SEM310 USER GUIDE
UNIVERSAL TRANSMITTER USER INSTRUCTIONS

Important - Please read this document before installing.
Every effort has been taken to ensure the accuracy of this document; 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.

IMPORTANT – CE, UKCA & SAFETY REQUIREMENTS
Product must be mounted inside a suitable enclosure providing environmental protection to IP54, => IP65 is recommended.
To maintain CE EMC requirements, input wires must be less than 3 metres.
The product contains no serviceable parts, or internal adjustments. No attempt must be made to repair this product. Faulty units must be returned to supplier for repair.
This product must be installed by a qualified person. All electrical wiring must be carried out in accordance with the appropriate regulations for the place of installation.
Before attempting any electrical connection work, please ensure all supplies are switched off.

ABSOLUTE MAXIMUM CONDITIONS (To exceed may cause damage to the unit).	
Supply Voltage	± 30 V dc (Protected for over voltage and reverse connection)
Current with over voltage	± 100 mA
Input Voltage	± 3 V between any terminals
Ambient	Temperature (-40 to 85) °C, Humidity (0 to 95) % RH (Non-condensing)

Important – Read this document before installing.

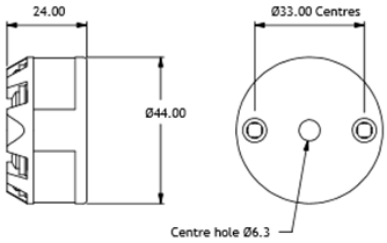
1~DESCRIPTION.
This head mounted temperature transmitter connects to RTD, thermocouple and other sensors and converts the linearised temperature to a (4 to 20) mA signal. The transmitter is a two-wire output device, and is fully configurable by the user, over a wide temperature range, with the aid of the USB configuration kit and software.
The SEM310 is a generic HART device, version 5,6 and 7 compatible.

2~RECEIVING AND UNPACKING.
Please inspect the packaging and instrument thoroughly for any signs of transit damage. If the instrument has been damaged, please notify your supplier immediately.

3~SPECIFICATION.
Refer to data sheet for full specification. Download at www.status.co.uk

Factory defaults	Pt100 IEC, (0 to 100) °C, Up-scale burnout Filter = off, User offset = 0.0 °C, HART address 0

4~INSTALLATION AND WIRING



Mounting holes: two holes 4.8 mm diameter, 33 mm centres.

Typical installation sequence (reference guide only) If the SEM310 is part of an assembly, steps 1 to 3 may have been completed	
1	Configuration (see section 5)
2	Mount transmitter to head (see section 4.1)
3	Wire sensor (see section 4.2 and 4.2.1)
4	Install assembly (see section 4.1)
5	Wire (4 to 20) mA loop (see section 4.2.2)

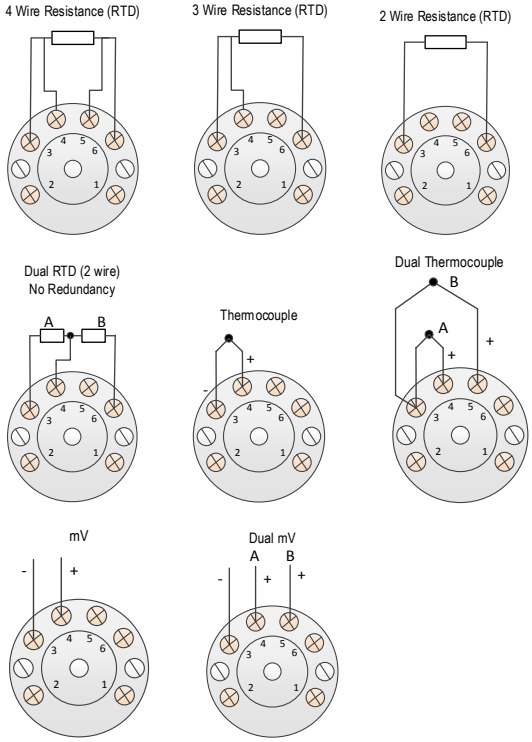
4.1~MECHANICAL.
The transmitter has been specifically designed to fit inside a DIN standard probe head enclosure, which provides adequate protection from moisture, dust, corrosive atmospheres etc. All cable entries must be sealed using the correct size gland. Likewise, any probe assembly fitted must be sealed.
The device body has a centre hole allowing the sensor wire to enter screw terminals from the transmitter centre; this is applicable when the sensor is mounted directly below the transmitter.
Care must be taken when locating the transmitter/assembly to ensure the working ambient temperature range of (-40 to 85) °C is not exceeded.

4.2~ELECTRICAL.
Electrical connections to the transmitter are made to the screw terminals provided on the top face.

Note; For RTD sensors, wires must be of equal length and type for the lead compensation to work correctly.
Note; For thermocouple sensors, the correct compensating cable must be used.

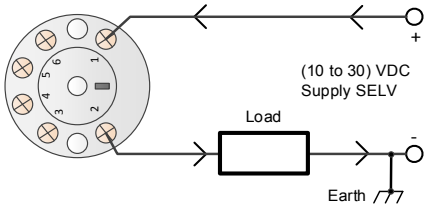
The screw terminals allow for wires to enter either from the inner or outer direction.
The transmitter is protected against reverse connection and over voltage. If no sensor (input) connection is made the transmitter will go into either up or down-scale output current, depending on configuration.
The transmitter conforms with EC directive BS EN 61326 when correctly installed in a termination head providing at least IP54 protection.

4.2.1~Input connections.
Note; Input sensor wires must be less than 3 metres to conform to BS EN 61326.
It is recommended a screened sensor cable is used and grounded at one point only.
The diagrams below show input connection wiring.



4.2.2~Two wire (4 to 20) mA output connection.
The diagram below gives output connection details; the output is shown connected to a VDC supply. The load symbol represents any other device connected in the loop, such as monitoring equipment, panel indicators and loop isolators. The load value can range from 0 ohms to the maximum loop load for given supply.

Always ensure the (4 to 20) mA loop is grounded at one point; this would normally be at the monitoring equipment or loop power supply.
Screened or twisted pair wires are recommended for output wires. Avoid running signal wires alongside mains or AC power lines.

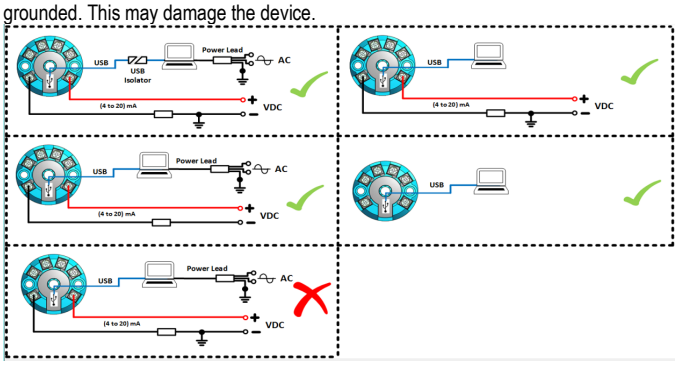


5~USER CONFIGURATION.

⚠ IMPORTANT

READ COMPLETE SECTION BEFORE ATTEMPTING CONFIGURATION.
A USB A to mini B lead is required for connecting the device to the PC. Refer to your supplier for details.

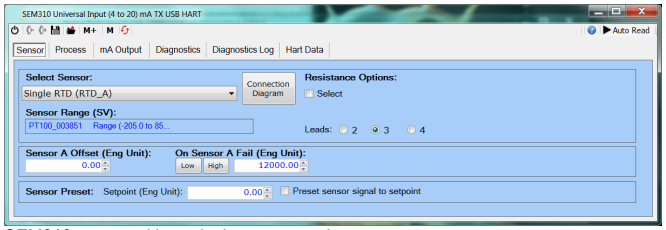
⚠ The device can be configured whilst connected and powered, a battery powered PC should be used to avoid the effects of ground loops if the (4 to 20) mA loop is grounded. This may damage the device.



Configuration steps
Install and run the software
Select the correct programming page in the software (follow any on screen safety precautions)
Connect the USB lead to the PC, connect the USB lead to the device
Read the unit configuration into the software
Re-configure or adjust configuration options as required
Send the new configuration to the unit

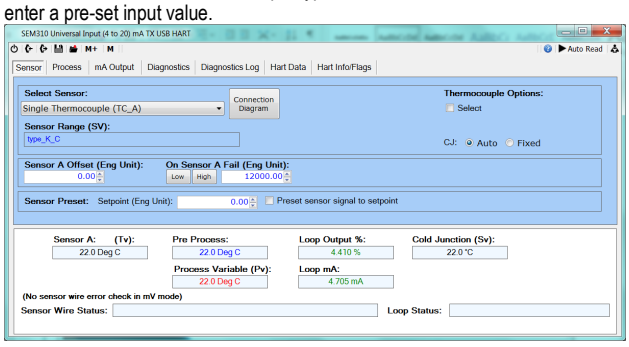
5.1~USBSpeedLink software.

Note; When the unit is correctly connected the "Send" and "Receive" menu buttons will turn black and the "data" section of the screen will open below the configuration section.

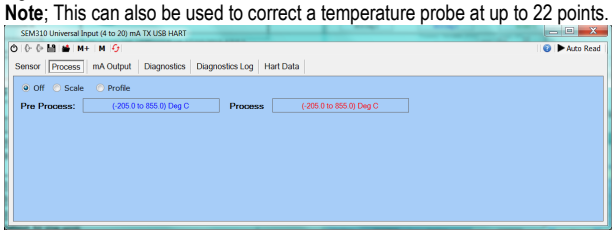


SEM310 screen with no device connected.
Note; Work from left to right across the tabs on the configuration software.

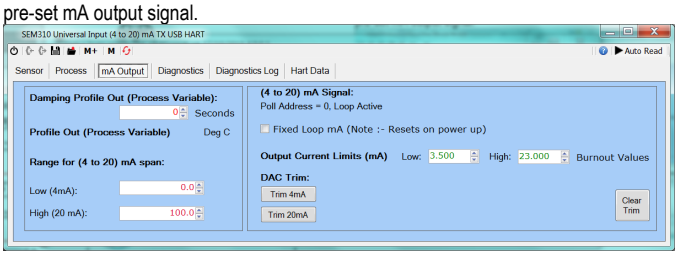
SEM310 Sensor tab (device connected showing live data reading)
The sensor tab is used to select input type, sensor offset, burnout and can be used to enter a pre-set input value.



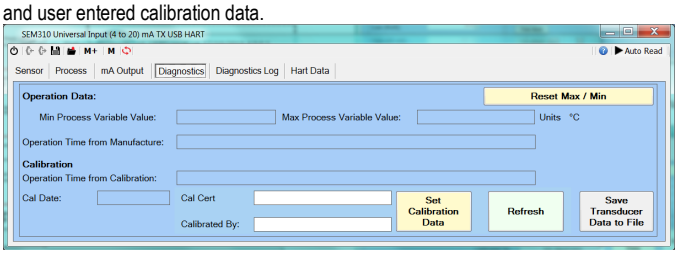
SEM310 Process tab
Off; For normal temperature sensor operation.
Scale; For process inputs, to select a straight-line relationship between input and output values.
Profile; Can be used to enter a user non-linear relationship between input and output signals.
Note; This can also be used to correct a temperature probe at up to 22 points.



SEM310 mA Output tab
Used to set the output range, trim the (4 and 20) mA levels, set damping and set a pre-set mA output signal.

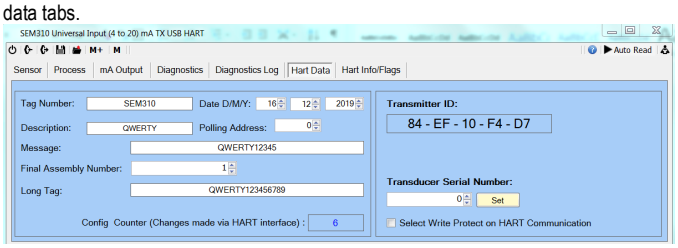


SEM310 Diagnostic tabs
Diagnostic information including maximum and minimum values, run time of the device and user entered calibration data.



The diagnostic log tab can be set to record a log onto the SEM310. A 150-point rolling log set at time intervals between 5 s up to 1 hr can be recorded for viewing or can be saved to a text file.

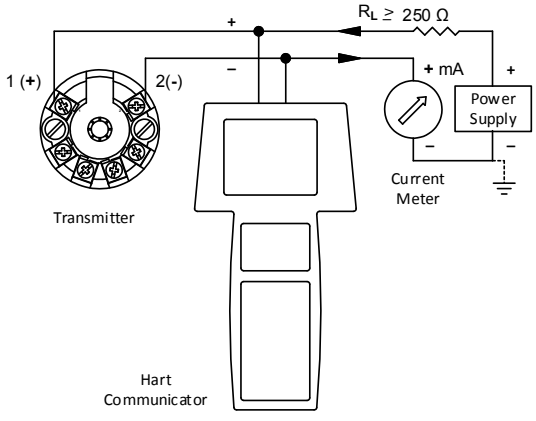
SEM310 HART tabs
HART data including polling the address can be entered and read using the two HART data tabs.



5.2~HART COMMUNICATIONS.

The SEM310 is a "Generic" HART device. It can be connected to a HART communications device as shown below.
Run-time data monitoring in either loop or HART mode is possible.
Basic set up parameters including (4 and 20) mA trim can be performed, for advanced features use the USB configuration software.

Universal commands	All universal commands are supported
Common practice commands supported	
34 Write damping value	35 Write range values
40 Enter/Exit fixed mA mode	41 Perform device self-test
42 Perform master reset	44 Set (Trim) PV zero
45 Trim DAC zero	46 Trim DAC gain
49 Write PV transducer number	59 Write number of response preamble



Status Instruments Ltd, Status Business Park, Gannaway Lane, Tewkesbury, Gloucestershire, UK, GL20 8FD, Web Page: www.status.co.uk,
Email: sales@status.co.uk
Technical Support: support@status.co.uk
Tel: +44 (0) 1684 296818, Fax: +44 (0) 1684 293746