

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

### POTENTIOMETER TRANSMITTER

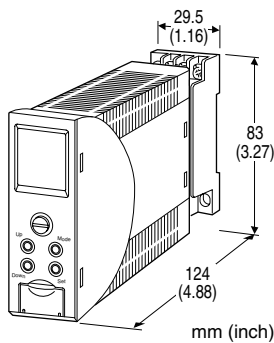
(PC programmable)

#### Functions & Features

- Provides a DC output proportional to a potentiometer or slidewire position input
- Adjustments with the front keypad
- Potentiometer's zero/span points can be captured by on-site calibrations
- OEL display with good visibility

#### Typical Applications

- Tank levels
- Positions: Compensating non-linear signal from the linking mechanism of a position detector



## MODEL: M2EXM-[1][2]

### ORDERING INFORMATION

- Code number: M2EXM-[1][2]

Specify a code from below for each [1] and [2].  
(e.g. M2EXM-M2/Q)

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

### INPUT

Total resistance 100  $\Omega$  - 10 k $\Omega$

### 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  $\pm$ 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 M-System's 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-5135)

### RELATED PRODUCTS

- M2E configurator software (model: M2ECFG)

Downloadable at M-System's 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. -5 to +105 % (Not available for current output not greater than 0 mA)

**Manual zero adjustments:** -5 to +5 %

(factory setting: 0 %)

**Manual span adjustments:** 95 to 105 %

(factory setting: 100 %)

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

**Configuration:** Program with front buttons or Via PC.

**Programmable features include:**

- Output range
  - Input scaling
  - Output scaling
  - Zero and span fine adjustments
  - Loop test
  - Linearization
- (Refer to the operating manual (EM-5135-B) for detail)
- Configurator connection:** 2.5 dia. miniature jack;  
RS-232-C level

## DISPLAY

**Display functions:** Displays and sets measured range, engineering unit

**Effective visual area:** 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

## INPUT SPECIFICATIONS

**Minimum span:** 5 %

**Excitation:** Approx. 0.5 V DC

## OUTPUT SPECIFICATIONS

■ **DC Current**

**Output range:** 0 - 20 mA DC

**Conformance range:** 0 - 21mA 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 -5 %)

■ **DC Voltage**

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

**Conformance range:** -5.5 - +5.5 V DC, -11 - +11 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.

## INSTALLATION

### Power Consumption

- **AC:**  
Max. 4.5 VA at 100 V  
Max. 6.5 VA at 200 V  
Max. 8.5 VA at 264 V
- **DC:** Max. 2.3 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 (without linearization)

**Accuracy:** Input accuracy + output accuracy

Inversely proportional to the span.

**Input accuracy (% of max. input range):** ±1Ω or 0.05 %, whichever is greater.

**Display accuracy:**

Input display: Input accuracy ±1 digit

Output display: Input accuracy + output accuracy ±1 digit

**Output accuracy:** ±0.04 % of max. output range

Refer to 'CALCULATION EXAMPLES OF OVERALL ACCURACY'.

**Temp. coefficient (% of max. I/O range):** ±0.015 %/°C  
(±0.008 %/°F)

**Input resolution:** Max. 18 bits

**Output resolution:** Max. 16 bits

**Response time (filter time constant: 0 sec.):** ≤ 0.5 sec.  
(0 - 90 %)

**Line voltage effect:** ±0.1 % over voltage range

**Insulation resistance:** ≥ 100 MΩ with 500 V DC

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

## CALCULATION EXAMPLES OF OVERALL ACCURACY

[Example] Total Resistance 1000 Ω, Input Setting 100 - 600 Ω, Output Range 0 - 20 mA, Output Setting 4 - 20 mA

• Input Accuracy = Total Resistance (1000 Ω) ÷ Input Span Setting (500 Ω) × 0.05 % = 0.1 %

• Output Accuracy = Output Range Span (20 mA) ÷ Output Span Setting (16 mA) × 0.04 % = 0.05 %

Overall accuracy = 0.1 + 0.05 = ±0.15 %

## 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

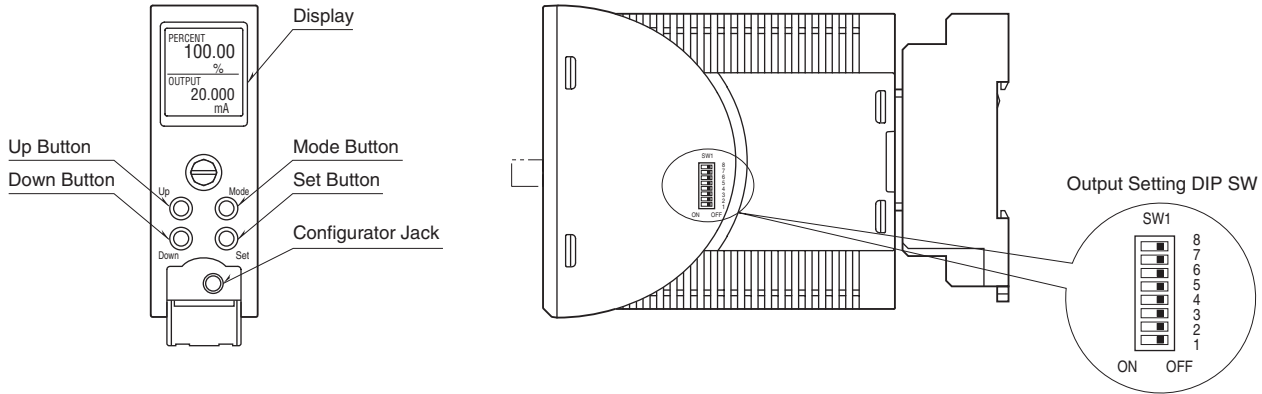
Input or output to power: Reinforced insulation (300 V)

Input to output: Basic insulation (300 V)

RoHS Directive

EN 50581

## EXTERNAL VIEW



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. Destination to shift is changed by the time pressing and holding the button. Used to return from each setting mode to measuring mode. (press and hold for 2 sec. or more)
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 for input/output scaling at setting changeable state,
Up Button	Used to shift through setting parameter, and to increase or select setting value.
Down Button	Used to shift through setting parameter, and to decrease or select setting value.
Configurator Jack	Used to configure with M2E configurator software (model: M2ECFG). At the same time, set the lockout setting of the unit to 'lock'.

Refer to the operating manual (EM-5135-B) for detailed procedures.

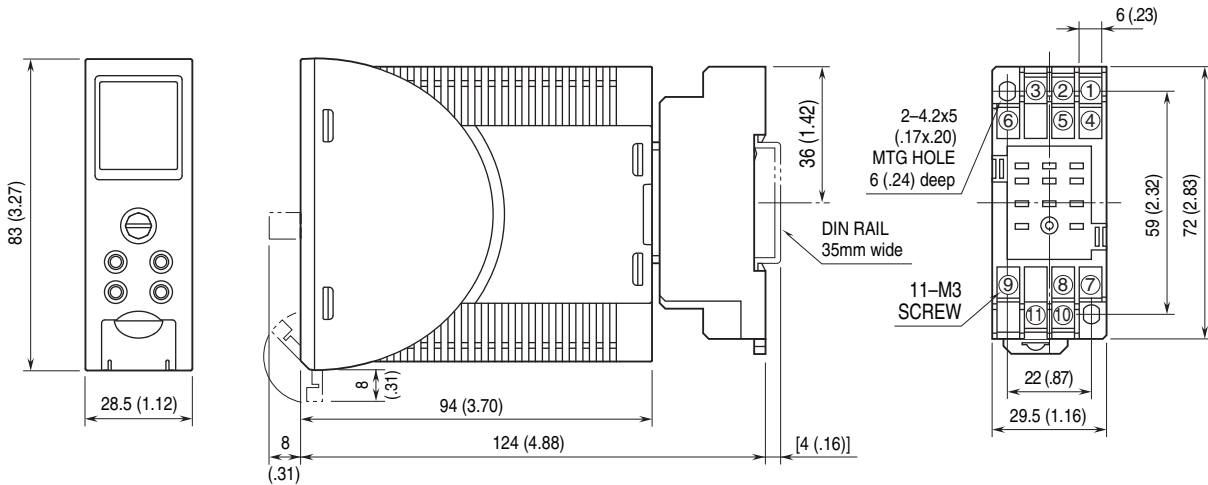
## PARAMETER LIST

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
	13	100 % input setting	—	—	10000
	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 – 20mA -5 – +5V -10 – +10V	—	0 – 20mA
	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	-5.00 – 105.00	%
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
	94	Version indication	—	—	—
Linearization	01	Lockout setting	Lock / Unlock	—	Lock
	100	User's table linearization	Disable / Enable	—	Disable
	166	Number of points	2 – 111	—	2
	167 – 388	Table	-5.00 – 105.00	%	X001 -5.00 Y001 -5.00 X002 105.00 Y002 105.00
01	Lockout setting	Lock / Unlock	—	Lock	

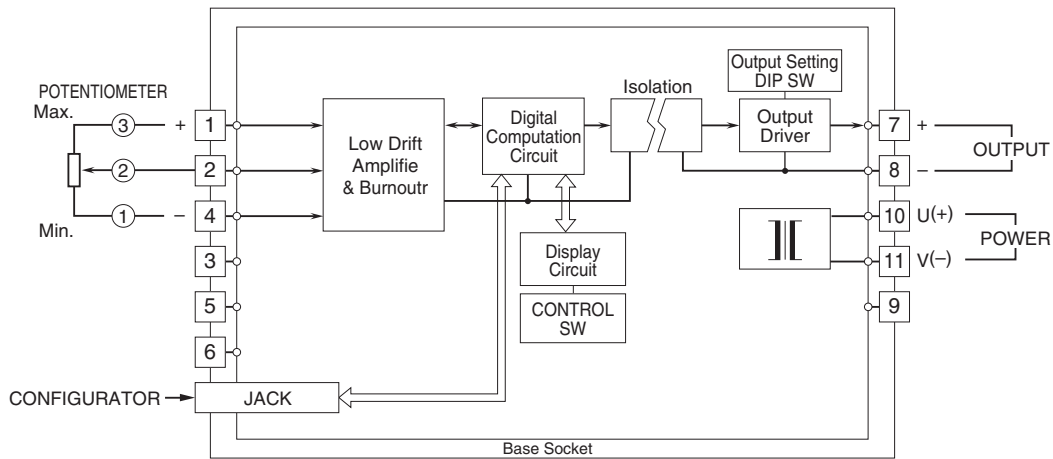
\* For detailed types, refer to the operating manual (EM-5135-B).

## DIMENSIONS unit: mm (inch)



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

## SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM



Specifications are subject to change without notice.