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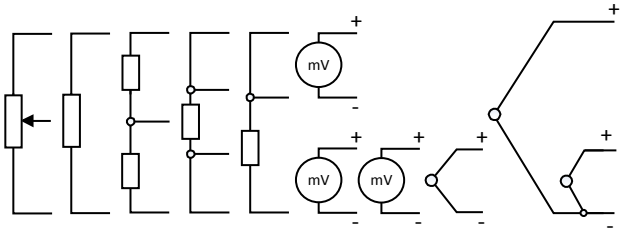
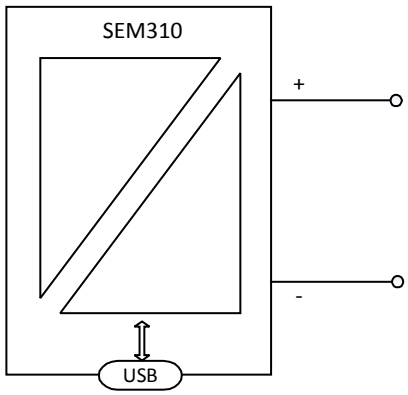
SEM310 USER GUIDE

SMART IN HEAD MOUNTED UNIVERSAL TRANSMITTER
TWO WIRE (4 to 20) mA OUTPUT





Important - Please read this document before any 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 & SAFETY REQUIREMENTS

Product must be mounted inside a suitable enclosure providing environmental protection to IP65 or greater.

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 (10 to 95) % RH (Non condensing)

Product Information

Example of Type and Range shown below

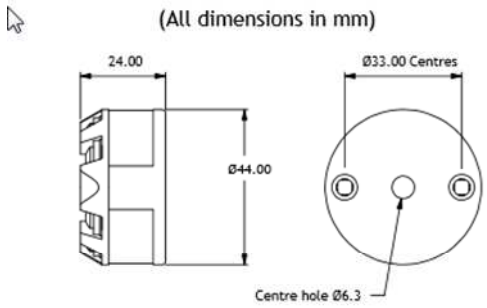
Conditions for use

The SEM310 temperature transmitter should be mounted in an enclosure with a minimum IP rating of IP54. The enclosure should be specified to operate in the ambient temperature range of (-40 to 85) °C.

Maintenance

The SEM310 apparatus contains no user serviceable adjustable, replaceable parts. No attempt should be made to repair a SEM310 device, all units must be returned to the manufacturer for repair or replacement. Attempted service or replacement of parts may invalidate the warranty of the SEM310.

Mechanical Detail



The SEM310 is mounted using two holes, on standard 33 mm fixing centres and will fit a DIN standard termination head. The SEM310 must be installed with adequate protection from moisture and corrosive atmospheres. Refer to conditions for use section of this user guide for information on enclosure IP rating.
Care must be taken to ensure the SEM310 is located to ensure the ambient temperature does not exceed the specified operating temperature.
A 6.3 mm hole is provided in the centre of the transmitter for sensor wires.
The sensor wires may also be fed on the outside of the transmitter.

Installation

For SEM310 specification please refer to product data sheet. Installation is normally performed in the following order. If the SEM310 has been purchased as part of a probe assembly ,steps (1 to 3) will have been completed. The user may wish to reconfigure the transmitter range, in this instance the SEM310 range can be changed on a completed probe assembly by following step 1.

1. Configuration
2. Mount Transmitter into head
3. Wire Sensor
4. Install Assembly
5. Wire (4 to 20) mA Loop

1. Configuration

Note: - The SEM310 can be configured whilst connected and powered, but a portable battery powered computer must be used to avoid the effects of ground loops if the (4 to 20) mA loop is grounded. This may damage the SEM310.

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Once software is installed remove protection cover from device port , plug in USB Lead to device ports and connect PC using USB cable.

In USBSpeedLink software, select Model type from "Field Product – In Head TX" menu.
For further information on configuration please open the help menu on the product configuration screen. On completion of configuration remove USB cable and replace protective cover over socket.

Factory default setting Sensor PT100 range (0 to 100) °C,

The main configuration is performed using the USB interface. The following parameters may be configured using the powerful USBSpeed link software tool, which also provide operator diagnostics.
The following functions apply :-

SENSOR	
Sensor type	mV, Dual mV, ohms, slide wire, thermocouple, dual thermocouple, RTD, dual RTD (2 wire).
Sensor wire	(ohms and rtd ranges only) 2, 3, or 4 wire.
Thermocouple type	Download from USBspeedlink expanding library, common type K,J,T,E,R,S,N,B,U,G,C,D.
Thermocouple CJ	Fixed or Auto.
RTD type	Download from USBspeedlink expanding library, common type PT100, PT1000, PT500, Ni, CU, KTY series.
Sensor(s) Fail	Value on sensor A, (sensor B) fail.
Sensor Pre-set	Override sensor signal with pre-set value, primary function diagnostics.
PROCESS	
Scaling	Scale sensor signal to PV, options - Off, Two point scaling or (4 to 22) step profile.
Units	Set PV units
mA Output	
Damping	Profile out damping (0 to 32) seconds.
Range	Range (PV units) For (4 to 20) mA output.
Fix Loop Current	Fix loop current to pre-set value (Note resets on power up) . Primary use Diagnostics.
Hart Multi_drop	Detects HART address > 0.
Set Max mA	Set the maximum output current (20 to 23)mA.
Set min mA	Set minimum output current (3.5 to 4.0) mA.
Trim	Read set and reset (4 and 20) mA Trim values. (as for Hart DAC trim).
DIAGNOSTICS	
Power ups	Number of power ups from manufacture.
Min Max PV	Minimum and maximum process variable value during operation with reset.
Operating times	From manufacture and calibration. Calibration time is resettable.
Calibration	Store Date, operator and certificate number.
Save Data	Save transducer data to text file.
DIAGNOSTCS LOG	
Type	150 point non volatile Process Variable log, with power off indication and sensor fail (not time stamped).
Rates	User set log periods seconds 5, 15, 30 minutes 1, 2, 5, 10, 20, 30, or 60.
Backup	Save log to PC in CSV style format (using semi colon delimiter) for easy export to text editor or spreadsheet.
HART DATA	
Edit	Tag Number and Date, Description, Message, Long Tag, Final Assembly Number, Transducer serial number.
Set	Poll address, write protect.
Reset	Configuration counter.
HART INFORMATION/FLAGS	
Read	Manufacturers ID, Short ID, Hart Revision, Device Revision, Software Revision, Unique ID, No Preambles, Max No Variables, Configuration Change register, Extd device status, Extd Manufacturers ID, Extd Distributers ID, Device status flags, Extd device status flags.
PROCESS DATA	
Data	Live data for sensor (TV) ,pre-scaling, post scaling (PV), Untrimmed mA output, Actual mA output, % output signal and device ambient temperature (SV) (cold junction).
Diagnostics	Sensor wire error detect (not supported in mV mode), Loop power detect.

SEM310 Hart Interface provides the user with the following functions :

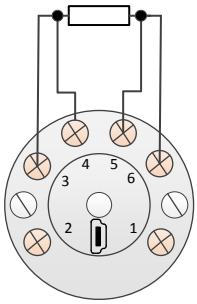
Universal Command	All universal commands are supported.	
Common Practice commands	34	Write Damping Value
	35	Write Range Values,
	40	Enter/Exit Fixed Current Mode
	41	Perform Device Self-Test
	42	Perform Master Reset
	44	Set (Trim) PV Zero
	45	Trim DAC Zero
	46	Trim DAC Gain
	49	Write PV transducer number
	59	Write Number Of Response Preambles

2. Mount Transmitter into Head

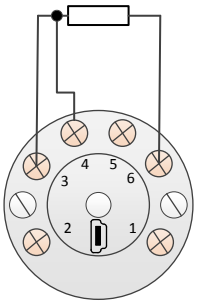
The SEM310 is mounted using two holes, on standard 33 mm fixing centres and will fit a DIN standard termination head. The SEM310 must be installed with adequate protection from moisture and corrosive atmospheres. Refer to conditions for use section of this user guide for information on enclosure IP rating. A centre hole is provided in the SEM310 case, this allows for sensor wire to enter wiring section through the SEM310 body.

3. Sensor Connection

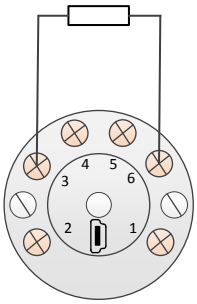
4 Wire Resistance (RTD)



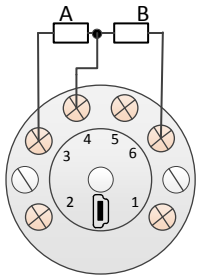
3 Wire Resistance (RTD)



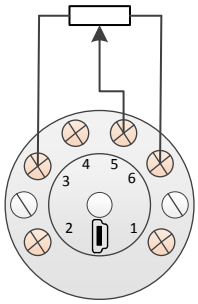
2 Wire Resistance (RTD)

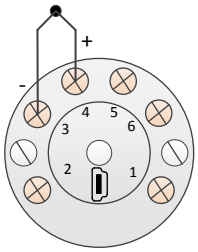


Dual RTD (2 wire)
No Redundancy

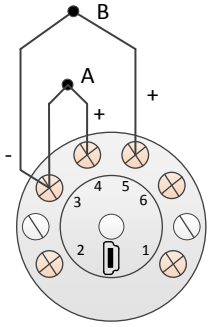


Slide Wire

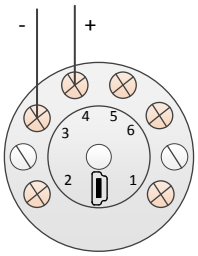




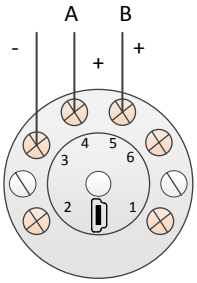
Thermocouple



Dual Thermocouple



mV



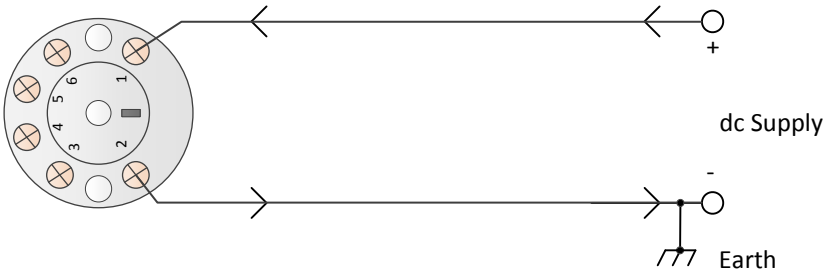
Dual mV

4. Install assembly

Care must be taken to ensure the SEM310 is located to ensure the ambient temperature does not exceed the specified operating temperature

5. Wire (4 to 20) mA Loop

Ensure all other aspects of the installation comply with the requirements of this document. The (4 to 20) mA loop is connected as follows:-



Additional Information

EMC	BS EN 61326-1 (Sensor wires maximum length 3 metres to comply.)
Enclosure	Colour Black