiftValue	Word	-32,768~32,767	Specify the shift amount.

Output labels

Name (comment)	Label name	Data	Initial value	Description
		type		
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 shift
error		Bit OFF		setting is completed.
Error flag	FB_ERROR	Bit	OFF	When ON, it indicates that an error
		DIL	OFF	has occurred.
Error code	ERROR_ID	Word	0	FB error code output.

FB Version Upgrade History

Version	Date	Description
1.00A	2012/03/16	First edition

Note

This chapter includes information related to the M+L60AD4_SetShift function block.

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

FB Name

M+L60AD4_SetLoggingPARAM

Item	Description					
Function overview	Perform the logging function of a specified channel.					
Symbol		M+L60AD4_SetLoggingPARAM				
	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		
	Target CH ———	w : ioh	FB_ERROR : B	Error flag		
	Logging enable/disable setting	B : i_Log_Enable	Error code			
	Logging data setting ———	W : i_Log_Data				
	Logging cycle settingvalue	W : i_Log_Cycle_Val				
	Logging cycle unit setting	W : i_Log_Cycle_Unit				
	Logging points after trigger	W : i_Log_Points				
	Level trigger condition setting	W : i_Log_Trig_Cond				
	Trigger data ———	W : i_Log_Trig_Data				
	Trigger setting value——	W : i_Log_Trig_Value				
A !' ! ! !	A I Divital	1.004.04				
Applicable hardware	Analog-Digital	L60AD4		. Carlo Carlo Barrero Carlo Barrero		
and software	converter module			e first five digits of serial		
	0.511	number is 13041 or la	ater only			
	CPU module					
		Series		Model		
		MELSEC-L Series	LCPU			
	Engineering	GX Works2 *1				
	software	Language	Softw	are version		
		English version	Version1.24A or la			
		Chinese version	Version1.49B or la			
		*1 For software versions				
		"Relevant manuals".	з аррисаето то тто тт			
Programming	Ladder					
language						
Number of steps	301 steps (for MELS	EC-L series CPU)				
		•	n depends on the CP	U model that is used and		
	input and output d		. appende on the Of	Codor triat lo dood drid		
	Input and output u	ommuon.				

Item	Description					
Function description	1) Sets the logging function of a specified channel when the FB_EN (Execution command)					
	signal is turned ON.					
	2) FB operation is one-shot only, triggered by the FB_EN signal.					
	3) The new setting value will not take effect until the 'operation condition setting request'					
	signal (Yn9) is turned (OFF->ON->OFF) or the Operation condition setting request FB					
	(M+L60AD4_RequestSetting) is executed.					
	4) When the target CH setting value is out of range, the FB_ERROR output turns on,					
	processing is interrupted, and the error code is stored in ERROR_ID.					
	Refer to the error code explanation section for details.					
Compiling method	Macro type					
Restrictions and	1) The FB does not include error recovery processing. Program the error recovery					
precautions	processing separately in accordance with the required system operation.					
	2) The FB cannot be used in an interrupt program.					
	3) Please ensure that the FB_EN signal is capable of being turned OFF by the program. Do					
	not use this FB in programs that are only executed once such as a subroutine,					
	FOR-NEXT loop, etc. because it is impossible to turn OFF.					
	4) When two or more of these FBs are used, precaution must be taken to avoid repetition of					
	the target CH.					
	5) This FB uses index registers Z7, Z8, and Z9. Please do not use these index registers in					
	an interrupt program.					
	6) Every input must be provided a value for proper FB operation.					
	7) If the parameter is set using the configuration function of GX Works 2, using this FB is					
	unnecessary.					
	8) The input range settings must be properly configured to match devices connected to the					
	L60AD4 module. Configure the settings according to the application by using the switch					
	settings of GX Works2. For information about intelligent function module switch settings,					
	refer to the GX Works2 Version1 Operation Manual (Common).					
FB operation	Pulsed execution (1 scan execution type)					
Type	Defeate "Aggregative 4. ED Library Agglication accomples"					
Application example	Refer to "Appendix 1 - FB Library Application examples"					
Timing chart	[When operation completes without error] [When an error occurs]					
	FB_EN(Execution command) FB_EN(Execution command)					
	FB_ENO(Execution status) FB_ENO(Execution status)					
	Logging function parameter setting write processing No processing No processing No processing No processing					
	FB_OK(Completed without error) FB_OK(Completed without FB_OK(Completed withou					
	FB_ERROR(Error flag)					
	ERROR_ID(Error code) 0 ERROR_ID(Error code) 0 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 target channel is not valid.	Please try again after confirming the setting.
	The target channel is not within the	
	range of 1 to 4.	

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. For details, refer to	address (in hexadecimal)
		Word	the CPU user's manual.	where the L60AD4
	Word			module is mounted. (For
				example, enter H10 for
				X10.)
Target CH	i_CH	Word	1~4	Specify the CH number.
Logging	i_Log_Enable		ON,OFF	ON: Enable the logging
enable/disable		Bit		function.
setting		DIL		OFF: Disable the logging
				function.
Logging data setting	i_Log_Data		0: Digital output value	Set the data to be logged.
		Word	1: Scaling value (digital	
			operation value)	

Name (comment)	Label name	Data	Setting range	Description
		type		
Logging cycle	i_Log_Cycle_Val		Logging cycle unit	Set the cycle to store
setting value			setting= 0: 80~32,767	data.
		Word	2) Logging cycle unit	
		vvoid	setting= 1: 1~32,767	
			3) Logging cycle unit	
			setting= 2: 1~3,600	
Logging cycle unit	i_Log_Cycle_Unit		0: µs	Specify the cycle unit to
setting		Word	1: ms	store data.
			2: s	
Logging points after	i_Log_Points		1~10,000	Specify the number of
trigger		Word		data to be logged after
				the hold trigger occurs.
Level trigger	i_Log_Trig_Cond		0: Disable	Set whether to use the
condition setting		Word	1: Above	level trigger or not. If
		vvoid	2: Below	used, set the condition.
			3: Pass through	
Trigger data	i_Log_Trig_Data		0~4,999	Set the buffer memory
		Word		address monitored for the
				level trigger.
Trigger setting value	i_Log_Trig_Value	Word	-32,768~32,767	Set the level at which the
		vvoiu		level trigger occurs.

Name (comment)	Label name	Data	Initial value	Description
		type		
Execution status	FB_ENO	Bit	OFF	ON: Execution command is ON.
		DIL	OFF	OFF: Execution command is OFF.
Completed without	FB_OK			When ON, it indicates that the
error		Bit	OFF	logging function parameter setting
				is completed.
Error flag	FB_ERROR	D:4	OFF	When ON, it indicates that an error
		Bit OFF	has occurred.	
Error code	ERROR_ID	Word	0	FB error code output.

FB Version Upgrade History

Version	Date	Description
1.00A	2012/03/16	First edition

Note

This chapter includes information related to the M+L60AD4_SetLoggingPARAM function block.

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

2.23 M+L60AD4_SetFlowRatePARAM (Flow amount integration function parameter setting)

FB Name

M+L60AD4_SetFlowRatePARAM

Item	Description				
Function overview	Set the flow amount	integration function of a	specified channel.		
Symbol	M+L60AD4_SetFlowRatePARAM				
	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	
	Target CH —	W : LOH	FB_ERROR : B	——Error flag	
	Flow amount integration enable/disable setting	B : i_FRI_Enable	ERROR_ID : W	Error code	
	Integration cycle setting value	W : i_FRI_Cycle_Val			
	Flow amount time unit setting	W : i_F_Time_Unit			
	Unit scaling setting—	W : i_F_Scale			
Applicable hardware	Analog-Digital	L60AD4			
and software	converter module		vortor modulos whose	o first five digits of social	
and software	converter module	* Applicable to A/D converter modules whose first five digits of serial			
	ODLL	number is 13041 or la	ater only		
	CPU module				
		Series M		Model	
		MELSEC-L Series	LCPU		
	Engineering	GX Works2 *1			
	software	Language	Softwa	are version	
		English version	Version1.24A or lat	er	
		Chinese version	Version1.49B or lat	er	
		*1 For software versions	applicable to the mo	odules used, refer to	
		"Relevant manuals".			
Programming	Ladder				
language					
Number of steps	293 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) Sets the flow amount integration function of a specified channel when the FB_EN					
	(Execution command) signal is turned ON.					
	2) FB operation is one-shot only, triggered by the FB_EN signal.					
	3) The new setting value will not take effect until the 'operation condition setting request'					
	signal (Yn9) is turned (OFF->ON->OFF) or the Operation condition setting request FB					
	(M+L60AD4_RequestSetting) is executed.					
	4) When the target CH setting value is out of range, the FB_ERROR output turns on,					
	processing is interrupted, and the error code is stored in ERROR_ID.					
	Refer to the error code explanation section for details.					
Compiling method	Macro type					
Restrictions and	1) The FB does not include error recovery processing. Program the error recovery					
precautions	processing separately in accordance with the required system operation.					
	2) The FB cannot be used in an interrupt program.					
	3) Please ensure that the FB_EN signal is capable of being turned OFF by the program. Do					
	not use this FB in programs that are only executed once such as a subroutine,					
	FOR-NEXT loop, etc. because it is impossible to turn OFF.					
	4) When two or more of these FBs are used, precaution must be taken to avoid repetition of					
	the target CH.					
	5) This FB uses index registers Z7, Z8, and Z9. Please do not use these index registers in					
	an interrupt program. 6) Every input must be provided a value for proper EB exerction					
	6) Every input must be provided a value for proper FB operation.					
	7) If the parameter is set using the configuration function of GX Works 2, using this FB is					
	unnecessary.					
	8) The input range settings must be properly configured to match devices connected to the					
	L60AD4 module. Configure the settings according to the application by using the switch					
	settings of GX Works2. For information about intelligent function module switch settings,					
ED	refer to the GX Works2 Version1 Operation Manual (Common).					
FB operation	Pulsed execution (1 scan execution type)					
Application example	Defeate "Appendix 1. ED Library Application examples"					
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) Flow amount integration Flow amount integration					
	function parameter setting write processing No processing Writing No processing Writing No processing Write processing No processing					
	FB_OK(Completed without error) FB_OK(Completed without error) FB_DOC(Completed without error)					
	FB_ERROR(Error flag) FB_ERROR(Error flag) ERRORJD(Error code) 0 ERRORJD(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 target channel is not valid.	Please try again after confirming the setting.
	The target channel is not within the	
	range of 1 to 4.	

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 L60AD4
		Word	For details,	module is mounted. (For example,
			refer to the CPU	enter H10 for X10.)
			user's manual.	
Target CH	i_CH	Word	1~4	Specify the CH number.
Flow amount	i_FRI_Enable		ON, OFF	ON: Enable the flow amount
integration		Bit		integration function.
enable/disable		DIL		OFF: Disable the flow amount
setting				integration function.
Integration cycle	i_FRI_Cycle_Val		1~5,000 (ms)	Set the integration cycle value of
setting value		Word		the connected flow meter. The unit
		vvoid		is ms. Match the analog output
				cycle of the connected flow meter.
Flow amount time	i_F_Time_Unit		0: /s	Set the range (time unit) of the flow
unit setting		Word	1: /min	meter.
			2: /h	

Name (comment)	Label name	Data	Setting range	Description
		type		
Unit scaling setting	i_F_Scale		0: ×1	Specify the unit scale to calculate
			1: ×10	the integrated flow amount.
		Word	2: ×100	
			3: ×1,000	
			4: ×10,000	

Name (comment)	Label name	Data	Initial value	Description
		type		
Execution status	FB_ENO	Bit	OFF	ON: Execution command is ON.
		DIL	OFF	OFF: Execution command is OFF.
Completed without	FB_OK			When ON, it indicates that the flow
error		Bit	OFF	amount integration function
				parameter setting is completed.
Error flag	FB_ERROR	Di4	OFF	When ON, it indicates that an error
		Bit	OFF	has occurred.
Error code	ERROR_ID	Word	0	FB error code output.

FB Version Upgrade History

Version	Date	Description
1.00A	2012/03/16	First edition

Note

This chapter includes information related to the M+L60AD4_SetFlowRatePARAM function block.

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

FB Name

M+L60AD4_SaveLogging

Item	Description				
Function overview	Save the logging data of a specified channel in a file.				
Symbol	Γ	M+L60AD4_SaveLogging			
	Execution command——	B : FB_ENO : B —— Execution status			
	Module start XY address	W : i_Start_IO_No	FB_OK : B ———Completed without error		
	Target CH ——	W : i_CH	o_Making_File : BCreating file		
	Maximum No. of save files	W : i_Max_Number	o_Exceed_Number : BMaximum No. exceeded flag		
	Overwrite save command	B : i_Over_Write	FB_ERROR: B ——Error flag		
			ERROR_ID : W Error code		
Applicable hardware	Analog-Digital	L60AD4			
and software	converter module	* Applicable to A/D conv	verter modules whose first five digits of serial		
		number is 13041 or la	ater only		
	CPU module				
		Series Model			
		MELSEC-L Series LCPU			
_		0000			
	Engineering	GX Works2 *1			
	software	Language	Software version		
		English version	Version1.24A or later		
		Chinese version	Version1.49B or later		
		*1 For software versions	s applicable to the modules used, refer to		
		"Relevant manuals".			
Programming	Ladder				
language					
Number of steps	1766 steps (for MELSEC-L series CPU)				
	* The number of step	os of the FB in a program	n depends on the CPU model that is used and		
	input and output d	efinition.			

Item	Description	
Function description	1) When FB_EN (Execution command) and the logging hold flag are turned ON, the	
	logging data from the start pointer for the number of the logging data are sorted	
	chronologically. Then, the logging data and the trigger occurrence information are saved	
	in CSV format in the SD memory card mounted on the CPU.	
	2) When FB_EN is ON, the FB starts the save processing of the logging data each time the logging hold flag is turned ON.	
	3) It requires multiple scans to complete the save processing of the logging data. To check	
	whether it is completed, check FB_OK (Completed without error).	
	4) The format for the file name that the FB saves in an SD memory card is "AD" + "second	
	and third digits of the module starting XY address that is expressed in 4 digits" + "Target	
	channel" + "serial number" +" .CSV". The maximum serial number depends on	
	i_Max_Number (Maximum No. of save files). If FB_EN is turned OFF, the serial number	
	is reset and the serial number starts from 1 again.	
	[File name example]	
	The file name is "AD453006.CSV" in the following case.	
	The module starting XY address is H0450,	
	the target channel is 3,	
	i_Max_Number (Maximum No. of save files) is 30, and	
	the number of files this FB created is 6.	
	5) When the FB creates a CSV file in an SD card, if the same file name is already in the SD	
	memory card, the existing file is replaced by a new file.	
	6) If i_Over_Write (Overwrite save command) is turned ON and the number of files the FB	
	saved in the SD memory card has exceeded i_Max_Number, the serial number returns	
	to 1 and the FB continues to perform the save processing of the logging data.	
	7) If i_Over_Write is turned OFF and the number of files saved in the SD memory card has	
	reached i_Max_Number, the FB stops the save processing of the logging data.	
	8) If the number of files the FB saved in the SD memory card has reached i_Max_Number,	
	o_Exceed_Number (Maximum No. reached flag) is turned ON regardless of whether	
	i_Over_Write is ON or OFF.	
	9) If there is an incorrect input in i_CH (Target CH) or i_Max_Number, FB_ERROR (Error	
	flag) is turned ON and the FB processing is aborted. Then an error code is stored in	
	ERROR_ID (error code).	

Item	Description	
	10) If the FB is executed without mounting an SD memory card, if the mounted SD memory	
	card does not have sufficient space, or if the number of files that can be saved is	
	exceeded *1, a CPU error *2 occurs. When an error causes a stop error in the CPU	
	module, FB_ERROR or ERROR_ID is not updated. When an error causes a	
	continuation error in the CPU module, FB_ERROR is turned ON and an error code is stored in ERROR_ID.	
	11) For information on the format of the CSV file the FB creates, refer to MELSEC-L	
	Analog-Digital Converter Module User's Manual.	
	*1 For information on the size of SD memory card and the number of files that can be	
	saved, refer to LCPU User's Manual (Hardware Design, Maintenance and Inspection).	
	*2 The parameter can be used to set the CPU operation state (continue/stop) for when an	
	access error to SD memory card occurs.	
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. [
	not use this FB in programs that are only executed once such as a subroutine,	
	FOR-NEXT loop, etc. because it is impossible to turn OFF.	
	4) This FB uses index registers, Z6, Z7, Z8, and Z9. Please do not use these index	
	registers in an interrupt program.	
	5) This FB can save logging data in an SD memory card only.	
	6) This FB uses a SP.FWRITE instruction. Therefore, if an error occurs during execution of the SP.FWRITE instruction, a CPU error occurs.	
	7) When two or more of these FBs are used, implement an interlock to prevent them from	
	being executed simultaneously.	
	[Interlock example]	
	When the target channels are set to channels 1 and 2 and their logging data are saved,	
	confirm that FB_OK for channel 1 is turned ON before turning ON EB_EN for channel 2.	
	8) It is not possible to save logging data if SM606 (SD memory card forced disable	
	Instruction) is turned ON while the logging data is being saved. In this case, FB_ERROR	
	is turned ON and an error code is stored in ERROR_ID.	
	9) Every input must be provided a value for proper FB operation.	

Item	Description					
	10) Pay attention to the size of the SD memory card and the number of files that can be					
	saved when determining i_Max_Number (Maximum No. of save files). If the size of the					
	SD memory card or the number of files that can be saved is exceeded when this FB is					
	executed, a CPU error occurs. For information on the size of SD memory card and the					
	number of files that can be saved, refer to LCPU User's Manual (Hardware Design,					
	Maintenance and Inspection).					
	11) The input range settings must be properly configured to match devices connected to					
	the L60AD4 module. Configure the settings according to the application by using the					
	switch settings of GX Works2. For information about intelligent function module switch					
	settings, refer to the GX Works2 Version1 Operation Manual (Common).					
FB operation	Pulsed execution (multiple scan execution type)					
type						
Application example	Refer to "Appendix 1 - FB Library Application examples"					
Timing chart	[When operation completes without error] [When an error occurs]					
	FB_ENCExecution command! FB_ENCExecution status! Logging hold flag o_Making_File(Creating file) FB_OKICompleted without error! o_Exceed_Number(Maximum No. exceeded flag) FB_ERRORIError flag! ERROR_IDIError code! O ERROR_IDIError code!					
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 target channel is not valid.	Please try again after confirming the setting.
	The target channel is not within the	
	range of 1 to 4.	
11 (Decimal)	The maximum number of save files is	Please try again after confirming the setting.
	not valid. The maximum number of save	
	files is not within the range of 1 to 999.	

Error code	Description	Action
20 (Decimal)	The processing is aborted because the	-
	logging hold flag is turned OFF while the	
	logging data is being saved.	
	An incomplete CSV file is saved in the	
	SD memory card.	
21 (Decimal)	It is not possible to access to the SD	Turn OFF SM606 and confirm that SM607 (SD
	memory card because SM606 (SD	memory card forced disable status flag) is
	memory card forced disable Instruction)	turned OFF. Then, execute the FB again.
	is turned ON.	
	If SM606 (SD memory card forced	
	disable Instruction) is turned ON while	
	the logging data is being saved, an	
	incomplete CSV file is saved in the SD	
	memory card.	
	Turn OFF SM606 and confirm that	
	SM607 (SD memory card forced disable	
	status flag) is turned OFF. Then,	
	execute the FB again.	
Error codes other	-	For details on the error codes for errors
than above		occurring, refer to Appendix 1 Error Code List in
		the MELSEC-L CPU Module User's Manual
		(Hardware Design, Maintenance and
		Inspection).

Labels

Name (comment)	Label name	Data	Setting range	Description
		type		
Execution command	FB_EN	Di4	ON,OFF	ON: The FB is activated.
		Bit		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 L60AD4
		Word	For details,	module is mounted. (For example,
			refer to the CPU	enter H10 for X10.)
			user's manual.	
Target CH	i_CH	Word	1~4	Specify the CH number.
Maximum No. of	i_Max_Number	Word	1~999	Specify the maximum number of
save files		vvoiu		CSV files the FB saves.

Name (comment)	Label name	Data	Setting range	Description
		type		
Overwrite save	i_Over_Write		ON,OFF	Set whether to overwrite a CSV file
command				with the youngest serial number
				when the number of CSV files
		Bit		saved by this FB exceeds the
				maximum number of save files.
				(When OFF, the save processing of
				logging data stops.)

Name (comment)	Label name	Data type	Initial value	Description
Execution status	FB_ENO	Bit	OFF	ON: Execution command is ON. OFF: Execution command is OFF.
Completed without error	FB_OK	Bit	OFF	When ON, it indicates that the file saving is completed. Turned OFF when the logging resumes.
Creating file	o_Making_File	Bit	OFF	When ON, it indicates that a file is being created.
Maximum No. exceeded flag	o_Exceed_Number	Bit	OFF	When ON, it indicates that the number of CSV files saved by this FB has reached the maximum number of save files.
Error flag	FB_ERROR	Bit	OFF	When ON, it indicates that an error has occurred.
Error code	ERROR_ID	Word	0	FB error code output.

FB Version Upgrade History

Version	Date	Description
1.00A	2012/03/16	First edition

Note

This chapter includes information related to the M+L60AD4_SaveLogging function block.

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

FB Name

 $M+L60AD4_MakeFlowRateDailyReport\\$

Function Overview

Item	Description			
Function overview	Save the flow amount daily report data of all channels in a file.			
Symbol		M+L60AD4_MakeFlowRateDailyReport		
	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_Making_File : B ———Creating file	
			FB_ERROR : B ——Error flag	
			ERROR_ID : W Error code	
Applicable hardware	Analog-Digital	L60AD4		
and software	converter module	* Applicable to A/D conv	verter modules whose first five digits of serial	ıl
		number is 13041 or later only		
	CPU module			
		Series Model		
		MELSEC-L Series LCPU		
	Engineering	GX Works2 *1		
	software			
	Software		5 5	
		English version		-
		Chinese version Version1.49B or later		
		*1 For software versions applicable to the modules used, refer to		
		"Relevant manuals".		
Programming	Ladder			
language				
Number of steps	1602 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 o	lefinition.		

Item	Description
Function description	1) By turning ON FB_EN (Execution command), the "flow amount per hour" that flows on
	the hour for 24 hours and the "total flow amount of the day" are calculated based on the
	integrated flow amount (Un\G1332~Un\G1339) of the L60AD4. Then, they are saved in
	a flow amount daily report file in CSV format. The flow amount daily report is saved in an
	SD memory card mounted on the CPU module.
	2) When FB_EN is ON, a flow amount daily report is created at 12 am every day. The
	process to create a flow amount daily report starts when the FB detects the change from 11 pm to 12 am.
	3) It requires multiple scans to complete the save processing of the flow amount daily
	report data. o_Making_File (Creating file) is turned ON while the flow amount daily report
	data is being saved.
	4) By executing a single FB, a flow amount daily report for all channels of a module can be created.
	5) The format for the file name that the FB saves in an SD memory card is "second and
	third digits of the module starting XY address that is expressed in 4 digits" + "lower two
	digits of the year the daily report is created " + "month and day the daily report is
	created" +" .CSV".
	[File name example]
	The file name is "45110601.CSV" when the module starting XY address is H0450 and
	the daily report was created on June 1, 2011.
	6) When the FB creates a CSV file in an SD memory card, if the same file is already in the
	SD memory card (e.g. the clock information of the CPU is changed), the existing file is replaced by a new file.
	7) If the FB is executed without mounting an SD memory card, if the mounted SD memory
	card does not have sufficient space, or if the number of files that can be saved is
	exceeded *1, a CPU error *2 occurs. When an error causes a stop error in the CPU
	module, FB_ERROR or ERROR_ID is not updated. When an error causes a
	continuation error in the CPU module, FB_ERROR is turned ON and an error code is
	stored in ERROR_ID.
	8) For information on the format of the CSV file the FB creates, refer to MELSEC-L
	Analog-Digital Converter Module User's Manual.
	*1 For information on the size of SD memory card and the number of files that can be
	saved, refer to LCPU User's Manual (Hardware Design, Maintenance and Inspection).
	*2 The parameter can be used to set the CPU operation state (continue/stop) for when an
	access error to SD memory card occurs.
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, etc. because it is impossible to turn OFF.				
	This FB uses index registers Z8, and Z9. Please do not use these index registers in an				
	interrupt program.				
	5) This FB can save flow amount daily report data in an SD memory card only.				
	6) This FB uses a SP.FWRITE instruction. Therefore, if an error occurs during execution of				
	the SP.FWRITE instruction, a CPU error occurs.				
	7) If SM606 (SD memory card forced disable Instruction) is turned ON while the flow				
	amount daily report data is being saved, it is not possible to execute the SP.FWRITE				
	instruction. Therefore, the flow amount daily report data cannot be saved. In this case,				
	FB_ERROR is turned ON and an error code is stored in ERROR_ID.				
	8) This FB uses the clock information of the CPU to calculate the "flow amount per hour"				
	and "total flow amount of the day". If the clock information of the CPU is changed while this FB is being performed, the processing to create a flow amount daily report may not				
	be performed normally. 9) Every input must be provided a value for proper FB operation. 10) If the size of SD memory card or the number of files that can be saved is exceeded by				
	10) If the size of SD memory card or the number of files that can be saved is exceeded by				
	executing this FB, a CPU error occurs. For information on the size of SD memory card				
	and the number of files that can be saved, refer to LCPU User's Manual (Hardware				
	Design, Maintenance and Inspection). 11) The input range settings must be properly configured to match devices connected to the L60AD4 module. Configure the settings according to the application by using the switch settings of GX Works2. For information about intelligent function module switch				
FB operation	settings, refer to the GX Works2 Version1 Operation Manual (Common). Real-time execution				
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]				
3					
	FB_EN(Execution command) FB_EN(Execution command)				
	EB_ENO(Execution status) EB_ENO(Execution status)				
	o_Making_File(Creating file) o_Making_File(Creating file) o_Making_File(Creating file) 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 Codes

●Error code list

Error code	Description	Action
21 (Decimal)	It is not possible to access to the SD	Turn OFF SM606 and confirm that SM607 (SD
	memory card because SM606 (SD	memory card forced disable status flag) is
	memory card forced disable Instruction)	turned OFF. Then, execute the FB again.
	is turned ON.	
	If SM606 (SD memory card forced	
	disable Instruction) is turned ON while	
	the flow amount daily report data is	
	being saved, an incomplete CSV file is	
	saved in the SD memory card.	
Error codes other	-	For details on the error code for errors
than above		occurring, refer to Appendix 1 Error Code List in
		the MELSEC-L CPU Module User's Manual
		(Hardware Design, Maintenance and
		Inspection).

Labels

●Input labels

Name (comment)	Label name	Data	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 L60AD4
		Word	For details,	module is mounted. (For example,
			refer to the CPU	enter H10 for X10.)
			user's manual.	

Output labels

Name (comment)	Label name	Data	Initial value	Description
		type		
Execution status	FB_ENO	Bit	OFF	ON: Execution command is ON.
		DIL	OFF	OFF: Execution command is OFF.
Completed without	FB_OK			When ON, it indicates that the
error		Bit	OFF	creation of the flow amount daily
				report is completed.
Creating file	o_Making_File	Dit	OFF	When ON, it indicates that a file is
		Bit	OFF	being created.
Error flag	FB_ERROR	Bit	OFF	When ON, it indicates that an error
			Oli	has occurred.
Error code	ERROR_ID	Word	0	FB error code output.

FB Version Upgrade History

Version	Date	Description
1.00A	2012/03/16	First edition

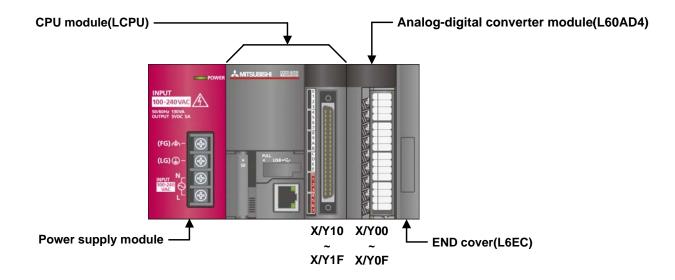
Note

This chapter includes information related to the M+L60AD4_MakeFlowRateDailyReport function block.

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

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

Appendix 1. FB Library Application examples L60AD4 FB application example 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.

List of devices

External inpu	ıt (commands)		
Device	FB function name	Application(ON details)	
MO	Read AD conversion data	AD value reading request	
M1 O	Read all AD conversion data	AD value reading all CHs request	
M20	Read scaling value	Scaling value reading request	
M30	Read all scaling values	Scaling value reading request	
M40	Conversion speed setting	Change speed settings request	
M50	Enable/disable AD conversion	AD enable/disable request	
M51	Ellable/disable AD collversion	AD enable/disable setting	
M60	Averaging process setting	Averaging specification request	
M70	Scaling setting	Scaling setting request	
M71	Scaling Setting	Scaling enable:ON/disable:OFF	
M80	Process alarm setting	Process alarm setting request	
M81	1 Tocess alaitti setting	Process alarm enable/disable	
M90	Input signal error detection	Input signal error setting req	
M91	setting	Input signal error enable/disabl	
M1 00	Operation condition setting request	Operation condition setting req	
M110	Offset setting	Offset setting request	
M111	Oliset setting	Offset value writing request	
M1 20	Gain setting	Gain setting request	
M1 21	Call Setting	Gain value writing request	
M1 30	Shift operation	Shift operation request	
M1 40	Differential conversion process	Diff conversion proc start req	
M1 50	Error operation	Error operation request	
M1 51	Cirol operation	Error reset request	
M1 60	Offset/gain value save	Offset/gain save file request	
M1 70	Offset/gain value restore	Offset/gain restore request	
M1 80	Input signal error detection extension setting	Input signal err ext setting req	
M1 90	Digital clipping setting	Digital clipping setting request	
M1 91	Digital clipping setting	Digital clipping enable/disable	
M200	Shift setting	Shift setting request	
M210	Logging function parameter	Logging fnc param setting req	
M211	setting	Log fnc param enable/disable set	
M220	Flow amount integration	Flow amount int param set req	
M221	function parameter setting	Flow amount int param en/disable	
M230	Logging data save	Logging data save request	
M231	Logging data save	Log file overwrite en/disable	
M240	Flow amount daily report creation	Flow amount daily rpt create req	

Data	register

Jata register		
Device	FB function name	Application(ON details)
DO	Read AD conversion data	AD conversion data
D1	Read AD Conversion data	AD value reading FB error code
D10		CH1 AD conversion data
D11	Read all AD conversion data	CH2 AD conversion data
D12	Read all AD conversion data	CH3 AD conversion data
D13]	CH4 AD conversion data
D20	Daniel and Bank and the	Scaling value
D21	Read scaling value	Scaling value read FB err code
D30		CH1 scaling value
D31		CH2 scaling value
D32	Read all scaling values	CH3 scaling value
D33		CH4 scaling value
D50	Enable/disable AD conversion	AD enable/disable FB error code
D60	Averaging process setting	Averaging process FB error code
D70	Scaling setting	Scaling setting FB error code
D80	Process alarm setting	Process alarm set FB error code
D90	Input signal error detection setting	Input signal setting FB err code
D110	Offset setting	Offset setting FB error code
D1 20	Gain setting	Gain setting FB error code
D1 30	Chiffi	Digital value
D1 31	Shift operation	Shift amount
D1 40		Digital value
D1 41	Differential conversion process	Differential conversion value
D1 42	1	Differential conversion standard
D150	Error operation	Module error code
D1 70	Offset/gain value restore	Offset/gain restore FB err code
D1 80	Input signal error detection extension setting	Input signal ext set FB err code
D190	Digital clipping setting	Digital clip setting FB err code
D200	Shift setting	Shift setting FB error code
D210	Logging function parameter setting	Log fnc param set FB err code
D220	Flow amount integration function parameter setting	Flow amt int param FB error code
D230	Logging data save	Logging data save FB error code
D240	Flow amount daily report creation	Flow amt daily rpt FB error code

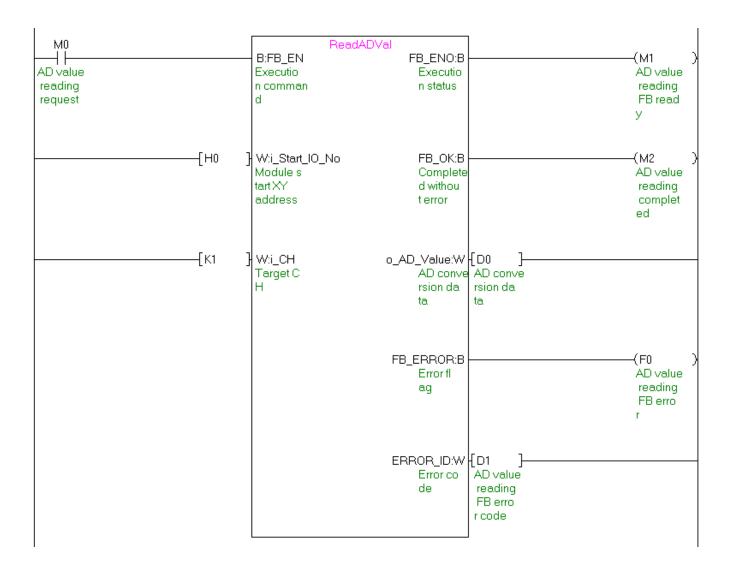
Eyternal	output.	(checks

xternal outpu Device	it (checks) FB function name	Application(ON details)
M1	FB lunction name	Application(ON details) AD value reading FB ready
M2	Read AD conversion data	AD value reading completed
FO		AD value reading FB error
M1 1	Read all AD conversion data	AD value reading FB all
M1 2	read all AB conversion data	AD value reading completion all
M21	Dand cooling welve	Scaling value reading FB ready
M22 F5	Read scaling value	Scaling value reading complete Scaling value reading FB error
M31		Scaling value reading FB ready
M32	Read all scaling values	Scaling value reading complete
M41	Conversion anded setting	Change speed setting FB ready
M42	Conversion speed setting	Change speed setting complete
M52		AD enable/disable setting ready
M53	Enable/disable AD conversion	AD enable/disable request
F1 0		AD enable/disable FB error
M61	Averaging present cotting	Averaging specification FB ready
M62 F15	Averaging process setting	Averaging proc setting complete Averaging process FB error
M72		Scaling setting FB ready
M73	Scaling setting	Scaling setting complete
F20		Scaling setting FB error
M82		Process alarm setting FB ready
M83	Process alarm setting	Process alarm setting complete
F25 M92		Process alarm setting FB error Input signal error setting ready
	Input signal error detection	
M93	setting	Input signal error setting comp
F30 M1 01	Operation condition setting	Input signal setting FB error Operate condition setting ready
M1 02	request	Operating condition setting ready
M112	request	Offset setting FB ready
M113	Offset setting	Offset setting complete
F35		Offset setting FB error
M1 22		Gain setting FB ready
M1 23	Gain setting	Gain setting complete
F40		Gain setting FB error
M1 31	Shift operation	Shift operation FB ready
M1 32		Shift operation complete
M1 41 M1 42	Differential conversion process	Diff conversion proc FB ready Diff conversion process complete
M1 52		Error operation ready
M153	Error operation	Error operation complete
F45		Module error flag
M1 61	Offset/gain value save	Offset/gain save file ready
M1 62 M1 71	-	Offset/gain save file comp Offset/gain value restore ready
M1 72	Offset/gain value restore	Offset/gain value restore comp
F50		Offset/gain value restore FB err
M1 81	Innut cianal error detection	Input signal error ext set ready
M182	Input signal error detection extension setting	Input signal error ext set comp
F55	T. L. T. TOTOLI GOLLING	Input signal ext set FB error
M192	Digital clipping cotting	Digital clipping setting ready
M193 F60	Digital clipping setting	Digital clipping set complete Digital clipping setting FB err
M201		Shift setting ready
M202	Shift cotting	Shift setting complete
F65	Shift setting	Shift setting FB error
M212	Logging function parameter	Logging fnc param setting ready
M213	setting	Logging fnc param set complete
F70		Logging fnc param setting FB err
M222	Flow amount integration	Flow amount int param set ready
M223 F75	function parameter setting	Flow amount int param set comp Flow amount int param set FB err
M232		Logging data save ready
M233		Logging data save complete
M234	Logging data save	Logging data saving
M235		Logging file max No. reached
F80		Logging data save FB error
M241		Flow amt daily rpt create ready
M242	Flow amount daily report	Flow amt daily rpt create comp
M243	creation	Flow amt daily report creating
F85		Flow amount daily report FB err

M+L60AD4_ReadADVal (Read AD conversion data)

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

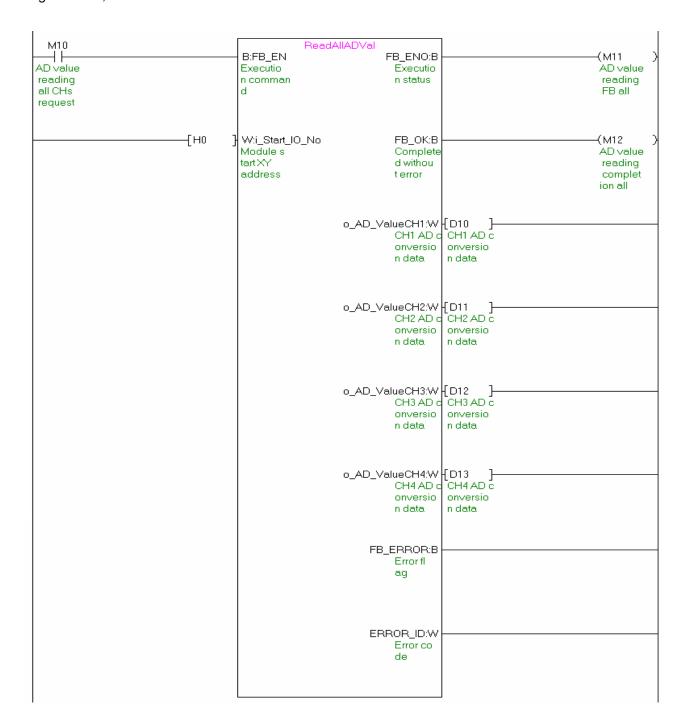
By turning ON M0, the AD conversion data of channel 1 is read.



M+L60AD4_ReadAllADVal (Read all AD conversion data)

Label name	Setting value	Description
i_Start_IO_No	H0	Set the starting XY address where the L60AD4 module is mounted to 0H.

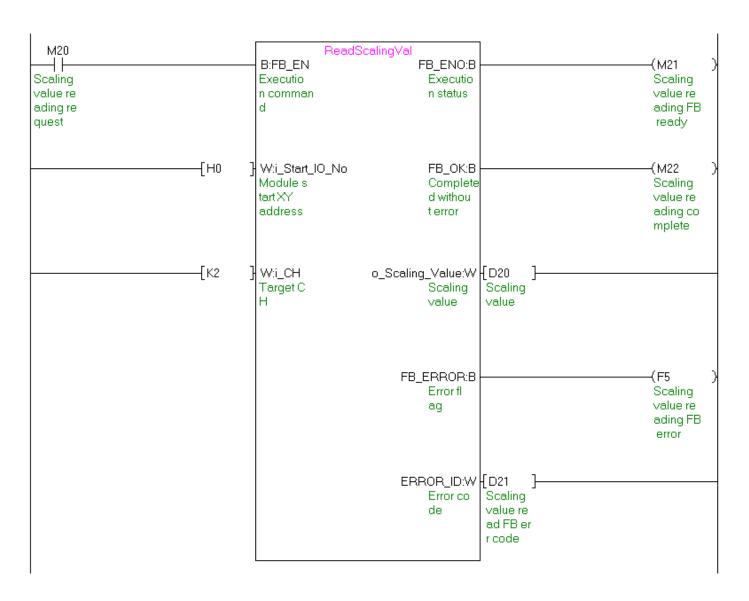
By turning ON M10, AD conversion data of all channels are read.



M+L60AD4_ReadScalingVal (Read scaling value)

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

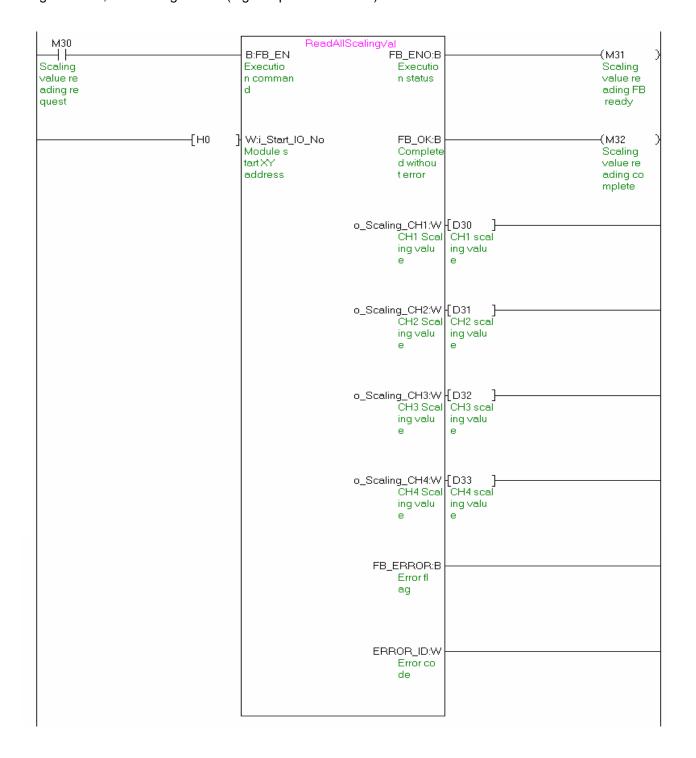
By turning ON M20, the scaling value (digital operation value) of channel 2 is read.



M+L60AD4_ReadAllScalingVal (Read all scaling values)

Label name	Setting value	Description
i_Start_IO_No	H0	Set the starting XY address where the L60AD4 module is mounted to 0H.

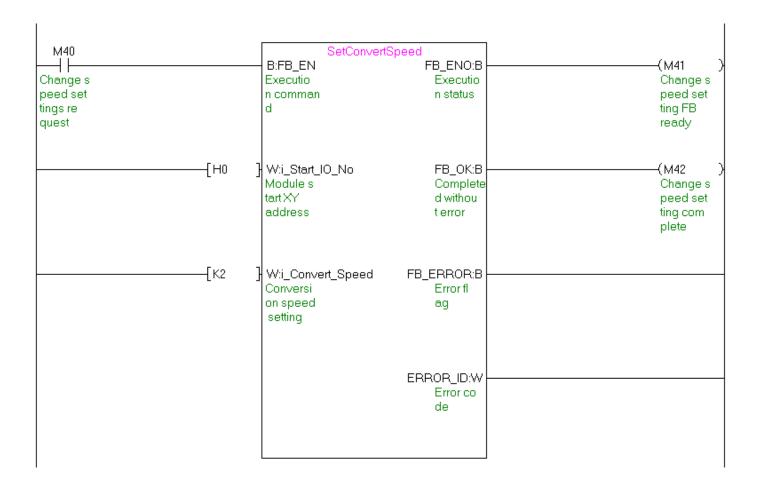
By turning ON M30, the scaling values (digital operation values) of all channels are read.



M+L60AD4_SetConvertSpeed (Conversion speed setting)

Label name	Setting value	Description
i_Start_IO_No	H0	Set the starting XY address where the L60AD4 module is mounted to 0H.
i_Convert_Speed	K2	Set the conversion speed of all channels to 1 ms.

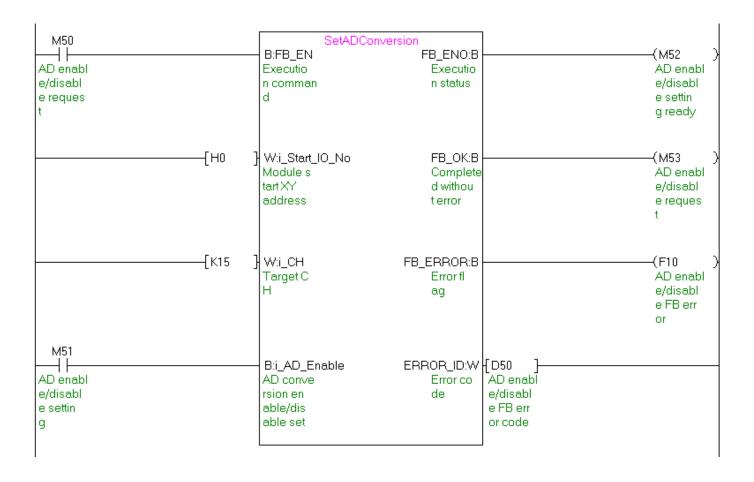
By turning ON M40, the conversion speed setting value is written to the buffer memory.



M+L60AD4_SetADConversion (Enable/disable AD conversion)

Label name	Setting value	Description
i_Start_IO_No	H0	Set the starting XY address where the L60AD4 module is mounted to 0H.
i_CH	K15	Specify the target channel to all channels.
i_AD_Enable	ON/OFF	Turn ON this parameter to enable the AD conversion of the target channel.

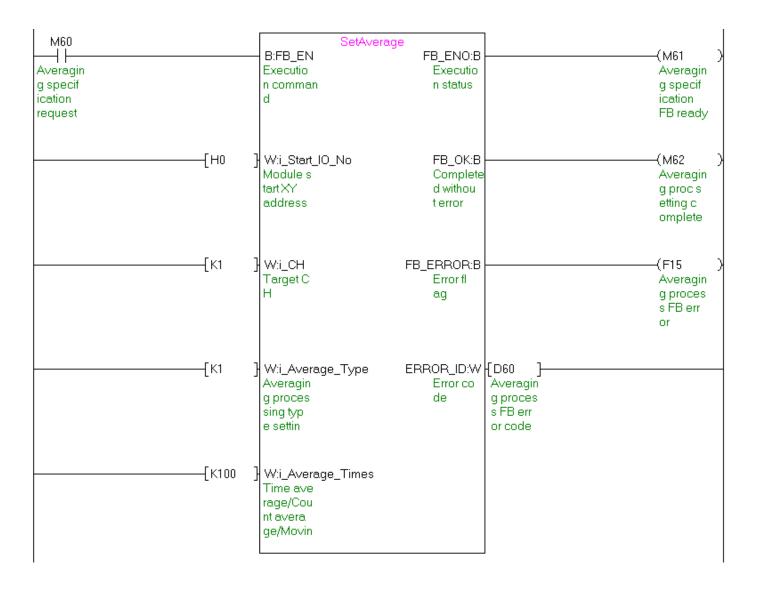
By turning ON M50, the conversion speed setting values of all changes are written to the buffer memory.



M+L60AD4_SetAverage (Averaging process setting)

Label name	Setting value	Description
i_Start_IO_No	H0	Set the starting XY address where the L60AD4 module is mounted to 0H.
i_CH	K1	Set the target channel to channel 1.
i_Average_Type	K1	Set the averaging processing type to "Time average".
i_Average_Times	K100	Set the time average to 100.

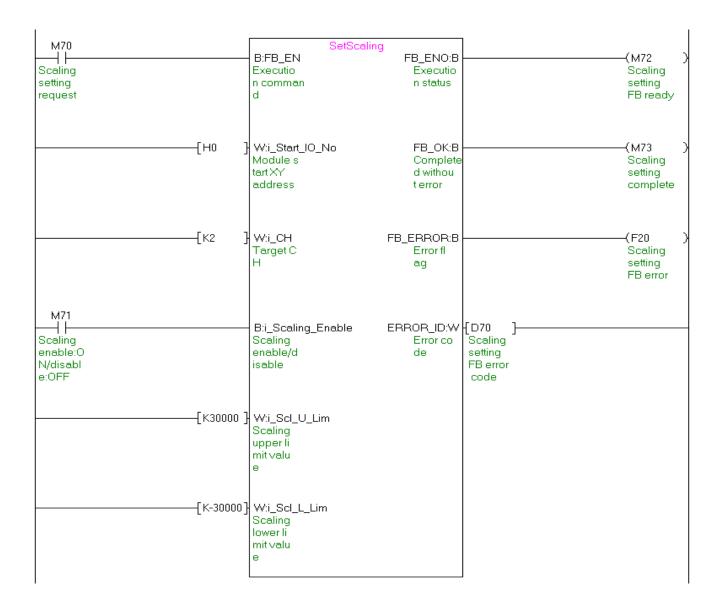
By turning ON M60, the averaging processing type setting value of channel 1 is written to the buffer memory.



M+L60AD4_SetScaling (Scaling setting)

Label name	Setting value	Description
i_Start_IO_No	H0	Set the starting XY address where the L60AD4 module is mounted to 0H.
i_CH	K2	Set the target channel to channel 2.
i_Scaling_Enable	ON/OFF	Turn ON to enable the scaling.
i_Scl_U_Lim	K30000	Set the scaling upper limit value to 30,000.
i_Scl_L_Lim	K-30000	Set the scaling lower limit value to -30,000.

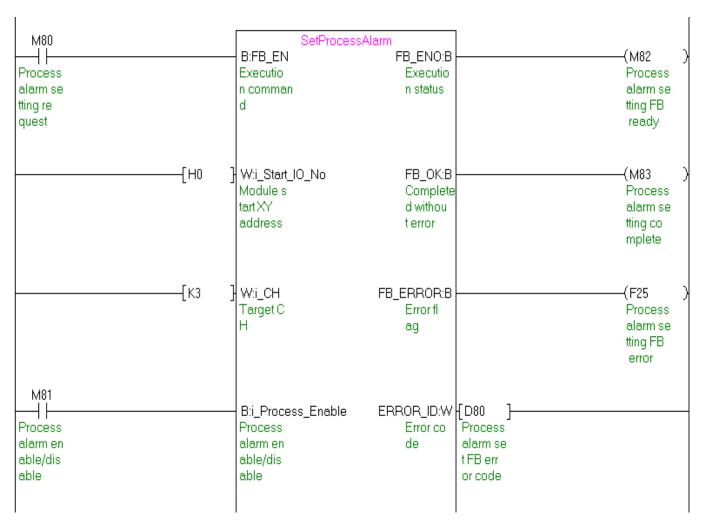
By turning ON M70, the scaling setting value of channel 2 is written to the buffer memory.



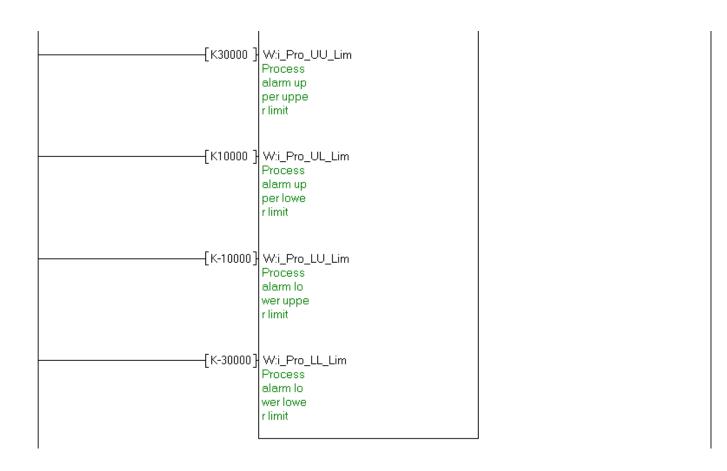
M+L60AD4_SetProcessAlarm (Process alarm setting)

Label name	Setting value	Description
i_Start_IO_No	H0	Set the starting XY address where the L60AD4 module is mounted to 0H.
i_CH	K3	Set the target channel to channel 3.
i_Process_Enable	ON/OFF	Turn ON to enable the warning output of the process alarm.
i_Pro_UU_Lim	K30000	Set the process alarm upper upper limit value to 30,000.
i_Pro_UL_Lim	K10000	Set the process alarm upper lower limit value to 10,000.
i_Pro_LU_Lim	K-10000	Set the process alarm lower upper limit value to -10,000.
i_Pro_LL_Lim	K-30000	Set the process alarm lower lower limit value to -30,000.

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



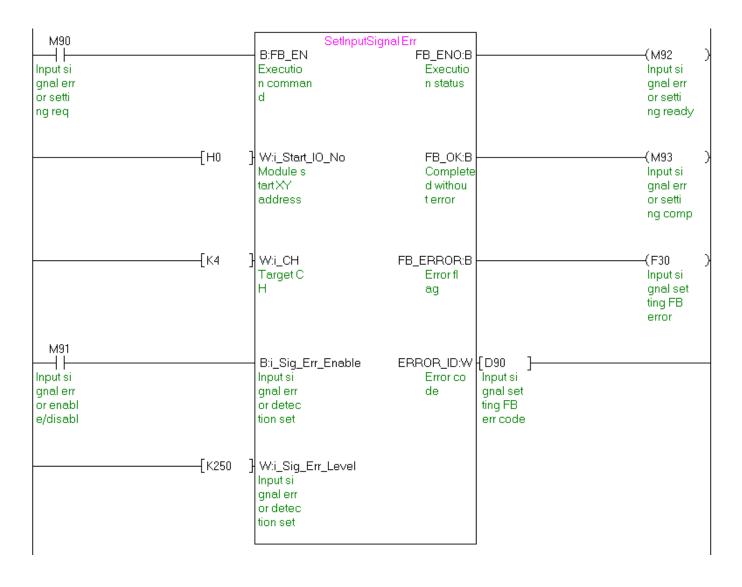
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M+L60AD4_SetInputSignalErr (Input signal error detection setting)

Label name	Setting value	Description
i_Start_IO_No	H0	Set the starting XY address where the L60AD4 module is mounted to 0H.
i_CH	K4	Set the target channel to channel 4.
i_Sig_Err_Enable	ON/OFF	Turn ON to enable the input signal error detection setting.
i_Sig_Err_Level	K250	Set the input signal error detection setting value to 25.0%.

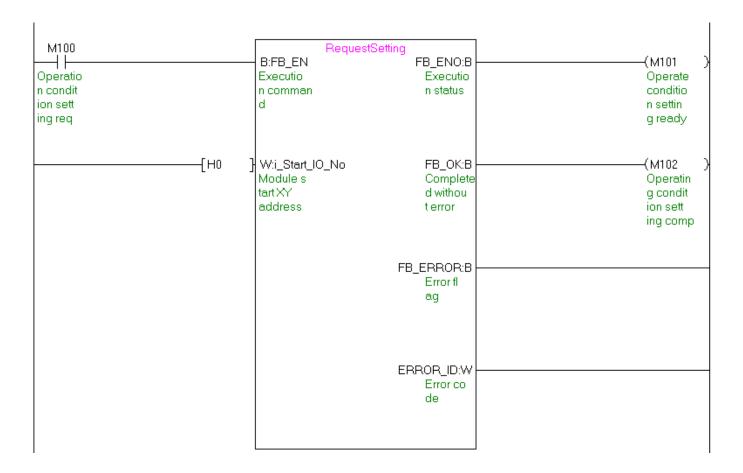
By turning ON M90, the input signal error detection setting value of channel 4 is written to the buffer memory.



M+L60AD4_RequestSetting (Operation condition setting request)

Label name	Setting value	Description
i_Start_IO_No	H0	Set the starting XY address where the L60AD4 module is mounted to 0H.

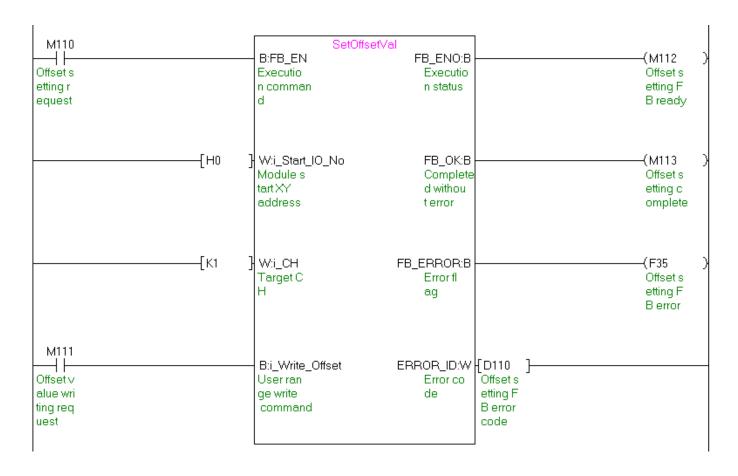
By turning ON M100, the settings of the enable/disable AD conversion, averaging process setting, input signal error detection extension setting, digital clipping setting, input signal error detection setting, conversion speed setting, warning output setting, scaling setting, logging function parameter setting and flow amount integration function setting are enabled.



M+L60AD4_SetOffsetVal (Offset setting)

Label name	Setting value	Description
i_Start_IO_No	H0	Set the starting XY address where the L60AD4 module is mounted to 0H.
i_CH	K1	Set the target channel to channel 1.
i_Write_Offset	ON/OFF	Turn ON to perform the user range write operation for channel 1.

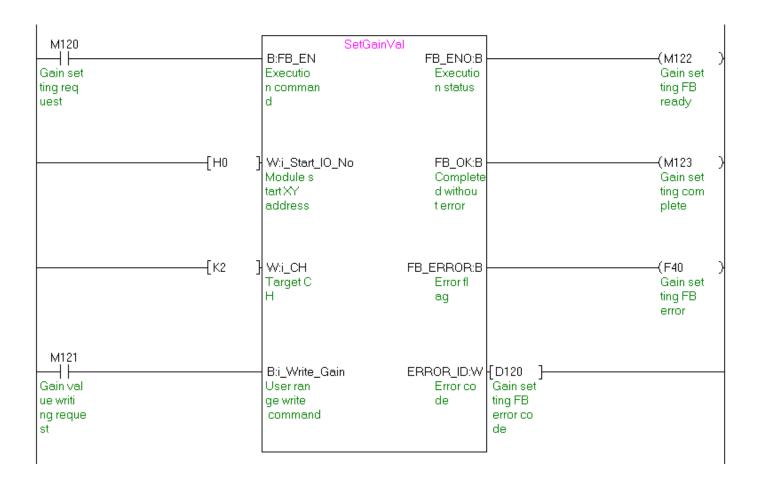
By turning ON M110 and then M111, the offset value of channel 1 is written.



M+L60AD4_SetGainVal (Gain setting)

Label name	Setting value	Description
i_Start_IO_No	H0	Set the starting XY address where the L60AD4 module is mounted to 0H.
i_CH	K2	Set the target channel to channel 2.
i_Write_Gain	ON/OFF	Turn ON to perform the user range write operation for channel 2.

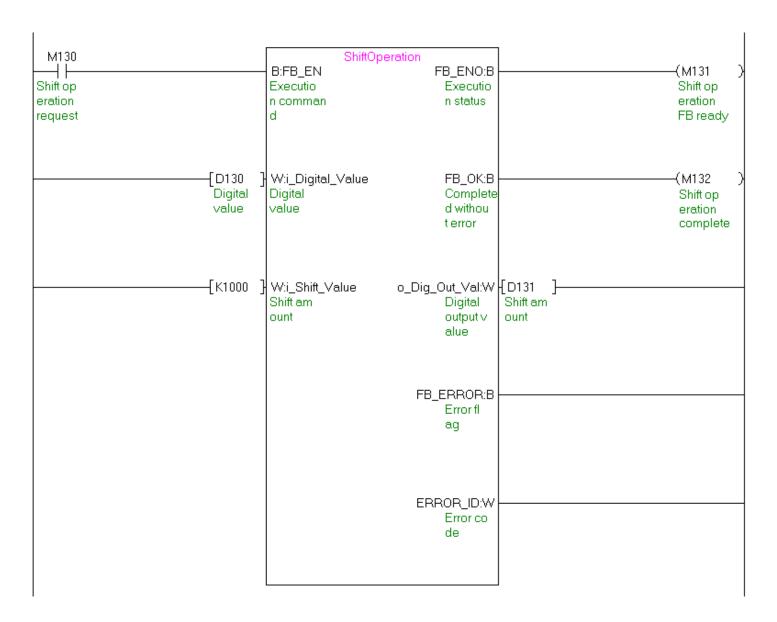
By turning ON M120 and then M121, the gain value of channel 2 is written.



M+L60AD4_ShiftOperation (Shift operation)

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

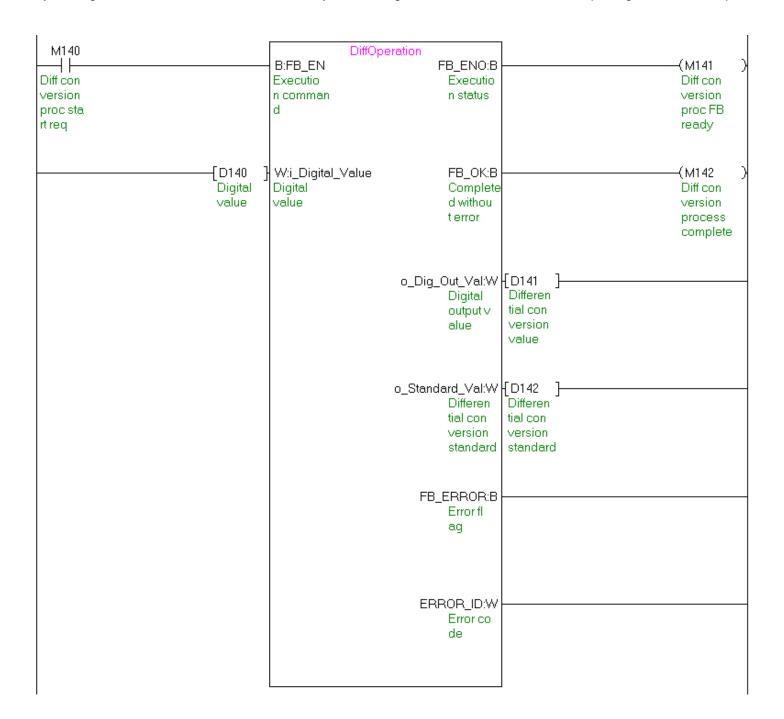
By turning ON M130, the sum obtained by adding the input digital output value to the shift amount is output.



M+L60AD4_DiffOperation (Differential conversion process)

Label name	Setting value	Description
i_Digital_Value	-	Store the digital value for which to perform the differential conversion.

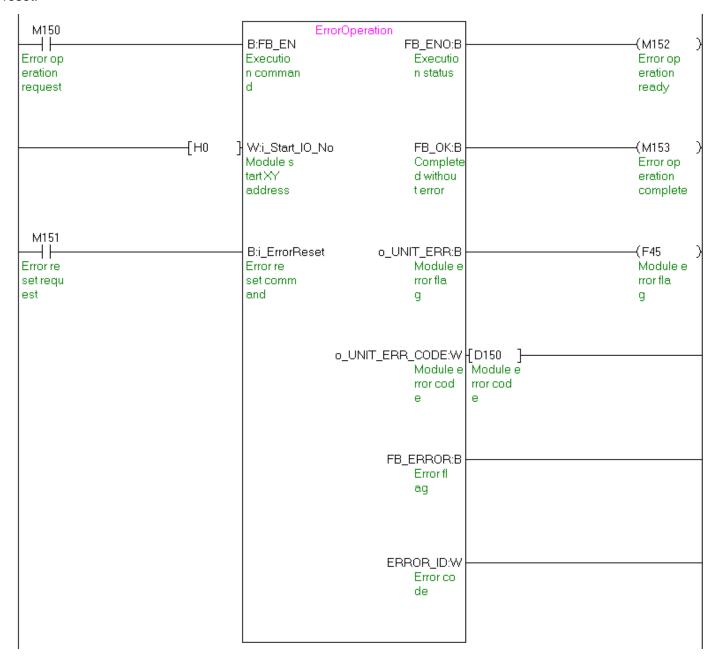
By turning ON M140, the difference obtained by subtracting the standard value from the input digital value is output.



M+L60AD4_ErrorOperation (Error operation)

Label name	Setting value	Description
i_Start_IO_No	H0	Set the starting XY address where the L60AD4 module is mounted to 0H.
i_ErrorReset	ON/OFF	Turn ON to reset errors.

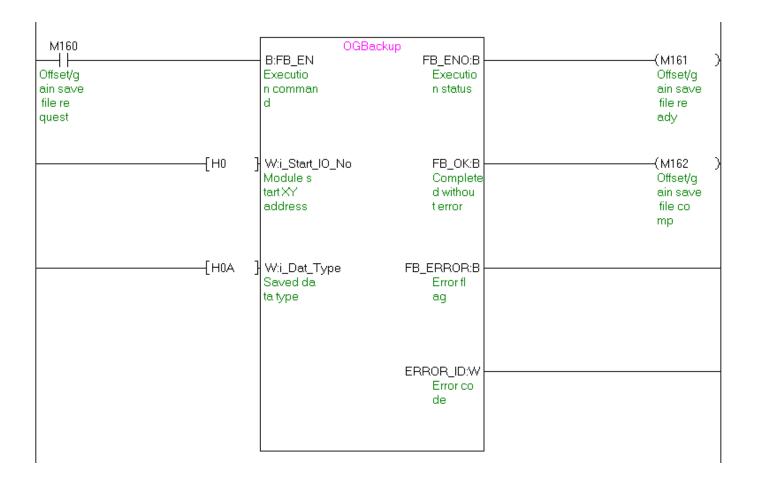
By turning ON M150, an error code is output if an error occurs. After an error output, by turning ON M151, the error is reset.



M+L60AD4_OGBackup (Offset/gain value save)

Label name	Setting value	Description
i_Start_IO_No	H0	Set the starting XY address where the L60AD4 module is mounted to 0H.
i_Dat_Type	H0A	Set the saved data type to "Voltage" for channels 1 and 3 and "Current" for
		channels 2 and 4.

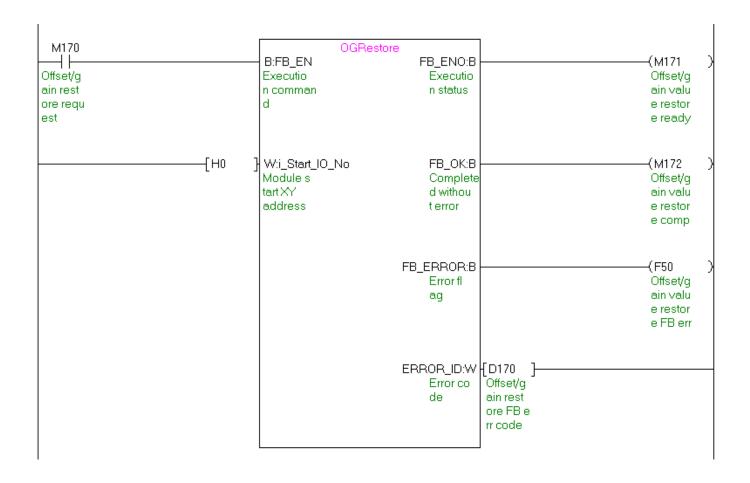
By turning ON M160, the offset/gain value of the user range setting is read and saved in a file to an SD memory card which is mounted on the CPU module.



M+L60AD4_OGRestore (Offset/gain value restore)

Label name	Setting value	Description
i_Start_IO_No	H0	Set the starting XY address where the L60AD4 module is mounted to 0H.

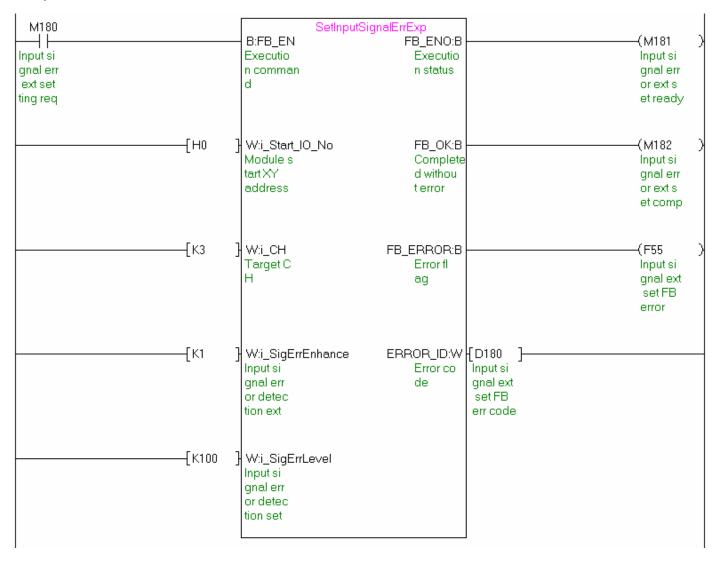
By turning ON M170, the offset/gain setting value of the user range setting is restored from the SD memory card.



M+L60AD4_SetInputSignalErrExp (Input signal error detection extension setting)

Label name	Setting value	Description
i_Start_IO_No	H0	Set the starting XY address where the L60AD4 module is mounted to 0H.
i_CH	K3	Set the target channel to channel 3.
i_SigErrEnhance	K1	Set the input signal error detection extension setting of channel 3 to "Upper
		lower limit detection".
i_SigErrLevel	K100	Set the input signal error detection setting value to 10.0%.

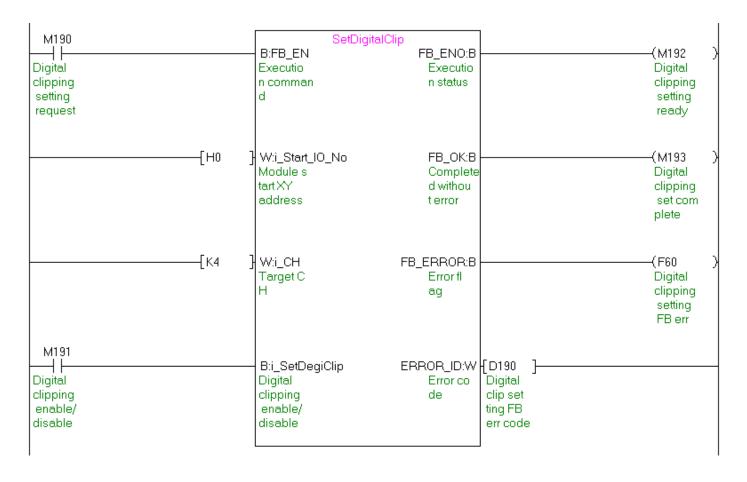
By turning ON M180, the input signal error detection extension setting value of channel 3 is written to the buffer memory.



M+L60AD4_SetDigitalClip (Digital clipping setting)

Label name	Setting value	Description
i_Start_IO_No	H0	Set the starting XY address where the L60AD4 module is mounted to 0H.
i_CH	K4	Set the target channel to channel 4.
i_SetDegiClip	ON/OFF	Turn ON to enable the digital clipping function.

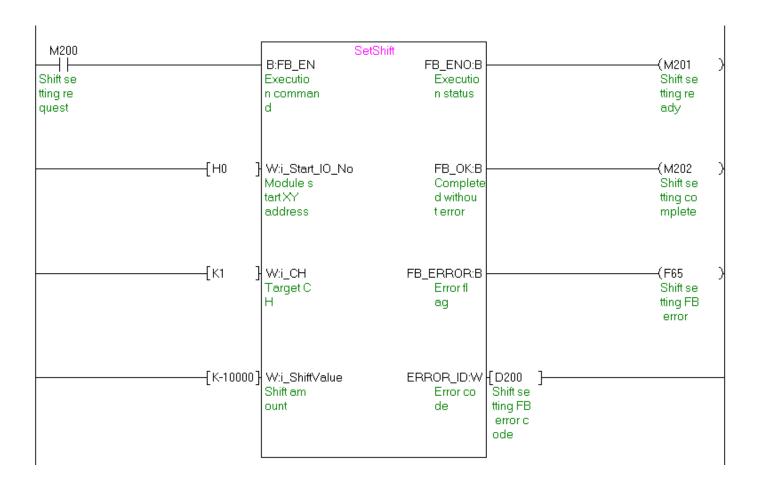
By turning ON M190, the digital clipping setting value of channel 4 is written to the buffer memory.



M+L60AD4_SetShift (Shift setting)

Label name	Setting value	Description
i_Start_IO_No	H0	Set the starting XY address where the L60AD4 module is mounted to 0H.
i_CH	K1	Set the target channel to channel 1.
i_ShiftValue	K-10000	Set the shift amount to -10,000.

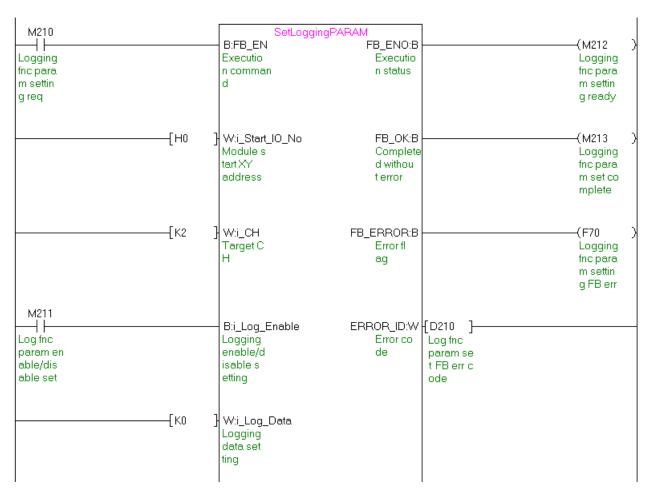
By turning ON M200, the shift setting value of channel 1 is written to the buffer memory.



M+L60AD4_SetLoggingPARAM (Logging function parameter setting)

Label name	Setting value	Description
i_Start_IO_No	H0	Set the starting XY address where the L60AD4 module is mounted to 0H.
i_CH	K2	Set the target channel to channel 2.
i_Log_Enable	ON/OFF	Turn ON to enable the logging.
i_Log_Data	K0	Set the logging data to "Digital output value".
i_Log_Cycle_Val	K320	Set the cycle to save the logging data to 320 µs.
i_Log_Cycle_Unit	K0	Set the time unit of the logging cycle to "µs".
i_Log_Points	K1	Set the data points to record from when the hold trigger occurs until the
		logging function stops temporarily to 1.
i_Log_Trig_Cond	K1	Set the condition to cause the level trigger "Above".
i_Log_Trig_Data	K12	Set the buffer memory address to operate the level trigger to 12.
i_Log_Trig_Value	K10000	Set the level at which the level trigger occurs to 10,000.

By turning ON M210, the logging function parameter setting value of channel 2 is written to the buffer memory.



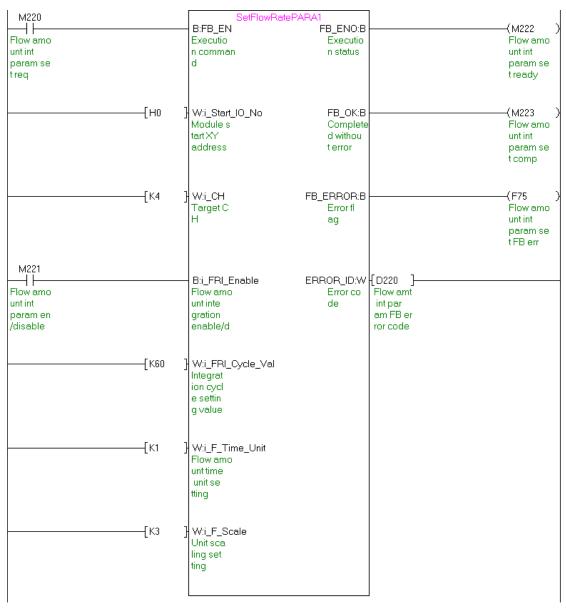
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 W:i_Log_Cycle_Val Logging cycle se tting va lue
 W:i_Log_Cycle_Unit Logging cycle un it setti ng
 W:i_Log_Points Logging points a fter tri gger
 W:i_Log_Trig_Cond Level tr igger co ndition setting
 W:i_Log_Trig_Data Trigger data
 00 } W:i_Log_Trig_Value Trigger setting value

M+L60AD4_SetFlowRatePARAM (Flow amount integration function parameter setting)

Label name	Setting value	Description
i_Start_IO_No	H0	Set the starting XY address where the L60AD4 module is mounted to 0H.
i_CH	K4	Set the target channel to channel 4.
i_FRI_Enable	ON/OFF	Turn ON to enable the flow amount integration function.
i_FRI_Cycle_Val	K60	Set the integration cycle of the connected flow meter to 60 ms.
i_F_Time_Unit	K1	Set the time unit of the flow meter to "min".
i_F_Scale	K3	Specify the unit scale of the integrated flow amount to "×1,000".

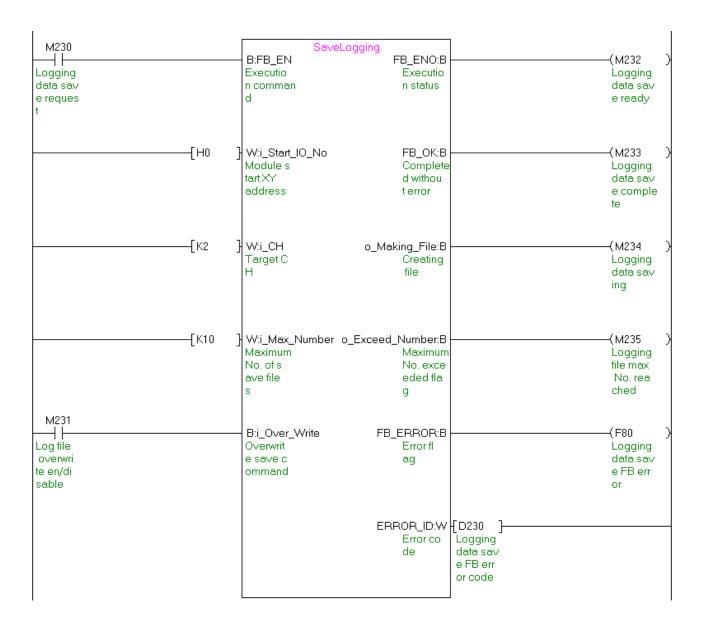
By turning ON M220, the flow amount integration function parameter setting value of channel 4 is written to the buffer memory.



M+L60AD4_SaveLogging (Logging data save)

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

By turning ON M230, the logging data from the start pointer of channel 2 for the number of the logging data are sorted chronologically. Then, the logging data and the trigger occurrence information are saved in CSV format in the SD memory card mounted on the CPU.



M+L60AD4_MakeFlowRateDailyReport (Flow amount daily report creation)

Label name	Setting value	Description
i_Start_IO_No	H0	Set the starting XY address where the L60AD4 module is mounted to 0H.

By turning ON M240, the "flow amount per hour" that flows on the hour for 24 hours and "total flow amount of the day" are calculated based on the integrated flow amount of the L60AD4. Then, they are saved in a flow amount daily report file in CSV format in an SD memory card mounted on the CPU module at 12 am every day.

