

## Super-mini Terminal Block Signal Conditioners M5X-UNIT

### HIGH/LOW SELECTOR

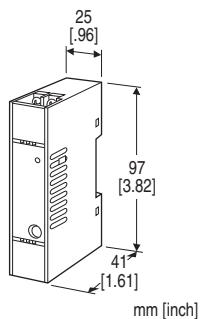
(PC programmable)

#### Functions & Features

- Monitors two DC input signals and transmits an output signal proportional to the higher or lower input
- PC programmable
- High-density mounting
- Power LED

#### Typical Applications

- Selecting greater flow, pressure, etc. for control
- Heating control based on the highest temperature among several T/C's on a furnace



### MODEL: M5XSES-1-R[1]

#### ORDERING INFORMATION

- Code number: M5XSES-1-R[1]
- Specify a code from below for [1].  
(e.g. M5XSES-1-R/Q)
- Specify the specification for option code /Q  
(e.g. /C01/S01/SET)

#### INPUT 1 - Field-selectable

##### ◆ DC Input

- Current input: 0 - 50 mA DC
- Voltage input: -1000 - +1000 mV DC
- Voltage input: -10 - +10 V DC

#### INPUT 2 - Field-selectable

##### ◆ DC Input

- Current input: 0 - 50 mA DC
- Voltage input: -1000 - +1000 mV DC
- Voltage input: -10 - +10 V DC

#### EXTERNAL INTERFACE

##### ◆ OUTPUT SIGNAL

- 1: DC output (field-selectable)
  - Current output: 0 - 20 mA DC
  - Voltage output: -5 - +5 V DC
  - Voltage output: -10 - +10 V DC

#### POWER INPUT

##### DC Power

- R: 24 V DC  
(Operational voltage range 24 V  $\pm$ 10 %, ripple 10 %p-p max.)

#### [1] OPTIONS

##### 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

##### TERMINAL SCREW MATERIAL

- /S01: Stainless steel

##### EX-FACTORY SETTING

- /SET: Preset according to the Ordering Information Sheet  
(No. ESU-2775)

#### FUNCTIONS

##### Signal Selector Functions:

- High selector
- Low selector

##### Factory Default Setting

- Signal Selector: High selector

#### RELATED PRODUCTS

- PC Configurator cable (model: COP-US)
  - PC configurator software (model: M5CFG)
- Downloadable at M-System's web site.

#### GENERAL SPECIFICATIONS

**Construction:** Terminal block

**Connection:** M3.5 screw terminals (torque 0.8 N·m)

**Screw terminal:** Nickel-plated steel (standard) or stainless steel

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

**Isolation:** Input to output to power

**Power indicator LED:** Green LED; Blinking patterns indicate different operating status of the transmitter.

**Parameters:** Stored in non-volatile memory; write/erase cycle endurance: less than 20 000

**Programming:** Downloaded from PC;

- input type
- input range
- output type
- output range
- zero and span
- select high/low

For detailed information, refer to the users manual for the PC configurator.

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

## INPUT SPECIFICATIONS

Standard default setting: DC current input 4 - 20 mA

### Output type

- DC current input: 0 - 50 mA DC
- DC voltage input: -1000 - +1000 mV DC
- DC voltage input: -10 - +10 V DC

(3 types can be switched for each input 1 and input 2 by DIP switch and PC)

### ■ DC Current

**Input resistance:** Incorporated (15.5 Ω)

**Input range:** 0 - 50 mA DC

**Measurable range:** 0 - 52.5 mA DC

**Minimum span:** 2 mA DC

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

### ■ DC Voltage

#### Input range

- S1: -1000 - +1000 mV DC
- S2: -10 - +10 V DC

#### Measurable range

- S1: -1100 - +1100 mV DC
- S2: -11 - +11 V DC

#### Minimum span:

- S1: 100 mV DC
- S2: 1 V DC

**Offset:** Lower range can be any specific value within the input range provided that the minimum span is maintained. If not specified, the input range is shown below.

#### Input resistance

- S1:  $\geq 100 \text{ k}\Omega$
- S2:  $\geq 1 \text{ M}\Omega$

## OUTPUT SPECIFICATIONS

Standard default setting: DC current output 4 - 20 mA

### Output type

- DC current output: 0 - 20 mA DC
- DC voltage output: -10 - +10 V DC

- DC voltage output: -5 - +5 V DC  
(3 types can be switched by DIP switch and PC)

■ **DC Current:** 0 - 20 mA DC

**Output range:** 0 - 23 mA DC

**Minimum span:** 1 mA

**Load resistance:** 550 Ω

### ■ DC Voltage

- **Output range -10 - +10 V DC**

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

**Minimum span:** 1 V

**Load resistance:** Output drive 1 mA max.

(ex. 0 - 10 V DC:  $10 \text{ V} \div 1 \text{ mA} = 10 \text{ k}\Omega$ )

- **Output range -5 - +5 V DC**

**Voltage range:** -5.75 - +5.75 V DC

**Minimum span:** 500 mV

**Load resistance:** Output drive 1 mA max.

(ex. 1 - 5 V DC:  $5 \text{ V} \div 1 \text{ mA} = 5000 \Omega$ )

## INSTALLATION

**Power consumption:**  $\leq 1\text{W}$

**Operating temperature:** -20 to +65°C (-4 to +149°F)

**Operating humidity:** 30 to 90 %RH (non-condensing)

**Atmosphere:** No corrosive gas or heavy dust

**Mounting:** DIN rail

**Weight:** 80 g (2.8 oz)

## PERFORMANCE in percentage of span

**Input accuracy (% of max. input range):**  $\pm 0.01 \%$

( $\pm 0.02$  for current input)

**Output accuracy (% of max. output range):**  $\pm 0.02 \%$

( $\pm 0.04$  for current output)

**Temp. coefficient:**  $\pm 0.015 \%/^{\circ}\text{C}$  ( $\pm 0.008 \%/^{\circ}\text{F}$ ) of max. span

**Response time:**  $\leq 500 \text{ msec.}$  (0 - 90 %)

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

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

**Dielectric strength:** 2000 V AC @1 minute (input to output to power to ground)

## ACCURACY AND CALCULATION EXAMPLES

### ■ Overall Accuracy

The accuracy includes input accuracy, which converts the sensor input into a digital value, and output accuracy, which converts the digital value into an analog signal.

The accuracy of the device is the total of the input accuracy and the output accuracy

#### Input accuracy

Input accuracy for the setting value span is shown as following formula.

Input accuracy = (input range  $\div$  input setting value span)  $\times$  0.01%

For current input,

Input accuracy = (input range ÷ input setting value span) × 0.02%

(Use the larger one when the input 1 and input 2 are different.)

### Output accuracy

Output accuracy for the setting value span is shown as following formula.

Output accuracy = (output range ÷ output setting value span) × 0.02%

For current output,

Output accuracy = (output range ÷ output setting value span) × 0.04%

### Calculation examples

The overall accuracy is ±0.1% when following setting.

Input 1: input range -10 - +10 V, input setting value span 0 - 5 V

Input 2: input range 0 - 50 mA, input setting value span 0 - 20 V

Output: output range 0 - 20 mA, output setting value span 4 - 20 mA

Input 1 accuracy = (20 V ÷ 5 V) × 0.01% = 0.04%

Input 2 accuracy = (50 mA ÷ 20 mA) × 0.02% = 0.05%

Output accuracy = (20 mA ÷ 16 mA) × 0.04% = 0.05%

Output 2 accuracy (0.05%) is larger than output 1 accuracy (0.04%), the overall accuracy is input accuracy 0.05% + output accuracy 0.05% = 0.1.

## STANDARDS & APPROVALS

### EU conformity:

EMC Directive

EMI EN 61000-6-4

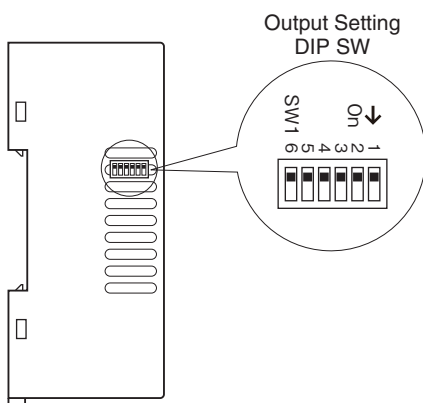
EMS EN 61000-6-2

RoHS Directive

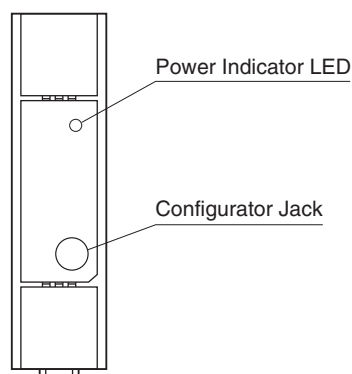
## EXTERNAL VIEW

Refer to the instruction manual for the setting procedure.

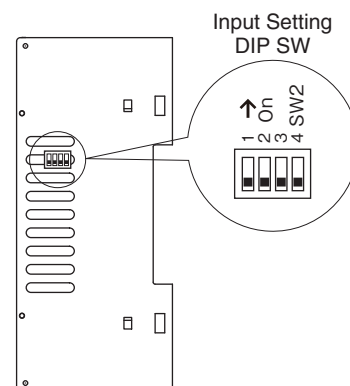
### LEFT VIEW



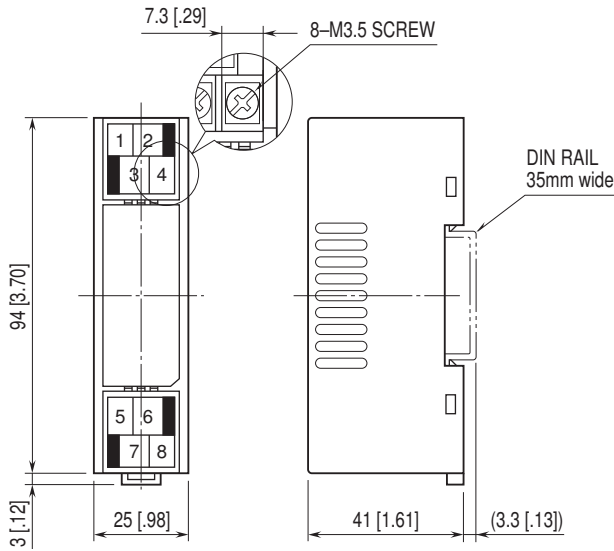
### FRONT VIEW



### RIGHT VIEW

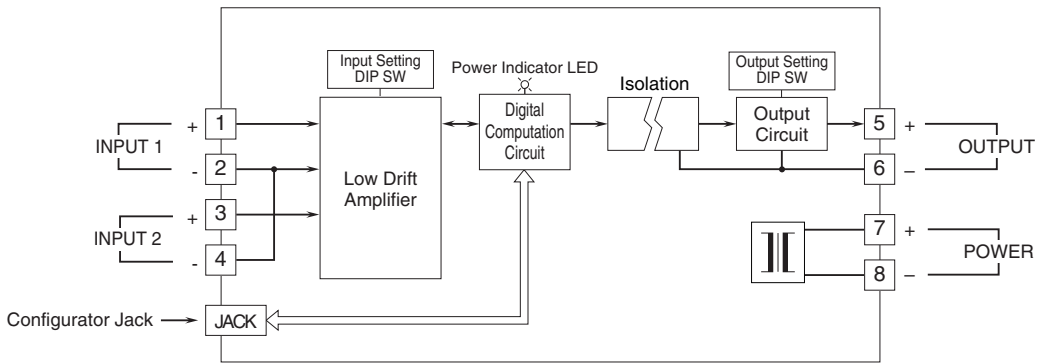



**EXTERNAL DIMENSIONS & TERMINAL ASSIGNMENTS unit: mm [inch]**



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

**SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM**



 Specifications are subject to change without notice.