SENTINEL™

OPERATORS MANUAL

Rev. 1 November 2016

QUICK STARTUP GUIDE

Electrical and compressed Gas Hazards

Safety

The SENTINEL trace moisture Analyzer delivered to you has been tested for safety, calibrated and approved as shipped from the factory. Note the following precautions:

CAUTION	Do not modify the unit. Improper modification can damage the product or lead to malfunction.

CAUTION	The sensor probe body does not have user serviceable parts inside, and is not designed to be opened. Opening the sensor probe body will void the warranty.

ESD Protection

Electrostatic Discharge (ESD) can cause immediate or latent damage to electronic circuits. Edgetech Instruments products are adequately protected against ESD for their intended use. It is possible to damage the product, however, by delivering electrostatic discharges when touching, removing, or inserting any objects inside the equipment housing.

1. To make sure you are not delivering high static voltages yourself when handling the replaceable sensor tip PCB
2. Handle ESD sensitive components on a properly grounded and protected ESD workbench.
3. When an ESD workbench is not available, ground yourself to the equipment chassis with a wrist strap and a resistive connection cord.
4 If you are unable to take either of the above precautions, touch a conductive part of the equipment chassis with your other hand before touching ESD sensitive components.

Always hold component boards by the edges and avoid touching the component contacts.

SENTINEL

The Sentinel unit is a “Plug & Play” trace moisture measurement system. It uses a single multi sense probe that reads humidity, temperature and pressure from this it calculates trace moisture concentration in PPMv or grlb It is supplied completely assembled, pre-programmed and has been fully function tested and calibrated. The unit requires only the multi sense probe to be inserted into the process to be measured. The display module mounted and power connection made to a local outlet. The display can be set with a wide range of display values that can be selected at time of order or reset on site using the RS232 menu. Temperature in C or F, %RH, Dewpoint in C or F, Pressure in Bar, PSIA, mBar or inHg. Moisture content in PPMv or grlb

MOUNTING the SENTINEL

The Sentinel unit can be configured as a Diffusion mount, Flow through sample chamber or pipe flange insertion mount.

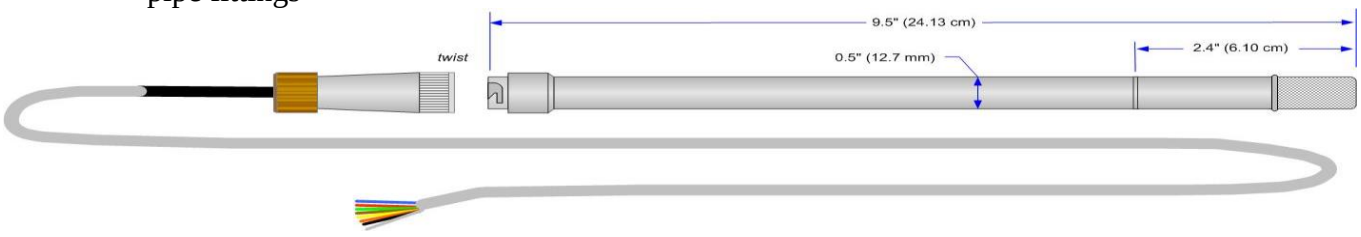
When the sensor is first introduced into the process it will need a period of time for the materials to dry down before the sensor reads PPMv moisture correctly.
During installation process the probe will have been exposed to ambient conditions. The tip PCB will have absorbed some moisture.
Once installed in the process any entrained moisture will be drawn off by the process gas and the unit will quickly reach equilibrium.

Allow the unit to stabilize after power up and to equilibrate at the sample conditions

WHEN USING SENSOR with CABLE.

Before mounting the sensor probe body into any system ensure the system is safe to work on. Depressurised and verify that all power to connections are isolated in the Off position.
Installation should be carried out by trained technicians and following local safety protocols

1. Select sensor insertion position, ensure safe clearance around the probe to avoid damage
2. Ensure there is adequate cable length from the probe cable to make connection to customer system
3. Check all pipe fittings and pipe boss dry assembly for fit up
   (Sensor is standard with ½" NPT fitting, option ¾"NPT, others are available on request)
4. Insert pipe fittings using suitable sealing tape or sealing compound
   Mount the sensor in position to measure the desired gas.
5. Ensure the sensor is inserted to an adequate depth to obtain a suitable flow of the sample gas around the tip sensor. Insertion depth; Max 6" (15cm) Min 2.4" (6cm) compression fitting should avoid the threaded tip cover joint area
6. Tighten the swage fitting till it grips the probe in place but at this stage do not apply force.
7. Re check the probe position and measurement depth are correct, fully tighten all pipe fittings



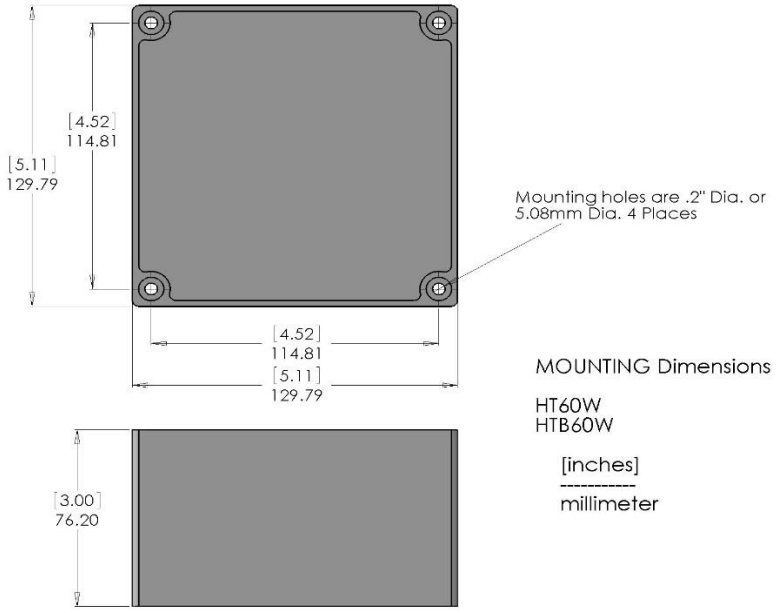
Do not apply Power until all wiring is completed and checked.

Using "Compression" type fitting (flow through or pipe flange mount)

1. Insure the compression fitting swage point are above the 2.4" minimum insertion or below the 6" maximum insertion points. If the sensor body is clamped above or below these points damage can occur to the internal screw threads.
2. How to install compression fittings. Insert the Sentinel sensor to your selected insertion depth, tighten by hand until the nut is finger tight. Further tighten the nut until the probe will not turn by hand and cannot be moved axially in the fitting.
   Mark the nut at the at the 6-0-clock position
   While holding the fitting body steady, tighten the nut one and one quarter turns till the nut is in the 9-0-clock position.
   Compression fittings may be disassembled and reassembled many times. See Sentinel Manual

CONTROL & DISPLAY MODULE

1. **Note the sensor connection cable is 6ft (1.52m) long so the display must be mounted within 6ft of the probe insertion point.**
2. **Remove the cover. The control box can be mounted with 4 screws installed through the same holes as the cover mounting screws**



1. Mount the Sensor as detailed in page 1, section 1 through 6.

2. Connect cable from Sensor to Electronics Unit
   Unit is prewired from factory. However the sensor can be disconnected for ease of installation. The probe cable is 6ft (2m) in length so ensure there is sufficient length between the sensor insertion and the display module.

3. When powered up the Sentinel display will show on the top line PPMv values. On the second line of the display will scroll to display, Dew point, Temperature and Pressure.
   Standard configuration is with Pressure in PSIA or mBar and Temperature in C.
   The display can be set with a wide range of display values that can be selected at time of order or reset on site using the RS232 menu.
   Temperature in C or F, %RH, Dewpoint in C or F, Pressure in Bar, PSIA, mBar or inHg.
   Moisture content in PPMv or grlb

4. There are 2 analogue outputs connections available (0-10V, 0-5V & 4-20mA) 4-20mA is default
   Output 1 PPMv scaled 4mA = 125PPMv and 20mA = 15,000PPMv
   Output 2 DP ^{o}C scaled 4mA = -40 ^{o}C and 20mA = 60 ^{o}C

5. There are 2 remote Alarm connections available the factory pre-set values for PPMv values
   Alarm 1 Low PPMv range Alarms at 4500PPMv and resets at 5000PPMv
   Alarm 2 High PPMv range Alarms at 10,000PPMv and resets at 9,500PPMv

6. Customers connections can be made as detailed in table below
   Alarm values can be defined with order or
   Alarm relays can be programed on site via RS232 (see manual)

TERMINAL TB1	ITEM
1,2	ALARM 2
3,4	ALARM 1
5	CHASSIS GROUND
6	ANALOG + OUTPUT 2
7	ANALOG + OUTPUT 1
8	ANALOG OUTPUT RET.
9	*FOR FACTORY USE*
10	*FOR FACTORY USE*
11	RS232 RETURN
12	DC POWER IN (+)
13	DC POWER IN (-)
14	RS232 TX
15	RS232 RX

DC power supply. Specifications are: 24VDC ± 10%, 1A maximum.

Standard units are supplied with universal VAC power adaptor

See Attached TB1 Pin Connector Guide. Note Pin Nine is used as terminal location guide

POWER

The Sentinel unit comes with as standard with a pre-wired universal power adaptor which requires a local 110/220V 50/60Hz outlet. The power adaptor is provided with a US style two power pin plug in connections.

The power cable length is 5ft (1.52m)

Notes:

Connect only the Outputs desired. See the Sentinel Manual for details.

Double check that the 24VDC power supply is correctly connected terminals 12 & 13

Do not apply Power until all wiring is completed. Once the unit is powered up allow 40sec for the display to initialize.

Always turn the power off before disconnecting or reconnecting the probe

TABLE OF CONTENTS Page

LIST OF ILLUSTRATIONS Page

LIST OF TABLES

2.0 EDGETECH INSTRUMENTS INC.'S COMMITMENT TO QUALITY

Thank you for purchasing one of our products. At Edgetech Instruments, it is our policy to provide cost-effective products and support services that meet or exceed your requirements, to deliver them on time, and to continuously look for ways to improve both. We all take great pride in the products which we manufacture 100% in the USA.

We want you to be entirely satisfied with your instrument. The information contained in this manual will get you started. It tells you what you need to get your equipment up and running, and introduces its many features.

We always enjoy hearing from the people who use our products. Your experience with our products is an invaluable source of information that we can use to continuously improve what we manufacture. We encourage you to contact or visit us to discuss any issues whatsoever that relate to our products or your application.

The Employees of Edgetech Instruments Inc.

3.0 INTRODUCTION

3.1 GENERAL DESCRIPTION

The Model Sentinel trace moisture system is, designed to continuously measure the status of your compressed air system. The instrument is powered by 24VDC. It uses a RH polymer and pressure sensors to determine the water vapor concentration in gas mixtures together with system pressure and temperature measurements. Outputs include 4 to 20 mA (Factory default unless specified otherwise when ordering), Two sets of analog outputs are supplied. Additional outputs include an RS-232C serial port, as well as electrically isolated relay contacts.

3.2 STANDARD FACTORY CONFIGURATIONS

The Sentinel is designed with a Standard configuration, as shown here.
In addition, you can consult the Factory for special configurations if needed.
The SENTINEL is designed to measure trace moisture conditions within compressed air or inert gas systems. It can measure and display calculated trace moisture in PPMv ot gr/lb. It also measures and displays RH, dew point, temperature and pressure. It consists of a display control module and a *SMART, Multi-Sense Probe.*.
The SENTINEL system continuously monitors both PPMv and dew point and provides a warning system to alert an operator should the system reach high or low PPMv alarm points
The Sentinel system comes fully prewired and requires only installation of the display control module box and the probe. A power connection needs to be available within 3m (10ft).

3.2.1 FACTORY DEFAULT OUTPUT RANGES

These <u>standard output measurement ranges</u> apply to all instruments unless specified otherwise when ordering. They correspond to 4 to 20 mA. There are 2 analogue outputs the factory defaults at selected.
Analogue output 1 PPMv.
Analogue output 2 DewPoint.

Default factory set Alarm points are PPMV Low 5000 and PPMv High 10,000
When the unit is powered up the display will show the 4-20mA range settings for optional remote connections

Default factory range is Pressure 600-1200mBar and Dew point -40 to 60F
The Dew Point value is displayed as Dew Point at atmospheric pressure. The system has imbedded intelligence that automatically corrects the DewPoint display so it always corrected to the system pressure.
The default display units are PPMv, Dew Point and temperature in degree F

Range	PPMv	130 to 23,000PPMv
	Dew Point:	-40°C to 90°C (-40°F to 194°F)
	Pressure	600 to1200mBar
	% RH	0 to 99.9%
	Air Temp:	-40°C to 125°C

INSTALLATION

4.1 PLACEMENT OF INSTRUMENT

If possible, locate the Sentinel in a clean area where the air to be measured is allowed to freely move around the enclosure. Optimal performance of the instrument is experienced when air is gently moving over sensor, providing a representative sample for measurement. Choose a location where the display may be conveniently observed. Depending on the location selected, it may be convenient to wire the instrument prior to mounting.

4.2 MOUNTING

4.2.1 WALL MOUNT

Instruments with the plastic wall mount housing are mounted to a flat surface as follows:

1. Remove the front cover. Using a flat screwdriver, carefully unscrew the four slotted plastic screws.

2. Mounting screws (not provided) are inserted in the same holes as the cover screws. They must have a head diameter that is small enough to fit inside the clearance holes, but large enough to press against the collar located at the bottom of the holes. No. 8 pan head or round head screws are recommended.

3. Reinstall the front cover. Do not over-tighten the cover mounting screws.

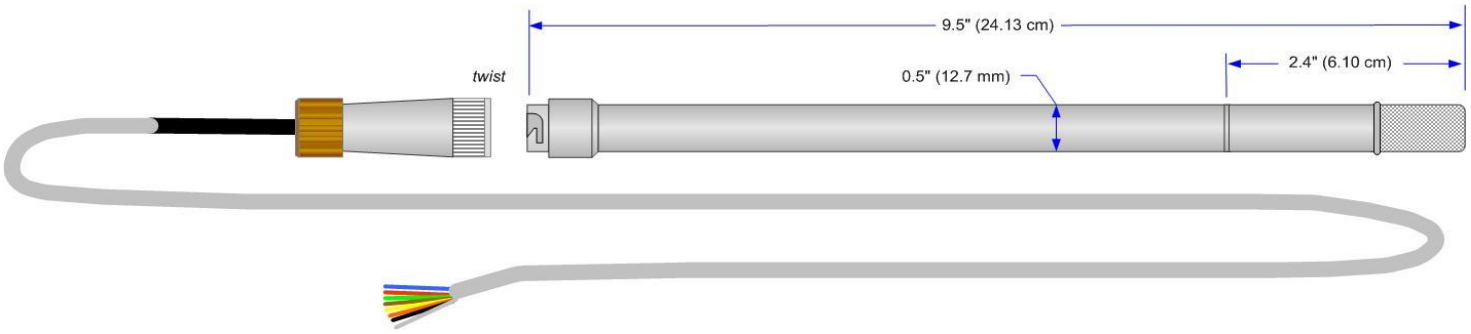
4.2.3 Mounting the PROBE with CABLE.

Before mounting the probe into any system ensure the system is safe to work on. Depressurize and verify that all the power connections are isolated in the OFF position.
Installation should be carried out by trained technicians and following all local safety protocols.

1. Ensure there is adequate cable length from the probe cable to make connection to the control box.
2. Select Probe insertion position, ensure safe clearance around the probe to avoid damage.
3. Check all pipe fittings and pipe boss dry assembly for fit up. Probe is standard with ½" NPT fitting, optional ¾" NPT.
4. Insert pipe fittings using suitable sealing tape or sealing compound. Mount the Probe in position to measure the desired gas.
5. Ensure the Probe is inserted to an adequate depth to obtain a good flow of the sample gas around the tip sensor. Insertion depth: Max 6" (15cm) Min 2.4" (6cm). The compression fitting should avoid the threaded tip cover joint area

6. Tighten the swage fitting till it grips the probe in place but at this stage do not apply force.
7. Re check the probe position and measurement depth are correct, fully tighten all pipe fittings
8. Slowly pressurize the system checking for any leaks. Do not quickly apply pressure. If the probe is incorrectly fitted it will be projected out of the fitting and can cause injury or damage.

Do not apply Power until all wiring is completed and checked



The SENTINEL unit is a standalone system and can now be powered up. If working correctly 3 values will be displayed on the read out.

4.3 ELECTRICAL WIRING

4.3.1 POWER SUPPLY

The Sentinel comes with as standard with a universal power adaptor that just needs to be plugged into a local outlet 110/220V 60/50Hz

CAUTION: DO NOT APPLY POWER TO THE UNIT UNTIL THE INSTALLATION HAS BEEN COMPLETED.

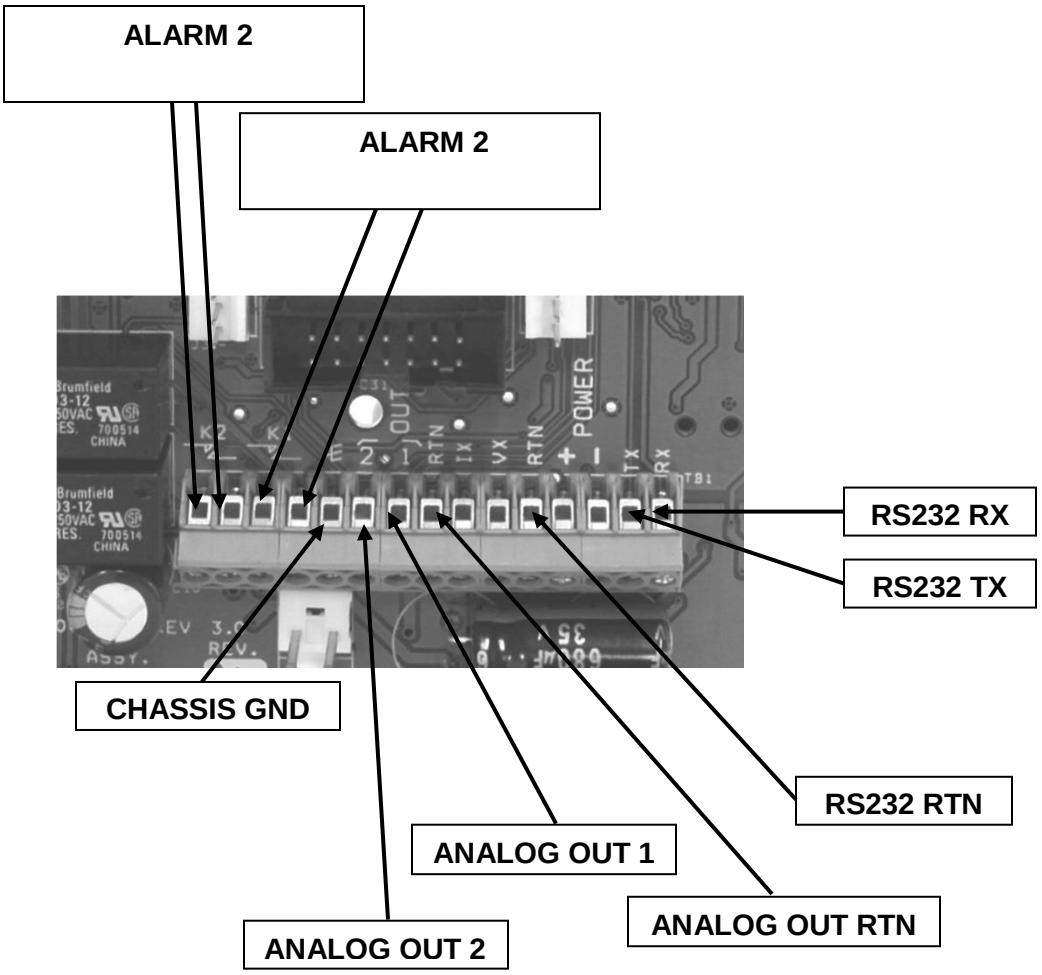
Additional customer connections

1. Two 4-20mA Analog Outputs: PPMv and Dew Point.
2. RS-232 Serial Interface.
3. Two user accessible relays for remote low PPMv/ high PPMv conditions.

TERMINAL TB1	ITEM
1, 2	Low PPMv ALARM Relay
3,4	High PPMv ALARM Relay
6	4-20mA OUTPUT PPMv
7	4-20mA OUTPUT Dew Point
8	4-20mA COM.
11	RS232 RETURN
14	RS232 TX
15	RS232 RX

Table 4-1 terminal strip connections

Figure 4-2 Terminal Strip Wiring



4.3.2 SELECTION OF ANALOG OUTPUTS

Two small electrical switches allow the selection of analog output scaling. These switches are located in the top left corner of the circuit board as shown in Figure 4-2 below. You can select the outputs to be either 4 to 20 mA, o to 5VDC, or 0 to 10VDC. Factory default is 4-20mA scale

To modify the output scaling, proceed as follows:

1. Be sure that DC Power is <u>not</u> applied to the unit.
2. Remove the outer cover.
3. Using a small screwdriver, set the switches as shown in Table 4-2.
4. Replace the cover.
5. Reapply DC power.

OUTPUTS	SWITCH 1	SWITCH 2
4 to 20 mA	DOWN	----
0 to 5VDC	UP	UP
0 to 10VDC	UP	DOWN

Table 4-2. Analog Output Switch Settings

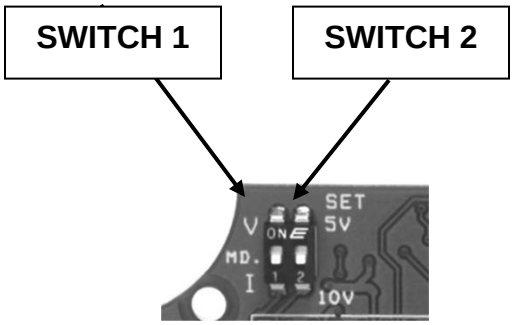


Figure 4-3 Output Selector Switches

4.3.3 INPUT/OUTPUT WIRING

Wire the Analog Outputs as required. See 4.2 above for information on output selection.

Connect the RS-232 Serial Output if desired. Only 2 wires are required if the output is needed for transmitting information only. A third wire is added for bi-directional communications with the serial port.

Connect the relays as needed. Used as upper or lower set point Alarm Relays. See Section 5.4.3 for further information.

5.0 OPERATION

5.1 USING THE RS-232C SERIAL PORT TO REPROGRAM YOUR SETTINGS

Note: If the Factory Default settings are satisfactory, there is no reason to perform any programming.

The Sentinel series system alarm is very versatile. Through the Serial Port, the user may view current settings, change factory set parameters, or receive an automatic update of system measurements and alarm status. Factory Set parameters include:

- Serial number of the Smart Sensor Tip
- Version Software
- Low PPMv set points: alarm engaged, disengaged
- High PPMv set points: alarm engaged, disengaged
- Units for Dew Point: degrees F or C
- 4-20mA output PPMv: Range Setting
- 4-20mA output DewPoint: Range Setting

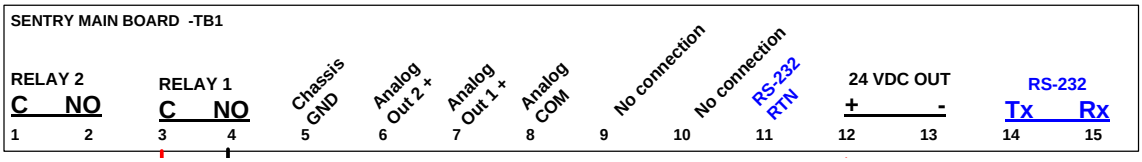
5.2 SERIAL PORT SETUP

You will need a serial cable with a female DB-9 connector on one end, which will mate to the serial port connector on your PC. ETI offers an RS-232 cable in our accessories. If you do not have a serial port on your PC, jump to the next page "**PC with USB port only**". The open end of your RS-232 Serial cable will need the three associated wires for Transmit / Receive / Return identified and exposed. These wires are to be connected to Terminal Strip TB1 on the Sentry circuit board as shown below:

Table 5-1 Serial Cable Wiring

Female DB-9 SERIAL CONNECTOR	TB1 TERMINAL STRIP
Pin 2	TX – Term. 14
Pin 3	RX – Term 15
Pin 5	RTN – Term. 11

Sentinel terminal block:



5.3 PC with USB Port only:

If your PC does not have an available serial port, you can use the ETI accessory: **RSCBL (**RS232 cable) plus the USB (**USB to SERIAL Converter)**. The ETI kit provides the 3 stripped RS232 wires, labeled and the wire ends properly tinned- to be connected to the Sentry plus a USB converter jack to plug into your PC USB port.

Using a terminal emulation program, such as HyperTerminal or TERA TERM, set your PC Com Port to:

BAUD:	19200
BITS	8
STOP BITS	1
PARITY	NONE
FLOW CONTROL	NONE

After connecting the serial cable, apply power to the Sentinel. A window appears showing warm-up and self-test data. Also included is Identification information including probe serial number and version of software. If the sensor probe or the smart sensor tip is not installed, a warning message will display. In this case, power down the unit, install the tip/ probe, and re-power the Sentry.
After the self-checking and start-up period, the window will display information similar to the photo shown on next page. This is the default condition. It indicates the current settings:

- Degrees F for Dew Point
- Imperial Display
- 4-20mA output range for PPMv
- 4-20mA output range for Dew Point
- PPMv Alarm Settings: High & Low, alarm and reset values

And then it begins to display the Sensor Serial Number followed by current measured values in a text string, tab delimited.

```
Sentinel Module
lcd [ 2: DP°C ] [ 3: PSIA ]


ANALOG OUTPUTS :  4 to 20mA
Out1: PPMv:   125.0   15000.0
Out2: DP°C:   -40.0     60.0

ALARMS:
ALM1: units=PPMv  Close=1  valON=5000.0  Open=0
valOFF=4500.0
ALM2: units=PPMv  Close=1  valON=10000.0  Open=0
valOFF=9500.0

Initialize Display (40sec).... wait....

524:SN PPMv= 12252   DP°C=   9.87   PSIA=  14.57   AT°C=
24.20
524:SN PPMv= 12244   DP°C=   9.86   PSIA=  14.57   AT°C=
24.20
524:SN PPMv= 12237   DP°C=   9.85   PSIA=  14.57   AT°C=
24.20
Normal reporting begins.
PPMv= 12212   DP°C=   9.82   PSIA=  14.57   AT°C=  24.20
PPMv= 12211   DP°C=   9.82   PSIA=  14.57   AT°C=  24.20
PPMv= 12201   DP°C=   9.81   PSIA=  14.57   AT°C=  24.20
PPMv= 12186   DP°C=   9.79   PSIA=  14.57   AT°C=  24.20
```

5.4 PROGRAMMING THE SENTINEL

If you do not see a window similar to the one shown above, you will not be able to program this instrument.
Check your terminal emulation program, the power supply, and check the interconnecting cable wiring as shown in Table 5 -1 above.

NOTE: WHEN PROGRAMMING ALPHABETIC CHARACTERS, USE UPPER CASE ONLY.

To begin reprogramming, press the ESCape key on your computer keyboard. The window will change to that shown below. To select the desired parameter, simply select the first letter as shown.
You will find it quite intuitive once you try it. Several programming examples will be shown here.

5.4.1Changing Display Parameters and Units

The display can be customized to show different measurement parameters and units.

Press L change display unit selection
The top line display of PPMv is fixed, the remaining display lines can be programmed to display. AT°C, AT°F, %RH, DP°C & DP°F, Bar, PSIA, gr/lb, mBar & inHg.

```
    Sensor#      524
Press L to select change display units selected
 L)cd   S)etAnalog   A)larms   D)efault  eX)it ? L

 Display units:
 [   XXXXX.X  PPMv    ]
 [ 2:DP°C ]  [ 3:PSIA ]

1. AT°C   6.  Bar
2. AT°F   7. PSIA
3.  %RH   8. mBar
4. DP°C   9. inHg
5. DP°F   A. grlb
          B. PPMv

Pressure range: 600-1200 mbar

 C)hange  eX)it: C
 [2: DP°C ] ?: 4
 [3: PSIA ] ?: 8

 [ 2:DP°C ]  [ 3:mBar ]

1. AT°C   6.  Bar
2. AT°F   7. PSIA
3.  %RH   8. mBar
4. DP°C   9. inHg
5. DP°F   A. grlb
          B. PPMv

 C)hange  eX)it: X

 L)cd   S)etAnalog   A)larms   D)efault  eX)it ? X

 EXIT MENU
Normal text begins to be displayed
PPMv= 12344   DP°C=   9.97   PSIA=  14.57   AT°C=  24.10
PPMv= 12344   DP°C=   9.97   mBar=1004.90   AT°C=  24.10
PPMv= 12286   DP°C=   9.91   mBar=1004.90   AT°C=  24.10
PPMv= 12252   DP°C=   9.87   mBar=1004.90   AT°C=  24.00
PPMv= 12261   DP°C=   9.88   mBar=1004.90   AT°C=  24.00
```

5.4.2 Changing analogue outputs

Outputs: There are (2) programable 0-5v, 0-10v or 4-20mA outputs. These are factory set to represent PPMv and DewPoint.

To set the (selected for this example 4-20mA) output ranges enter “S”. Enter “1” for change output 1. Or enter “2” to change output 2.

To set Output 1, enter “B”. You will be prompted to enter which parameter to represent output 1. In the example above, output 1 is set to represent PPMv Next you are prompted to enter the low value. In the example above, “100” was entered to represent 4 mA.

Then you are prompted to enter the high value. In the example above, “15000” was entered to represent 20mA.

The entry will be recognized and then prompt to enter “S” to save new settings or “X” to exit.

To set Output 2, Enter “2 In the example, Output 2 is set to represent pressure by entering “4” when prompted. DP°C is selected. You will be prompted to enter a °C value for the low setting. In the example, 4 mA is set to “-40” °C and 20mA is set to “60” °C.

```
Sensor#      524
Press S Change Analog outputs
 L)cd   S)etAnalog   A)larms   D)efault  eX)it ? S

ANALOG OUTPUTS :  4mA to 20mA
Out1: PPMv:   100.0   15000.0
Out2: DP°C:   -40.0     60.0

 Outputs are 4-20mA
 Setup output 1
 Setup output 2
 1 or 2  eX)it ? 1

1. AT°C   6.  Bar
2. AT°F   7. PSIA
3.  %RH   8. mBar
4. DP°C   9. inHg
5. DP°F   A. grlb
          B. PPMv

Pressure range: 600-1200 mbar

       4-20mA    OUT1  sel? B
       PPMv Limits: MIN= 100.0    MAX=20000.0
       Enter low value: 100.0
       Enter high value: 15000.0

 <SP>   S)ave   eX)it :

 Outputs are 4-20mA
 Setup output 1
 Setup output 2
 1 or 2  eX)it ? 2

1. AT°C   6.  Bar
2. AT°F   7. PSIA
3.  %RH   8. mBar
4. DP°C   9. inHg
5. DP°F   A. grlb
          B. PPMv

       4-20mA    OUT2  sel? 4
       DP°C Limits: MIN= -40.0    MAX=  60.0
       Enter low value: -40.0
       Enter high value: 60.0

 <SP>   S)ave   eX)it :S
Out1: PPMv:  100.0   15000.0
              4mA      20mA
Out2: DP°C:  -40.0     60.0

 L)cd   S)etAnalog   A)larms   D)efault  eX)it ? X
 EXIT MENU
```

5.4.3 ALARM RELAY OUTPUTS

Two relays, R1 and R2, are built into the Sentinel

There are (2) **ALARM LOGIC PARAMETERS.** There are (2) Alarm Relays. The Relay Alarms are factory set to represent PPMV low and PPMv high . The logic that turns the alarm on, is Low PPMv alrm point or high PPMv alarm point. Both relays follow the same logic. For each logic point (PPMv) a ***trip point*** and a ***reset to normal operation point*** is set.

For Low PPMv, the setpoint determines the pressure point when the alarm is activated (Default is 4500). Normal operation of the Sentinel is not restored (alarm off) until the return to 5000PPMv.

For High PPMv, the setpoint determines the PPMv when the alarm is activated. Normal operation is not restored (alarm off) until the return to normal operation point is achieved This second dew point is set to a lower dew point than the trigger point. The factory default is 500PPMv below the trigger point. Both conditions must be at return to normal operation before the alarm turns off.

To set the Alarm set points enter "M". The current settings will be displayed. Then follow the prompts to enter the set points. After you have made the alarm setting, enter S to save or X to exit.

```
Sensor#      524
Press A change alarm and relay trip points
 L)cd   S)etAnalog   A)larms   D)efault  eX)it ? A

ALM#  UNITS  RANGE_L  RANGE_H  CLOSE    VALUE   OPEN     VALUE
 1    PPMv   100.0    20000.0    BELOW  4500.0    ABOVE  5000.0
 2    PPMv   100.0    20000.0    ABOVE  10000.0    BELOW  9500.0

Set Alarm: 1)  2) or eX)it  ?1

1. AT°C   6.  Bar
2. AT°F   7. PSIA
3.  %RH   8. mBar
4. DP°C   9. inHg
5. DP°F   A. grlb
          B. PPMv

Pressure Type: 600-1200 mbar

          sel? B

PPMv: LowLimit= 100.0  HighLimit=20000.0
Relay  ClOSE:  0.BELOW  1.ABOVE ? 1   Value= 5000.0
Relay OPEN:  0.BELOW  1.ABOVE ? 0   Value= 4500.0

 (Space)   S)ave   eX)it :S

====================== Alarm Paramters ======================

ALM#  UNITS  RANGE_L  RANGE_H  CLOSE    VALUE   OPEN     VALUE

 1    PPMv   100.0    20000.0    ABOVE  5000.0    BELOW  4500.0
 2    PPMv   100.0    20000.0    ABOVE  10000.0    BELOW  9500.0
============================================================

 L)cd   S)etAnalog   A)larms   D)efault  eX)it ? X
 EXIT MENU
```

5.4.4 Reset to factory default settings

In the event that you wish to reset to the factory default settings
Press D load factory default values and the following screen will appear

```
    Sensor#      524
Press D to select load factory default settings
 L)cd   S)etAnalog   A)larms   D)efault  eX)it ? D

 F)actory Defaults   eX)it ?: F
 °° Factory Defaults Loaded °°

 L)cd   S)etAnalog   A)larms   D)efault  eX)it ? X
 EXIT MENU
```

6.0 MAINTENENACE

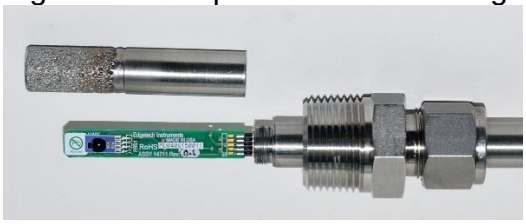
6.1 ROUTINE MAINTENANCE

The only maintenance required by the Sentinel is periodic check to ensure the unit is functioning. The rate of contamination of the tip filter, varies from user to user. It depends upon flow rate of the gas being measured, the quantity of contaminants in the gas.
The HP125 probe intelligent tip sensor does require yearly calibration. The Sentinel system can also have a replacement calibrated tip supplied to allow a fast onsite change over for a new fully calibrated tip board with no down time.

SENSOR CIRCUIT BOARD

Inside the barrel of the Sensor probe, mounted directly at the tip, is the plug-in sensor circuit board. This board has been calibrated at the Factory for a standard output level. Since all boards have been calibrated for the same normalized level, they may be replaced in the field without the requirement for recalibration, while maintaining the full published system accuracy specification.

Figure 6-1 Exploded view showing the Sensor Circuit Board



6.1.1 REMOVING THE SENSOR CIRCUIT BOARD

Figure 7-1 shows the Sensor Circuit Board. It may be accessed by first unscrewing the mesh filter. Then holding the sides of the sensor tip gently pull out in a straight pulling motion. Do not move the tip from side to side as this can damage the connectors.
For replacement Intelligent tip the Sentinel uses the code HPB configuration

7.0 SPECIFICATIONS

Measurement Range:

Trace moisture:	130 to 23,000 PPMv
Dew Point:	-40°C to 60°C (-40°F to 140°F)
Ambient Temperature:	-40°C to 125°C (-40°F to 140°F)
Equivalent %RH:	1% to 99.9%
Pressure	600 to 1200 mBar

Operating Temperature:

Sensor:	-40°C to 65°C (-40°F to 149°F)
Control Unit:	0°C to 50°C (32°F to 122°F)

Pressure: 100 psig maximum (7bar)

Analog Outputs: 4 to 20 mA ,0-5VDC, 0-10VDC

Load: 4 to 20 mA : 400 ohms or lower
0 to 5/10VDC: 1K ohm or higher

Serial Outputs: RS-232C, bidirectional

Relay Outputs:

K1:	Alarm 1
K2:	Alarm 2
Contact Rating:	Normally Open (Form A)
	3A at 250VAC, or 30VDC

Remote Cables: 3 ft. standard

Power Supply: 24VDC ±10%, 1A maximum

8.0 APPENDIX

8.1 WARRANTY STATEMENT

All equipment manufactured by Edgetech Instruments Inc. is warranted against defective components and workmanship for repair at their plant in Massachusetts, free of charge, for a period of twelve months. Malfunction due to improper use is not covered in this warranty and Edgetech Instruments Inc. disclaims any liability for consequential damage resulting from defects in the performance of the equipment. No product is warranted as being fit for a particular purpose and there is no warranty of merchantability. This warranty applies only if (i) the items are used solely under the operating conditions and in the manner recommended in the instruction manual, specifications, or other literature; (ii) the items have not been misused or abused in any manner or repairs attempted thereon; (iii) written notice of the failure within the warranty period is forwarded to Edgetech Instruments Inc. and the directions received for properly identifying items returned under warranty are followed; and (iv) the return notice authorizes Edgetech Instruments Inc. to examine and disassemble returned products to the extent Edgetech Instruments Inc. deems necessary to ascertain the cause for failure. The warranties expressed herein are exclusive. There are no other warranties, either expressed or implied, beyond those set forth herein, and Edgetech Instruments Inc. does not assume any other obligation or liability in connection with the sale or use of said products.

Equipment not manufactured by Edgetech Instruments Inc. is supported only to the extent of the original manufacturer’s warranties

8.2 N.I.S.T. TRACEABILITY – WHAT DOES IT MEAN?

This precision measuring instrument is certified by Edgetech Instruments Inc. to be traceable to N.I.S.T., the National Institute of Standards and Technology (formerly known as the National Bureau of Standards, or NBS), in Gaithersburg, Maryland, U.S.A. You have received a Certificate of Calibration with this instrument. What does N.I.S.T. Traceability mean in terms of this instrument?

The instrument measures Dew Point using the Optical Chilled Mirror (OCM) technique, which provides a primary rather then a secondary measurement of Dew Point temperature. In addition, Dew Point is a fundamental measurement of humidity. It is not affected by temperature.

The Dew Point temperature is measured using a Platinum Resistance Thermometer (PRT). This device is a coil of nearly pure platinum, where the rate of change of resistance with temperature is precisely known. Resistance is accurately measured and is automatically converted to temperature information within the instrument.

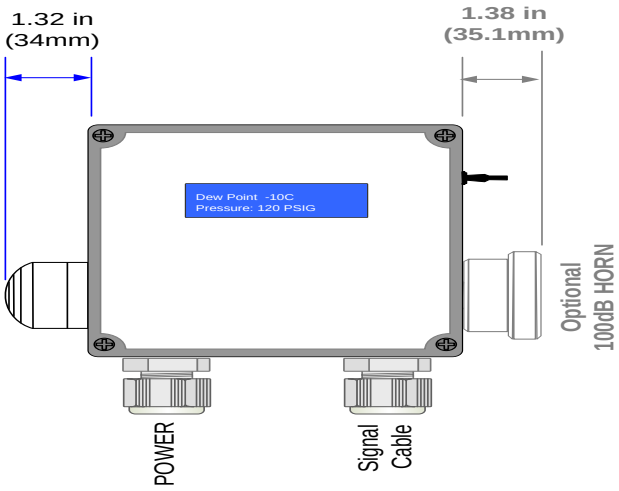
TRACEABILITY:

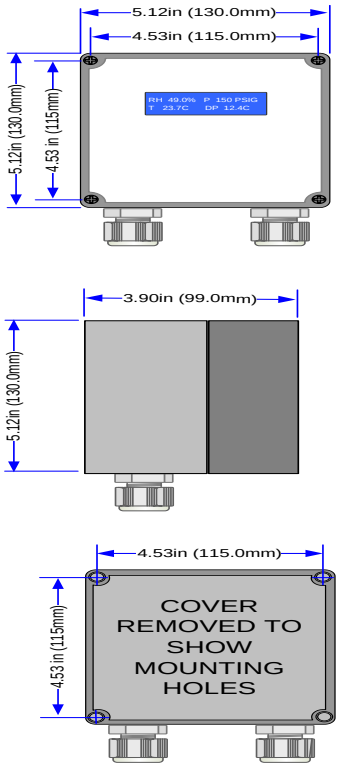
- 1. The precise platinum resistance thermometer is N.I.S.T. traceable by the traceable resistance standards maintained by the PRT manufacturer.

- 2. A multi-point Dew Point calibration is performed on every chilled mirror sensor, using Edgetech Instruments Inc.'s traceable secondary dew point standard. This instrument, a precise chilled mirror hygrometer, is periodically sent directly to N.I.S.T. for certification against the USA's Dew Point transfer standard, a Two-Pressure Generator.

8.3 OVERALL AND MOUNTING DIMENSIONS

8.3.1 WALL MOUNT DIMENSIONS





Notes