Multi-output Super-mini Signal Conditioners with Display M1E-1 Series

SIGNAL TRANSMITTER

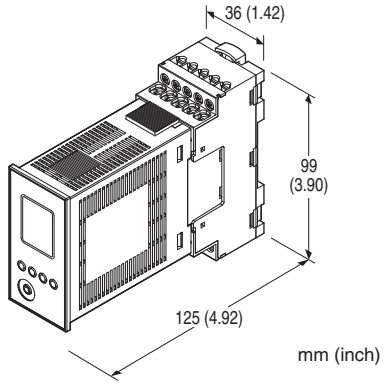
(multi-output, PC programmable)

Functions & Features

- Converts DC input from a sensor into a standard process signal
- 4 channels
- Isolation between inputs and outputs
- 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-1-4-R[1]

ORDERING INFORMATION

- Code number: M1EXV-1-4-R[1]

Specify a code from below for [1].
(e.g. M1EXV-1-4-R/Q)

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

INPUT – Field-selectable

◆ **DC Input**

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

NO. OF INPUT CHANNELS

1: 1 channel

OUTPUT – Field-selectable

◆ **DC Output**

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

NO. OF OUTPUT CHANNELS

4: 4 channels

POWER INPUT

DC Power

R: 24 V DC

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

[1] 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

EX-FACTORY SETTING

/SET: Preset according to the Ordering Information Sheet (No. ESU-6033)

RELATED PRODUCTS

- Installation base (model: M1E-BS2)
- M1E configurator software (model: M1ECFG (M1E1CFG))

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-6036) for the M1E configurator for applicable cable types.

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)

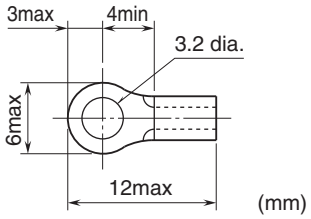
Screw terminal: Nickel-plated steel

Housing material: Flame-resistant resin (black)

Isolation: Input to output 1 to output 2 to output 3 to output

4 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. 40000 hours
(Expected time for the Display brightness to be reduced to 50 % when the Display is used continuously with brightness setting 2 in 25 ℃)
Display type: OEL display
Display digit: Negative 5 digits, positive 6 digits (-99999 to 999999)
Decimal point position: Selectable

INPUT SPECIFICATIONS

■ **DC Current**: Input resistor incorporated (50 Ω)
Input range: 0 - 20 mA DC
Minimum span: 1 mA
The measurement available for -5 - +105% of input setting range.

■ **DC Voltage**
•**Narrow Spans (mV)**
Input range: -5 – +5 V DC
Minimum span: 250 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**
•**Narrow Spans (mV)**
Output range: -5 - +5 V DC
Conformance range: -5.5 - +5.5 V DC
Minimum span: 250 mV
•**Wide Spans (V)**
Output range: -10 - +10 V DC
Conformance range: -11 - +11 V DC
Minimum span: 1 V
Load resistance: 10 kΩ min.

INSTALLATION

Power consumption
•**DC**: ≤ 5 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: 150 g (0.33 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): ±0.03 %
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
(input to output 1 to output 2 to output 3 to output 4 to power to ground)

CALCULATION EXAMPLES OF OVERALL ACCURACY

[Example] Input signal: 1 - 5 V DC, Output signal: 4 - 20 mA DC, Max segment gain with linearization set: 1.5
Input Range -5 – +5 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 (10 V) ÷ Input Span (4 V) × 0.03 % = 0.075 %

• Output Accuracy = Output Range Span (20 mA) ÷ Output Span (16 mA) × 0.03 % × Segment Gain (1.5) = 0.05625 %

Overall Accuracy = 0.075 + 0.05625 = ±0.13125 %

STANDARDS & APPROVALS

EU conformity:

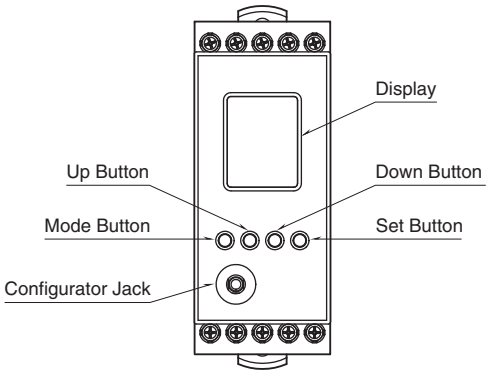
EMC Directive

EMI EN 61000-6-4

EMS EN 61000-6-2

RoHS Directive

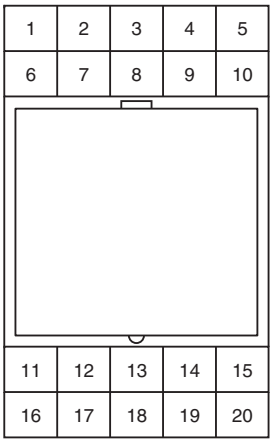
EXTERNAL VIEW



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. While in each setting mode, pressing Mode button shift to the setting mode for the next output. Pressing Mode button for ≥ 2 seconds returns to Measuring mode from each setting mode. In Measuring mode, shortly pressing the button shifts to the next screen.
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 oar 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-6033-B) for detailed procedures of parameter settings.

TERMINAL ASSIGNMENTS



No.	FUNCTION	No.	FUNCTION
1	Unused	11	OUT1 Output +
2	Unused	12	OUT1 Output –
3	Input voltage +	13	OUT4 Output +
4	Input current +	14	OUT2 Output +
5	Input –	15	OUT2 Output –
6	Unused	16	OUT3 Output +
7	Unused	17	OUT3 Output –
8	Unused	18	OUT4 Output –
9	Unused	19	Power +
10	Unused	20	Power –

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

PARAMETER LIST

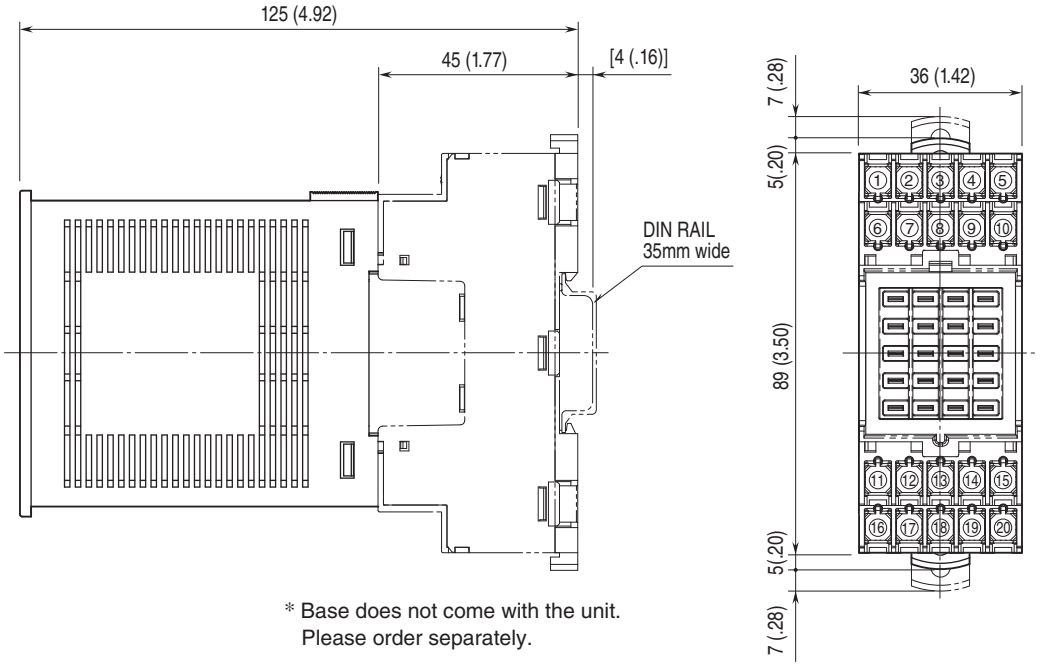
The following parameters can be set or checked, by the front button operation, or fron the PC by using M1E configuration software (model: M1ECFG).

MODE	ITEM	SETTING PARAMETER	RANGE	UNIT	INITIAL VALUE
Input setting	01	Lockout setting	Lock / Unlock	—	Lock
	11	Input range	0 – 20 mA -5 – +5 V -10 – +10 V	—	0 – 20 mA
	12	0% input setting	0.000 – 19.000 -5.000 – 4.750 -10.000 – 9.000	mA V V	4.000
	13	100% input setting	1.000 – 20.000 -4.750 – 5.000 -9.000 – 10.000	mA V V	20.000
	14	0% input scaling	-99999 – 999999	—	0.00
	15	100% input scaling	-99999 – 999999	—	100.00
	16	Input decimal scaling	No decimal point The number of decimal places : 1 – 5	—	2 places of decimals
	17	Unit (INP Scaling)	Choose from 68 types*	—	%
	31	Filter time constant	0 – 30	sec.	0
	41	Input Zero fine adjust	-5.000 – 5.000	%	0.000
	42	Input Span fine adjust	95.000 – 105.000	%	100.000
	45	Input User's table linearization	Cancel / Set	—	Cancel
Output 1 setting	01	Lockout setting	Lock / Unlock	—	Lock
	51	OUT1 Output enable	Disable / Enable	—	Enable
	61	OUT1 Output range	0 – 20 mA -5 – +5 V -10 – +10 V	—	0 – 20 mA
	62	OUT1 0% output setting	0.000 – 19.000 -5.000 – 4.750 -10.000 – 9.000	mA V V	4.000
	63	OUT1 100% output setting	1.000 – 20.000 -4.750 – 5.000 -9.000 – 10.000	mA V V	20.000
	91	OUT1 Output Zero fine adjust	-5.000 – 5.000	%	0.000
	92	OUT1 Output Span fine adjust	95.000 – 105.000	%	100.000
	95	OUT1 User's table linearization	Cancel / Set	—	Cancel
	98	OUT1 Loop test	-5.00 – 105.00	%	Cancel
Output 2 Setting	01	Lockout setting	Lock / Unlock	—	Lock
	151	OUT2 Output enable	Disable / Enable	—	Enable
	161	OUT2 Output range	0 – 20 mA -5 – +5 V -10 – +10 V	—	0 – 20 mA
	162	OUT2 0% output setting	0.000 – 19.000 -5.000 – 4.750 -10.000 – 9.000	mA V V	4.000
	163	OUT2 100% output setting	1.000 – 20.000 -4.750 – 5.000 -9.000 – 10.000	mA V V	20.000
	191	OUT2 Output Zero fine adjust	-5.000 – 5.000	%	0.000
	192	OUT2 Output Span fine adjust	95.000 – 105.000	%	100.000
	195	OUT2 User's table linearization	Cancel / Set	—	Cancel
	198	OUT2 Loop test	-5.00 – 105.00	%	Cancel

MODE	ITEM	SETTING PARAMETER	RANGE	UNIT	INITIAL VALUE
Output 3 setting	01	Lockout setting	Lock / Unlock	—	Lock
	251	OUT3 Output enable	Disable / Enable	—	Enable
	261	OUT3 Output range	0 – 20 mA -5 – +5 V -10 – +10 V	—	0 – 20 mA
	262	OUT3 0% output setting	0.000 – 19.000 -5.000 – 4.750 -10.000 – 9.000	mA V V	4.000
	263	OUT3 100% output setting	1.000 – 20.000 -4.750 – 5.000 -9.000 – 10.000	mA V V	20.000
	291	OUT3 Output Zero fine adjust	-5.000 – 5.000	%	0.000
	292	OUT3 Output Span fine adjust	95.000 – 105.000	%	100.000
	295	OUT3 User's table linearization	Cancel / Set	—	Cancel
	298	OUT3 Loop test	-5.00 – 105.00	%	Cancel
Output 4 setting	01	Lockout setting	Lock / Unlock	—	Lock
	351	OUT4 Output enable	Disable / Enable	—	Enable
	361	OUT4 Output range	0 – 20 mA -5 – +5 V -10 – +10 V	—	0 – 20 mA
	362	OUT4 0% output setting	0.000 – 19.000 -5.000 – 4.750 -10.000 – 9.000	mA V V	4.000
	363	OUT4 100% output setting	1.000 – 20.000 -4.750 – 5.000 -9.000 – 10.000	mA V V	20.000
	391	OUT4 Output Zero fine adjust	-5.000 – 5.000	%	0.000
	392	OUT4 Output Span fine adjust	95.000 – 105.000	%	100.000
	395	OUT4 User's table linearization	Cancel / Set	—	Cancel
	398	OUT4 Loop test	-5.00 – 105.00	%	Cancel
Advanced	01	Lockout setting	Lock / Unlock	—	Lock
	401	Display 1 setting	Upper: choose from 7 types* Lower: choose from 8 types*	—	Upper: INPUT Lower: OUTPUT1
	402	Display 2 setting	Upper: choose from 8 types* Lower: choose from 8 types*	—	Upper: INPUT Lower: OUTPUT2
	403	Display 3 setting	Upper: choose from 8 types* Lower: choose from 8 types*	—	Upper: INPUT Lower: OUTPUT3
	404	Display 4 setting	Upper: choose from 8 types* Lower: choose from 8 types*	—	Upper: INPUT Lower: OUTPUT4
	405	Display change time	0 (fixed), 1 – 60	sec.	3
	406	Brightness	1 (darkest) – 4 (brightest)	—	4
	407	Display timeout	0 (always on), 1 – 60	min.	10
	408	Reset all settings	OFF / RESET	—	OFF
	409	Version indication	—	—	—

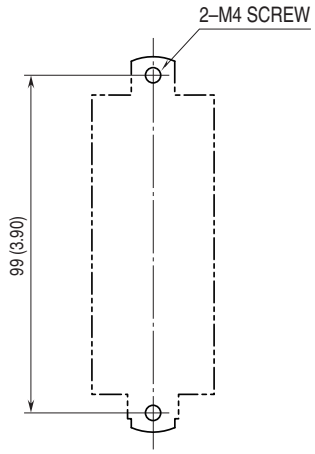
* For detailed setting, refer to the operating manual (EM-6033-B).

EXTERNAL DIMENSIONS & TERMINAL ASSIGNMENTS unit: mm



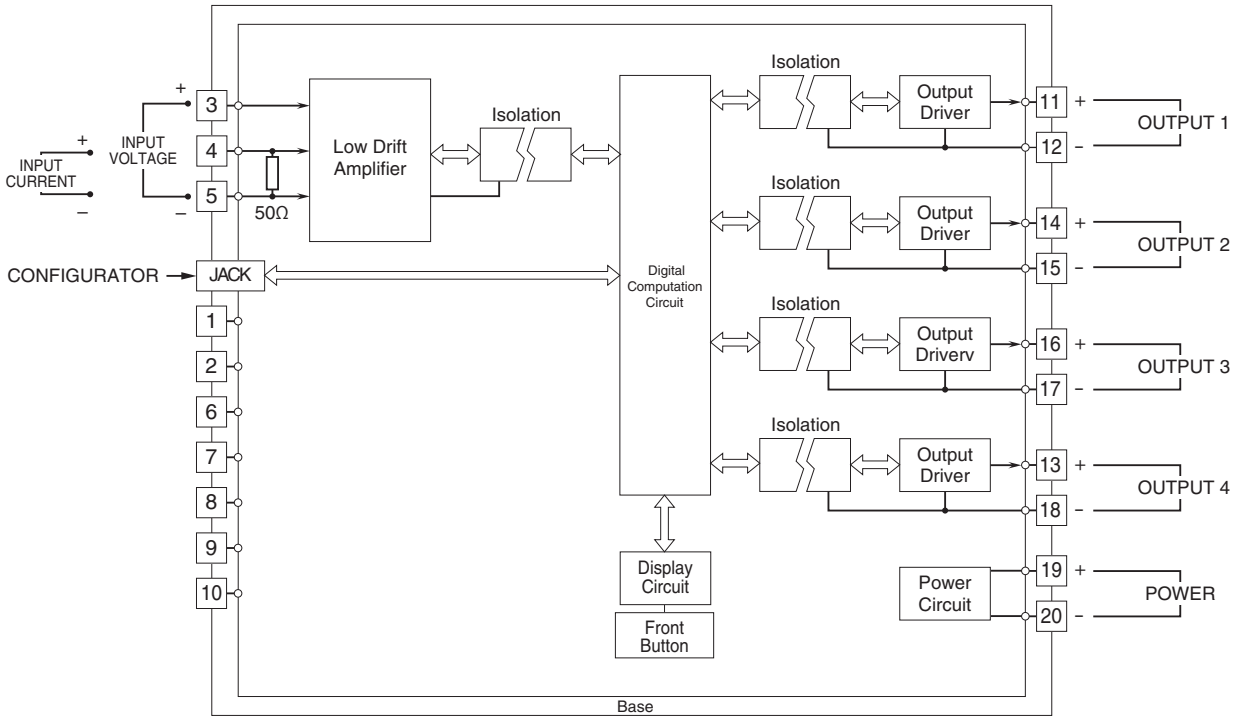
* Base does not come with the unit.
Please order separately.

MOUNTING REQUIREMENTS unit: mm [inch]



*** Mounting requirements for base.**

SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM



⚠ Specifications are subject to change without notice.

M-SYSTEM CO., LTD.
https://www.m-system.co.jp/