

# MELSEC-L RTD Input Module FB Library Reference Manual

Applicable module:  
L60RD8

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## Reference Manual Revision History

Reference Manual Number	Date	Description
FBM-M125-A	2015/07/15	First edition

## 1. Overview

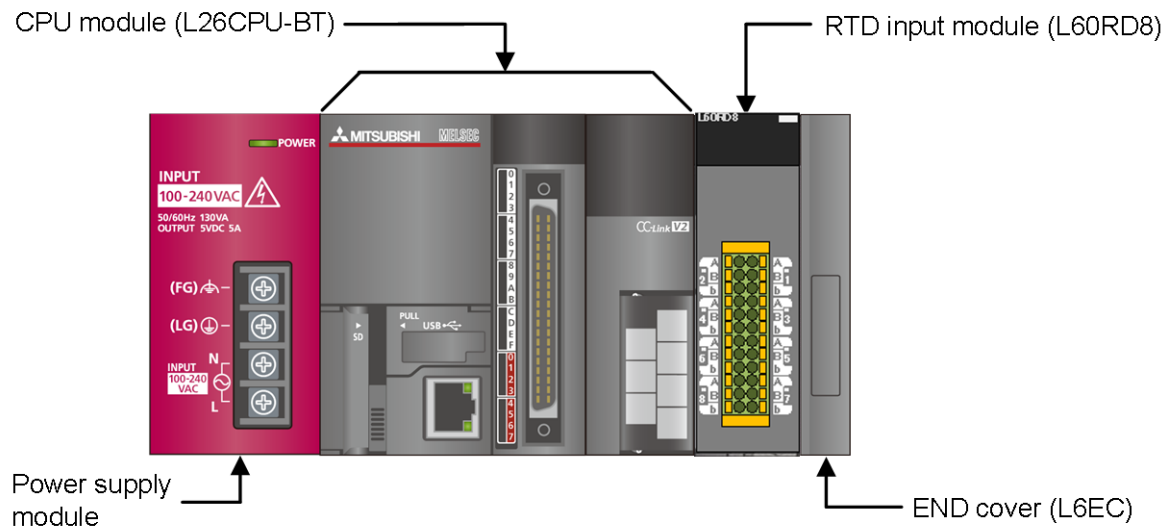
### 1.1. Overview of the FB Library

This FB Library is for using the MELSEC-L RTD input module L60RD8 (hereinafter L60RD8).

### 1.2. Function of the FB Library

Item	Description
M+L60RD8_InitialSetting	Sets the following data of the specified channel. <ul style="list-style-type: none"><li>• Input range setting</li><li>• Celsius/Fahrenheit display setting</li></ul>
M+L60RD8_SetAverage	Sets the averaging processing of the specified channel.
M+L60RD8_SetDigitalOperation	Sets the scaling and the sensor correction of the specified channel.
M+L60RD8_SetDisconnect	Sets the disconnection detection of the specified channel.
M+L60RD8_SetProcessAlarm	Sets the process alarm of the specified channel.
M+L60RD8_SetRateAlarm	Sets the rate alarm of the specified channel.
M+L60RD8_RequestSetting	Validates the settings of each function.
M+L60RD8_ReadTemperatureVal	Reads the temperature measured value of the specified channel.
M+L60RD8_ReadAllTemperatureVal	Reads the temperature measured value of all channels.
M+L60RD8_ReadOperationVal	Reads the digital operation value of the specified channel.
M+L60RD8_ReadAllOperationVal	Reads the digital operation value of all channels.
M+L60RD8_ErrorOperation	Monitors error codes and resets errors.

### 1.3. System Configuration Example



### 1.4. Relevant Manuals

- MELSEC-L RTD Input 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+L60RD8\_InitialSetting (Initial setting)

#### FB Name

M+L60RD8\_InitialSetting

#### Function Overview

Item	Description												
Function overview	Sets the following data of the specified channel. <ul style="list-style-type: none"> <li>• Input range setting</li> <li>• Celsius/Fahrenheit display setting</li> </ul>												
Symbol	<div style="display: flex; align-items: center; justify-content: space-between;"> <div style="width: 30%;"> <p>Execution command — B : FB_EN</p> <p>Module start XY address — W : iw_Start_IO_No</p> <p>Target CH — W : iw_CH</p> <p>Input range setting — W : iw_InputRange</p> <p>Celsius/Fahrenheit display setting — W : iw_DisplayType</p> </div> <div style="width: 40%; border: 1px solid black; padding: 5px; text-align: center;"> <p>M+L60RD8_InitialSetting</p> </div> <div style="width: 30%;"> <p>FB_ENO : B — Execution status</p> <p>FB_OK : B — Completed without error</p> <p>FB_ERROR : B — Error flag</p> <p>ERROR_ID : W — Error code</p> </div> </div>												
Applicable hardware and software	RTD input module	L60RD8											
	CPU module	<table border="1" style="width: 100%; text-align: center;"> <thead> <tr> <th>Series</th> <th>Model</th> </tr> </thead> <tbody> <tr> <td>MELSEC-L Series</td> <td>LCPU</td> </tr> </tbody> </table>	Series	Model	MELSEC-L Series	LCPU							
	Series	Model											
MELSEC-L Series	LCPU												
Engineering software	GX Works2 *1 <table border="1" style="width: 100%; text-align: center;"> <thead> <tr> <th>Language</th> <th>Software version</th> </tr> </thead> <tbody> <tr> <td>Japanese version</td> <td>Version1.86Q or later</td> </tr> <tr> <td>English version</td> <td>Version1.24A or later</td> </tr> <tr> <td>Chinese (Simplified) version</td> <td>Version1.49B or later</td> </tr> <tr> <td>Chinese (Traditional) version</td> <td>Version1.49B or later</td> </tr> <tr> <td>Korean version</td> <td>Version1.49B or later</td> </tr> </tbody> </table> <p>*1 For software versions applicable to the modules used, refer to "Relevant manuals".</p>	Language	Software version	Japanese version	Version1.86Q or later	English version	Version1.24A or later	Chinese (Simplified) version	Version1.49B or later	Chinese (Traditional) version	Version1.49B or later	Korean version	Version1.49B or later
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Chinese (Simplified) version	Version1.49B or later												
Chinese (Traditional) version	Version1.49B or later												
Korean version	Version1.49B or later												
Programming language	Ladder												
Number of steps	314 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	<ol style="list-style-type: none"> <li>1) By turning ON FB_EN (Execution command), the input range setting and Celsius/Fahrenheit display setting of the specified channel are set.</li> <li>2) FB operation is one-shot only, triggered by the FB_EN signal.</li> <li>3) The setting value is validated when the Operating condition setting request signal (Yn9) is turned OFF → ON → OFF or the Operating condition setting request FB (M+L60RD8_RequestSetting) is executed.</li> <li>4) When the setting value of iw_CH (Target CH) is out of range, the FB_ERROR output turns ON and processing is interrupted. The error code 10 (Decimal) is stored in ERROR_ID. Refer to the error code explanation section for details.</li> </ol>
Compiling method	Macro type
Restrictions and precautions	<ol style="list-style-type: none"> <li>1) The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation.</li> <li>2) The FB cannot be used in an interrupt program.</li> <li>3) Please ensure that the FB_EN signal is capable of being turned OFF by the program. Do not use this FB in programs that are only executed once such as a subroutine, FOR-NEXT loop because it is impossible to turn OFF.</li> <li>4) When two or more of these FBs are used, precaution must be taken to avoid repetition of iw_CH (Target CH).</li> <li>5) This FB uses index registers Z7 to Z9. Please do not use these index registers in an interrupt program.</li> <li>6) Every input must be provided with a value for proper FB operation.</li> <li>7) When a value set for iw_InputRange (Input range setting) or iw_DisplayType (Celsius/Fahrenheit display setting) is out of the setting range, no errors occur in this FB; however an error occurs in the module at an operating condition setting request. Please read the MELSEC-L RTD Input Module User's Manual for the errors on the module.</li> </ol>
FB operation type	Pulsed execution (1 scan execution type)
Application example	Refer to "Appendix 1. FB Library Application Examples".
Timing chart	<div style="display: flex; justify-content: space-between;"> <div style="width: 48%;"> <p><b>[When operation completes without error]</b></p> </div> <div style="width: 48%;"> <p><b>[When an error occurs]</b></p> </div> </div>

Item	Description
Relevant manuals	<ul style="list-style-type: none"> <li>• MELSEC-L RTD Input Module User's Manual</li> <li>• MELSEC-L CPU Module User's Manual (Hardware Design, Maintenance and Inspection)</li> <li>• GX Works2 Version 1 Operating Manual (Common)</li> <li>• GX Works2 Version 1 Operating Manual (Simple Project, Function Block)</li> </ul>

## Error codes

### ●Error code list

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

## Labels

### ●Input labels

Name (Comment)	Label name	Data type	Setting range	Description
Execution command	FB_EN	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
Module start XY address	iw_Start_IO_No	Word	Depends on the I/O point range of the CPU. For details, refer to the CPU user's manual.	Specify the start XY address (in hexadecimal) where the L60RD8 is connected. (For example, enter H10 for X10.)
Target CH	iw_CH	Word	1 to 8	1 to 8: Specify the channel number.
Input range setting	iw_InputRange	Word	0000 <sub>H</sub> 0040 <sub>H</sub> to 004D <sub>H</sub>	0000 <sub>H</sub> : Conversion disabled [Resistance temperature detector] 0040 <sub>H</sub> : Pt100 (-20 to 120°C) 0041 <sub>H</sub> : Pt100 (-200 to 850°C) 0042 <sub>H</sub> : JPt100 (-20 to 120°C) 0043 <sub>H</sub> : JPt100 (-200 to 600°C) 0044 <sub>H</sub> : Pt1000 (-200 to 850°C) 0045 <sub>H</sub> : Pt50 (-200 to 650°C) 0047 <sub>H</sub> : Ni100 (-60 to 250°C) 0048 <sub>H</sub> : Ni120 (-60 to 250°C) 0049 <sub>H</sub> : Ni500 (-60 to 250°C) 004C <sub>H</sub> : Cu100 (-180 to 200°C) 004D <sub>H</sub> : Cu50 (-180 to 200°C)
Celsius/Fahrenheit display setting	iw_DisplayType	Word	0, 1	0: Celsius display 1: Fahrenheit display

●Output labels

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

### FB Version Upgrade History

Version	Date	Description
1.00A	2015/07/15	First edition

### Note

This chapter includes information related to the function block.

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

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



## 2.2. M+L60RD8\_SetAverage (Averaging processing setting)

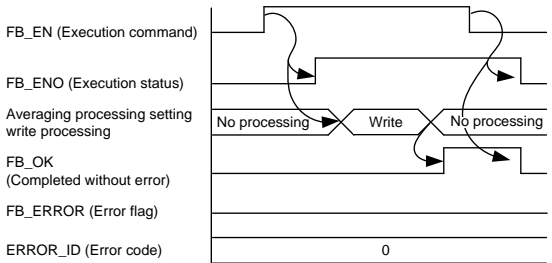
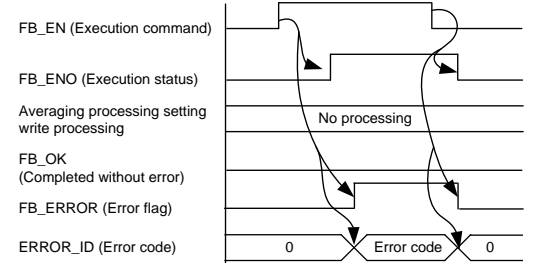
### FB Name

M+L60RD8\_SetAverage

### Function Overview

Item	Description												
Function overview	Sets the averaging processing of the specified channel.												
Symbol	<div style="display: flex; align-items: center; justify-content: center;"> <div style="margin-right: 20px;"> <p>Execution command — B : FB_EN</p> <p>Module start XY address — W : iw_Start_IO_No</p> <p>Target CH — W : iw_CH</p> <p>Averaging processing type setting — W : iw_Average_Type</p> <p>Time average/Count average/ Moving average settings — W : iw_Average_Times</p> </div> <div style="border: 1px solid black; padding: 10px; text-align: center;"> <p>M+L60RD8_SetAverage</p> </div> <div style="margin-left: 20px;"> <p>FB_ENO : B — Execution status</p> <p>FB_OK : B — Completed without error</p> <p>FB_ERROR : B — Error flag</p> <p>ERROR_ID : W — Error code</p> </div> </div>												
Applicable hardware and software	RTD input module	L60RD8											
	CPU module	<table border="1" style="width: 100%; text-align: center;"> <thead> <tr> <th>Series</th> <th>Model</th> </tr> </thead> <tbody> <tr> <td>MELSEC-L Series</td> <td>LCPU</td> </tr> </tbody> </table>	Series	Model	MELSEC-L Series	LCPU							
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Chinese (Simplified) version	Version1.49B or later												
Chinese (Traditional) version	Version1.49B or later												
Korean version	Version1.49B or later												
Programming language	Ladder												
Number of steps	<p>486 steps (for MELSEC-L series CPU)</p> <p>* The number of steps of the FB in a program depends on the CPU model that is used and input and output definition.</p>												

Item	Description
Function description	<ol style="list-style-type: none"> <li>1) By turning ON FB_EN (Execution command), the averaging processing of the specified channel is set.</li> <li>2) FB operation is one-shot only, triggered by the FB_EN signal.</li> <li>3) The setting value is validated when the Operating condition setting request signal (Yn9) is turned OFF → ON → OFF or the Operating condition setting request FB (M+L60RD8_RequestSetting) is executed.</li> <li>4) When the setting value of iw_CH (Target CH) is out of range, the FB_ERROR output turns ON and processing is interrupted. An error code is stored in ERROR_ID. Refer to the error code explanation section for details.</li> <li>5) When the setting value of iw_Average_Type (Averaging processing type setting) is out of range, the FB_ERROR output turns ON and the processing is interrupted. An error code is stored in ERROR_ID. Refer to the error code explanation section for details.</li> </ol>
Compiling method	Macro type
Restrictions and precautions	<ol style="list-style-type: none"> <li>1) The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation.</li> <li>2) The FB cannot be used in an interrupt program.</li> <li>3) Please ensure that the FB_EN signal is capable of being turned OFF by the program. Do not use this FB in programs that are only executed once such as a subroutine, FOR-NEXT loop because it is impossible to turn OFF.</li> <li>4) When two or more of these FBs are used, precaution must be taken to avoid repetition of iw_CH (Target CH).</li> <li>5) This FB uses index registers Z7 to Z9. Please do not use these index registers in an interrupt program.</li> <li>6) Every input must be provided with a value for proper FB operation.</li> <li>7) To operate the L60RD8, set the input range according to the device and system to be connected. Set the proper settings for the device and system with the parameter setting in GX Works2 or the initial setting FB (M+L60RD8_InitialSetting). For details on how to use the parameter setting in GX Works2, refer to GX Works2 Version 1 Operating Manual (Common).</li> <li>8) When a value set for iw_Average_Times (Time average/Count average/Moving average settings) is out of the setting range, no errors occur in this FB; however an error occurs in the module at an operating condition setting request. Please read the MELSEC-L RTD Input Module User's Manual for the errors on the module.</li> </ol>
FB operation type	Pulsed execution (1 scan execution type)
Application example	Refer to "Appendix 1. FB Library Application Examples".

Item	Description	
Timing chart	<p>[When operation completes without error]</p> 	<p>[When an error occurs]</p> 
Relevant manuals	<ul style="list-style-type: none"> <li>• MELSEC-L RTD Input Module User's Manual</li> <li>• MELSEC-L CPU Module User's Manual (Hardware Design, Maintenance and Inspection)</li> <li>• GX Works2 Version 1 Operating Manual (Common)</li> <li>• GX Works2 Version 1 Operating Manual (Simple Project, Function Block)</li> </ul>	

### Error codes

● Error code list

Error code	Description	Action
10 (Decimal)	The specified channel is not valid. iw_CH (Target CH) is not within the range of 1 to 8.	Please try again after confirming the setting.
11 (Decimal)	The specified averaging processing type is not valid. iw_Average_Type (Averaging processing type setting) is not within the range of 0 to 3 <sub>H</sub> .	Please try again after confirming the setting.

## Labels

### ●Input labels

Name (Comment)	Label name	Data type	Setting range	Description
Execution command	FB_EN	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
Module start XY address	iw_Start_IO_No	Word	Depends on the I/O point range of the CPU. For details, refer to the CPU user's manual.	Specify the start XY address (in hexadecimal) where the L60RD8 is connected. (For example, enter H10 for X10.)
Target CH	iw_CH	Word	1 to 8	Specify the channel number.
Averaging processing type setting	iw_Average_Type	Word	0 <sub>H</sub> : Sampling processing 1 <sub>H</sub> : Time average 2 <sub>H</sub> : Count average 3 <sub>H</sub> : Moving average	Specify the averaging processing type.
Time average/Count average/Moving average settings	iw_Average_Times	Word	Time average 13 to 18000 (100 ms) Count average 4 to 36000 (times) Moving average 2 to 1000 (times)	Set the time average, count average, and moving average of the channel specified for the averaging processing.

### ●Output labels

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

## FB Version Upgrade History

Version	Date	Description
1.00A	2015/07/15	First edition

## Note

This chapter includes information related to the function block.

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

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

### 2.3. M+L60RD8\_SetDigitalOperation (Digital operation processing setting)

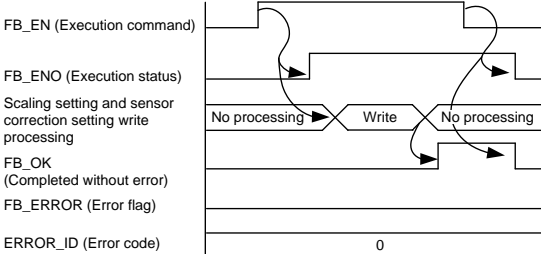
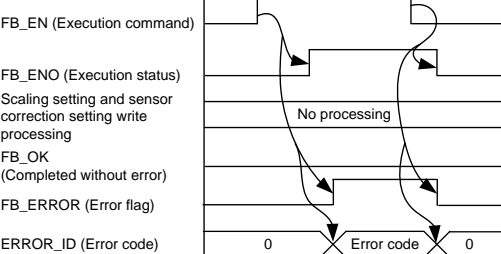
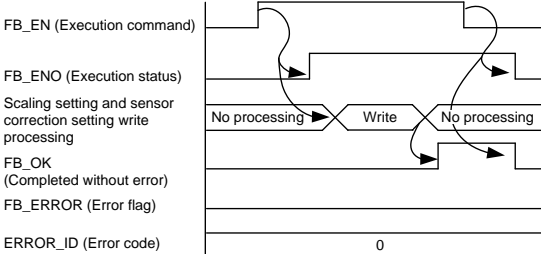
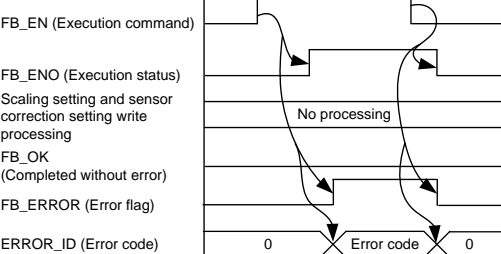
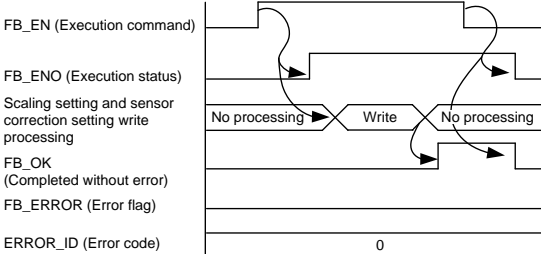
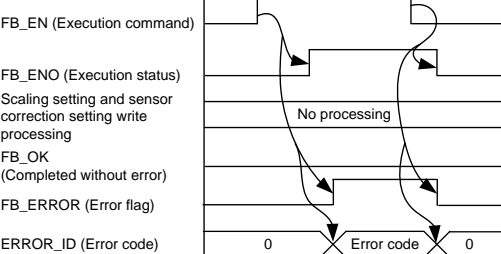
#### FB Name

M+L60RD8\_SetDigitalOperation

#### Function Overview

Item	Description												
Function overview	Sets the operation method of digital operation values of the specified channel.												
Symbol	<div style="display: flex; align-items: center; justify-content: space-between;"> <div style="width: 30%;"> <p>Execution command — B : FB_EN</p> <p>Module start XY address — W : iw_Start_IO_No</p> <p>Target CH — W : iw_CH</p> <p>Digital operation processing method — W : iw_DigOperation</p> <p>Scaling upper limit value — W : iw_Scl_U_Lim</p> <p>Scaling lower limit value — W : iw_Scl_L_Lim</p> </div> <div style="width: 35%; border: 1px solid black; padding: 5px; text-align: center;"> <p>M+L60RD8_SetDigitalOperation</p> </div> <div style="width: 30%;"> <p>FB_ENO : B — Execution status</p> <p>FB_OK : B — Completed without error</p> <p>FB_ERROR : B — Error flag</p> <p>ERROR_ID : W — Error code</p> </div> </div>												
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Chinese (Simplified) version	Version1.49B or later												
Chinese (Traditional) version	Version1.49B or later												
Korean version	Version1.49B or later												
Programming language	Ladder												
Number of steps	<p>510 steps (for MELSEC-L series CPU)</p> <p>* The number of steps of the FB in a program depends on the CPU model that is used and input and output definition.</p>												

Item	Description
Function description	<p>1) By turning ON FB_EN (Execution command), the following is set for the specified channel according to the input value of iw_DigOperation (Digital operation processing method).</p> <p>a) When "0: No selection" is set Both of the scaling function and the sensor correction function are disabled.</p> <p>b) When "1: Scaling" is set The scaling function is enabled and the sensor correction function is disabled.</p> <p>c) When any of "2: Sensor correction (shift) to 4: Sensor correction (shift + sensor two-point correction)" is set The scaling function is disabled. The sensor correction function is set according to the input value of iw_DigOperation (Digital operation processing method).</p> <p>2) When a value other than "1: Scaling" is set for iw_DigOperation (Digital operation processing method), iw_Scl_U_Lim (Scaling upper limit value) and iw_Scl_L_Lim (Scaling lower limit value) are not set.</p> <p>3) FB operation is one-shot only, triggered by the FB_EN signal.</p> <p>4) The setting value is validated when the Operating condition setting request signal (Yn9) is turned OFF → ON → OFF or the Operating condition setting request FB (M+L60RD8_RequestSetting) is executed.</p> <p>5) When the setting value of iw_CH (Target CH) or iw_DigOperation (Digital operation processing method) is out of range, the FB_ERROR output turns ON and the processing is interrupted. An error code is stored in ERROR_ID. Refer to the error code explanation section for details.</p>
Compiling method	Macro type

Item	Description		
Restrictions and precautions	<p>1) The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation.</p> <p>2) The FB cannot be used in an interrupt program.</p> <p>3) Please ensure that the FB_EN signal is capable of being turned OFF by the program. Do not use this FB in programs that are only executed once such as a subroutine, FOR-NEXT loop because it is impossible to turn OFF.</p> <p>4) When two or more of these FBs are used, precaution must be taken to avoid repetition of iw_CH (Target CH).</p> <p>5) This FB uses index registers Z7 to Z9. Please do not use these index registers in an interrupt program.</p> <p>6) Every input must be provided with a value for proper FB operation.</p> <p>7) To operate the L60RD8, set the input range according to the device and system to be connected. Set the proper settings for the device and system with the parameter setting in GX Works2 or the initial setting FB (M+L60RD8_InitialSetting). For details on how to use the parameter setting in GX Works2, refer to GX Works2 Version 1 Operating Manual (Common).</p> <p>8) When "1: Scaling" is set for iw_DigOperation (Digital operation processing method) and either of the following operations 1) and 2) is performed, no errors occur in this FB; however an error occurs in the module at an operating condition setting request. Please read the MELSEC-L RTD Input Module User's Manual for the errors on the module.</p> <p>a) When a value set for iw_Scl_U_Lim (Scaling upper limit value) or iw_Scl_L_Lim (Scaling lower limit value) is out of the setting range</p> <p>b) When the values set for iw_Scl_U_Lim (Scaling upper limit value) and iw_Scl_L_Lim (Scaling lower limit value) are the same</p>		
FB operation type	Pulsed execution (1 scan execution type)		
Application example	Refer to "Appendix 1. FB Library Application Examples".		
Timing chart	<table border="0" style="width: 100%;"> <tr> <td style="width: 50%; vertical-align: top;"> <p>[When operation completes without error]</p>  </td> <td style="width: 50%; vertical-align: top;"> <p>[When an error occurs]</p>  </td> </tr> </table>	<p>[When operation completes without error]</p> 	<p>[When an error occurs]</p> 
<p>[When operation completes without error]</p> 	<p>[When an error occurs]</p> 		
Relevant manuals	<ul style="list-style-type: none"> <li>• MELSEC-L RTD Input Module User's Manual</li> <li>• MELSEC-L CPU Module User's Manual (Hardware Design, Maintenance and Inspection)</li> <li>• GX Works2 Version 1 Operating Manual (Common)</li> <li>• GX Works2 Version 1 Operating Manual (Simple Project, Function Block)</li> </ul>		



## Error codes

### ●Error code list

Error code	Description	Action
10 (Decimal)	The specified channel is not valid. iw_CH (Target CH) is not within the range of 1 to 8.	Please try again after confirming the setting.
11 (Decimal)	The digital operation processing method is not valid. iw_DigOperation (Digital operation processing method) is not set within the range of 0 to 4.	Please try again after confirming the setting.

## Labels

### ●Input labels

Name (Comment)	Label name	Data type	Setting range	Description
Execution command	FB_EN	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
Module start XY address	iw_Start_IO_No	Word	Depends on the I/O point range of the CPU. For details, refer to the CPU user's manual.	Specify the start XY address (in hexadecimal) where the L60RD8 is connected. (For example, enter H10 for X10.)
Target CH	iw_CH	Word	1 to 8	Specify the channel number.
Digital operation processing method	iw_DigOperation	Word	0 to 4	Specify the operation method of digital operation values. 0: No selection (Both scaling and sensor correction disabled) 1: Scaling 2: Sensor correction (shift) 3: Sensor correction (sensor two-point correction) 4: Sensor correction (shift + sensor two-point correction)
Scaling upper limit value	iw_Scl_U_Lim	Word	-32,000 to 32,000	Specify the scaling upper limit value.
Scaling lower limit value	iw_Scl_L_Lim	Word	-32,000 to 32,000	Specify the scaling lower limit value.

●Output labels

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

### FB Version Upgrade History

Version	Date	Description
1.00A	2015/07/15	First edition

### Note

This chapter includes information related to the function block.

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

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

## 2.4. M+L60RD8\_SetDisconnect (Disconnection detection setting)

### FB Name

M+L60RD8\_SetDisconnect

### Function Overview

Item	Description												
Function overview	Sets the disconnection detection of the specified channel.												
Symbol	<div style="display: flex; align-items: center; justify-content: space-between;"> <div style="width: 30%;"> <p>Execution command — B : FB_EN</p> <p>Module start XY address — W : iw_Start_IO_No</p> <p>Target CH — W : iw_CH</p> <p>Conversion setting at disconnection detection — W : iw_DisconnType</p> <p>Conversion setting value at disconnection detection — W : iw_DisconnVal</p> </div> <div style="width: 35%; border: 1px solid black; padding: 5px; text-align: center;"> <p>M+L60RD8_SetDisconnect</p> </div> <div style="width: 30%;"> <p>FB_ENO : B — Execution status</p> <p>FB_OK : B — Completed without error</p> <p>FB_ERROR : B — Error flag</p> <p>ERROR_ID : W — Error code</p> </div> </div>												
Applicable hardware and software	RTD input module	L60RD8											
	CPU module	<table border="1" style="width: 100%; text-align: center;"> <thead> <tr> <th>Series</th> <th>Model</th> </tr> </thead> <tbody> <tr> <td>MELSEC-L Series</td> <td>LCPU</td> </tr> </tbody> </table>	Series	Model	MELSEC-L Series	LCPU							
	Series	Model											
MELSEC-L Series	LCPU												
Engineering software	<p>GX Works2 *1</p> <table border="1" style="width: 100%; text-align: center;"> <thead> <tr> <th>Language</th> <th>Software version</th> </tr> </thead> <tbody> <tr> <td>Japanese version</td> <td>Version1.86Q or later</td> </tr> <tr> <td>English version</td> <td>Version1.24A or later</td> </tr> <tr> <td>Chinese (Simplified) version</td> <td>Version1.49B or later</td> </tr> <tr> <td>Chinese (Traditional) version</td> <td>Version1.49B or later</td> </tr> <tr> <td>Korean version</td> <td>Version1.49B or later</td> </tr> </tbody> </table> <p>*1 For software versions applicable to the modules used, refer to "Relevant manuals".</p>	Language	Software version	Japanese version	Version1.86Q or later	English version	Version1.24A or later	Chinese (Simplified) version	Version1.49B or later	Chinese (Traditional) version	Version1.49B or later	Korean version	Version1.49B or later
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Chinese (Simplified) version	Version1.49B or later												
Chinese (Traditional) version	Version1.49B or later												
Korean version	Version1.49B or later												
Programming language	Ladder												
Number of steps	<p>427 steps (for MELSEC-L series CPU)</p> <p>* The number of steps of the FB in a program depends on the CPU model that is used and input and output definition.</p>												

Item	Description
Function description	<ol style="list-style-type: none"> <li>1) By turning ON FB_EN (Execution command), the disconnection detection setting of the specified channel is configured.</li> <li>2) FB operation is one-shot only, triggered by the FB_EN signal.</li> <li>3) The setting value is validated when the Operating condition setting request signal (Yn9) is turned OFF → ON → OFF or the Operating condition setting request FB (M+L60RD8_RequestSetting) is executed.</li> <li>4) When the setting value of iw_CH (Target CH) is out of range, the FB_ERROR output turns ON and processing is interrupted. An error code is stored in ERROR_ID. Refer to the error code explanation section for details.</li> </ol>
Compiling method	Macro type
Restrictions and precautions	<ol style="list-style-type: none"> <li>1) The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation.</li> <li>2) The FB cannot be used in an interrupt program.</li> <li>3) Please ensure that the FB_EN signal is capable of being turned OFF by the program. Do not use this FB in programs that are only executed once such as a subroutine, FOR-NEXT loop because it is impossible to turn OFF.</li> <li>4) When two or more of these FBs are used, precaution must be taken to avoid repetition of iw_CH (Target CH).</li> <li>5) This FB uses index registers Z7 to Z9. Please do not use these index registers in an interrupt program.</li> <li>6) Every input must be provided with a value for proper FB operation.</li> <li>7) To operate the L60RD8, set the input range according to the device and system to be connected. Set the proper settings for the device and system with the parameter setting in GX Works2 or the initial setting FB (M+L60RD8_InitialSetting). For details on how to use the parameter setting in GX Works2, refer to GX Works2 Version 1 Operating Manual (Common).</li> <li>8) When a value set for iw_DisconnType (Conversion setting at disconnection detection) is out of the setting range, no errors occur in this FB; however an error occurs in the module at an operating condition setting request. Please read the MELSEC-L RTD Input Module User's Manual for the errors on the module.</li> </ol>
FB operation type	Pulsed execution (1 scan execution type)
Application example	Refer to "Appendix 1. FB Library Application Examples".

Item	Description	
Timing chart	<p>[When operation completes without error]</p>	<p>[When an error occurs]</p>
Relevant manuals	<ul style="list-style-type: none"> <li>• MELSEC-L RTD Input Module User's Manual</li> <li>• MELSEC-L CPU Module User's Manual (Hardware Design, Maintenance and Inspection)</li> <li>• GX Works2 Version 1 Operating Manual (Common)</li> <li>• GX Works2 Version 1 Operating Manual (Simple Project, Function Block)</li> </ul>	

## Error codes

### ●Error code list

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

## Labels

### ●Input labels

Name (Comment)	Label name	Data type	Setting range	Description
Execution command	FB_EN	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
Module start XY address	iw_Start_IO_No	Word	Depends on the I/O point range of the CPU. For details, refer to the CPU user's manual.	Specify the start XY address (in hexadecimal) where the L60RD8 is connected. (For example, enter H10 for X10.)
Target CH	iw_CH	Word	1 to 8	Specify the channel number.
Conversion setting at disconnection detection	iw_DisconnType	Word	0 <sub>H</sub> : Value just before disconnection 1 <sub>H</sub> : Upscale 2 <sub>H</sub> : Downscale 3 <sub>H</sub> : Any value	Specify the conversion setting at disconnection detection.
Conversion setting value at disconnection detection	iw_DisconnVal	Word	-32,768 to 32,767	Specify the conversion setting value at disconnection detection.

●Output labels

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

### FB Version Upgrade History

Version	Date	Description
1.00A	2015/07/15	First edition

### Note

This chapter includes information related to the function block.

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

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

## 2.5. M+L60RD8\_SetProcessAlarm (Process alarm setting)

### FB Name

M+L60RD8\_SetProcessAlarm

### Function Overview

Item	Description												
Function overview	Sets the process alarm of the specified channel.												
Symbol	<div style="display: flex; align-items: center;"> <div style="flex: 1;"> <p>Execution command — B : FB_EN</p> <p>Module start XY address — W : iw_Start_IO_No</p> <p>Target CH — W : iw_CH</p> <p>Process alarm enable/disable — B : ib_Pro_Enable</p> <p>Process alarm upper upper limit value — W : iw_Pro_UU_Lim</p> <p>Process alarm upper lower limit value — W : iw_Pro_UL_Lim</p> <p>Process alarm lower upper limit value — W : iw_Pro_LU_Lim</p> <p>Process alarm lower lower limit value — W : iw_Pro_LL_Lim</p> </div> <div style="flex: 1; border: 1px solid black; padding: 5px; text-align: center;"> <p>M+L60RD8_SetProcessAlarm</p> </div> <div style="flex: 1;"> <p>FB_ENO : B — Execution status</p> <p>FB_OK : B — Completed without error</p> <p>FB_ERROR : B — Error flag</p> <p>ERROR_ID : W — Error code</p> </div> </div>												
Applicable hardware and software	RTD input module	L60RD8											
	CPU module	<table border="1" style="width: 100%; text-align: center;"> <thead> <tr> <th>Series</th> <th>Model</th> </tr> </thead> <tbody> <tr> <td>MELSEC-L Series</td> <td>LCPU</td> </tr> </tbody> </table>	Series	Model	MELSEC-L Series	LCPU							
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MELSEC-L Series	LCPU												
Engineering software	<p>GX Works2 *1</p> <table border="1" style="width: 100%; text-align: center;"> <thead> <tr> <th>Language</th> <th>Software version</th> </tr> </thead> <tbody> <tr> <td>Japanese version</td> <td>Version 1.86Q or later</td> </tr> <tr> <td>English version</td> <td>Version 1.24A or later</td> </tr> <tr> <td>Chinese (Simplified) version</td> <td>Version 1.49B or later</td> </tr> <tr> <td>Chinese (Traditional) version</td> <td>Version 1.49B or later</td> </tr> <tr> <td>Korean version</td> <td>Version 1.49B or later</td> </tr> </tbody> </table> <p>*1 For software versions applicable to the modules used, refer to "Relevant manuals".</p>	Language	Software version	Japanese version	Version 1.86Q or later	English version	Version 1.24A or later	Chinese (Simplified) version	Version 1.49B or later	Chinese (Traditional) version	Version 1.49B or later	Korean version	Version 1.49B or later
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Chinese (Traditional) version	Version 1.49B or later												
Korean version	Version 1.49B or later												
Programming language	Ladder												
Number of steps	<p>258 steps (for MELSEC-L series CPU)</p> <p>* The number of steps of the FB in a program depends on the CPU model that is used and input and output definition.</p>												

Item	Description
Function description	<ol style="list-style-type: none"> <li>1) By turning ON FB_EN (Execution command), the process alarm of the specified channel is set.</li> <li>2) FB operation is one-shot only, triggered by the FB_EN signal.</li> <li>3) The setting value is validated when the Operating condition setting request signal (Yn9) is turned OFF → ON → OFF or the Operating condition setting request FB (M+L60RD8_RequestSetting) is executed.</li> <li>4) When the setting value of iw_CH (Target CH) is out of range, the FB_ERROR output turns ON and processing is interrupted. An error code is stored in ERROR_ID. Refer to the error code explanation section for details.</li> </ol>
Compiling method	Macro type
Restrictions and precautions	<ol style="list-style-type: none"> <li>1) The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation.</li> <li>2) The FB cannot be used in an interrupt program.</li> <li>3) Please ensure that the FB_EN signal is capable of being turned OFF by the program. Do not use this FB in programs that are only executed once such as a subroutine, FOR-NEXT loop because it is impossible to turn OFF.</li> <li>4) When two or more of these FBs are used, precaution must be taken to avoid repetition of iw_CH (Target CH).</li> <li>5) This FB uses index registers Z7 to Z9. Please do not use these index registers in an interrupt program.</li> <li>6) Every input must be provided with a value for proper FB operation.</li> <li>7) To operate the L60RD8, set the input range according to the device and system to be connected. Set the proper settings for the device and system with the parameter setting in GX Works2 or the initial setting FB (M+L60RD8_InitialSetting). For details on how to use the parameter setting in GX Works2, refer to GX Works2 Version 1 Operating Manual (Common).</li> <li>8) In any of the following cases 1) to 3), no errors occur in this FB; however an error occurs in the module at an operating condition setting request. Please read the MELSEC-L RTD Input Module User's Manual for the errors on the module. <ol style="list-style-type: none"> <li>a) When a value greater than the value set for iw_Pro_LU_Lim (Process alarm lower upper limit value) is set for iw_Pro_LL_Lim (Process alarm lower lower limit value)</li> <li>b) When a value that exceeds iw_Pro_UL_Lim (Process alarm upper lower limit value) is set for iw_Pro_LU_Lim (Process alarm lower upper limit value)</li> <li>c) When a value that exceeds iw_Pro_UU_Lim (Process alarm upper upper limit value) is set for iw_Pro_UL_Lim (Process alarm upper lower limit value)</li> </ol> </li> </ol>
FB operation type	Pulsed execution (1 scan execution type)
Application example	Refer to "Appendix 1. FB Library Application Examples".



Item	Description	
Timing chart	<p>[When operation completes without error]</p>	<p>[When an error occurs]</p>
Relevant manuals	<ul style="list-style-type: none"> <li>• MELSEC-L RTD Input Module User's Manual</li> <li>• MELSEC-L CPU Module User's Manual (Hardware Design, Maintenance and Inspection)</li> <li>• GX Works2 Version 1 Operating Manual (Common)</li> <li>• GX Works2 Version 1 Operating Manual (Simple Project, Function Block)</li> </ul>	

## Error codes

### ● Error code list

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

## Labels

### ● Input labels

Name (Comment)	Label name	Data type	Setting range	Description
Execution command	FB_EN	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
Module start XY address	iw_Start_IO_No	Word	Depends on the I/O point range of the CPU. For details, refer to the CPU user's manual.	Specify the start XY address (in hexadecimal) where the L60RD8 is connected. (For example, enter H10 for X10.)
Target CH	iw_CH	Word	1 to 8	Specify the channel number.
Process alarm enable/disable	ib_Pro_Enable	Bit	ON, OFF	ON: Enable the warning output of the process alarm. OFF: Disable the warning output of the process alarm.
Process alarm upper upper limit value	iw_Pro_UU_Lim	Word	-32,768 to 32,767	Specify the process alarm upper upper limit value.
Process alarm upper lower limit value	iw_Pro_UL_Lim	Word	-32,768 to 32,767	Specify the process alarm upper lower limit value.
Process alarm lower upper limit value	iw_Pro_LU_Lim	Word	-32,768 to 32,767	Specify the process alarm lower upper limit value.

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

●Output labels

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

### FB Version Upgrade History

Version	Date	Description
1.00A	2015/07/15	First edition

### Note

This chapter includes information related to the function block.

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

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

## 2.6. M+L60RD8\_SetRateAlarm (Rate alarm setting)

### FB Name

M+L60RD8\_SetRateAlarm

### Function Overview

Item	Description																																	
Function overview	Sets the rate alarm of the specified channel.																																	
Symbol	<div style="border: 1px solid black; padding: 10px; width: fit-content; margin: auto;"> <p style="text-align: center;">M+L60RD8_SetRateAlarm</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%; border: none;">Execution command</td> <td style="width: 30%; border: none;">B : FB_EN</td> <td style="width: 30%; border: none;">FB_ENO : B</td> <td style="width: 10%; border: none;">Execution status</td> </tr> <tr> <td style="border: none;">Module start XY address</td> <td style="border: none;">W : iw_Start_IO_No</td> <td style="border: none;">FB_OK : B</td> <td style="border: none;">Completed without error</td> </tr> <tr> <td style="border: none;">Target CH</td> <td style="border: none;">W : iw_CH</td> <td style="border: none;">FB_ERROR : B</td> <td style="border: none;">Error flag</td> </tr> <tr> <td style="border: none;">Rate alarm enable/disable</td> <td style="border: none;">B : ib_Rate_Enable</td> <td style="border: none;">ERROR_ID : W</td> <td style="border: none;">Error code</td> </tr> <tr> <td style="border: none;">Rate alarm warning detection cycle</td> <td style="border: none;">W : iw_Rate_Out</td> <td></td> <td></td> </tr> <tr> <td style="border: none;">Rate alarm change rate selection</td> <td style="border: none;">B : ib_Rate_Chg_Sel</td> <td></td> <td></td> </tr> <tr> <td style="border: none;">Rate alarm upper limit value</td> <td style="border: none;">W : iw_Rate_U_Lim</td> <td></td> <td></td> </tr> <tr> <td style="border: none;">Rate alarm lower limit value</td> <td style="border: none;">W : iw_Rate_L_Lim</td> <td></td> <td></td> </tr> </table> </div>		Execution command	B : FB_EN	FB_ENO : B	Execution status	Module start XY address	W : iw_Start_IO_No	FB_OK : B	Completed without error	Target CH	W : iw_CH	FB_ERROR : B	Error flag	Rate alarm enable/disable	B : ib_Rate_Enable	ERROR_ID : W	Error code	Rate alarm warning detection cycle	W : iw_Rate_Out			Rate alarm change rate selection	B : ib_Rate_Chg_Sel			Rate alarm upper limit value	W : iw_Rate_U_Lim			Rate alarm lower limit value	W : iw_Rate_L_Lim		
Execution command	B : FB_EN	FB_ENO : B	Execution status																															
Module start XY address	W : iw_Start_IO_No	FB_OK : B	Completed without error																															
Target CH	W : iw_CH	FB_ERROR : B	Error flag																															
Rate alarm enable/disable	B : ib_Rate_Enable	ERROR_ID : W	Error code																															
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Chinese (Traditional) version	Version1.49B or later																																	
Korean version	Version1.49B or later																																	
Programming language	Ladder																																	
Number of steps	264 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	<ol style="list-style-type: none"> <li>1) By turning ON FB_EN (Execution command), the rate alarm of the specified channel is set.</li> <li>2) FB operation is one-shot only, triggered by the FB_EN signal.</li> <li>3) The setting value is validated when the Operating condition setting request signal (Yn9) is turned OFF → ON → OFF or the Operating condition setting request FB (M+L60RD8_RequestSetting) is executed.</li> <li>4) When the setting value of iw_CH (Target CH) is out of range, the FB_ERROR output turns ON and processing is interrupted. An error code is stored in ERROR_ID. Refer to the error code explanation section for details.</li> </ol>
Compiling method	Macro type
Restrictions and precautions	<ol style="list-style-type: none"> <li>1) The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation.</li> <li>2) The FB cannot be used in an interrupt program.</li> <li>3) Please ensure that the FB_EN signal is capable of being turned OFF by the program. Do not use this FB in programs that are only executed once such as a subroutine, FOR-NEXT loop because it is impossible to turn OFF.</li> <li>4) When two or more of these FBs are used, precaution must be taken to avoid repetition of iw_CH (Target CH).</li> <li>5) This FB uses index registers Z7 to Z9. Please do not use these index registers in an interrupt program.</li> <li>6) Every input must be provided with a value for proper FB operation.</li> <li>7) To operate the L60RD8, set the input range according to the device and system to be connected. Set the proper settings for the device and system with the parameter setting in GX Works2 or the initial setting FB (M+L60RD8_InitialSetting). For details on how to use the parameter setting in GX Works2, refer to GX Works2 Version 1 Operating Manual (Common).</li> <li>8) In either of the following cases 1) and 2), no errors occur in this FB; however an error occurs in the module at an operating condition setting request. Please read the MELSEC-L RTD Input Module User's Manual for the errors on the module. <ol style="list-style-type: none"> <li>a) When a value set for iw_Rate_Out (Rate alarm warning detection cycle) is out of the setting range</li> <li>b) When a value that exceeds iw_Rate_U_Lim (Rate alarm upper limit value) is set for iw_Rate_L_Lim (Rate alarm lower limit value)</li> </ol> </li> </ol>
FB operation type	Pulsed execution (1 scan execution type)
Application example	Refer to "Appendix 1. FB Library Application Examples".

Item	Description	
Timing chart	<p>[When operation completes without error]</p>	<p>[When an error occurs]</p>
Relevant manuals	<ul style="list-style-type: none"> <li>• MELSEC-L RTD Input Module User's Manual</li> <li>• MELSEC-L CPU Module User's Manual (Hardware Design, Maintenance and Inspection)</li> <li>• GX Works2 Version 1 Operating Manual (Common)</li> <li>• GX Works2 Version 1 Operating Manual (Simple Project, Function Block)</li> </ul>	

## Error codes

### ● Error code list

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

## Labels

### ● Input labels

Name (Comment)	Label name	Data type	Setting range	Description
Execution command	FB_EN	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
Module start XY address	iw_Start_IO_No	Word	Depends on the I/O point range of the CPU. For details, refer to the CPU user's manual.	Specify the start XY address (in hexadecimal) where the L6ORD8 is connected. (For example, enter H10 for X10.)
Target CH	iw_CH	Word	1 to 8	Specify the channel number.
Rate alarm enable/disable	ib_Rate_Enable	Bit	ON, OFF	ON: Enable the warning output of the rate alarm. OFF: Disable the warning output of the rate alarm.
Rate alarm warning detection cycle	iw_Rate_Out	Word	1 to 36,000	Specify the rate alarm warning detection cycle.

Name (Comment)	Label name	Data type	Setting range	Description
Rate alarm change rate selection	ib_Rate_Chg_Sel	Bit	ON, OFF	OFF: Ratio ON: Temperature
Rate alarm upper limit value	iw_Rate_U_Lim	Word	-32,768 to 32,767	Specify the rate alarm upper limit value.
Rate alarm lower limit value	iw_Rate_L_Lim	Word	-32,768 to 32,767	Specify the rate alarm lower limit value.

●Output labels

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

### FB Version Upgrade History

Version	Date	Description
1.00A	2015/07/15	First edition

### Note

This chapter includes information related to the function block.

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

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

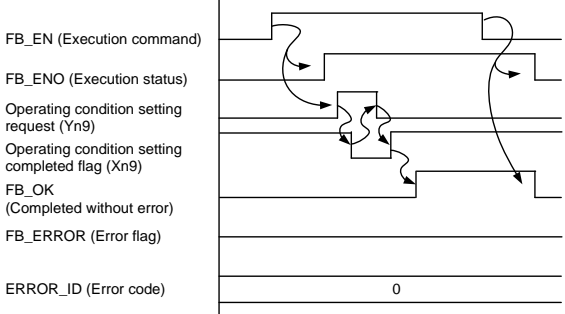
## 2.7. M+L60RD8\_RequestSetting (Operating condition setting request)

### FB Name

M+L60RD8\_RequestSetting

### Function Overview

Item	Description												
Function overview	Validates the settings of each function.												
Symbol	<div style="display: flex; align-items: center; justify-content: space-between;"> <div style="width: 30%;"> <p>Execution command — B : FB_EN</p> <p>Module start XY address — W : iw_Start_IO_No</p> </div> <div style="width: 40%; border: 1px solid black; padding: 5px; text-align: center;"> <p>M+L60RD8_RequestSetting</p> </div> <div style="width: 30%;"> <p>FB_ENO : B — Execution status</p> <p>FB_OK : B — Completed without error</p> <p>FB_ERROR : B — Error flag</p> <p>ERROR_ID : W — Error code</p> </div> </div>												
Applicable hardware and software	RTD input module	L60RD8											
	CPU module	<table border="1" style="width: 100%; text-align: center;"> <thead> <tr> <th>Series</th> <th>Model</th> </tr> </thead> <tbody> <tr> <td>MELSEC-L Series</td> <td>LCPU</td> </tr> </tbody> </table>	Series	Model	MELSEC-L Series	LCPU							
	Series	Model											
MELSEC-L Series	LCPU												
Engineering software	<p>GX Works2 *1</p> <table border="1" style="width: 100%; text-align: center;"> <thead> <tr> <th>Language</th> <th>Software version</th> </tr> </thead> <tbody> <tr> <td>Japanese version</td> <td>Version1.86Q or later</td> </tr> <tr> <td>English version</td> <td>Version1.24A or later</td> </tr> <tr> <td>Chinese (Simplified) version</td> <td>Version1.49B or later</td> </tr> <tr> <td>Chinese (Traditional) version</td> <td>Version1.49B or later</td> </tr> <tr> <td>Korean version</td> <td>Version1.49B or later</td> </tr> </tbody> </table> <p>*1 For software versions applicable to the modules used, refer to "Relevant manuals".</p>	Language	Software version	Japanese version	Version1.86Q or later	English version	Version1.24A or later	Chinese (Simplified) version	Version1.49B or later	Chinese (Traditional) version	Version1.49B or later	Korean version	Version1.49B or later
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English version	Version1.24A or later												
Chinese (Simplified) version	Version1.49B or later												
Chinese (Traditional) version	Version1.49B or later												
Korean version	Version1.49B or later												
Programming language	Ladder												
Number of steps	292 steps (for MELSEC-L series CPU) * The number of steps of the FB in a program depends on the CPU model that is used and input and output definition.												
Function description	1) By turning ON FB_EN (Execution command), the settings of all channels (channel 1 to channel 8) are enabled. For the applicable setting, refer to MELSEC-L RTD Input Module User's Manual. 2) After FB_EN (Execution command) is turned ON, the execution of this FB continues until each function setting is completed.												
Compiling method	Macro type												

Item	Description
Restrictions and precautions	<ol style="list-style-type: none"> <li>1) When this FB is executed while the L60RD8 is being operated, conversion is stopped. The conversion restarts after FB_OK turns ON.</li> <li>2) Before executing this FB, turn OFF the sensor correction flag (Xn1). If this FB is executed with the sensor correction flag (Xn1) ON, the settings are not validated.</li> <li>3) The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation.</li> <li>4) Please ensure that the FB_EN signal is capable of being turned OFF by the program. Do not use this FB in programs that are only executed once such as a subroutine, FOR-NEXT loop because it is impossible to turn OFF.</li> <li>5) The FB cannot be used in an interrupt program.</li> <li>6) This FB uses index register Z9. Please do not use the index register in an interrupt program.</li> <li>7) Every input must be provided with a value for proper FB operation.</li> <li>8) When this FB is used in two or more places, a duplicated coil warning may occur during compile operation due to the Y signal being operated by index modification. However this is not a problem and the FB will operate without error.</li> <li>9) To operate the L60RD8, set the input range according to the device and system to be connected. Set the proper settings for the device and system with the parameter setting in GX Works2 or the initial setting FB (M+L60RD8_InitialSetting). For details on how to use the parameter setting in GX Works2, refer to GX Works2 Version 1 Operating Manual (Common).</li> </ol>
FB operation type	Pulsed execution (multiple scan execution type)
Application example	Refer to "Appendix 1. FB Library Application Examples".
Timing chart	 <p>The timing chart illustrates the sequence of events for the FB_L60RD8. It shows the following signals and their states over time:</p> <ul style="list-style-type: none"> <li><b>FB_EN (Execution command):</b> A pulsed signal that starts high and then drops to low.</li> <li><b>FB_ENO (Execution status):</b> A signal that transitions from high to low when FB_EN is first asserted.</li> <li><b>Operating condition setting request (Yn9):</b> A signal that becomes active (high) when FB_EN is first asserted.</li> <li><b>Operating condition setting completed flag (Xn9):</b> A signal that becomes active (high) after the setting request is processed.</li> <li><b>FB_OK (Completed without error):</b> A signal that becomes active (high) after the setting is completed.</li> <li><b>FB_ERROR (Error flag):</b> Remains inactive (low) throughout the process.</li> <li><b>ERROR_ID (Error code):</b> Remains at 0 throughout the process.</li> </ul>
Relevant manuals	<ul style="list-style-type: none"> <li>• MELSEC-L RTD Input Module User's Manual</li> <li>• MELSEC-L CPU Module User's Manual (Hardware Design, Maintenance and Inspection)</li> <li>• GX Works2 Version 1 Operating Manual (Common)</li> <li>• GX Works2 Version 1 Operating Manual (Simple Project, Function Block)</li> </ul>



## Error codes

### ●Error code list

Error code	Description	Action
None	None	None

## Labels

### ●Input labels

Name (Comment)	Label name	Data type	Setting range	Description
Execution command	FB_EN	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
Module start XY address	iw_Start_IO_No	Word	Depends on the I/O point range of the CPU. For details, refer to the CPU user's manual.	Specify the start XY address (in hexadecimal) where the L60RD8 is connected. (For example, enter H10 for X10.)

### ●Output labels

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

## FB Version Upgrade History

Version	Date	Description
1.00A	2015/07/15	First edition

## Note

This chapter includes information related to the function block.

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

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

## 2.8. M+L60RD8\_ReadTemperatureVal (Read temperature measured value)

### FB Name

M+L60RD8\_ReadTemperatureVal

### Function Overview

Item	Description												
Function overview	Reads the temperature measured value of the specified channel.												
Symbol	<div style="display: flex; align-items: center; justify-content: center;"> <div style="margin-right: 20px;"> <p>Execution command — B : FB_EN</p> <p>Module start XY address — W : iw_Start_IO_No</p> <p>Target CH — W : iw_CH</p> </div> <div style="border: 1px solid black; padding: 10px; text-align: center;"> <p>M+L60RD8_ReadTempVal</p> </div> <div style="margin-left: 20px;"> <p>FB_ENO : B — Execution status</p> <p>FB_OK : B — Completed without error</p> <p>ow_Temp_Value : W — Temperature measured value</p> <p>FB_ERROR : B — Error flag</p> <p>ERROR_ID : W — Error code</p> </div> </div>												
Applicable hardware and software	RTD input module	L60RD8											
	CPU module	<table border="1" style="width: 100%; text-align: center;"> <thead> <tr> <th>Series</th> <th>Model</th> </tr> </thead> <tbody> <tr> <td>MELSEC-L Series</td> <td>LCPU</td> </tr> </tbody> </table>	Series	Model	MELSEC-L Series	LCPU							
	Series	Model											
MELSEC-L Series	LCPU												
Engineering software	GX Works2 *1 <table border="1" style="width: 100%; text-align: center;"> <thead> <tr> <th>Language</th> <th>Software version</th> </tr> </thead> <tbody> <tr> <td>Japanese version</td> <td>Version1.86Q or later</td> </tr> <tr> <td>English version</td> <td>Version1.24A or later</td> </tr> <tr> <td>Chinese (Simplified) version</td> <td>Version1.49B or later</td> </tr> <tr> <td>Chinese (Traditional) version</td> <td>Version1.49B or later</td> </tr> <tr> <td>Korean version</td> <td>Version1.49B or later</td> </tr> </tbody> </table> <p>*1 For software versions applicable to the modules used, refer to "Relevant manuals".</p>	Language	Software version	Japanese version	Version1.86Q or later	English version	Version1.24A or later	Chinese (Simplified) version	Version1.49B or later	Chinese (Traditional) version	Version1.49B or later	Korean version	Version1.49B or later
Language	Software version												
Japanese version	Version1.86Q or later												
English version	Version1.24A or later												
Chinese (Simplified) version	Version1.49B or later												
Chinese (Traditional) version	Version1.49B or later												
Korean version	Version1.49B or later												
Programming language	Ladder												
Number of steps	333 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	<ol style="list-style-type: none"> <li>1) By turning ON FB_EN (Execution command), the temperature measured value of the specified conversion channel (channel 1 to channel 8) is read.</li> <li>2) The read ow_Temp_Value (Temperature measured value) depends on the settings of the input range and averaging processing function.</li> <li>3) When the conversion completed flag (XnE) is OFF, reading the temperature measured value of the specified channel is not executed.</li> <li>4) When the setting value of iw_CH (Target CH) is out of range, the FB_ERROR output turns ON and processing is interrupted. The error code 10 (Decimal) is stored in ERROR_ID. Refer to the error code explanation section for details.</li> <li>5) When the temperature measured value is set in the auto refresh setting of the intelligent function module, this FB is unnecessary.</li> </ol>
Compiling method	Macro type
Restrictions and precautions	<ol style="list-style-type: none"> <li>1) The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation.</li> <li>2) The FB cannot be used in an interrupt program.</li> <li>3) Please ensure that the FB_EN signal is capable of being turned OFF by the program. Do not use this FB in programs that are only executed once such as a subroutine, FOR-NEXT loop because it is impossible to turn OFF.</li> <li>4) When two or more of these FBs are used, precaution must be taken to avoid repetition of iw_CH (Target CH).</li> <li>5) This FB uses index registers Z7 to Z9. Please do not use these index registers in an interrupt program.</li> <li>6) Every input must be provided with a value for proper FB operation.</li> <li>7) To operate the L60RD8, set the input range according to the device and system to be connected. Set the proper settings for the device and system with the parameter setting in GX Works2 or the initial setting FB (M+L60RD8_InitialSetting). For details on how to use the parameter setting in GX Works2, refer to GX Works2 Version 1 Operating Manual (Common).</li> </ol>
FB operation type	Real-time execution
Application example	Refer to "Appendix 1. FB Library Application Examples".
Timing chart	<div style="display: flex; justify-content: space-between;"> <div style="width: 48%;"> <p>[When operation completes without error]</p> </div> <div style="width: 48%;"> <p>[When an error occurs]</p> </div> </div>

Item	Description
Relevant manuals	<ul style="list-style-type: none"> <li>• MELSEC-L RTD Input Module User's Manual</li> <li>• MELSEC-L CPU Module User's Manual (Hardware Design, Maintenance and Inspection)</li> <li>• GX Works2 Version 1 Operating Manual (Common)</li> <li>• GX Works2 Version 1 Operating Manual (Simple Project, Function Block)</li> </ul>

## Error codes

### ●Error code list

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

## Labels

### ●Input labels

Name (Comment)	Label name	Data type	Setting range	Description
Execution command	FB_EN	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
Module start XY address	iw_Start_IO_No	Word	Depends on the I/O point range of the CPU. For details, refer to the CPU user's manual.	Specify the start XY address (in hexadecimal) where the L60RD8 is connected. (For example, enter H10 for X10.)
Target CH	iw_CH	Word	1 to 8	Specify the channel number.

### ●Output labels

Name (Comment)	Label name	Data type	Initial value	Description
Execution status	FB_ENO	Bit	OFF	ON: Execution command is ON. OFF: Execution command is OFF.
Completed without error	FB_OK	Bit	OFF	When ON, it indicates that the temperature measured value is being read.
Temperature measured value	ow_Temp_Value	Word	0	The temperature measured value is stored.
Error flag	FB_ERROR	Bit	OFF	When ON, it indicates that an error has occurred.
Error code	ERROR_ID	Word	0	FB error code output.

## FB Version Upgrade History

Version	Date	Description
1.00A	2015/07/15	First edition

## Note

This chapter includes information related to the function block.

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

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

## 2.9. M+L60RD8\_ReadAllTemperatureVal (Read temperature measured value (all CHs))

### FB Name

M+L60RD8\_ReadAllTemperatureVal

### Function Overview

Item	Description												
Function overview	Reads the temperature measured values of channel 1 to channel 8.												
Symbol	<div style="border: 1px solid black; padding: 10px; width: fit-content; margin: auto;"> <p style="text-align: center; margin: 0;">M+L60RD8_ReadAllTempVal</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%; vertical-align: top;"> <p>Execution command — B : FB_EN</p> <p>Module start XY address — W : iw_Start_IO_No</p> </td> <td style="width: 40%; vertical-align: top; text-align: center;"> <p>FB_ENO : B</p> <p>FB_OK : B</p> <p>ow_TempValue_CH1 : W</p> <p>ow_TempValue_CH2 : W</p> <p>ow_TempValue_CH3 : W</p> <p>ow_TempValue_CH4 : W</p> <p>ow_TempValue_CH5 : W</p> <p>ow_TempValue_CH6 : W</p> <p>ow_TempValue_CH7 : W</p> <p>ow_TempValue_CH8 : W</p> <p>FB_ERROR : B</p> <p>ERROR_ID : W</p> </td> <td style="width: 30%; vertical-align: top;"> <p>— Execution status</p> <p>— Completed without error</p> <p>— CH1 Temperature measured value</p> <p>— CH2 Temperature measured value</p> <p>— CH3 Temperature measured value</p> <p>— CH4 Temperature measured value</p> <p>— CH5 Temperature measured value</p> <p>— CH6 Temperature measured value</p> <p>— CH7 Temperature measured value</p> <p>— CH8 Temperature measured value</p> <p>— Error flag</p> <p>— Error code</p> </td> </tr> </table> </div>		<p>Execution command — B : FB_EN</p> <p>Module start XY address — W : iw_Start_IO_No</p>	<p>FB_ENO : B</p> <p>FB_OK : B</p> <p>ow_TempValue_CH1 : W</p> <p>ow_TempValue_CH2 : W</p> <p>ow_TempValue_CH3 : W</p> <p>ow_TempValue_CH4 : W</p> <p>ow_TempValue_CH5 : W</p> <p>ow_TempValue_CH6 : W</p> <p>ow_TempValue_CH7 : W</p> <p>ow_TempValue_CH8 : W</p> <p>FB_ERROR : B</p> <p>ERROR_ID : W</p>	<p>— Execution status</p> <p>— Completed without error</p> <p>— CH1 Temperature measured value</p> <p>— CH2 Temperature measured value</p> <p>— CH3 Temperature measured value</p> <p>— CH4 Temperature measured value</p> <p>— CH5 Temperature measured value</p> <p>— CH6 Temperature measured value</p> <p>— CH7 Temperature measured value</p> <p>— CH8 Temperature measured value</p> <p>— Error flag</p> <p>— Error code</p>								
<p>Execution command — B : FB_EN</p> <p>Module start XY address — W : iw_Start_IO_No</p>	<p>FB_ENO : B</p> <p>FB_OK : B</p> <p>ow_TempValue_CH1 : W</p> <p>ow_TempValue_CH2 : W</p> <p>ow_TempValue_CH3 : W</p> <p>ow_TempValue_CH4 : W</p> <p>ow_TempValue_CH5 : W</p> <p>ow_TempValue_CH6 : W</p> <p>ow_TempValue_CH7 : W</p> <p>ow_TempValue_CH8 : W</p> <p>FB_ERROR : B</p> <p>ERROR_ID : W</p>	<p>— Execution status</p> <p>— Completed without error</p> <p>— CH1 Temperature measured value</p> <p>— CH2 Temperature measured value</p> <p>— CH3 Temperature measured value</p> <p>— CH4 Temperature measured value</p> <p>— CH5 Temperature measured value</p> <p>— CH6 Temperature measured value</p> <p>— CH7 Temperature measured value</p> <p>— CH8 Temperature measured value</p> <p>— Error flag</p> <p>— Error code</p>											
Applicable hardware and software	RTD input module	L60RD8											
	CPU module	<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="width: 50%;">Series</th> <th style="width: 50%;">Model</th> </tr> </thead> <tbody> <tr> <td>MELSEC-L Series</td> <td>LCPU</td> </tr> </tbody> </table>	Series	Model	MELSEC-L Series	LCPU							
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Chinese (Simplified) version	Version1.49B or later												
Chinese (Traditional) version	Version1.49B or later												
Korean version	Version1.49B or later												
Programming language	Ladder												
Number of steps	<p>314 steps (for MELSEC-L series CPU)</p> <p>* The number of steps of the FB in a program depends on the CPU model that is used and input and output definition.</p>												

Item	Description
Function description	<ol style="list-style-type: none"> <li>1) By turning ON FB_EN (Execution command), the temperature measured values of channel 1 to channel 8 are read.</li> <li>2) The read ow_TempValue_CH1 (CH1 Temperature measured value) to ow_TempValue_CH8 (CH8 Temperature measured value) depend on the settings of the input range and averaging processing function.</li> <li>3) When the conversion completed flag (XnE) is OFF, reading the temperature measured values of channel 1 to channel 8 are not executed.</li> <li>4) When the temperature measured value is set in the auto refresh setting of the intelligent function module, this FB is unnecessary.</li> </ol>
Compiling method	Macro type
Restrictions and precautions	<ol style="list-style-type: none"> <li>1) The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation.</li> <li>2) The FB cannot be used in an interrupt program.</li> <li>3) Please ensure that the FB_EN signal is capable of being turned OFF by the program. Do not use this FB in programs that are only executed once such as a subroutine, FOR-NEXT loop because it is impossible to turn OFF.</li> <li>4) This FB uses index registers Z8 and Z9. Please do not use these index registers in an interrupt program.</li> <li>5) Every input must be provided with a value for proper FB operation.</li> <li>6) To operate the L60RD8, set the input range according to the device and system to be connected. Set the proper settings for the device and system with the parameter setting in GX Works2 or the initial setting FB (M+L60RD8_InitialSetting). For details on how to use the parameter setting in GX Works2, refer to GX Works2 Version 1 Operating Manual (Common).</li> </ol>
FB operation type	Real-time execution
Application example	Refer to "Appendix 1. FB Library Application Examples".
Timing chart	<p>The timing chart shows the following signals and their states:</p> <ul style="list-style-type: none"> <li><b>FB_EN (Execution command):</b> A pulse that starts the process.</li> <li><b>FB_ENO (Execution status):</b> Becomes active (high) during the 'Refreshing' period and inactive (low) during 'Refresh stop'.</li> <li><b>ow_TempValue_CH□ (CH□ Temperature measured value):</b> Data is updated during the 'Refreshing' period.</li> <li><b>FB_OK (Completed without error):</b> Becomes active (high) during the 'Refreshing' period and inactive (low) during 'Refresh stop'.</li> <li><b>FB_ERROR (Error flag):</b> Remains inactive (low).</li> <li><b>ERROR_ID (Error code):</b> Remains at 0.</li> </ul>
Relevant manuals	<ul style="list-style-type: none"> <li>• MELSEC-L RTD Input Module User's Manual</li> <li>• MELSEC-L CPU Module User's Manual (Hardware Design, Maintenance and Inspection)</li> <li>• GX Works2 Version 1 Operating Manual (Common)</li> <li>• GX Works2 Version 1 Operating Manual (Simple Project, Function Block)</li> </ul>

## Error codes

### ●Error code list

Error code	Description	Action
None	None	None

## Labels

### ●Input labels

Name (Comment)	Label name	Data type	Setting range	Description
Execution command	FB_EN	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
Module start XY address	iw_Start_IO_No	Word	Depends on the I/O point range of the CPU. For details, refer to the CPU user's manual.	Specify the start XY address (in hexadecimal) where the L60RD8 is connected. (For example, enter H10 for X10.)



●Output labels

Name (Comment)	Label name	Data type	Initial value	Description
Execution status	FB_ENO	Bit	OFF	ON: Execution command is ON. OFF: Execution command is OFF.
Completed without error	FB_OK	Bit	OFF	When ON, it indicates that the temperature measured value is being read.
CH1 Temperature measured value	ow_TempValue_CH1	Word	0	The temperature measured value of channel 1 is stored.
CH2 Temperature measured value	ow_TempValue_CH2	Word	0	The temperature measured value of channel 2 is stored.
CH3 Temperature measured value	ow_TempValue_CH3	Word	0	The temperature measured value of channel 3 is stored.
CH4 Temperature measured value	ow_TempValue_CH4	Word	0	The temperature measured value of channel 4 is stored.
CH5 Temperature measured value	ow_TempValue_CH5	Word	0	The temperature measured value of channel 5 is stored.
CH6 Temperature measured value	ow_TempValue_CH6	Word	0	The temperature measured value of channel 6 is stored.
CH7 Temperature measured value	ow_TempValue_CH7	Word	0	The temperature measured value of channel 7 is stored.
CH8 Temperature measured value	ow_TempValue_CH8	Word	0	The temperature measured value of channel 8 is stored.
Error flag	FB_ERROR	Bit	OFF	Always OFF
Error code	ERROR_ID	Word	0	Always 0

### FB Version Upgrade History

Version	Date	Description
1.00A	2015/07/15	First edition

### Note

This chapter includes information related to the function block.

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

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

## 2.10. M+L60RD8\_ReadOperationVal (Read digital operation value)

### FB Name

M+L60RD8\_ReadOperationVal

### Function Overview

Item	Description												
Function overview	Reads the digital operation value and the digital operation processing method of the specified channel.												
Symbol	<div style="display: flex; align-items: center; justify-content: space-between;"> <div style="width: 30%;"> <p>Execution command — B : FB_EN</p> <p>Module start XY address — W : iw_Start_IO_No</p> <p>Target CH — W : iw_CH</p> </div> <div style="width: 40%; border: 1px solid black; padding: 5px; text-align: center;"> <p>M+L60RD8_ReadOperationVal</p> </div> <div style="width: 30%;"> <p>FB_ENO : B — Execution status</p> <p>FB_OK : B — Completed without error</p> <p>ow_Operation_Val : W — Digital operation value</p> <p>ow_DigOperation : B — Digital operation processing method</p> <p>FB_ERROR : B — Error flag</p> <p>ERROR_ID : W — Error code</p> </div> </div>												
Applicable hardware and software	RTD input module	L60RD8											
	CPU module	<table border="1" style="width: 100%; text-align: center;"> <thead> <tr> <th>Series</th> <th>Model</th> </tr> </thead> <tbody> <tr> <td>MELSEC-L Series</td> <td>LCPU</td> </tr> </tbody> </table>	Series	Model	MELSEC-L Series	LCPU							
	Series	Model											
MELSEC-L Series	LCPU												
Engineering software	GX Works2 *1 <table border="1" style="width: 100%; text-align: center;"> <thead> <tr> <th>Language</th> <th>Software version</th> </tr> </thead> <tbody> <tr> <td>Japanese version</td> <td>Version1.86Q or later</td> </tr> <tr> <td>English version</td> <td>Version1.24A or later</td> </tr> <tr> <td>Chinese (Simplified) version</td> <td>Version1.49B or later</td> </tr> <tr> <td>Chinese (Traditional) version</td> <td>Version1.49B or later</td> </tr> <tr> <td>Korean version</td> <td>Version1.49B or later</td> </tr> </tbody> </table> <p>*1 For software versions applicable to the modules used, refer to "Relevant manuals".</p>	Language	Software version	Japanese version	Version1.86Q or later	English version	Version1.24A or later	Chinese (Simplified) version	Version1.49B or later	Chinese (Traditional) version	Version1.49B or later	Korean version	Version1.49B or later
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Japanese version	Version1.86Q or later												
English version	Version1.24A or later												
Chinese (Simplified) version	Version1.49B or later												
Chinese (Traditional) version	Version1.49B or later												
Korean version	Version1.49B or later												
Programming language	Ladder												
Number of steps	332 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	<ol style="list-style-type: none"> <li>1) By turning ON FB_EN (Execution command), the digital operation value and the digital operation processing method of the specified conversion channel (channel 1 to channel 8) are read.</li> <li>2) The read ow_Operation_Val (Digital operation value) depends on the input range setting, the averaging processing function setting, the scaling function setting, and the sensor correction function setting.</li> <li>3) When the conversion completed flag (XnE) is OFF, reading the digital operation value and the digital operation processing method is not executed.</li> <li>4) When the setting value of iw_CH (Target CH) is out of range, the FB_ERROR output turns ON and processing is interrupted. The error code 10 (Decimal) is stored in ERROR_ID. Refer to the error code explanation section for details.</li> <li>5) When the digital operation value is set in the auto refresh setting of the intelligent function module, this FB is unnecessary.</li> </ol>
Compiling method	Macro type
Restrictions and precautions	<ol style="list-style-type: none"> <li>1) The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation.</li> <li>2) The FB cannot be used in an interrupt program.</li> <li>3) Please ensure that the FB_EN signal is capable of being turned OFF by the program. Do not use this FB in programs that are only executed once such as a subroutine, FOR-NEXT loop because it is impossible to turn OFF.</li> <li>4) When two or more of these FBs are used, precaution must be taken to avoid repetition of iw_CH (Target CH).</li> <li>5) This FB uses index registers Z7 to Z9. Please do not use these index registers in an interrupt program.</li> <li>6) Every input must be provided with a value for proper FB operation.</li> <li>7) To operate the L60RD8, set the input range according to the device and system to be connected. Set the proper settings for the device and system with the parameter setting in GX Works2 or the initial setting FB (M+L60RD8_InitialSetting). For details on how to use the parameter setting in GX Works2, refer to GX Works2 Version 1 Operating Manual (Common).</li> </ol>
FB operation type	Real-time execution
Application example	Refer to "Appendix 1. FB Library Application Examples".

Item	Description	
Timing chart	<p>[When operation completes without error]</p>	<p>[When an error occurs]</p>
Relevant manuals	<ul style="list-style-type: none"> <li>• MELSEC-L RTD Input Module User's Manual</li> <li>• MELSEC-L CPU Module User's Manual (Hardware Design, Maintenance and Inspection)</li> <li>• GX Works2 Version 1 Operating Manual (Common)</li> <li>• GX Works2 Version 1 Operating Manual (Simple Project, Function Block)</li> </ul>	

## Error codes

### ●Error code list

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

## Labels

### ●Input labels

Name (Comment)	Label name	Data type	Setting range	Description
Execution command	FB_EN	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
Module start XY address	iw_Start_IO_No	Word	Depends on the I/O point range of the CPU. For details, refer to the CPU user's manual.	Specify the start XY address (in hexadecimal) where the L60RD8 is connected. (For example, enter H10 for X10.)
Target CH	iw_CH	Word	1 to 8	Specify the channel number.

●Output labels

Name (Comment)	Label name	Data type	Initial value	Description
Execution status	FB_ENO	Bit	OFF	ON: Execution command is ON. OFF: Execution command is OFF.
Completed without error	FB_OK	Bit	OFF	When ON, it indicates that the digital operation value is being read.
Digital operation value	ow_Operation_Val	Word	0	The digital operation value is stored.
Digital operation processing method	ow_DigOperation	Word	0	The digital operation processing method is stored. 0: No selection 1: Scaling being run 2: Sensor correction being run (shift) 3: Sensor correction being run (sensor two-point correction) 4: Sensor correction being run (shift + sensor two-point correction)
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	2015/07/15	First edition

### Note

This chapter includes information related to the function block.

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

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

## 2.11. M+L60RD8\_ReadAllOperationVal (Read digital operation value (all CHs))

### FB Name

M+L60RD8\_ReadAllOperationVal

### Function Overview

Item	Description												
Function overview	Reads the digital operation values of channel 1 to channel 8.												
Symbol	<div style="border: 1px solid black; padding: 10px; width: fit-content; margin: auto;"> <p style="text-align: center; margin: 0;">M+L60RD8_ReadAllOperationVal</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%; vertical-align: top;"> <p>Execution command — B : FB_EN</p> <p>Module start XY address — W : iw_Start_IO_No</p> </td> <td style="width: 40%; vertical-align: top; text-align: center;"> <p>FB_ENO : B</p> <p>FB_OK : B</p> <p>ow_Operation_CH1 : W</p> <p>ow_Operation_CH2 : W</p> <p>ow_Operation_CH3 : W</p> <p>ow_Operation_CH4 : W</p> <p>ow_Operation_CH5 : W</p> <p>ow_Operation_CH6 : W</p> <p>ow_Operation_CH7 : W</p> <p>ow_Operation_CH8 : W</p> <p>FB_ERROR : B</p> <p>ERROR_ID : W</p> </td> <td style="width: 30%; vertical-align: top;"> <p>— Execution status</p> <p>— Completed without error</p> <p>— CH1 Digital operation value</p> <p>— CH2 Digital operation value</p> <p>— CH3 Digital operation value</p> <p>— CH4 Digital operation value</p> <p>— CH5 Digital operation value</p> <p>— CH6 Digital operation value</p> <p>— CH7 Digital operation value</p> <p>— CH8 Digital operation value</p> <p>— Error flag</p> <p>— Error code</p> </td> </tr> </table> </div>		<p>Execution command — B : FB_EN</p> <p>Module start XY address — W : iw_Start_IO_No</p>	<p>FB_ENO : B</p> <p>FB_OK : B</p> <p>ow_Operation_CH1 : W</p> <p>ow_Operation_CH2 : W</p> <p>ow_Operation_CH3 : W</p> <p>ow_Operation_CH4 : W</p> <p>ow_Operation_CH5 : W</p> <p>ow_Operation_CH6 : W</p> <p>ow_Operation_CH7 : W</p> <p>ow_Operation_CH8 : W</p> <p>FB_ERROR : B</p> <p>ERROR_ID : W</p>	<p>— Execution status</p> <p>— Completed without error</p> <p>— CH1 Digital operation value</p> <p>— CH2 Digital operation value</p> <p>— CH3 Digital operation value</p> <p>— CH4 Digital operation value</p> <p>— CH5 Digital operation value</p> <p>— CH6 Digital operation value</p> <p>— CH7 Digital operation value</p> <p>— CH8 Digital operation value</p> <p>— Error flag</p> <p>— Error code</p>								
<p>Execution command — B : FB_EN</p> <p>Module start XY address — W : iw_Start_IO_No</p>	<p>FB_ENO : B</p> <p>FB_OK : B</p> <p>ow_Operation_CH1 : W</p> <p>ow_Operation_CH2 : W</p> <p>ow_Operation_CH3 : W</p> <p>ow_Operation_CH4 : W</p> <p>ow_Operation_CH5 : W</p> <p>ow_Operation_CH6 : W</p> <p>ow_Operation_CH7 : W</p> <p>ow_Operation_CH8 : W</p> <p>FB_ERROR : B</p> <p>ERROR_ID : W</p>	<p>— Execution status</p> <p>— Completed without error</p> <p>— CH1 Digital operation value</p> <p>— CH2 Digital operation value</p> <p>— CH3 Digital operation value</p> <p>— CH4 Digital operation value</p> <p>— CH5 Digital operation value</p> <p>— CH6 Digital operation value</p> <p>— CH7 Digital operation value</p> <p>— CH8 Digital operation value</p> <p>— Error flag</p> <p>— Error code</p>											
Applicable hardware and software	RTD input module	L60RD8											
	CPU module	<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="width: 50%;">Series</th> <th style="width: 50%;">Model</th> </tr> </thead> <tbody> <tr> <td>MELSEC-L Series</td> <td>LCPU</td> </tr> </tbody> </table>	Series	Model	MELSEC-L Series	LCPU							
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MELSEC-L Series	LCPU												
Engineering software	GX Works2 *1 <table border="1" style="width: 100%; border-collapse: collapse; text-align: center; margin-top: 5px;"> <thead> <tr> <th style="width: 50%;">Language</th> <th style="width: 50%;">Software version</th> </tr> </thead> <tbody> <tr> <td>Japanese version</td> <td>Version1.86Q or later</td> </tr> <tr> <td>English version</td> <td>Version1.24A or later</td> </tr> <tr> <td>Chinese (Simplified) version</td> <td>Version1.49B or later</td> </tr> <tr> <td>Chinese (Traditional) version</td> <td>Version1.49B or later</td> </tr> <tr> <td>Korean version</td> <td>Version1.49B or later</td> </tr> </tbody> </table> <p>*1 For software versions applicable to the modules used, refer to "Relevant manuals".</p>	Language	Software version	Japanese version	Version1.86Q or later	English version	Version1.24A or later	Chinese (Simplified) version	Version1.49B or later	Chinese (Traditional) version	Version1.49B or later	Korean version	Version1.49B or later
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Chinese (Simplified) version	Version1.49B or later												
Chinese (Traditional) version	Version1.49B or later												
Korean version	Version1.49B or later												
Programming language	Ladder												

Item	Description
Number of steps	309 steps (for MELSEC-L series CPU) * The number of steps of the FB in a program depends on the CPU model that is used and input and output definition.
Function description	1) By turning ON FB_EN (Execution command), the digital operation values of channel 1 to channel 8 are read. 2) The read ow_Operation_CH1 (CH1 Digital operation value) to ow_Operation_CH8 (CH8 Digital operation value) depend on the input range setting, the averaging processing function setting, the scaling function setting, and the sensor correction function setting. 3) When the conversion completed flag (XnE) is OFF, reading the digital operation values of channel 1 to channel 8 is not executed. 4) When the digital operation value is set in the auto refresh setting of the intelligent function module, this FB is unnecessary.
Compiling method	Macro type
Restrictions and precautions	1) The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation. 2) The FB cannot be used in an interrupt program. 3) Please ensure that the FB_EN signal is capable of being turned OFF by the program. Do not use this FB in programs that are only executed once such as a subroutine, FOR-NEXT loop because it is impossible to turn OFF. 4) This FB uses index registers Z8 and Z9. Please do not use these index registers in an interrupt program. 5) Every input must be provided with a value for proper FB operation. 6) To operate the L60RD8, set the input range according to the device and system to be connected. Set the proper settings for the device and system with the parameter setting in GX Works2 or the initial setting FB (M+L60RD8_InitialSetting). For details on how to use the parameter setting in GX Works2, refer to GX Works2 Version 1 Operating Manual (Common).
FB operation type	Real-time execution
Application example	Refer to "Appendix 1. FB Library Application Examples".
Timing chart	<p>The timing chart illustrates the sequence of events during the execution of the FB. It shows the relationship between the execution command (FB_EN), the execution status (FB_ENO), the digital operation values (ow_Operation_CH□), and the completion flags (FB_OK, FB_ERROR, ERROR_ID). The process starts with a 'Refresh stop' period where the digital operation values are constant. This is followed by a 'Refreshing' period where the digital operation values are updated. Once refreshing is complete, FB_OK is set to ON, and FB_ERROR and ERROR_ID remain at 0.</p>

Item	Description
Relevant manuals	<ul style="list-style-type: none"> <li>• MELSEC-L RTD Input Module User's Manual</li> <li>• MELSEC-L CPU Module User's Manual (Hardware Design, Maintenance and Inspection)</li> <li>• GX Works2 Version 1 Operating Manual (Common)</li> <li>• GX Works2 Version 1 Operating Manual (Simple Project, Function Block)</li> </ul>

## Error codes

### ●Error code list

Error code	Description	Action
None	None	None

## Labels

### ●Input labels

Name (Comment)	Label name	Data type	Setting range	Description
Execution command	FB_EN	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
Module start XY address	iw_Start_IO_No	Word	Depends on the I/O point range of the CPU. For details, refer to the CPU user's manual.	Specify the start XY address (in hexadecimal) where the L60RD8 is connected. (For example, enter H10 for X10.)

### ●Output labels

Name (Comment)	Label name	Data type	Initial value	Description
Execution status	FB_ENO	Bit	OFF	ON: Execution command is ON. OFF: Execution command is OFF.
Completed without error	FB_OK	Bit	OFF	When ON, it indicates that the digital operation value is being read.
CH1 Digital operation value	ow_Operation_CH1	Word	0	The digital operation value of channel 1 is stored.
CH2 Digital operation value	ow_Operation_CH2	Word	0	The digital operation value of channel 2 is stored.
CH3 Digital operation value	ow_Operation_CH3	Word	0	The digital operation value of channel 3 is stored.
CH4 Digital operation value	ow_Operation_CH4	Word	0	The digital operation value of channel 4 is stored.
CH5 Digital operation value	ow_Operation_CH5	Word	0	The digital operation value of channel 5 is stored.



Name (Comment)	Label name	Data type	Initial value	Description
CH6 Digital operation value	ow_Operation_CH6	Word	0	The digital operation value of channel 6 is stored.
CH7 Digital operation value	ow_Operation_CH7	Word	0	The digital operation value of channel 7 is stored.
CH8 Digital operation value	ow_Operation_CH8	Word	0	The digital operation value of channel 8 is stored.
Error flag	FB_ERROR	Bit	OFF	Always OFF
Error code	ERROR_ID	Word	0	Always 0

### FB Version Upgrade History

Version	Date	Description
1.00A	2015/07/15	First edition

### Note

This chapter includes information related to the function block.

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

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

## 2.12. M+L60RD8\_ErrorOperation (Error operation)

### FB Name

M+L60RD8\_ErrorOperation

### Function Overview

Item	Description												
Function overview	Monitors error codes and resets errors.												
Symbol	<div style="border: 1px solid black; padding: 10px; width: fit-content; margin: auto;"> <p style="text-align: center; margin: 0;">M+L60RD8_ErrorOperation</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%; vertical-align: top;"> <p>Execution command — B : FB_EN</p> <p>Module start XY address — W : iw_Start_IO_No</p> <p>Error reset request — B : ib_Error_Reset</p> </td> <td style="width: 40%; vertical-align: top; text-align: center;"> <p>FB_ENO : B — Execution status</p> <p>FB_OK : B — Completed without error</p> <p>ob_UNIT_ERROR : B — Module error flag</p> <p>ow_UNIT_ERR_CODE : W — Module error code</p> <p>FB_ERROR : B — Error flag</p> <p>ERROR_ID : W — Error code</p> </td> <td style="width: 30%;"></td> </tr> </table> </div>		<p>Execution command — B : FB_EN</p> <p>Module start XY address — W : iw_Start_IO_No</p> <p>Error reset request — B : ib_Error_Reset</p>	<p>FB_ENO : B — Execution status</p> <p>FB_OK : B — Completed without error</p> <p>ob_UNIT_ERROR : B — Module error flag</p> <p>ow_UNIT_ERR_CODE : W — Module error code</p> <p>FB_ERROR : B — Error flag</p> <p>ERROR_ID : W — Error code</p>									
<p>Execution command — B : FB_EN</p> <p>Module start XY address — W : iw_Start_IO_No</p> <p>Error reset request — B : ib_Error_Reset</p>	<p>FB_ENO : B — Execution status</p> <p>FB_OK : B — Completed without error</p> <p>ob_UNIT_ERROR : B — Module error flag</p> <p>ow_UNIT_ERR_CODE : W — Module error code</p> <p>FB_ERROR : B — Error flag</p> <p>ERROR_ID : W — Error code</p>												
Applicable hardware and software	RTD input module	L60RD8											
	CPU module	<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="width: 50%;">Series</th> <th style="width: 50%;">Model</th> </tr> </thead> <tbody> <tr> <td>MELSEC-L Series</td> <td>LCPU</td> </tr> </tbody> </table>	Series	Model	MELSEC-L Series	LCPU							
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Engineering software	<p>GX Works2 *1</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="width: 50%;">Language</th> <th style="width: 50%;">Software version</th> </tr> </thead> <tbody> <tr> <td>Japanese version</td> <td>Version1.86Q or later</td> </tr> <tr> <td>English version</td> <td>Version1.24A or later</td> </tr> <tr> <td>Chinese (Simplified) version</td> <td>Version1.49B or later</td> </tr> <tr> <td>Chinese (Traditional) version</td> <td>Version1.49B or later</td> </tr> <tr> <td>Korean version</td> <td>Version1.49B or later</td> </tr> </tbody> </table> <p>*1 For software versions applicable to the modules used, refer to "Relevant manuals".</p>	Language	Software version	Japanese version	Version1.86Q or later	English version	Version1.24A or later	Chinese (Simplified) version	Version1.49B or later	Chinese (Traditional) version	Version1.49B or later	Korean version	Version1.49B or later
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English version	Version1.24A or later												
Chinese (Simplified) version	Version1.49B or later												
Chinese (Traditional) version	Version1.49B or later												
Korean version	Version1.49B or later												
Programming language	Ladder												
Number of steps	<p>305 steps (for MELSEC-L series CPU)</p> <p>* The number of steps of the FB in a program depends on the CPU model that is used and input and output definition.</p>												
Function description	<p>1) When FB_EN (Execution command) is turned ON, an error of the target module is monitored.</p> <p>2) After FB_EN (Execution command) is turned ON, the error is reset when ib_Error_Reset (Error reset request) is turned ON during error occurrence.</p>												

Item	Description
Compiling method	Macro type
Restrictions and precautions	<ol style="list-style-type: none"> <li>1) The FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation.</li> <li>2) The FB cannot be used in an interrupt program.</li> <li>3) Please ensure that the FB_EN signal is capable of being turned OFF by the program. Do not use this FB in programs that are only executed once such as a subroutine, FOR-NEXT loop because it is impossible to turn OFF.</li> <li>4) This FB uses index registers Z8 and Z9. Please do not use these index registers in an interrupt program.</li> <li>5) Every input must be provided with a value for proper FB operation.</li> <li>6) When this FB is used in two or more places, a duplicated coil warning may occur during compile operation due to the Y signal being operated by index modification. However this is not a problem and the FB will operate without error.</li> <li>7) To operate the L60RD8, set the input range according to the device and system to be connected. Set the proper settings for the device and system with the parameter setting in GX Works2 or the initial setting FB (M+L60RD8_InitialSetting). For details on how to use the parameter setting in GX Works2, refer to GX Works2 Version 1 Operating Manual (Common).</li> </ol>
FB operation type	Real-time execution
Application example	Refer to "Appendix 1. FB Library Application Examples".
Timing chart	
Relevant manuals	<ul style="list-style-type: none"> <li>• MELSEC-L RTD Input Module User's Manual</li> <li>• MELSEC-L CPU Module User's Manual (Hardware Design, Maintenance and Inspection)</li> <li>• GX Works2 Version 1 Operating Manual (Common)</li> <li>• GX Works2 Version 1 Operating Manual (Simple Project, Function Block)</li> </ul>

## Error codes

### ●Error code list

Error code	Description	Action
None	None	None

## Labels

### ●Input labels

Name (Comment)	Label name	Data type	Setting range	Description
Execution command	FB_EN	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
Module start XY address	iw_Start_IO_No	Word	Depends on the I/O point range of the CPU. For details, refer to the CPU user's manual.	Specify the start XY address (in hexadecimal) where the L60RD8 is connected. (For example, enter H10 for X10.)
Error reset request	ib_Error_Reset	Bit	ON, OFF	Turn ON for the error reset. Turn OFF after the error reset.

### ●Output labels

Name (Comment)	Label name	Data type	Initial value	Description
Execution status	FB_ENO	Bit	OFF	ON: Execution command is ON (Module errors are being monitored.) OFF: Execution command is OFF.
Completed without error	FB_OK	Bit	OFF	When ON, it indicates that an error reset is completed.
Module error flag	ob_UNIT_ERROR	Bit	OFF	When ON, it indicates that a module error has occurred.
Module error code	ow_UNIT_ERR_CODE	Word	0	Stores the error code of the current error.
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	2015/07/15	First edition

## Note

This chapter includes information related to the function block.

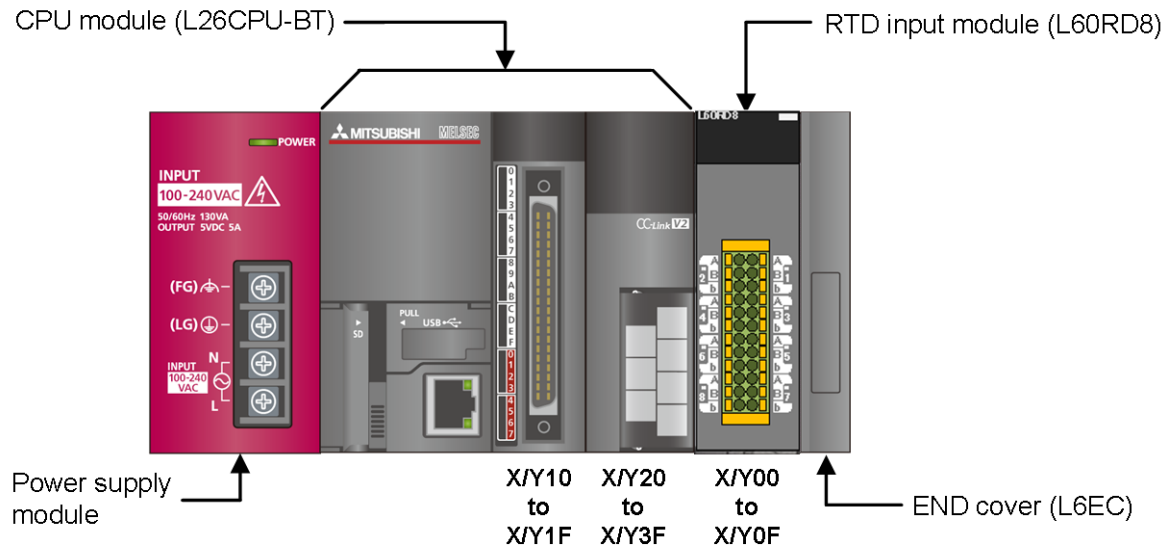
It does not include information on restrictions of use such as combination with modules or programmable controller CPUs.

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

## Appendix 1. FB Library Application Examples

L60RD8 FB application examples are as follows.

### 1) System configuration



#### Reminder

- Every input must be provided with a value for proper FB operation. If not set, the values will be unspecified.
- Abbreviations may be used in the label comments due to the limitation on the number of the characters to display in GX Works2.

### 2) Global label setting

None

### 3) Application example settings

#### a) Common setting

Input and output item	Value	Description
Module start XY address	0	Specify the start XY address where the L60RD8 is connected.

## List of devices

### a) External input (command)

Device	FB name	Application (ON details)
M0	M+L60RD8_InitialSetting	Initial setting request
M10	M+L60RD8_SetAverage	Averaging proc setting request
M20	M+L60RD8_SetDigitalOperation	Digital operation proc set req.
M30	M+L60RD8_SetDisconnect	Disconnection detection set req.
M40	M+L60RD8_SetProcessAlarm	Process alarm setting request
M41		Process alarm enable/disable set
M50	M+L60RD8_SetRateAlarm	Rate alarm setting request
M51		Rate alarm enable/disable set
M52		Rate alarm change rate selection
M60	M+L60RD8_RequestSetting	Operating condition setting req.
M70	M+L60RD8_ReadTemperatureVal	Temp measure value reading req.
M80	M+L60RD8_ReadAllTemperatureVal	All temp measure value read req.
M90	M+L60RD8_ReadOperationVal	Digital operation value read req.
M100	M+L60RD8_ReadAllOperationVal	All digital opr value read req.
M110	M+L60RD8_ErrorOperation	Error operation request
M111		Error reset request

b) External output (check)

Device	FB name	Application (ON details)
M1	M+L60RD8_InitialSetting	Initial setting FB ready
M2		Initial setting complete
F0		Initial setting FB error
D0		Initial setting FB error code
M11	M+L60RD8_SetAverage	Averaging proc setting FB ready
M12		Averaging proc setting complete
F1		Averaging proc setting FB error
D10		Averaging proc set FB error code
M21	M+L60RD8_SetDigitalOperation	Digital opr proc set FB ready
M22		Digital opr proc set complete
F2		Digital opr proc set FB error
D20		Digital opr proc set FB err code
M31	M+L60RD8_SetDisconnect	Disconnection detect set FB rdy.
M32		Disconnection detection set comp
F3		Disconnection detect set FB err.
D30		Disconnect detect set FB err cod
M42	M+L60RD8_SetProcessAlarm	Process alarm setting FB ready
M43		Process alarm setting complete
F4		Process alarm setting FB error
D40		Process alarm set FB error code
M53	M+L60RD8_SetRateAlarm	Rate alarm setting FB ready
M54		Rate alarm setting complete
F5		Rate alarm setting FB error
D50		Rate alarm setting FB error code
M61	M+L60RD8_RequestSetting	Operate condition set req FB rdy
M62		Operating condition set req comp
M71	M+L60RD8_ReadTemperatureVal	Temp measure value read FB ready
M72		Temp measure value read complete
F7		Temp measure value read FB error
D70		Temperature measured value
D71		Temp msr value read FB err code

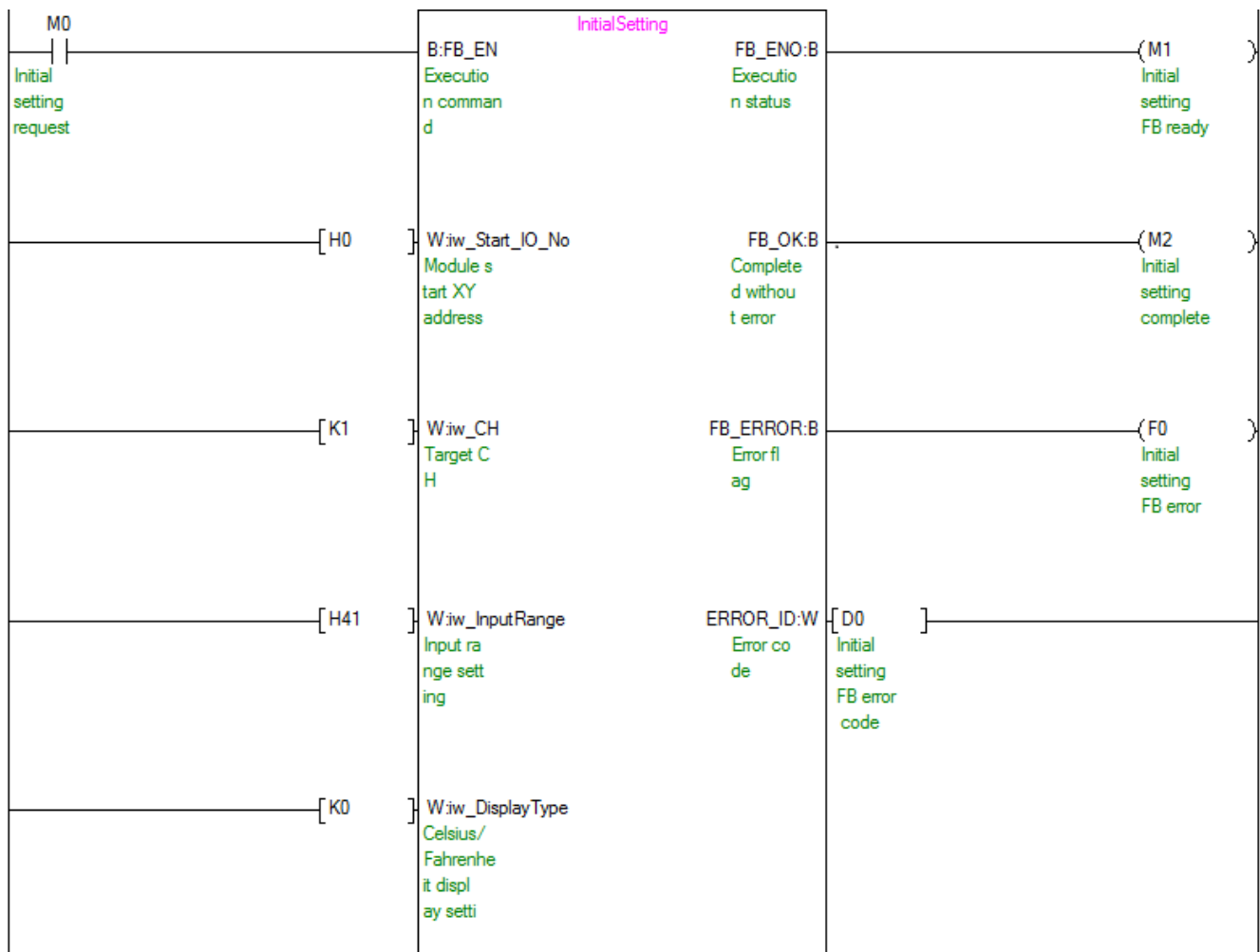


Device	FB name	Application (ON details)
M81	M+L60RD8_ReadAllTemperatureVal	All temp msr value read FB ready
M82		All temp msr value read complete
D80		CH1 Temperature measured value
D81		CH2 Temperature measured value
D82		CH3 Temperature measured value
D83		CH4 Temperature measured value
D84		CH5 Temperature measured value
D85		CH6 Temperature measured value
D86		CH7 Temperature measured value
D87		CH8 Temperature measured value
M91		M+L60RD8_ReadOperationVal
M92	Digital operation val read comp	
F9	Digitl operation val read FB err	
D90	Digital operation value	
D91	Digital operation processing method	
D92	Digital val read FB error code	
M101	M+L60RD8_ReadAllOperationVal	All digital value read FB ready
M102		All digital value read complete
D100		CH1 Digital operation value
D101		CH2 Digital operation value
D102		CH3 Digital operation value
D103		CH4 Digital operation value
D104		CH5 Digital operation value
D105		CH6 Digital operation value
D106		CH7 Digital operation value
D107	CH8 Digital operation value	
M112	M+L60RD8_ErrorOperation	Error operation FB ready
M113		Error reset complete
M114		Module error
D110		Module error code

M+L60RD8\_InitialSetting (Initial setting)

Label name	Setting value	Description
iw_Start_IO_No	H0	Set the start XY address where the L60RD8 is connected to 0H.
iw_CH	K1	Set the target channel to channel 1.
iw_InputRange	H41	Set the input range setting to Pt100 (-200 to 850°C)
iw_DisplayType	K0	Set the Celsius/Fahrenheit display setting to the Celsius display.

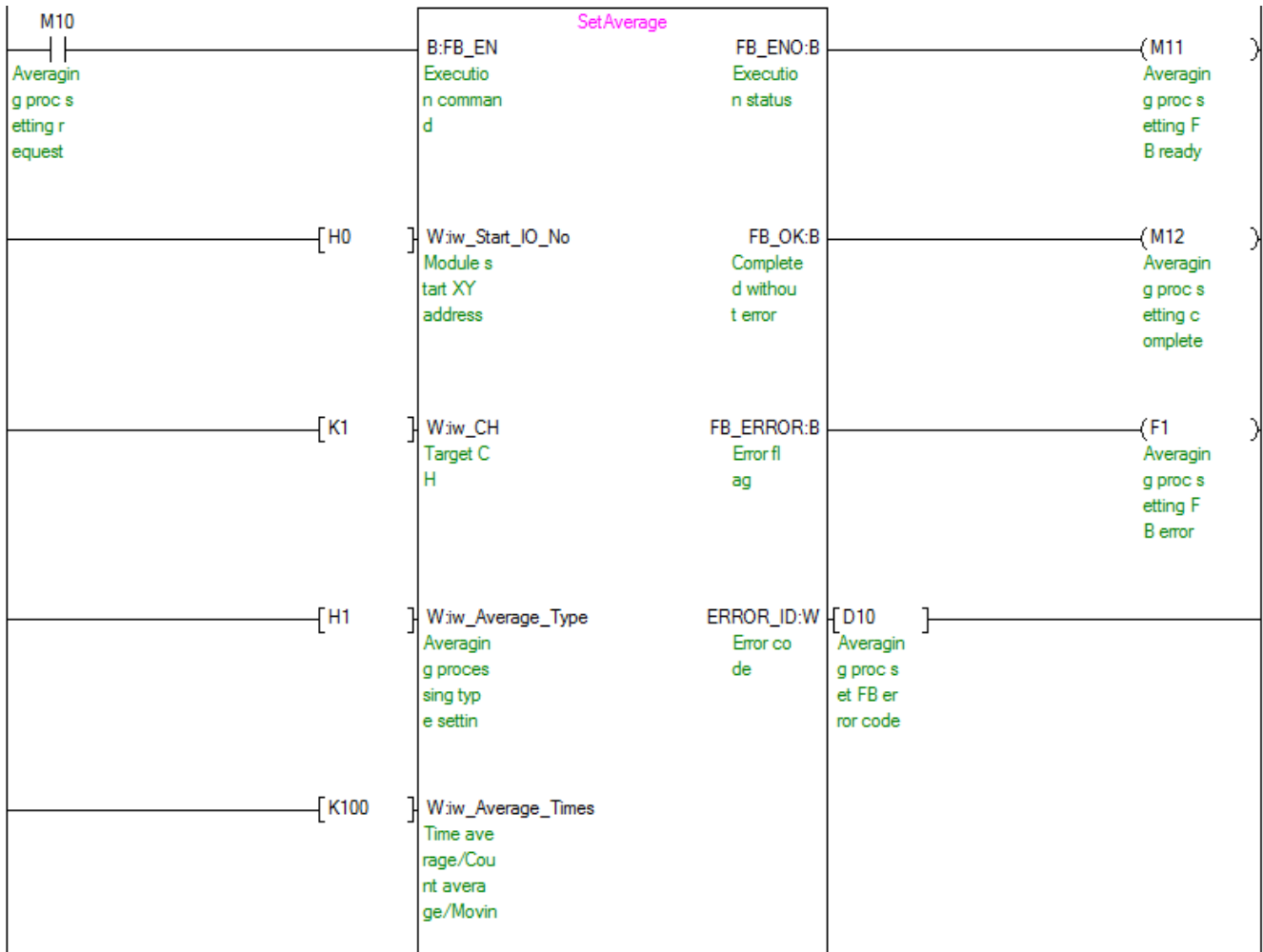
By turning ON M0, the setting values of the input range setting and Celsius/Fahrenheit display setting of channel 1 are written to the buffer memory.



M+L60RD8\_SetAverage (Averaging processing setting)

Label name	Setting value	Description
iw_Start_IO_No	H0	Set the start XY address where the L60RD8 is connected to 0H.
iw_CH	K1	Set the target channel to channel 1.
iw_Average_Type	H1	Set the averaging processing type to "Time Average".
iw_Average_Times	K100	Set the time average to 100.

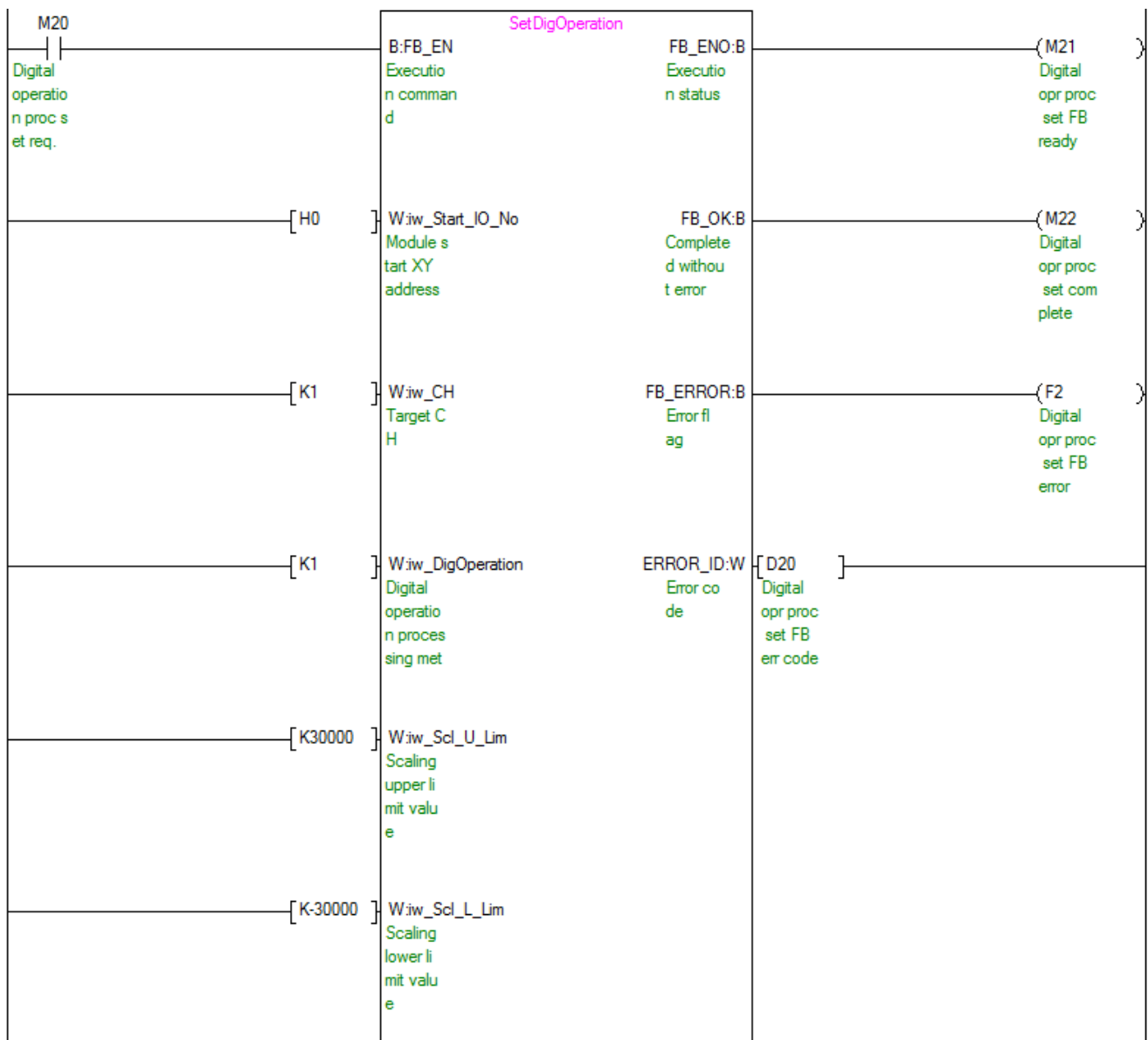
By turning ON M10, the averaging processing type setting value of channel 1 is written to the buffer memory.



M+L60RD8\_SetDigitalOperation (Digital operation processing setting)

Label name	Setting value	Description
iw_Start_IO_No	H0	Set the start XY address where the L60RD8 is connected to 0H.
iw_CH	K1	Set the target channel to channel 1.
iw_DigOperation	K1	Set the digital operation processing method to "Scaling".
iw_Scl_U_Lim	K30000	Set the scaling upper limit value to 30,000.
iw_Scl_L_Lim	K-30000	Set the scaling lower limit value to -30,000.

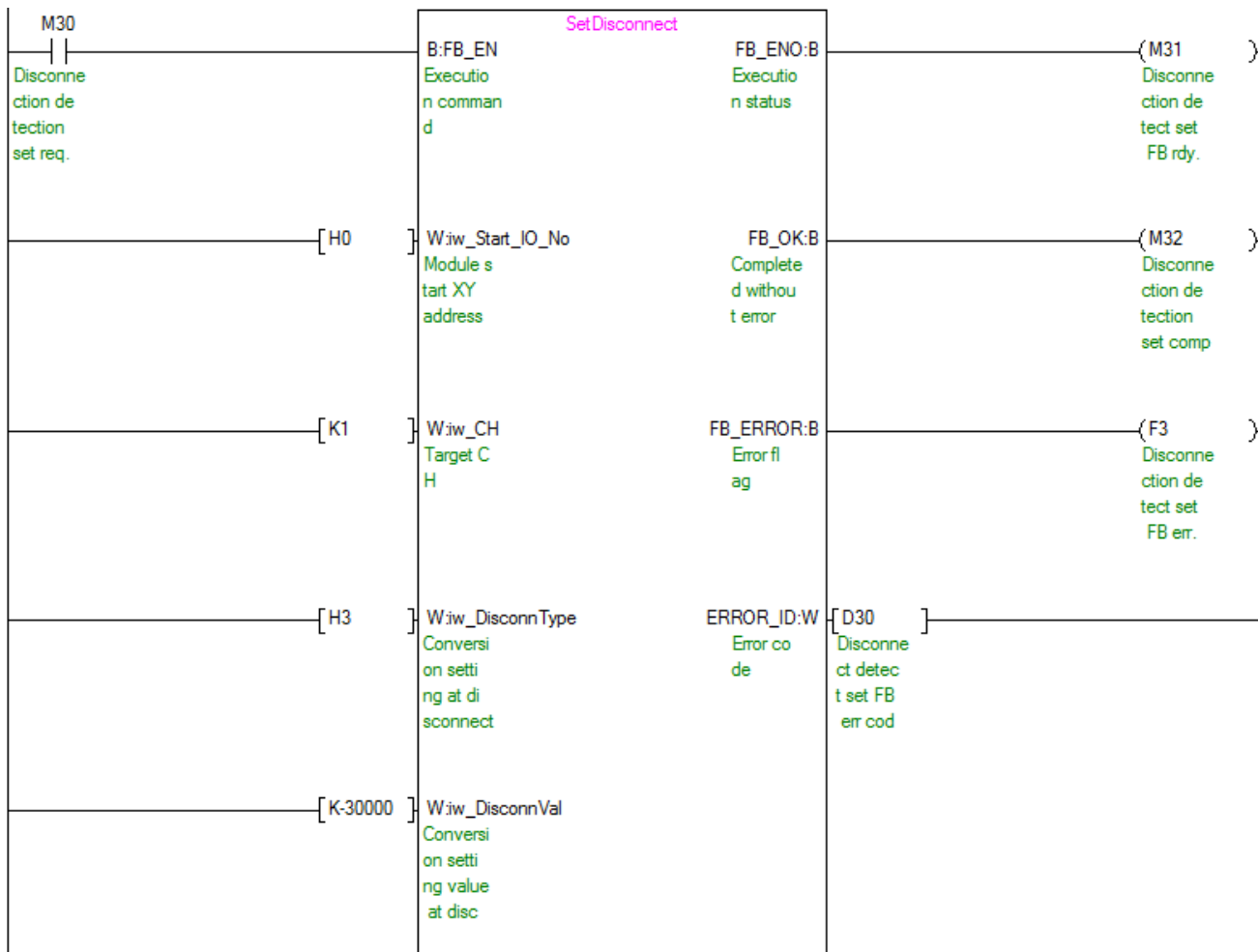
By turning ON M20, the setting value that enables the scaling function and disables the sensor correction function for channel 1, the scaling upper limit value, and the lower limit value are written to the buffer memory.



M+L60RD8\_SetDisconnect (Disconnection detection setting)

Label name	Setting value	Description
iw_Start_IO_No	H0	Set the start XY address where the L60RD8 is connected to 0H.
iw_CH	K1	Set the target channel to channel 1.
iw_DisconnType	H3	Set the conversion setting at disconnection detection of channel 1 to "3: Any value".
iw_DisconnVal	K-30000	Set the conversion setting value at disconnection detection to -30,000.

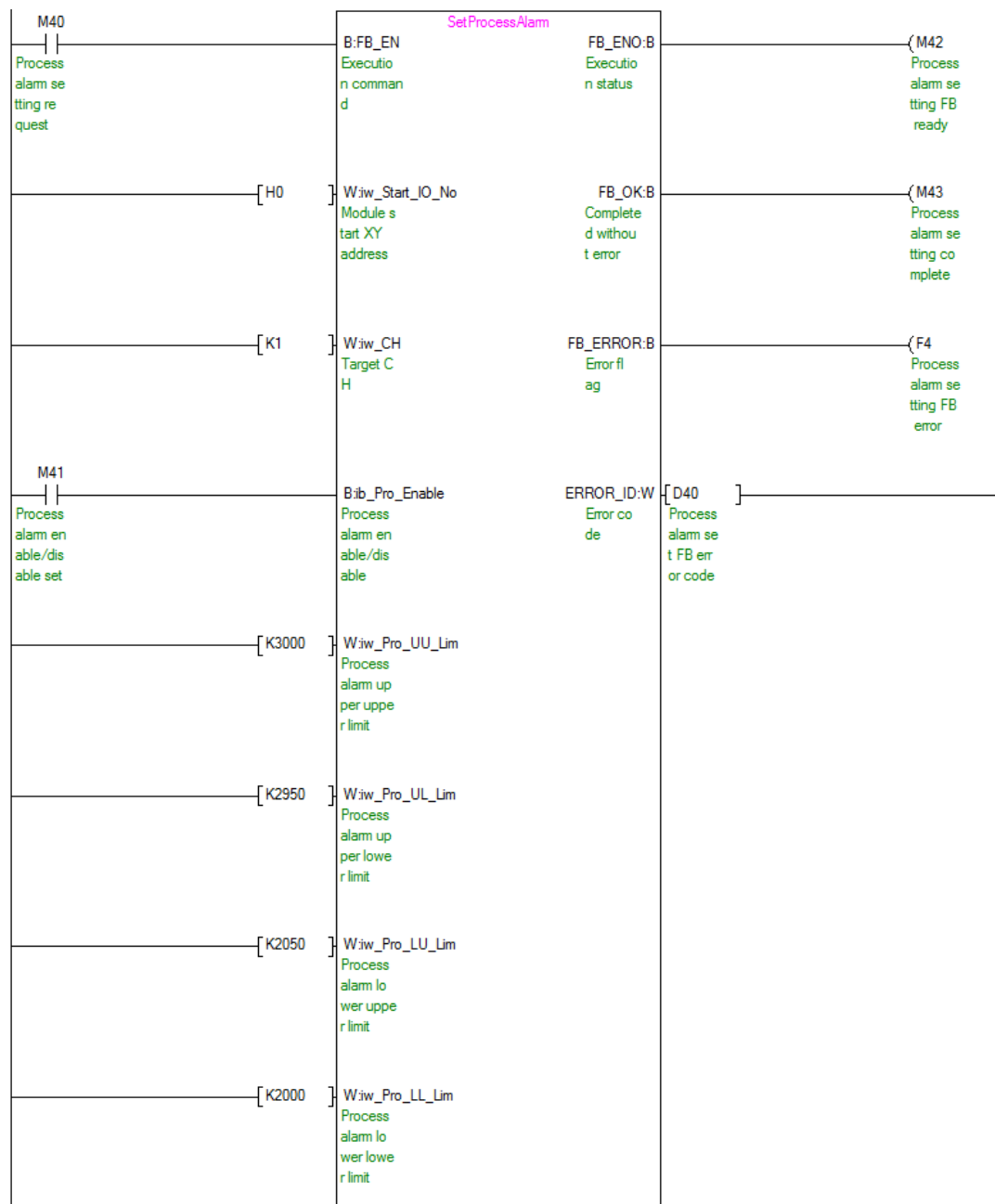
By turning ON M30, the conversion setting and conversion setting value at disconnection detection of channel 1 are written to the buffer memory.



M+L60RD8\_SetProcessAlarm (Process alarm setting)

Label name	Setting value	Description
iw_Start_IO_No	H0	Set the start XY address where the L60RD8 is connected to 0H.
iw_CH	K1	Set the target channel to channel 1.
ib_Pro_Enable	ON/OFF	Turn ON to enable the process alarm.
iw_Pro_UU_Lim	K3000	Set the process alarm upper upper limit value to 3000.
iw_Pro_UL_Lim	K2950	Set the process alarm upper lower limit value to 2950.
iw_Pro_LU_Lim	K2050	Set the process alarm lower upper limit value to 2050.
iw_Pro_LL_Lim	K2000	Set the process alarm lower lower limit value to 2000.

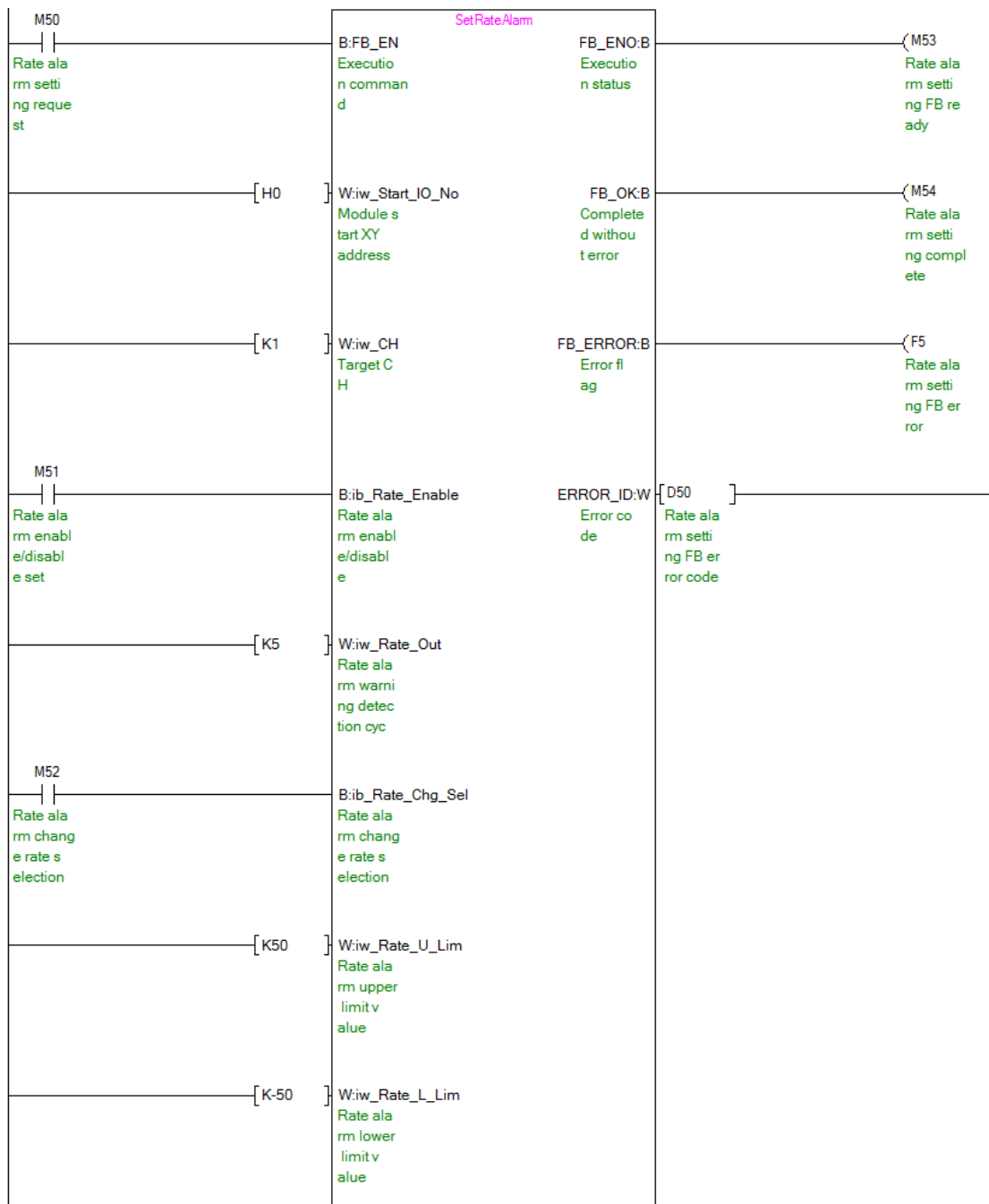
By turning ON M40, the process alarm setting value of channel 1 is written to the buffer memory.



M+L60RD8\_SetRateAlarm (Rate alarm setting)

Label name	Setting value	Description
iw_Start_IO_No	H0	Set the start XY address where the L60RD8 is connected to 0H.
iw_CH	K1	Set the target channel to channel 1.
ib_Rate_Enable	ON/OFF	Turn ON to enable the rate alarm.
iw_Rate_Out	K5	Set the rate alarm warning detection cycle to 5 times.
iw_Rate_U_Lim	K50	Set the rate alarm upper limit value to 50.
iw_Rate_L_Lim	K-50	Set the rate alarm lower limit value to -50.

By turning ON M50, the rate alarm setting value of channel 1 is written to the buffer memory.

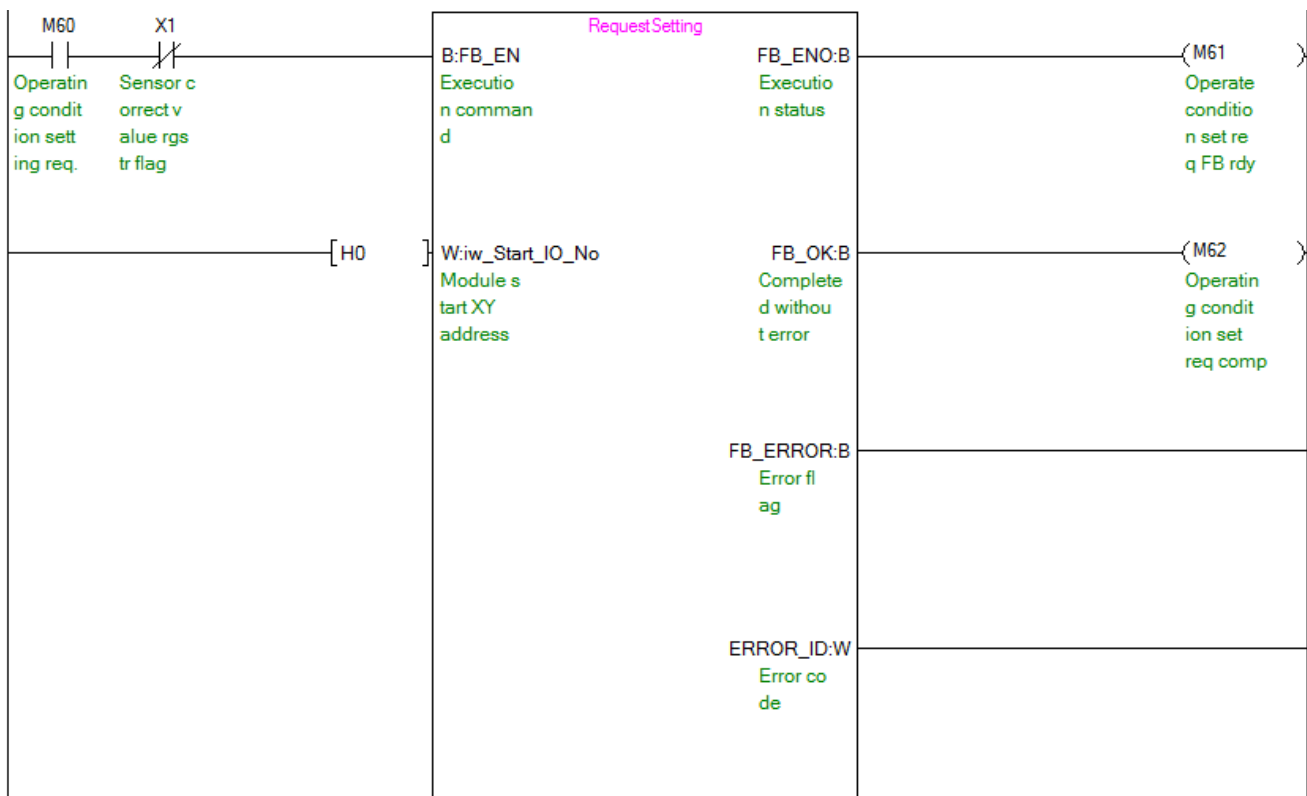


M+L60RD8\_RequestSetting (Operating condition setting request)

Label name	Setting value	Description
iw_Start_IO_No	H0	Set the start XY address where the L60RD8 is connected to 0H.

By turning ON M60, the following settings are validated.

- Input range setting
- Celsius/Fahrenheit display setting
- Averaging processing setting
- Scaling setting
- Sensor correction setting
- Disconnection detection setting
- Process alarm setting
- Rate alarm setting

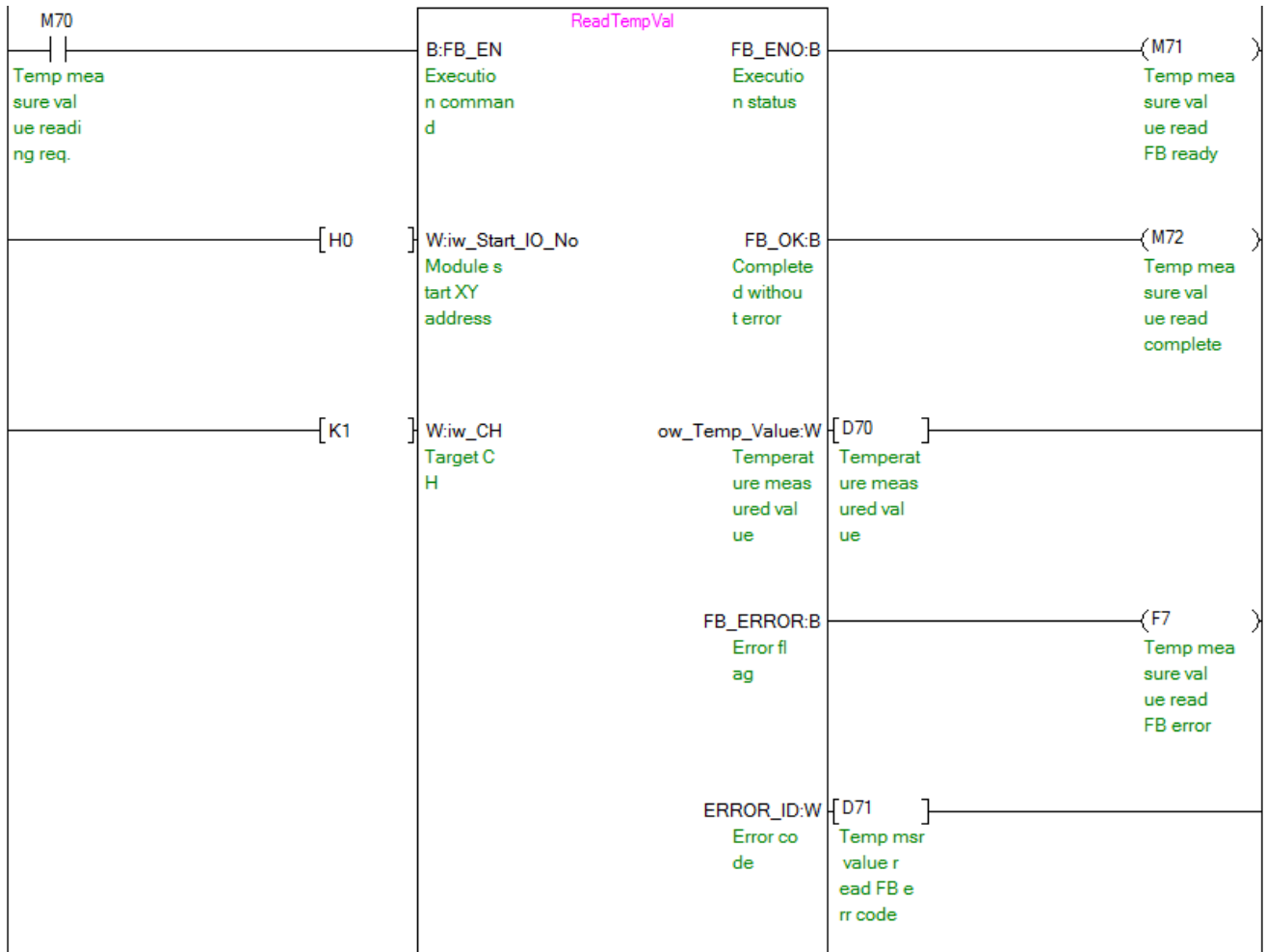




M+L60RD8\_ReadTemperatureVal (Read temperature measured value)

Label name	Setting value	Description
iw_Start_IO_No	H0	Set the start XY address where the L60RD8 is connected to 0H.
iw_CH	K1	Set the target channel to channel 1.

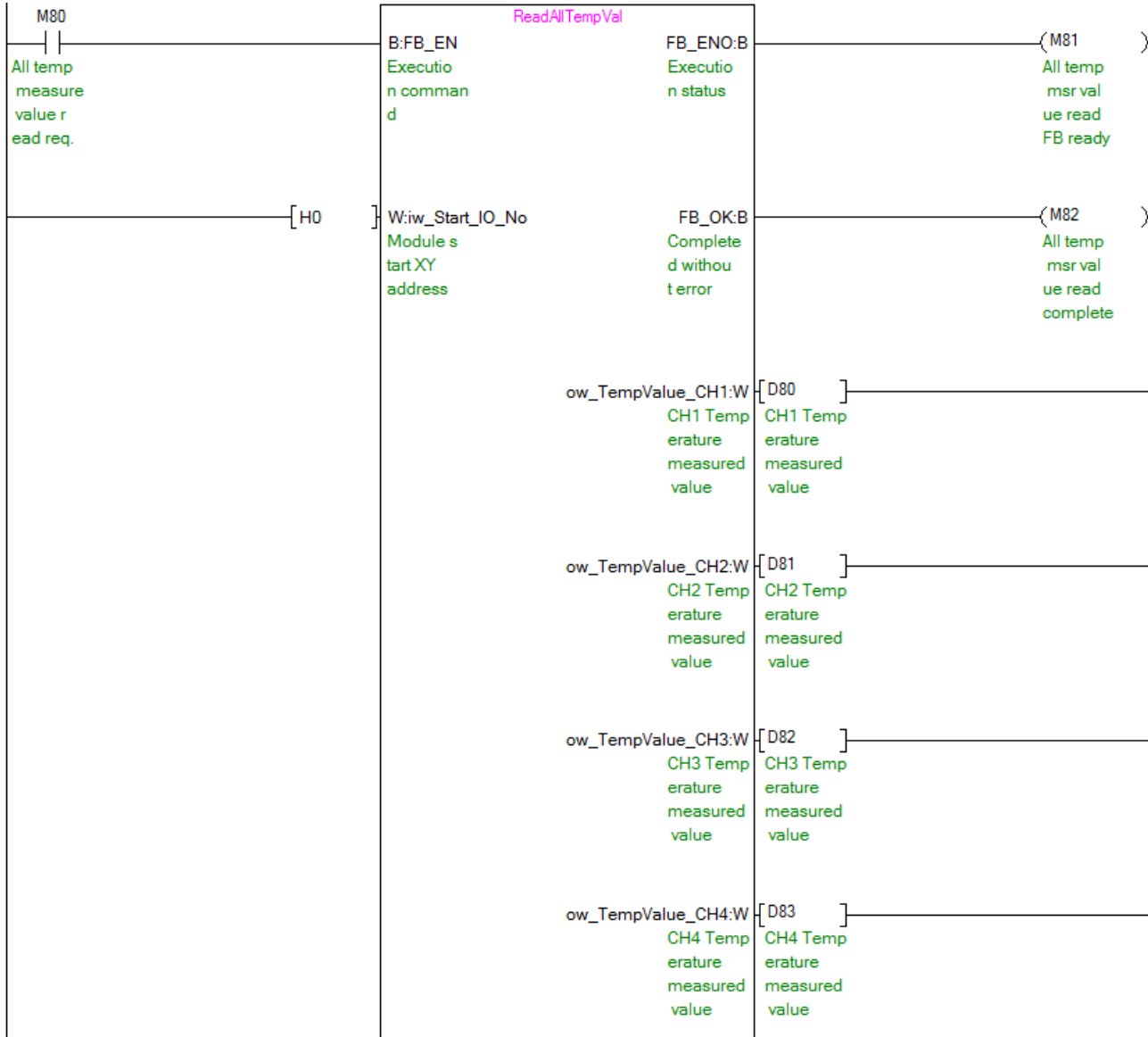
By turning ON M70, the temperature measured value of channel 1 is read.



M+L60RD8\_ReadAllTemperatureVal (Read temperature measured value (all CHs))

Label name	Setting value	Description
iw_Start_IO_No	H0	Set the start XY address where the L60RD8 is connected to 0H.

By turning ON M80, the temperature measured values of channel 1 to channel 8 are read.



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ow_TempValue_CH5:W CH5 Temperature measured value	[D84 ]	CH5 Temperature measured value
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ow_TempValue_CH6:W CH6 Temperature measured value	[D85 ]	CH6 Temperature measured value
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ow_TempValue_CH7:W CH7 Temperature measured value	[D86 ]	CH7 Temperature measured value
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ow_TempValue_CH8:W CH8 Temperature measured value	[D87 ]	CH8 Temperature measured value
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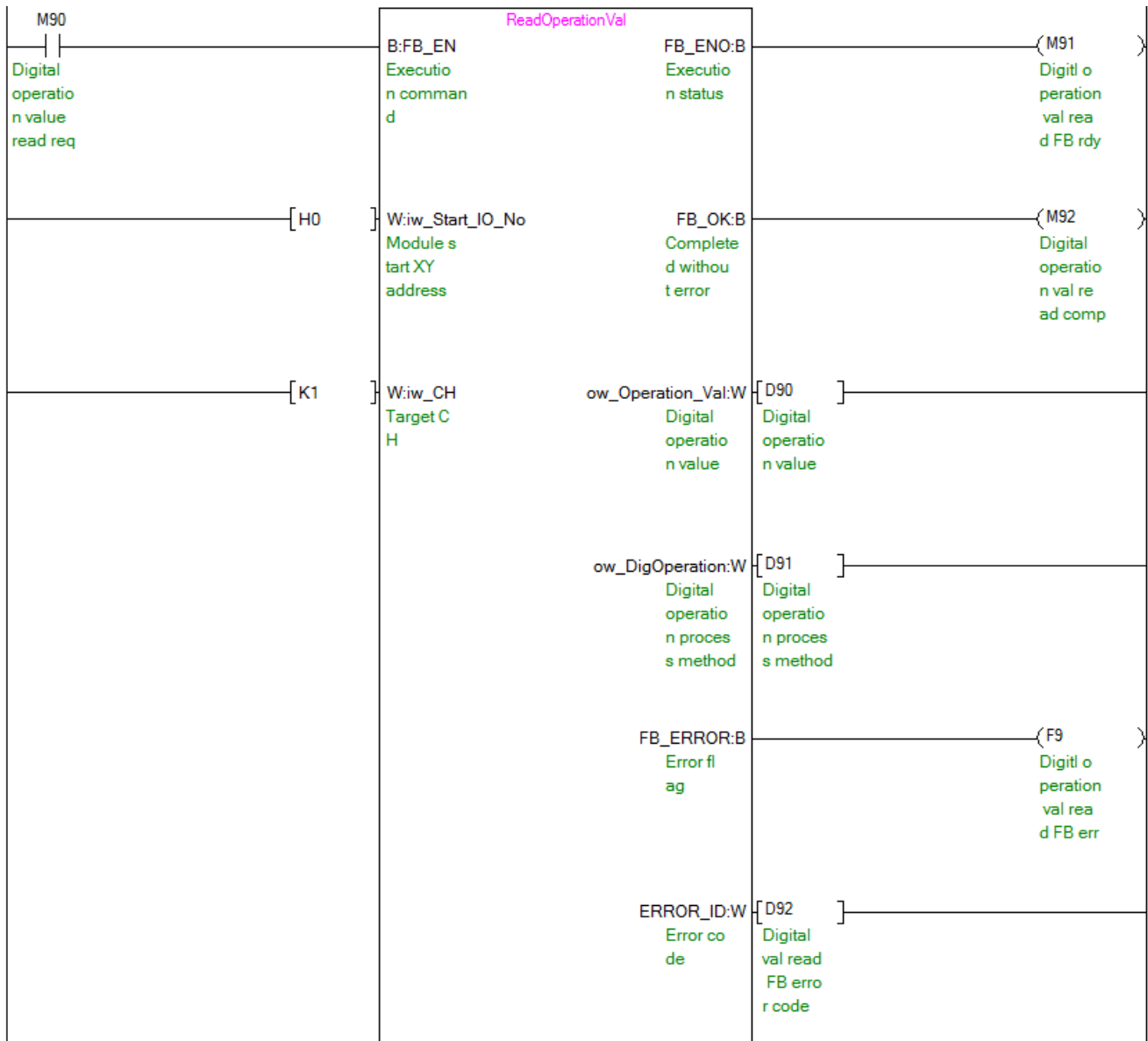
FB_ERROR:B Error flag		
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ERROR_ID:W Error code		
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M+L60RD8\_ReadOperationVal (Read digital operation value)

Label name	Setting value	Description
iw_Start_IO_No	H0	Set the start XY address where the L60RD8 is connected to 0H.
iw_CH	K1	Set the target channel to channel 1.

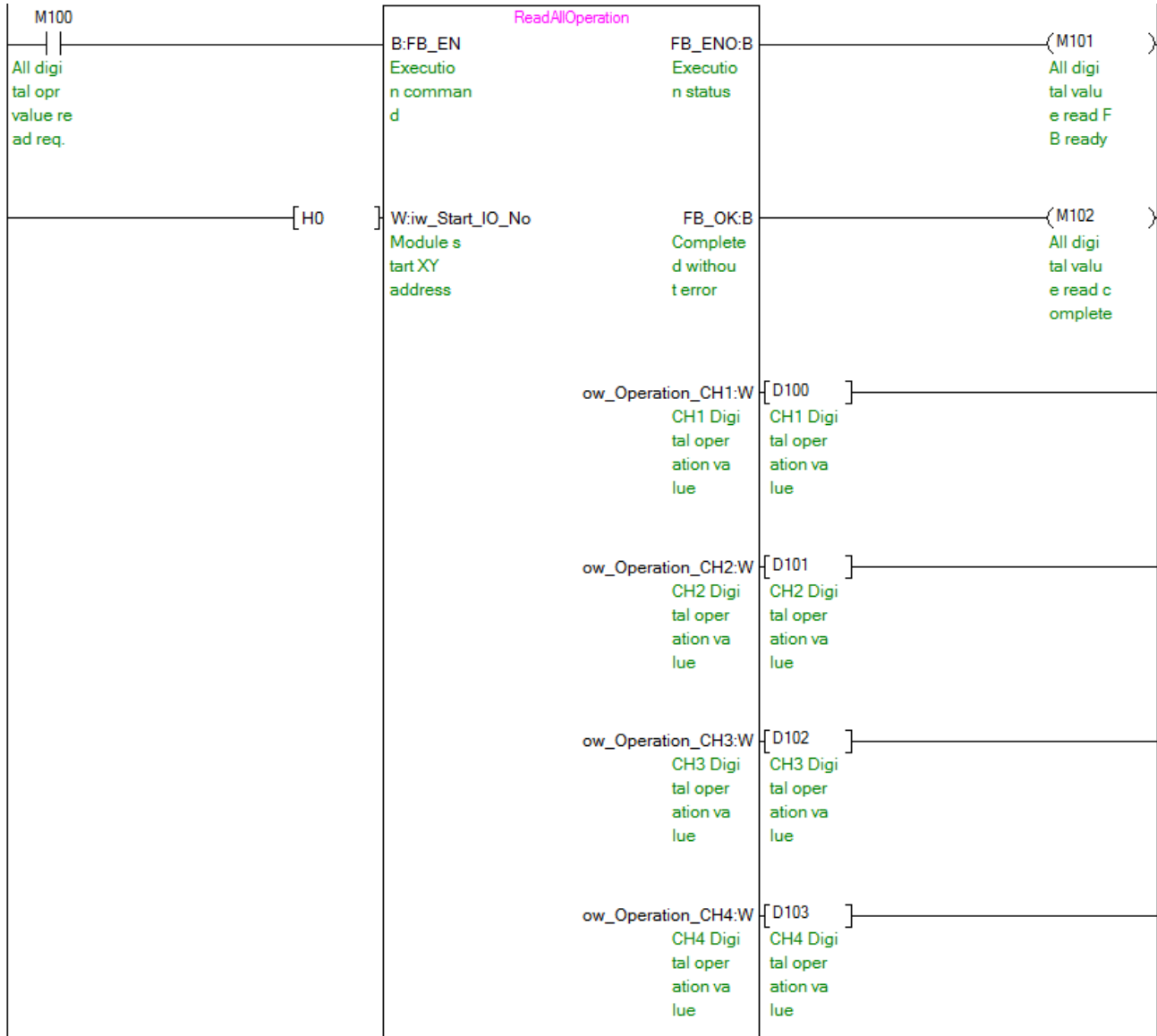
By turning ON M90, the digital operation value of channel 1 is read.



M+L60RD8\_ReadAllOperationVal (Read digital operation value (all CHs))

Label name	Setting value	Description
iw_Start_IO_No	H0	Set the start XY address where the L60RD8 is connected to 0H.

By turning ON M100, the digital operation values of channel 1 to channel 8 are read.



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ow_Operation_CH5:W CH5 Digital operation value	[D104]	CH5 Digital operation value
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ow_Operation_CH6:W CH6 Digital operation value	[D105]	CH6 Digital operation value
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ow_Operation_CH7:W CH7 Digital operation value	[D106]	CH7 Digital operation value
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ow_Operation_CH8:W CH8 Digital operation value	[D107]	CH8 Digital operation value
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FB_ERROR:B Error flag		
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ERROR_ID:W Error code		
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M+L60RD8\_ErrorOperation (Error operation)

Label name	Setting value	Description
iw_Start_IO_No	H0	Set the start XY address where the L60RD8 is connected to 0H.
ib_Error_Reset	ON/OFF	Turn ON for the error reset.

By turning ON M110, the error code is output when an error occurs. By turning ON M111 after the error output, the error is reset.

