

For Super-mini Signal Conditioners with Display Mini-M M2E Series

M2E CONFIGURATOR SOFTWARE

M2ECFG

USERS MANUAL

MSYSTEM
M-SYSTEM CO., LTD.

5-2-55, Minamitsumori, Nishinari-ku, Osaka 557-0063 JAPAN

Tel: +81-6-6659-8201 Fax: +81-6-6659-8510

<http://www.m-system.co.jp/>

E-mail: info@m-system.co.jp

CONTENTS

1. INTRODUCTION	4
1-1. GENERAL DESCRIPTION	4
1-2. APPLICABLE DEVICES.....	4
1-3. PC REQUIREMENTS	4
1-4. INSTALLING & DELETING THE PROGRAM.....	4
2. GETTING STARTED	5
2-1. STARTUP.....	5
2-2. TERMINATION.....	5
2-3. SCREEN COMPONENT IDENTIFICATION.....	5
2-4. CONNECTING TO THE DEVICE	6
3. DEVICE INFO - DEVICE INFORMATION	8
4. SETTING PARAMETERS	9
4-1. PARAMETER SETTING IN [DEVICE CONFIGURATION].....	9
4-1-1. BASIC - BASIC SETTING	9
4-1-2. RANGE - RANGE SETTING	11
4-2. PARAMETER SETTING IN [FILE CONFIGURATION]	12
4-2-1. UPLOAD.....	12
4-2-2. DOWNLOAD	12
4-2-3. EDIT	12
4-3. COMPARING SETTING VALUE IN THE DEVICE	13
4-4. HOW TO SETUP I/O (EXAMPLE).....	13
4-4-1. CONNECTING TO THE DEVICE	13
4-4-2. BASIC CONFIGURATION EXAMPLES.....	13
4-4-2-1. M2EXV.....	13
4-4-2-2. M2EXM	14
4-4-2-3. M2EXR	14
4-4-2-4. M2EXT	15
4-4-2-5. M2EXS.....	16
4-4-2-6. M2EXDY	16
4-4-3. OTHER SETTINGS.....	16
5. ADJUST - FINE ADJUSTMENTS	17
6. LOOP TEST	18
7. TREND GRAPH	19
8. READING / SAVING FILES	20
8-1. READING SETTING VALUES OF SETTING PARAMETERS SAVED AS FILE	20
8-2. SAVING PARAMETERS IN A FILE	20

9. PARAMETER DETAILS	21
9-1. PARAMETERS LIST.....	21
9-2. BASIC - BASIC SETTING	22
9-2-1. INPUT RANGE V R T	22
9-2-2. 0% INPUT SETTING / 100% INPUT SETTING V M R T D Y	22
9-2-3. ANGLE OFFSET / ANGLE SPAN S	23
9-2-4. ROTATING DIRECTION S	23
9-2-5. 0% INPUT SCALING / 100% INPUT SCALING V M S D Y	23
9-2-6. INPUT SCALING DECIMAL POINT V M S D Y	23
9-2-7. INPUT DECIMAL POINT R T	23
9-2-8. OUTPUT RANGE.....	23
9-2-9. 0% OUTPUT SETTING / 100% OUTPUT SETTING	23
9-2-10. 0% OUTPUT SCALING / 100% OUTPUT SCALING	24
9-2-11. OUTPUT DECIMAL POINT.....	24
9-2-12. OVERRANGE OUTPUT < 0% / OVERRANGE OUTPUT > 100% S	24
9-3. OPTION - OPTION SETTING.....	24
9-3-1. BURNOUT R T	24
9-3-2. UNIT (INP SCALING) / UNIT (OUT SCALING)	24
9-3-3. USER UNIT	24
9-3-4. TEMPERATURE UNIT R T	24
9-3-5. COLD JUNCTION COMPENSATION T	24
9-3-6. TERMINAL TEMPERATURE T	24
9-3-7. FILTER TIME CONSTANT.....	25
9-3-8. SENSOR WIRES R	25
9-3-9. WIRE RESISTANCE R	25
9-3-10. LOW CUT D Y	25
9-3-11. LOW CUT POINT D Y	25
9-3-12. INPUT ZERO FINE ADJ. / INPUT SPAN FINE ADJ. V M R T D Y	25
9-3-13. OUTPUT ZERO FINE ADJ. / OUTPUT SPAN FINE ADJ.....	25
9-4. ADVANCE - ADVANCED SETTING	25
9-4-1. UPPER DISPLAY SETTING.....	25
9-4-2. LOWER DISPLAY SETTING	26
9-4-3. BRIGHTNESS	26
9-4-4. DISPLAY TIMEOUT.....	26
9-5. LINEARIZER - LINEARIZATION SETTING V M S D Y	26
9-5-1. USER'S TABLE LINEARIZATION V M S D Y	27
9-5-2. NUMBER OF POINTS V M S D Y	27
9-5-3. TABLE V M S D Y	27
10. APPENDIX	28
10-1. USER TABLE FORMAT V M S D Y.....	28

1. INTRODUCTION

1-1. GENERAL DESCRIPTION

This software is used to program setting parameters for Super-mini Signal Conditioners with Display Mini-M M2E Series (referred hereunder as 'device'). The following major functions are available:

- 1) Edit setting value of setting parameters online (connected to the device) in real time
- 2) Edit setting value of setting parameters offline (not connected to the device)
- 3) Download setting value of setting parameters to the device, upload from the device
- 4) Save setting value of setting parameters as files, read from files
- 5) Compare setting value of setting parameters edited on the screen with the ones stored in the device

1-2. APPLICABLE DEVICES

This software is applicable to the following products, which is editable setting value of setting parameters:

FUNCTION	MODEL	SYMBOL	VERSION
Signal Transmitter	M2EXV	V	1.00.0030
Potentiometer Transmitter	M2EXM	M	1.00.0031
RTD Transmitter	M2EXR	R	1.00.0018
Thermocouple Transmitter	M2EXT	T	1.00.0019
Self-Synch Transmitter	M2EXS	S	1.00.0019
Current Loop Supply	M2EXDY	DY	1.00.0010

The lowest software version applicable to edit setting value of setting parameters each hardware model is indicated in the above table. Confirm that the software you have is compatible with the hardware you have.

The latest version is downloadable at M-System's web site (www.m-system.co.jp) if you need higher version software.

In this manual, descriptions given with the above symbols are applied only to the models those symbols are assigned to. Other descriptions with no specific symbol are applied to all models.

1-3. PC REQUIREMENTS

The following PC performance is required for adequate operation of the M2ECFG.

PC	IBM PC compatible
OS	Windows 7 (32 bit / 64 bit) (English/ Japanese) Windows 8.1 (32 bit / 64 bit) (English / Japanese) Windows 10 (32 bit / 64 bit) (English / Japanese) The software may not operate adequately in certain conditions.
CPU	Must meet the relevant Windows' requirements.
Memory	Must meet the relevant Windows' requirements.
Communication Port	COM port (RS-232-C) or USB port

One of the dedicated cables as listed below is also required to connect the transmitter device to the PC.

Port	PC Configurator Cable Model No.
RS-232-C	MCN-CON
USB	COP-US

Use "Smaller - 100%" of "Make text and other items larger or smaller" on the display of the Windows.

The display may be jumbled with other than the text size "Smaller - 100%".

1-4. INSTALLING & DELETING THE PROGRAM

This software can be installed via the compressed file distributed by M-System. Decompress the compressed file and run the file named "setup.exe". Simply follow the on-screen instructions to complete the installation.

For Windows 7, 8.1, Open Control Panel > Uninstall a program, or Uninstall or change a program. Select the M2ECFG from the program list and click [Uninstall] button.

For Windows 10, open Settings from Start menu > System > Apps & features.

Select the M2ECFG from the program list and click [Uninstall] button.

2. GETTING STARTED

2-1. STARTUP

For Windows 7

Open Pro gram > M-SYSTEM > Configurator > M2ECFG

For Windows 8.1

Open Program > M-SYSTEM > M2ECFG

For Windows 10

All apps > M-SYSTEM > M2ECFG

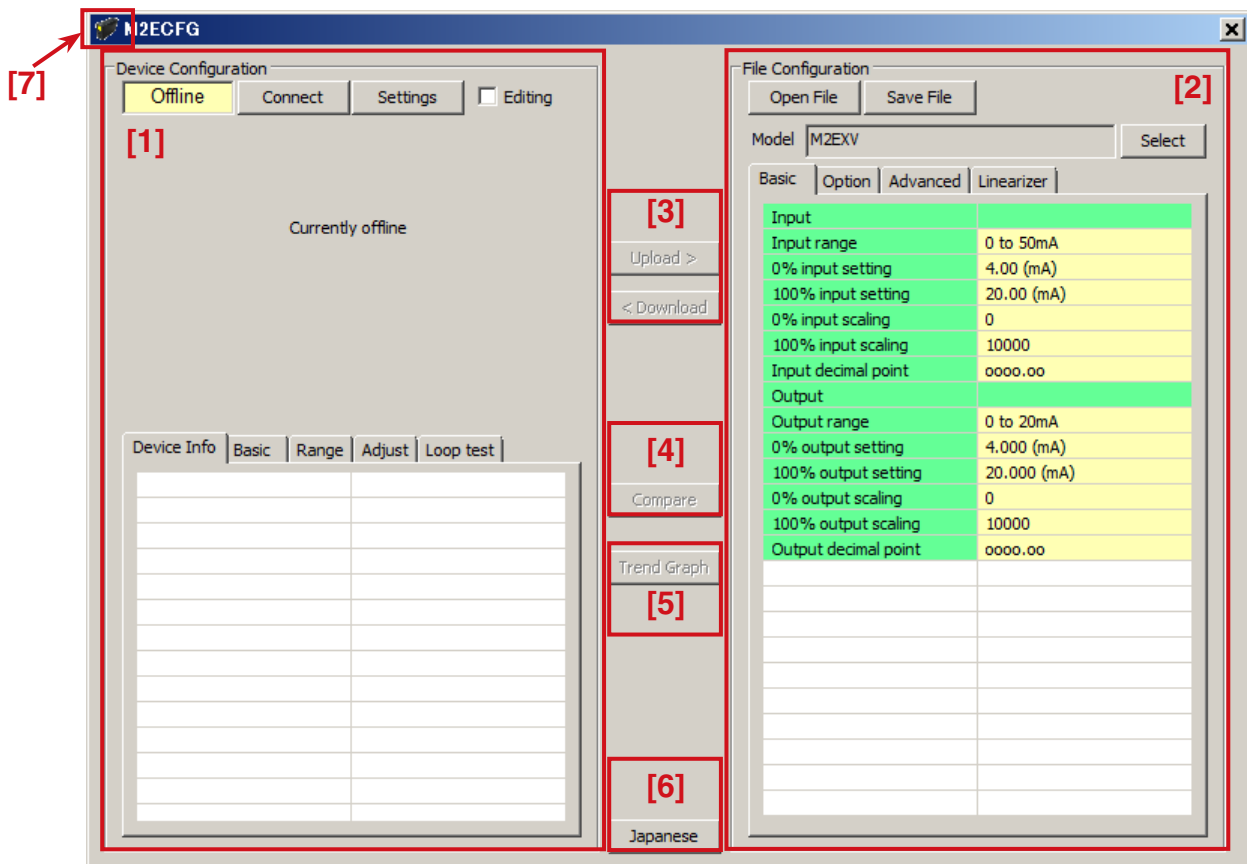
To start up M2ECFG on the Windows PC.


2-2. TERMINATION

To terminate the program, click the Close button [X] on the right-top of the window.

2-3. SCREEN COMPONENT IDENTIFICATION

The following table shows descriptions of each screen components.



[1] Device Configuration	Shows setting value of the parameters of the device presently connected online. You can check information in the device, edit setting value of these parameters in real time.
[2] File Configuration	Used to create and edit parameter sets on the PC. You can upload setting value of a parameter set from a device, edit it and download it to the device again.
[3] Upload Download	Used to load device setting parameter into file settings (upload) or write setting value of the parameters under [File Configuration] into a device (download).
[4] Compare	Opens Compare window to compare edited setting value of parameters in frame and actual device.
[5] Trend Graph	Opens Trend Graph window to show a trend graph for the connected device input values, etc. (Not available while I/O is fixed.)
[6] English / Japanese	Switches the display language. Clicking the button switches between English and Japanese. The program starts up in English mode as initial state when the OS is other than Japanese version. You can switch to Japanese only when the OS supports Japanese language.
[7] Version	Click (or right-click)  on the left-top of the window to show the menu. Click [About M2ECFG...], and the version No. dialog box will appear.

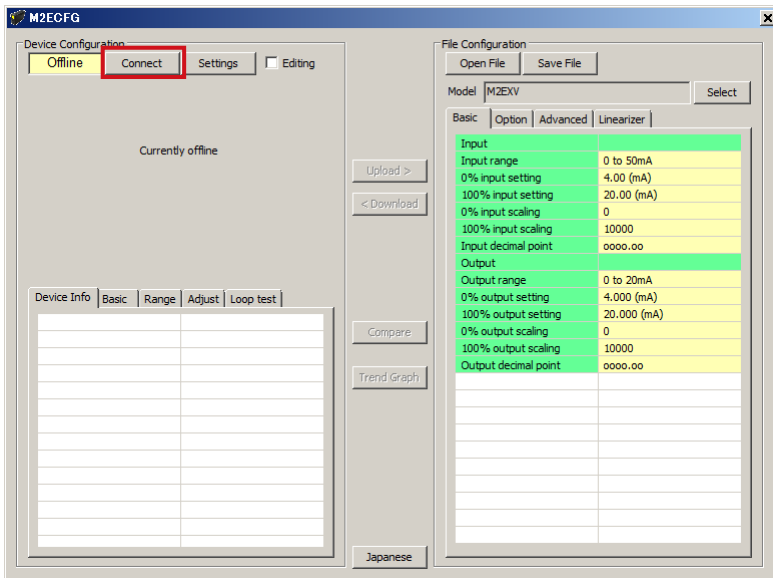
2-4. CONNECTING TO THE DEVICE

When the PC starts communication with the device, the [Device Info], [Basic], [Range], [Adjust] and [Loop test] in the [Device Configuration] frame are shown, where you can edit and adjust setting values of the parameters.

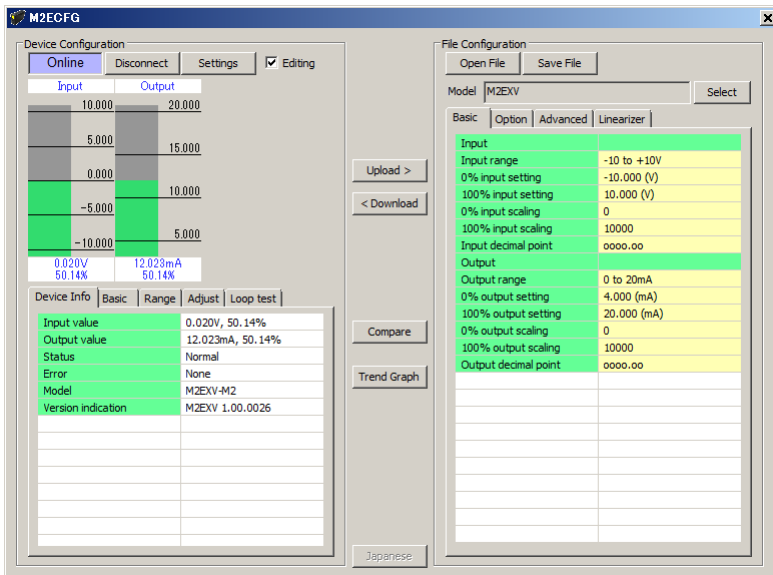
Note: The [File Configuration] shows initial values of the model indicated in the [Model] field, and they may be different from the setting parameters in the [Device Configuration] frame. Click [Upload] to read setting parameters from the device connected to the M2ECFG and show them in the [File Configuration] frame.

Choose the COM port number to which the device is to be connected by clicking [Settings]. Once one of the COM port is specified after the PC Configurator has been installed and started, you do not need to repeat the setting procedure until you want to change the COM port setting.

Click [Connect] button to start communication with the connected device.



Supported device connected with the PC Configurator Cable is automatically identified and the device information is displayed in the [Device Configuration] frame.



The bargraphs on the screen show real time I/O status of the device, and you can now access to the menu tabs such as Device Info, Basic, Range, Adjust and Loop test.

Scales of bargraph are drawn automatically by [0% input setting], [100% input setting], [0% output setting] and [100% output setting].

The scales of the input bargraph for **S** are drawn for the range 0 – 360°.

When the cable is disconnected, the display in the [Device Info] frame returns to blank status and the PC Configurator is ready to be connected to another device. In order to continue, just connect a new device. You do not need to click [Connect] button. Device is automatically connected when the Configurator Connection Cable is inserted. Click [Disconnect] to terminate the communication with the device.

3. DEVICE INFO - DEVICE INFORMATION

When the PC starts to communicate with the device, the [Device Configuration] shows present I/O data and status, model number and other information.

Device Info	Basic	Range	Adjust	Loop test
Input value	0.00mA, 0.00%			
Output value	3.998mA, 0.00%			
Status	Normal			
Error	None			
Model	M2EXV - M2			
Version indication	M2EXV 1.00.0030			

Name	Explanations																								
Input value	Shows the current input value in engineering unit and in percent.																								
Output value	Shows the current output value in engineering unit and in percent.																								
Status	Shows the current device status. Available device status are as follows:																								
	<table border="1"> <tr> <td>Normal</td> <td>The device is operating in normal parameters.</td> </tr> <tr> <td>Fixed I/O</td> <td>I/O is fixed with operation of the software. (The status of fixed I/O with front button of the device is not available.) (Device display: none)</td> </tr> <tr> <td>Unlock</td> <td>Settings are being changed on the front button of the connected device. (When the device is in this state, settings cannot be changed with this software. Check mark [Editing] will be automatically disabled.) (Device display: Unlock)</td> </tr> </table>	Normal	The device is operating in normal parameters.	Fixed I/O	I/O is fixed with operation of the software. (The status of fixed I/O with front button of the device is not available.) (Device display: none)	Unlock	Settings are being changed on the front button of the connected device. (When the device is in this state, settings cannot be changed with this software. Check mark [Editing] will be automatically disabled.) (Device display: Unlock)																		
Normal	The device is operating in normal parameters.																								
Fixed I/O	I/O is fixed with operation of the software. (The status of fixed I/O with front button of the device is not available.) (Device display: none)																								
Unlock	Settings are being changed on the front button of the connected device. (When the device is in this state, settings cannot be changed with this software. Check mark [Editing] will be automatically disabled.) (Device display: Unlock)																								
Error	Device errors shown below are indicated. (When multiple errors occur at the same time, the highest priority error is displayed.)																								
	<table border="1"> <thead> <tr> <th>Error Message</th> <th>Priority</th> <th>Status</th> </tr> </thead> <tbody> <tr> <td>BURNOUT ERROR D R T</td> <td>1</td> <td>Input wires broken (output downward)</td> </tr> <tr> <td>BURNOUT ERROR U R T</td> <td>1</td> <td>Input wires broken (output upward)</td> </tr> <tr> <td>OVER RANGE D</td> <td>2</td> <td>Input value is less than -5% (for DY, -7.5%).</td> </tr> <tr> <td>OVER RANGE U</td> <td>2</td> <td>Input value exceeds 105% (for DY, 107.5%).</td> </tr> <tr> <td>SCALING ERROR D</td> <td>3</td> <td>Calculated result of input scaling value or output scaling value is less than -99999.</td> </tr> <tr> <td>SCALING ERROR U</td> <td>3</td> <td>Calculated result of input scaling value or output scaling value exceeds 999999.</td> </tr> <tr> <td>None</td> <td>4</td> <td>No error</td> </tr> </tbody> </table>	Error Message	Priority	Status	BURNOUT ERROR D R T	1	Input wires broken (output downward)	BURNOUT ERROR U R T	1	Input wires broken (output upward)	OVER RANGE D	2	Input value is less than -5% (for DY , -7.5%).	OVER RANGE U	2	Input value exceeds 105% (for DY , 107.5%).	SCALING ERROR D	3	Calculated result of input scaling value or output scaling value is less than -99999.	SCALING ERROR U	3	Calculated result of input scaling value or output scaling value exceeds 999999.	None	4	No error
Error Message	Priority	Status																							
BURNOUT ERROR D R T	1	Input wires broken (output downward)																							
BURNOUT ERROR U R T	1	Input wires broken (output upward)																							
OVER RANGE D	2	Input value is less than -5% (for DY , -7.5%).																							
OVER RANGE U	2	Input value exceeds 105% (for DY , 107.5%).																							
SCALING ERROR D	3	Calculated result of input scaling value or output scaling value is less than -99999.																							
SCALING ERROR U	3	Calculated result of input scaling value or output scaling value exceeds 999999.																							
None	4	No error																							
CJM temperature T	Shows the temperature measured with the Cold Junction Compensation Sensor (CJM) of the device. Or shows the set temperature in using the fixed terminal temperature without using the CJM.																								
Input EMF value T	Shows the electromotive force of the thermocouple connected to the device.																								
RTD resistance R	Show the resistance value of the RTD connected to the device.																								
Model	Model number of the device This is the original model number at M-System factory. Actual model suffix codes may differ if the device setting has been changed at site.																								
Version indication	Firmware revision number of the device																								

4. SETTING PARAMETERS

To set parameters, [Device Configuration] to edit the basic settings in real time such like I/O ranges and scalings of the device, and [File Configuration] to edit all setting parameters regardless of the communication with the device are available.

4-1. PARAMETER SETTING IN [DEVICE CONFIGURATION]

The [Device Configuration] includes [Basic] to modify each setting value and [Range] to set the 0% and 100% input and output using actual input signals.

4-1-1. BASIC - BASIC SETTING

Shows and edits setting value of setting parameters in the Basic tab for the device. Setting parameter items on the screen may change depending upon models.

Device Info	Basic	Range	Adjust	Loop test
Input				
Input range	-10 to +10V			
0% input setting	-10.000 (V)			
100% input setting	10.000 (V)			
0% input scaling	0			
100% input scaling	10000			
Input decimal point	0000.00			
Output				
Output range	0 to 20mA			
0% output setting	4.000 (mA)			
100% output setting	20.000 (mA)			
0% output scaling	0			
100% output scaling	10000			
Output decimal point	0000.00			

When [Editing] check box is checked, modifiable parameters are highlighted on the light yellow background. Click one of such parameters and to show a pull-down list or an edit box to modify it. Modifications are reflected in the device immediately.

Device Info	Basic	Range	Adjust	Loop test
Input				
Input range	-10 to +10V			
0% input setting	0 to 50mA			
100% input setting	-1000 to +1000mV			
0% input scaling	-10 to +10V			
100% input scaling	0			
100% input scaling	10000			
Input decimal point	0000.00			
Output				
Output range	0 to 20mA			
0% output setting	4.000 (mA)			
100% output setting	20.000 (mA)			
0% output scaling	0			
100% output scaling	10000			
Output decimal point	0000.00			

Pull-down menu: For example, click the [Input range] field. When a pull-down menu is displayed as shown left, select an appropriate value.

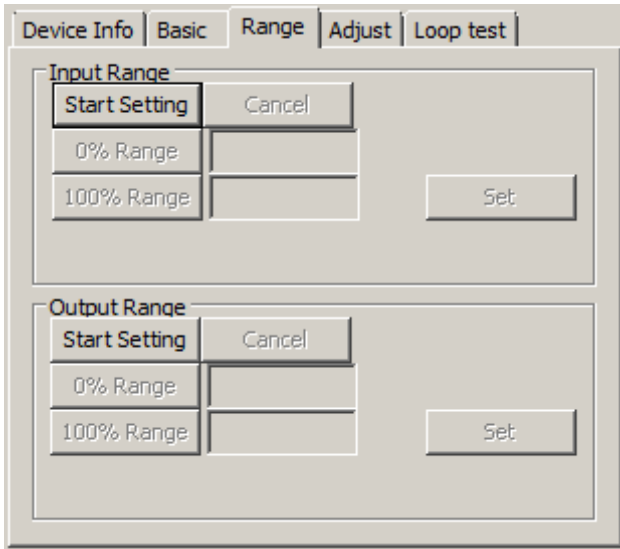
Device Info	Basic	Range	Adjust	Loop test
Input				
Input range	-10 to +10V			
0% input setting	-10.000 (V)			
100% input setting	10.000 (V)			
0% input scaling	<input type="text" value="0"/>			
100% input scaling	10000			
Input decimal point	0000.00			
Output				
Output range	0 to 20mA			
0% output setting	4.000 (mA)			
100% output setting	20.000 (mA)			
0% output scaling	0			
100% output scaling	10000			
Output decimal point	0000.00			

Edit box: For example, click the [0% input scaling] field. When an edit box for editing setting value is displayed as shown left, enter a setting value and press Enter key.

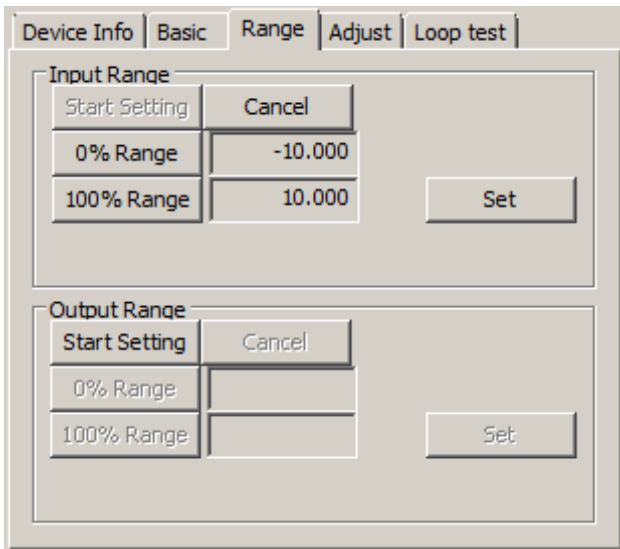
Model specific setting parameter items and ranges are explained in “9. PARAMETER DETAILS” on page 21.

4-1-2. RANGE - RANGE SETTING

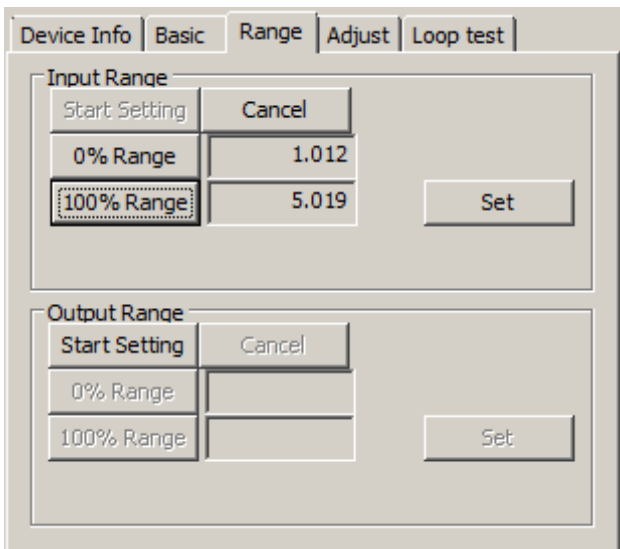
[0% input setting], [100% input setting], [0% output setting], and [100% output setting] can be performed using the actual input and output signals.



1) Click [Start Setting] button in the [Input Range] frame. It moves on to the mode where [0% input setting] and [100% input setting] is set with actual input, [0% Range], [100% Range], [Set], and [Cancel] buttons are enabled as shown left below.



2) Set input of the device to the value you want to set to input value 0% and click [0% Range] button. Set the value you want to set to input value 100% and click [100% Range] button. Input engineering unit value at that time is indicated next to each button. For example, input 1 V and click [0% Range] button and input 5 V and click [100% Range] button. The screen will be as shown left below.



When you click [Set] button, the displayed values will be set to [0% input setting] and [100% input setting] in the [Basic] tab on the [Device Configuration] frame. Click [Cancel] button to cancel the input range setting.

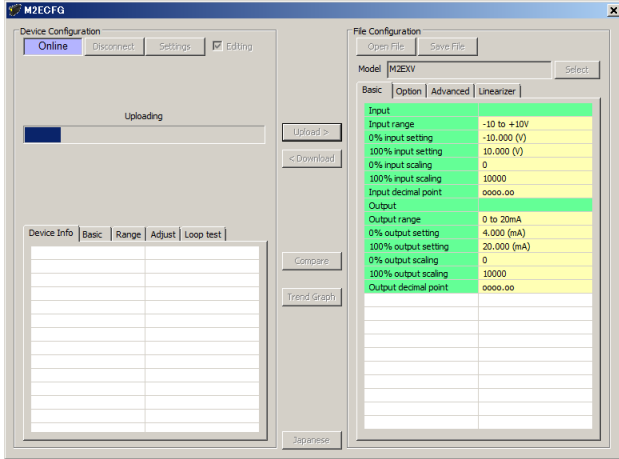
Similar procedure is applicable when setting [0% output setting] and [100% output setting]. However, you must vary the simulated input signal levels until the monitored output shows a desired 0% output or 100% output before clicking [0% Range] and [100% Range] buttons. Click [Set] button to set.

4-2. PARAMETER SETTING IN [FILE CONFIGURATION]

All setting parameters can be edited in the [File Configuration] frame. Read parameters from the device (upload), edit them, and then write them to the device (download). You can also save settings in a file, read, write, and edit a file without connecting to the device. To save and read files, refer to “8-2. SAVING PARAMETERS IN A FILE” on page 20.

4-2-1. UPLOAD

Click [Upload] while the PC communicates with the device. The M2ECFG starts reading parameters stored in the connected device. A progress bar [Uploading] is indicated on the screen until the uploading is complete.

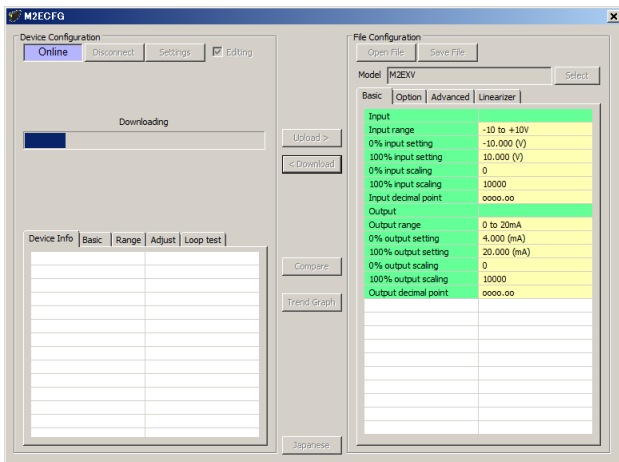


When the uploading is complete, the parameters are shown within the [File Configuration] frame and can be edited.

Caution! DO NOT turn off the power supply to the device or disconnect the configurator cable while uploading.

4-2-2. DOWNLOAD

When you finish editing parameters, click [Download] while the PC communicates with the device. The M2ECFG starts writing parameters edited on the screen to the connected device. A progress bar is indicated on the screen until the downloading is complete.



When the downloading is complete, the setting value of setting parameter edited in the [File Configuration] frame is written into the device and the change is applied.

Caution! DO NOT turn off the power supply to the device or disconnect the configurator cable while downloading.

4-2-3. EDIT

Click a value field, and a pull-down menu or an edit box will be displayed. Select or enter your desired value. The procedure is the same as that described in “4-1-1. BASIC - BASIC SETTING” on page 9.

When you finish editing parameters, write them to the device in order to reflect them immediately in the same procedure as that described in “4-2-2. DOWNLOAD” on page 12. To save them in a file, refer to “8-2. SAVING PARAMETERS IN A FILE” on page 20.

Model specific setting parameter items and ranges are explained in “9. PARAMETER DETAILS” on page 21.

4-3. COMPARING SETTING VALUE IN THE DEVICE

Setting values of setting parameters presently edited on the screen (file setting) and those stored in the connected device (device setting) can be compared side by side. Edited setting values of setting parameters can be compared with those in a file if you open it in advance with [Open File] button, or with those of another device if you upload in advance with [Upload] button.

Setting Mode	Setting Parameter	Device Configuration	File Configuration
Basic	Input range	-10 to +10V	0 to 50mA
Basic	0% input setting	-10.000 (V)	4.00 (mA)
Basic	100% input setting	10.000 (V)	20.00 (mA)
Basic	0% input scaling	0	0
Basic	100% input scaling	10000	10000
Basic	Input decimal point	0000.00	0000.00
Basic	Output range	-10 to +10V	0 to 20mA
Basic	0% output setting	-10.000 (V)	4.000 (mA)
Basic	100% output setting	10.000 (V)	20.000 (mA)
Basic	0% output scaling	0	0
Basic	100% output scaling	10000	10000
Basic	Output decimal point	0000.00	0000.00
Option	Unit(INP scaling)	V	%
Option	User unit setting		
Option	Unit(OUT scaling)	V	%
Option	User unit setting		
Option	Filter time constant	0 (sec)	0 (sec)
Option	Input Zero fine adjust	+0.000 (%)	+0.000 (%)
Option	Input Span fine adjust	100.000 (%)	100.000 (%)
Option	Output Zero fine adjust	+0.000 (%)	+0.000 (%)
Option	Output Span fine adjust	100.000 (%)	100.000 (%)
Advanced	Upper display setting	INPUT	INPUT (Scaling)
Advanced	Lower display setting	PERCENT	OUTPUT (Scaling)
Advanced	Brightness	4	4

Clicking [Compare] button starts reading setting value of setting parameters from the connected device.

Parameters are compared and listed on the screen side by side, Setting Mode, Setting Parameter, Device Configuration and File Configuration in order.

The rows showing differences between Device Configuration and File Configuration are highlighted in red background. The total number of non-matching setting parameter is mentioned at the bottom.

Caution! DO NOT turn off the power supply to the device or disconnect the configurator cable while comparing.

4-4. HOW TO SETUP I/O (EXAMPLE)

General configurations that can be performed using the M2ECFG are described using examples.

4-4-1. CONNECTING TO THE DEVICE

Start up the M2ECFG. Click [Settings] button and choose or confirm the COM port to which the device is connected and click [Connect].

The PC starts to communicate with the device. Present parameter setting is uploaded and displayed under the [Device Configuration] on the screen. Check the [Editing] box so that you can now change the parameters in the [Device Configuration] frame.

Note 1: The connected device needs to be in Lock state since the [Editing] box cannot be checked if the connected device is in Unlock state.

Note 2: Disable Fixed I/O since the [Editing] box cannot be checked during a loop test (fixed I/O).

Note 3: It is not necessary to check the [Editing] box to edit the parameters in the [File Configuration] frame. Click [Upload] to read the parameters from the device.

4-4-2. BASIC CONFIGURATION EXAMPLES

Basic configuration examples per model are described here. The edited parameters are reflected in the device immediately.

Note: The edited parameters in the [File Configuration] frame are not reflected in the device in real time. Click [Download] button to write them to the device.

4-4-2-1. M2EXV

The procedure to configure the I/O of the M2EXV to the following specifications is described here:

Input: 4 to 20 mA DC

Output: 1 to 5 V DC

1) Input range

Set [Input range] according to the specification of input signal.

- [Input range]

0 – 50 mA

-1000 – +1000 mV

-10 – +10 V

For 4 – 20 mA DC input, choose the input type “0 – 50 mA”.

When [Input range] is selected, [0% input setting] and [100% input setting] are automatically set to the initial values of the selected [Input range]. Set them to your desired values.

Set [0% input setting] and [100% input setting] within the selected [Input range].

Set [0% input setting] to 4.00 and [100% input setting] to 20.00 for 4 – 20 mA DC.

2) Output range

Set [Output range] according to the specification of output signal.

- [Output range]

0 – 20 mA

-5 – +5 V

-10 – +10 V

For 1 – 5 V DC output, choose the output type “-5 – +5 V”.

Set [0% output setting] and [100% output setting] within the selected [Output range].

Set [0% output setting] to 1.000 and [100% output setting] to 5.000 for 1 – 5 V DC.

4-4-2-2. M2EXM

The procedure to configure the I/O of the M2EXM to the following specifications is described here:

Input: 100 to 600 Ω

Output: 4 to 20 mA DC

1) Input range

Set [0% input setting] to 100 and [100% input setting] to 600.

2) Output range

Set [Output range] according to the specification of output signal.

- [Output range]

0 – 20 mA

-5 – +5 V

-10 – +10 V

For 4 – 20 mA DC output, choose the output type “0 – 20 mA”.

Set [0% output setting] and [100% output setting] within the selected [Output range].

Set [0% output setting] to 4.000 and [100% output setting] to 20.000 for 4 – 20 mA DC.

4-4-2-3. M2EXR

The procedure to configure the I/O of the M2EXR to the following specifications is described here:

Input: Pt 100 (JIS '97, IEC) 0 to 100°C

Output: 1 to 5 V DC

1) Input range

Set [Input range] according to the specification of input signal.

- [Input range]

JPt 100 (JIS '89)

Pt 100 (JIS '89)

Pt 100 (JIS '97, IEC)

Pt 50 Ω (JIS '81)

Ni 508.4 Ω

Pt 1000

Ni 100

Cu 10 @ 25°C

Choose the input type “Pt 100 (JIS '97, IEC)”.

When [Input range] is selected, [0% input setting] and [100% input setting] are automatically set to the initial values of the selected [Input range]. Set them to your desired values.

Set [0% input setting] and [100% input setting] within the selected [Input range].

Set [0% input setting] to 0.0 and [100% input setting] to 100.0 for 0 – 100 °C.

Note: Set the temperature unit in the [Option] tab in the [File Configuration] frame. Refer to “4-2. PARAMETER SETTING IN [FILE CONFIGURATION]” on page 12 to set.

2) Output range

Set [Output range] according to the specification of output signal.

- [Output range]

0 – 20 mA

-5 – +5 V

-10 – +10 V

For 1 – 5 V DC output, choose the output type “-5 – +5 V”.

Set [0% output setting] and [100% output setting] within the selected [Output range].

Set [0% output setting] to 1.000 and [100% output setting] to 5.000 for 1 – 5 V DC.

4-4-2-4. M2EXT

The procedure to configure the I/O of the M2EXT to the following specifications is described here:

Input: K (CA) 0 to 1000 °C

Output: 4 to 20 mA DC

1) Input range

Set [Input range] according to the specification of input signal.

- [Input range]

(PR)

K (CA)

E (CRC)

J (IC)

T (CC)

B (RH)

R

S

C (WRe 5-26)

N

U

L

P (Platinel II)

Choose the input type “K (CA)”.

When [Input range] is selected, [0% input setting] and [100% input setting] are automatically set to the initial values of the selected [Input range]. Set them to your desired values.

Set [0% input setting] and [100% input setting] within the selected [Input range].

Set [0% input setting] to 0.0 and [100% input setting] to 1000.0 for 0 – 1000 °C.

Note: Set the temperature unit in the [Option] tab in the [File Configuration] frame. Refer to “4-2. PARAMETER SETTING IN [FILE CONFIGURATION]” on page 12 to set.

2) Output range

Set [Output range] according to the specification of output signal.

- [Output range]

0 – 20 mA

-5 – +5 V

-10 – +10 V

For 4 – 20 mA DC output, choose the output type “0 – 20 mA”.

Set [0% output setting] and [100% output setting] within the selected [Output range].

Set [0% output setting] to 4.000 and [100% output setting] to 20.000 for 4 – 20 mA DC.

4-4-2-5. M2EXS

The procedure to configure the I/O of the M2EXS to the following specifications is described here:

Input: 0 to 270°

Output: 0 to 10 V DC

1) Input range

Set [Angle offset] to 0.00 and [Angle span] to 270.00.

2) Output range

Set [Output range] according to the specification of output signal.

- [Output range]

0 – 20 mA

-5 – +5 V

-10 – +10 V

For 0 – 10 V DC output, choose the output type “-10 – +10 V”.

Set [0% output setting] and [100% output setting] within the selected [Output range].

Set [0% output setting] to 0.000 and [100% output setting] to 10.000 for 0 – 10 V DC.

4-4-2-6. M2EXDY

The procedure to configure the I/O of the M2EXDY to the following specifications is described here:

Input: 4 to 20 mA

Output: 0 to 5 V DC

1) Input range

Set [0% input setting] to 4.00 and [100% input setting] to 20.00.

2) Output range

Set [Output range] according to the specification of output signal.

- [Output range]

0 – 20 mA

-5 – +5 V

-10 – +10 V

For 0 – 5 V DC output, choose the output type “-5 – +5 V”.

Set [0% output setting] and [100% output setting] within the selected [Output range].

Set [0% output setting] to 0.000 and [100% output setting] to 5.000 for 0 – 5 V DC.

4-4-3. OTHER SETTINGS

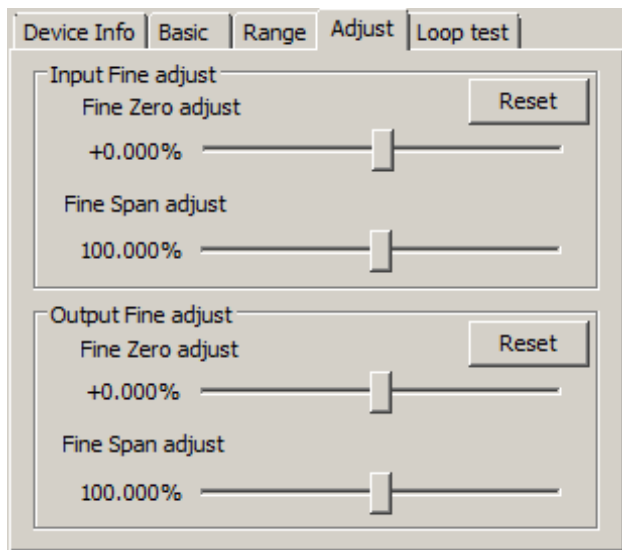
Edit other setting parameters in the [File Configuration]. Read the parameters with [Upload] from the device, edit them, and write them to the device with [Download].

Model specific setting parameter items and ranges are explained in “9. PARAMETER DETAILS” on page 21.

5. ADJUST - FINE ADJUSTMENTS

Fine adjustments can be conducted independently for the input and the output. Fine Zero is adjusted by offset adjustment, while Fine Span is adjusted by gain adjustment.

Adjustment can be made by moving each slider left or right. Click the side of a slider or use arrow keys to apply minimum step adjustments.



Perform Input Fine Adjustment while monitoring the input indicated on the display of the device or in the upper part in the [Device Configuration] frame of the M2ECFG. 1) Apply the value you want to set to input value 0%. 2) Adjust the sliding potentiometer until the monitored input signal shows 0% input. 3) Apply the value you want to set to input value 100%. 4) Adjust the sliding potentiometer until the monitored input signal shows 100% input.

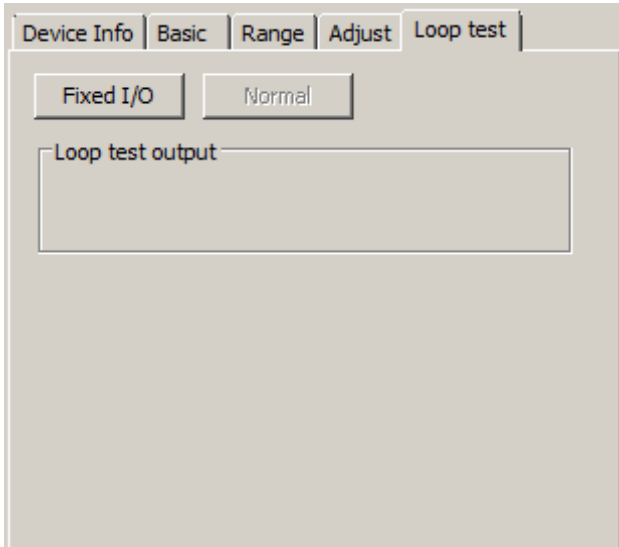
For Output Fine Adjustment, perform Fine Zero adjustment or Fine Span adjustment while monitoring the output with a measuring instrument such like digital multi-meter, and match each output. When the device outputs 0%, adjust Output Fine Zero Adjustment, and when the device outputs 100%, adjust Output Fine Span Adjustment.

To reset the Input or Output Fine Adjustments to the ex-factory state, click each [Reset] button.

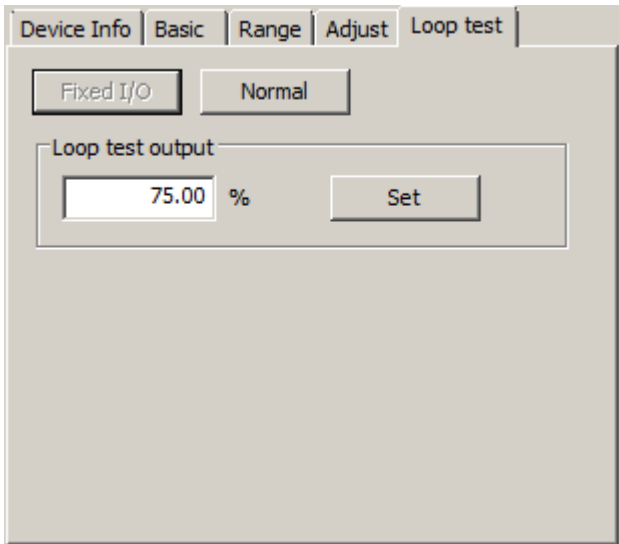
Note: The Input and Output Fine Adjustments are not available with **S**.

6. LOOP TEST

The device output signal can be simulated without actual input signals to conduct a loop test. (This is available only when [Editing] box is unchecked)



- 1) Click [Fixed I/O] button. The output signal is fixed according to present input, and even when the input varies the output remains fixed. The output signal can be changed as shown left below.



- 2) Enter a desired output value in the text box and click Enter key or [Set] button, the output is fixed with entered value.

SYMBOL	SIMULATED OUTPUT RANGE
VMS	-5.00 to +105.00%
RT	-10.00 to +110.00%
DY	-7.50 to +107.50%

- 3) Click [Normal] button to cancel the loop test mode.

Note 1: If the communication or the configurator cable is disconnected from the connected device during Fixed I/O, the device Fixed I/O will be disabled after a certain time.

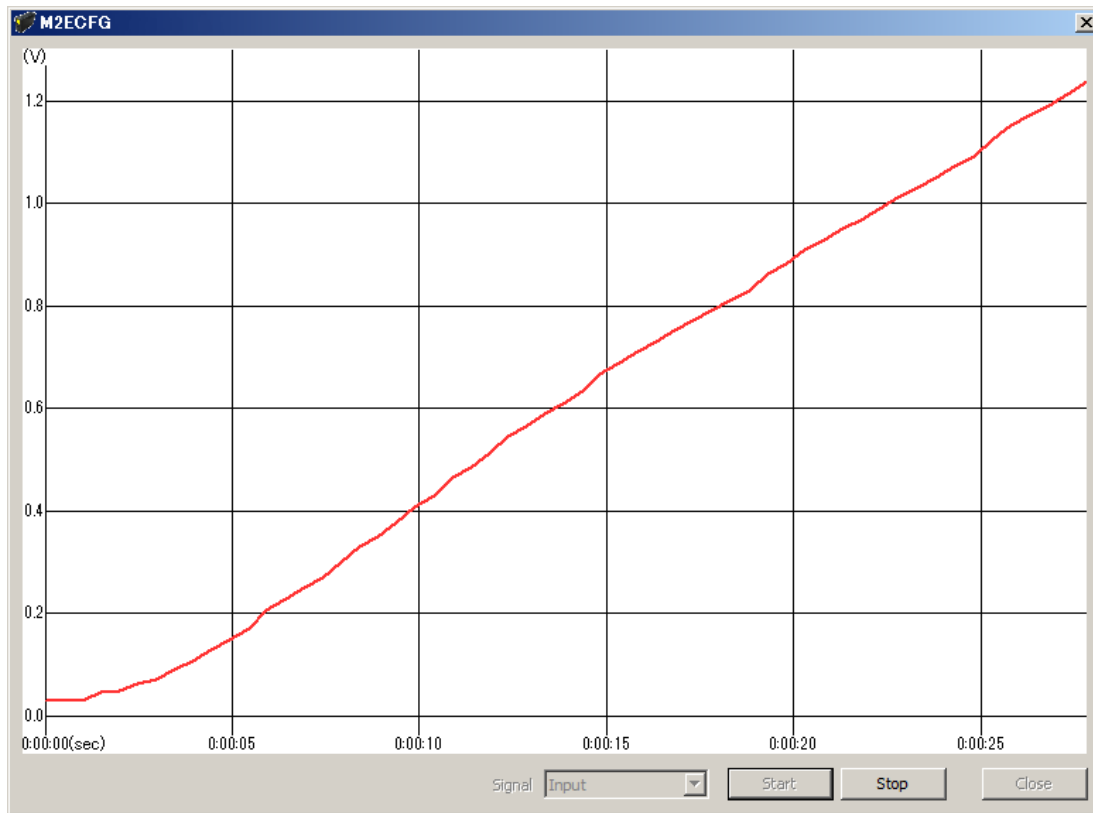
Note 2: [Editing] box cannot be checked during Fixed I/O.

Note 3: DO NOT perform the loop test of this software and the loop test of the device at the same time.

7. TREND GRAPH

When you click [Trend Graph] button, the following window is displayed. I/O signal of the device can be monitored on a trend graph. The trend is recorded and displayed in 0.5 seconds intervals.

Note: During Fixed I/O, trend graph is not available.



Choose the signal you want to record from the [Signal] list box and click [Start] to start recording and displaying in real time.

Click [Stop] to stop recording.

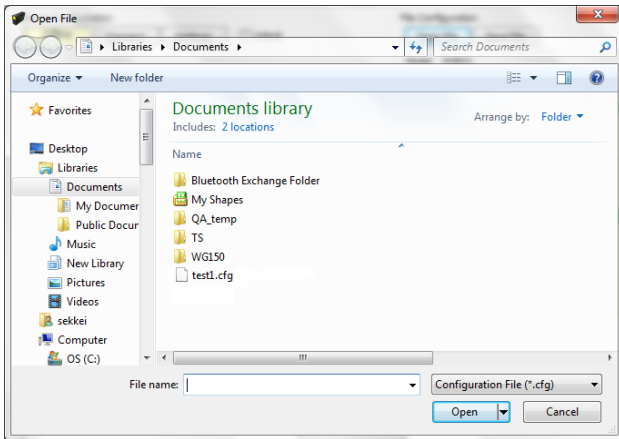
The vertical axis is for the value of the selected signal; its range covers the maximum and minimum values of the signal from the point when the [Start] button is clicked to start recording. The number of decimal places for the vertical axis varies depending on the range of the maximum and minimum values. (The range automatically varies when the maximum or minimum value is changed)

The horizontal axis is for time. The left end shows the value when recording is started by clicking the [Start] button and the right end shows the current value. (The graph is reduced as time passes)

8. READING / SAVING FILES

The setting parameters edited in the [File Configuration] can be saved as a file. You can write the same settings to other devices easily.

8-1. READING SETTING VALUES OF SETTING PARAMETERS SAVED AS FILE

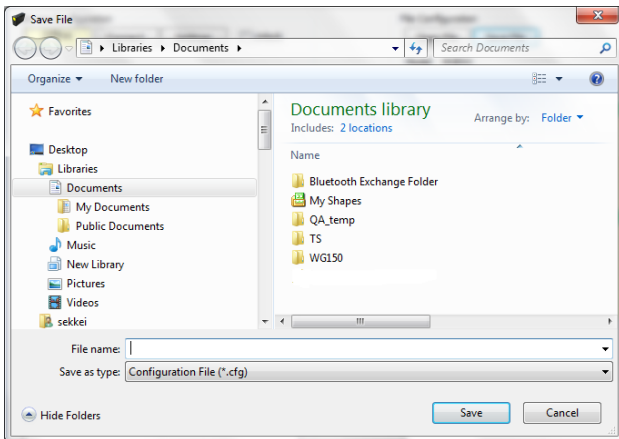


Clicking the [Open File] button displays a window like the left figure. This screen is the standard Open File screen for Windows so screen composition may differ depending on the OS being used to run this software.

Select a parameter file to show a stored setting value of setting parameter.

In order to download the setting value of setting parameter to the connected device, click [Download] button.

8-2. SAVING PARAMETERS IN A FILE



Clicking [Save File] calls up the Windows-standard Save As dialog box. This screen is the standard Save File screen for Windows so screen composition may differ depending on the OS being used to run this software.

Enter a desired file name to File Name field and click [Save] to store a setting value of setting parameter in the [File Configuration] frame.

In order to save the setting value of setting parameters of the connected device, click [Upload] first and then save them as a file.

Note: Do not overwrite the contents of the saved files; otherwise, errors will occur when loading.

9. PARAMETER DETAILS

9-1. PARAMETERS LIST

Supported parameters depend upon model types. Supported ones are marked with '✓' in the following table.

		M2EXV	M2EXM	M2EXR	M2EXT	M2EXS	M2EXDY	Page
Basic setting	Input range	✓		✓	✓			22
	0% input setting / 100% input setting	✓	✓	✓	✓		✓	22
	Angle offset / Angle span					✓		23
	Rotating direction					✓		23
	0% input scaling / 100% input scaling	✓	✓			✓	✓	23
	Input scaling decimal point	✓	✓			✓	✓	23
	Input decimal point			✓	✓			23
	Output range	✓	✓	✓	✓	✓	✓	23
	0% output setting / 100% output setting	✓	✓	✓	✓	✓	✓	23
	0% output scaling / 100% output scaling	✓	✓	✓	✓	✓	✓	24
	Output decimal point	✓	✓	✓	✓	✓	✓	24
	Overrange output < 0% / Overrange output > 100%					✓		24
Option	Burnout			✓	✓			24
	Unit (INP scaling / OUT scaling)	✓	✓	✓	✓	✓	✓	24
	User unit	✓	✓	✓	✓	✓	✓	24
	Temperature unit			✓	✓			24
	Cold junction comp				✓			24
	Terminal temperature				✓			24
	Filter time constant	✓	✓	✓	✓	✓	✓	25
	Sensor wires			✓				25
	Wire resistance			✓				25
	Low cut						✓	25
	Low cut point						✓	25
	Input Zero fine adjust / Input Span fine adjust	✓	✓	✓	✓		✓	25
	Output Zero fine adjust / Output Span fine adjust	✓	✓	✓	✓	✓	✓	25
	Advanced	Upper display setting	✓	✓	✓	✓	✓	✓
Lower display setting		✓	✓	✓	✓	✓	✓	26
Brightness		✓	✓	✓	✓	✓	✓	26
Display timeout		✓	✓	✓	✓	✓	✓	26
Linearization	User's table linearization	✓	✓			✓	✓	27
	Number of points	✓	✓			✓	✓	27
	Table	✓	✓			✓	✓	27

9-2. BASIC - BASIC SETTING

9-2-1. INPUT RANGE **V R T**

Device input specifications can be configured. Can be selected from the following:

SYMBOL	INPUT RANGE	MODEL
V	0 – 50 mA -1000 – +1000 mV -10 – +10 V	M2EXV
R	JPt 100 (JIS '89) Pt 100 (JIS '89) Pt 100 (JIS '97, IEC) Pt 50 Ω (JIS '81) Ni 508.4 Ω Pt 1000 Ni 100 Cu 10 (25 deg C)	M2EXR
T	(PR) K (CA) E (CRC) J (IC) T (CC) B (RH) R S C (WRe 5-26) N U L P (Platinel II)	M2EXT

Note 1: After setting, [0% input setting] and [100% input setting] turn to initial values.

Note 2: When [Input range] is changed with **V**, turn the power off, and change the wiring to the input terminals of the device.

9-2-2. 0% INPUT SETTING / 100% INPUT SETTING **V M R T DY**

0% and 100% input signals can be configured within the setting range. For example, with **V**, when the input signal is 1 – 5 V DC with the [Input range] -10 – +10 V, set [0% input setting] to 1.000 and [100% input setting] to 5.000. 1.000 to 5.000 V input will be scaled to 0% to 100%.

SYMBOL	INPUT	SETTING RANGE	MIN. SPAN
V	0 – 50 mA	0.00 – 50.00	2.00
	-1000 – +1000 mV	-1000.0 – 1000.0	100.0
	-10 – +10 V	-10.000 – 10.000	1.000
M	–	0 – 10000	500
R	JPt 100 (JIS '89)	-200.00 – 500.00 (°C)	20.00 (°C)
	Pt 100 (JIS '89)	-200.00 – 650.00 (°C)	
	Pt 100 (JIS '97, IEC)	-200.00 – 850.00 (°C)	
	Pt 50 Ω (JIS '81)	-200.00 – 649.00 (°C)	
	Ni 508.4 Ω	-50.00 – 200.00 (°C)	
	Pt 1000	-200.00 – 850.00 (°C)	
	Ni 100	-50.00 – 200.00 (°C)	
	Cu 10 (25 deg C)	-50.00 – 250.00 (°C)	

T	(PR)	0.0 – 1760.0 (°C)	20.0 (°C)
	K (CA)	-270.0 – 1370.0 (°C)	
	E (CRC)	-270.0 – 1000.0 (°C)	
	J (IC)	-210.0 – 1200.0 (°C)	
	T (CC)	-270.0 – 400.0 (°C)	
	B (RH)	0.0 – 1820.0 (°C)	
	R	-50 – 1760.0 (°C)	
	S	-50 – 1760.0 (°C)	
	C (WRe 5-26)	0.0 – 2315.0 (°C)	
	N	-270.0 – 1300.0 (°C)	
	U	-200.0 – 600.0 (°C)	
	L	-200.0 – 900.0 (°C)	
	P (Platinel II)	0.0 – 1395.0 (°C)	
DY	–	0.00 – 20.00	1.00

9-2-3. ANGLE OFFSET / ANGLE SPAN **S**

Set the angle offset and span for the input signal. For example, set [Angle offset] to 50.00 and [Angle span] to 100.00, and 50.00 to 150.00° input will be scaled to 0% to 100%.

	SETTING RANGE
Angle offset	0.00 – 359.99°
Angle span	60.00 – 359.99°

9-2-4. ROTATING DIRECTION **S**

Set the rotating direction of the self-synchronizing motor from the following:

CW (clockwise)
CCW (counter-clockwise)

9-2-5. 0% INPUT SCALING / 100% INPUT SCALING **V M S DY**

Scaling values for [0% input setting] and [100% input setting] can be configured.

For example, with **V**, when you set [0% input setting] to -10.000, [100% input setting] to 10.000, [0% input scaling] to 0 and [100% input scaling] to 10000, -10 to +10 V input will be scaled to 0 to 10000 and shown on the display of the device.

Set [0% input scaling] and [100% input scaling] within the range of -99999 to 999999.

9-2-6. INPUT SCALING DECIMAL POINT **V M S DY**

Set decimal point position for [Input scaling] among no decimal point to 5 places of decimals.

9-2-7. INPUT DECIMAL POINT **R T**

Set decimal point position for [Input setting] among no decimal point to 2 places of decimals.

9-2-8. OUTPUT RANGE

Device output specifications can be configured. Can be selected from the following:

0 – 20 mA
-5 – +5 V
-10 – +10 V

After setting, [0% output setting] and [100% output setting] turn to initial value.

Caution! Turn the device power off and the DIP switches on the side of the device must be appropriately set to the selected output type when changing [Output range].

9-2-9. 0% OUTPUT SETTING / 100% OUTPUT SETTING

Engineering unit value for 0% and 100%, when the % value calculated by output value is converted to output engineering unit value, can be configured. For example, with [Output range] is 0 – 20 mA, when you set 4.00 to [0% output setting] and 20.00 to [100% output setting], 0 to 100% output will be scaled to 4.00 to 20.00 mA.

OUTPUT	SETTING RANGE	MIN. SPAN
0 – 20 mA	0.00 – 20.00	1.000
-5 – +5 V	-5.000 – 5.000	0.250
-10 – +10 V	-10.000 – 10.000	1.000

9-2-10. 0% OUTPUT SCALING / 100% OUTPUT SCALING

Values for [0% output setting] and [100% output setting] in [Output scaling] on the display when the device is in measuring mode can be configured. For example, when you set 0 to [0% output scaling] and 5000 to [100% output scaling], 0% to 100% output will be scaled to 0 to 5000 indicated on the display of the device.

For [0% output scaling] and [100% output scaling], set in the range of -99999 to 999999.

9-2-11. OUTPUT DECIMAL POINT

Set decimal point positions for [Output scaling]. For [Output decimal point], set in the range from no decimal point to 5 places of decimals.

9-2-12. OVERRANGE OUTPUT < 0% / OVERRANGE OUTPUT > 100% **S**

Set the output range for the input < 0% or > 100%.

	SETTING RANGE
Ovrange output < 0%	-5.00 – 0.00%
Ovrange output > 100%	100.00 – 105.00%

9-3. OPTION - OPTION SETTING

9-3-1. BURNOUT **R T**

Select the operation at burnout from the following:

None
Down
Up

When the device detects disconnection of a temperature sensor, it can output 110% with upscale burnout or -10% with down-scale. Or setting not to detect the disconnection is also available.

9-3-2. UNIT (INP SCALING) / UNIT (OUT SCALING)

The unit displayed when [Input scaling] or [Output scaling] is selected as the display value while the device is in measuring mode can be selected and configured.

The following 68 units are available:

DC, AC, mV, V, kV, μ A, mA, A, kA, mW, W, kW, var, kvar, Mvar, VA, Hz, Ω , k Ω , M Ω , cm, mm, m, m/sec, mm/min, cm/min, m/min, m/h, m/s², inch, L, L/s, L/min, L/h, m³, m³/sec, m³/min, m³/h, Nm³/h, N·m, N/m², g, kg, kg/h, N, kN, Pa, kPa, MPa, t, t/h, °C, °F, K, %RH, J, kJ, MJ, rpm, sec, min, min⁻¹, pH, %, ppm, deg, (blank), User

9-3-3. USER UNIT

Can be configured when you select [User] in [Unit (INP scaling)] or [Unit (OUT scaling)].

Configurable up to 13 characters shown below.

Available characters:

0 – 9 A – Z a – z ! " # \$ % & ' () = - + * ^ | @ ` [] { } ; : < > ? _ , . /

9-3-4. TEMPERATURE UNIT **R T**

Select the temperature unit for [0% input setting] and [100% input setting] from the following:

Deg C
Deg F
K

Deg C = Celsius (°C), deg F = Fahrenheit (°F)

9-3-5. COLD JUNCTION COMPENSATION **T**

Select the cold junction compensation (CJC) method from the following:

CJM
FXD TEMP

With CJM, the thermal electromotive force is compensated using the supplied CJC Sensor (model: CJM).

With FXD TEMP, the thermal electromotive force at the temperature set with the [Terminal temperature] is compensated. (Error may be increased due to the preset fixed terminal temperature different from the actual terminal temperature.)

9-3-6. TERMINAL TEMPERATURE **T**

Set the terminal temperature for the cold junction compensation within the range of -50.00 to 100.00°C. Configurable only with FXD TEMP selected for the [Cold junction compensation].

9-3-7. FILTER TIME CONSTANT

First order lag filter used. No filter is applied when set to 0. Time constant is selectable from 0, 1 – 30 seconds.

First order lag filter is equivalent to that of ordinary CR filters and the time configured is the time required for a step input to track and reach approx. 63% of the full-scale of 0% to 100%.

9-3-8. SENSOR WIRES **R**

Set number of sensor wires for RTD from the following:

- 2 wires
- 3 wires

9-3-9. WIRE RESISTANCE **R**

Compensate the wire resistance within the range of 0.00 to 100.00 (Ohm).

Configurable only with 2 wires selected for the [Sensor wires].

9-3-10. LOW CUT **DY**

Whether to enable the low cut function can be configured.

- Enable
- Disable

9-3-11. LOW CUT POINT **DY**

Specify the threshold of low-cut point to be judged, which can be set from 0.00 to 100.00% when [Low cut] function is enabled.

9-3-12. INPUT ZERO FINE ADJ. / INPUT SPAN FINE ADJ. **V M R T DY**

Input engineering unit value can be adjusted.

The adjustable ranges of the [Input Zero fine adjust] and [Input Span fine adjust] depend on the models as shown in the following table.

SYMBOL	ADJUSTABLE RANGE		MODEL
	INPUT ZERO FINE ADJUST	INPUT SPAN FINE ADJUST	
V M DY	-5.000 – +5.000%	95.000 – 105.000%	M2EXV, M2EXM, M2EXDY
R T	-10.00 – +10.00°C	-10.00 – +10.00°C	M2EXR, M2EXT

9-3-13. OUTPUT ZERO FINE ADJ. / OUTPUT SPAN FINE ADJ..

Output engineering unit value can be adjusted.

[Output zero fine adj.] can be set between -5.000 – +5.000 (%) and [Output span fine adj.] can be set between 95.000 – 105.000 (%).

9-4. ADVANCE - ADVANCED SETTING

9-4-1. UPPER DISPLAY SETTING

Information to be displayed on the upper device display while the Device is in measuring mode can be configured from the following:

SYMBOL	UPPER DISPLAY SETTING	MODEL
V M S DY	Input engineering unit value Input scaling Percent value (*) Output engineering unit value Output scaling	M2EXV, M2EXM, M2EXS, M2EXDY
R	Input engineering unit value Input resistance Percent value (*) Output engineering unit value Output scaling	M2EXR
T	Input engineering unit value Input electromotive force value Percent value (*) Output engineering unit value Output scaling	M2EXT

(*) Percent value for input.

9-4-2. LOWER DISPLAY SETTING

Information to be displayed on the lower device display while the Device is in measuring mode can be configured from the following:

SYMBOL	UPPER DISPLAY SETTING	MODEL
VMSDY	Input engineering unit value Input scaling Percent value (*) Output engineering unit value Output scaling No display	M2EXV, M2EXM, M2EXS, M2EXDY
R	Input engineering unit value Input resistance Percent value (*) Output engineering unit value Output scaling No display	M2EXR
T	Input engineering unit value Input electromotive force value Percent value (*) Output engineering unit value Output scaling No display	M2EXT

(*) Percent value for input.

9-4-3. BRIGHTNESS

The display brightness of the Device can be adjusted. Adjustable range is 1 (dark) to 4 (bright).

9-4-4. DISPLAY TIMEOUT

Specify how much idle time must elapse before the display is turned off.

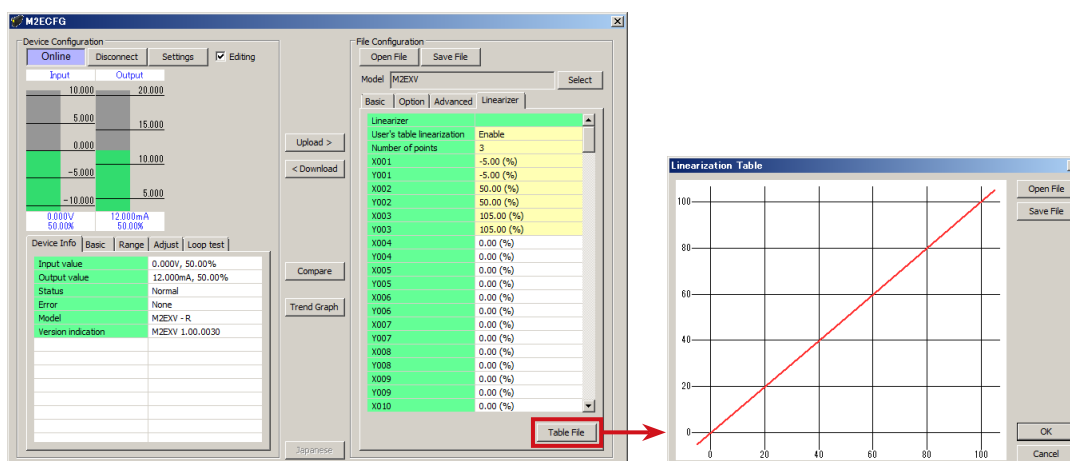
Adjustable range is 0 or 1 to 60 (min.). Display remains on indefinitely if set to 0.

9-5. LINEARIZER - LINEARIZATION SETTING VMSDY

In the [Linearizer] tab, specified by a segment linearization table with calibration points defined with multiple sets of input (X) and output (Y) values.

A user-specified linearization table in the [Linearizer] tab can be saved as a table file, while those saved as table files can be also imported. Click [Table] to read or save a file.

Note: [Table] button is available only when [Linearization] is “Enabled” with User Table.



Click [Table File] to display the screen shown upper right.

Click [Open File] or [Save File] button to read or save a table file. Refer to “10. APPENDIX” on page 28 for detailed table format.

9-5-1. USER'S TABLE LINEARIZATION **V M S DY**

Select the type of linearization function from the following table according to the model.

SYMBOL	TYPE	MODEL
V M S	Disable Enable	M2EXV, M2EXM, M2EXS
DY	Linear Square root extraction Segment linearization	M2EXDY

When [Disable] or [Linear] is selected, no conversion is performed with a user specified table.

When [Enable] or [Segment linearization] is selected, with a user specified table, the input is converted to the output.

When [Square root extraction] is selected, the square root of the input is extracted, and which is obtained as the output.

9-5-2. NUMBER OF POINTS **V M S DY**

Specify the number of calibration points in the linearization table. Adjustable setting ranges are shown in the following table according to the model. When table file is read, it is automatically updated according to available number of Xn, Yn pair.

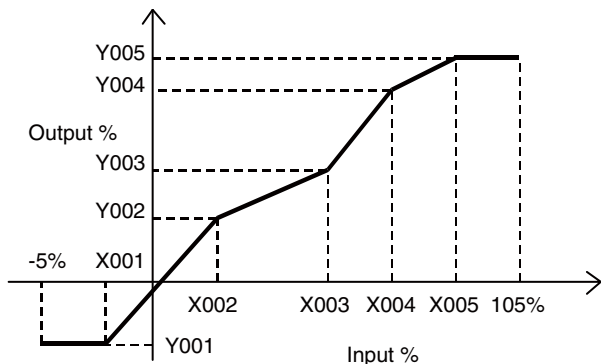
SYMBOL	SETTING RANGE	MODEL
V M	2 – 111	M2EXV, M2EXM
S	2 – 32	M2EXS
DY	2 – 128	M2EXDY

9-5-3. TABLE **V M S DY**

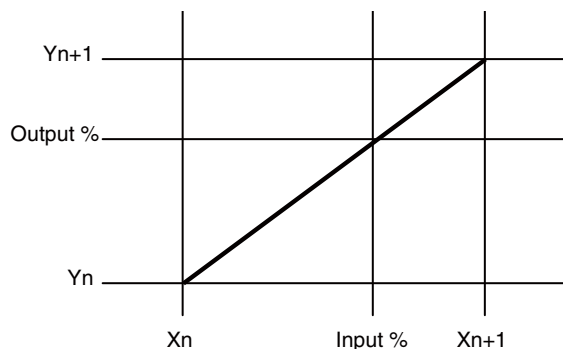
Configure a user specified table used for conversion. Adjustable setting ranges are shown in the following table according to the model. Arrange in order from the smallest X value starting from X001. If you set in different order, precise conversion cannot be achieved.

SYMBOL	X, Y SETTING RANGE	MODEL
V M S	-5.00 – +105.00%	M2EXV, M2EXM, M2EXS
DY	-7.50 – +107.50%	M2EXDY

Conversion using user specified table searches original values from tables containing pairs of X = input (unit %) and Y = output (unit %), and uses Y for the matching table output.



Non-specified Xs and Ys, i.e. the range between two calibration points are approximated by a linear line.



When the input value is out of the defined range, the closest Y value is applied.

10. APPENDIX

10-1. USER TABLE FORMAT V M S DY

The following indicates user specified table file format used in this software.

User specified table to be used for the device X-Y linearization function is saved in a user specified table file. Linearization data is saved in text format with components as indicated below.

```
/* User linearization table comment */  
{  
    -5.00, -5.00  
    0.00,  1.00  
    50.00, 49.00  
    105.00, 105.00  
}
```

The bracket ‘{’ in the second row indicates the beginning of the table, while the ‘}’ in the last row indicated the end.

Write in a way that each row contains only ‘{’ or ‘}’ as shown.

Each row for the table contains a pair of X_n and Y_n , which are separated by ‘,’. For the setting range of X_n , Y_n , refer to “9-5-3. TABLE V M S DY” on page 27, for the maximum number of the pairs, refer to “9-5-2. NUMBER OF POINTS V M S DY” on page 27.

The row starting with ‘/’ is recognized as a comment.

Table file must be saved with extension “txt”.