Burnout
Due to the sensing method, certain combinations of open circuit sensor wires may result in the output current dropping for approximately 500mS, before rising to upscale output.

Care must be taken when designing the 4-20mA circuit to ensure that the total burden of the loop, that is the total voltage requirements of all the equipment in the loop added together, does not exceed the power supply voltage. If a number of devices are connected in the loop, ensure that only one instrument is tied to ground. Grounding the loop at two points will result in shorting out part of the loop and therefore any transmitters in that part of the loop will not operate.

Maximum load resistor, RL, is calculated as follows :

RL = (v-8)/20 x 1000

For 24V supply :

RL = (24-8)/20 x 1000 = 800R

3.3 EMC

This transmitter conforms with EC directives BS EN 50081-1 and BS EN 50082-2 when correctly installed in a termination head providing at least IP20 protection and fitted with a sensor with less than 3 metres of cable.

4.0 RANGES

This transmitter is normally supplied ranged 0 to 100ºC, unless a special range has been requested at the time of order. With the aid of suitable equipment, this transmitter can programmed to a different range by following the simple procedure listed below.

4.1 Equipment

The following apparatus will be required in order to re-range the transmitter:-

- Power supply voltage between 10-30 V DC, 30 mA min current
- RTD Calibrator or Precision resistance box (0 - 390R)
- Connecting cables
- 3 mm Diameter screw driver or similar device.
- Current meter 0 - 20mA to monitor loop current.

4.2 Method (See Figure 4)

1. Connect circuit as shown in Figure 4 and set the RTD calibrator for temperature required at 4mA.
2. Press and hold the programming switch by inserting a 3mm diameter screw driver blade through the programming hole, located in the top face of the transmitter housing. Hold the switch for approximately 5 seconds, until the RED programming led flashes. Release the switch.
3. Set the RTD calibrator for the required temperature at 20mA. Allow 10 seconds settling time, then press and release the programming switch. The programming LED will flash quickly for a few moments, then go out. The transmitter is now ranged.
4. Check the transmitter output range is correct by setting the RTD calibrator to the 4mA and then 20mA settings, checking the output current reading on the meter.

4.3 Calibration Circuit

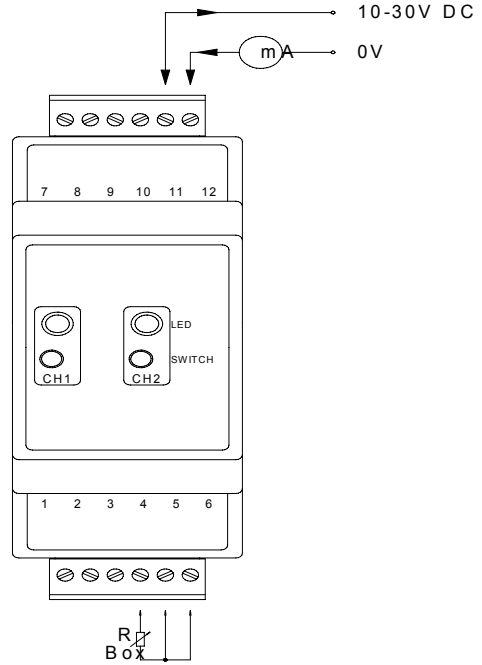

Figure 3

SEM523P
DIN RAIL MOUNTED DUAL CHANNEL TEMPERATURE TRANSMITTER

Designed, manufactured and supported by

STATUS INSTRUMENTS

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1.0 DESCRIPTION

The transmitter is a dual channel DIN rail mounted 4-20mA transmitter that connects to any standard Pt100 sensor and converts the sensor temperature to a 4-20 mA signal.

An LED provides a visual indication of sensor fault and programming mode. The transmitter is simply ranged and calibrated on the bench by using a single on-board push button switch, without the need for soldering links. Digital technology ensures accurate and drift free linearisation to all common curves, providing a level of performance not possible with earlier analogue types.

2.0 SPECIFICATION @ 20ºC

2.1 Input

Input Type	3 Wire Pt100 (Pt500 or Pt1000 to special order)
Linearisation	BS EN 60751 (IEC751) BS 1904 (DIN 43760) JISC 1604
Excitation Current	1mA Maximum
Range	-200 to 850ºC
Minimum Span	20ºC
Lead Resistance	<10 R per leg (balanced)
Burnout	Upscale 22mA (Downscale preset current to order) Red programming LED illuminates when temperature is outside -200 to 850ºC range
Accuracy	±0.1ºC ± 0.1% of reading range -100 to 500 ±0.2ºC ± 0.1% of reading range -200 to 850
Thermal Drift	Zero ± 0.01C / ºC Span 50 ppm
Connections	Screw Terminals Two part

2.2 Output

Output	4 to 20 mA, 2 wire loop powered
Maximum Output Range	3.8 to 22 mA
Operating Voltage	8 to 30 V DC
Accuracy	± 5uA
Thermal Drift	± 1uA/°C
Response Time	500mS to reach 70% of final value
Loop Resistance	800R @ 24 V DC
Loop Sensitivity	0.4 µA / volt
Loop Noise	±0.001 µA
Protection	Reverse Polarity Protected
Connections	Screw Terminals
Input/Output Isolation	Not isolated
Channel to	
Warm-up Time	2 Minutes to full accuracy
EMC	Emissions BS EN50081-1 Susceptibility BS EN50082-2
Ambient Temp. Range	0 to 70 ºC
Ambient Storage	-40 to 70 ºC
Ambient Humidity	0 to 95 % (Non condensing)
Default Range	0-100ºC. Contact sales office for factory configuration to any other range.

3.0 INSTALLATION

3.1 Mechanical

This transmitter has been specifically designed to be mounted on a universal DIN rail inside an enclosure, which must provide adequate protection from moisture, corrosive atmosphere etc. All cable entries should be sealed using the correct size cable gland. Care must be taken when locating the transmitter to ensure the ambient temperature will remain inside the specified range of 0 to 70 ºC. The diagrams show the mechanical layout and a typical application of the transmitter mounted on a universal DIN rail, with sensor wires entering at the top and bottom of the unit.

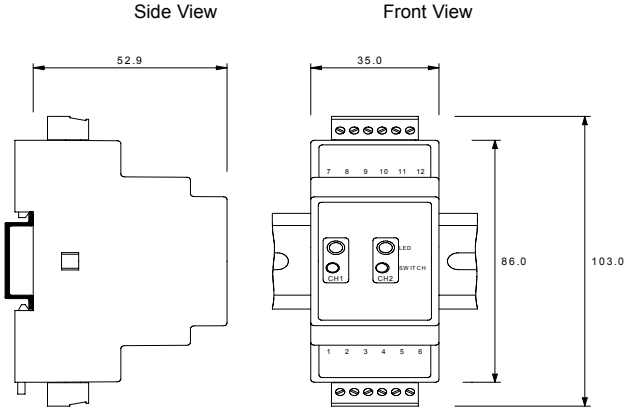

Figure 1

Rail (DIN EN 50022-35)

3.2 Electrical

Connections to the transmitter are made by screw terminals. To maintain CE compliance, input and output wiring must be screened cable with the screen earthed at one end only. All three input wires must have the same core diameter to maintain equal lead resistance in each wire.

The transmitter is protected against reverse connection, therefore incorrect connection of the output wires will result in near zero current flowin the loop. Incorrect connection of the sensor wires will result in the transmitter output going to burnout condition.

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 output. The output loop shows a 24 VDC power supply, used to provide loop excitation, the transmitter, and a load, all connected in series. The load symbol represents other equipment in the loop e.g. indicators, controllers, loggers etc.

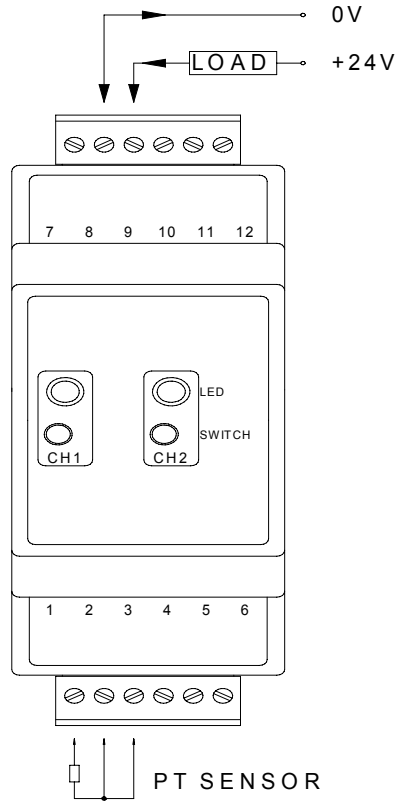

Figure 2