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 @ 24ºC

2.11 RTD Input (Pt100)

Sensor Range	-200 to +850ºC (18 to 390 Ω)
Minimum Span[1]	25ºC
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 ºC/ºC, Span 100 ppm / ºC
Excitation Current	300µA to 550µA
Maximum Lead Resistance	50 Ω / leg
Lead Resistance Effect	0.002ºC / Ω
Preset Ranges	Refer to section 3.3

2.12 Thermocouple Input

Sensor Ranges	Thermocouple Type	Measuring Range ºC [4]	Minimum Span [1] ºC
	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 0.5ºC (Which ever is greater)
Thermal Drift	Zero 0.1µV/ ºC, Span 100 ppm/ºC
Cold Junction Error	±0.5ºC
Cold Junction Tracking	0.05ºC/ºC
Cold Junction Range	-40 to +85ºC
Preset Ranges	Refer to section 3.3

2.13 Millivolt Input

Input	Voltage Source
Range	-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/ºC, Span 100 ppm / ºC

2.14 Slidewire Input

Input	3 Wire potentiometer
Resistance Range	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 / ºC

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 / ºC
Supply Voltage	10 to 35V
Maximum Output Load	[(Vsupply -10)/20] K Ω (eg 700 Ω @ 24V) Restricted to 300 Ω maximum for inloop programming
Protection	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 0.1ºC/year
Environmental	
Ambient Operating Range	-40 to 60ºC
Ambient Storage Temperature	-25 to 70ºC
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	SEI 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: ºC/ºF: 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.

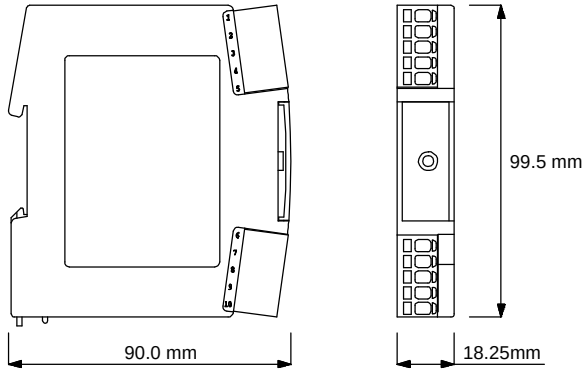
3.0 INSTALLATION

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

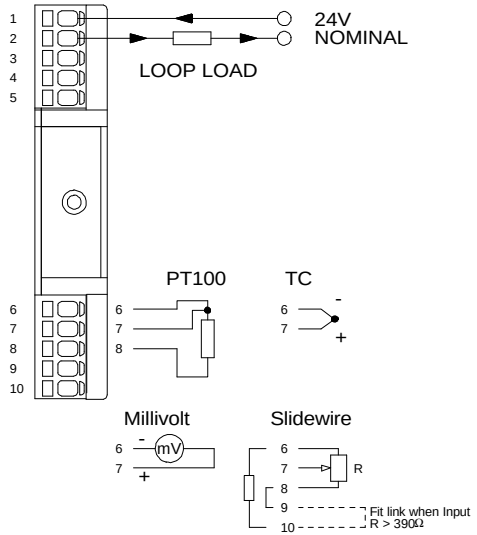


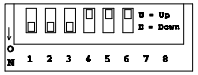
Figure 2 shows the method of connection to provide a 4-20 mA current loop output. The Pt100 sensor shown would normally take the form of a probe assembly with a three wire connection. The output loop has a voltage power supply used to provide loop excitation. The load symbol represents other equipment 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.

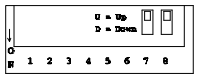


Example right shows 1,2,3 DOWN, 4,5,6 UP.

RANGE	1 2 3 4 5 6	CODE
Computer Programmable		
Prog	UUUUUU	00
Use this code to configure unit using RCPW software		
Pt100, EN60751		
-100 to 100	DUUUUU	01
-50 to 50	UDUUUU	02
-50 to 100	DDUUUU	03
-50 to 150	UUDUUU	04
0 to 50	DUDUUU	05
0 to 100	UDDUUU	06
0 to 150	DDDUUU	07
0 to 200	UUUDUU	08
0 to 300	DUUDUU	09
0 to 400	UDUDUU	10
0 to 500	DDUDUU	11
0 to 600	UUDDUU	12
50 to 150	DUDDUU	13
Pt100, IEC 584-1		
-25 to 125	UDDDUU	14
0 to 100	DDDDUU	15
0 to 250	UUUUDU	16
250 to 500	DUUUDU	17
-50 to 150	UDUUDU	18
0 to 200	DDUUDU	19
50 to 150	UUDUDU	20
Pt100, JISC 1604		
-25 to 125	DUDUDU	21
0 to 100	UDDUDU	22
0 to 250	DDDUDU	23
250 to 500	UUUDDU	24
-50 to 150	DUUDDU	25
0 to 200	UDUDDU	26
50 to 150	DDUDDU	27

RANGE	1 2 3 4 5 6	CODE
Type K, IEC 584-3 BS 4937		
0 to 100	UUDDDU	28
0 to 200	DUDDDU	29
0 to 500	UDDDDU	30
0 to 600	DDDDDU	31
0 to 800	UUUUUD	32
0 to 1000	DUUUUD	33
0 to 1200	UDUUUD	34
0 to 2400	DDUDDD	59
Type J, IEC 584-3 BS 4937		
0 to 100	DDUUUD	35
0 to 150	UUDUUD	36
0 to 200	DUDUUD	37
0 to 400	UDDUUD	38
0 to 600	DDDUUD	39
0 to 2000	UDUDDD	58
Type T, IEC 584-3 BS 4937		
-50 to 50	UUUDUD	40
-50 to 100	DUUDUD	41
0 to 100	UDUDUD	42
-100 to 100	DDUDUD	43
0 to 200	UUDDUD	44
0 to 400	DUDDUD	45
Type R, IEC 584-3 BS 4937		
0 to1000	UDDDUD	46
0 to1600	DDDDUD	47
Type S, IEC 584-3 BS 4937		
0 to1000	UUUUDD	48
0 to1600	DUUUDD	49
Type N, IEC 584-3 BS 4937		
0 to 100	UDUUDD	50
0 to 200	DDUUDD	51
0 to 400	UUDUDD	52
0 to 600	DUDUDD	53
0 to 800	UDDUDD	54
0 to1000	DDDUDD	55
0 to1200	UUUDDD	56
Type E, IEC 584-3 BS 4937		
0 to1000	DUUDDD	57

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



Temperature Units, Switch 7		Burnout, Switch 8	
U=	ºC	U=	Low
D=	ºF	D=	High

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

SEM215

PROGRAMMABLE

DIN RAIL

TEMPERATURE

TRANSMITTER

Designed, manufactured and supported by :

STATUS INSTRUMENTS LTD

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