

## Space-saving Signal Conditioners M3-UNIT Series

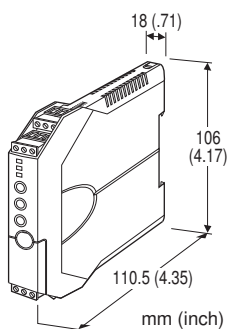
(Operational voltage range 9 - 36 V, ripple 10 %p-p max.)

### 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
- High-density mounting available



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

#### ORDERING INFORMATION

- Code number: M3LM-R4/[1][2]
- Specify a code from below for each [1] and [2].  
(e.g. M3LM-R4/A/Q)
- Specify the specification for option code /Q (e.g. /C01)
  - Orders will be shipped with default factory settings (0 - 1 kΩ input / 4 - 20 mA output).

#### INPUT

Total resistance 90 Ω - 20 kΩ

#### 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

#### [1] CONFIGURATION OPTIONS

A: PC and field configurable

B: Field configurable

#### [2] OPTIONS

##### Standards & Approvals

blank: CE marking

/UL: UL approval, CE marking

##### Other Options

blank: none

/Q: Option other than the above (specify the specification)

(UL not available)

#### SPECIFICATIONS OF OPTION: Q

##### COATING (For the detail, refer to M-System's web site.)

/C01: Silicone coating

/C02: Polyurethane coating

/C03: Rubber coating

#### 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;

Blinking patterns indicate operation status of the transmitter.

##### Configuration

**PC configurator:** (Model: M3LMCON) via Windows PC connected to the front jack.

##### Programmable features include:

- Input range
- Output type
- Output 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. Also I/O calibration and fine adjustment are available with a PC.

**Configurator connection:** 2.5 dia. miniature jack; RS-232-C level

## INPUT SPECIFICATIONS

■ **Potentiometer:** Total resistance 90 Ω - 20 kΩ

**Minimum span of each range**

0 - 90 Ω : 2.5 Ω

0 - 200 Ω : 3 Ω

0 - 400 Ω : 3 Ω

0 - 1000 Ω : 10 Ω

0 - 20 kΩ : 10 Ω

**Excitation:** ≤ 0.65 V DC (at 1 kΩ)

## 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**

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

**Minimum span:** 250 mV

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

**Wide Spans**

**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: 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 Ω : ±0.02 (%)

0 - 200 Ω : ±0.02

0 - 400 Ω : ±0.01

0 - 1000 Ω : ±0.01

0 - 20 kΩ : ±0.02

**Output accuracy (% of output range):** ±0.04 %; inversely proportional to the span.

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

**Response time:** ≤ 0.9 sec. (0 - 90 %)

**Burnout response:** ≤ 10 sec.

**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 or power to ground)

500 V AC @ 1 minute (output to power)

## CALCULATION EXAMPLES OF OVERALL ACCURACY

[Example] Input Range 250 - 750 Ω, Output Range 1 - 5 V  
 Max. Input Range (1000 Ω) ÷ Span (500 Ω) × 0.01 % + Max. Output Range (20 V) ÷ Span (4 V) × 0.04 % = 0.22 %

## STANDARDS & APPROVALS

**EU conformity:**

EMC Directive

EMI EN 61000-6-4

EMS EN 61000-6-2

RoHS Directive

EN 50581

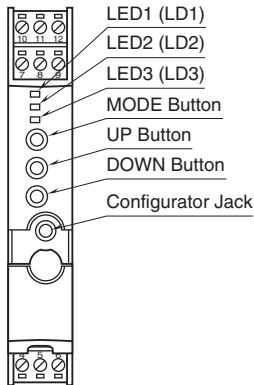
**Approval:**

UL/C-UL general safety requirements

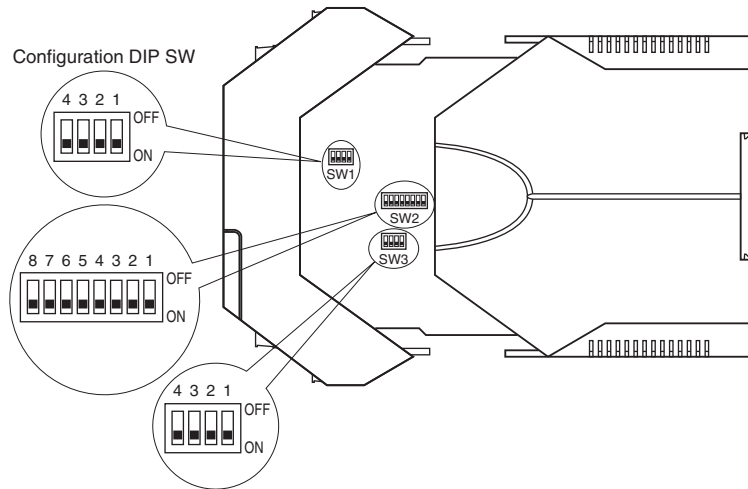
(UL 61010-1, CAN/CSA-C22.2 No.1010-1)

## EXTERNAL VIEW

■ FRONT VIEW



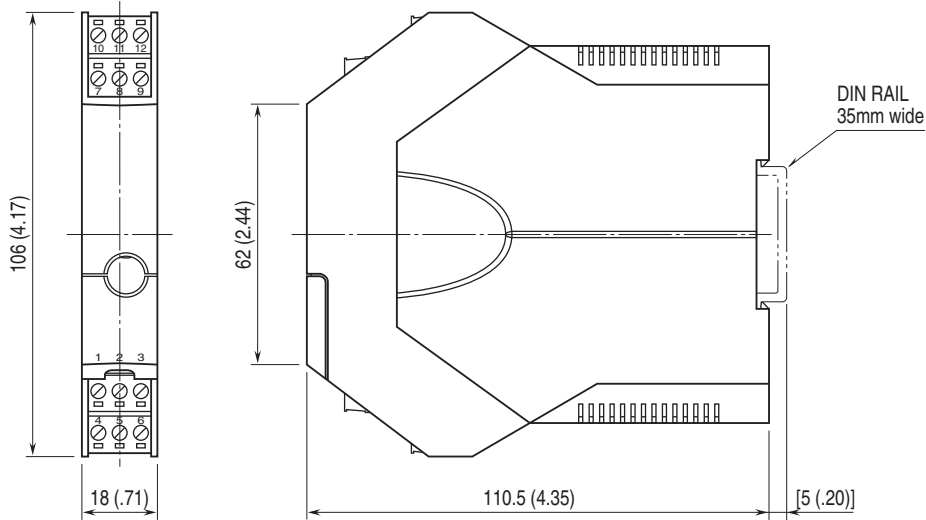
■ SIDE VIEW



For M3LM-R4/A, the DIP switch setting is required to select output types before setting a precise output range using the PC configurator software.

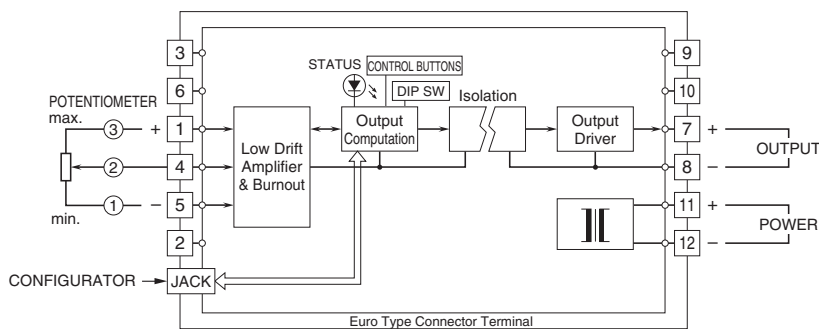
For detailed information on the configuration and calibration, refer to the instruction manual.

## 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.