1.0 GENERAL

The SEM315 is a HART Din Rail temperature transmitter that accepts commonly used temperature sensor, slidewire transducer or millivolt signal and converts the output to the industry standard 4-20mA transmission signal.

The software package RCP2 or a Hart Communicator with the necessary "Device Description" can be used to program the unit.

Separate instructions are available for programming the transmitter using RCP2.

2.0 SPECIFICATION @ 20ºC

2.11 RTD Input (Pt100), 2 3 or 4 Wire

Sensor Range	-200 to +850ºC (18 to 390Ω)
Minimum Span [1]	25ºC
Linearisation	BS EN 60751 (IEC 751) BS 1904 (DIN 43760) JISC 1604 CUSTOM [X] [3]
Max Lead Resistance	50 Ω per leg (balanced for 3 wire)
Basic Measurement Accuracy [2]	±0.01% FRI ±0.07% Rdg (FRI = Full Range Input)
RTD Excitation Current	300µA to 500µA
Thermal Drift	Zero 0.008 ºC/ºC, Span 100 ppm / ºC

2.12 Thermocouple Input

Sensor Ranges	Thermocouple Type	Measuring Range [4] ºC	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]	User defined	
Linearisation	BS EN 60584-01 / BS 4937 / IEC 584-1 (multi segment Polynomials)		
Basic Measurement Accuracy [2]	0.04% FRI ±0.04% RDG or 0.5 ºC (whichever is greater)		
Thermal Drift	Span 100 ppm / ºC		
Cold Junction Error	±0.5ºC		
Cold Junction Tracking	0.05ºC/ ºC		
Cold Junction Range	-40 to +85 ºC		

2.13 Millivolt Input

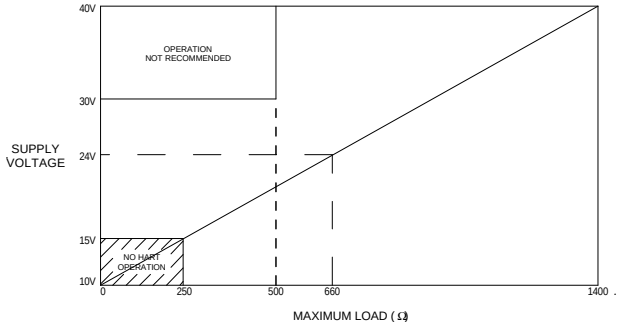
Input	Voltage Source
Range	-10 to +75mV
Characterisation	Linear Custom [X] [3]
Minimum Span	5mV
Basic Measurement Accuracy [2]	±10µV ± 0.07%Rdg
Input Impedance	10 M Ω
Thermal Drift	Zero 0.1 µA/ ºC, Span 100ppm/ ºC

2.14 Slidewire Input

Input	3 Wire potentiometer
Resistance Range	10 Ω to 390 Ω (End to End) Larger values can be accommodated by fitting a link, see Figure 2.
Characterisation	Linear Custom [X] [3]
Minimum Span [1]	5% of FRI
Basic Measurement Accuracy [2]	0.1% FRI
Thermal Drift	Zero, 0.005% of span / ºC Span, 100 ppm / ºC
Range	0-100%

2.2 Output

Output range	4-20mA, Min. 3.8mA, max. 20.2mA
Accuracy	±5µA
Thermal Drift	1µA / ºC
Supply Voltage [5]	10 to 40V
Supply Voltage effect	0.2µA / V
Maximum output load	[(Vsupply - 10) / 21] KΩ 250 Ω minimum loop load for correct HART operation. [5]



Note 1 Any span may be selected but full accuracy is only guaranteed for spans greater than the minimum recommended.
2 Includes the effect of calibration, linearisation and repeatability.
3 Custom characterisation is available pre programmed at the factory. Contact your nearest Sales office.
4 Consult Thermocouple reference tables for practical temperature ranges.
5 For supply voltages over 30V, a minimum loop load of 500 Ω is necessary.

2.3 General

Input/Output Isolation	500VAC (breakdown voltage 3000VAC)
Time Constant (Filter Off)	0.5 secs (to 90% of final value)
Filter Factor Programmable	Off / selectable between 1 and 32 seconds / or Adaptive
Warm-up Time	2 minutes to full accuracy
Re-calibration Interval	1 year, to maintain accuracy to published specification. 5 years, to maintain accuracy to less than twice published specification.

Environmental

Ambient Operating Range	-40 to 85ºC
Ambient Storage Temperature	-50 to +90ºC
Ambient Humidity Range	10 to 95% 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
Dimensions	90 x 99 x 18.5mm
Flammability	UL94-V0
Connections	Tension clamp two part terminals and 3.5mm jack for comms

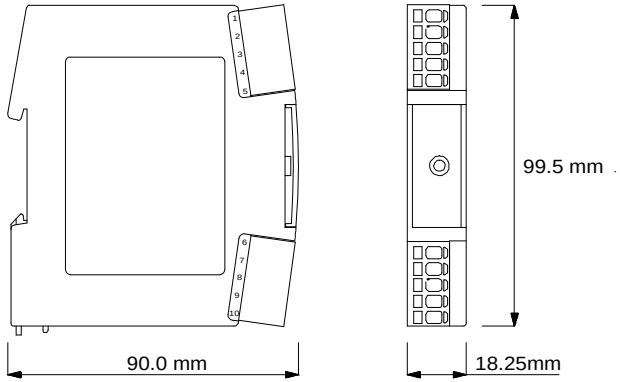
3.0 INSTALLATION

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



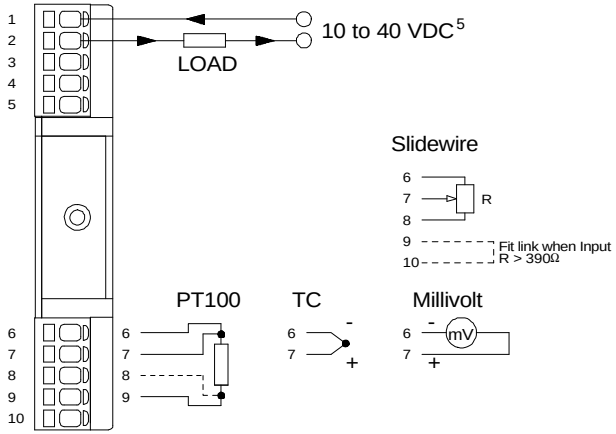
3.2 Electrical

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 input wires must have the same core diameter to maintain equal resistance in each wire.

Figure 2 shows the method of connection to provide a 4-20 mA current loop output. 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.

Figure 2



* Resistance Range, 10 Ω to 390 Ω (End to End)
Larger values can be accommodated by linking terminals as shown.

4.0 HART Programming

Consult HART website for more details: http://www.hartcomm.org

4.1 Connection Arrangement for HART Communicator

Figure 3.1a

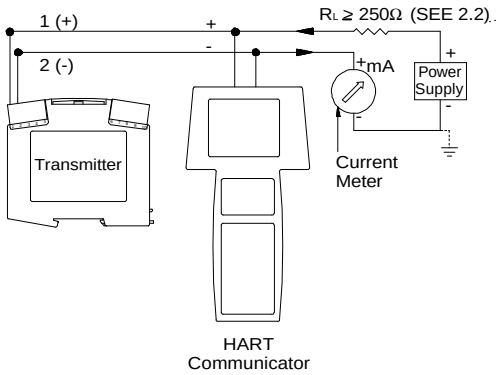
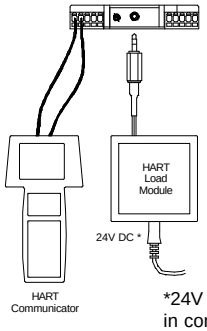


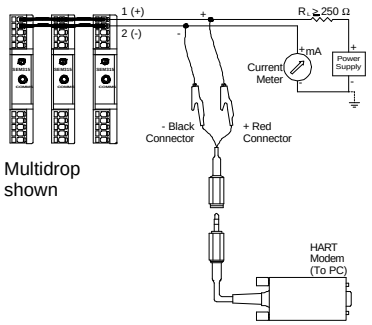
Figure 3.1b



*24V Power supply is provided in configuration kits

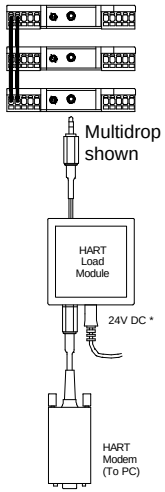
4.2 Connection Arrangements For HART Modem (e.g. RCP2)

Figure 3.2a



Multidrop shown

Figure 3.2b



Note.

Transmitters must be configured individually for Multidrop mode, by setting the Device Number between 1 and 15.

This cannot be done while the transmitters are connected together.

The SEM315 can also be configured by connecting the Communicator or HART modem across the load in figure 3.1a and

SEM315

DIN RAIL

HART®

TEMPERATURE

TRANSMITTER

Designed, manufactured and supported by :

STATUS INSTRUMENTS LTD

Green Lane Business Park

Green Lane. Tewkesbury

Glos. GL20 8DE. 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.

HART is a registered trademark of the HART Communication Foundation.

Stock code : 52-214-2275-01 Issue : 01