

Space-saving Signal Conditioners M3-UNIT Series

STRAIN GAUGE TRANSMITTER

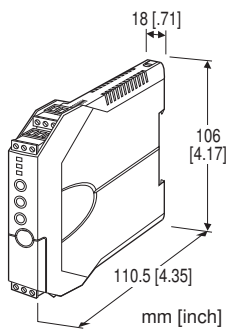
(field- and PC-configurable)

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 ≤ 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 of [1] through [3].
(e.g. M3LLC-S1-R4/A/UL/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 (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)

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. 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

■ 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

■ **Contact Input:** TTL level (5V-CMOS level), open collector or dry contact (detecting voltage: approx. 5 V, saturation voltage: ≤ 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: 500 mV

Conformance range: -3 - +3 V DC

Wide Spans (V)

Maximum range: -10 - +10 V DC

Minimum span: 0.5 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: ± 0.1 %

Output: ± 0.1 %

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

± 0.03 %/°C (± 0.02 %/°F) at < -5 °C, $> +55$ °C

Response time: ≤ 10 msec. (0 - 90 %)

Excitation: Set value ± 250 mV

Line voltage effect: ± 0.1 % over voltage range

Insulation resistance: ≥ 100 M Ω 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

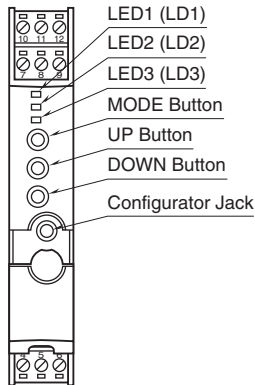
Approval:

UL/C-UL general safety requirements

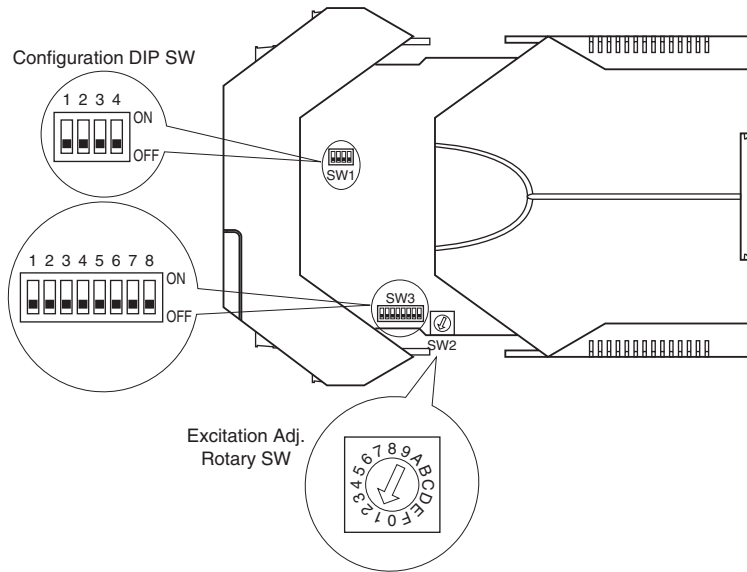
(UL 61010-1, CAN/CSA-C22.2 No.1010-1)

EXTERNAL VIEW

FRONT VIEW



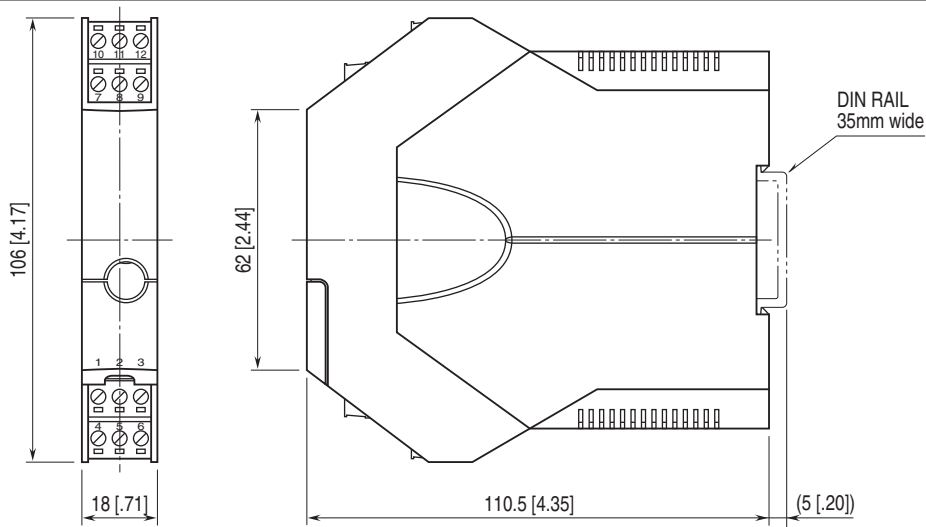
SIDE VIEW



The DIP switch setting is required to select output types before setting a precise output range using the PC configurator software.

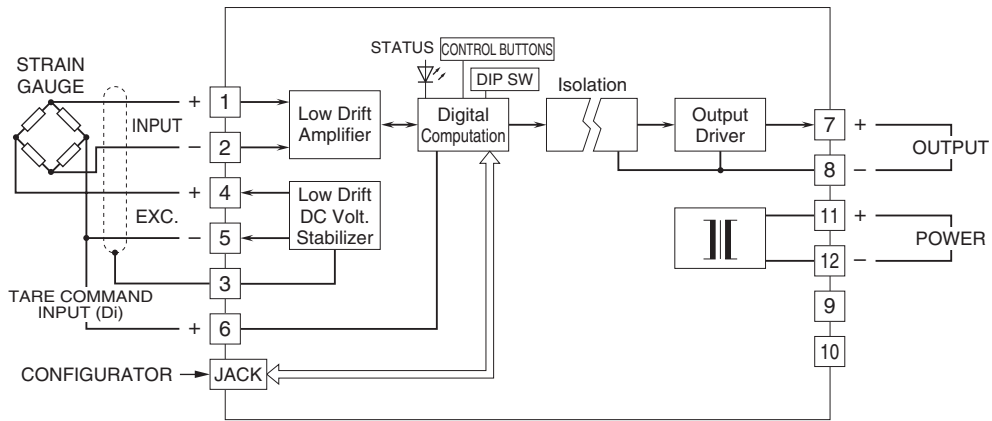
For detailed information on the configuration and calibration, refer to the instruction manual.

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.