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

DC ALARM

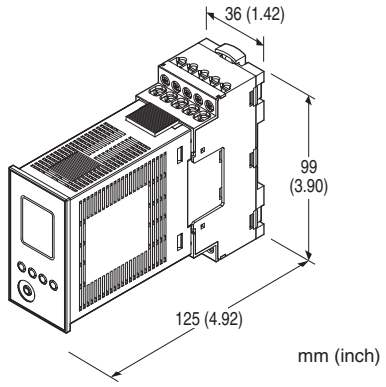
(2 channels, PC programmable, dual or quad alarm trip)

Functions & Features

- Provides relay outputs at preset DC input levels
- Quad or dual trip
- 2 Channels
- Front LCD display indicating values in scaled engineering unit range is used to program the module
- Adjustable deadband (hysteresis)
- ON delay time selectable
- Hi/Lo trip and energized/de-energized coil independently selectable for each setpoint
- Settable with front buttons
- Enclosed relays
- Relays can be powered by 200 V AC and 100 V DC
- High-density mounting on DIN rail

Typical Applications

- Annunciator
- Various alarm applications



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

MODEL: M1EAXV-2-[1]-R[2]

ORDERING INFORMATION

- Code number: M1EAXV-2-[1]-R[2]

Specify a code from below for each of [1] and [2].
(e.g. M1EAXV-2-2-R/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

[1] OUTPUT

2: 4 points; N.O. or make contact
3: 4 points; N.C. or break contact
5: 2 points; SPDT or transfer contact

POWER INPUT

DC Power

R: 24 V DC
(Operational voltage range 24 V ±10 %, 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

EX-FACTORY SETTING

/SET: Preset according to the Ordering Information Sheet (No. ESU-5995)

RELATED PRODUCTS

- Installation base (model: M1E-BS2)
- M1EA configurator software (model: M1EACFG)

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-5994) for the M1EA configurator for applicable cable types.

GENERAL SPECIFICATIONS

Construction: Plug-in

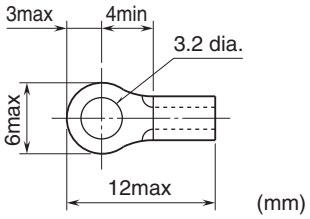
Connection

- 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:
• Output code 2, 3: Ch1 input to Ch2 input to 1L1 or 1L2 alarm output to 1L3 or 1L4 alarm output to 2L1 or 2L2 alarm output to 2L3 or 2L4 alarm output to power
• Output code 5: Ch1 input to Ch2 input to 1L1 alarm output to 1L2 alarm output to 2L1 alarm output to 2L2 alarm output to power
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 (reversing display of the current value and the alarm setting value when alarm is tripped)
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 ℃)
Display type: OEL display
Display digit: Negative 5 digits, positive 6 digits (-99999 to 999999)
Decimal point position: Selectable

INPUT SPECIFICATIONS

Input ranges are shown below.
For setting change of the input range and setting value, refer to the operating manual (EM-5995-B).

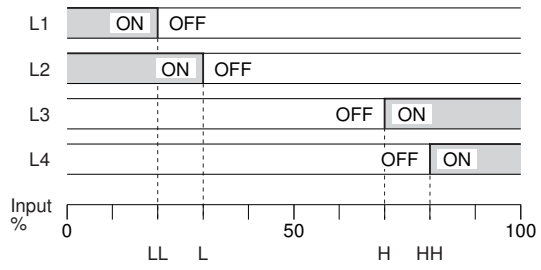
■ DC Current
Input resistance: Incorporated (28 Ω)
Input range: 0 - 50 mA DC
Minimum span: 2 mA
The measurement available for -5 - +105% of input setting range.

■ 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

Relay rating: 100 V AC @ 0.5 A (cos ø = 1)
120 V AC @ 0.5 A (cos ø = 1)
240 V AC @ 0.5 A (cos ø = 1)
30 V DC @ 1 A (resistive load)
Maximum switching voltage: 250 V AC or 125 V DC
Maximum switching power: 120 VA or 30 W
Minimum load: 5 V DC @ 1 mA
Mechanical life: 5×10^7 cycles

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



Trip operation in power failure
Output code 2: All relays turn OFF.
Output code 3: All relays turn ON.
Output code 5: Terminals 13 – 15, 16 – 18, 6 – 12, 1 – 7 turn ON.

INSTALLATION

Power consumption
•**DC**: ≤ 6 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 in percentage of FS input

Accuracy (display accuracy, setting accuracy):
± (0.1% of FS + 1 digit)
See CALCULATION EXAMPLES OF OVERALL ACCURACY.
Temp. coefficient: ±0.015 %/°C (±0.008 %/°F)
Response time (Filter time constant: 0 sec.): ≤ 0.5 sec.
(0 – 100 % at 90 % setpoint)
Line voltage effect: ±0.1 % over voltage range
Insulation resistance: ≥ 100 MΩ with 500 V DC
Dielectric strength:

• Output code 2, 3: 1500 V AC @ 1 minute (Ch1 input to Ch2 input to 1L1 or 1L2 alarm output to 1L3 or 1L4 alarm output to 2L1 or 2L2 alarm output to 2L3 or 2L4 alarm output to power to ground)
• Output code 5: 1500 V AC @ 1 minute (Ch1 input to Ch2 input to 1L1 alarm output to 1L2 alarm output to 2L1 alarm output to 2L2 alarm output to power to ground

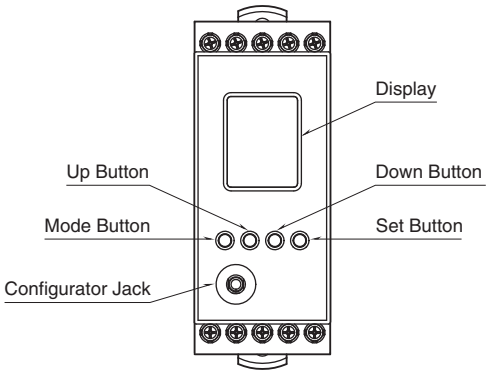
CALCULATION EXAMPLES OF OVERALL ACCURACY

[Example] Input Range -10 – +10 V, Input Setting -5 – +5 V
• Accuracy = Input Range Span (20 V) ÷ Input Span Setting (10 V) × 0.1 % = ±0.2 % + 1 digit

STANDARDS & APPROVALS

EU conformity:
EMC Directive
EMI EN 61000-6-4
EMS EN 61000-6-2
Low Voltage Directive
EN 61010-1
Measurement Category II (output)
Pollution Degree 2
• Output code 2, 3
Input or output to power: Reinforced insulation (300 V)
Input to output: Basic insulation (300 V)
1L1 or 1L2 alarm output to 1L3 or 1L4 alarm output to 2L1 or 2L2 alarm output to 2L3 or 2L4 alarm output: Basic insulation (300 V)
• Output code 5
Input or output to power: Reinforced insulation (300 V)
Input to output: Basic insulation (300 V)
1L1 alarm output to 1L2 alarm output to 2L1 alarm output to 2L2 alarm output: Basic insulation (300 V)
RoHS Directive

EXTERNAL VIEW

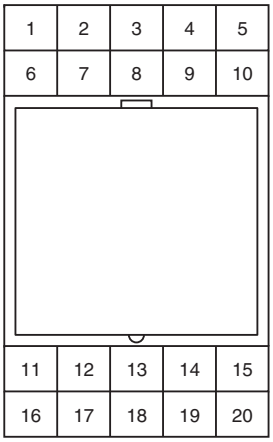


■ COMPONENT FUNCTION

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 and to enter (save) the setting value. Cancels Ch1's and Ch2's alarm latches in Measuring mode (hold down for ≥ 2 seconds).
Up button	Shifts through setting parameter items and to increase or select the setting value. Cancels Ch1's latched alarm in Measuring mode (hold down for ≥ 2 seconds).
Down button	Shifts through setting parameter items and to decrease or select the setting value. Cancels Ch2's latched alarm in Measuring mode (hold down for ≥ 2 seconds).
Configurator Jack	Used to perform configuration with M1EA configurator software (model: M1EACFG). When using the software, set the Lockout setting of the unit to 'Lock'.

Refer to the operating manual (EM-5995-B) for detailed procedures.

TERMINAL ASSIGNMENTS



• OUTPUT CODE: 2, 3

No.	FUNCTION	No.	FUNCTION
1	COM4 (2L3, 2L4)	11	2L1 Alarm output
2	2L3 Alarm output	12	2L2 Alarm output
3	Ch1 Input voltage +	13	COM1 (1L1, 1L2)
4	Ch1 Input current +	14	1L1 Alarm output
5	Ch1 Input –	15	1L2 Alarm output
6	COM3 (2L1, 2L2)	16	COM2 (1L3, 1L4)
7	2L4 Alarm output	17	1L3 Alarm output
8	Ch2 Input voltage +	18	1L4 Alarm output
9	Ch2 Input current +	19	Power +
10	Ch2 Input –	20	Power –

• OUTPUT CODE: 5

No.	FUNCTION	No.	FUNCTION
1	COM4 (2L2)	11	N.O. (2L1)
2	N.O. (2L2)	12	N.C. (2L1)
3	Ch1 Input voltage +	13	COM1 (1L1)
4	Ch1 Input current +	14	N.O. (1L1)
5	Ch1 Input –	15	N.C. (1L1)
6	COM3 (2L1)	16	COM2 (1L2)
7	N.C. (2L2)	17	N.O. (1L2)
8	Ch2 Input voltage +	18	N.C. (1L2)
9	Ch2 Input current +	19	Power +
10	Ch2 Input –	20	Power –

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

PARAMETER LIST

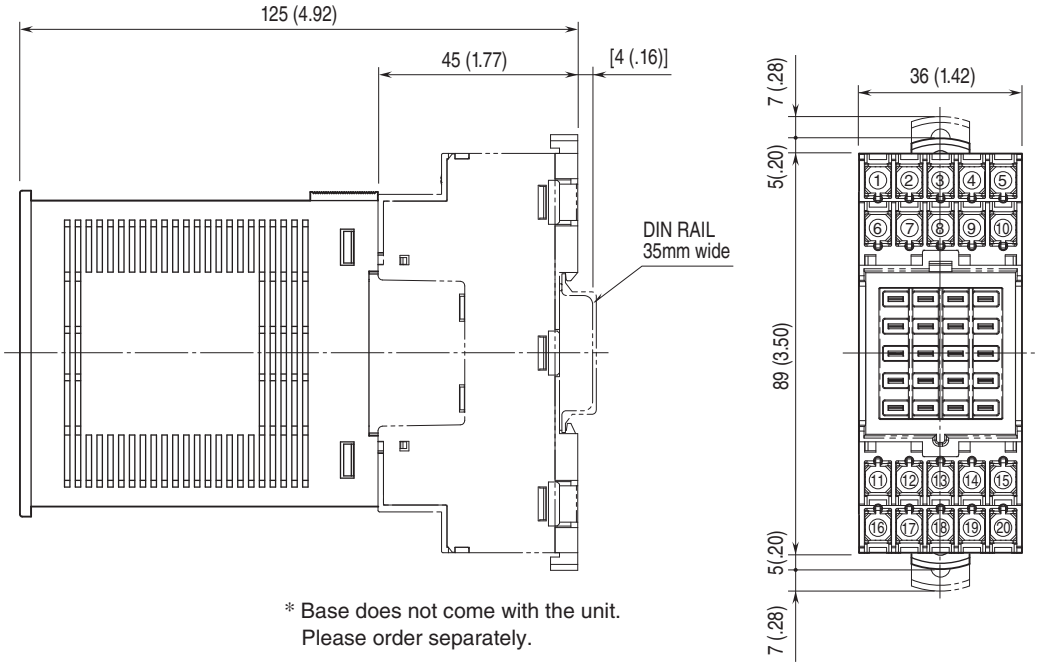
The following parameters can be set or checked, by the front button operation, or from the PC by using M1EA configuration software (model: M1EACFG).

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*	—	%
	30	Ch1 L1 alarm enable	Disable / Enable	—	Enable
	31	Ch1 L1 alarm setpoint	-99999 – 999999*	—	20.00
	32	Ch1 L1 trip action	High / Low	—	Low
	33	Ch1 L1 deadband	0 – 999999*	—	0.01
	34	Ch1 L1 coil at alarm	Energized / De-energized	—	Energized
	40	Ch1 L2 alarm enable	Disable / Enable	—	Enable
	41	Ch1 L2 alarm setpoint	-99999 – 999999*	—	80.00 (2 points alarm) 30.00 (4 points alarm)
	42	Ch1 L2 trip action	High / Low	—	High (2 points alarm) Low (4 points alarm)
	43	Ch1 L2 deadband	0 – 999999*	—	0.01
	44	Ch1 L2 coil at alarm	Energized / De-energized	—	Energized
	50	Ch1 L3 alarm enable	Disable / Enable	—	Enable
	51	Ch1 L3 alarm setpoint	-99999 – 999999*	—	70.00
	52	Ch1 L3 trip action	High / Low	—	High
	53	Ch1 L3 deadband	0 – 999999*	—	0.01
	54	Ch1 L3 coil at alarm	Energized / De-energized	—	Energized
	60	Ch1 L4 alarm enable	Disable / Enable	—	Enable
	61	Ch1 L4 alarm setpoint	-99999 – 999999*	—	80.00
	62	Ch1 L4 trip action	High / Low	—	High
	63	Ch1 L4 deadband	0 – 999999*	—	0.01
	64	Ch1 L4 coil at alarm	Energized / De-energized	—	Energized
	70	Ch1 Alarm ON-delay time	0 – 999	sec.	0
	71	Ch1 Power ON-delay time	0 – 999	sec.	5
	72	Ch1 Latching alarm	Disable / Enable	—	Disable
	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
	89	Ch1 Alarm test	—	—	Cancel

MODE	ITEM	SETTING PARAMETER	RANGE	UNIT	INITIAL VALUE
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*	—	%
	130	Ch2 L1 alarm enable	Disable / Enable	—	Enable
	131	Ch2 L1 alarm setpoint	-99999 – 999999*	—	20.00
	132	Ch2 L1 trip action	High / Low	—	Low
	133	Ch2 L1 deadband	0 – 999999*	—	0.01
	134	Ch2 L1 coil at alarm	Energized / De-energized	—	Energized
	140	Ch2 L2 alarm enable	Disable / Enable	—	Enable
	141	Ch2 L2 alarm setpoint	-99999 – 999999*	—	80.00 (2 points alarm) 30.00 (4 points alarm)
	142	Ch2 L2 trip action	High / Low	—	High (2 points alarm) Low (4 points alarm)
	143	Ch2 L2 deadband	0 – 999999*	—	0.01
	144	Ch2 L2 coil at alarm	Energized / De-energized	—	Energized
	150	Ch2 L3 alarm enable	Disable / Enable	—	Enable
	151	Ch2 L3 alarm setpoint	-99999 – 999999*	—	70.00
	152	Ch2 L3 trip action	High / Low	—	High
	153	Ch1 L3 deadband	0 – 999999*	—	0.01
	154	Ch2 L3 coil at alarm	Energized / De-energized	—	Energized
	160	Ch2 L4 alarm enable	Disable / Enable	—	Enable
	161	Ch2 L4 alarm setpoint	-99999 – 999999*	—	80.00
	162	Ch2 L4 trip action	High / Low	—	High
	163	Ch2 L4 deadband	0 – 999999*	—	0.01
	164	Ch2 L4 coil at alarm	Energized / De-energized	—	Energized
	170	Ch2 Alarm ON-delay time	0 – 999	sec.	0
	171	Ch2 Power ON-delay time	0 – 999	sec.	5
	172	Ch2 Latching alarm	Disable / Enable	—	Disable
	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
	189	Ch2 Alarm test	—	—	Cancel
	01	Lockout setting	Lock / Unlock	—	Lock
Advanced	201	Display setting	Upper: choose from 14 types* Lower: choose from 15 types*	—	Upper: Ch1 ALARM (Scaling) Lower: Ch2 ALARM (Scaling)
	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	—	—	—
	01	Lockout setting	Lock / Unlock	—	Lock

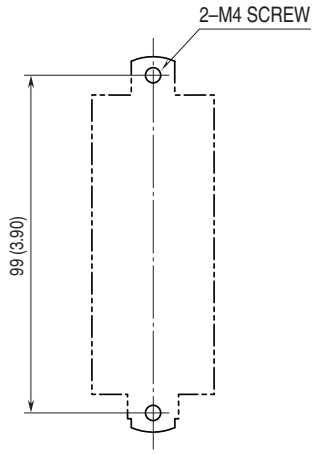
* For details, refer to the operating manual (EM-5995-B).

EXTERNAL DIMENSIONS & TERMINAL ASSIGNMENTS unit: mm [inch]



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

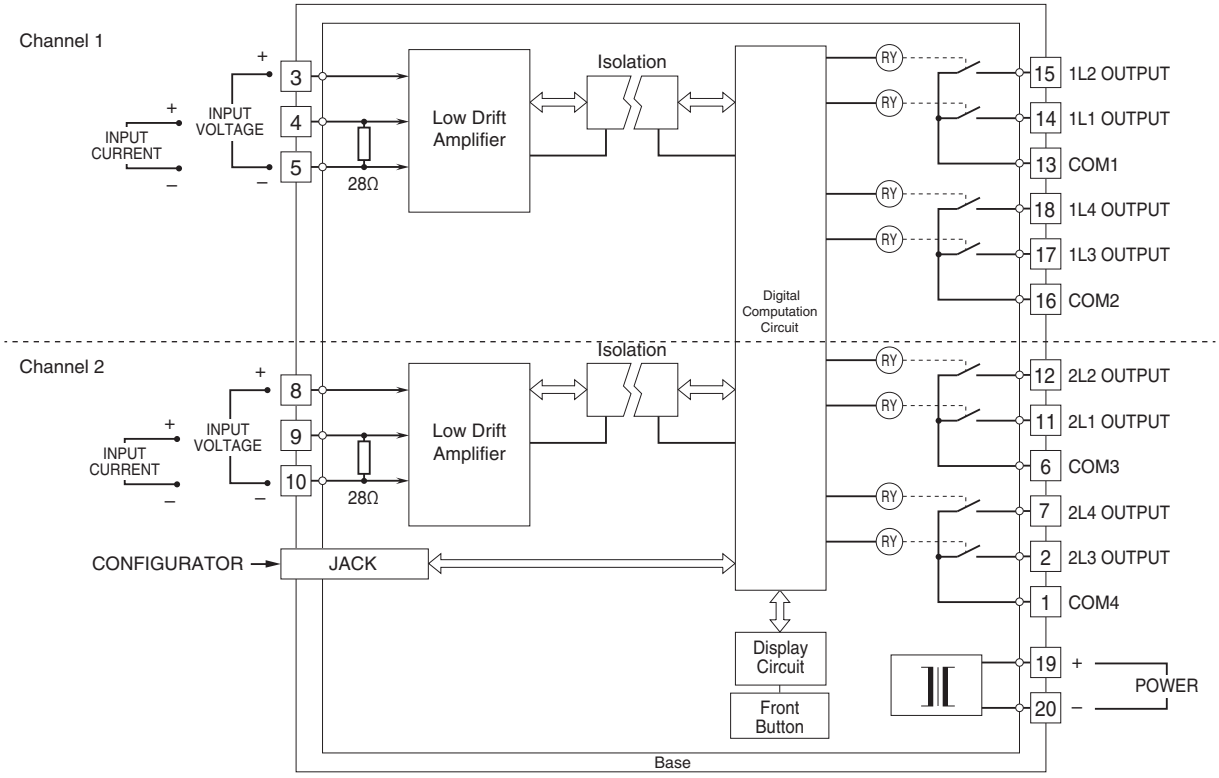
MOUNTING REQUIREMENTS unit: mm [inch]



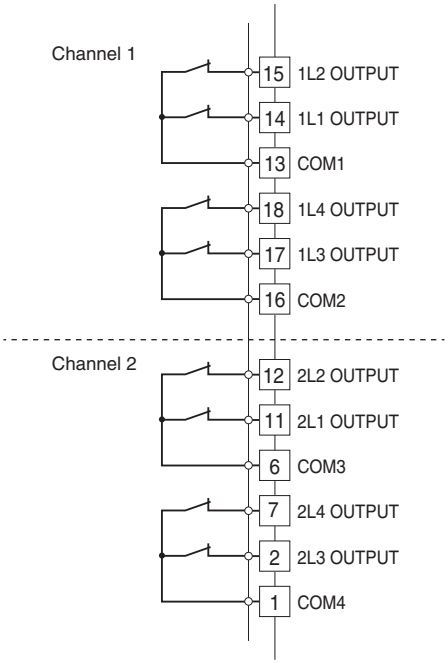
*** Mounting requirements for base.**

SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM

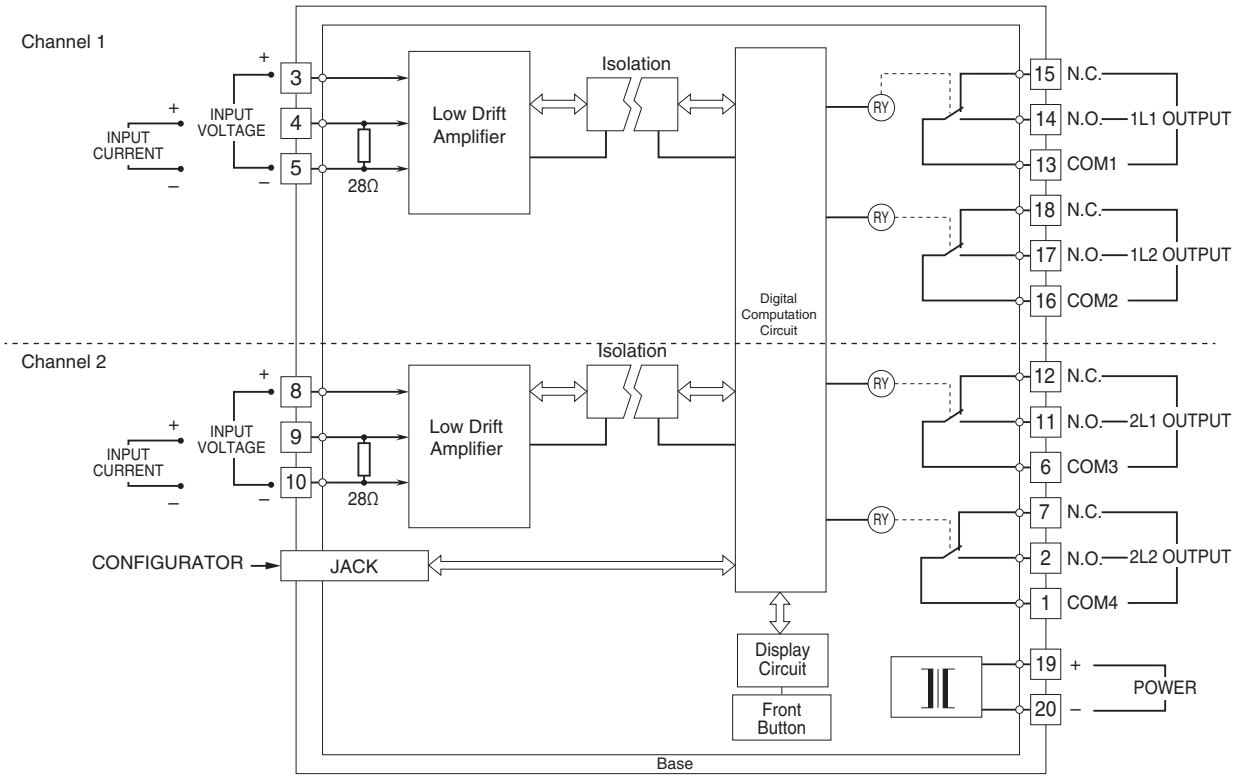
■ **OUTPUT CODE 2: N.O. RELAY**



■ **OUTPUT CODE 3: N.C. RELAY**

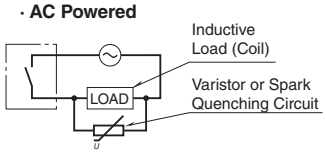


■ **OUTPUT CODE 5: SPDT RELAY**

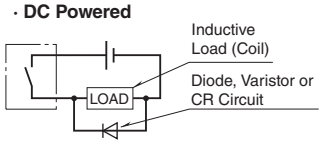


• Relay Protection

· AC Powered



· DC Powered



⚠ Specifications are subject to change without notice.