

## Space-saving Signal Conditioners M3-UNIT Series

### STRAIN GAUGE TRANSMITTER

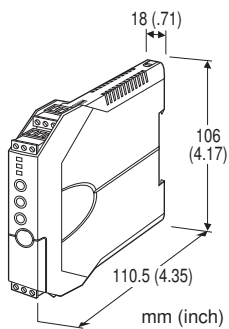
(field- and PC-configurable)

#### Functions & Features

- Provides a DC output signal proportional to a bridge type strain gauge utilized in load cells and pressure transducers
- Compatibility with strain gauges of various bridge resistances and output ratings
- Supplies required excitation voltage; 0.1 - 10.0 V adjustable
- Response time  $\leq 10$  msec.
- Front control button function can be locked

#### Typical Applications

- Weighing system for tanks, hoppers and silos
- Weighing system using cranes
- Pressure sensor utilizing strain gauges
- Float level meter utilizing strain gauges



## MODEL: M3LLC-[1]-R4/[2][3]

### ORDERING INFORMATION

- Code number: M3LLC-[1]-R4/[2][3]
  - Specify a code from below for each [1] through [3]. (e.g. M3LLC-S1-R4/A/Q)
  - Specify the specification for option code /Q (e.g. /C01)
  - Factory setting:
- Input signal
- S1: 1.0 mV
  - S2: 3.0 mV
  - S3: 10.0 mV
  - S4: 30.0 mV
- Excitation voltage: 1 V
- Output range: 4 - 20 mA

### [1] INPUT STRAIN GAUGE

- S1: 0.0 - 1.0 mV/V
- S2: 0.0 - 3.0 mV/V
- S3: 0.0 - 10.0 mV/V
- S4: 0.0 - 30.0 mV/V

### 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.)

### [2] CONFIGURATION OPTIONS

- A: PC and field configurable
- B: Field configurable

### [3] 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: 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

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



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**Isolation:** Input to output to power  
**Overrange output:** -15 to +115 %  
**Zero adjustment:** -15 to +15 % (front)  
**Span adjustment:** 85 to 115 % (front)  
**Status indicator LED:** Tri-color (green/amber/red) LED;  
Blinking patterns indicate operation status of the transmitter.

## Configuration

### PC configurator:

Programmable features include:

- Input range and output type and range
- Zero and span adjustments

(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

### ■ Strain Gauge Input

- Strain Gauge

**Rated output from strain gauge:**

- S1: Volt. range -10.0 – +10.0 mV, span 1.0 – 10.0 mV
- S2: Volt. range -30.0 – +30.0 mV, span 3.0 – 30.0 mV
- S3: Volt. range -99.9 – +99.9 mV, span 10.0 – 99.9 mV
- S4: Volt. range -300.0 – +300.0 mV, span 30.0 – 300.0 mV

Consult factory for use with a compression/tension load cells.

- **Excitation:** 0.1 – 10.0 V adjustable (0.1 V increments)

**Maximum current:** 30mA

■ **Tare Command Input:** TTL level (5V-CMOS level), open collector or dry contact  
(saturation voltage  $\leq$  1 V, sink current 0.5 mA)

## OUTPUT SPECIFICATIONS

### ■ DC Current

**Maximum range:** 0 – 20 mA DC

**Minimum span:** 1 mA

(Add 0.1 % to accuracy with output span 2 mA or less.)

**Conformance range:** 0 – 20 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

(Overrange voltage below -11.5 V 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 10 mA maximum; 5 mA for negative output

## INSTALLATION

### Power consumption

- DC: Approx. 5 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:** 150 g (0.33 lb)

## PERFORMANCE in percentage of span

**Accuracy:** Input + output

**Input:**  $\pm 0.1$  %

**Output:**  $\pm 0.1$  %

**Temp. coefficient:**  $\pm 0.015$  %/°C ( $\pm 0.008$  %/°F) of max. range at -5 to +55°C [23 to 131°F];  
 $\pm 0.03$  %/°C ( $\pm 0.02$  %/°F) at  $< -5^\circ\text{C}$ ,  $> +55^\circ\text{C}$

**Response time:**  $\leq 10$  msec. (0 – 90 %)

**Excitation:** Set value  $\pm 250$  mV

**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)

## STANDARDS & APPROVALS

**EU conformity:**

EMC Directive

EMI EN 61000-6-4

EMS EN 61000-6-2

RoHS Directive

EN 50581

**Approval:**

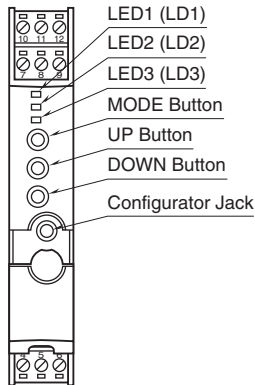
UL/C-UL general safety requirements

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

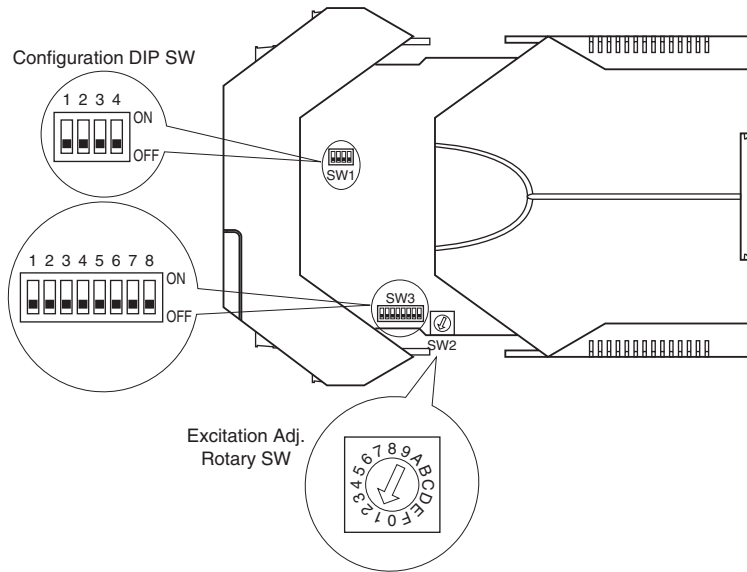


## EXTERNAL VIEW

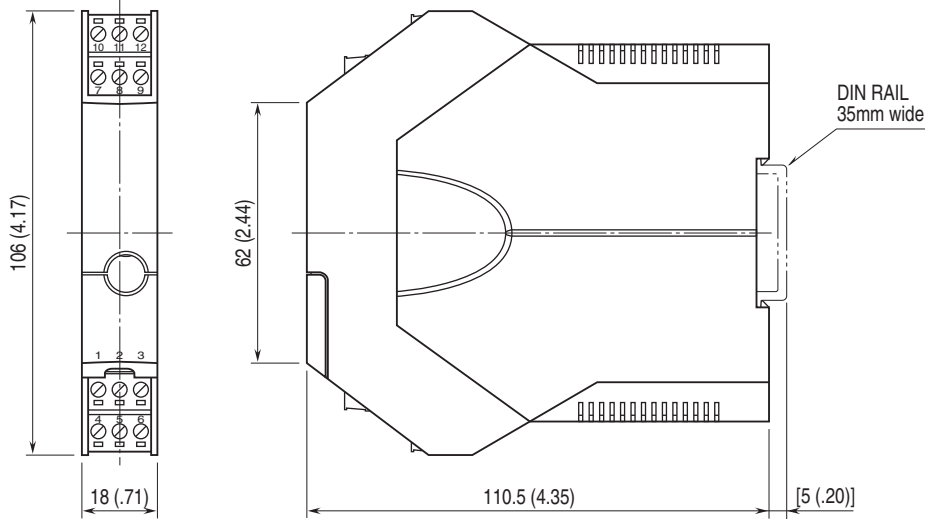
### FRONT VIEW



### SIDE VIEW

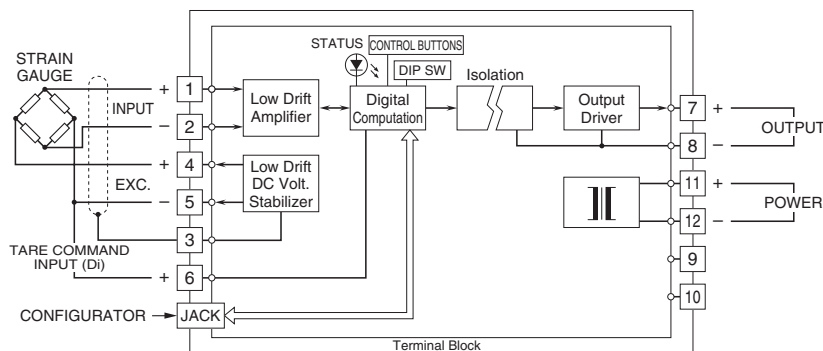


## EXTERNAL DIMENSIONS & TERMINAL ASSIGNMENTS unit: mm (inch)



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

## SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM





Specifications are subject to change without notice.



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