For Super-mini Signal Conditioners with Display M1E-1 Series

# M1E CONFIGURATOR SOFTWARE

# Model: M1E1CFG

# USERS MANUAL



MG CO., LTD. www.mgco.jp
5-2-55 Minamitsumori, Nishinari-ku, Osaka 557-0063 JAPAN

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# 1. INTRODUCTION

## 1-1. GENERAL DESCRIPTION

The M1E1CFG is used to program parameters for Super-mini Signal Conditioners with Display M1E-1 series (hereinafter referred to as 'device').
The following major functions are available:

1) Download parameters to a device and upload the parameters from the device
2) Edit parameters offline (not connected to the device)
3) Save parameters as a file and read the parameters from the file
4) Compare parameters (to be) edited on the screen with the currently set parameters of the device
5) Adjust parameters online (connected to the device) in real time

## 1-2. APPLICABLE DEVICES

M1E1CFG is applicable to the following products in the firmware versions as respectively indicated below or higher:

| TYPE | MODEL | SYMBOL | FIRMWARE VERSION |
|---|---|---|---|
| Signal Transmitter | M1EXV-1 | – | ******* |

Confirm that the product you have purchased is compatible with M1E1CFG.

The latest versions of the M1E1CFG and users manual are downloadable at our web site.

In this manual, descriptions given with the above symbols are applied only to the respective models to which those symbols are assigned.
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 M1E1CFG.

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

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

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

Set your windows DPI to 'Smaller - 100%' for optimum display.
Some screens may not be displayed properly if set to other than 'Smaller - 100%'.

## 1-4. INSTALLING & UNINSTALLING THE PROGRAM

### INSTALL

The program is provided as compressed archive.
Decompress the archive and execute "setup.exe" to start up the M1E1CFG installer program.
Follow instructions on the Windows.

### UNINSTALL

- For Windows 7 and 8.1, open Control Panel > Uninstall a program, or Uninstall or change a program.
  Select the M1E1CFG from the program list and click [Uninstall] button.
- For Windows 10, open Settings from Start menu > System > Apps & features.
  Select the M1E1CFG from the program list and click [Uninstall] button.

# 2. GETTING STARTED

## 2-1. STARTING THE M1E1CFG

- Windows 7 : Open Program > M-SYSTEM > Configurator > M1E1CFG
- Windows 8.1: Open All Apps on the Start screen > M-SYSTEM > M1E1CFG
- Windows 10 : Open All Apps on the Start menu > M-SYSTEM > M1E1CFG

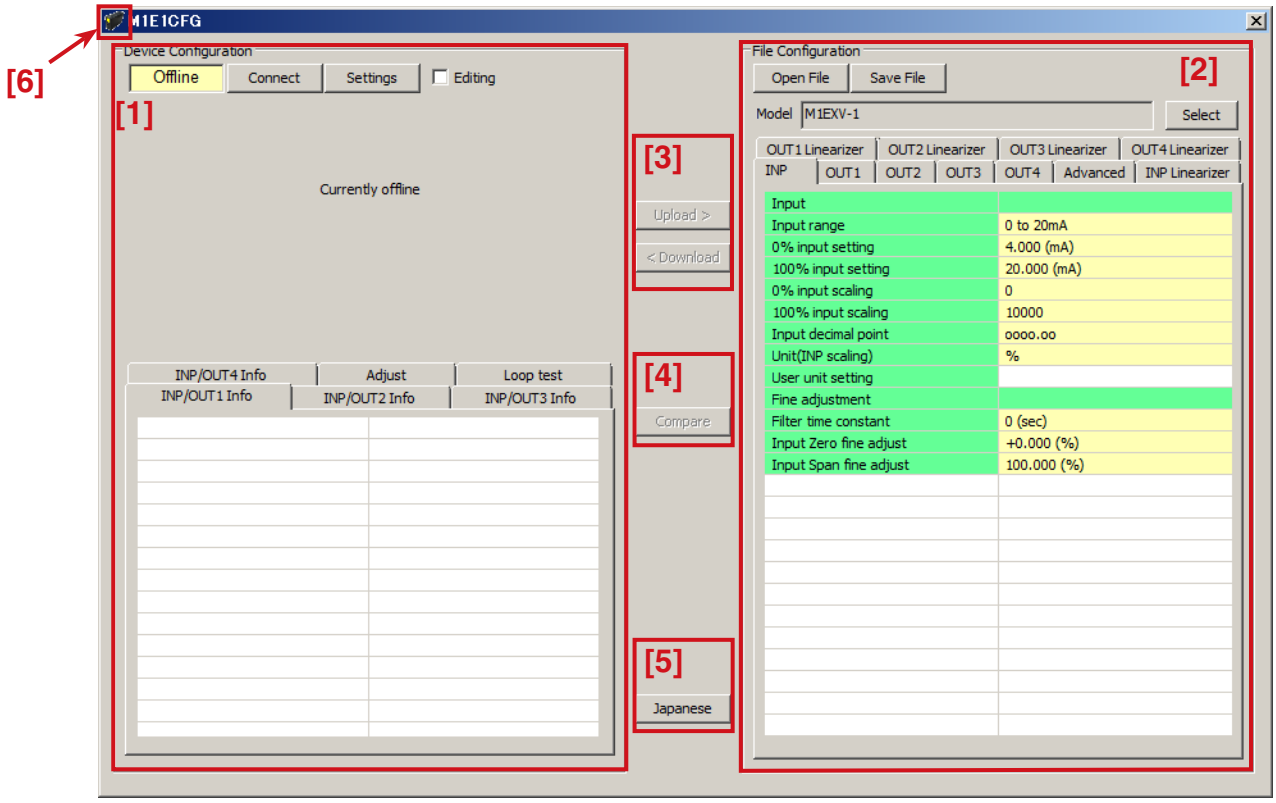
to start up the M1E1CFG on the Windows PC.

## 2-2. TERMINATION

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

## 2-3. SCREEN COMPONENTS

The table below shows details of each screen component on the M1E1XFG window.




| | |
|---|---|
| [1] Device Configuration | Communication port is set, and M1E1CFG is connected or disconnected with the device.<br>Parameters of the device being connected can be adjusted in real time.<br>I/O settings are displayed in real time. |
| [2] File Configuration | All parameters are shown and edited regardless of whether the device is connected or disconnected.<br>The edited parameters can be saved in a file and the saved parameters can be read from the file. |
| [3] Upload / Download | [Upload>] button is to read parameters of a device and show them in the [File Configuration] frame.<br>[<Download] button is to write edited parameters into a device. |
| [4] Compare | [Compare] button to compare parameters of the connected device with those shown in the [File Configuration] frame.<br>The parameters of the item showing a difference are highlighted in red. |
| [5] English / Japanese | The button to switch the display language between English and Japanese.<br>The program starts up in English mode as initial state when the OS is other than Japanese version.<br>It can be switched to Japanese only when the OS supports Japanese language. |
| [6] Version | Click (or right-click) on the left-top of the window to show the menu.<br>Click [About M1E1CFG(A)…], and the version No. dialog box will appear. |

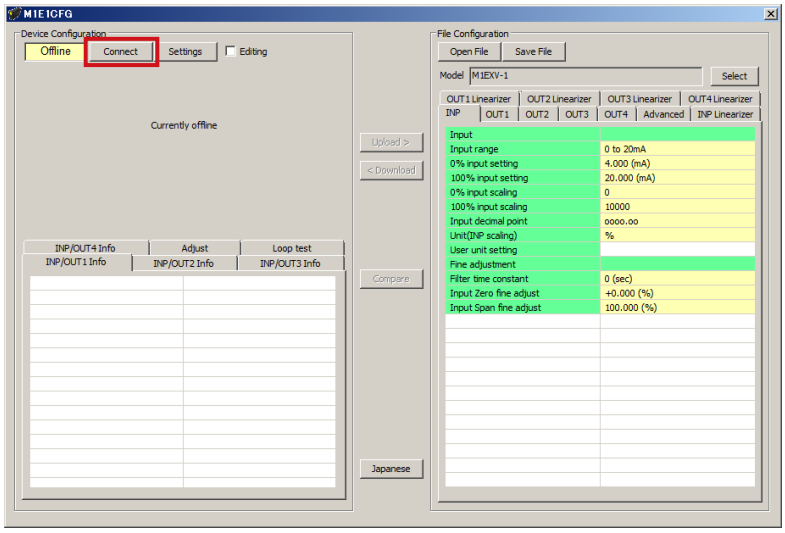
## 2-4. CONNECTING TO THE DEVICE

When the PC starts communication with the device, [INP/OUT1 Info], [INP/OUT2 Info], [INP/OUT3 Info], [INP/OUT4 Info], [Adjust] and [Loop test] are shown in the [Device Configuration] frame, where the parameters are edited or adjusted.

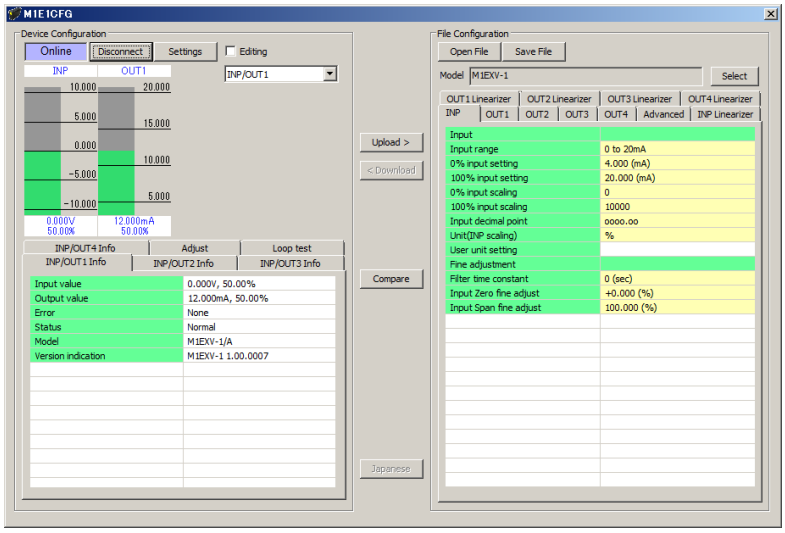
**NOTE 1:** Make sure that the "Lockout Setting" of the connected device is 'Lock' to change parameters on M1E1CFG.

**NOTE 2:** 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 M1E1CFG and show them in the [File Configuration] frame.

Click [Settings] to choose the COM port number used to communicate which the device.
Once a COM port is specified after the M1E1CFG has been installed and started, there is no need to repeat the setting procedure until the next time the COM port needs to be changed.
Click [Connect] button to start communication with the device to be connected.



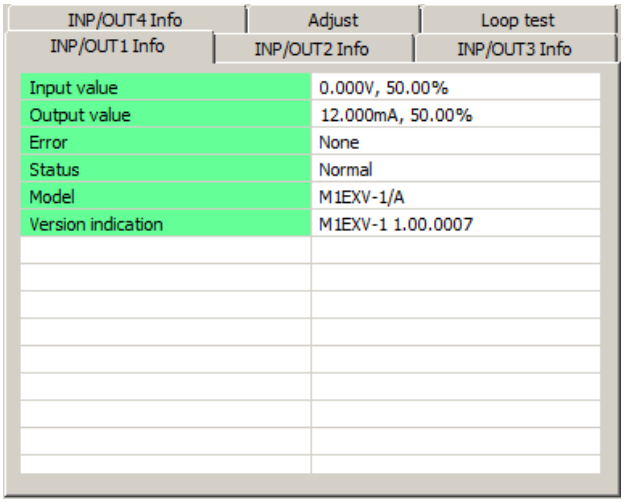

The model of the device is automatically recognized and the device data is uploaded and shown in the [Device Configuration] frame.




The bargraph shows real time I/O status of the device, and the I/O to display on the bargraph can be selected from the pull-down menu.
Access the menu tab such as [INP/OUT1 Info], [INP/OUT2 Info], [INP/OUT3 Info], [INP/OUT4 Info], [Adjust] or [Loop test] to perform necessary operation.
The scales of the bargraph are determined automatically by [0% input setting] and [100% input setting], or [0% output setting] and [100% output setting].
When the configurator cable is disconnected, the display on the [INP/OUT1 Info], [INP/OUT2 Info], [INP/OUT3 Info], or [INP/OUT4 Info] tab disappears and the M1E1CFG becomes ready to connect with another device.
In order to proceed to another device, simply connect a new device by inserting a cable so that the M1E1CFG automatically starts to communicate with the new device without clicking the [Connect] button.
Click [Disconnect] to terminate the communication with the device.

# 3. INP/OUT INFO - INPUT and OUTPUT INFORMATION

When the PC starts to communicate with the device, I/O information such as current I/O values, device status, model number, etc. are shown on each of the [INP/OUT1 Info], [INP/OUT2 Info], [INP/OUT3 Info], and [INP/OUT4 Info] tab.




| Item | Explanations | | |
|---|---|---|---|
| Input value | Current input value is indicated in engineering unit and in percentage. | | |
| Output value | Current output value of the corresponding output is indicated in engineering unit and in percentage. | | |
| Status | Current device status as shown below is indicated.<br>(When two or more statuses occur at the same time, the highest priority status is indicated.) | | |
| | Display | Priority | Status |
| | Fixed I/O | 1 | I/O is fixed with the M1E1CFG operation.<br>(The fixed I/O state set with the front buttons of the device is not reflected.)<br>(Device display: None) |
| | Unlock | 2 | Settings are being changed with the front buttons of the connected device.<br>(When the device is in this state, settings cannot be changed on M1E1CFG.<br>The checkmark on the [Editing] box will be automatically disabled.)<br>(Device display: Unlock) |
| | Normal | 3 | The device is operating normally. (Device display: Lock) |
| Error | Current error of the corresponding channel as shown below is indicated.<br>(When multiple errors occur at the same time, the highest priority error is indicated.) | | |
| | Error Message | Priority | Status |
| | OVER RANGE D | 1 | Input value is less than -5%. |
| | OVER RANGE U | 1 | Input value exceeds 105%. |
| | SCALING ERROR D | 2 | Calculated result of input scaling value is less than -99999. |
| | SCALING ERROR U | 2 | Calculated result of input scaling value exceeds 999999. |
| | None | 3 | No error |
| Model | Model number of the device<br>Note: Ex-factory model number is indicated.<br>The model number will be the same even if I/O settings are changed at site. | | |
| Version | Firmware version number of the device | | |

# 4. SETTING PARAMETERS

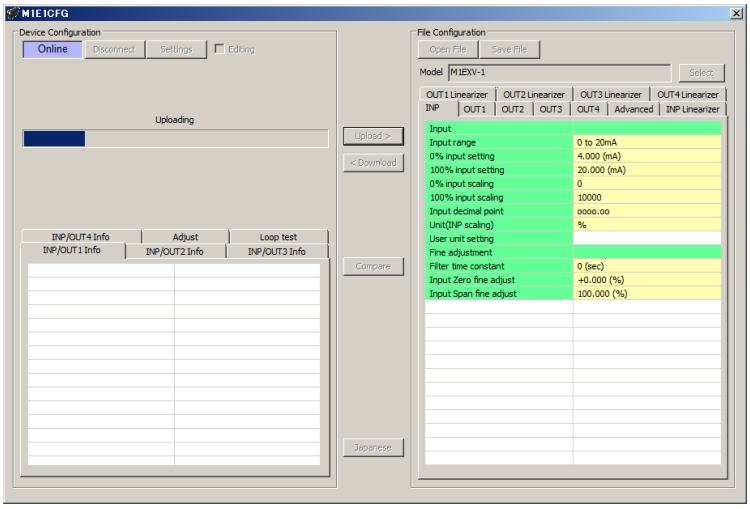
All setting parameters can be edited in the [File Configuration] frame.

## 4-1. PARAMETER SETTING IN [FILE CONFIGURATION]

Read parameters from a device (upload), edit them, and then write them to the device (download).
Setting parameters can also be saved in a file, and the file can be read, edited, and written to.
Thus, parameters to be edited can also be read from a saved file.
To save and read a file, refer to "7. READING / SAVING FILES" on page 14.

### 4-1-1. UPLOAD

Click [Upload>] while the PC communicates with the device.
The M1E1CFG starts reading parameters from the connected device, and a progress bar appears to show the progress of the upload.

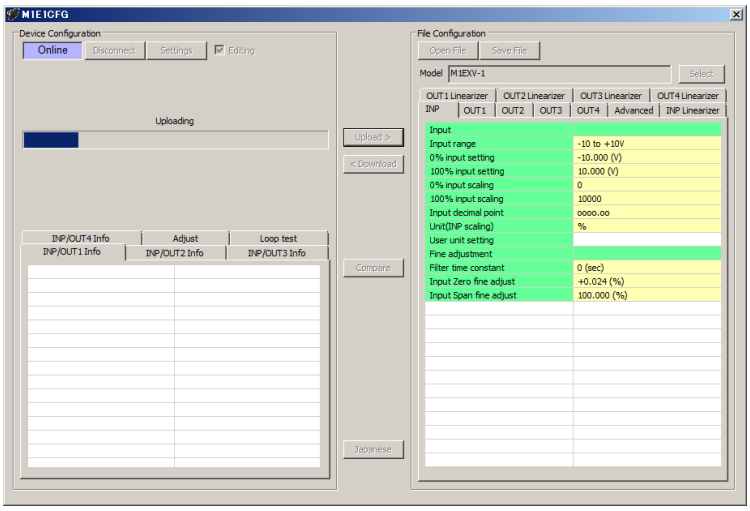



When the upload is complete, the parameters are shown within the [File Configuration] frame and become editable.

**NOTE 1**: DO NOT turn off the power supply to the device or disconnect the configurator cable while uploading.
**NOTE 2**: DO NOT edit the setting parameters in the [File Configuration] frame while uploading.

### 4-1-2. DOWNLOAD

When you finish editing the parameters, click [<Download] while the PC communicates with the device.
The M1E1CFG starts writing the parameters having been edited to the connected device.
A progress bar appears to show the progress of the download.

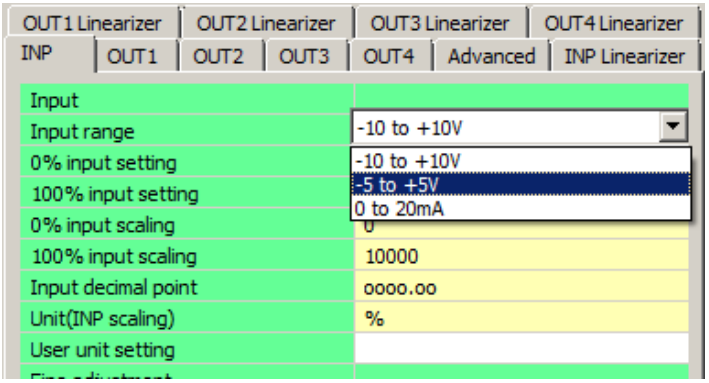



When the download is complete, the setting parameters edited in the [File Configuration] frame are written into the device.

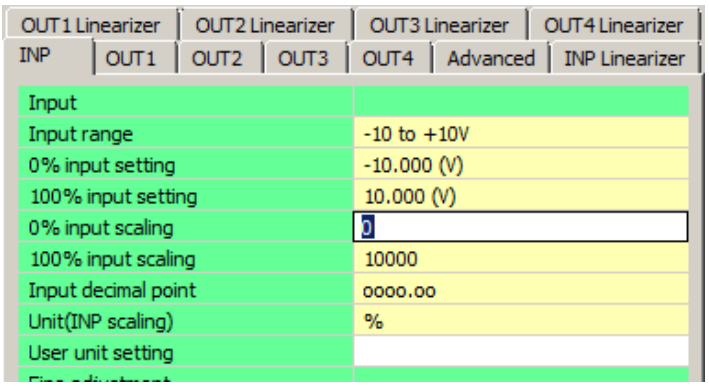
**NOTE 1:** DO NOT turn off the power supply to the device or disconnect the configurator cable while downloading.
**NOTE 2**: DO NOT edit the setting parameters in the [File Configuration] frame while downloading.

### 4-1-3. EDITING SETTING PARAMETERS

Click a value field, and a pull-down menu or an edit box will be displayed.
Select or enter a value in accordance with your desired setting.
Pull-down menu: For example, click the [Input range] field to show a pull-down menu.
Select a desired input range (See figure below).




Edit box: For example, click the [0% input scaling] field to show the edit box.
Enter a desired value and press Enter key (See figure below).



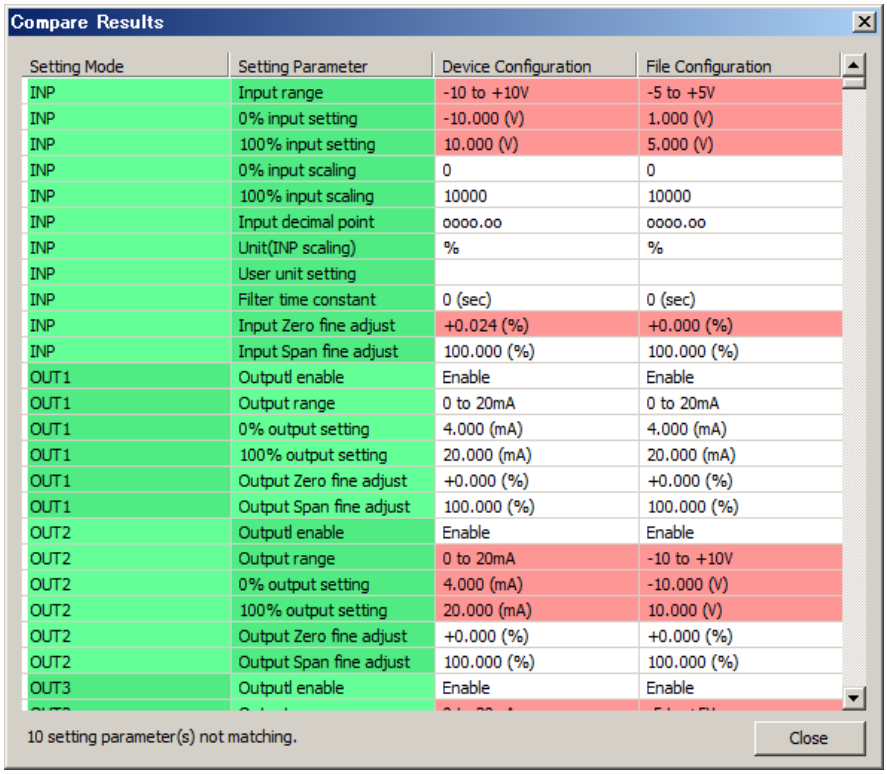

When parameters have been edited, write them to the device in order to reflect them immediately in the same procedure as that described in "4-1-2. DOWNLOAD" on page 8.
To save them in a file, refer to "7-2. SAVING PARAMETERS IN A FILE" on page 14.

For specific setting parameter items and ranges for respective models, please refer to "8. PARAMETER DETAILS" on page 15.

## 4-2. COMPARING SETTING VALUES IN THE DEVICE

Setting parameters currently shown (values in the File Configuration column) can be compared with those stored in the connected device (values in the Device Configuration column).
Thus, parameters stored in the connected device can be compared with parameters of another device by uploading from the other device, or with those of its own or another device by reading from a file.

Click [Compare] button to start reading setting parameters from the connected device and show the result of comparison as shown below.




The parameters are compared, respectively, and listed on the screen side by side in order of items for [INP Setting], [OUT1 Setting], [OUT2 Setting], [OUT3 Setting], [OUT4 Setting], [Advanced], [OUT1 Linearizer], [OUT2 Linearizer], [OUT3 Linearizer], and [OUT4 Linearizer] tabs.
The rows of values showing differences between [Device Configuration] and [File Configuration] are highlighted in red.
The total number of parameters whose values do not match is indicated at the bottom.

**NOTE 1**: DO NOT turn off the power supply to the device or disconnect the configurator cable while comparing.
**NOTE 2**: DO NOT edit the setting parameters in the [File Configuration] frame while comparing.

## 4-3. CONFIGURATION EXAMPLES

General configurations that can be performed using the M1E1CFG are described with specific examples.

### 4-3-1. CONNECTING TO THE DEVICE

Start up the M1E1CFG.
Click [Settings] button and choose or confirm the COM port used to communicate with the device and click [Connect].
The PC starts to communicate with the device.
Click [Upload>] to read parameters from the device.
Check the [Editing] box in the [Device Configuration] frame to allow download of the setting in the [File configuration] frame.

**NOTE 1**: Make sure that the “Lockout Setting” of the connected device is ‘Lock’, or the [Editing] box cannot be checked.
**NOTE 2**: Make sure to disable Fixed I/O since the [Editing] box cannot be checked during a loop test (fixed I/O).

### 4-3-2. CONFIGURATION EXAMPLES OF INPUT SETTING / OUT1 SETTING / OUT2 SETTING / OUT3 SETTING / OUT4 SETTING

Configuration examples in the [INPUT], [OUT1 Setting], [OUT2 Setting], [OUT3 Setting], and [OUT4 Setting] tabs of each model are described.
When editing is complete, click [<Download] to write the edited parameters in the device.

#### 4-3-2-1. M1EXV-1

The procedure to configure the I/O of the M1EXV-1 unit in accordance with the following specifications is described:
Input : 0 to 10 V DC
Output : OUT1 = 4 to 20 mA DC, OUT2 = 2 to 10 mA DC, OUT3 = 0 to 10 V DC, OUT4 = 1 to 5 V DC

**1) Input**

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

| • [Input range] |
|---|
| -10 – +10 V |
| -5 – +5 V |
| 0 – 20 mA |

Select the input range "-10 – +10 V"
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] to 0.000 and [100% input setting] to 10.000

**2) Output**

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

| • [Output range] |
|---|
| -10 – +10 V |
| -5 – +5 V |
| 0 – 20 mA |

Select the output range "0 – 20 mA" in the [OUT1 Setting], "0 – 20 mA" in the [OUT2 Setting], "-10 – +10 V" in the [OUT3 Setting], and "-5 – +5 V" in the [OUT4 Setting].

When [Output range] is selected, [0% output setting] and [100% output setting] are automatically set to the initial values of the selected [Output range]. Set them to your desired values.
Set [0% output setting] and [100% output setting] within the selected [Output range] as follows.
[OUT1 Setting]: [0% output setting] to 4.000; [100% output setting] to 20.000
[OUT2 Setting]: [0% output setting] to 2.000; [100% output setting] to 10.000
[OUT3 Setting]: [0% output setting] to 0.000; [100% output setting] to 10.000
[OUT4 Setting]: [0% output setting] to 1.000; [100% output setting] to 5.000

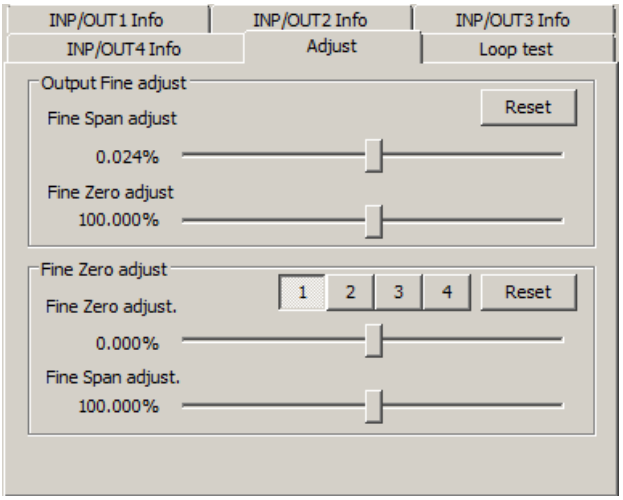
### 4-3-3. OTHER SETTINGS

For setting parameter items and ranges other than I/O setting for respective models, please refer to "8. PARAMETER DETAILS" on page 15.

# 5. ADJUST - FINE ADJUSTMENTS

Fine zero and span adjustments can be performed for each of the input and the output.
'Fine Zero adjust' is an offset adjustment, while 'Fine Span adjust' is a gain adjustment.

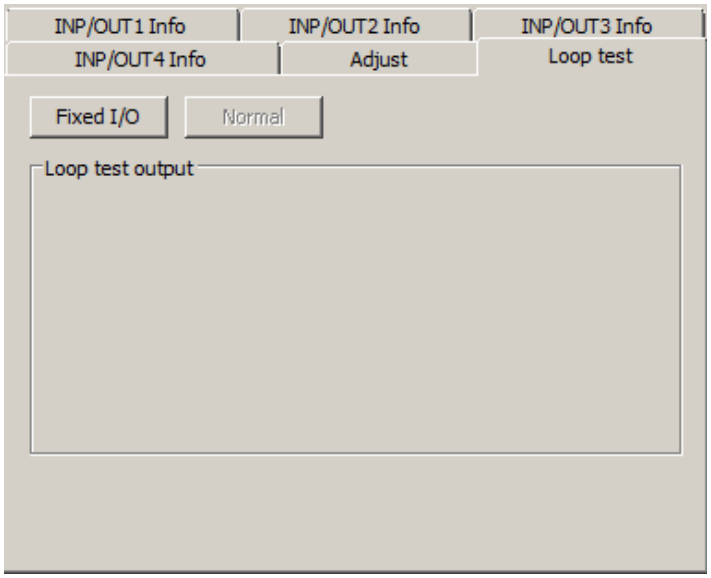
Drag each slider to the left or to the right to adjust.
Click either side of the slider or use arrow keys to adjust by minimum increments.



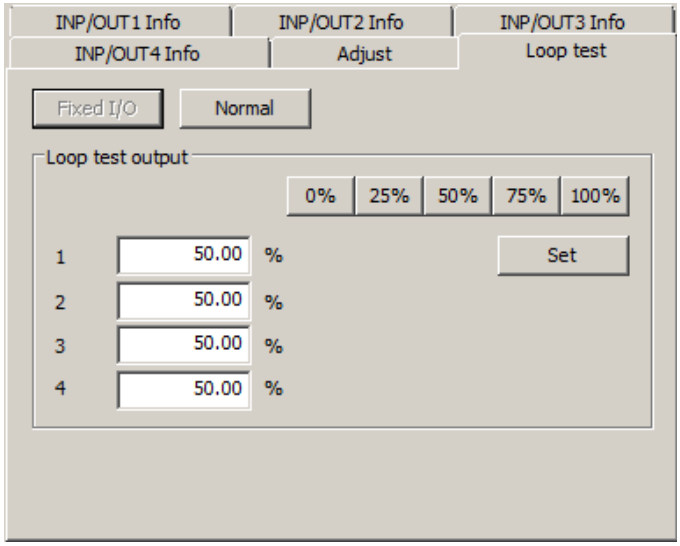

Perform 'Input Fine adjustment' while monitoring the input value indicated on the display of the device or the input value indicated on the upper part in the [Device Configuration] frame of the M1E1CFG.
Specifically, perform 'Fine Zero adjustment' by applying 0% input signal and adjust the indicated value to 0%, and perform 'Fine Span adjustment' by applying 100 % input signal and adjusting the indicated value to 100%.
Click [1], [2], [3], or [4] button to select an output from OUT1 to 4 to perform fine adjustment.
For 'Output Fine adjustment', perform 'Fine Zero adjustment' or 'Fine Span adjustment' while monitoring the output with a measuring instrument such as digital multi-meter.
Specifically, perform 'Fine Zero adjustment' by applying 0% input signal and adjusting the output signal to 0%, and perform 'Fine Span adjustment' by applying 100 % input signal and adjusting the output signal to 100%.
To reset the Input and Output Fine adjustments to the factory default state, click each [Reset] button.

# 6. LOOP TEST

Loop test is performed with simulated output.
Note that Loop test can be performed only when the [Editing] box is unchecked.




1) Click [Fixed I/O] button to fix the output signal at the current value.
The output signals become editable as shown below.
In this state, the output does not change even if the input changes.




2) Enter a desired output value in the value field of each of [1], [2], [3], and [4], which indicate OUT1 to 4.
Or, simply click [0%], [25%], [50%], [75%], or [100%] to enter the specified value in all the value fields.
Click Enter key or [Set] button to output signal of the specified percentage.

| SYMBOL | SIMULATED OUTPUT RANGE |
|---|---|
| – | -5.00 to +105.00 % |

3) Click [Normal] button to return to the normal mode in which the output follows the input.

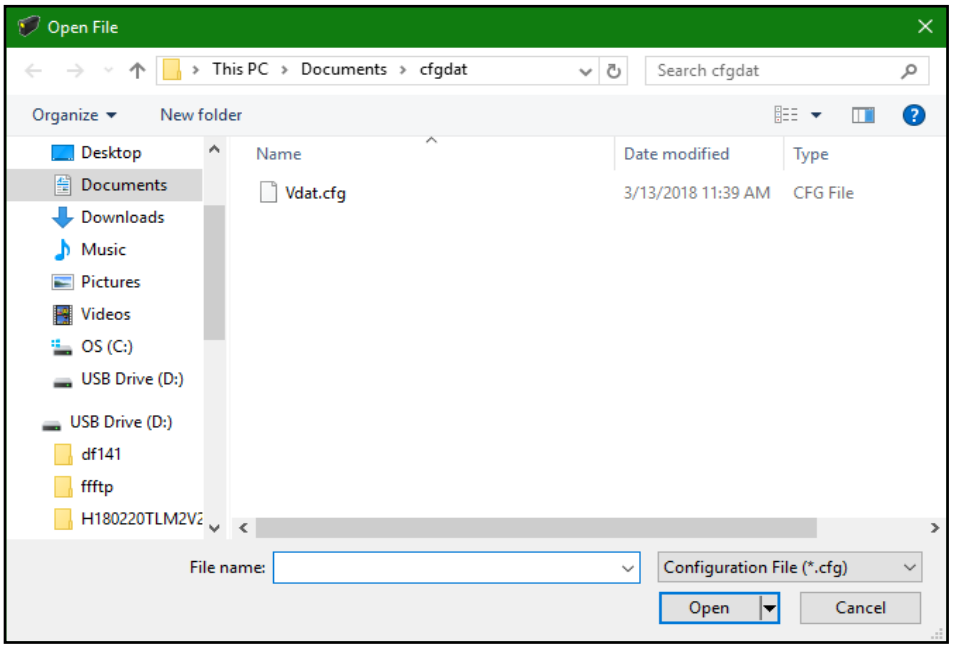
**Note 1**: If the communication or the configurator cable is disconnected from the connected device during Fixed I/O, 'Loop test output" is stopped after a certain time.
**Note 2**: The [Editing] box cannot be checked during Fixed I/O.
**Note 3**: DO NOT perform the front button operation of the device during the loop test.

# 7. READING / SAVING FILES

The setting parameters edited in the [File Configuration] can be saved as a file.
By reading the parameters from the file, the same settings can be written to other devices easily.

## 7-1. READING SETTING PARAMETERS SAVED AS FILE

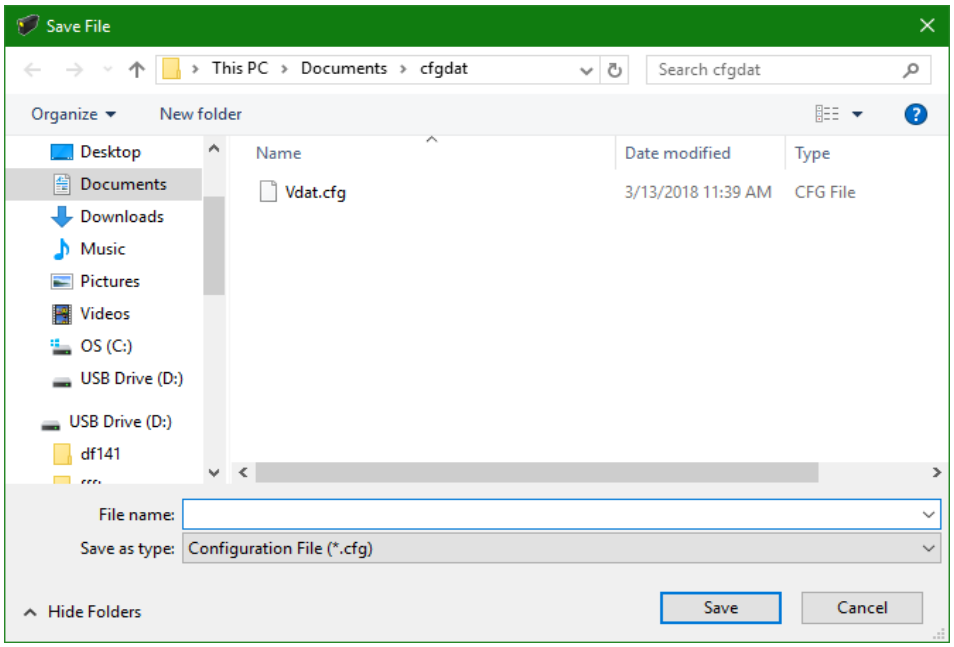
Clicking [Open File] calls up the Windows-standard Open dialog box, depending on the PC's operating system on which M1E1CFG is running.




Select a parameter file and click [Open] to show the stored parameters in the [File Configuration] frame.
In order to write the parameters to the connected device, click [<Download] button.

## 7-2. SAVING PARAMETERS IN A FILE

Clicking [Save File] calls up the Windows-standard Save As dialog box, depending on the PC's operating system on which M1E1CFG is running.




Enter a desired file name to File Name field and click [Save] to store the parameters in the [File Configuration] frame.
**NOTE**: DO NOT overwrite a saved file with a text editor or the like, otherwise errors may occur when reading the file.

# 8. PARAMETER DETAILS

## 8-1. PARAMETER LIST

Supported parameters depend upon model types as shown in the following table.

| | | M1EXV-1 | Page |
|---|---|---|---|
| Input Setting | Input range | ✓ | 15 |
| | 0% input setting / 100% input setting | ✓ | 15 |
| | 0% input scaling / 100% input scaling | ✓ | 16 |
| | Input scaling decimal point | ✓ | 16 |
| | Input decimal point | ✓ | 16 |
| | Unit (INP scaling) | ✓ | 16 |
| | User unit setting | ✓ | 16 |
| | Filter time constant | ✓ | 16 |
| | Input Zero fine adjust / Input Span fine adjust | ✓ | 16 |
| OUT1 / OUT2 / OUT3 / OUT4 Setting | Output Enable | ✓ | 16 |
| | Output range | ✓ | 16 |
| | 0% output setting / 100% output setting | ✓ | 17 |
| | Output Zero fine adjust / Output Span fine adjust | ✓ | 17 |
| Advanced | Upper display setting | ✓ | 17 |
| | Lower display setting | ✓ | 17 |
| | Brightness | ✓ | 17 |
| | Display timeout | ✓ | 17 |
| | Display change time | ✓ | 17 |
| Input / OUT1 / OUT2 /OUT3 / OUT4 Linearizer | User's table linearization | ✓ | 18 |
| | Number of points | ✓ | 18 |
| | Table | ✓ | 19 |

## 8-2. INPUT SETTING

### 8-2-1. INPUT RANGE

Select input range of the device from the following table.

| SYMBOL | INPUT RANGE |
|---|---|
| – | -10 – +10 V<br>-5 – +5 V<br>0 – 20 mA |

**NOTE**: When the input range is changed, [0% input setting], [100% input setting], [Input Zero fine adjust] and [Input Span fine adjust] of the channel return to initial values.

### 8-2-2. 0% INPUT SETTING / 100% INPUT SETTING

Set 0% and 100% input signals according to the selected input range.
For example, when the input signal is 1 – 5 V DC with the [Input range] -5 – +5 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 |
|---|---|---|---|
| – | -10 – +10 V | -10.000 – 10.000 | 1.000 |
| | -5 – +5 V | -5.000 – 5.000 | 0.250 |
| | 0 – 20 mA | 0.000 – 20.000 | 1.000 |

### 8-2-3. 0% INPUT SCALING / 100% INPUT SCALING

Set scaling values for [0% input setting] and [100% input setting].
For example, when:
[input range] is set to -10 – +10 V;
[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.

### 8-2-4. INPUT SCALING DECIMAL POINT

Set decimal point position for [Input scaling] from among None, 1, 2, 3, 4, and 5 places of decimals.

### 8-2-5. UNIT (INP SCALING)

Select unit for [Input scaling] from among the following 68 units:
DC, AC, mV, V, kV, µA, mA, A, kA, mW, W, kW, var, kvar, Mvar, VA, Hz, Ω, kΩ, MΩ, cm, mm, m, m/sec, mm/min, cm/min, m/min, m/h, $m/s^2$, inch, L, L/s, L/min, L/h, $m^3$, $m^3$/sec, $m^3$/min, $m^3$/h, $Nm^3$/h, N·m, $N/m^2$, 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

### 8-2-6. USER UNIT

Set your desired unit using characters shown below when User is selected in [Unit (INP scaling)].
A unit can be created by using up to any 13 characters.
Settable characters: 0–9 A–Z a–z ! " # $ % & ' ( ) = - +* ^ | @ ` [ ] { } ; : < > ? _ , . /

### 8-2-7. FILTER TIME CONSTANT

First order lowpass filter can be set with the specified time constant.
When set to '0', the first order lowpass filter is not available.
Set the time constant within the range of 1 to 30 seconds.
The first order lag filter is equivalent to ordinary CR filters and the set time constant is the time taken for output to follow up to about 63 % when input varies from 0 % to 100 %.

### 8-2-8. INPUT ZERO FINE ADJUST / INPUT SPAN FINE ADJUST

Input engineering unit value can be adjusted.
The adjustable ranges of the [Input Zero fine adjust] and [Input Span fine adjust] vary depending on the models.
See the table below.

| SYMBOL | ADJUSTABLE RANGE | |
|---|---|---|
| | INPUT ZERO FINE ADJUST | INPUT SPAN FINE ADJUST |
| – | -5.000 – +5.000% | 95.000 – 105.000% |

## 8-3. OUT1 / OUT2 / OUT3 / OUT4 SETTING

### 8-3-1. OUTPUT ENABLE

Enable or disable each channel.

| |
|---|
| Enable |
| Disable |

**NOTE**: Parameter settings can be performed even when the channel is disabled.

### 8-3-2. OUTPUT RANGE

Select output range of the device from the following table.

| |
|---|
| -10 – +10 V |
| -5 – +5 V |
| 0 – 20 mA |

NOTE: When the output range of OUT1 is changed, [0% output setting], [100% output setting], [Output Zero fine adjust], and [Output Span fine adjust] of the OUT1 return to initial values. When changing the output range of OUT2 to 4 is the same.

### 8-3-3. 0% OUTPUT SETTING / 100% OUTPUT SETTING

Set 0% and 100% output signals according to the selected output range.
For example, when the output signal is 4 – 20 mA with the [Output range] 0 – 20 mA, set [0% output setting] to 4.000 and [100% output setting] to 20.000.
4.00 to 20.00 mA output will be scaled to 0% to 100%.

| OUTPUT | SETTING RANGE | MIN. SPAN |
|---|---|---|
| -10 – +10 V | -10.000 – 10.000 | 1.000 |
| -5 – +5 V | -5.000 – 5.000 | 0.250 |
| 0 – 20 mA | 0.000 – 20.000 | 1.000 |

### 8-3-4. OUTPUT ZERO FINE ADJUST / OUTPUT SPAN FINE ADJUST

Output engineering unit value can be adjusted.
Set [Output Zero fine adjust] and [Output Span fine adjust] within the range of -5.000 – +5.000 (%) and 95.000 – 105.000 (%), respectively.

## 8-4. ADVANCE - ADVANCED SETTING

### 8-4-1. UPPER DISPLAY SETTING

Information to be displayed on the upper display of the device in the measuring mode can be selected from the table below.
Displays 1 to 4 can be configured.

| SYMBOL | UPPER DISPLAY SETTING |
|---|---|
| – | Input engineering unit value<br>Input scaling<br>Percent value (*1)<br>OUT1 Output engineering unit value<br>OUT2 Output engineering unit value<br>OUT3 Output engineering unit value<br>OUT4 Output engineering unit value<br>No display (*2) |

(*1) Percent value for input.
(*2) Not selectable for Display 1.

### 8-4-2. LOWER DISPLAY SETTING

Information to be displayed on the lower display of the device in the measuring mode can be selected from the table below.
Displays 1 to 4 can be configured.
“No display” is automatically set when “No display” is selected at [UPPER DISPLAY SETTING].

| SYMBOL | LOWER DISPLAY SETTING |
|---|---|
| – | Input engineering unit value<br>Input scaling<br>Percent value (*1)<br>OUT1 Output engineering unit value<br>OUT2 Output engineering unit value<br>OUT3 Output engineering unit value<br>OUT4 Output engineering unit value<br>No display (*2) |

(*) Percent value for input.

### 8-4-3. BRIGHTNESS

Adjust display brightness of the device.
Settable range: 1 (darkest) – 4 (brightest)

### 8-4-4. DISPLAY TIMEOUT

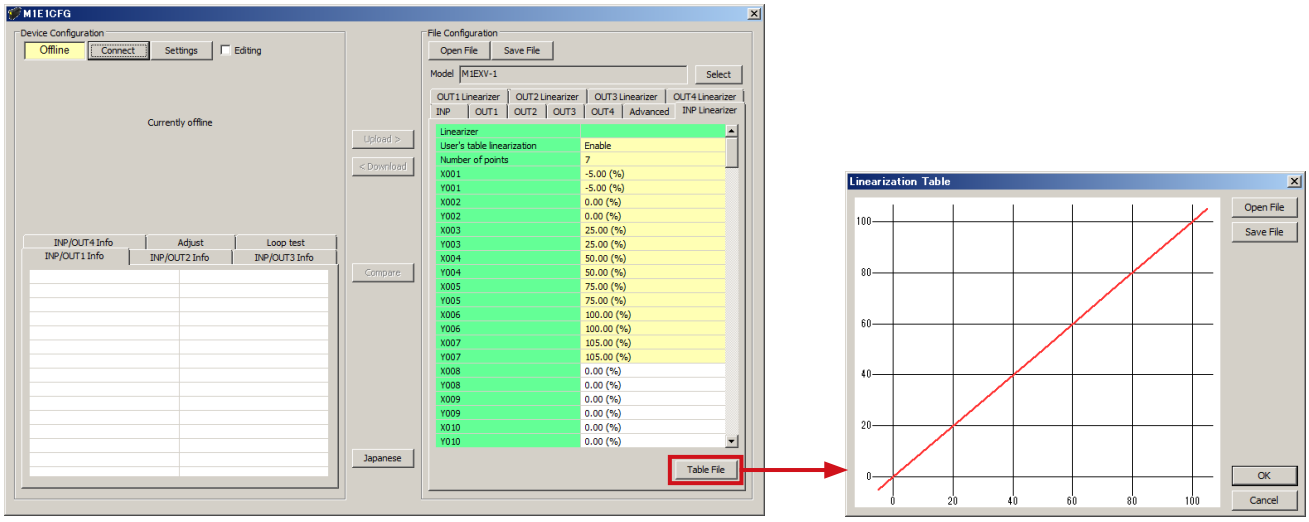
Set a timeout period to turn off the display when there is no operation within a certain time period.
Settable range: 0 – 60 minutes
To keep the display always on, set to 0.

### 8-4-5. DISPLAY CHANGE TIME

The displays having been set switch at preset time intervals.
Settable range: 0 – 60 seconds
Set to ‘0’ when the display need not switch automatically.

## 8-5. LINEARIZER – LINEARIZATION SETTING

In each [Linearizer] tab, multiple pairs (points) of input (X) and output (Y) values can be specified to convert I/O to a line chart.
A user-specified linearization table can be manually input or read and imported from a table file.
Click [Table File] button to open the 'Linearization Table' window and click [Open File] to open a table file, or click [Save File] to save the table as a table file.
NOTE: [Table File] button is active only when [User's table linearization] is set to "Enable".




Refer to "9. APPENDIX" on page 20 for detailed table format.

### 8-5-1. USER'S TABLE LINEARIZATION

Enable or disable linearization with a user-specified table.

| |
|---|
| Disable |
| Enable |

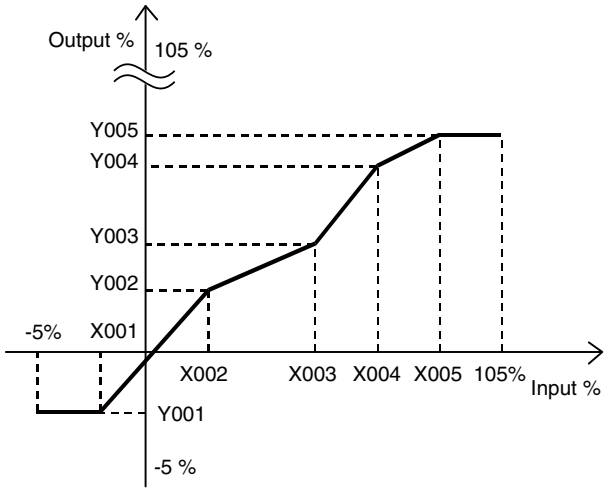
When set to [Disable], I/O conversion with a user-specified table is not performed.
When set to [Enable], input is converted into output according to the user-specified table.

### 8-5-2. NUMBER OF POINTS

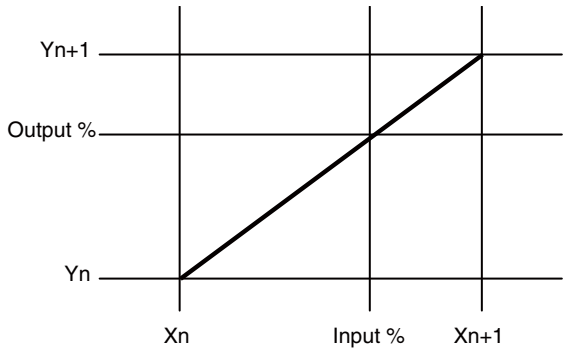
Specify the number of points to be set for the linearization table.
Settable range: 2 to 111
When a table file is read, the number is automatically updated according to the available number of Xn, Yn pairs.

### 8-5-3. LINEARIZATION TABLE

Specify a user-specified table used for I/O conversion.
Both X and Y adjustable range is -5 to +105 (%).
X values need to be set in ascending order from X001; otherwise conversion cannot be correctly performed.
Conversion is performed based on the user specified table in which values of X corresponding to input (unit: %) and values of Y corresponding to output (unit: %) are paired, respectively.
The table is searched for an X value that matches the input to be converted, and a Y value paired with the X value is outputted.




When the input to be converted does not match any X value in the table, two X values which are closest to the input in positive and negative directions are selected and linearly interpolated, thereby obtaining a Y value to be outputted.




If one of closest X values is out of the table range, a value of Y paired with the other X is outputted.

# 9. APPENDIX

## 9-1. USER TABLE FILE FORMAT

The following indicates the format of user-specified table files used in linearization.

A user specified table file includes contents of a user-specified table used in linearization:
The file is saved as a text file and data is formatted as follows.

```
/* 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 indicates the end.
Write so that the second and last row contain only '{' and '}', respectively.
In each row, Xn and Yn are paired and separated by comma.
In the same manner as setting on M1E1CFG, values are represented in percentage and set within the range of -5.00 to +105.00% (two decimal places), and Xn values need to be arranged in ascending order.
Max. 111 pairs of 'Xn, Yn' can be included.
The row starting with '/' is recognized as a comment.
A table file must be saved with extension "txt".