



## SEM215

- THERMOCOUPLE, RTD, mV & SLIDE-WIRE INPUTS
- INPUT/OUTPUT GALVANICALLY ISOLATED
- LOOP POWERED
- 4-20 mA OUTPUT
- DIN RAIL MOUNTED
- PC CONFIGURABLE
- FIELD RANGE SELECTABLE
- COMPACT SIZE & FAST WIRING
- FLAMMABLE ATMOSPHERE COMPATIBLE (OPTION)



### RAIL-MOUNTING

### INTRODUCTION

The SEM215 Series Rail-mounted Universal Temperature Transmitters provide accurate and reproducible conversion of any commonly used thermocouple sensors, Pt-100 RTDs, slide-wire transducer or mV signals to isolated industry standard 4-20 mA output. The versatility of this smart temperature transmitter results in lower stock holdings and greater operational flexibility.

Isolation is a standard feature, removing all ground loop effects as the input is electrically and physically isolated from the loop power supply.

The transmitter can easily be configured in the field by setting the positions of eight switches located close to the rail clip. Six switches are available to provide 57 pre-set ranges, one switch is for unit selection and the last switch will be used to specify the burnout option. These switches are inaccessible in normal use to prevent tampering.

Configuration can also be performed via a personal computer. The sensor type, range, filter factor, linearisation scheme, temperature offset and the device tag are easily programmed using a PC and a simple Windows® based software program. This allows for reprogramming or interrogation of the transmitter, while it is installed in the loop. Sensors can be changed without the need for recalibration. Special sensors can be accommodated by using the type "X" element, which allows any custom characterization and linearisation option.

Sensor referencing enables the transmitter to be accurately matched to a particular sensor. A user programmable offset is available to remove any system error or to shift the temperature reading in either direction. Four selectable settings have been provided to remove any incoming noise from the sensor.

The transmitter is very compact enabling a high packing density to be achieved and by using the latest tension clamp technology for the two part terminals, connections are made in half the time taken to wire conventional screw terminals. These terminations are maintenance-free and the tension clamp ensures that the contact is permanently under tension, eliminating any potential problem of loosening due to temperature fluctuations or vibration.

In normal operation the current output varies between 4 and 20 mA. If the input sensor develops a fault, or the software in either of the two microprocessors detects an error, then the current output is driven either upscale (greater than 20 mA) or downscale (less than 4 mA) depending upon the sense of the burnout parameter selected. The use of two microprocessors results in error-free data transmission across the isolation barriers.

The transmitter is protected against reverse connection, so that incorrect output wiring results in near zero current flow in the loop.

## SPECIFICATIONS @ 20°C & 24 VDC

### RTD (Pt-100) Input

<b>Sensor Range</b>	-200...850°C
<b>Accuracy<sup>1</sup></b>	±0.01% f.s. ± 0.05% Rdg
<b>Minimum Span<sup>2</sup></b>	25°C
<b>Excitation Current</b>	300 µA to 550 µA
<b>Max. Lead Resistance</b>	50 Ω / leg
<b>Lead Resist. Effect</b>	0.002°C / Ω

### Thermocouple Input

<b>Thermocouple Types</b>	K, J, T, R, S, E, N, F, L
<b>Accuracy<sup>1</sup></b>	±0.04% f.s. ± 0.04% Rdg or 0.5°C (whichever is greater)
<b>Cold Junction Error</b>	±0.5°C
<b>Cold Junction Range</b>	-40...+70°C

Thermocouple Type	Measuring Range °C	Minimum Span <sup>2</sup> °C
K	-200...1370	50
J	-200...1200	50
T	-210...400	25
R	-10...1760	100
S	-10...1760	100
E	-200...1000	50
F (L)	-100...600	25
N	-180...1300	50
X	±9999	Custom

### Millivolt Input

<b>Input Range</b>	-10...75 mV
<b>Accuracy<sup>1</sup></b>	±10 µV. ± 0.07% Rdg
<b>Minimum Span<sup>2</sup></b>	5 mV
<b>Input Impedance</b>	10 MΩ
<b>Characterization</b>	Linear Custom for sensor 'X' ( 4th order polynomial)

### Slide-wire Input

<b>Input</b>	3-wire potentiometer
<b>Accuracy<sup>1</sup></b>	±0.1%
<b>Resistance Range</b>	10...390 Ω (larger values by linking terminals 9 & 10)
<b>Minimum Span<sup>2</sup></b>	5 mV
<b>Characterization</b>	Linear Custom for sensor 'X' ( 4th order polynomial)

### Output

<b>Output Range</b>	4...20 mA
<b>Accuracy<sup>3</sup></b>	±5 µA
<b>Supply Voltage</b>	10...35 VDC
<b>Max. Output Load</b>	[(V supply - 10) / 20]] kΩ (i.e. 700 Ω @ 24 V)
<b>Voltage Effect</b>	0.2 µA / V
<b>Thermal Drift</b>	1 µA / °C
<b>Protection</b>	Reverse connection; Over voltage 35 VDC

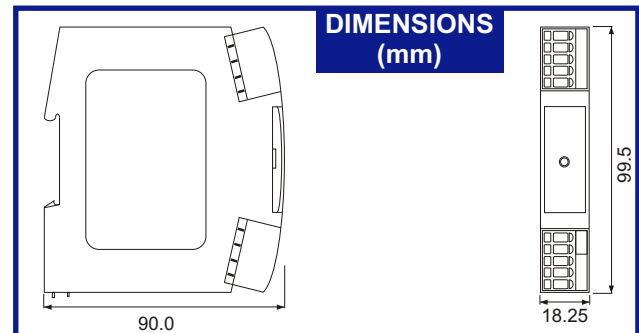
### General

<b>Input/Output Isolation</b>	500 VAC rms
<b>Material</b>	ABS
<b>Update Time</b>	0.25 second maximum
<b>Stability</b>	0.1% f.s. or 0.1°C / year
<b>Burnout Action</b>	Upscale or downscale
<b>Ambient</b>	-10...+70°C; 10 to 90% RH
<b>Hazardous Ares</b>	EEx ia IIC T4...T6 (option)

### Communications

<b>PC Interface</b>	RS-232 via adapter
<b>Data Rate</b>	1200 baud
<b>Min. Output Load</b>	100...300 Ω for 'In Loop' Programming
<b>Cable Length</b>	1000 meters maximum
<b>Configuration</b>	Sensor type, Burnout option and °C/°F configurable both via the instrument and a PC; Hi / Lo, Filter, Tag No. And User offset via PC only

- Notes
- Accuracy includes the effects of calibration, linearisation, and repeatability.
  - Any span may be selected, but standard accuracy is only applicable to spans greater than the minimum recommended.
  - Restricted to 300 ohms for in loop programming.



## Ordering SEM215

**SEM215** Standard unit

**SEM215X** Approved for Hazardous Area Use to EEx ia IIC T5

**The programming kit for configuring model 215 transmitters must be purchased at a low price, or we configure the unit to your specifications.**



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