

Space-saving Signal Conditioners M3-UNIT Series

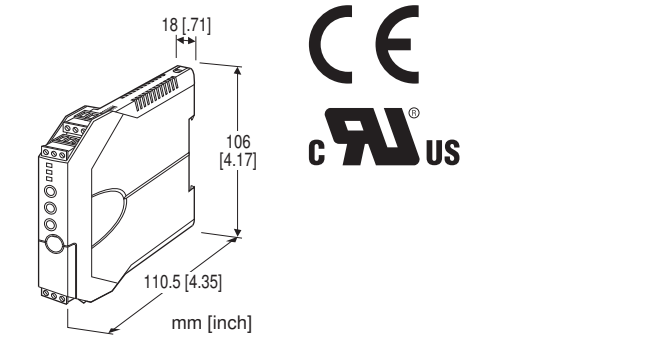
(Operational voltage range 9 - 36 V, ripple 10 %p-p max.)

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 of [1] and [2].
(e.g. M3LM-R4/A/UL/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 (multiple selections)

Standards & Approvals

blank: CE marking

/UL: UL approval, CE marking

Other Options

blank: none

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

SPECIFICATIONS OF OPTION: Q

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

/C01: Silicone coating

/C02: Polyurethane coating

/C03: Rubber coating (UL not available)

RELATED PRODUCTS

- PC configurator software (model: M3CFG)

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

(applicable wire size: 0.2 to 2.5 mm², stripped length 8 mm)

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: M3LMCFG) 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 (0.22 lb)

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

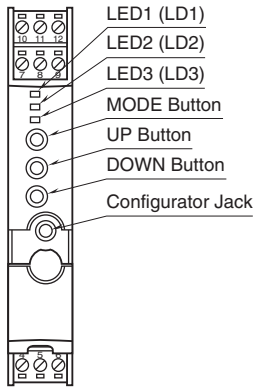
Approval:

UL/C-UL general safety requirements

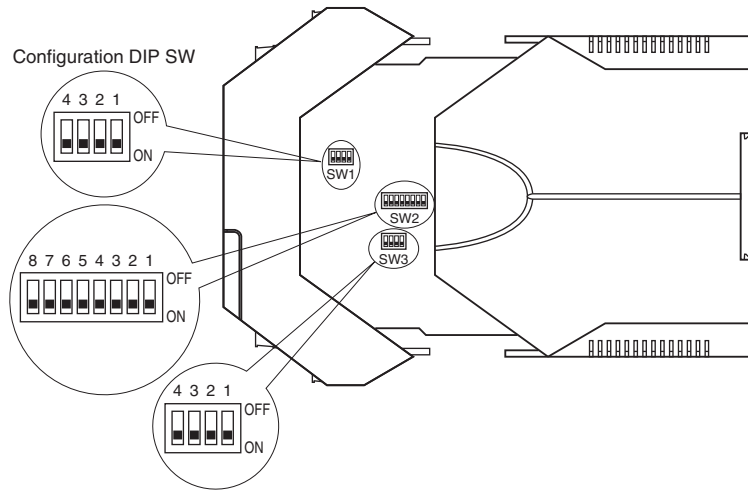
(UL 61010-1, CAN/CSA-C22.2 No.1010-1)

EXTERNAL VIEW

FRONT VIEW



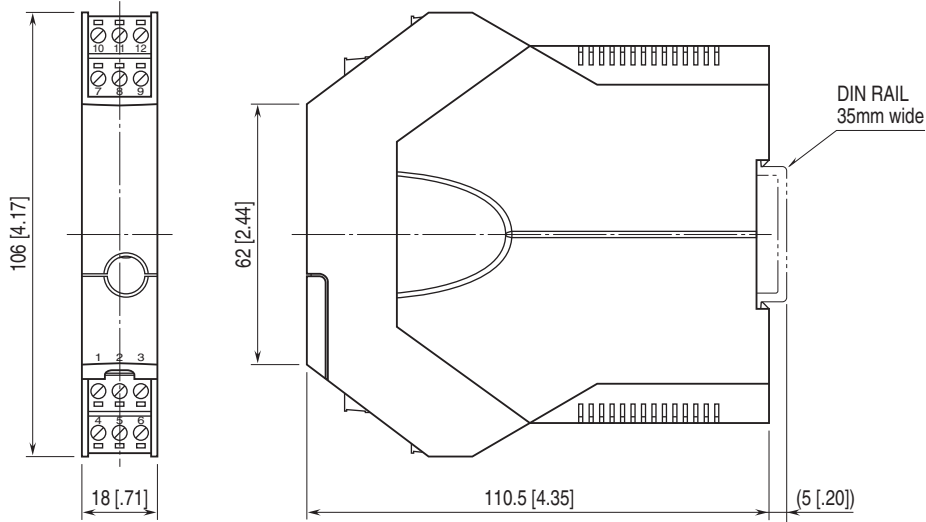
SIDE VIEW



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.

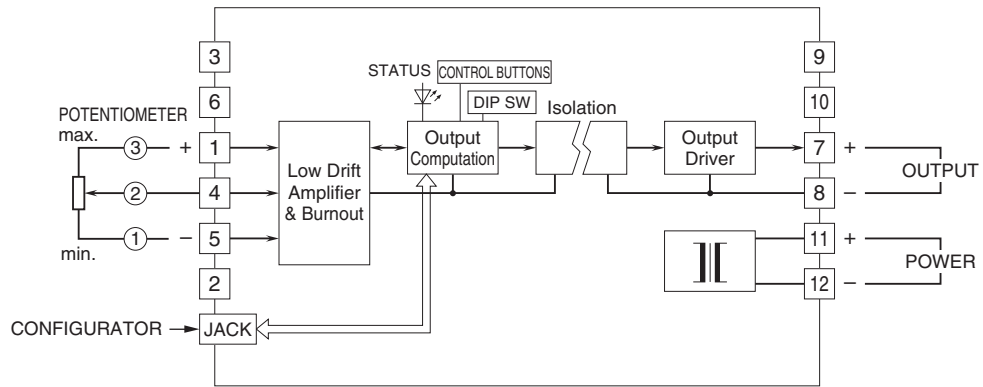
For detailed information on the configuration and calibration, refer to the instruction manual.

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.