User instruction for SEM310X electrical apparatus for use in a hazardous area.
Important: Read and understand this document before any installation.

ATEX & IECEx Instructions

For safe installation of the SEM310X in hazardous areas the following instructions must be observed. The transmitter must be installed by competent personnel, who are familiar with national and international laws, directives and standards that apply to their region. For installation in European Economic Area (EEA) member countries users must follow requirements for electrical equipment for use in potentially explosive atmospheres, e.g. EN60079-14 & EN60079-17. This instruction sheet describes installation, which conforms with BS EN60079-14 & BS EN60079-17. Important - Particular attention must be paid to the section titled "Special conditions for safe use", failure to comply to this requirement will result in an unsafe system.
The SEM310X has been issued with a EU-type examination certificate, confirming compliance with European ATEX directive 2014/34/EU for the following specification :-

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Product Information

The following Information is printed on the product label

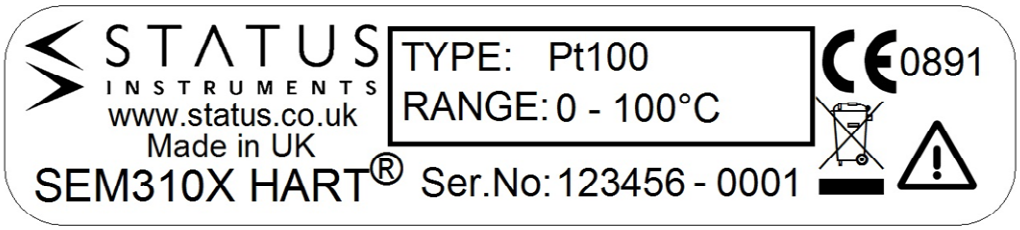
Manufacturer	Status Instruments Ltd
Type Number	SEM310X
Certificate Ref	EMT16ATEX0005X

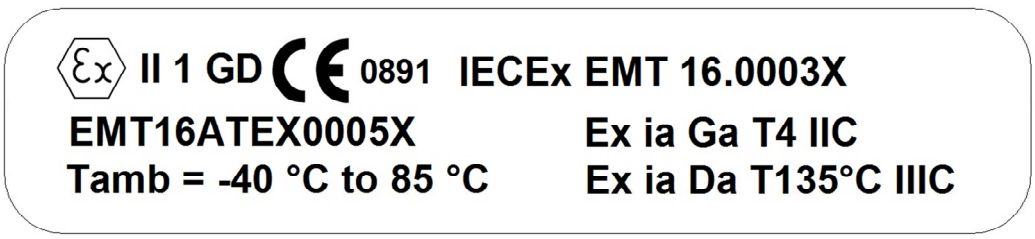
Zones

Area Classification		Zone Criteria for Application Atmosphere
Gases	Dusts	
Zone 0	Zone 20	Present continuously or for long periods (> 1000 hours per annum)
Zone 1	Zone 21	Likely to occur in normal operation occasionally (> 10 to < 1000 hours per annum)
Zone 2	Zone 22	Unlikely to occur in normal operation (< 10 hours per annum)

Classification

Example of Type and Range shown below





Working Parameters

		Terminals + / -
Ui	=	30 V
Ii	=	100 mA
Pi	=	750 mW
Ci	=	0
Li	=	0
Uo	=	-
Io	=	-
Po	=	-

Additional Information

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

STATUS INSTRUMENTS

Special conditions for safe use

1. a) For gas applications, the SEM310X temperature transmitters must be mounted in an ATEX/IECEx approved enclosure rated for IP54 and located in an area where the enclosure will not be subject to impact or friction

   b) For dust applications, the SEM310X temperature transmitters must be mounted in a suitably ATEX or IECEx certified enclosure appropriate for the zone of end use.

2. The equipment shall only be configured by means of the USB connection outside the hazardous area, however it can it be config by HART in hazardous area via HART communication.

3. If the equipment is mounted in an enclosure with separate IS circuits, appropriate segregation shall be provided in accordance with IEC 60079-11 Clause 6.2.1.

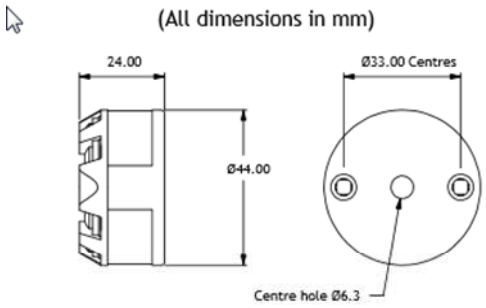
4. Only suitable for connection to Thermocouple(s), RTD temperature sensor(s) or slide wire resistance devices or a simple apparatus. They shall conform to the requirements for simple apparatus as defined in IEC 60079-11 clause 5.7 and shall meet the dielectric withstanding requirements of IEC 60079-11 clause 6.3.13. The insulation must be capable of withstanding an r.m.s a.c. test voltage of 2U + 1000V, with a minimum of 1500V r.m.s., where U is the sum of the voltages of the intrinsically safe and the non-intrinsically safe circuit.

5. The ambient temperature range of the enclosure will limit the permitted ambient range of the overall equipment. Refer to enclosure certification.

Maintenance

The appropriate regulations concerning maintenance, repair and testing must be observed. In particular, all parts on which explosion protection depends must be checked during maintenance. The transmitter must never be configured in the hazardous area, the device must be removed and taken to a non hazardous area for configuration.
The enclosure used to house the SEM310X must be cleaned regularly to prevent build up of excessive dust layers.
The SEM310X apparatus contains no user serviceable adjustable, replaceable parts. No attempt should be made to repair a SEM310X device, all units must be returned to the manufacturer for repair or replacement. Attempted service or replacement of parts may invalidate the explosive protection features of the SEM310X.

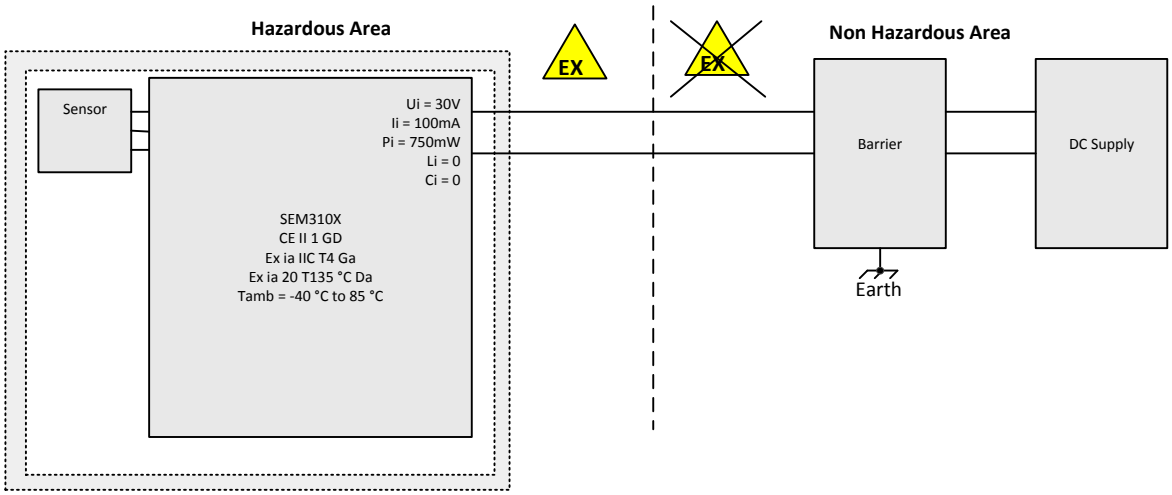
Mechanical Detail



The SEM310X is mounted using two holes, on standard 33 mm fixing centres and will fit a DIN standard termination head. The SEM310X must be installed with adequate protection from moisture and corrosive atmospheres. Refer to "special conditions for safe use" section of this user guide for information on enclosure IP rating.
Care must be taken to ensure the SEM310X is located to ensure the ambient temperature does not exceed the specified operating temperature as specified in the "TEMPERATURE CLASS" table.
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.

Electrical Detail

REFER TO CONDITIONS FOR SAFE USE



Sensor wires must be isolated from earth breakdown voltage 500 V dc

Installation

REFER TO CONDITIONS FOR SAFE USE

For SEM310X specification please refer to product data sheet. Installation is normally performed in the following order. If the SEM310X 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 SEM310X 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

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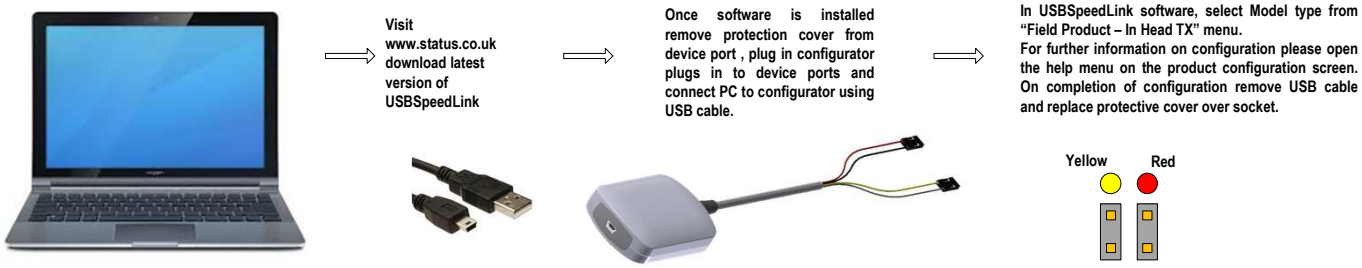
1. Configuration – Only to be performed in the safe area

Note: - The SEM310X 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 SEM310X. Only to be performed in the safe area



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.

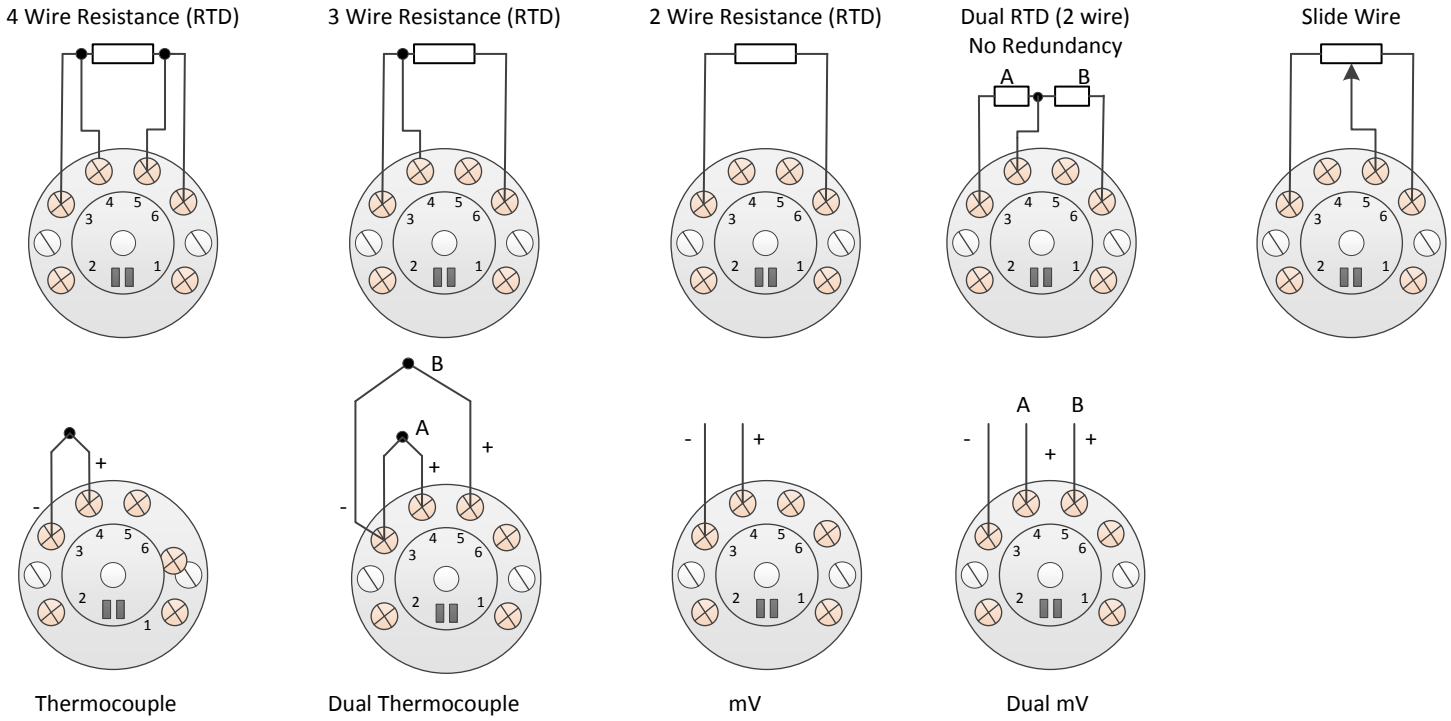
SEM310X Hart Interface provides the user with the following functions :

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 SEM310X is mounted using two holes, on standard 33 mm fixing centres and will fit a DIN standard termination head. The SEM310X must be installed with adequate protection from moisture and corrosive atmospheres. Refer to "special conditions for safe use" section of this user guide for information on enclosure IP rating. A centre hole is provided in the SEM310X case, this allows for sensor wire to enter wiring section through theSEM310X body. Observe the "special conditions for safe use " instruction.

3. Sensor Connection



4. Install assembly

Care must be taken to ensure the SEM310X is located to ensure the ambient temperature does not exceed the specified operating temperature (-40 to 85) °C

5. Wire (4 to 20) mA Loop

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