

1.0 GENERAL

The transmitter is a universal Din Rail mounted temperature transmitter that accepts most commonly used temperature sensors, slide wire transducers or millivolt signals and transmits them as a 4-20mA signal to a host system. The unit can be programmed by the user from a selection of preset ranges selected by DIL switches or by the software package RCPW if required.

2.0 SPECIFICATION @ 24°C

2.11 RTD Input (Pt100)

Sensor Range	-200 to +850°C (18 to 390 Ω)
Minimum Span ¹	25°C
Linearisation	BS EN 60751 (IEC 751) BS1904 (DIN 43670) JISC 1604 CUSTOM [X], Contact Sales Office
Basic Measurement Accuracy ²	±0.01% FRI ⁵ ±0.05% Rdg
Thermal Drift	Zero 0.008 °C/°C, Span 100 ppm / °C
Excitation Current	300µA to 550µA
Maximum Lead Resistance	50 Ω / leg
Lead Resistance Effect	0.002°C / Ω
Preset Ranges	Refer to section 3.3

2.12 Thermocouple Input

Sensor Ranges	Thermocouple Measuring Range °C ⁴	Minimum Span ¹ °C
	TC Type K	-200 to 1370 50
	TC Type J	-200 to 1200 50
	TC Type T	-210 to 400 25
	TC Type R	-10 to 1760 100
	TC Type S	-10 to 1760 100
	TC Type E	-200 to 1000 50
	TC Type F(L)	-100 to 600 25
	TC Type N	-180 to 1300 50
	TC Type [X] ³	± 9999 Custom
Linearisation	BS EN 60584-2, IEC 584-2 (BS 4937)	
Basic Measurement Accuracy ²	±0.04% FRI ⁵ ±0.04% Rdg or 0.5°C (Which ever is greater)	
Thermal Drift	Zero 0.1µV/°C, Span 100 ppm/°C	
Cold Junction Error	±0.5°C	
Cold Junction Tracking	0.05°C/°C	
Cold Junction Range	-40 to +85°C	
Preset Ranges	Refer to section 3.3	

2.13 Millivolt Input

Input Range	Voltage Source -10 to +75 mV
Characterisation	Linear. Custom [X] ³ , 4th order polynomial
Minimum Span ¹	5 mV
Basic Measurement Accuracy ²	±10µV ±0.07% Rdg
Input Impedance	10 M Ω
Thermal Drift	Zero 0.1µV/°C, Span 100 ppm / °C

2.14 Slidewire Input

Input Resistance Range	3 Wire potentiometer 10 Ω to 390 Ω (End to End) For input with R > 390 Ω terminals 9 and 10 have to be linked.
Characterisation	Linear. Custom [X] ³ , 4th order polynomial
Minimum Span ¹	5% of full range
Basic Measurement Accuracy ²	0.1% FRI ⁵
Temperature Drift	100 ppm / °C

- Notes.
- 1 Any span may be selected, full accuracy is only guaranteed for spans greater than the minimum recommended.
 - 2 Basic Measurement Accuracy includes the effects of calibration, linearisation and repeatability.
 - 3 Customer linearisation requirements are available preprogrammed at the factory, contact your supplier for details.
 - 4 Consult thermocouple reference standards for thermocouple material limitation.
 - 5 FRI = Full Range Input

2.2 Output

Output Range	4-20mA (<3.8 to >20.2 mA)
Maximum Output	23mA
Accuracy	±5µA
Voltage Effect	0.2µA /V
Thermal Drift	1µA / °C
Supply Voltage	10 to 35V
Maximum Output Load	[(Vsupply - 10)/20] K Ω (eg 700 Ω @ 24V)
Protection	Restricted to 300 Ω maximum for inloop programming Reverse connection overvoltage 35V

2.3 General

Input/Output Isolation	500VAC rms (galvanically isolated)
Update Time	250 mS Maximum
Time Constant (Filter Off)	< 1 Second (Time to reach 63% of final value)
Filter Factor Programmable	Off, 2 seconds, 10 seconds or Adaptive
Warm-up Time	2 minutes to full accuracy
Stability	0.1% FRI ⁵ or 0.1°C/year
Environmental	
Ambient Operating Range	-40 to 60°C
Ambient Storage Temperature	-25 to 70°C
Ambient Humidity Range	10 to 90% RH non condensing
EMC	
Emissions	EN50081-1
Immunity	EN50082-2
Mechanical	
Enclosure	Din Rail mounted to fit Din EN 50022-35
Material	ABS
Weight	70g
Flammability	SEL UL 94-VI
Dimensions	90 x 99 x 18.5mm
Connections	Tension clamp two part terminals and 3.5mm jack for comms

Communications

PC Interface	RS232 via configurator
Minimum Output Load	250 Ω for 'In Loop' programming (Available as quick selector or via PC)
Maximum Cable Length	1000 metres
Configurable Parameters	Sensor type: Burnout: °C/°F: Output: Available as "Quick Selector" or via PC: Hi/Lo: Filter: Tag: User Offset (Available via PC programming only)
Comms Protocol	ANSI X3.28 1976
Data Rate	1200 baud

2.4 Intrinsically Safe Applications

SEM215X KEMA Ex-98.E.2215 X
EEx ia IIC T4...T6

Special conditions for safe use:- The apparatus must only be connected to intrinsically safe circuits with the following maximum values : Umax - 30V ; Imax - 100mA ; Pmax - 750mW.

The apparatus must be housed in an enclosure which provides a degree of protection of IP20 for the terminals as per EN60529.

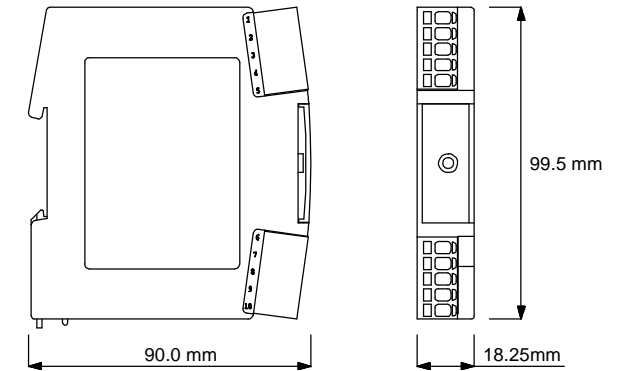
3.0 INSTALLATION

3.1 Mechanical

The transmitter is designed to mount onto a standard Din Rail. The transmitter should be installed with adequate protection from moisture and corrosive atmospheres. The transmitter may be mounted in any orientation.

Care must be taken when locating the transmitter to ensure the ambient temperature remains within the specified operating range. Figure 1 shows the mechanical layout of the transmitter.

Figure 1



3.2 Electrical

Connections to the transmitter are made to the tension clamp terminals provided on the front face. Output signal wiring should use screened twisted pair. It is recommended that screened cable is used for the input signal wires for cable runs greater than one metre. For Pt100 inputs all three input wires must have the same core diameter to maintain equal resistance in each wire. If required the user may change the range of the transmitter by selecting one of the ranges from the table shown in section 3.3. Power must be switched OFF first. The selection switch is located at the rear of the transmitter between the Din Rail mounting.

Figure 2

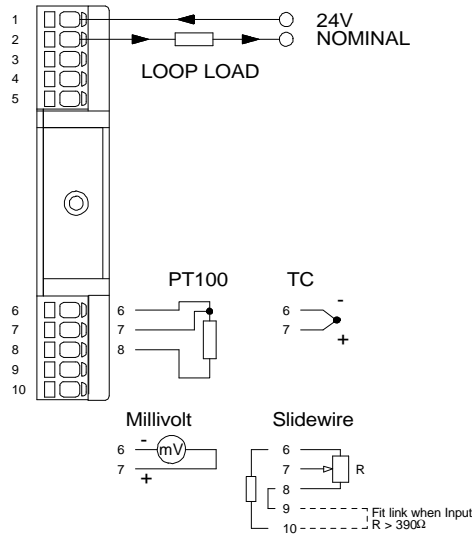


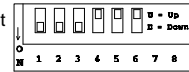
Figure 2 shows the method of connection to provide a 4-20 mA current loop output. The Pt100 sensor shown would normally take the form of a probe assembly with a three wire connection. The output loop has a voltage power supply used to provide loop excitation. The load symbol represents other equipment in the loop, normally indicators, controllers or loggers. Care must be taken when designing the 4-20mA circuit to ensure that the total voltage requirements of all the equipment in the loop added together, does not exceed the power supply voltage. If a number of instruments are connected in the loop, ensure that only one instrument is tied to ground. Grounding the loop at two points will cause a short circuit of part of the loop leading to measurement errors.

To maintain CE compliance the transmitter should be mounted in an enclosure to prevent access to the transmitter during normal operation.

3.3 Preset Ranges

WARNING - Power must be removed before changing DIP settings.

Sensor and temperature ranges may be preset using table shown below.



Example right shows 1,2,3 DOWN, 4,5,6 UP.

RANGE 1 2 3 4 5 6 CODE RANGE 1 2 3 4 5 6 CODE

Computer Programmable						Type K, IEC 584-3 BS 4937						
Prog	U	U	U	U	U	00	0 to 100	U	U	U	U	28
Use this code to configure unit using RCPW software	U	U	U	U	U	00	0 to 200	D	U	U	U	29
	U	U	U	U	U	00	0 to 500	U	D	U	U	30
	U	U	U	U	U	00	0 to 600	D	D	U	U	31
	U	U	U	U	U	00	0 to 800	U	U	U	U	32
	U	U	U	U	U	00	0 to 1000	D	U	U	U	33
	U	U	U	U	U	00	0 to 1200	U	U	U	U	34
	U	U	U	U	U	00	0 to 2400	D	D	U	U	59
Pt100, EN60751						Type J, IEC 584-3 BS 4937						
-100 to 100	D	U	U	U	U	01	0 to 100	D	D	U	U	35
-50 to 50	U	D	U	U	U	02	0 to 150	U	D	U	U	36
-50 to 100	D	D	U	U	U	03	0 to 200	D	U	U	U	37
-50 to 150	U	D	U	U	U	04	0 to 400	U	D	U	U	38
0 to 50	D	D	U	U	U	05	0 to 600	D	D	U	U	39
0 to 100	U	D	U	U	U	06	0 to 2000	U	D	U	U	58
0 to 150	D	D	U	U	U	07						
0 to 200	U	U	U	U	U	08						
0 to 300	D	U	U	U	U	09						
0 to 400	U	D	U	U	U	10						
0 to 500	D	D	U	U	U	11						
0 to 600	U	U	U	U	U	12						
50 to 150	D	U	U	U	U	13						

Pt100, IEC 584-1						Type T, IEC 584-3 BS 4937						
-25 to 125	U	D	D	U	U	14	-50 to 50	U	U	U	U	40
0 to 100	D	D	D	U	U	15	-50 to 100	D	U	U	U	41
0 to 250	U	U	U	U	U	16	0 to 100	U	D	U	U	42
250 to 500	D	U	U	U	U	17	-100 to 100	D	D	U	U	43
-50 to 150	U	D	U	U	U	18	0 to 200	U	U	U	U	44
0 to 200	D	D	U	U	U	19	0 to 400	D	U	U	U	45
50 to 150	U	D	U	U	U	20						

Pt100, JISC 1604						Type R, IEC 584-3 BS 4937						
-25 to 125	D	U	D	U	U	21	0 to 1000	U	D	D	U	46
0 to 100	U	D	D	U	U	22	0 to 1600	D	D	D	U	47
0 to 250	D	D	D	U	U	23						
250 to 500	U	U	U	U	U	24						
-50 to 150	D	U	U	U	U	25						
0 to 200	U	D	U	U	U	26						
50 to 150	D	D	U	U	U	27						

Type S, IEC 584-3 BS 4937						Type N, IEC 584-3 BS 4937						
0 to 1000	D	U	U	U	U	57	0 to 100	U	D	U	U	50
							0 to 200	D	D	U	U	51
							0 to 400	U	D	U	U	52
							0 to 600	D	U	U	U	53
							0 to 800	U	D	U	U	54
							0 to 1000	D	D	U	U	55
							0 to 1200	U	U	U	U	56

Temperature units and Burnout Options may be preset using table shown below.

Temperature Units, Switch 7		Burnout, Switch 8	
U=	°C	U=	Low
D=	°F	D=	High

Note. Switches 1-6 UP (RCPW) will override this facility.

SEM215 PROGRAMMABLE DIN RAIL TEMPERATURE TRANSMITTER

Designed, manufactured and supported by :

STATUS INSTRUMENTS LTD

Green Lane
Tewkesbury
Glos. GL20 8HD
UK
Sales : 01684 853300
Support : 01684 853301
Fax : 01684 293746
Email: support@status.co.uk

Every effort has been taken to ensure the accuracy of this specification, however we do not accept responsibility for damage, injury, loss or expense resulting from errors and omissions, and we reserve the right of amendment without notice.

Stock code : 52-214-2190-02

Issue : 01