

DIN RAIL UNIVERSAL TEMPERATURE TRANSMITTER

SEM1615

- > UNIVERSAL DUAL CHANNEL INPUT
- > DIN RAIL MOUNT
- > MATHS FUNCTIONS
- > SENSOR CHARACTERISTICS DOWNLOAD VIA USB PORT
ALLOWS FOR CUSTOM TYPES
- > FLASH TESTED TO 4 KV DC
- > (4 to 20) mA LOOP OUTPUT



> INTRODUCTION

The SEM1615 is a universal transmitter that accepts RTD, Thermocouple, Potentiometer or millivolt input signals and converts them to the industry standard (4 to 20) mA transmission signal.

The SEM1615 is programmed using a standard USB lead and our free configuration software “USBSpeedlink” downloaded from our web site.

> ENHANCED FEATURES

Some of the enhanced SEM1615 features are as follows;

SENSOR REFERENCING

The SEM1615 sensor referencing via the Windows based “USBSpeedlink” software allows for close matching to a known reference sensor eliminating possible sensor errors.

CUSTOM LINEARISATION

The SEM1615 can be programmed with a custom linearization to suit nonstandard sensors or sensors with unusual or unique characteristics. Consult the sales office for details.

SENSOR BURN OUT DETECTION

If a sensor wire is broken or becomes disconnected the SEM1615 output will automatically go to its user defined level (upscale or downscale) or a pre-set value.

OUTPUT CURRENT PRESET

For ease of system calibration and commissioning the output can be set to a pre-defined level anywhere within the (4 to 20) mA range.

DIN RAIL UNIVERSAL TEMPERATURE TRANSMITTER

SPECIFICATIONS @ 20°C

ELECTRICAL INPUT

Range + Options	Accuracy	Stability
Resistance		
(10 to 10000) Ω Excitation 200 μ A Lead resistance (0 to 20) Ω (2,3 or 4 Wire connection)	(10 to 500) $\Omega \pm 0.055 \Omega$, (500 to 2500) $\Omega \pm 0.5 \Omega$, (2500 to 10500) $\Omega \pm 0.2 \%$ of reading (+ Lead error on 2 wire)	(0 to 500) Ω 0.013 $\Omega/^{\circ}\text{C}$, (500 to 2500) Ω 0.063 $\Omega/^{\circ}\text{C}$, (2500 to 10500) Ω 0.27 $\Omega/^{\circ}\text{C}$
Slide Wire		
(0 to 100) % Travel Wire resistance (1 to 100) K Ω	$\pm 0.1 \%$	$\pm 0.001\%/^{\circ}\text{C}$
mV		
(-205 to 205) mV DC (-1000 to 1000) mV DC	± 0.02 mV ± 10.0 mV	± 0.005 mV/ $^{\circ}\text{C}$ ± 0.02 mV/ $^{\circ}\text{C}$

SENSOR INPUT

RTD (Single/ 2 wire Dual Channel; isolated tip only for Dual operation)

Type	Range	Accuracy
Pt100 (IEC)	(-200 to 850) $^{\circ}\text{C}$	0.2 $^{\circ}\text{C} \pm$ ($^{\circ}0.05\%$ of reading) (Plus sensor error)
Pt500 (IEC)	(-200 to 750) $^{\circ}\text{C}$	
Pt1000 (IEC)	(-200 to 600) $^{\circ}\text{C}$	
Ni100	(-60 to 180) $^{\circ}\text{C}$	
Ni120	(-80 to 260) $^{\circ}\text{C}$	
Ni1000	(-60 to 180) $^{\circ}\text{C}$	
Cu53	(-50 to 180) $^{\circ}\text{C}$	
Cu100	(-80 to 260) $^{\circ}\text{C}$	
Cu1000	(-80 to 260) $^{\circ}\text{C}$	
Library contains more standards/types Including silicon sensors		
Temperature stability: - Refer to resistance stability values for thermal effect		

Thermocouple (Single/Dual Channel; isolated tip only for Dual operation)

Type	Range	Accuracy
K	(-200 to 1370) $^{\circ}\text{C}$	$\pm 0.1 \%$ of full scale $\pm 0.5 \text{ }^{\circ}\text{C}$ (Plus sensor error)
J	(-100 to 1200) $^{\circ}\text{C}$	
N	(-200 to 1300) $^{\circ}\text{C}$	
E	(-200 to 1000) $^{\circ}\text{C}$	
T	(-200 to 400) $^{\circ}\text{C}$	$\pm 0.2 \%$ of full scale $\pm 0.5 \text{ }^{\circ}\text{C}$ (Plus sensor error)
R	(0 to 1760) $^{\circ}\text{C}$	$\pm 0.1 \%$ of full scale $\pm 0.5 \text{ }^{\circ}\text{C}$ over range (800 to 1760) $^{\circ}\text{C}$ (Plus sensor error)
S	(0 to 1760) $^{\circ}\text{C}$	
L	(-100 to 600) $^{\circ}\text{C}$	$\pm 0.1 \%$ of full scale $\pm 0.5 \text{ }^{\circ}\text{C}$ (Plus sensor error)
U	(0 to 600) $^{\circ}\text{C}$	
B	(-200 to 1300) $^{\circ}\text{C}$	
C	(0 to 2300) $^{\circ}\text{C}$	
D	(0 to 2300) $^{\circ}\text{C}$	
G	(0 to 2300) $^{\circ}\text{C}$	
Library contains more standards/types		
Temperature stability: - Refer to mV stability values for thermal effect		

DUAL CHANNEL OPERATION

Thermocouples A & B	Functions; Average, Redundancy, A + B, A – B, Highest, Lowest
mV A & B	Functions; Average, A + B, A – B, Highest, Lowest
RTD A & B	Two wire connection. Functions; Average, A + B, A – B, Highest, Lowest

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➤ SPECIFICATIONS @ 20°C

COLD JUNCTION (Ambient sensor)

Type	Range	Accuracy/Stability
Thermistor 10K Beta 3380	(-30 to 70) °C	±0.2 °C
Thermal drift	Zero at 20°C	±0.05 °C/°C

OUTPUT

Type Options	Range	Accuracy/Notes
Two wire current	(4 to 20) mA	(mA Out/ 2000) or 5 uA whichever is the greater
Thermal drift	Zero at 20°C	±1 uA/°C
User set minimum current	(3.5 to 4.0) mA	3.8 mA default
User set maximum current	(20 to 23.0) mA	20.5 mA default
User set error current	(3.5 to 23.0) mA	Any mA value within range
User pre-set current	(3.5 to 23.0) mA	For diagnostics
Loop effect	± 0.2 uA/V	
Loop supply	(10 to 30) V DC	SELV
Max load	[(V supply – 10)/20] KΩ	700 Ω @ 24 V DC
Protection	Reverse and over voltage	

USB USER INTERFACE

Type Options Function	Description	Notes
USB 2.0	Mini B USB	USB powers device for config only. Power loop for live data.
Baud Rate	38,400	
Sensor configuration	Sensor type Sensor offset Sensor fail high or low Pre-set sensor value Set No. wires, resistance Input T/C Cold junction compensation	TC/mV/RTD/Ohms/Slide wire Dual TC/mV/RTD Dual sensors use separate offsets Dual sensors share sensor fail For diagnostics 2, 3 or 4 wire Automatic or fixed
Profiler configuration	Set profiler input range Set profiler segments Enter profile X-Y values Set profiler output units Set the output process range TC & RTD input only set units	In sensor units (4 to 22) segments Profiler set up
Output signal	Select the process range for re-transmission Set minimum current Set maximum current Set the error current Pre-set Loop current	Set in profiler out units (3.5 to 4.0) mA (20 to 23.0) mA (3.5 to 23.0) mA (3.5 to 23.0) mA
Damping	User set process variable (PV) damping	(1 to 32) seconds to reach 70% final value
Diagnostics	Read (PV, mA, CJ °C, error & power off) log points back from device Set the log period Clear log and start new log Export log data Detect open circuit sensor wire Calibration date, certificate number, calibrated by	Up to 150 points Log rate (1 to 60) readings per hour
Live data	Read process variable (PV) Read profiler input signal Read profiler output signal Read cold junction temperature Read % output Read mA output	

HART UNIVERSAL TEMPERATURE TRANSMITTER

GENERAL

Function	Description
Isolation	Flash tested 5 seconds at 4 KV DC, working voltage 50 V AC
Reading update	200 ms
Response time	500 ms to reach 70% final value
Warm up	2 minutes
Start-up time	5 seconds

AMBIENT CONDITIONS

Temperature	Operating/storage (-30 to 70) °C
Humidity	Operating/storage (10 to 95) % Non-condensing
Installation enclosure	EN50022 DIN rail enclosure offering protection >= IP65
Configuration ambient	(10 to 30) °C

CONNECTIONS

Output	Screw terminals 2.5 mm maximum Pins (4,5)
Input	Screw terminals 2.5 mm maximum Pins (7,8,9,12)
USB	Mini B USB

APPROVALS

EMC	BS EN 61326 Industrial
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MECHANICAL

Enclosure	DIN 43880
Material	Polyimide 6.6
Dimensions	(17.5 x 90 x 56.4) mm
Weight	Approximately 70 g
Colour	Grey

ORDER CODE: SEM1615

