

## 2 Channel Super-mini Signal Conditioners with Display M1E-2 Series

### SIGNAL TRANSMITTER

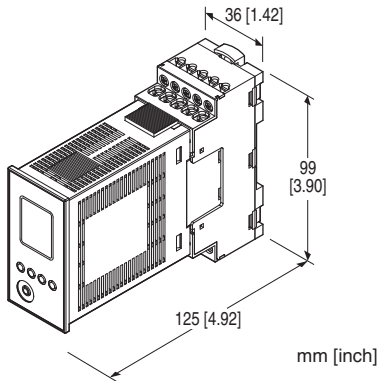
(2 channels, PC programmable)

#### Functions & Features

- Converts DC input from a sensor into a standard process signal
- 2 channels
- Adjustments with the front button
- OEL display with good visibility
- Linearization available for each channel (111 points)

#### Typical Applications

- Isolation between control room and field instrumentation
- Ideal for quick spare part



Note: The figure shows the combination of the unit and the base.

### MODEL: M1EXV-2-[1][2]

#### ORDERING INFORMATION

- Code number: M1EXV-2-[1][2]
- Specify a code from below for each of [1] and [2]. (e.g. M1EXV-2-M2/Q)
- Specify the specification for option code /Q (e.g. /C01/SET)

#### NO. OF CHANNELS

2: 2 channels

#### INPUT - Field-selectable

##### ◆ DC Input

- Current input: 0 - 50 mA DC
- Voltage input: -1000 - +1000 mV DC
- Voltage input: -10 - +10 V 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  $\pm$ 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 our web site.)

/C01: Silicone coating

/C02: Polyurethane coating

/C03: Rubber coating

##### EX-FACTORY SETTING

/SET: Preset according to the Ordering Information Sheet (No. ESU-5982)

#### RELATED PRODUCTS

- Installation base (model: M1E-BS2)
  - PC Configurator cable (model: MCN-CON or COP-US)
  - M1E configurator software (model: M1ECFG)
- Downloadable at our web site.

#### GENERAL SPECIFICATIONS

Construction: Plug-in

##### Connection

- Connected to base with connector
- Base

M2.6 screw terminals (torque: 0.5 N·m)

Applicable solderless terminal size (M3)

Screw terminal: Nickel-plated steel

Housing material: Flame-resistant resin (black)

Isolation: Ch1 input to Ch2 input to Ch1 output to Ch2 output to power

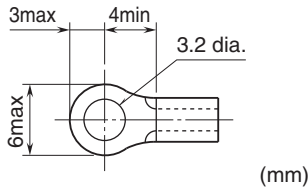
Overrange output: Approx. -5 to +105 % (Not available for current output not greater than 0 mA)

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

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

**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

■ **Recommended solderless terminal size - M3 (unit: mm)**



## 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. 50000 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

■ **DC Current**  
**Input resistance:** Incorporated (28 Ω)  
**Input range:** 0 - 50 mA DC  
**Minimum span:** 2 mA  
 The measurement available for -5 - +105% of input setting range.

■ **DC Voltage**

- **Narrow Spans (mV)**  
**Input range:** -1000 - +1000 mV DC  
**Minimum span:** 100 mV
- **Wide Spans (V)**  
**Input range:** -10 - +10 V DC  
**Minimum span:** 1 V  
**Input resistance:** 1 MΩ minimum  
 The measurement available for -5 - +105% of input setting range.

## OUTPUT SPECIFICATIONS

■ **DC Current**  
**Output range:** 0 - 20 mA DC  
**Conformance range:** 0 - 21mA DC  
**Minimum span:** 1 mA

**Load resistance:** Output drive 15 V max.  
 (e.g. 4 - 20 mA: 750 Ω [15 V ÷ 20 mA])  
 (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  
**Load resistance:** 200 kΩ min.

## 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)  
**Storage temperature:** -5 to +55°C (23 to 131°F)  
**Operating humidity:** 10 to 85 %RH (non-condensing)  
**Mounting:** Surface or DIN rail  
**Weight:** 120 g (0.26 lb) except base

## PERFORMANCE

**Accuracy:** Input accuracy + output accuracy  
 input accuracy + (output accuracy × segment gain) when segment gain > 1  
 See CALCULATION EXAMPLES OF OVERALL ACCURACY.  
 Inversely proportional to the setting span.  
**Input accuracy:** (% of max. input range): ±0.03 %  
**Display accuracy:**  
 Input display: Input accuracy ±1 digit  
 Output display: Input accuracy + output accuracy ±1 digit  
**Output accuracy:** (% of max. output range)  
 0 - 20 mA: ±0.06 %  
 -5 - +5 V: ±0.03 %  
 -10 - +10 V: ±0.03 %  
**Temp. coefficient (% of max. I/O range):** ±0.015 %/°C (±0.008 %/°F)  
**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:** 1500 V AC @ 1 minute  
 (Ch1 input to Ch2 input to Ch1 output to Ch2 output to power to ground)

## CALCULATION EXAMPLES OF OVERALL ACCURACY

[Example] Input Range -10 - +10 V, Input Setting 1 - 5 V,  
 Output Range 0 - 20 mA, Output Setting 4 - 20 mA,  
 Segment Gain 1.5

## ■ Overall accuracy

• Input Accuracy = Input Range Span (20 V) ÷ Input Span Setting (4 V) × 0.03 % = 0.15 %

• Output Accuracy = Output Range Span (20 mA) ÷ Output Span Setting (16 mA) × 0.06 % × Segment Gain (1.5) = 0.1125 %

Overall Accuracy = 0.15 + 0.1125 = ±0.2625 %

## STANDARDS & APPROVALS

### EU conformity:

EMC Directive

EMI EN 61000-6-4

EMS EN 61000-6-2

Low Voltage Directive

EN 61010-1

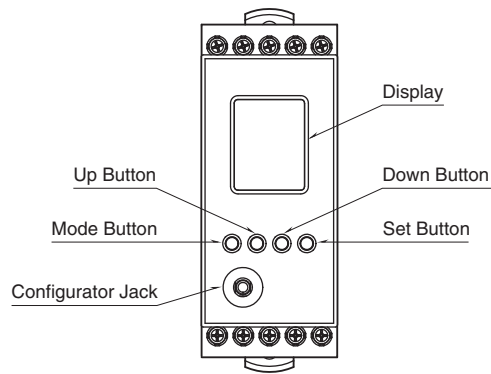
Installation Category II

Pollution Degree 2

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

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 $\geq 2$ 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 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 M1E configurator software (model: M1ECFG). When using the software, set the Lockout setting of the unit to 'Lock'.

Refer to the operating manual (EM-5982-B) for detailed procedures.

## TERMINAL ASSIGNMENTS

1	2	3	4	5
6	7	8	9	10
11	12	13	14	15
16	17	18	19	20

No.	FUNCTION	No.	FUNCTION
1	Unused	11	Ch1 Output +
2	Unused	12	Ch1 Output -
3	Ch1 Input voltage +	13	Unused
4	Ch1 Input current +	14	Ch2 Output +
5	Ch1 Input -	15	Ch2 Output -
6	Unused	16	Unused
7	Unused	17	Unused
8	Ch2 Input voltage +	18	Unused
9	Ch2 Input current +	19	Power U (+)
10	Ch2 Input -	20	Power V (-)

**\* Base does not come with the unit. Please order separately.**

## PARAMETER LIST

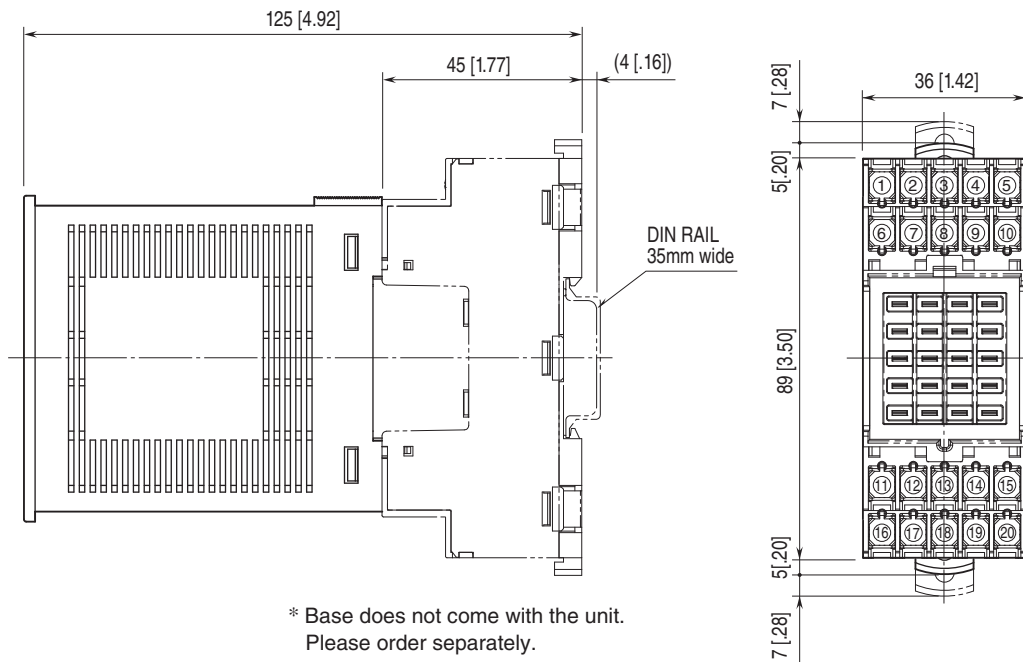
It is available to configure or confirm settings shown below by using front button. Configuring or confirming with PC is available when using M1E configurator software (model: M1ECFG).

MODE	ITEM	SETTING PARAMETER	RANGE	UNIT	INITIAL VALUE	
Ch1 Setting	01	Lockout setting	Lock / Unlock	–	Lock	
	11	Ch1 Input range	0 – 50 mA -1000 – +1000 mV -10 – +10 V	–	0 – 50 mA	
	12	Ch1 0 % input setting	0.00 – 48.00 -1000.0 – 900.0 -10.000 – 9.000	mA mV V	4.00	
	13	Ch1 100 % input setting	2.00 – 50.00 -900.0 – 1000.0 -9.000 – 10.000	mA mV V	20.00	
	14	Ch1 0 % input scaling	-99999 – 999999	–	0.00	
	15	Ch1 100 % input scaling	-99999 – 999999	–	100.00	
	16	Ch1 Input decimal point	No decimal point The number of decimal places: 1 – 5	–	2 places of decimals	
	17	Ch1 Unit (INP Scaling)	Choose from 68 types*	–	%	
	18	Ch1 Output range	0 – 20 mA -5 – +5 V -10 – +10 V	–	0 – 20 mA	
	19	Ch1 0 % output setting	0.000 – 19.000 -5.000 – 4.750 -10.000 – 9.000	mA V V	4.000	
	20	Ch1 100 % output setting	1.000 – 20.000 -4.750 – 5.000 -9.000 – 10.000	mA V V	20.000	
	79	Ch1 Filter time constant	0 – 30	sec.	0	
	80	Ch1 Input Zero fine adjust	-5.000 – 5.000	%	0.000	
	81	Ch1 Input Span fine adjust	95.000 – 105.000	%	100.000	
	82	Ch1 Output Zero fine adjust	-5.000 – 5.000	%	0.000	
	83	Ch1 Output Span fine adjust	95.000 – 105.000	%	100.000	
	89	Ch1 Loop test	-5.00 – 105.00	%	Cancel	
	Ch2 Setting	111	Ch2 Input range	0 – 50 mA -1000 – +1000 mV -10 – +10 V	–	0 – 50 mA
		112	Ch2 0 % input setting	0.00 – 48.00 -1000.0 – 900.0 -10.000 – 9.000	mA mV V	4.00
113		Ch2 100 % input setting	2.00 – 50.00 -900.0 – 1000.0 -9.000 – 10.000	mA mV V	20.00	
114		Ch2 0 % input scaling	-99999 – 999999	–	0.00	
115		Ch2 100 % input scaling	-99999 – 999999	–	100.00	
116		Ch2 Input decimal point	No decimal point The number of decimal places: 1 – 5	–	2 places of decimals	
117		Ch2 Unit (INP Scaling)	Choose from 68 types*	–	%	
118		Ch2 Output range	0 – 20 mA -5 – +5 V -10 – +10 V	–	0 – 20 mA	
119		Ch2 0 % output setting	0.000 – 19.000 -5.000 – 4.750 -10.000 – 9.000	mA V V	4.000	
120		Ch2 100 % output setting	1.000 – 20.000 -4.750 – 5.000 -9.000 – 10.000	mA V V	20.000	
179		Ch2 Filter time constant	0 – 30	sec.	0	
180		Ch2 Input Zero fine adjust	-5.000 – 5.000	%	0.000	
181		Ch2 Input Span fine adjust	95.000 – 105.000	%	100.000	
182		Ch2 Output Zero fine adjust	-5.000 – 5.000	%	0.000	
183		Ch2 Output Span fine adjust	95.000 – 105.000	%	100.000	
189		Ch2 Loop test	-5.00 – 105.00	%	Cancel	
01		Lockout setting	Lock / Unlock	–	Lock	

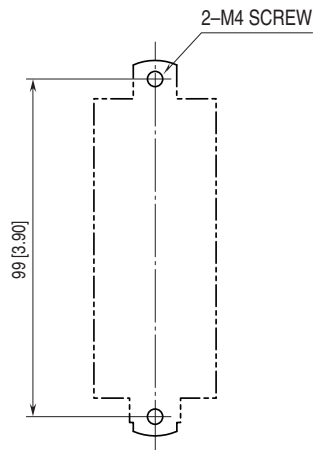
MODE	ITEM	SETTING PARAMETER	RANGE	UNIT	INITIAL VALUE
Advanced	201	Display setting	Upper: choose from 8 types* Lower: choose from 9 types*	–	Upper: Ch1 INPUT Lower: Ch2 INPUT
	202	Channel enable	Choose from 3 types*	–	Ch1 enable Ch2 enable
	203	Brightness	1 (darkest) – 4 (brightest)	–	4
	204	Display timeout	0 (always on), 1 – 60	min.	10
	205	Reset all settings	OFF / RESET	–	OFF
	206	Version indication	–	–	–
Ch1 Linearization	01	Lockout setting	Lock / Unlock	–	Lock
	210	Ch1 User's table linearization	Disable / Enable	–	Disable
	276	Ch1 Number of points	2 – 111	–	2
	277 – 498	Ch1 Table	-5.00 – 105.00	%	X001 -5.00 Y001 -5.00 X002 105.00 Y002 105.00
Ch2 Linearization	01	Lockout setting	Lock / Unlock	–	Lock
	510	Ch2 User's table linearization	Disable / Enable	–	Disable
	576	Ch2 Number of points	2 – 111	–	2
	577 – 798	Ch2 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-5982-B).

## EXTERNAL DIMENSIONS & TERMINAL ASSIGNMENTS unit: mm [inch]

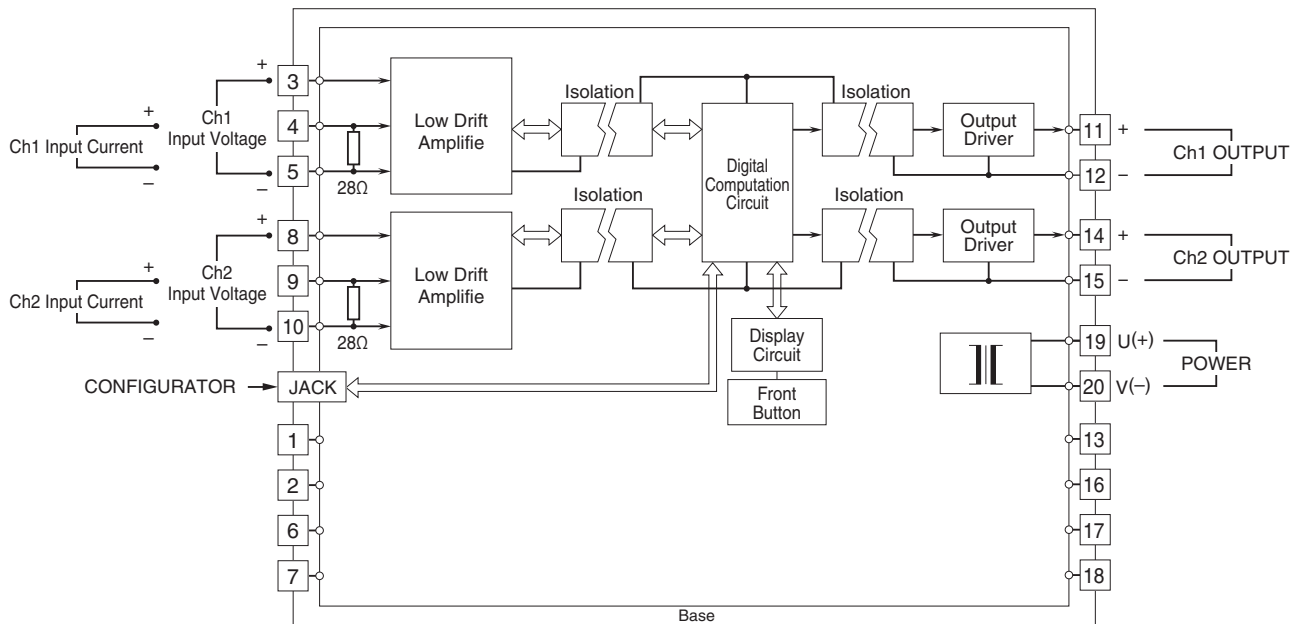


## MOUNTING REQUIREMENTS unit: mm [inch]



\* Mounting requirements for base.

## SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM



Specifications are subject to change without notice.