OPERATING MANUAL

DC ALARM
(PC programmable, quad or octad alarm trip)

MODEL **M1EAXV-1**

CONTENTS

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BEFORE USE ....

Thank you for choosing M-System. Before use, please check contents of the package you received as outlined below.
If you have any problems or questions with the product, please contact M-System's Sales Office or representatives.

■ PACKAGE INCLUDES:

DC alarm (body).....(1)

■ MODEL NO.

Confirm Model No. marking on the product to be exactly what you ordered.

■ OPERATING MANUAL

This manual describes detailed operation regarding settings.
The M1EAXV-1 is programmable using a PC. For detailed information on the PC configuration, refer to the M1EACFG users manual (EM-5994).
The M1EACFG Configurator Software is downloadable at M-System's web site: http://www.m-system.co.jp

POINTS OF CAUTION

■ CONFORMITY WITH EU DIRECTIVES

- This equipment is suitable for Pollution Degree 2, Measurement Category II (output, transient voltage 2500V). Prior to installation, check that the insulation class of this unit satisfies the system requirements. Insulation class of this unit is as follows.

Output code: A, B

Input or output to power	Reinforced insulation (300V)
Input to output	Basic insulation (300V)
L1 or L2 alarm output to L3 or L4 alarm output to L5 or L6 alarm output to L7 or L8 alarm output	Basic insulation (300V)

Output code: C

Input or output to power	Reinforced insulation (300V)
Input to output	Basic insulation (300V)
L1 alarm output to L2 alarm output to L3 alarm output to L4 alarm output	Basic insulation (300V)

- Altitude up to 2000 meters.
- The equipment must be mounted inside a panel.
- The equipment must be installed such that appropriate clearance and creepage distances are maintained to conform to CE requirements. Failure to observe these requirements may invalidate the CE conformance.
- The actual installation environments such as panel configurations, connected devices, connected wires, may affect the protection level of this unit when it is integrated in a panel system. The user may have to review the CE requirements in regard to the whole system and employ additional protective measures to ensure the CE conformity.
- Install lightning surge protectors for those wires connected to remote locations.

■ POWER INPUT RATING & OPERATIONAL RANGE

- Locate the power input rating marked on the product and confirm its operational range as indicated below:
  24V DC rating: 24V ±10%, ≤ 6W

■ GENERAL PRECAUTIONS

- Before you remove the unit from its base socket or mount it, turn off the power supply and input signal for safety.

■ ENVIRONMENT

- Indoor use.
- When heavy dust or metal particles are present in the air, install the unit inside proper housing with sufficient ventilation.
- Do not install the unit where it is subjected to continuous vibration. Do not subject the unit to physical impact.
- Environmental temperature must be within -5 to +55°C (23 to 131°F) with relative humidity within 10 to 85% RH in order to ensure adequate life span and operation.
- Be sure that the ventilation slits are not covered with cables, etc.

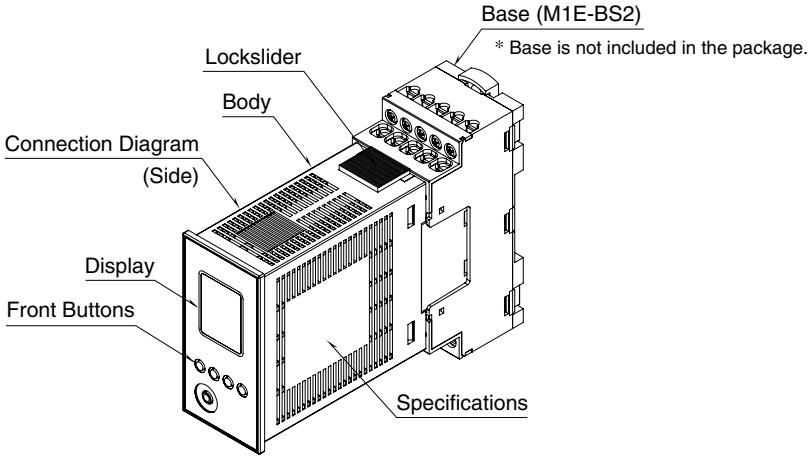
■ WIRING

- Do not install cables close to noise sources (relay drive cable, high frequency line, etc.).
- Do not bind these cables together with those in which noises are present. Do not install them in the same duct.

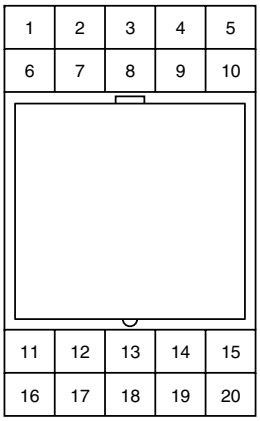
■ AND ....

- The unit is designed to function as soon as power is supplied, however, a warm up for 10 minutes is required for satisfying complete performance described in the data sheet.

COMPONENT IDENTIFICATION



■ TERMINAL ASSIGNMENTS



• Output Code: A, B

No.	FUNCTION	No.	FUNCTION
1	COM4 (L7, L8)	11	L5 Alarm output
2	L7 Alarm output	12	L6 Alarm output
3	Input voltage +	13	COM1 (L1, L2)
4	Input current +	14	L1 Alarm output
5	Input –	15	L2 Alarm output
6	COM3 (L5, L6)	16	COM2 (L3, L4)
7	L8 Alarm output	17	L3 Alarm output
8	No connection	18	L4 Alarm output
9	No connection	19	Power +
10	No connection	20	Power –

• Output Code: C

No.	FUNCTION	No.	FUNCTION
1	COM4 (L4)	11	NO (L3)
2	NO (L4)	12	NC (L3)
3	Input voltage +	13	COM1 (L1)
4	Input current +	14	NO (L1)
5	Input –	15	NC (L1)
6	COM3 (L3)	16	COM2 (L2)
7	NC (L4)	17	NO (L2)
8	No connection	18	NC (L2)
9	No connection	19	Power +
10	No connection	20	Power –

INSTALLATION

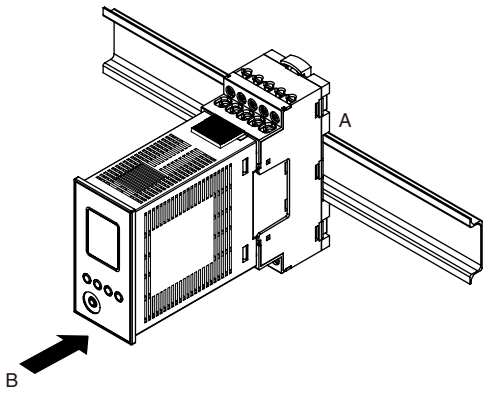
Pulling out the base while pushing the lockslider on the top of the unit enables to remove the base from the unit (base is not included in the package).

■ DIN RAIL MOUNTING (SIDE)

• Mounting the unit

A) Hang the upper hook at the rear side of unit on the DIN rail.

B) Push the lower part of the unit in the direction of the arrow until the unit is firmly fixed to the DIN rail.

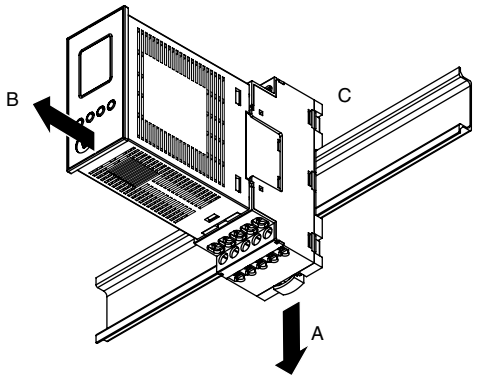


• Removing the unit

A) Push down the DIN rail adaptor using a minus screwdriver.

B) Pull out the lower part of the unit.

C) Remove the upper part from the DIN rail.



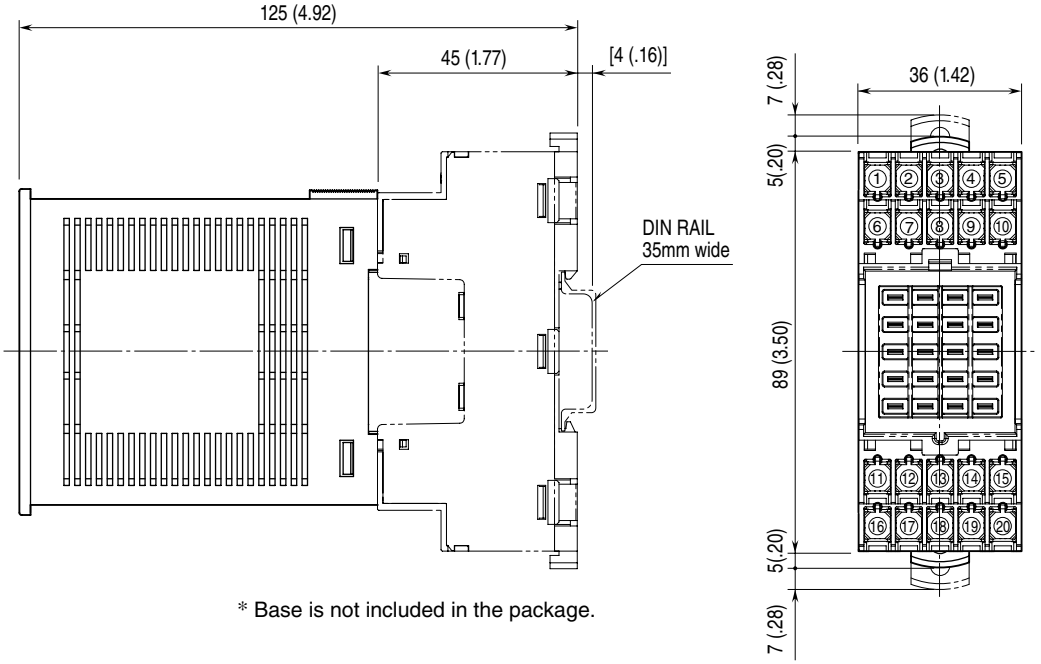
■ WALL MOUNTING

Referring to "MOUNTING REQUIREMENTS unit: mm (inch)" on page 5, pull out the upper and lower sliders of the unit and fix them with M4 screws (Torque: 1.4 N·m).

TERMINAL CONNECTIONS

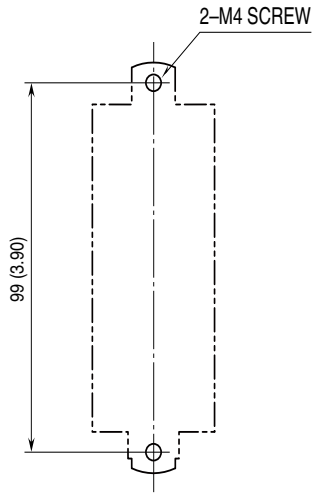
Connect the unit as in the diagram below or refer to the connection diagram on the side of the unit.

■ EXTERNAL DIMENSIONS unit: mm (inch)



* Base is not included in the package.

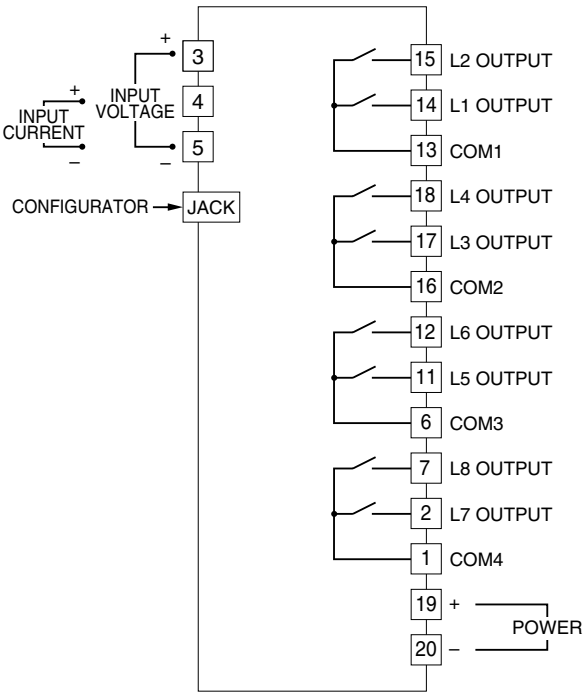
■ MOUNTING REQUIREMENTS unit: mm (inch)



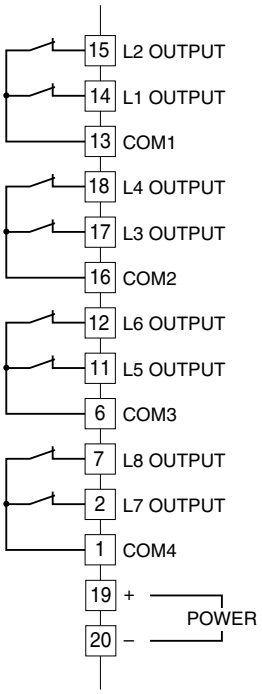
Note: Mounting requirements for base.

■ CONNECTION DIAGRAM

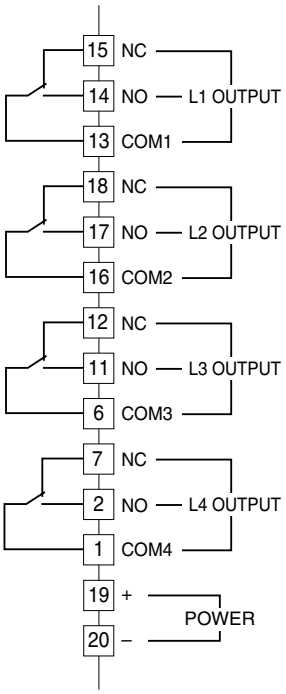
• OUTPUT CODE A: N.O. Relay



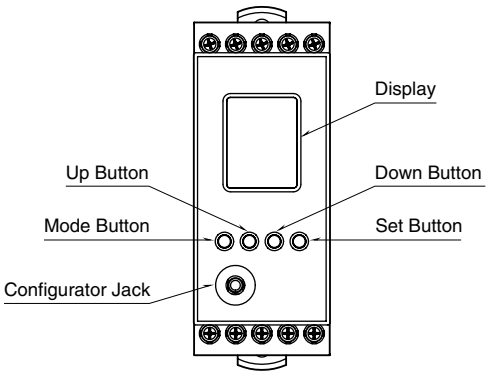
• OUTPUT CODE B: N.C. Relay



• OUTPUT CODE C: SPDT Relay



EXTERNAL VIEWS



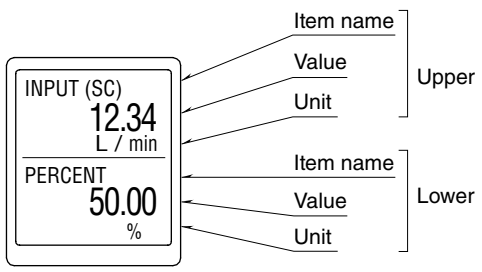
COMPONENT	FUNCTION
Display	Indicates present values, setting values and abnormal information. Two types of present values at upper and lower are displayed by setting.
Mode button	Used to shift from measuring mode to each setting mode. The destination changes depending on how long the button is held down. Used to return from each setting mode to measuring mode (press and hold for 2 sec. or more).
Up button	Used to shift through setting parameters and to increase or select setting value.
Down button	Used to shift through setting parameters and to decrease or select setting value.
Set button	Used to change setting value of setting parameter. When at setting changeable state, used to enter (save) the setting value. Used to move on through digits of setting value at setting changeable state. Used to release latching alarm in measuring mode (press and hold for 2 sec. or more).
Configurator Jack	Used to configure with M1EA configurator software (model: M1EACFG). At the same time, set the lockout setting of the unit to 'lock'.

SCREEN DISPLAY

■ DISPLAY IN MEASURING MODE

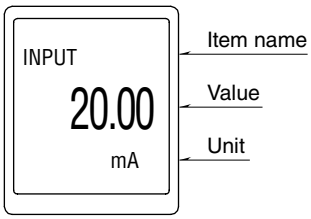
• Double tiered display

The unit's display can be divided into two parts and show two items selected. For selectable items, refer to [201] Display setting.
The value and alarm setting value are highlighted when the alarm is tripped (available only when ALARM has been set in Display setting).



• Single tiered display

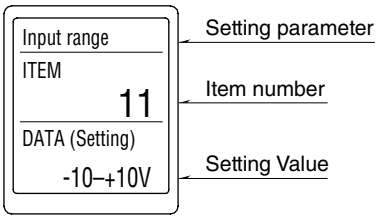
When displayed item is one, it is available to show big characters in single tiered display.



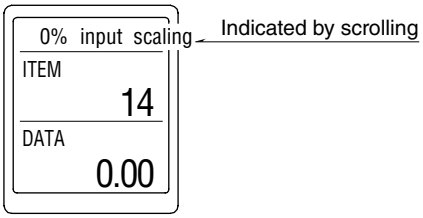
Refer to the Display setting of the Advanced mode for settings.

■ DISPLAY IN EACH SETTING MODE

For each setting, current values of setting parameter, ITEM number and setting value are indicated. During setting, '(Setting)' is indicated at the side of 'DATA' display.
If the power is mistakenly shut down during setting, setting values are discarded (which returns to the value before setting change).



The long setting parameter is indicated by scrolling.

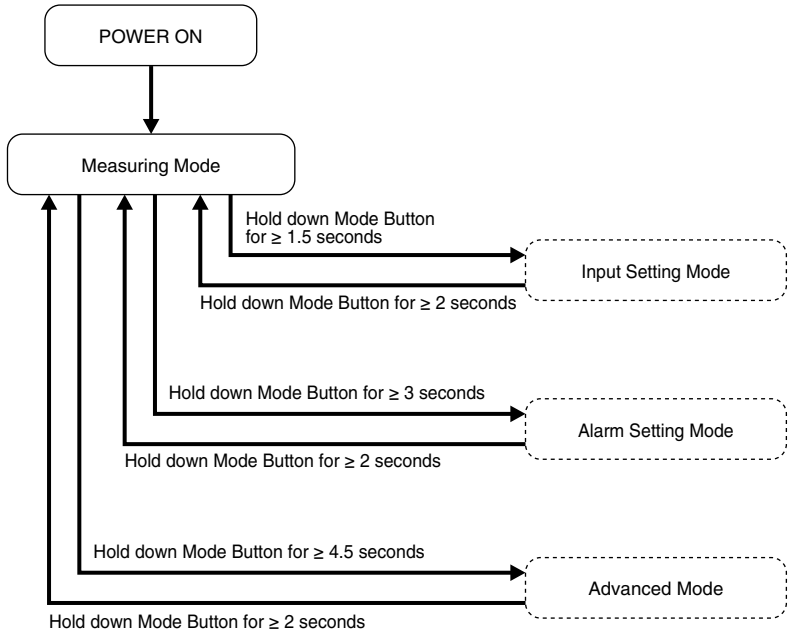


■ DISPLAY TIMEOUT

When there is no operation within the setting time of display timeout, the display is turned off. In this case, press any button of Mode, Set, Up or Down to generate an alarm or error, so that the display comes back. To keep the display always on, set the setting time to 0.

PROGRAMMING

■ SETTING FLOWCHART



■ OPERATION IN EACH SETTING MODE

• Basic operation

Mode button:	In measuring mode, holding down Mode button for ≥ 1.5 seconds, ≥ 3 seconds, or ≥ 4.5 seconds enables to move on to each setting mode. Holding down Mode button for ≥ 2 seconds in each setting mode enables to return to measuring mode. Holding down Mode button for ≥ 2 seconds while changing setting ('(Setting)' is displayed next to 'DATA') enables to discard setting value in the process of being changed and to return to the previous setting ('(Setting)' next to 'DATA' is off).
Set button:	By pressing Set button at each setting parameter, the setting value becomes blinking and changeable ('(Setting)' is displayed next to 'DATA'.). During setting change, pressing Set button enables to save (enter) the setting value, which changes blinking to ON.
Up button:	Press Up button when moving through setting parameters. During setting change, pressing Up button enables to select the setting value or to increase the numerical value, and keeping pressing the button increases the value continuously. .
Down button:	Press Down button when moving through setting parameters. During setting change, pressing Down button enables to select the setting value or to decrease the numerical value, and keeping pressing the button decreases the value continuously.

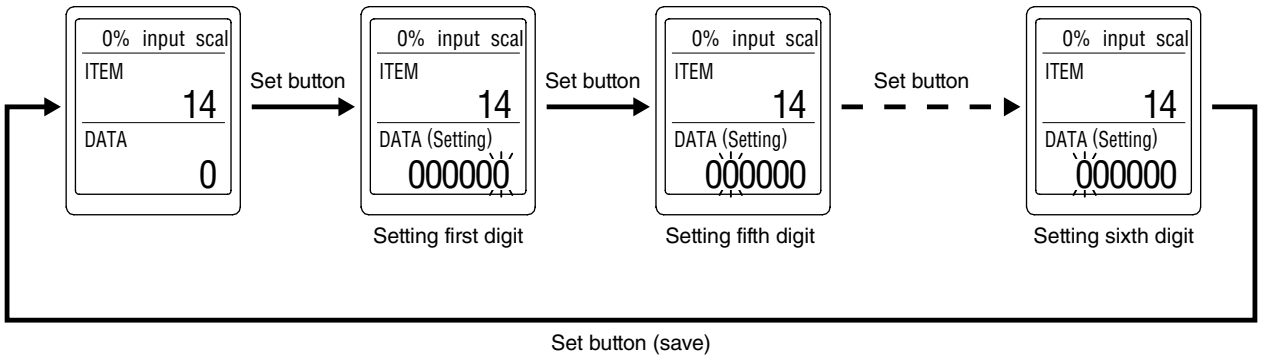
Note: DO NOT press 2 or more buttons simultaneously.

• Numerical value setting parameter

For Numerical value setting parameter, set values digit by digit. Pressing Set button enables to move blinking digit. At the blinking digit, set numerical value with Up and Down button.

By keeping pressing Up or Down button while the digit is blinking, the numerical value of the digit continuously increases or decreases to the maximum or minimum. Each time Set button is pressed, blinking digit moves from the least significant in ascending order, and when Set button is pressed again at the most significant digit, the digit changes from blinking to ON, and the setting value is determined.

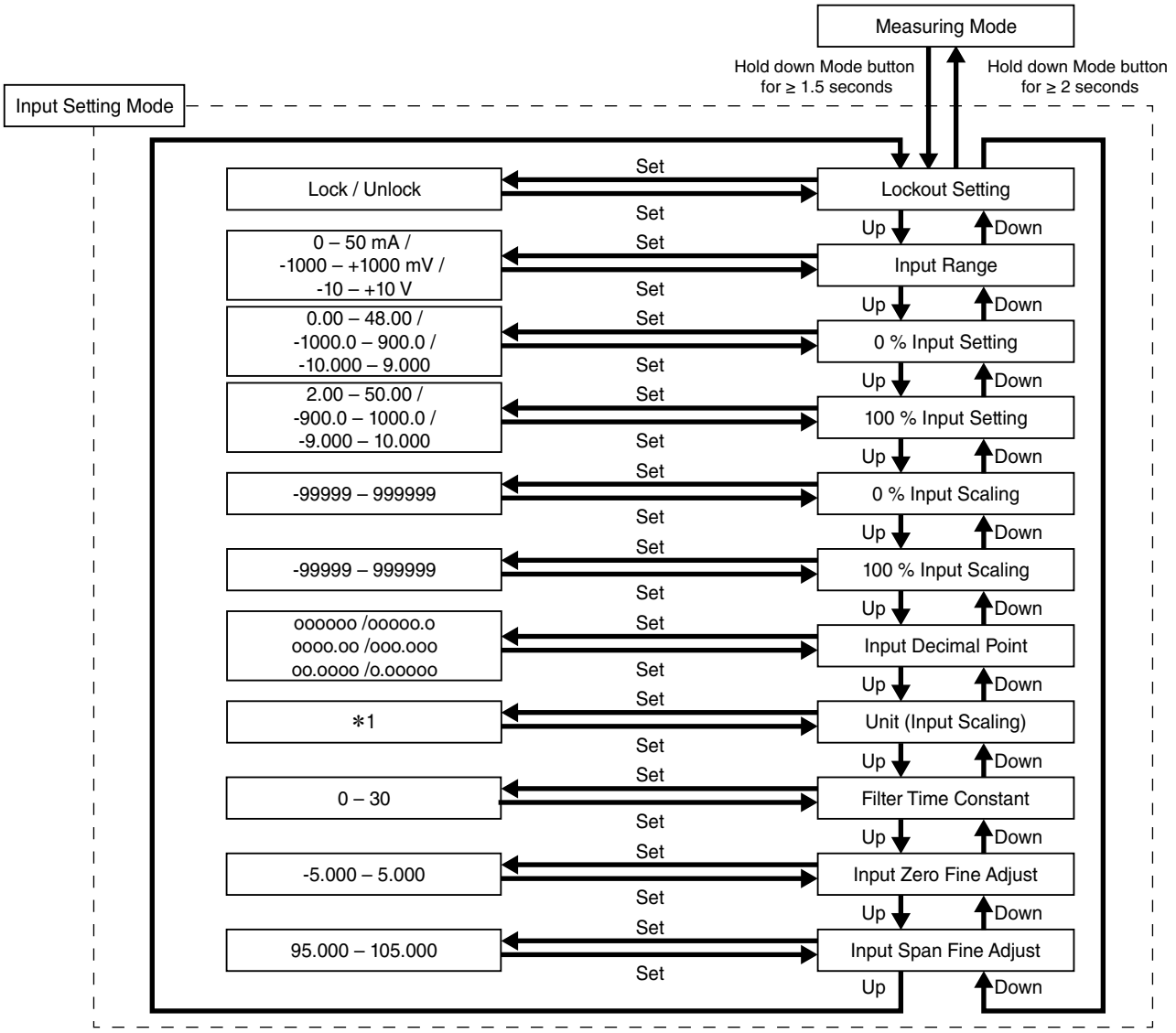
During setting, to discard setting value in the process of being changed, press and hold Mode button for ≥ 2 seconds.



• Lockout setting

'Lockout setting' is available for the unit. When unlocking the lockout setting, indicate 'Lockout Setting' of 'ITEM 01' in each setting mode and set 'Unlock'. To enable lockout setting again, set 'Lock'. Even when lockout setting is enabled, it is available to confirm the each setting value. 'DATA (Locked)' is indicated in that case.

■ INPUT SETTING MODE



*1. Refer to [17] Unit (INP Scaling) for usable unit.

• Parameters

MODE	ITEM	SETTING PARAMETER	RANGE	UNIT	INITIAL VALUE
Input Setting	01	Lockout setting	Lock / Unlock	—	Lock
	11	Input range	0 – 50 mA -1000 – +1000 mV -10 – +10 V	—	0 – 50 mA
	12	0 % input setting	0.00 – 48.00 -1000.0 – 900.0 -10.000 – 9.000	mA mV V	4.00
	13	100 % input setting	2.00 – 50.00 -900.0 – 1000.0 -9.000 – 10.000	mA mV V	20.00
	14	0 % input scaling	-99999 – 999999	—	0.00
	15	100 % input scaling	-99999 – 999999	—	100.00
	16	Input decimal point	No decimal point The number of decimal places : 1 – 5,	—	2 places of decimals
	17	Unit (INP Scaling)	Choose from 68 types	—	%
	79	Filter time constant	0 – 30	sec.	0
	80	Input Zero fine adjust	-5.000 – 5.000	%	0.000
	81	Input Span fine adjust	95.000 – 105.000	%	100.000

[01] Lockout Setting

Set Lock / Unlock of lockout setting.

SETTING VALUE	DESCRIPTION	INITIAL VALUE
Lock	Lockout setting enable	Lock
Unlock	Lockout setting disable	

Even when setting is 'Lock', it is available to move on to each setting mode and to confirm the setting value of each setting parameter. In each setting parameter display, when 'Lock', 'DATA (Locked)' is indicated, when 'Unlock', 'DATA' is indicated.

[11] Input range

Set the type of input signal.

SETTING VALUE	DESCRIPTION	INITIAL VALUE
0 – 50 mA	Input: 0 – 50 mA DC	0 – 50 mA
-1000 – +1000 mV	Input: -1000 – +1000 mV DC	
-10 – +10 V	Input: -10 – +10 V DC	

When input range is changed, turn the power off, and change the connection to the input terminal of the unit.
Input setting value is changed to initial value.

[12] 0 % input setting

Set the 0 % input setting.
Setting range differs according to input range.

INPUT RANGE	SETTING RANGE	MIN. SPAN	INITIAL VALUE
0 – 50 mA	0.00 – 48.00	2.00	4.00
-1000 – +1000 mV	-1000.0 – 900.0	100.0	-1000.0
-10 – +10 V	-10.000 – 9.000	1.000	-10.000

Set as follows.
[12] 0 % input setting < [13] 100 % input setting

[13] 100 % input setting

Set the 100 % input setting.
Setting range differs according to input range.

INPUT RANGE	SETTING RANGE	MIN. SPAN	INITIAL VALUE
0 – 50 mA	2.00 – 50.00	2.00	20.00
-1000 – +1000 mV	-900.0 – 1000.0	100.0	1000.0
-10 – +10 V	-9.000 – 10.000	1.000	10.000

Set as follows.
[12] 0 % input setting < [13] 100 % input setting

[14] 0 % input scaling

Set the display value of 0 % input setting.

SETTING RANGE	INITIAL VALUE
-99999 – 999999	0.00

Note: When having changed the input scaling, check the alarm setpoint.

[15] 100 % input scaling

Set the display value of 100 % input setting.

SETTING RANGE	INITIAL VALUE
-99999 – 999999	100.00

Note: When having changed the input scaling, check the alarm setpoint.

[16] Input decimal point

Set the decimal point position of [14] 0 % and [15] 100 % input display scaling.

SETTING VALUE	DESCRIPTION	INITIAL VALUE
oooooo	Decimal point: None	2 places of decimals
ooooo.o	Number of decimal places: 1	
oooo.oo	Number of decimal places: 2	
ooo.ooo	Number of decimal places: 3	
oo.oooo	Number of decimal places: 4	
o.ooooo	Number of decimal places: 5	

[17] Unit (INP Scaling)

Set the unit to display input scaling.
Available units are following 68 types.
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

Selecting 'User' enables to move on to user's unit setting display. A unit can be created by using any characters. Up to 13 characters available.*1 Up and Down button enables to move on selected characters. Set button enables to select a character. While setting, pressing Mode button enables to delete a character, pressing and holding Mode button enables to discard the settings. Pressing and holding Set button enables to determine the setting and return to setting display of [17] Unit (INP Scaling). The unit is indicated by 'INPUT (Scaling)' at measuring mode display.
If turning power off while setting, it returns to setting display of [17] Unit (INP Scaling) (The setting value is discarded).
*1. Settable characters

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

The unit is displayed in [INPUT (Scaling)] in measuring mode.
Initial value: %

[79] Filter time constant

Set filter time constant of the first order lowpass filter.
The first order lowpass filter is available with setting time. When this parameter is set to '0', the first order lowpass filter is not available (Response time: ≤ 0.5 sec. (0 – 100 % at 90 % setpoint)).
The setting time constant is the time taken for output to follow up to about 63 %, when input varies from 0 % to 100 %. It can be set within the range between 0 – 30 seconds.
Initial value: 0

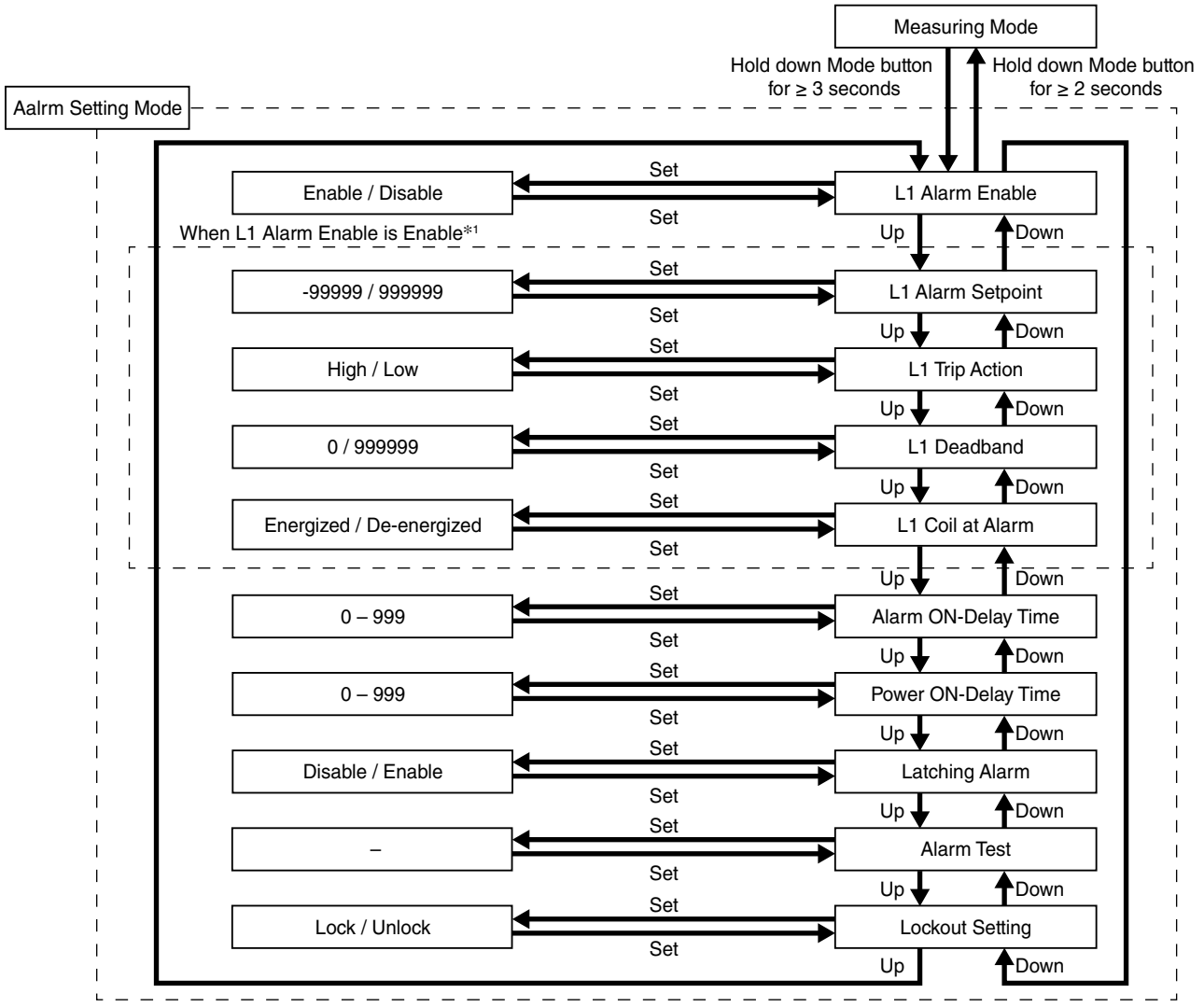
[80] Input zero fine adjust

Perform fine adjustment of input signal. Available range between -5.000 – +5.000 %.
Initial value: 0.000

[81] Input span fine adjust

Perform fine adjustment of input signal. Available range between 95.000 – 105.000 %.
Initial value: 100.000

■ ALARM SETTING MODE



*1. As an example, the procedure for L1 is described here. L2 through L8 are also the same as L1.

• Parameters

MODE	ITEM	SETTING PARAMETER	RANGE	UNIT	INITIAL VALUE
Alarm Setting	30	L1 alarm enable	Disable / Enable	—	Enable
	31	L1 alarm setpoint	-99999 – 999999	—	10.00
	32	L1 trip action	High / Low	—	Low
	33	L1 deadband	0 – 999999	—	0.01
	34	L1 coil at alarm	Energized / De-energized	—	Energized
	40	L2 alarm enable	Disable / Enable	—	Enable
	41	L2 alarm setpoint	-99999 – 999999	—	30.00 (4 points alarm) 20.00 (8 points alarm)
	42	L2 trip action	High / Low	—	Low
	43	L2 deadband	0 – 999999	—	0.01
	44	L2 coil at alarm	Energized / De-energized	—	Energized
	50	L3 alarm enable	Disable / Enable	—	Enable
	51	L3 alarm setpoint	-99999 – 999999	—	70.00 (4 points alarm) 30.00 (8 points alarm)
	52	L3 trip action	High / Low	—	High (4 points alarm) Low (8 points alarm)
	53	L3 deadband	0 – 999999	—	0.01
	54	L3 coil at alarm	Energized / De-energized	—	Energized
	60	L4 alarm enable	Disable / Enable	—	Enable
	61	L4 alarm setpoint	-99999 – 999999	—	90.00 (4 points alarm) 40.00 (8 points alarm)
	62	L4 trip action	High / Low	—	High (4 points alarm) Low (8 points alarm)
	63	L4 deadband	0 – 999999	—	0.01
	64	L4 coil at alarm	Energized / De-energized	—	Energized
	130	L5 alarm enable	Disable / Enable	—	Enable
	131	L5 alarm setpoint	-99999 – 999999	—	60.00
	132	L5 trip action	High / Low	—	High
	133	L5 deadband	0 – 999999	—	0.01
	134	L5 coil at alarm	Energized / De-energized	—	Energized
	140	L6 alarm enable	Disable / Enable	—	Enable
	141	L6 alarm setpoint	-99999 – 999999	—	70.00
	142	L6 trip action	High / Low	—	High
	143	L6 deadband	0 – 999999	—	0.01
	144	L6 coil at alarm	Energized / De-energized	—	Energized
	150	L7 alarm enable	Disable / Enable	—	Enable
	151	L7 alarm setpoint	-99999 – 999999	—	80.00
	152	L7 trip action	High / Low	—	High
	153	L7 deadband	0 – 999999	—	0.01
	154	L7 coil at alarm	Energized / De-energized	—	Energized
	160	L8 alarm enable	Disable / Enable	—	Enable
	161	L8 alarm setpoint	-99999 – 999999	—	90.00
	162	L8 trip action	High / Low	—	High
	163	L8 deadband	0 – 999999	—	0.01
	164	L8 coil at alarm	Energized / De-energized	—	Energized
	70	Alarm ON-delay time	0 – 999	sec.	0
	71	Power ON-delay time	0 – 999	sec.	5
	72	Latching alarm	Disable / Enable	—	Disable
	89	Alarm test	—	—	Cancel
	01	Lockout setting	Lock / Unlock	—	Lock

**[30] L1 alarm enable / [40] L2 alarm enable /
[50] L3 alarm enable / [60] L4 alarm enable /
[130] L5 alarm enable / [140] L6 alarm enable /
[150] L7 alarm enable / [160] L8 alarm enable**

Set enable/disable of alarm.

SETTING VALUE	DESCRIPTION	INITIAL VALUE
Enable	Provide alarm output	Enable
Disable	Not provide alarm output	

When 'L1 alarm enable' is set to Disable, setting items of L1 alarm cannot be set except 'L1 alarm enable' and are not displayed in the alarm display of Measuring Mode.

**[31] L1 alarm setpoint / [41] L2 alarm setpoint /
[51] L3 alarm setpoint / [61] L4 alarm setpoint /
[131] L5 alarm setpoint / [141] L6 alarm setpoint /
[151] L7 alarm setpoint / [161] L8 alarm setpoint**

Set the threshold level to determine the alarm. Set with scaling value.

SETTING RANGE	INITIAL VALUE	
-99999 – 999999*1	L1	10.00
	L2	30.00 (4 points alarm)
		20.00 (8 points alarm)
	L3	70.00 (4 points alarm)
		30.00 (8 points alarm)
	L4	90.00 (4 points alarm)
		40.00 (8 points alarm)
	L5	60.00
	L6	70.00
	L7	80.00
	L8	90.00

*1. Set within the range between [14] 0% input scaling and [15] 100% input scaling.

**[32] L1 trip action / [42] L2 trip action /
[52] L3 trip action / [62] L4 trip action /
[132] L5 trip action / [142] L6 trip action /
[152] L7 trip action / [162] L8 trip action**

Set high or low for direction of alarm trip action.

SETTING VALUE	DESCRIPTION	INITIAL VALUE
High	High	L1, L2: Low
Low	Low	L3, L4: High (4 points alarm) Low (8 points alarm) L5, L6, L7, L8: High

**[33] L1 deadband / [43] L2 deadband / [53] L3 deadband /
[63] L4 deadband / [133] L5 deadband / [143] L6 deadband /
[153] L7 deadband / [163] L8 deadband**

Set the deadband when alarm is off.

SETTING RANGE	INITIAL VALUE
0 – 999999	0.01

**[34] L1 coil at alarm / [44] L2 coil at alarm /
[54] L3 coil at alarm / [64] L4 coil at alarm /
[134] L5 coil at alarm / [144] L6 coil at alarm /
[154] L7 coil at alarm / [164] L8 coil at alarm**

Set the output logic of alarm. The logic is inverted when De-energized is set.

SETTING VALUE	DESCRIPTION	INITIAL VALUE
Energized	Energized	Energized
De-energized	De-energized	

[70] Alarm ON-delay time

Set the delay time for alarm action in second (Common for L1 to L8).

SETTING RANGE	INITIAL VALUE
0 – 999	0

[71] Power ON-delay time

Set the delay time for alarm action when power is turned on in second.

SETTING RANGE	INITIAL VALUE
0 – 999	5

[72] Latching alarm

Set disable/enable for latching alarm.

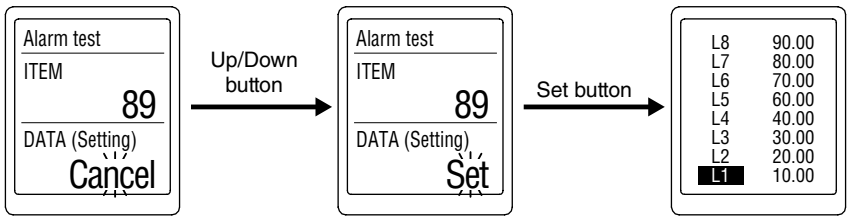
SETTING VALUE	DESCRIPTION	INITIAL VALUE
Enable	Enable	Disable
Disable	Disable	

To release latching alarm, turn the power of the unit off or set to disable. Or press and hold 'Set' button more than 2 second to release.

[89] Alarm test

To perform simulated output,

1. Press Set button to blink 'Cancel'.
2. Change 'Cancel' to 'Set' with Up or Down button and then press Set button.
   The display where you can perform alarm tests appears.
3. The alarm name being selected is displayed inverted. To switch ON/OFF of simulated output, press Set button. To switch the alarm level to select, press Up or Down button.*1
4. Pressing and holding Mode button more than 2 seconds or turning off the power enables to exit Alarm test.



*1. While alarm test is being performed, actual input is disregarded.
During alarm test, when the display turns off by the display timeout function, it comes back by pressing a front button.

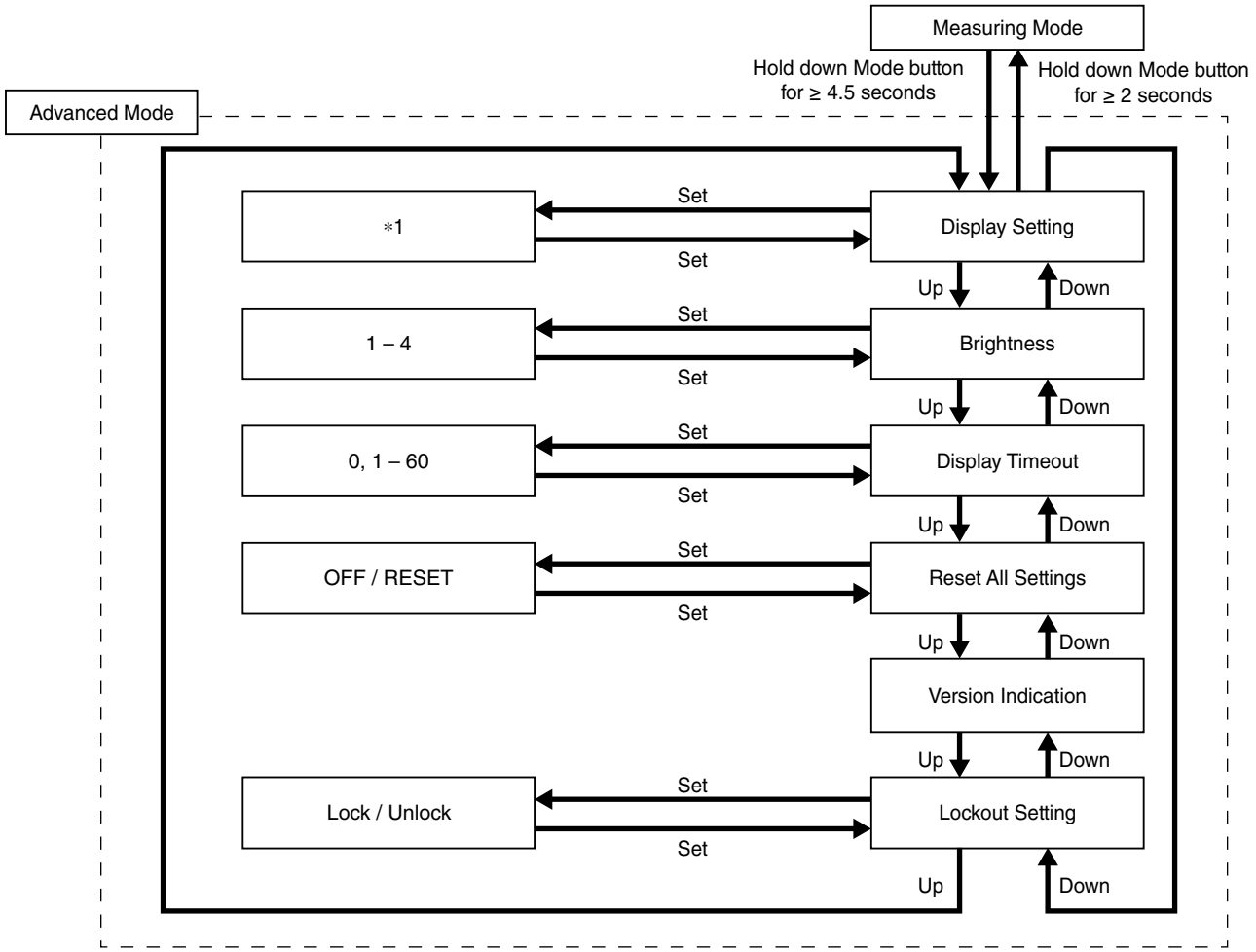
[01] Lockout setting

Set Lock / Unlock of lockout setting.

SETTING VALUE	DESCRIPTION	INITIAL VALUE
Lock	Lockout setting enable	Lock
Unlock	Lockout setting disable	

Even when setting is 'Lock', it is available to move on to each setting mode and to confirm the setting value of each setting parameter. In each setting parameter display, when 'Lock', 'DATA (Locked)' is indicated, when 'Unlock', 'DATA' is indicated.

■ ADVANCED MODE



∗1. For detail, refer to [201] display setting.

• Parameters

MODE	ITEM	SETTING PARAMETER	RANGE	UNIT	INITIAL VALUE
Advanced	201	Display setting	Upper: choose from 4 types Lower: choose from 5 types	—	Upper: INPUT (Scaling) Lower: ALARM
	203	Brightness	1 (darkest) – 4 (brightest)	—	4
	204	Display timeout	0 (always on), 1 – 60	min.	10
	205	Reset all settings	OFF / RESET	—	OFF
	206	Version indication	—	—	—
	01	Lockout setting	Lock / Unlock	—	Lock

[201] Display setting

Set display setting in measuring mode.
The unit's display can be divided into upper and lower parts, where you can select the displayed contents.
To set the upper part's setting, press 'Set' button once, pressing it again, set the lower part's setting, and pressing it once more determines the settings.

Upper

SETTING VALUE	DESCRIPTION	INITIAL VALUE
INPUT	Input engineering unit value	INPUT (Scaling)
INPUT (Scaling)*1	Input scaling	
PERCENT	Percent value*2	
ALARM	Alarm	

Lower

SETTING VALUE	DESCRIPTION	INITIAL VALUE
INPUT	Input engineering unit value	ALARM
INPUT (Scaling)*1	Input scaling	
PERCENT	Percent value*2	
ALARM	Alarm	
None	No display	

*1. In measuring mode, INPUT (Scaling) is displayed as INPUT (SC).
*2. The value displayed is the value converted into 0.00 to 100.00% based on the input setting value.

[203] Brightness

Adjust brightness of display. It is available to set the range between 1 (darkest) – 4 (brightest).
Initial value: 4

[204] Display timeout

Set a time limit to turn off the display when there is no operation within a certain time.
It can be set within the range between 0 – 60 minutes.
To keep the display always on, set it to 0.
When an error occurs at display off, the display comes back..
Initial value: 10

[205] Reset all settings

Return settings to initial value.

SETTING VALUE	DESCRIPTION
OFF	Not initialized.
RESET	Initialize all settings.*1

*1. When setting value is initialized, each parameter currently set is overwritten with initial value. 'COMPLETE' is indicated when initializing setting value is completed. Notice that it does not return to the setting value which was specified by the option Ex-factory setting (/SET).

[206] Version indication

Indicates firmware version.

[01] Lockout Setting

Set Lock / Unlock of lockout setting.

SETTING VALUE	DESCRIPTION	INITIAL VALUE
Lock	Lockout setting enable	Lock
Unlock	Lockout setting disable	

Even when setting is 'Lock', it is available to move on to each setting mode and to confirm the setting value of each setting parameter. In each setting parameter display, when 'Lock', 'DATA (Locked)' is indicated, when 'Unlock', 'DATA' is indicated.

ERROR MESSAGES

DISPLAY	ERROR DESCRIPTION	WHAT TO DO
OVER RANGE U	The input exceeds 105%.	Adjust the input signal in order not to exceed 105%.
OVER RANGE D	The input exceeds lower limit of -5%.	Adjust the input signal in order not to be lower than -5%.
SCALING ERROR U	Input scaling value exceeds 999999 (upward).	Adjust the input signal for the input scaling not to exceed 999999.
SCALING ERROR D	Input scaling value exceeds -99999 (downward).	Adjust the input signal for the input scaling not to be lower than -99999.
EEPROM I ERROR	Internal data error	A repair is needed if the display does not recover after the power is reset..
EEPROM R ERROR	Memory reading error	'Reset all settings' in advanced mode.*1
EEPROM W ERROR	Memory writing error	'Reset all settings' in advanced mode.*1
ADC ERROR	AD converter error	A repair is needed if the display does not recover after the power is reset.

*1. All setting parameters are initialized. A repair is needed if it does not recover.

Indicated errors vary as follows depending on setting value of display setting.
Error is indicated blinking at upper or lower.
When multiple errors occur, only the high priority error is displayed.
The order of priority is EEPROM ERROR, ADC ERROR, OVER RANGE, SCALING ERROR in descending order.

		DISPLAY SETTING		
		INPUT ENGINEERING UNIT VALUE	INPUT SCALING VALUE	PERCENT VALUE
ERROR MESSAGES	OVER RANGE U	✓	✓	—
	OVER RANGE D			
	SCALING ERROR U (INPUT)	✓	✓	—
	SCALING ERROR D (INPUT)			
	EEPROM I ERROR	✓		
	EEPROM R ERROR			
	EEPROM W ERROR			
	ADC ERROR			

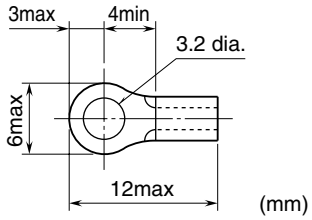
WIRING INSTRUCTIONS FOR BASE

■ SCREW TERMINAL

Torque: 0.5 N·m

■ SOLDERLESS TERMINAL

Refer to the drawing below for recommended ring tongue terminal size. Spade tongue type is also applicable.
Recommended manufacturer: Japan Solderless Terminal MFG.Co.Ltd, Nichifu Co.,ltd (Solderless terminals with insulation sleeve do not fit)
Applicable wire size: 0.25 to 1.65 mm^2



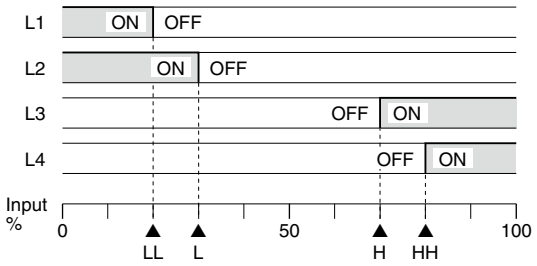
CHECKING

1) Terminal wiring: Check that all cables are correctly connected according to the connection diagram.
2) Power input voltage: Check voltage across the terminal 19 – 20 with a multimeter.
3) Input: Check that the input signal is within 0 – 100% of full-scale.
4) Alarm operations: Check the alarm operations referring to the figure below.
5) Output load: Check that the output load is 250 V AC/ 120 VA or 125 V DC/30 W at the maximum.

   For maximum relay life with inductive load, external protection is recommended.

Alarm Trip Operation

• Example Quad N.O. contacts (LL, L, H, HH)



Trip operation in power failure
Output code A: All relays turn OFF.
Output code B: All relays turn ON.
Output code C: Terminals 13 – 15, 16 – 18, 16 – 12, 1 – 7 turn ON.

MAINTENANCE

Regular calibration procedure is explained below:

■ CALIBRATION

Warm up the unit for at least 10 minutes.

• H Setpoint

Increase the input signal from a value lower than the setpoint and check that the relay trips at the setting value.

• L Setpoint

Decrease the input signal from a value higher than the setpoint and check that the relay trips at the setting value.

• Input Value

Apply 0%, 25%, 50%, 75% and 100% input signal. Perform input fine adjustment when input value is out of accuracy on the display.

Refer to this manual, when adjusting with front buttons. Refer to the M1EACFG users manual (EM-5994), when adjusting with M1EA Configurator Software (model: M1EACFG). And then follow the procedure shown below.

• INPUT FINE ADJUSTMENT

1) Set the input signal to 0 %, and adjust the input display to 0 % by [80] Input Zero fine adjust.
2) Set the input signal to 100 %, and adjust the input display to 100 % by [81] Input Span fine adjust.
3) Again set the simulated input to 0 %, confirm the input display.
4) If input display is shifted, repeat the procedure from 1) to 3).

LIGHTNING SURGE PROTECTION

M-System offers a series of lightning surge protector for protection against induced lightning surges. Please contact M-System to choose appropriate models.