

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

CURRENT LOOP SUPPLY

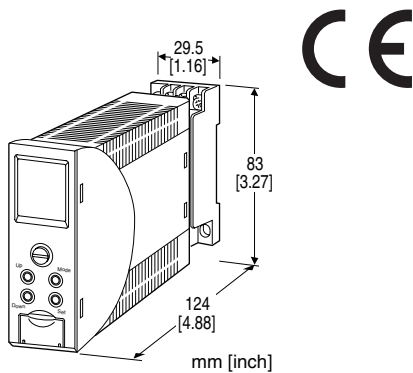
(PC programmable)

Functions & Features

- Adjustments with the front button
- OEL display with good visibility
- Microprocessor based
- Shortcircuit protection
- Segment linearization, square root extraction configurable
- Usable as Isolator for 4 - 20 mA DC signals

Typical Applications

- Various 2-wire transmitters



MODEL: M2EXDY-[1][2]

ORDERING INFORMATION

- Code number: M2EXDY-[1][2]

Specify a code from below for each of [1] and [2].

- (e.g. M2EXDY-M2/Q)
- Specify the specification for option code /Q (e.g. /C01/S01/SET)

INPUT

Current

4 - 20 mA DC (Input resistance 250 Ω)

(Selectable within 0 - 20 mA DC)

OUTPUT - Field-selectable

◆ DC Output

- **Current output:** 0 - 20 mA DC
- **Voltage output:** -5 - +5 V DC
- **Voltage output:** -10 - +10 V DC

[1] POWER INPUT

AC Power

M2: 100 - 240 V AC (Operational voltage range 85 - 264 V, 47 - 66 Hz)

DC Power

R: 24 V DC

(Operational voltage range 24 V ±10 %, ripple 10 %p-p max.)

P: 110 V DC

(Operational voltage range 85 - 150 V, ripple 10 %p-p max.)

[2] OPTIONS

blank: none

/Q: With options (specify the specification)

SPECIFICATIONS OF OPTION: Q (multiple selections)

COATING (For the detail, refer to our web site.)

/C01: Silicone coating

/C02: Polyurethane coating

/C03: Rubber coating

TERMINAL SCREW MATERIAL

/S01: Stainless steel

EX-FACTORY SETTING

/SET: Preset according to the Ordering Information Sheet (No. ESU-5170)

Default setting will be used if not otherwise specified.

RELATED PRODUCTS

- M2E configurator software (model: M2ECFG)

Downloadable at our web site.

A dedicated cable is required to connect the module to the PC. Please refer to the internet software download site or the users manual (EM-5147) for the M2E configurator for applicable cable types.

GENERAL SPECIFICATIONS

Construction: Plug-in

Connection: M3 screw terminals (torque 0.8 N·m)

Screw terminal: Chromated steel (standard) or stainless steel

Housing material: Flame-resistant resin (gray)

Isolation: Input to output to power

Overrange output: Approx. -7.5 to +107.5 % (Not available for current output not greater than 0 mA)

Zero fine adjustment: -5 to +5 % (front button)

Span fine adjustment: 95 to 105 % (front button)

Output setting: DIP Switch on side panel (refer to the instruction manual)

Configuration: Program with front buttons or Via PC.

Programmable features include: Refer to the parameter list.

Configurator connection: 2.5 dia. miniature jack;

RS-232-C level

DISPLAY

Display functions: Displays and sets measured range, engineering unit

Display size: Approx. 15.6 × 20.8 mm (0.61" × 0.82")

Number of pixels: 68 × 95 (horizontal × vertical)

Character color: Yellow

Display life: Approx. 60000 hours

(Expected time for the Display brightness to be reduced to 50 % when the Display is used continuously with brightness setting 2 in 25 °C)

Display type: OEL display

Display digit: Negative 5 digits, positive 6 digits (-99999 to 999999)

Decimal point position: Selectable

SUPPLY OUTPUT

■ SUPPLY OUTPUT (across the terminals 1 - 2)

Output voltage: 24 - 28 V DC with no load

19 V DC minimum at 20 mA

Current rating: ≤ 22 mA DC

Permissible load resistance:

$LR (\Omega) \leq (19 - \text{Min. Operational Voltage})V \div 0.02 A$

• Shortcircuit Protection

Current limited: 35 mA max.

Protected time duration: No limit

INPUT SPECIFICATIONS

■ DC Current

Input resistance: Incorporated (250 Ω)

Input range: 0 - 20 mA DC

Minimum span: 1 mA DC

The measurement available for -7.5 - +107.5% of input setting range.

OUTPUT SPECIFICATIONS

■ DC Current

Output range: 0 - 20 mA DC

Conformance range: 0 - 21.5 mA DC

Minimum span: 1 mA

Offset: Lower range can be any specific value within the output range provided that the minimum span is maintained.

Load resistance: Output drive 15 V max.

(Not available to output less than 0 mA, output range may not be extended to -7.5 %)

■ DC Voltage

Output range: -5 - +5 V DC, -10 - +10 V DC

Conformance range: -5.75 - +5.75 V DC, -11.5 - +11.5 V DC

Minimum span: 250 mV, 1 V

Offset: Lower range can be any specific value within the output range provided that the minimum span is maintained.

Load resistance: Output drive 1 mA max.

LINEARIZATION

■ Linearization Types

Linear: Proportional to the input

Square root: The input is square root extracted.

User's table: Segment linearization

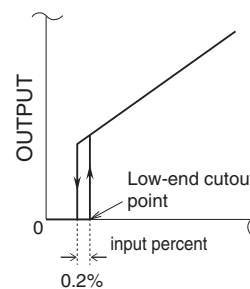
Calibration points: Max. 128 points; the input % and linearized value in scaling are specified in pairs.

Selectable range: -7.5 to +107.5 % as input %; -7.5 to +107.5 % as output)

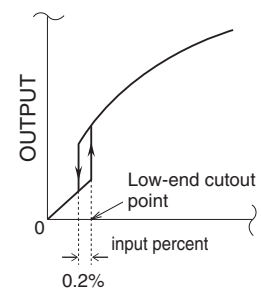
■ Low-end Cutout: Low-end cutout (Low Cut) point selectable within the range of 0 to 100 %.

With linear or segment linearization, the output signal is forcibly set to 0 % for the input lower than the low-cut point. With the square root extraction, the output signal is linear to the input when the latter is lower than the low-cut point.

• Linear or User Table



• Square Root



INSTALLATION

Power Consumption

•AC:

≤ 7 VA at 100 V

≤ 10 VA at 200 V

≤ 12 VA at 264 V

•DC: ≤ 4 W

Operating temperature: -5 to +55°C (23 to 131°F)

Operating humidity: 10 to 85 %RH (non-condensing)

Mounting: Surface or DIN rail

Weight: Approx. 200 g (0.44 lb)

PERFORMANCE

Accuracy: Input accuracy + output accuracy

See CALCULATION EXAMPLES OF OVERALL ACCURACY.

Inversely proportional to the setting span.

Except the accuracy of input resistor.

Input accuracy: (% of max. input range)

Input accuracy differs depending on the linearization type.

Linear: $\pm(0.04 \%$ of FS)

Square root extraction (1 % or more of input): $\pm(0.1 \%$ of FS)

Segment linearization:

$\pm(0.04 \%$ of FS) [gain ≤ 1]

$\pm(0.04 \%$ x gain of FS) [gain > 1]

Display accuracy:

Input display: Input accuracy ± 1 digit

Output display: Input accuracy + output accuracy ± 1 digit

Output accuracy: $\pm 0.04 \%$ of max. output range

Temp. coefficient (% of max. I/O range): $\pm 0.015 \%/^{\circ}\text{C}$

($\pm 0.008 \%/^{\circ}\text{F}$)

Response time (filter time constant: 0 sec.): ≤ 0.5 sec.

(0 - 90 %)

Line voltage effect: $\pm 0.1 \%$ over voltage range

Insulation resistance: $\geq 100 \text{ M}\Omega$ with 500 V DC

Dielectric strength: 2000 V AC @1 minute (input to output to power to ground)

CALCULATION EXAMPLES OF OVERALL ACCURACY

[Example] Input Range: 0 - 20 mA, Input Setting: 4 - 20 mA, Output Range: 0 - 20 mA, Output Setting: 4 - 20 mA (when the linearization type is linear)

■ **Overall accuracy**

• Input Accuracy = Input Range Span (20 mA) \div Input Span Setting (16 mA) $\times 0.04 \%$ = 0.05 %

• Output Accuracy = Output Range Span (20 mA) \div Output Span Setting (16 mA) $\times 0.04 \%$ = 0.05 %

Overall Accuracy = 0.05 + 0.05 = $\pm 0.10 \%$

STANDARDS & APPROVALS

EU conformity:

EMC Directive

EMI EN 61000-6-4

EMS EN 61000-6-2

Low Voltage Directive

EN 61010-1

Installation Category II

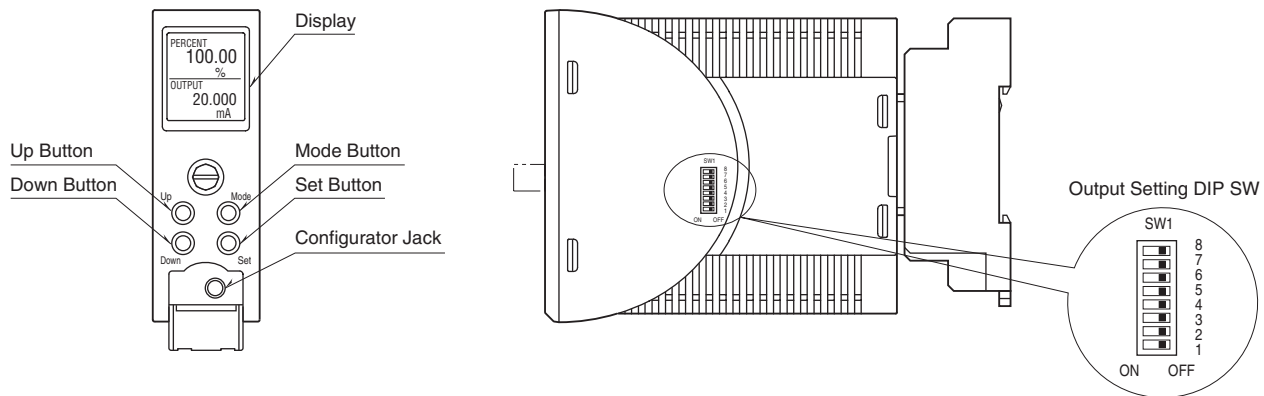
Pollution Degree 2

Input or output to power: Reinforced insulation (300 V)

Input to output: Basic insulation (300 V)

RoHS Directive

EXTERNAL VIEW



COMPONENT	FUNCTION
Display	Indicates present values, setting values and abnormal information. Two types of present values are displayed respectively at the upper and lower parts according to setting.
Mode Button	Shifts from Measuring mode to each setting mode. The destination changes depending on how long the button is held down. Pressing Mode button for ≥ 2 seconds returns to Measuring mode from each setting mode..
Set Button	Shifts the setting value of each setting parameter item to a setting changeable state. When at setting changeable state, used to move through the digits of setting value for input/output scaling and to enter (save) the setting value.
Up Button	Shifts through setting parameter items and to increase or select the setting value.
Down Button	Shifts through setting parameter items and to decrease or select the setting value.
Configurator Jack	Used to perform configuration with M2E configurator software (model: M2ECFG). When using the software, set the Lockout setting of the unit to 'Lock'.

Refer to the operating manual (EM-5170-B) for detailed procedures.

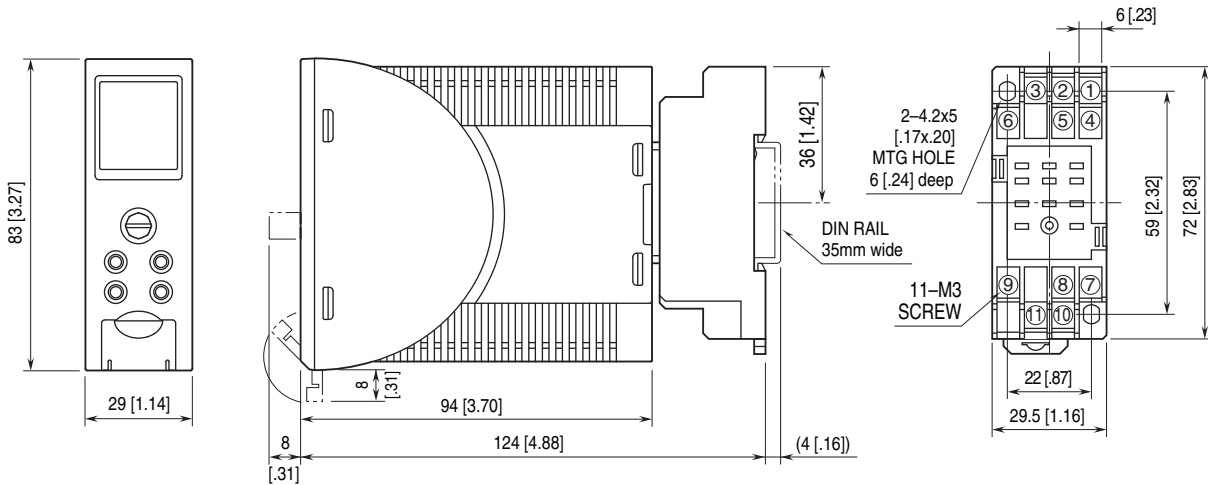
PARAMETER LIST

It is available to configure or confirm settings shown below by using front button. Configuring or confirming with PC is available when using M2E configurator software (model: M2ECFG).

MODE	ITEM	SETTING PARAMETER	RANGE	UNIT	INITIAL VALUE
Basic setting	01	Lockout setting	Lock / Unlock	—	Lock
	12	0 % input setting	0.00 – 19.00	mA	4.00
	13	100 % input setting	1.00 – 20.00	mA	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	Output range	0 – 20 mA -5 – +5 V -10 – +10 V	—	0 – 20 mA
	18	0 % output setting	0.000 – 19.000 -5.000 – 4.750 -10.000 – 9.000	mA V V	4.000
	19	100 % output setting	1.000 – 20.000 -4.750 – 5.000 -9.000 – 10.000	mA V V	20.000
	20	0 % output scaling	-99999 – 999999	—	0.00
	21	100 % output scaling	-99999 – 999999	—	100.00
	22	Output decimal point	No decimal point The number of decimal places: 1 – 5	—	2 places of decimals
	Option	26	Loop test	-7.50 – 107.50	%
54		Low cut	Disable / Enable	—	Disable
55		Low cut point	0.00 – 100.00	%	0.00
60		Unit (INP Scaling)	Choose from 68 types*	—	%
61		Unit (OUT Scaling)	Choose from 68 types*	—	%
67		Filter time constant	0 – 30	sec.	0
69		Input Zero fine adjust	-5.000 – 5.000	%	0.000
70		Input Span fine adjust	95.000 – 105.000	%	100.000
71		Output Zero fine adjust	-5.000 – 5.000	%	0.000
72		Output Span fine adjust	95.000 – 105.000	%	100.000
Advanced	01	Lockout setting	Lock / Unlock	—	Lock
	90	Display setting	Upper: choose from 5 types* Lower: choose from 6 types*	—	Upper: INPUT Lower: PERCENT
	91	Brightness	1 (darkest) – 4 (brightest)	—	4
	92	Display timeout	0 (always on), 1 – 60	min.	10
	93	Reset all settings	OFF / RESET	—	OFF
Linearization	94	Version indication	—	—	—
	01	Lockout setting	Lock / Unlock	—	Lock
	100	Linearization	Linear, Square root, User's table	—	Linear
	166	Number of points	2 – 128	—	2
	167 – 422	Table	-7.50 – 107.50	%	X001 -7.50 Y001 -7.50 X002 107.50 Y002 107.50
01	Lockout setting	Lock / Unlock	—	Lock	

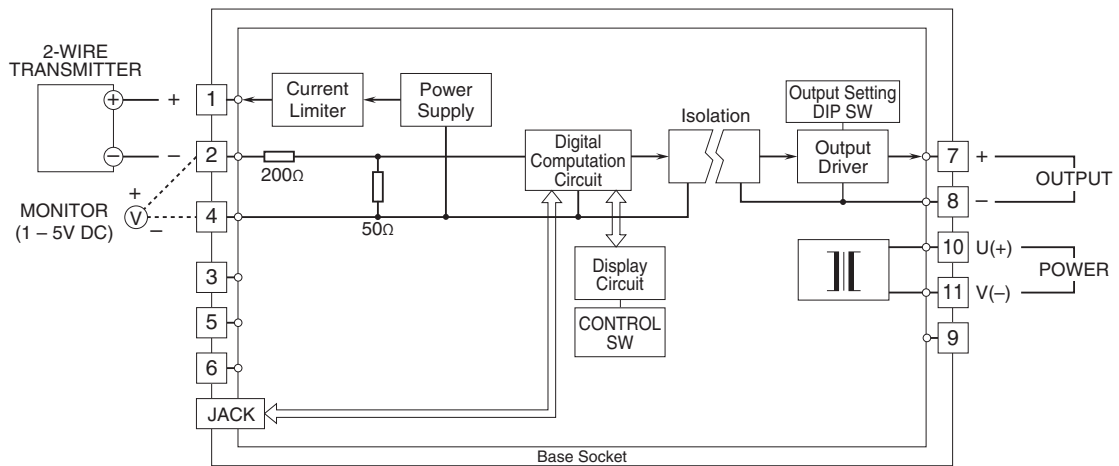
* For detailed types, refer to the operating manual (EM-5170-B).

EXTERNAL DIMENSIONS & TERMINAL ASSIGNMENTS unit: mm [inch]

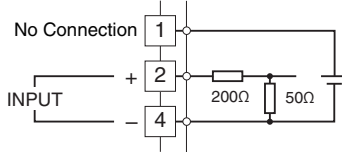


• When mounting, no extra space is needed between units.

SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM



■ When Used as Current Input



Specifications are subject to change without notice.