

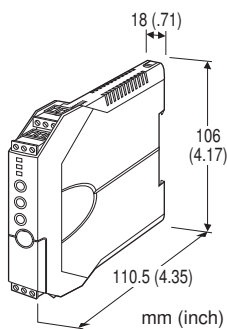
## Space-saving Signal Conditioners M3-UNIT Series

### POTENTIOMETER TRANSMITTER

(field- and PC-configurable)

#### Functions & Features

- Provides a DC output proportional to a potentiometer or slidewire position input
- Easy 'One-Step Cal' calibration using the front three control buttons without needing a PC; PC software is also usable
- Both input and output type and range are configurable
- Front control button function can be locked
- CE marking
- UL approval



### MODEL: M3LM-R4/[1][2]

#### ORDERING INFORMATION

- Code number: M3LM-R4/[1][2]
- Specify a code from below for [1] and [2].  
(e.g. M3LM-R4/A)
- Orders will be shipped with default factory settings (0 - 1 k $\Omega$  input / 4 - 20 mA output).

#### INPUT

Total resistance 90  $\Omega$  - 20 k $\Omega$

#### OUTPUT - Field-selectable

##### Current

0 - 20 mA DC

##### Voltage

-2.5 - +2.5 V DC

-10 - +10 V DC

#### POWER INPUT

##### DC Power

R4: 10 - 32 V DC

(Operational voltage range 9 - 36 V, ripple 10 %p-p max.)

#### [1] CONFIGURATION OPTIONS

A: PC and field configurable

B: Field configurable

#### [2] OPTIONS

##### STANDARDS & APPROVALS

blank: CE marking

/UL: UL approval, CE marking

#### RELATED PRODUCTS

- PC configurator software (model: M3CON)

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 for the PC configurator for applicable cable types.

#### GENERAL SPECIFICATIONS

**Construction:** Small-sized front terminal structure

**Connection:** Euro type connector terminal

**Housing material:** Flame-resistant resin (gray)

**Isolation:** Input to output to power

**Overrange output:** -15 to +115 %

**Zero adjustment:** -15 to +15 % (front)

**Span adjustment:** 85 to 115 % (front)

**Burnout:** Upscale (default), downscale or no burnout selectable

**Status indicator LED:** Tri-color (green/amber/red) LED;

Flashing patterns indicate operation status of the transmitter.

**Configuration:** PC configurator

**Programmable features include:**

- I/O type and range
  - Zero and span adjustments
  - Burnout action
  - User's linearization table setting (max. 125 points, specified within -15 to +115 % for both input and output) (Refer to the instruction manual)
- 'One-Step Cal' calibration:** With I/O type and the full-scale range configured via the internal DIP switches, precise 0 % and 100 % ranges are calibrated via the front control buttons with a help of LED.

#### INPUT SPECIFICATIONS

■ **POTENTIOMETER:** Total resistance 90  $\Omega$  - 20 k $\Omega$

**Minimum span of each range**

0 - 90  $\Omega$  : 2.5  $\Omega$

0 - 200  $\Omega$  : 3  $\Omega$

0 - 400  $\Omega$  : 3  $\Omega$

0 - 1000  $\Omega$  : 10  $\Omega$

0 - 20 k $\Omega$  : 10  $\Omega$

Excitation:  $\leq$  0.65 V DC (at 1 k $\Omega$ )

## OUTPUT SPECIFICATIONS

### ■ DC CURRENT

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

**Minimum span:** 1 mA

**Conformance range:** 0 - 24 mA DC (Negative overrange current below 0 mA is not available.)

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

**Load resistance:** Output drive 12 V maximum

### ■ DC VOLTAGE

#### Narrow Spans (mV)

**Maximum range:** -2.5 - +2.5 V DC

**Minimum span:** 250 mV

**Conformance range:** -3 - +3 V DC

#### Wide Spans (V)

**Maximum range:** -10 - +10 V DC

**Minimum span:** 1 V

**Conformance range:** -11.5 - +11.5 V DC

**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 maximum

## INSTALLATION

### Power Consumption

•DC power input: Approx. 3 W

**Operating temperature:** -25 to +65°C (-13 to +149°F)

Max. 55°C (131°F) for UL approval

**Operating humidity:** 0 to 95 %RH (non-condensing)

**Mounting:** DIN rail

**Weight:** 100 g (3.53 oz)

## PERFORMANCE

**Accuracy:** Input Accuracy + Output Accuracy

**Input accuracy:** (% of input range) inversely proportional to the span

0 - 90  $\Omega$  :  $\pm$ 0.02 (%)

0 - 200  $\Omega$  :  $\pm$ 0.02

0 - 400  $\Omega$  :  $\pm$ 0.01

0 - 1000  $\Omega$  :  $\pm$ 0.01

0 - 20 k $\Omega$  :  $\pm$ 0.02

**Output accuracy:**  $\pm$ 0.04 % of output range; inversely proportional to the span.

**Temp. coefficient:**  $\pm$ 0.015 %/°C ( $\pm$ 0.008 %/°F) of max. range at -5 to +55°C (23 to 131°F)

**Response time:**  $\leq$  0.9 sec. (0 - 90 %)

**Burnout response:**  $\leq$  10 sec.

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

**Insulation resistance:**  $\geq$  100 M $\Omega$  with 500 V DC

**Dielectric strength:** 1500 V AC @ 1 minute

(input to output or power to ground)

500 V AC @ 1 minute (output to power)

## CALCULATION EXAMPLES OF OVERALL ACCURACY

[Example] Input Range 250 - 750  $\Omega$ , Output Range 1 - 5 V  
Max. Input Range (1000  $\Omega$ )  $\div$  Span (500  $\Omega$ )  $\times$  0.01 % + Max. Output Range (20 V)  $\div$  Span (4 V)  $\times$  0.04 % = 0.22 %

## STANDARDS & APPROVALS

### CE conformity:

EMC Directive (2004/108/EC)

EMI EN 61000-6-4: 2007

EMS EN 61000-6-2: 2005

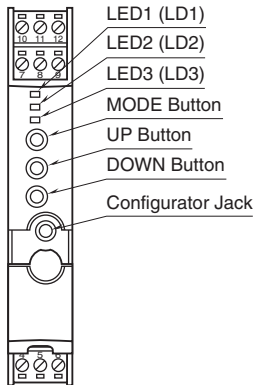
### Approval:

UL/C-UL general safety requirements

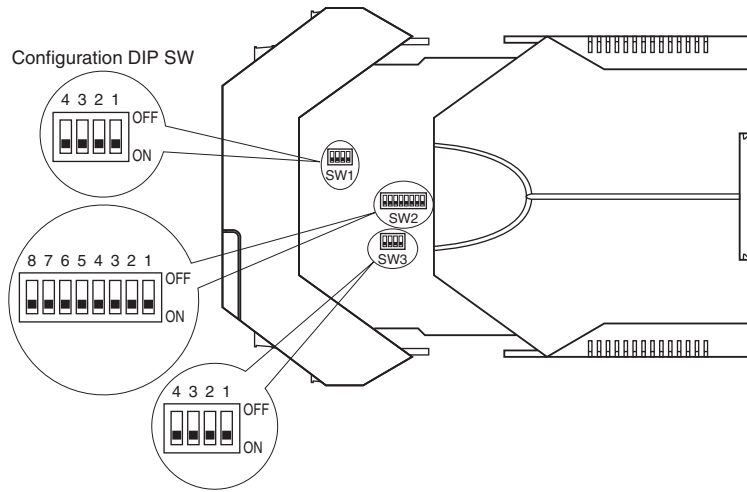
(UL 61010-1, CAN/CSA-C22.2 No.1010-1)

## EXTERNAL VIEW

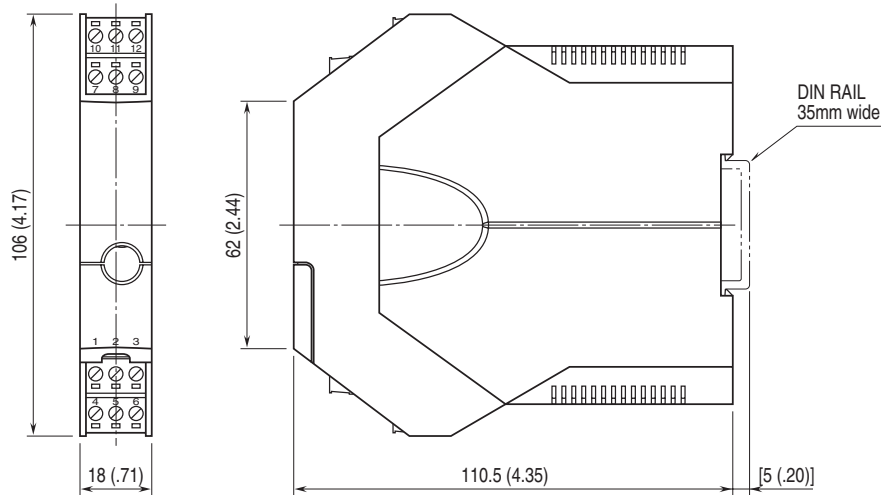
■ FRONT VIEW



■ SIDE VIEW

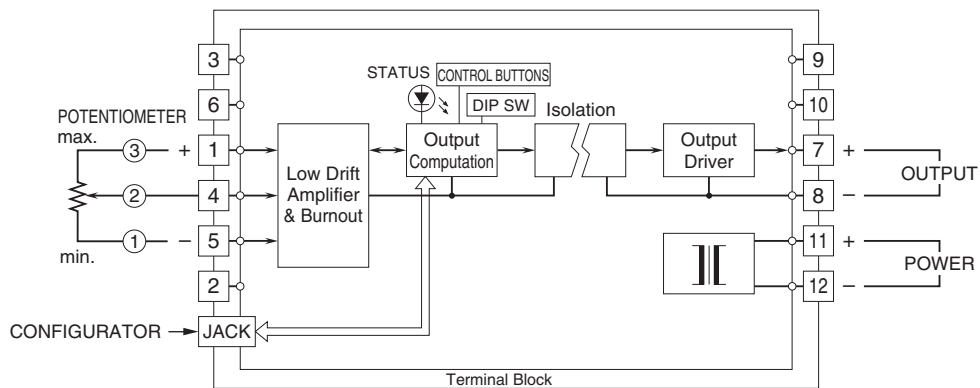


## EXTERNAL DIMENSIONS & TERMINAL ASSIGNMENTS unit: mm (inch)



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

## SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM





Specifications are subject to change without notice.