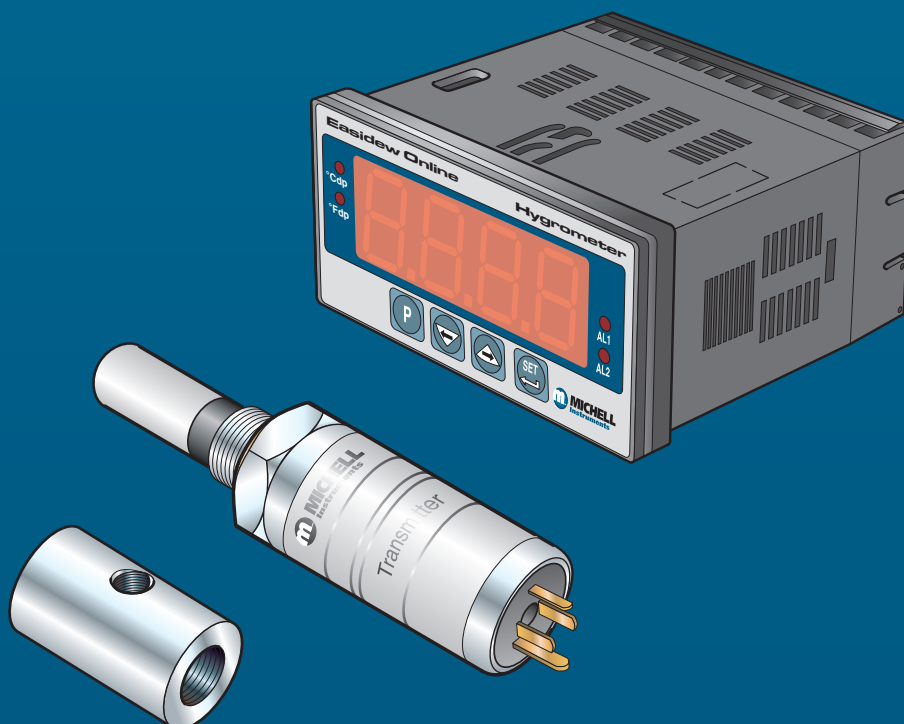# Easidew Online Dew-Point Hygrometer User's Manual
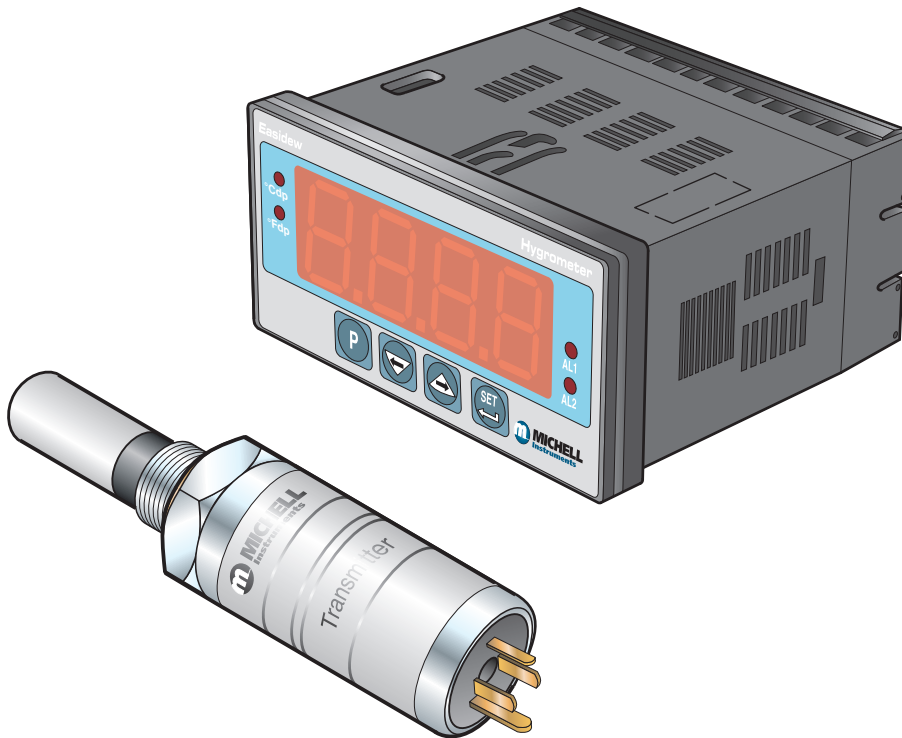
97094 Issue 20
May 2020

Please fill out the form(s) below for each instrument that has been purchased.

Use this information when contacting Michell Instruments for service purposes.

Instrument	
Code	
Serial Number	
Invoice Date	
Location of Instrument	
Tag No	

Instrument	
Code	
Serial Number	
Invoice Date	
Location of Instrument	
Tag No	

Instrument	
Code	
Serial Number	
Invoice Date	
Location of Instrument	
Tag No	

Easidew Online

For Michell Instruments' contact information please go to
www.michell.com

Contents

Figures

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Appendices

Safety

The manufacturer has designed this equipment to be safe when operated using the procedures detailed in this manual. The user must not use this equipment for any other purpose than that stated. Do not apply values greater than the maximum value stated.

This manual contains operating and safety instructions, which must be followed to ensure the safe operation and to maintain the equipment in a safe condition. The safety instructions are either warnings or cautions issued to protect the user and the equipment from injury or damage. Use competent personnel using good engineering practice for all procedures in this manual.

Electrical Safety

The instrument is designed to be completely safe when used with options and accessories supplied by the manufacturer for use with the instrument.

Pressure Safety

DO NOT permit pressures greater than the safe working pressure to be applied to the instrument. The specified safe working pressure (SWP), for this instrument is 45 MPa (450 barg / 6500 psig).

Toxic Materials

The use of hazardous materials in the construction of this instrument has been minimized. During normal operation it is not possible for the user to come into contact with any hazardous substance which might be employed in the construction of the instrument. Care should, however, be exercised during maintenance and the disposal of certain parts.

Repair and Maintenance

The instrument must be maintained either by the manufacturer or an accredited service agent. For contact information visit the website at www.michell.com.

Calibration

The recommended calibration interval for this instrument is 12 months unless it is to be used in a mission-critical application or in a dirty or contaminated environment in which case the calibration interval should be reduced accordingly. The instrument should be returned to the manufacturer, Michell Instruments Ltd., or one of their accredited service agents for re-calibration.

Safety Conformity

This product meets the essential protection requirements of the relevant EU and US directives.

Abbreviations

The following abbreviations are used in this manual:

AC	alternating current
atm	pressure unit (atmosphere)
barg	pressure unit (=100 kP or 0.987 atm) gauge
bara	bar absolute
°C	degrees Celsius
°F	degrees Fahrenheit
DC	direct current
ft	foot (feet)
g	gram(s)
Hz	Hertz
lbf-ft	pound force per foot
Nl/min	normal liters per minute
m	meter(s)
mA	milliampere
max	maximum
min	minute(s)
mm	millimeter(s)
MPa	megapascal (Pascals x10^6)
m/sec	meters per second
Nm	Newton meter
ppm_v	parts per million (by volume)
RS485	serial data transmission standard
Rx	receive
scfh	standard cubic feet per hour
scfs	standard cubic feet per second
SWP	safe working pressure
sec	second(s)
temp	temperature
V	Volts
Ω	Ohms

Warnings

The following general warnings listed below are applicable to this instrument. They are repeated in the text in the appropriate locations.

Where this hazard warning symbol appears in the following sections, it is used to indicate areas where potentially hazardous operations need to be carried out.

Where this symbol appears in the following sections it is used to indicate areas of potential risk of electric shock.

1   INTRODUCTION

The Easidew Online dew-point hygrometer is an instrument designed for the continuous online measurement of water dew point in gaseous sample streams, in a diverse range of applications.

The system comprises a programmable monitor configured to accept a 4–20 mA current loop signal from the Michell Easidew ceramic metal-oxide dew-point transmitter. The span of the transmitter is set to cover the dew-point range -100 to +20ºCdp (-148 to +68ºFdp) at operating pressures up to 45 Mpa (450 barg / 6500 psig).

The monitor also has a re-transmission facility which buffers the transmitter output for onward transmission to other systems. The transmitter input to the monitor is configured as a 4–20 mA current loop signal and the re-transmitted output can be configured as either a 4–20 mA or a 0–20 mA current loop signal (ranged as per the input).

Two alarm outputs are provided for connection to external systems. Alarm 1 provides a set of single pole make contacts and Alarm 2 provides a set of changeover contacts. Both sets are potential free and Alarm 1 contacts (single pole make) are rated at 250 V, 3 A and the Alarm 2 contacts (changeover) are rated at 250 V, 5 A.

A digital communications interface is also provided to enable retrieval of transmitter values and fault status via Modbus RTU over RS485.

Figure 1 shows the monitor and the transmitter.
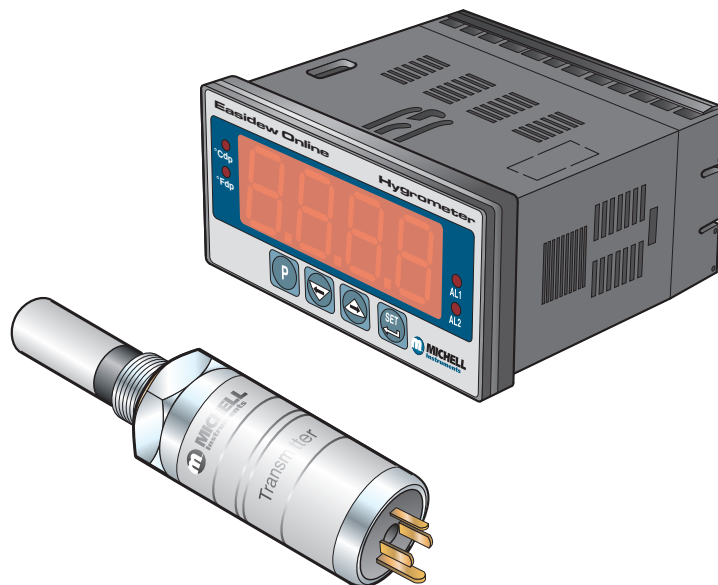
Figure 1   *Easidew Online Monitor and Transmitter*

1.1   Features

The Easidew Online Hygrometer is simple to use and install, and can be configured to meet specific needs.

- 5/8" - 18 UNF process connections

- Dew-point or ppm_v moisture content

- IP66 (NEMA 4) Sensor and IP65 (NEMA 12) Monitor (front panel only)

- Measurement range -100 to +20°C (-148 to +68°Fdp)

- Dual alarms

- Accuracy ±2°Cdp

- Clear and easy to read display

- Calibration certificate (traceable to NPL and NIST)

- 4–20mA re-transmission

- Modbus RTU over RS485 digital communications

2   INSTALLATION

> ⚠ **It is essential that the connection of electrical and gas supplies to this instrument be undertaken by competent personnel.**

2.1   Unpacking the Instrument

The Easidew instruments and accessories are packed into a box and the method of unpacking is shown as follows:
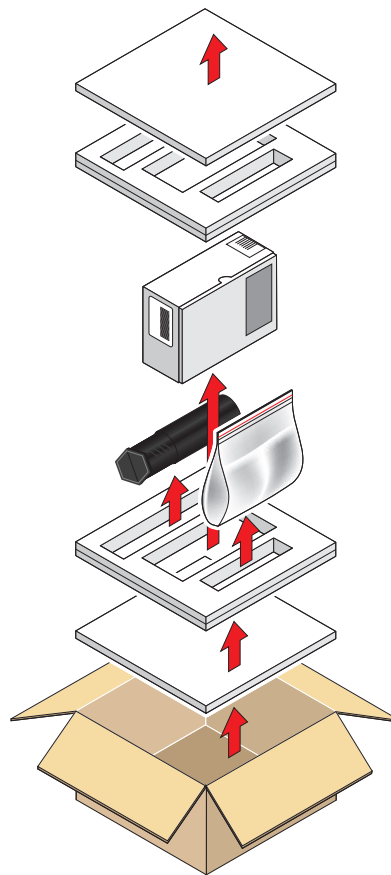
Figure 2   *Unpacking Method*

Open the box and unpack carefully as follows. Save all the packing materials for the purpose of returning the instrument for re-calibration or any warranty claims. Note that the packing method may vary slightly in the U.S.

1.   Remove the top packing (1)

2.   Remove the dew-point transmitter box (3)

3.   Remove the accessories pack (4)

4.   Remove the monitor box (2)

2.1.1   Unpacking the Easidew Transmitter

NOTE: For environmental and operating conditions refer to Appendix A.

Unpack the dew-point transmitter box as follows:
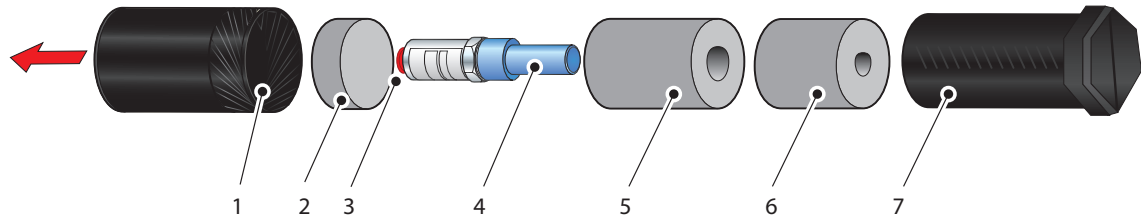
Figure 3   *Transmitter Unpacking Method*

1.   Unscrew the cap (1) from the packing tube (6). Remove the foam block (2).

1.   Remove the transmitter from the tube, complete with the body cover (4) and tip cover (5).

2.   Remove the body cover (4) and the tip cover (5) but leave the blue plastic protective cover (3) in place until ready for installation.

NOTE: The transmitter sensing element is protected while in transit by a blue cover containing a small desiccant capsule. The connection pins are protected by a red plastic cap. None of these plastic items are required for the operation of the transmitter.

2.1.2   Unpacking the Monitor

The monitor (2) is packed, together with its fixing clamps (1) as shown below.
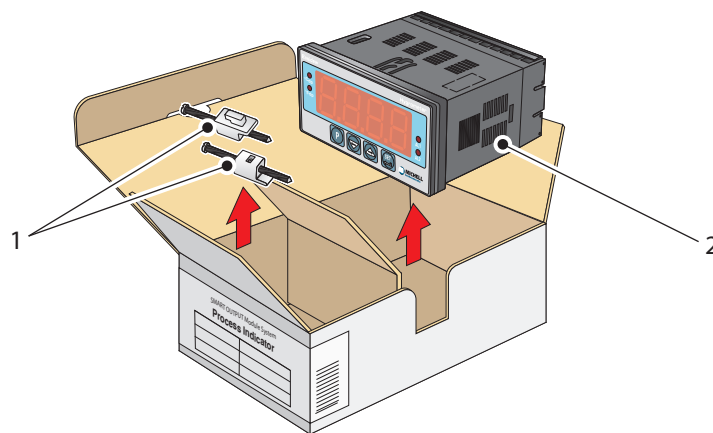
Figure 4   *Monitor Unpacking Method*

2.1.3   Accessories Pack

The accessories pack is shown below.
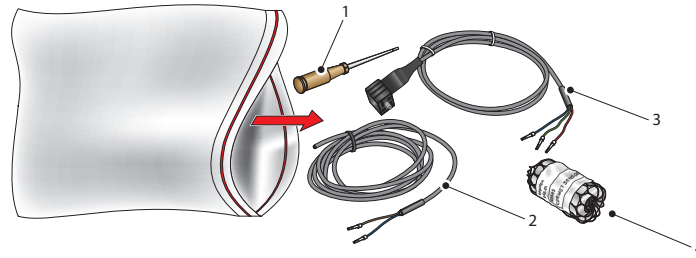
Figure 5   *Accessories Pack*

Remove the screwdriver (1), the two leads (2) and (3) and the sample block (4) from the bag.

2.2   Easidew Online Components

On delivery please check that all the following standard components are present in the packing box. Report any shortages to Michell Instruments, immediately.
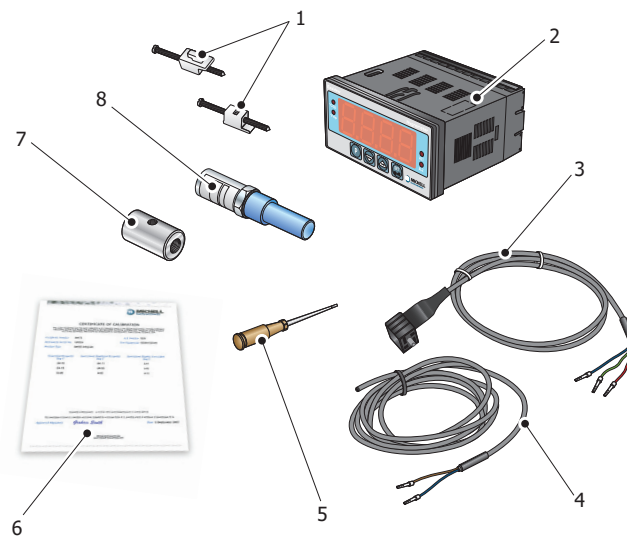
Figure 6   *Easidew Online Components*

1.   Monitor clamps (2 off)

2.   Easidew Monitor

3.   Transmitter cable assembly

4.   Power cable

5.   Screwdriver

6.   Calibration certificate

7.   Sample block

8.   Easidew transmitter

2.3 Monitor

The controls and indicators associated with the Easidew Online are located on the front panel of the monitor.

Connections to the Easidew dew-point transmitter, the digital communications port and the external power supply are all made to the rear panel of the monitor.

Figure 7   *Monitor Panel Layout*

2.3.1 Fault Conditions

Message Displayed	Cause	Action
ErrL	Sensor failure	Check power supply to transmitter. Check transmitter cable for continuity/damage. Rectify/replace cable
	Instrument failure	Refer to Michell or local representative for repair

Sbr	Sensor failure or break in sensor connection	Check transmitter cable for continuity/damage. Rectify/replace cable

ErrH	Gas is wetter than +20°Cdp	Check gas source supply
	Sensor contaminated	Replace/re-calibrate transmitter

outR	Input out of range	Check gas source supply. Re-calibrate/replace transmitter

rurC	Reverse input connection	Swap input connections from the transmitter to the monitor

2.3.2   Monitor Controls and Indicators

Item	Description
1	**°F units indicator** Indicates that the displayed dew-point reading is in degrees Fahrenheit.
2	**°C units indicator** Indicates that the displayed dew-point reading is in degrees Celsius. **Note: if neither the °Cdp nor °Fdp LED is lit, ppm$_v$ is selected.**
3	**Main reading display** Displays the value measured by the connected transmitter, or flashes one of the status conditions shown in Section 2.3.1.
4	**AL1** Indicates alarm relay 1 is active, which by default is a <u>LOW</u> alarm.
5	**AL2** Indicates alarm relay 2 is active, which by default is a **HIGH** alarm. Section 3.3.2 details the setting up of AL2 trip points.

	Item	Description
6	6.1	**Program Key (P)** Launches the menu system. Also used as a back button to exit menus.
	6.2	**← Left arrow (decrement)** Scrolls through submenus OR decreases selected parameter.
	6.3	**→ Right arrow (increment)** Scrolls through submenus OR increases selected parameter.
	6.4	**Set Key (P)** Used to enter menus OR accept the new value of the currently selected parameter.

Table 1   Monitor Front Panel Controls and Indicators

2.3.3   Electrical Connections

Electrical connections to the Easidew Online system are as follows:

Required:

- AC power supply, 100 to 240 V AC (-15%, +10%), 50/60 Hz, 6 VA. A low voltage (24 V DC) option is also available.

Optional:

- Transmitter current loop input, 4–20 mA (24 V DC loop power provided by monitor).

- Alarm 1 (Low), potential free contacts, single pole make. Contacts rated at 250 V, 3 A.

- Alarm 2 (High), potential free contacts, single pole changeover. Contacts rated at 250 V, 5 A.

- Re-transmitted input signal from the dew-point transmitter 4–20 mA or 0–20 mA.

- Modbus RTU over RS485 digital communications interface.
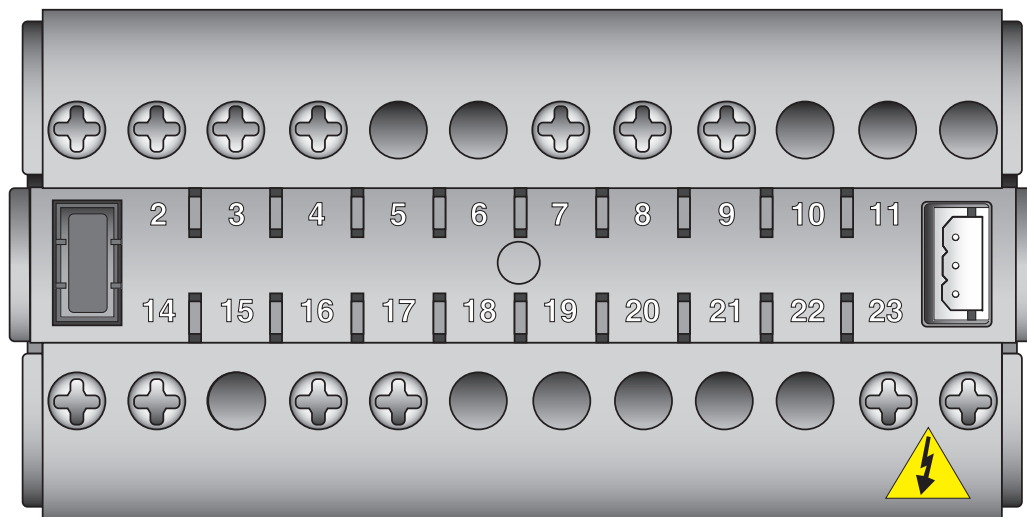
Figure 8   *Monitor Rear Panel Connections*

Terminal	Wire Colour	Signal	Supply Information
1	Blue	0 V (GND)	Transmitter Cable Screen
3	Green	4–20 mA loop return	
4	Red	Transmitter loop supply (+ve)	+24 V DC w.r.t. terminal 1
7	User defined	ALR2 (normally closed)	
8	User defined	ALR2 (normally open)	
9	User defined	ALR2 (common)	
13	User defined	Current loop out (-ve)	Default 4–20 mA
14	User defined	Current loop out (+ve)	Default 4–20 mA
16	User defined	ALR1 (common)	
17	User defined	ALR1 (normally open)	
23 (AC Version)	Blue	Power in (neutral)	100 – 240 V, 50/60 Hz
24 (AC Version)	Brown	Power in (live)	100 – 240 V, 50/60 Hz
23 (DC Version)	Blue	Negative (-)	0 V
24 (DC Version)	Brown	Positive (+)	24 V
NOTE: There are no terminals in positions 5, 6, 10, 11, 12, 15, 18, 19, 20, 21 and 22			

Table 2   Summary of Electrical Connections

2.3.4   AC Power Supply Input

It is essential that the connection of electrical supplies to this instrument be undertaken by competent personnel.

Connect the AC power supply to the monitor as shown in *Figure 9*. Refer also to Table 2 which gives a summary of all the connections to the rear panel of the monitor.

Monitor
viewed from underneath
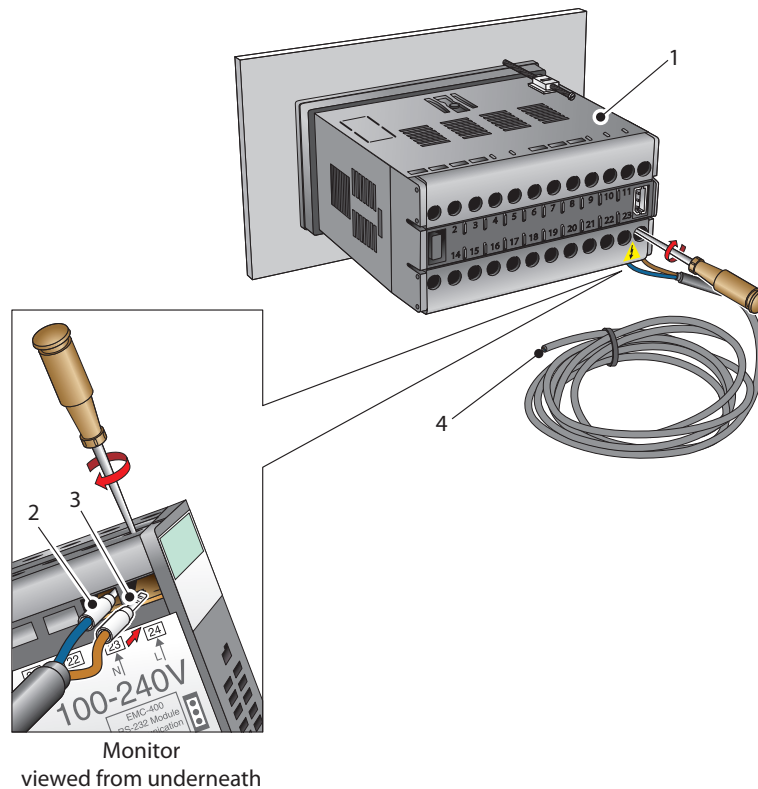
Figure 9   *AC Power Supply Connections*

1.   Ensure that no power is connected to the mains lead.

2.   Connect the blue (white – US standard) (neutral) lead (2) to terminal 23 on the rear panel of the monitor.

3.   Connect the brown (black – US standard) (live) lead (3) to terminal 24 on the rear panel of the monitor.

4.   Strip back the insulation on the free end of the power cable and wire to an appropriate power supply plug (brown lead to live supply terminal, blue lead to neutral supply terminal).

5.   Check that the wiring has been completed correctly before connecting to a mains power supply.

2.3.5   DC Power Supply Input (Optional)

Connect the DC power supply to the monitor as shown in *Figure 10*. Refer also to Table 2 which gives a summary of all the connections to the rear panel of the monitor.
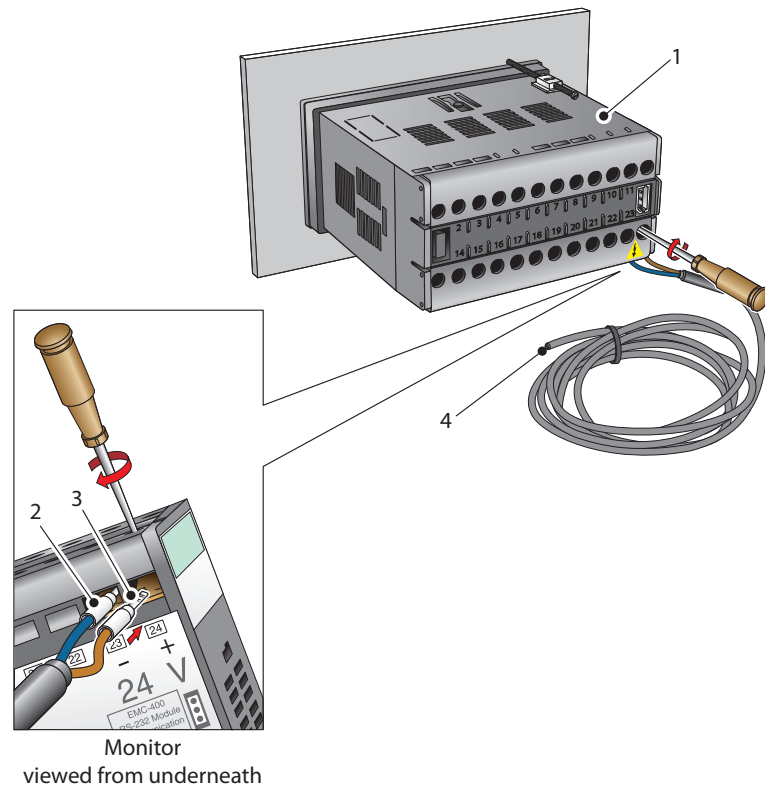
Figure 10   *DC Power Supply Connections*

1.   Ensure that no power is connected to the mains lead.

2.   Connect the blue (white – US standard) lead (2) to terminal 23 on the rear panel of the monitor.

3.   Connect the brown (black – US standard) lead (3) to terminal 24 on the rear panel of the monitor.

4.   Strip back the insulation on the free end of the power cable and wire to an appropriate power supply plug (brown lead to positive (+) supply terminal, blue lead to negative (-) supply terminal).

5.   Check that the wiring has been completed correctly before connecting to a 24 V power supply.

2.3.6   Transmitter Connection

Connect the transmitter cable to the monitor as shown below:
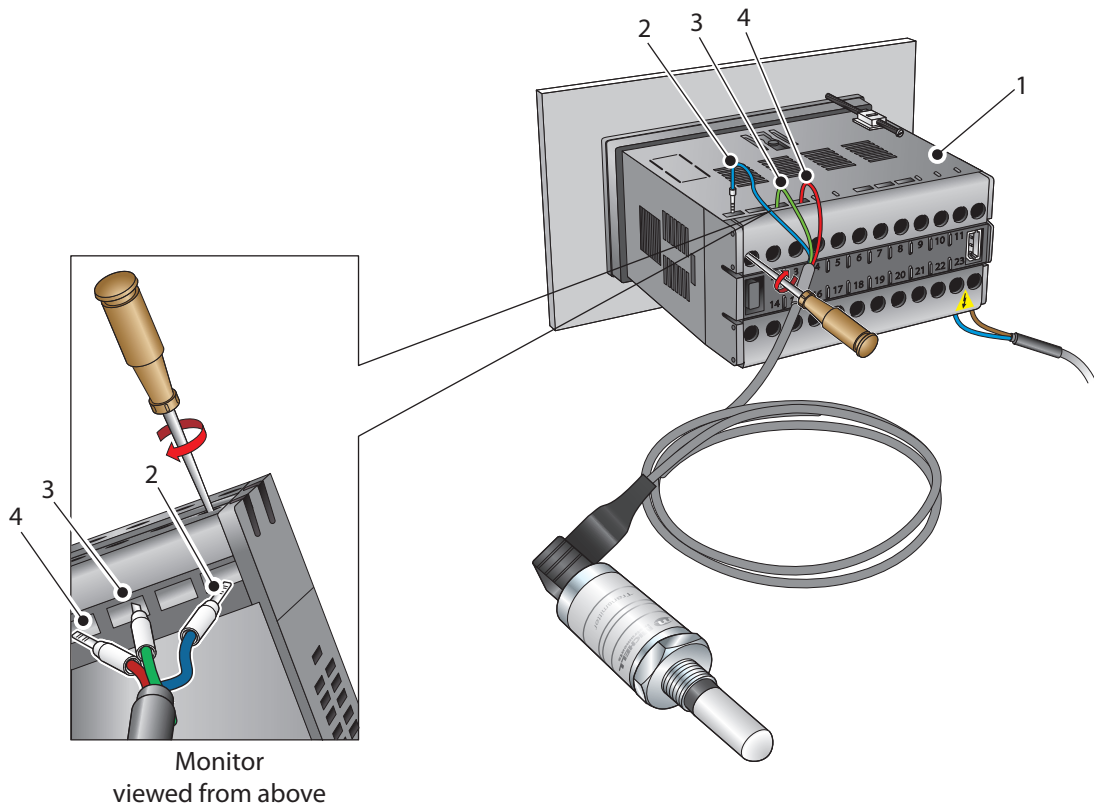
Figure 11   *Transmitter Connections*

1.   Connect the blue wire (2) of the transmitter cable to terminal 1 on the monitor (1).

2.   Connect the green wire (3) of the transmitter cable to terminal 3 on the monitor.

3.   Connect the red wire (4) of the transmitter cable to terminal 4 on the monitor.

4.   Check that the transmitter cable wiring has been completed correctly.

2.3.7   Signal Output Connections

The Easidew Online system has four possible signal outputs: Alarm 1 (ALr1), Alarm 2 (ALr2), the re-transmitted input signal (4–20 mA or 0–20 mA current loop signal depending upon instrument configuration) and the digital communications interface.

2.3.7.1 Alarm Outputs

Alarm 1 is a single pole make contact. Connect incoming signal lines to terminal 16 (common) and terminal 17 (normally open). Alarm 1 contacts rated at 250 V, 3 A.

Alarm 2 comprises a set of changeover contacts. Connect incoming signal lines to terminal 9 (common), terminal 8 (normally open) and terminal 7 (normally closed). Alarm 2 contacts rated at 250 V, 5 A.

> **DANGER**
> **Electric Shock Risk**
>
> **Alarm level signals could be at mains potential so it is essential that, before connecting these signal lines, checks are made to ensure that these inputs are not live and that it is safe to handle them.**

2.3.7.2 Re-transmission Output

The re-transmission output is current sourcing. Connect the positive output to terminal 14 and the negative output to terminal 13. Use appropriately coloured wires e.g., red (positive), black (negative).

2.3.7.3 RS485 Modbus RTU Communications Port

On the right-hand side of the monitor is a digital communication port. To use this port requires cable P/N EA2-OL-MON-29739.

Details on how to configure the port settings are found in Section 3.3.9: Digital Communication Parameters Set-Up.

Details on the Modbus register map are found in Section 3.4: Modbus RTU over RS485 Communications.
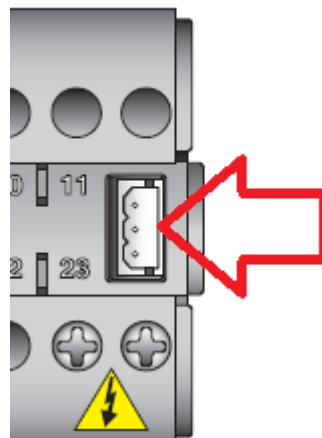
Figure 12   *Digital Communications Port*

2.3.8   Mounting the Monitor

The monitor is designed for panel mounting and requires a panel cut-out of 46 x 92mm (1.8 x 3.6"). The recommended panel thickness is 2 to 5mm (0.08 to 0.2").

To mount the unit, proceed as follows (refer to *Figure 13):*

1.   Pass the monitor (1) through the front of the panel (2).

2.   Support the monitor and insert the hook on the clamp (3) into the slot (4) located on top of the monitor casing.

3.   Tighten the fixing screw (5) finger tight, against the back of the panel.

4.   Insert the hook on the second clamp (6) into the slot located on the underside of the instrument casing and tighten the fixing screw, finger tight, against the back of the panel.

5.   Ensure that the monitor is sitting flush to the front of the panel (2) and tighten the fixing screws evenly against the back of the panel.

Caution: Do not overtighten the screws as this could cause the case to crack.
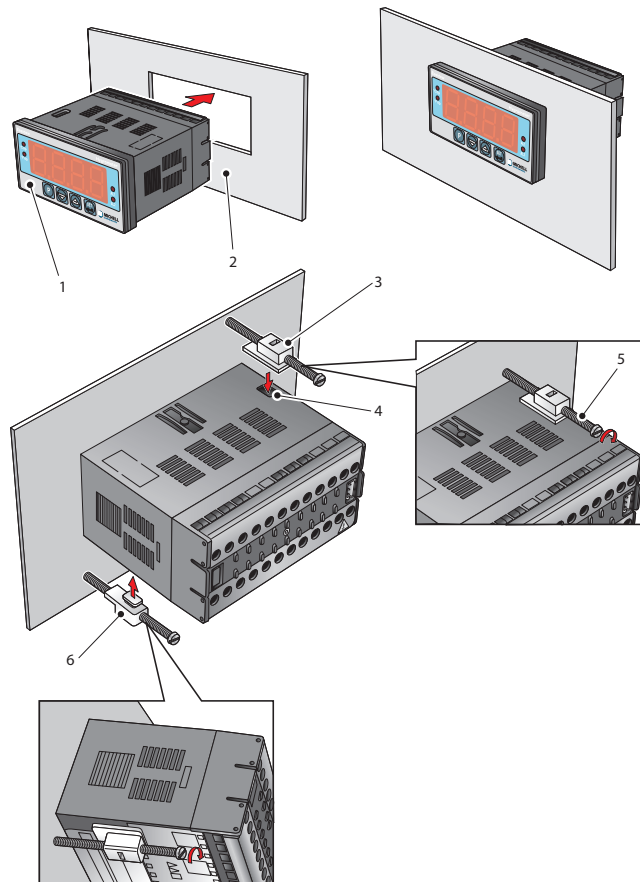
Figure 13   *Mounting the Monitor*

2.4   Easidew Transmitter

NOTE: The transmitter's sensing element is shown for illustration purposes only. Please keep the HDPE or SS guard fitted at all times, if possible.

Sensing Element

Process Connection

Hexagonal Nut

Transmitter Label

Transmitter Cover

Electrical Connector
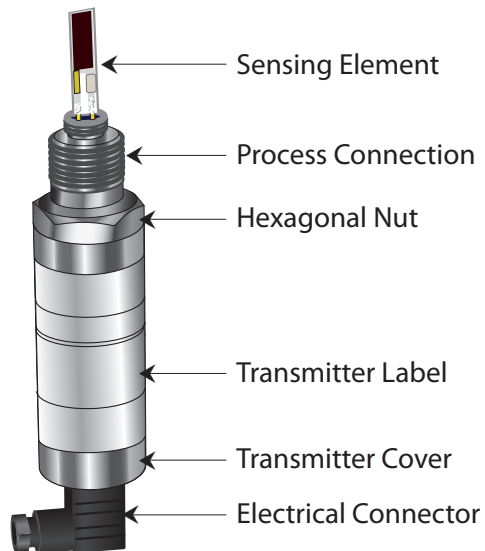
Figure 14   *Easidew Transmitter*

2.5   Preparation of the Transmitter Cable

2.5.1   Electrical Connections
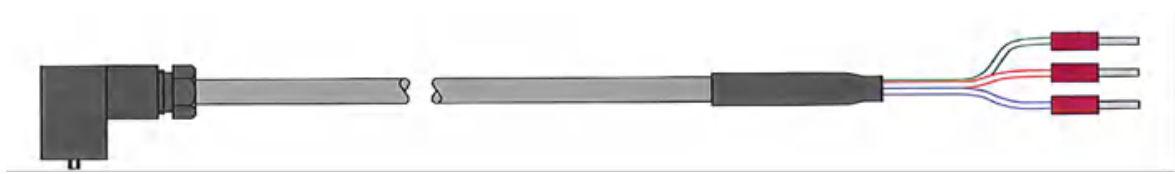
Connector Pin	Michell Standard Conductor Colour	Function
1	Green	4–20mA Signal Return (Power Supply -ve)
3	Red	Power Supply +ve
GND	Blue	Ground, Cable Screen Connection This pin directly connects to the metal casing of the transmitter, but not to the transmitter electronics, and is intended for cable screening only.

Warning: The sensor must be operated with the 4–20mA signal return connected to a suitable load, or negative power supply connection. Leaving this pin unconnected may result in damage to the transmitter. Refer to wiring schematics later on in this document for connection examples.

Note: The sensor cable is supplied as standard. Replacement pre-wired cables can be obtained by contacting your local Michell Instruments representative or assembled by the user according to instructions in the following section.

2.5.2   Sensor Cable Assembly

For guidance on type of cable refer to Section 2.5.3.

Assembly Instructions

1.   Remove the screw from the rear of the DIN connector housing.

2.   Lever the terminal block from the connector housing by inserting a small screwdriver in the notch on the front face of the terminal block.

3.   Ensure the small sealing O-ring and washer and retained with the screw.

Figure 15   *Easidew Transmitter*

4.   Cable should be assembled according to *Figure 16*.
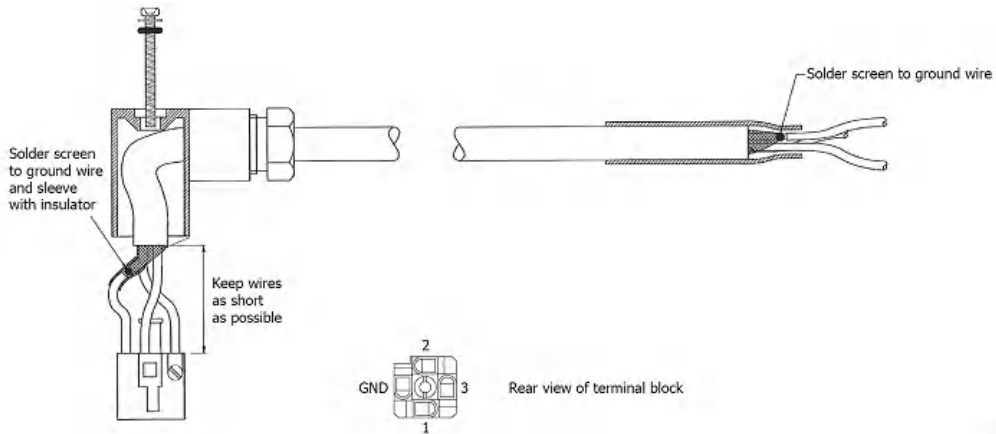
Figure 16   *Easidew Transmitter*

2.5.3   Cable selection for self-assembled cables

It is recommended to use 3-core screened cable. For short runs, a cable with individual conductor sizes of 24 AWG / $0.21mm_2$ would be a typical choice. For longer runs, a cable with larger conductors may be required to keep loop resistance within allowable limits. A chart of maximum loop resistance vs supply voltage is provided in the following section to aid in cable selection.

2.5.4   Maximum Loop Resistance vs Supply Voltage
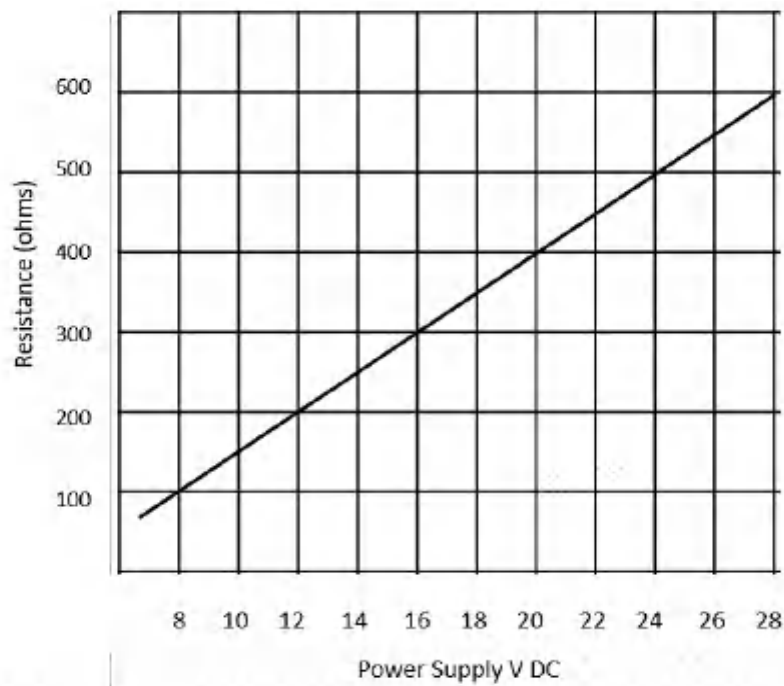
Figure 17   *Maximum Load of Easidew – Including Cable Resistance*

NOTE: Cable resistance of the entire loop must be considered when calculating loop resistance.

2.6   Cable Connection

When installing the connector, and to ensure that full ingress protection is achieved, the securing screw (with the O-ring and washer) must be tightened to a minimum torque setting of 3.4 Nm (2.5 ft-lbs). The transmitter cable used must be a minimum diameter of 4.6mm (0.2").

O-ring and washer
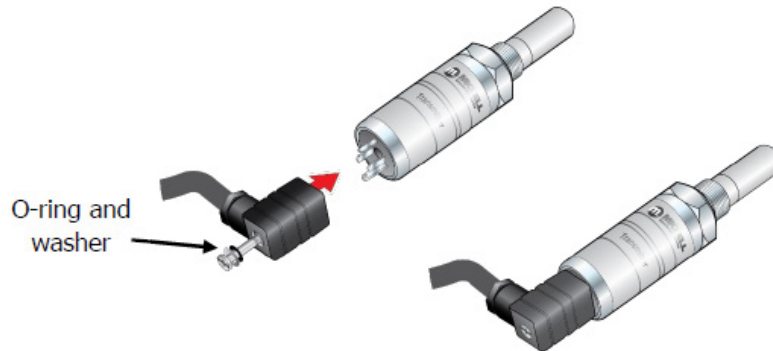
Figure 18   *Connector Installation*

2.7   Transmitter Mounting

Prior to installation of the transmitter, unscrew and remove the blue plastic cover and retain for future use. Take care to prevent any contamination of the sensor before installation (handle the transmitter by the main body only, avoiding contact with the sensor guard).

The dew-point transmitter is designed to operate in a flowing gas stream of between 1 and 5 Nl/min (2.1 and 10.6 scfh) when mounted in a sample block, at operating pressures up to a maximum of 45 MPa (450 barg / 6500 psig). Direct pipeline mounting requires 1 to 10m/sec (0 to 32.8fps) at pressures dependant on the type of material used (customer defined).

NOTE: Pass the bonded seal over the 5/8" - 18 UNF mounting thread and assemble into the sampling location by hand using the wrench flats only. DO NOT grip and twist the sensor cover when installing the sensor.

When installed, fully tighten using a wrench until the seal is fully compressed and to the following torque setting:

5/8" - 18 UNF   30.5 Nm (22.5 ft-lbs)

2.7.1   Transmitter Mounting – Sample Block (Optional)

> ⚠️ **The following procedure must be carried out by a qualified installation engineer.**

To mount the transmitter into the sensor block (preferred method), proceed as follows, refer to *Figure 19.*

1.   Ensure that the protective cover (2), and its desiccant capsule (2a), have been removed from the tip of the transmitter.

2.   Fit the bonded seal (4) over the threaded part of the transmitter body.

> ⚠️ **WARNING: Under no circumstances should the sensor guard be handled with the fingers.**

3.   Screw the transmitter (1) into the sample block (3) and tighten to a minimum torque setting of 30.5 Nm (22.5 ft-lbs). **NOTE: Use the flats of the hexagonal nut and not the sensor body.**

4.   Fit the transmitter cable/connector assembly to the plug located on the base of the transmitter and tighten the fixing screw (see Section 2.4).
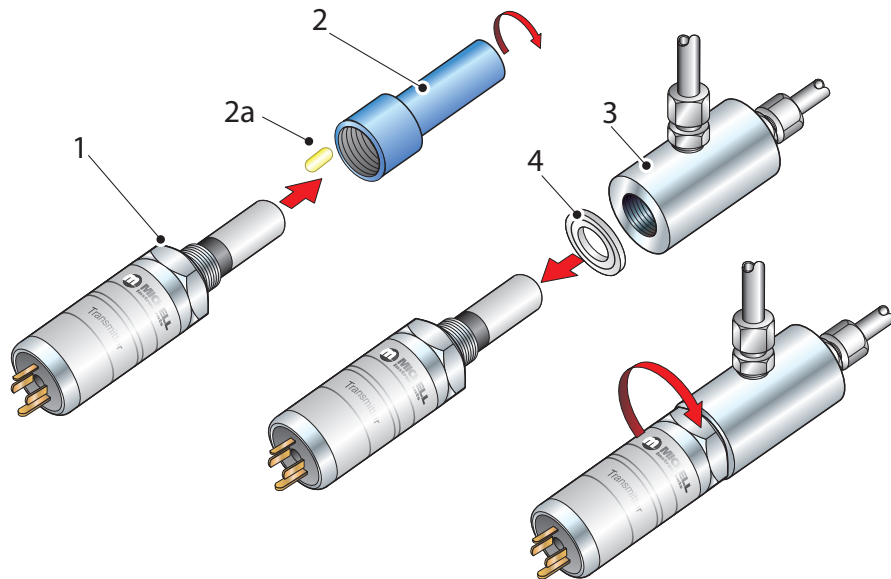
Figure 19   *Transmitter Mounting – Sensor Block*

2.7.2   Transmitter Mounting – Direct Pipeline Connection

The transmitter may be directly mounted into a pipe or duct, as shown in *Figure 20.*

> ⚠️ **CAUTION: Do not mount the transmitter too close to the bottom of a bend where any condensate in the pipeline might collect and saturate the probe.**

The pipe or duct will require a thread to match the transmitter body thread. Fixing dimensions are shown in *Figure 20*. For circular pipework, to ensure the integrity of a gas tight seal, a mounting flange will be required on the pipework in order to provide a flat surface to seal against.

> ⚠️ **The following procedure must be carried out by competent personnel.**

1. Ensure that the blue protective cover (and its desiccant capsule) has been removed from the tip of the transmitter.

> ⚠️ **WARNING: Under no circumstances should the sensor guard be handled with the fingers.**

2. Fit a bonded seal (2) over the threaded part of the transmitter body.

3. Screw the transmitter (3) into the pipe (1). Tighten enough to obtain a gas tight seal. (Torque will depend upon the pipeline material.) **NOTE: Do not overtighten or the thread on the pipework may be stripped.**
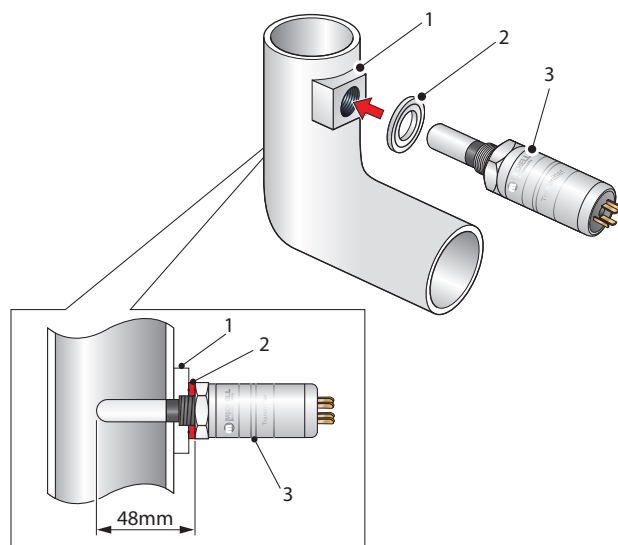
Figure 20   *Transmitter Mounting – Pipe or Duct*

2.7.3   Transmitter Mounting – With Additional Process Connection Adapter

⚠️ **The following procedure must be carried out by a qualified installation engineer.**

To mount the adapter into the transmitter, proceed as follows (see *Figure 21*) :

1. Ensure that the protective cover (2), and its desiccant capsule (2a), have been removed from the tip of the transmitter.

2. Fit the bonded seal (3) over the threaded part of the transmitter body.

3. Screw the adapter (4) onto the threaded part of the transmitter and tighten to 30.5 Nm (22.5 ft-lbs). **NOTE: Use the flats of the hexagonal nut and not the sensor body.**

⚠️ **WARNING: Under no circumstances should the sensor guard be handled with the fingers.**

4. Screw the transmitter (1) with its seal (3) and adapter (4) into the sample block (see Section 2.7.1) or pipeline (see Section 2.7.2) and fully tighten using a wrench until the seal is fully compressed and to the following torque settings:

   G 1/2" BSP   56 Nm (41.3 ft-lbs)

   3/4" - 16 UNF `   40 Nm (29.5 ft-lbs)

   1/2" NPT   Use a suitable sealant e.g. PTFE tape using correct taping procedures

   NOTE: **Use the flats of the hexagonal nut and not the sensor body.**
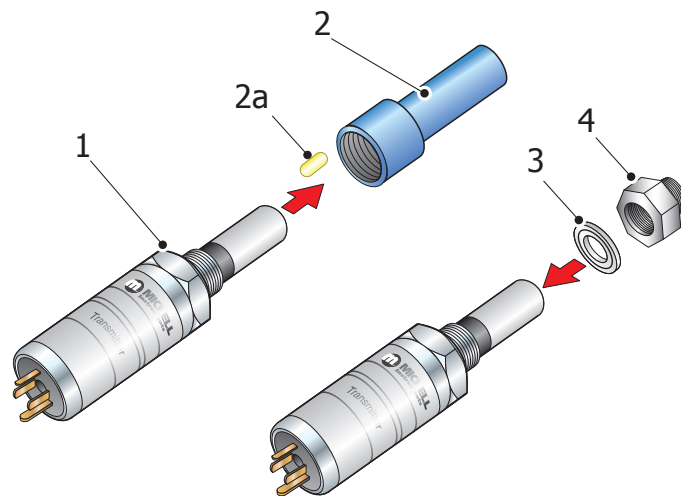
Figure 21   *Transmitter Mounting with Adapter*

2.8   Mounting the Sample Block and Transmitter

2.8.1   Sample Block Gas Connections

Sample gas connections are made to the Gas In and Gas Out ports on the sample block see *Figure 22.* Either port on the sample block may be used as the Gas Input port (i.e. for connection purposes the ports are interchangeable).

Normally, connections are made via stainless steel pipework, in which case the sensor block/transmitter assembly will be self supporting. If Teflon tubing is used it may be necessary to support the assembly with a body clip.
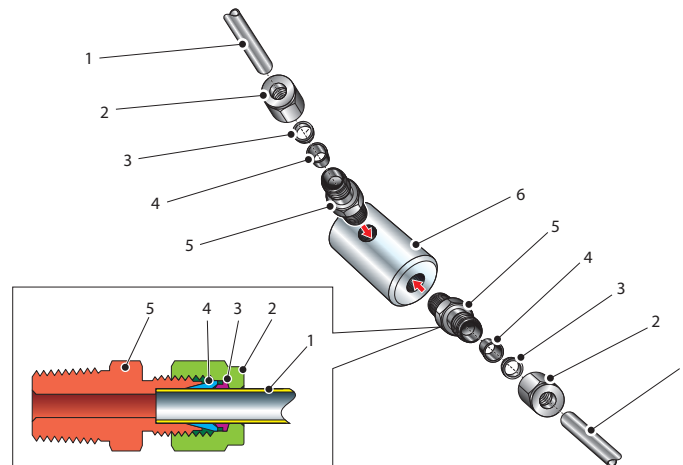
Figure 22   *Sample Block Gas Connections*

Both the Input and Output gas connections are ⅛" NPT. It is recommended that both the Gas Input and Output connections are made made via ⅛" NPT to 6mm or ⅛" NPT to ¼" stainless steel tube adaptors (2 to 5 – *Figure 22)*. The method of connection to the sensor block (6) is as follows:

NOTE: The following description relates to 6mm tube fixings. The sample block ports are both ⅛" NPT female process connections. Tube adaptors are not supplied with the equipment but can be obtained by contacting your local distributor or Michell Instruments (see www.michell.com for details).

1.   Cut a suitable length of 6mm (¼" U.S.) stainless steel tubing (1) to the correct length and, if necessary, bend to shape to suit the location of the sensor block assembly. **NOTE: To facilitate ease of connection to the port, at least 75mm (3") of the tubing coming out of the Gas In port must be straight.**

2.   Clean off any burrs or metal shavings adhering to the tubing.

3.   Screw the ⅛" NPT (¼" U.S.) NPT Swagelok adaptor (5) into the ⅛" NPT (¼" U.S.) NPT inlet port in the sensor block (6) and tighten to a torque setting of 35 Nm (25 lbf-ft).

4.   Pass the stainless steel tubing (1) through the locking nut (2). NOTE: Threads towards the gas port.

5.   Fit the back ferrule (3) over the stainless steel tubing (1) with the bevelled end facing the back of the front ferrule (4).

6.   Place the front ferrule (4) over the stainless steel tubing (1), bevelled end towards the adaptor (5).

7.   Push the stainless steel tubing (1) as far as it will go into the adaptor (5) and tighten up the locking nut (2) finger tight.

8.   Hold the adaptor (5) flats with a spanner and tighten up the locking nut (2) to a torque setting of 35 Nm (25 lbf-ft) (1¼ turns). This action compresses the front ferrule (4) and back ferrule (3) onto the tubing to form a gas tight seal.

9.   Connect up the other gas port as described in steps 1 to 8 above.

3   OPERATION

As supplied, the instrument is ready for operation and has been set-up with a set of default parameters. This section describes both the general operation of the instrument and the method of setting it up and changing the default parameters should this become necessary.

The default parameters are as follows:

- Span -100 to +20°Cdp (-148 to +68°Fdp) or 0 to 3000 ppm$_V$

- Temperature units °Cdp

- Current loop input, 4–20 mA (7.5°C/mA or 13.5°F/mA)

- Re-transmission current loop output, 4–20 mA (7.5°C/mA or 13.5°F/mA)

- Alarm 1 set-point -20°Cdp (-4°Fdp)

- Alarm 2 set-point -40°Cdp (-40°Fdp)

- Data communications, Slave address 1, Baud rate 9600, Parity None, Stop bits 1

For the supplied dew-point transmitter, the span and current loop input setting should not be changed. The span will require changing if the instrument is to be ranged in °F, if a different transmitter is employed, if the user chooses to re-range the Easidew transmitter or if ppm$_V$ is selected.

The instrument must also have been installed as detailed in Section 2 and connected to a sample gas supply that is representative of the process being monitored.

3.1   General Operational Information

Operation of the Easidew Online is completely automatic and once set-up requires little or no operator intervention.

The sample gas is taken into the sample block via the Gas In port and, in flowing through the sample block, comes into contact with the dew-point transmitter which, in turn, produces a current loop output signal proportional to the measured dew-point temperature. This output signal is converted to a real time analog dew-point temperature reading by the monitor.

The gas flow through the sample block must be controlled outside the instrument, typically by means of a needle valve located in the sample gas input line.

3.2   Preparation For Operation

3.2.1   First-Time Operation

To commence operation, proceed as follows:

1. Check that electrical power supply and the relevant analog and alarm outputs are connected to external systems as required and as described in Section 2.7.

2. Check that the gas sample flow rate through the sample block, or the pipeline in which the transmitter is located, is within the operational limits. (Adjust any external flow control valves, located in the gas sample input line to the instrument to achieve required flow rate.)

3. Switch on the power supply to the instrument. The instrument display will now come on, typically showing the default parameters and units as detailed in *Figure 23*.

The instrument is now operational and after a few seconds, in which all the segments of the display are tested, the monitor will display the measured dew-point temperature or moisture content.

In the absence of any error indications the instrument will now be operational.

Figure 23   *Typical Display*

If the display is flashing, a fault condition exists. The fault conditions are described in Section 2.3.1 of the manual.

3.3   Monitor Setup

3.3.1   Change alarm type (high/low)

Alarm 1 is a low alarm, triggered when the reading drops below the set-point; whereas Alarm 2 is a high alarm, triggered when the reading exceeds the set-point.

To change these default settings, follow the instructions below:

Alarm 1:

1.   Press the **P** key once and the display will read **tECH**.

2.   Press the **SET** key and the display will flash between **ConF** and **PinP**.

3.   Press the ⇨ key twice and the display will flash between **ConF** and **Alr1**.

4.   Press the **SET** key twice to display **Alt1**.

5.   Press the ⇨ key once to display a flashing 4 digit number. For the Alarm 1 default setting this will be 0001 (low alarm).

6.   Press the ⇦ key once to change the display to 0000 (high alarm).

7.   Press the **SET** key to accept the new value. The default setting for Alarm 1 is now reversed.

8.   Either press the **P** key twice to return to the main display or press the **P** key once followed by the ⇨ key to move to the **Alr2** setting sequence from step 4 above.

Alarm 2:

1.   Press the **P** key once and the display will read **tECH**.

2.   Press the **SET** key and the display will flash between **ConF** and **PinP**.

3.   Press the ⇨ key three times and the display will flash between **ConF** and **Alr2**.

4.   Press the **SET** key twice to display **Alt2**.

5.   Press the ⇨ key once to display a flashing 4 digit number. For the Alarm 2 default setting this will be 0000 (high alarm).

6.   Press the ⇨ key once to change the display to 0001 (low alarm).

7.   Press the **SET** key to store the new value.

8.   Press the **P** key twice to return to the main display. The default setting for Alarm 2 is now reversed.
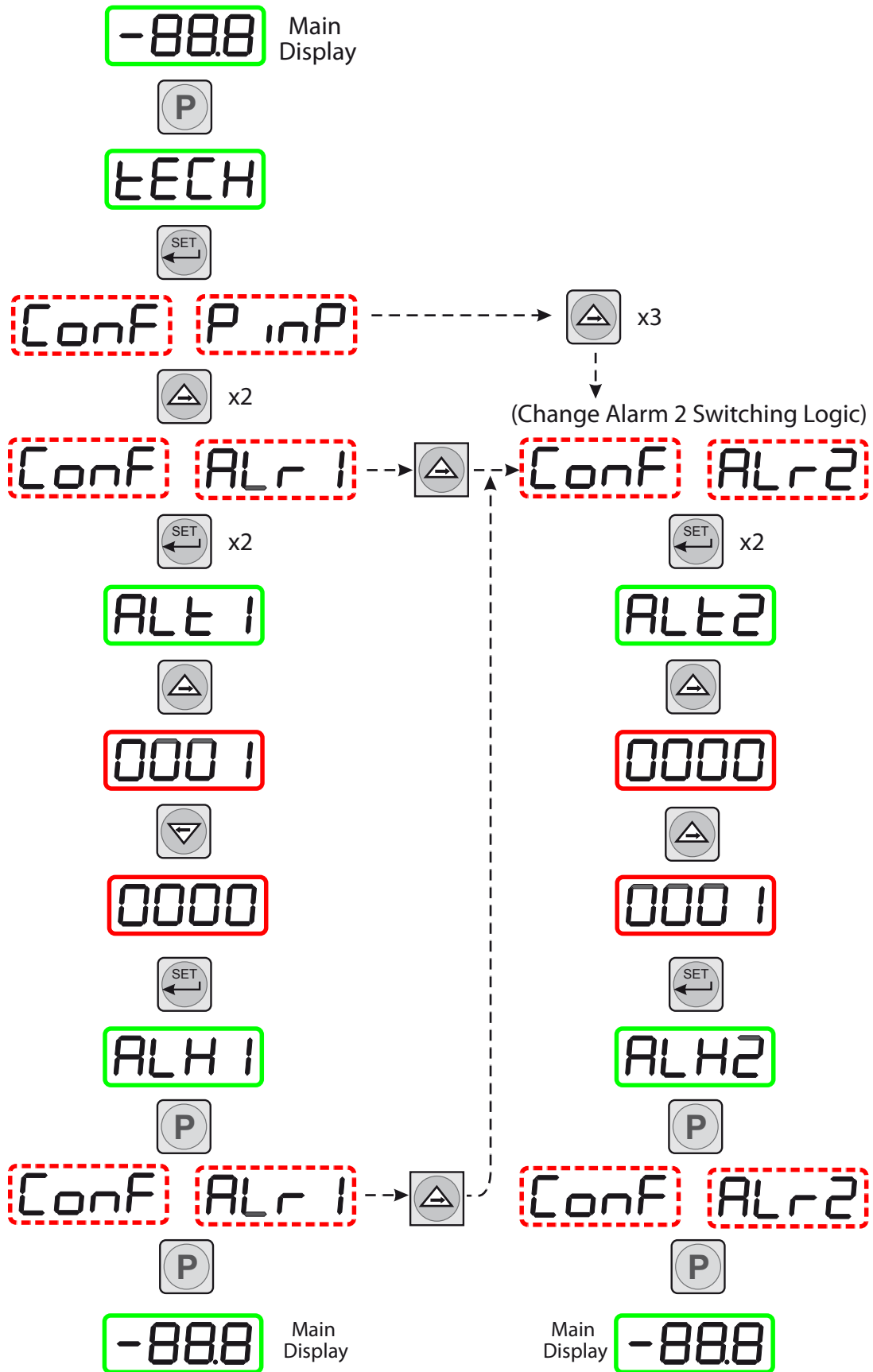
Figure 24   *Change Alarm Switching Logic*

3.3.2   Change alarm set-points

The alarm set-point levels are set-up from the program menu as follows (to exit to the main display without saving any new settings press the **P** key):

Figure 25 shows the operational key sequence.

To set-up both alarm set-points:

1.   Press the **SET** key once, **ALr1** will be displayed. (To set Alarm 2 only, press the **SET** key twice and follow the Alarm 2 branch instead).

2.   Press the ⇨ key to display the flashing current Alarm 1 set-point (-20°C in this example).

3.   Use the ⇨ and ⇦ keys to set the required value (-25.5°C in this example).

4.   Press the **SET** key once to store the new (or existing) value for Alarm 1 and to enter the set-up menu for Alarm 2, **ALr2**. (To exit to the main display without changing Alarm 2 set-point levels, press the **P** key.)

5.   Press the ⇨ key to display the flashing current Alarm 2 set-point (-40°C in this example).

6.   Use the ⇨ and ⇦ keys to set the required value (-50°C in this example).

7.   Press the **SET** key once to store the new value for Alarm 2. The display then returns to the main dew-point temperature display.

Figure 25   *Set-up Alarm Levels*

3.3.3   Analog output: change from 4–20mA to 0–20mA

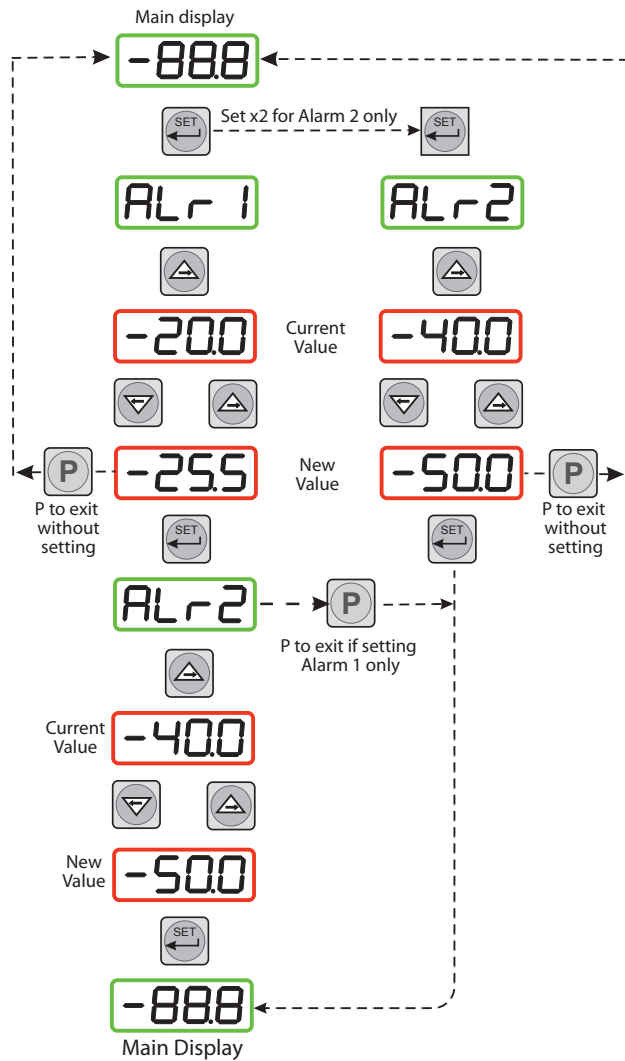The Easidew Online is provided with an analog current loop output module which buffers and re-transmits the current loop input signal from the dew-point transmitter.

To change output from 4–20 mA to 0–20 mA:

1. Press the **P** key once, the display will read **tECH**.

2. Press the **SET** key and the display will flash between **ConF** and **PinP**.

3. Press the ⇨ key and the display will flash between **out1** and **ConF**.

4. Press the **SET** key to display **oAt1**.

5. Press the ⇨ key once to display a flashing 4 digit number. For the default setting (4–20 mA) this will be 0001.

6. Press the ⇦ key once to change the display to 0000. This selects the re-transmission output to be 0–20 mA.

7. Press the **SET** key to accept the new value. The output current loop is now 0–20 mA. The display will flash between **out1** and **ConF**.

8. Press the **P** key once to return to the main dew-point temperature display.
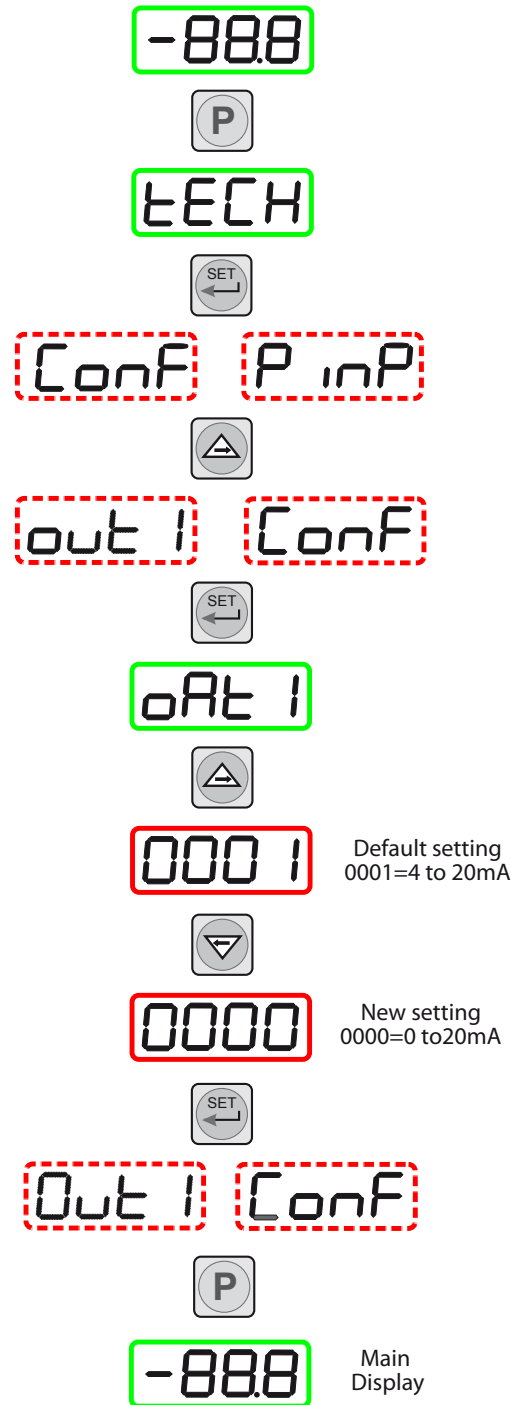

Figure 26   *Configure Analog Output*

3.3.4   Monitor Input Range

By default the monitor is ranged -100/+20C dew point.

To change the range to Fahrenheit follow the procedures in Sections 3.3.5 and 3.3.8.

To change the range to ppm$_V$ follow the procedures in Sections 3.3.6 and 3.3.8.

(Set monitor to ppm$_V$ mode and alarm set-point limits sections.)

3.3.5 Set the monitor to °F dew-point mode

To change the range and unit settings, proceed as follows. *Figure 27* shows the operational key sequence.

1. Press the **P** key once, the display will read **tECH**.

2. Press the **SET** key six times and the display will read **tPoL**.

3. Press the ⇨ key and the display will flash with the current minimum span limit (-100.0).

4. Use the ⇨ and ⇦ keys to set the required equivalent Fahrenheit value (-148.0) and press the **SET** key. **tPoH** is then displayed.

5. Press the ⇨ key, the display will flash the current maximum span limit (020.0).

6. Use the ⇨ and ⇦ keys to set the required equivalent Fahrenheit value (068.0) and press the **SET** key twice. **unit** is then displayed.

7. Press the ⇨ key, the display will flash the current unit (°C).

8. Use the ⇨ and ⇦ keys to set the required scale units (°F in this example) and press the **SET** key. **LoL** is then displayed.

9. Press the ⇨ key and the display will flash with the current alarm lower range limit (-100.0).

10. Use the ⇨ and ⇦ keys to set the required equivalent Fahrenheit value (-148) and press the **SET** key. **uPL** is then displayed.

11. Press the ⇨ key, the display will flash the current alarm upper range limit (020.0).

Figure 27 *Span and Unit Settings*

12. Use the ⇨ and ⇦ keys to set the required equivalent Fahrenheit value (068.0) and press the **SET** key. **PUoF** is then displayed.

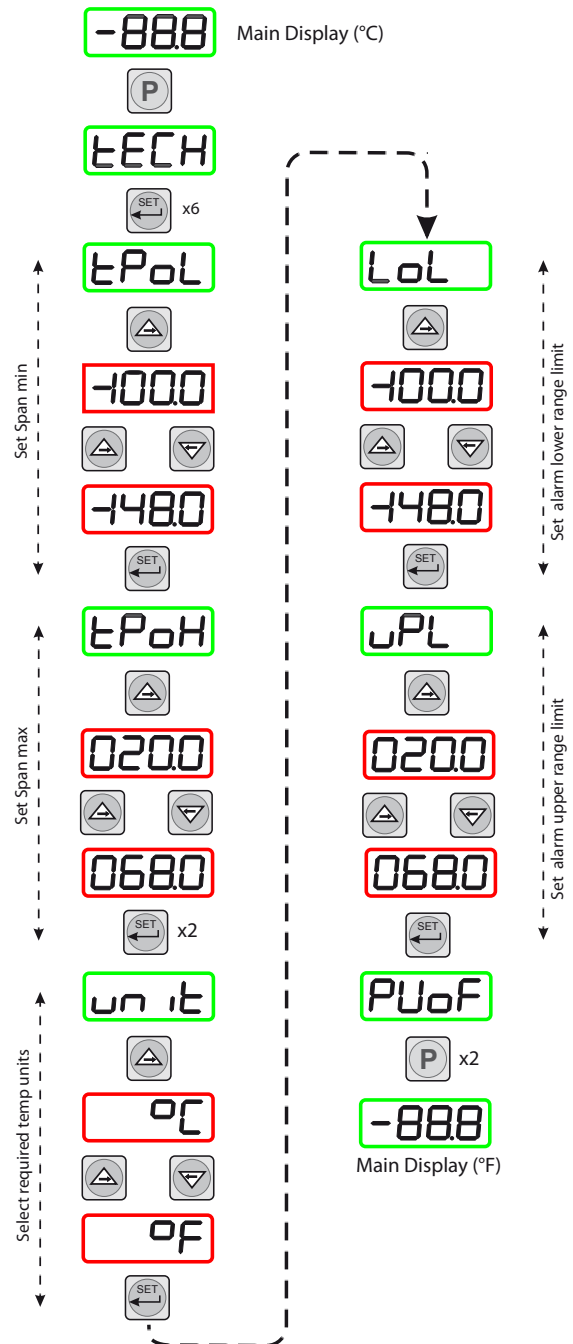13. Press the **P** key twice to return to the main menu.

The maximum and minimum alarm level limits should now be changed to suit the new (Fahrenheit) unit values (refer to Section 3.3.8).

3.3.6 Set the monitor to ppm$_V$ mode

To change the monitor to read parts per million by volume (ppm$_V$) proceed as follows:

Figure 30 shows the operational key sequence.

> **CAUTION: The dew-point transmitter must be configured to provide an output in ppm$_V$ which can be set up at the time of order or by using the Michell communications kit. Contact Michell Instruments for information (for contact details see www.michell.com).**

1. Press the **P** key once, the display will read **tECH**.

2. Press the **SET** key four times and the display will read **dPnt**.

3. Press the ⇨ key, the display will flash the current decimal point position (0001).

4. Press the ⇦ key to set 0000 on the display (no decimal point), and press the **SET** key twice. **tPoL** is then displayed.

5. Press the ⇨ key, the display will flash the current minimum span limit (-1000)

6. Use the ⇨ and ⇦ keys to set the required ppmV minimum reading (0000) and press the **SET** key. **tPoH** is then displayed.

7. Press the ⇨ key, the display will flash the current maximum span limit (0200).

8. Use the ⇨ and ⇦ keys to set the required ppmV maximum reading (3000) and press the **SET** key twice. **unit** is then displayed.

9. Press the ⇨ key, the display will flash the current unit (°C).

10. Press the ⇨ key three times to set the display reading to '_' (ppmV) and press the **SET** key. **LoL** is then displayed.

11. Press the ⇨ key, the display will flash the current alarm lower range limit (-1000) (formerly -100.0 with no sign or decimal point showing).

12. Use the ⇨ and ⇦ keys to set the required alarm lower range limit (point where display starts to flash) (0 or different value), and press the **SET** key. **uPL** is then displayed.

13. Press the ⇨ key, the display will flash the current alarm upper range limit (0200) (formerly 020.0 with no decimal point showing).

14. Use the ⇨ and ⇦ keys to set the required alarm upper range limit (point where display starts to flash) (3000 or different value), and press the **SET** key. **PUoF** is now displayed.

15. Press the **P** key twice and the main display, now reading ppmV will show. **NOTE: Neither the °C nor the °F LED indicators on the front panel of the monitor are now lit.**

On completion of the above procedure, appropriate alarm levels (relevant to the new ppm$_V$ scale) will need to be set-up (refer to Section 3.3.8).
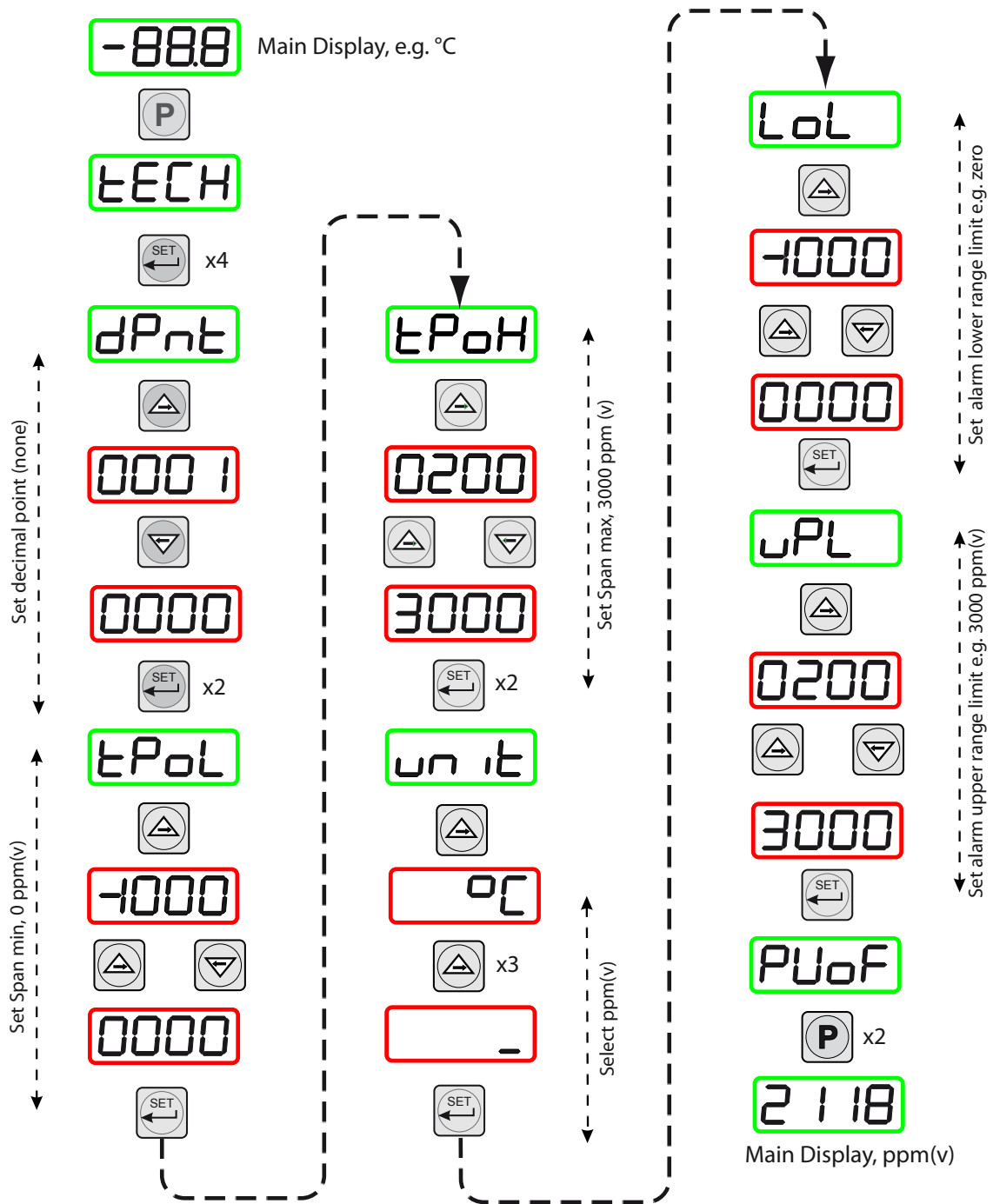
Figure 28   *Set-up Monitor (to read ppm_V)*

3.3.7   Monitor Limits When Unit Scaled to ppm$_V$

When unit is scaled to ppm$_V$ the display will read zero when the mA input signal is between 3 and 4 mA.

NOTE: On displays supplied before December 2011 the display will show negative ppm$_V$ values when the sensor input signal is between 3 and 4 mA.

3.3.8   Alarm Set-Point Limit Configuration

The following procedure is used to set limits to which the alarm levels can be set and should be done after changing the range of the monitor.

Figure 30 shows the operational key sequence.

1.   Press the **P** key once, the display will read **tECH**.

2.   Press the **SET** key once and the display will flash between **ConF** and **PinP**.

3.   Press the ⇨ key four times and the display will flash between **ConF** and **GEnn**.

4.   Press the **SET** key once, the display will read **SU-L**.

5.   Press the ⇨ key once to display a flashing 4 digit number representing the current minimum alarm level setting. (The default setting for the °C range is -100.0).

6.   Use the ⇨ and ⇦ keys to set the required new value (e.g. -148.0).

7.   Press the **SET** key to accept the new value. The display will read **SU-u**.

8.   Press the ⇨ key once to display a flashing 4 digit number representing the current maximum alarm level setting. (The default setting for the °C range is 020.0)

9.   Use the ⇨ and ⇦ keys to set the required new value (e.g. 068.0).

10.   Press the **SET** key to accept the new value, followed by the **P** key to return to the main display.
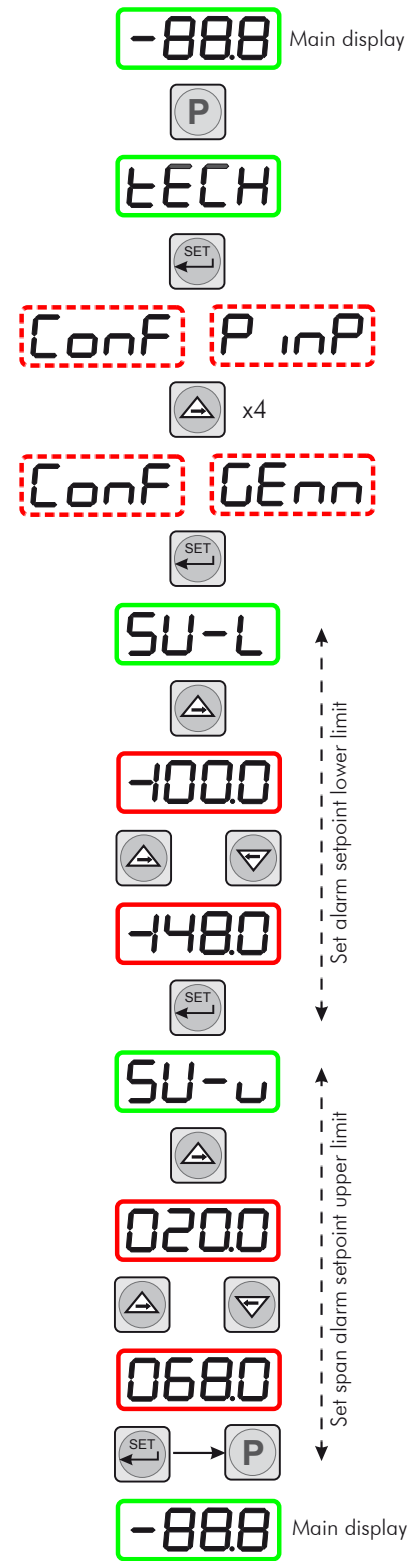
Figure 29   *Set-up Alarm Set-Point Limits*

3.3.9   Digital Communication Parameters Set-Up

The default parameters for the Easidew Online instrument are as follows:

Default Address = 1, Baud rate = 9600, Parity = None, Stop bits = 1

To change these parameters, proceed as follows:

Figure 29 shows the operational key sequence.

1.   Press the **P** key once, the display will read **tECH**.

2.   Press the **SET** key and the display will flash between **ConF** and **PinP**.

3.   Press the ⇨ key five times, the display will flash between **ConF** and **Corn**.

    Set-up instrument address

4.   Press the **SET** key once to display **SAdr**.

5.   Press the ⇨ key once to display a flashing 4 digit number. The default setting is 0001.

6.   Use the ⇨ and ⇦ keys to give the required new value (e.g. 0002). **NOTE: The range of possible addresses is between 1 and 247**. Press the **SET** key to accept the new value.

    Set baud rate

7.   **bAud** will now be displayed. Press the ⇨ key once to display a flashing 4 digit number. The default setting is 0003, representing 9600 baud.

8.   Use the ⇨ and ⇦ keys to give the required new value (the range is 0 to 4). 0 = 1200 baud, 1 = 2400 baud, 2 = 4800 baud, 3 = 9600 baud, 4 = 19200 baud. Press the **SET** key to accept the selected value.

    Set parity

9.   **Prty** will now be displayed. Press the ⇨ key once to display a flashing 4 digit number. The default setting is 0000, representing no parity (none).

10.   Use the ⇨ and ⇦ keys to give the required new value (the range is 0 to 2). 0 = none, 1 = Odd, 2 = Even. Press the **SET** key to accept the selected value.

    Set number of stop bits

11.   **StPb** will now be displayed. Press the ⇨ key once to display a flashing 4 digit number. The default setting is 0000, representing 1 stop bit.

12.   Use the ⇨ and ⇦ keys to give the required new value (the range is 0–1) 0 = 1 stop bit, 1= 2 stop bits.

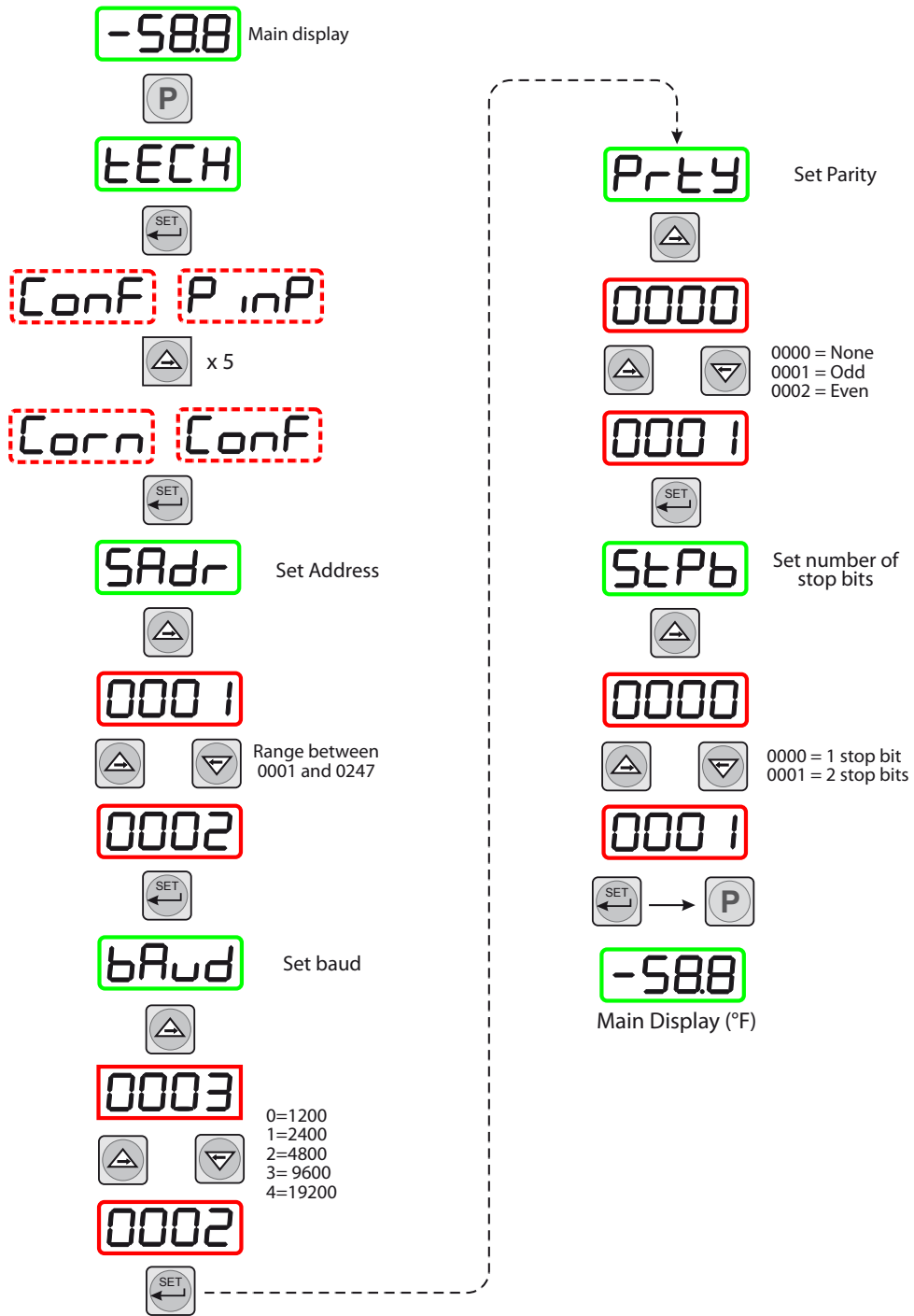13.   Press the **SET** key to accept the selected value, followed by the **P** key to return to the main display.

Figure 30   *Set-up Data Communications Parameters*

3.4   Modbus RTU over RS485 Communications

All the data values relating to the monitor are stored in 16-bit wide input registers.

Modbus RTU implemenation

This is a partial implementation of the Modbus RTU Standard with the following code implemented:

Function Code	Description
4	Read Input Register

Register Types

Data Type	Description
int16	16 bit signed integer
special	Refer to register description/comments for data structure

Default Serial Port Parameters (RS485)

9600 Baud Rate, 8 Data Bits, No Parity, 1 Stop Bit, No Flow Control

Register Map – Input Registers (Read Only)

Register Address		Data Type	Description	Comment
Dec	Hex			
0	0000	int16	Displayed Value	Value displayed on the front of the monitor, without decimal point.
7	0007	special	Errors	
			bit 0 = Sensor Break (SBR) bit 1 = Sensor Over-Range (Over) bit 2 = Sensor Under-Range (Under)	Value is 0 when no errors present. Value would be 5 when sensor is disconnected (SBR + Under)
8	0008	special	Decimal Point Selection	
			0 = 0 DP XXXX 1 = 1 DP XXX.X 2 = 2 DP XX.XX 3 = 3 DP X.XXX	

Example: Reading the displayed value on the front of the monitor

Request by master (PC): 0x 01 04 0000 0001 31CA

01 = Modbus Slave Address / Device ID
04 = Function Code 4 – Read Input Register
0000 = Register Address
0001 = Number of registers to read
31CA = CRC16 Checksum

Response by slave (Monitor): 0x 01 04 02 0402 3A31

01 = Modbus Slave Address / Device ID
04 = Function Code 4 – Read Input Register
02 = Number of subsequent data bytes
0402 = Contents of register 0
31CA = CRC16 Checksum

Decoding the response

0x0402 in base 10 (decimal) is 1026.
If the monitor resolution is set to 1 decimal place, the result must be divided by 10, so in this example the displayed value would be reading 102.6

In another example, if the response was 65270 then the result would be -26.6.
Signed integers use two's complement representation, therefore 65270 - 65536 = -266, with the monitor set to 1 decimal place resolution -266 / 10 = -26.6.

Example: Using Baseblock COMTest Pro to read the displayed value on the front of the monitor

The screenshots below show how to configure Baseblock COMTest Pro. A useful free tool for troubleshooting Modbus communications.

Download from:
https://www.baseblock.com/PRODUCTS/comtestpro.htm

Further Reading

For more information about the Modbus RTU protocol please see recommended resources below:

	http://www.simplymodbus.ca/FAQ.htm is an excellent resource covering the basics of the Modbus protocol. Full descriptions of the function codes (including FC04) can be found in the sidebar.
	https://www.scadacore.com/tools/programming-calculators/online-hex-converter/ is an excellent resource for determining register types/byte order issues in raw received Modbus data.

4   GOOD MEASUREMENT PRACTICE

The Easidew Online Hygrometer is designed to operate in a flowing gas stream and is suitable for the measurement of the moisture content of a wide variety of gases. In general, if the gas (in conjunction with water vapor) is not corrosive to ceramics or base metals then it will be suitable for measurement by the Easidew Online.

4.1   General Operational Guidelines

General guidelines to be followed when setting-up a sampling system are as follows:

- **Operate with an appropriate flow rate**

When installed in a sample block, the optimum flow rate is 5L/min to ensure fast responses to changes in dew point. Sample gas flow should be regulated by a precision needle valve installed either on the inlet of the sample block (atmospheric dew-point measurement) or on the outlet of the sample block (pressure dew-point measurement). Avoid too much restriction on the inlet or outlet of the sample block, as this may cause an undesired pressure gradient across the block.

To avoid long sample transport times a fast-loop bypass may be desirable, especially for higher pressure samples.

- **Transmitter Positioning**

The sample point should be as close to the critical measurement point as possible. Also, never sample from the bottom of a pipe as entrained liquids may be drawn into the sensing element.
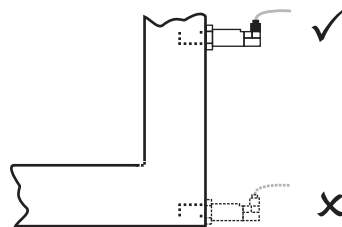

Figure 31   *Installation Location*

- **Avoidance of Dead Spaces**

Dead space causes moisture entrapment points, increased system response times and measurement errors, as a result of the trapped moisture being released into the passing sample gas and causing an increase in partial vapor pressure.
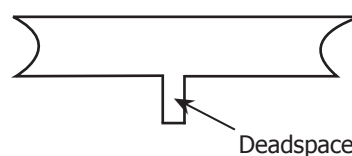
Deadspace

Figure 32   *Indication of Dead Space*

• **Particulate and Oil Removal**

Particulate matter at high velocity can damage the sensing element and similarly, at low velocity, they may 'blind' the sensing element and reduce its response speed. If particulate, such as degraded desiccant, pipe scale or rust is present in the sample gas, use an in-line filter.

• **High-Quality Tube and Fittings**

Michell Instruments recommends that, wherever possible, stainless steel tubing and fittings should be used. This is particularly important at low dew points since other materials have hygroscopic characteristics and adsorb moisture on the tube walls, slowing down response and, in extreme circumstances, giving false readings. For temporary applications, or where stainless steel tubing is not practical, use high quality thick walled PTFE tubing.

• **Complexity avoidance (tee pieces, in-line couplings, etc.)**

Sample pipework should, ideally, be specially designed for each application rather than adapted from that previously installed for another application. Dead space in sample lines increases response time by holding water molecules which are more slowly released to the passing gas sample.

• **Sample Gas Selection**

Generally, if the sample gas (in conjunction with water vapor) is not corrosive to base metals, it will be suitable for measurement by the Easidew Online system. Gases containing entrained solids should be filtered before application to the sample block.

Care should be taken with gas mixtures containing potentially condensable components in addition to water vapor, e.g. oil, to ensure that only water vapor is present in the sample.

4.2   Maintenance and Calibration

Routine maintenance of the Easidew Online Hygrometer is confined to regular re-calibration. For most applications, annual re-calibration ensures that the stated accuracy of the Easidew Online Hygrometer is maintained.

Specialist calibration instrumentation is required to calibrate the transmitter and a true calibration can only be performed by exposure of the dew-point sensor to a reference gas of known dew point.

Calibration services are offered by Michell Instruments at their accredited calibration laboratories. All calibrations are traceable to national standards either via the National Physical Laboratory (UK) or the National Institute of Standards and Technology (USA).

The Easidew transmitter can be returned to Michell Instruments either directly or via the authorized distributor, for calibration at 13 points across the range -100 to +20°Cdp (-148 to +68°Fdp).

Alternatively, Michell Instruments can provide an exchange transmitter. Prior to re-calibration, an exchange transmitter can be ordered from Michell Instruments or an authorized distributor.

Once the replacement transmitter and calibration certificate have been received, the original transmitter can be disconnected from the sample line and the monitor and the replacement transmitter fitted in its place. Refer to Section 2.1.1. The original transmitter should be packed in its original packing (see *Figure 3)* and returned to Michell Instruments, either directly, or via their authorized agent.

Easidew transmitters are fully interchangeable and can be used with any Easidew Online monitor. Transmitter interchangeability is not affected by cable length.

4.2.1   Clean Monitor

The front panel of the monitor should be cleaned with a moist lint free cloth. Mild detergent may be used to remove any stubborn marks or stains but **DO NOT** use any type of solvent, e.g. acetone, which could damage the instrument.

Appendix A

Technical Specifications

Appendix A　　　Technical Specifications

Monitor	
Performance	
Measurement Range (Dew Point)	-100 to +20°C (-148 to +68°F) dew point
Electrical Specifications	
Input Signal	4–20 mA input from Michell dew-point transmitter
Output Signal	4–20 mA (or –20mA) (2-wire connection, current source) User configurable over range
Alr 1 Relay	Single pole make contact, rating 3 A @ 250 V AC
Alr 2 Relay	Changeover contacts, rating 5 A @ 250 V AC
Output	Dew point or moisture content for ppm_v
Analog Output Scaled Range	Dew point: -100 to +20°C Moisture content in gas: 0–3000 ppm_v Non-standard available upon request
Power Connection	2 wire, length 2m (6.6ft)
Supply Voltage	100 to 240 V AC (+10%, -15%), 50/60 Hz (Optional 24 V DC) (-15%, +10%) 6W
Over Voltage Category	III, fixed installation category
Display	20.3mm red 4 digit LED display
Temperature and Alarms Indicators	Red LED's
Load Resistance	Max 600 Ω
Current Consumption	AL1, AL2, °C, °F
Power Connection	60 mA max
Transmitter cable	Copper braid screened cable; 4 core 7 / 0.2 (0.22mm²), stranded, tinned copper conductors, PVC, insulated, Melinex taped, Black PVC outer. Max length 800m (2,624 ft)
Operating Specifications	
Environmental Ratings	Standard, indoor at an altitude of less than 2000 meters with non-condensing humidity
Operating Temperature	0 to +50°C (+32 to +122°F) 90% RH max (non condensing)
Operating Mode	Continuous
Mechanical Specifications	
Ingress Protection	IP65 (NEMA 4X) at front, IP20 at rear
Housing Material	1/8 DIN 43700 plastic housing
Dimensions	96 X 48 x 86.5mm (3.8 x 1.9 x 3.4") horizontal
Mounting	Panel mounting (cut out 92 x 46mm (3.6 x 1.8"))
Weight	Approximately 210g (7.4oz)

Transmitter	
Performance	
Measurement Range (Dew Point)	-100 to +20ºCdp (-148 to +68ºFdp)
Accuracy (Dew Point)	±2ºCdp (±3.6ºFdp)
Response Time	5 mins to T95 (dry to wet)
Repeatability	0.5ºCdp (0.9ºFdp)
Calibration	13-point calibration with traceable point calibration certificate
Electrical Specification	
Output Signal	4–20 mA (2-wire connection current source) User-configurable over range
Output	Dew point or moisture content for ppm$_V$
Analog Output Scaled Range	Dew point: -100 to +20ºC (-148 to +68ºF) OR Moisture content in gas: 0–3000 ppm$_V$ Non-standard available upon request
Supply Voltage	12 to 28 V DC
Load Resistance	Max 250 Ω @ 12 V (500 Ω @ 24 V)
Current Consumption	20 mA max
CE Marked	Certified
Operating Specifications	
Operating Temperature	-40 to +60ºC (-40 to +140ºF)
Operating Pressure	45 MPa (450 barg / 6500 psig) max
Compensated Temperature Range:	-20 to +50°C(-4 to 122ºF) NOTE: The transmitter accuracy statement is only valid for the temperature range: -20/+50°C
Storage Temperature:	-40 to +60°C (-40 to +140ºF)
Flow Rate	1 to 5 Nl/min (2.1 to 10.6 scfh) mounted in standard sampling block; 0 to 10 m/sec (0 to 32.8 fps) direct insertion
Mechanical Specifications	
Ingress Protection	IP66 in accordance with standard BS EN60529:1992 NEMA 4 in protection accordance with standard NEMA 250-2003
Housing Material	316 stainless steel
Dimensions	Transmitter plus connector L=132mm x ø45mm (5.19" x ø1.77")
Sensor Guard	Standard: HDPE Guard < 10μm Optional: 316 stainless steel sintered guard < 80μm
Process Connection & Material	5/8" - 18 UNF 316 stainless steel
Weight	150g (5.29oz)
Interchangeability	Fully interchangeable transmitter
Electrical Connection	Hirschmann GDS series (DIN 4350-C)
Diagnostic Conditions (factory programmed)	**Condition** / **Output** Sensor fault — 23 mA Under-range dew point — 4 mA Over-range dew point — 20 mA
Digital Diagnostic Communications	RS485, 2-wire Modbus RTU

A.1 Dimensions

Transmitter   **5/8" Bonded Seal**

Sample Block

FRONT VIEW   SIDE VIEW
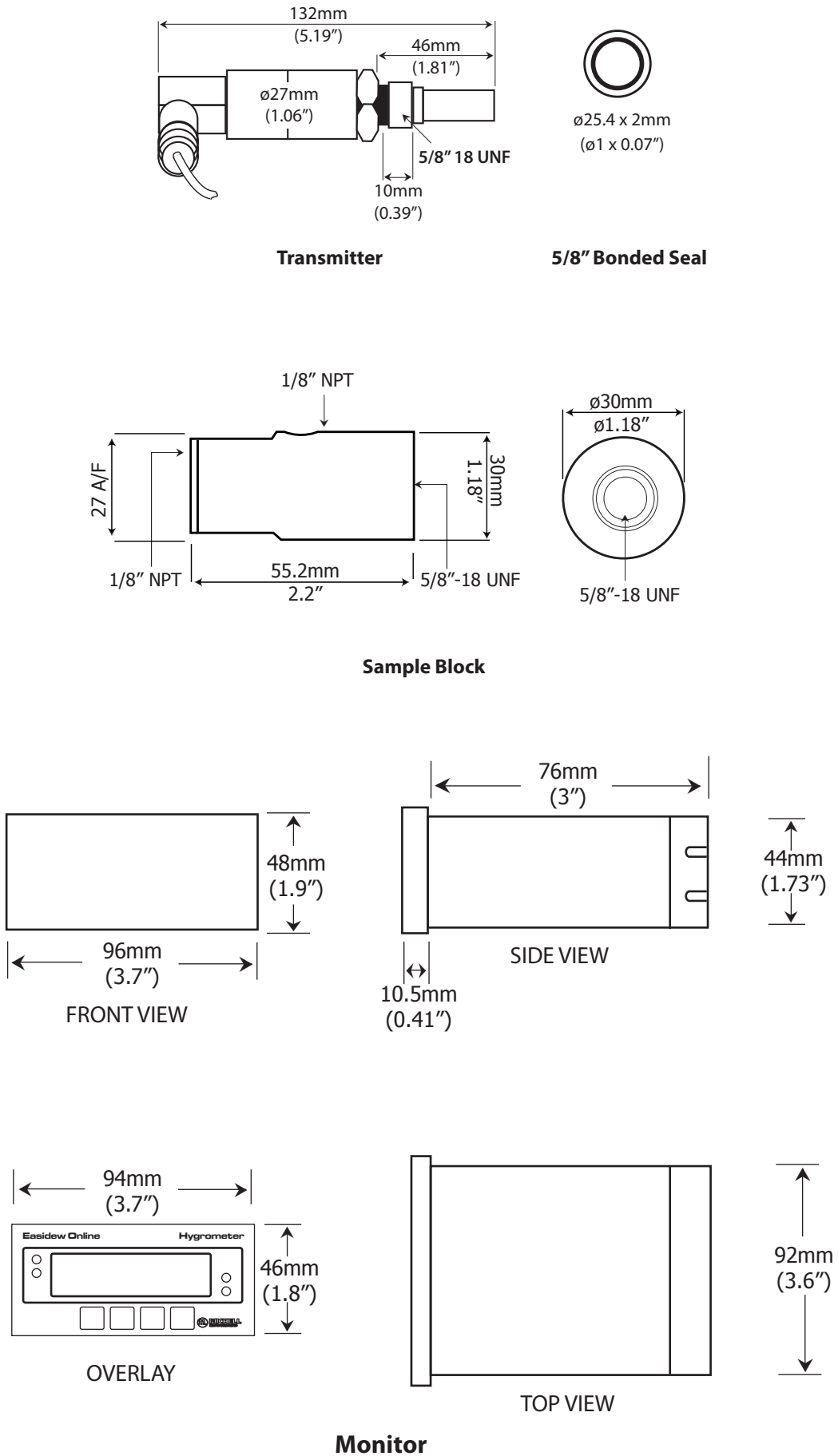
OVERLAY   TOP VIEW

Monitor

Figure 33   *Dimensions*

Appendix B

Quality, Recycling & Warranty Information

Appendix B   Quality, Recycling & Warranty Information

Michell Instruments is dedicated to complying to all relevant legislation and directives. Full information can be found on our website at:

www.michell.com/compliance

This page contains information on the following directives:

- ATEX Directive

- Calibration Facilities

- Conflict Minerals

- FCC Statement

- Manufacturing Quality

- Modern Slavery Statement

- Pressure Equipment Directive

- REACH

- RoHS3

- WEEE2

- Recycling Policy

- Warranty and Returns

This information is also available in PDF format.

Appendix C

Return Document & Decontamination Declaration

Appendix C   Return Document & Decontamination Declaration

Decontamination Certificate

IMPORTANT NOTE: Please complete this form prior to this instrument, or any components, leaving your site and being returned to us, or, where applicable, prior to any work being carried out by a Michell engineer at your site.

Instrument			Serial Number	
Warranty Repair?	YES	NO	Original PO #	
Company Name			Contact Name	
Address				
Telephone #			E-mail address	

Reason for Return /Description of Fault:

Has this equipment been exposed (internally or externally) to any of the following?
Please circle (YES/NO) as applicable and provide details below

Biohazards	YES	NO
Biological agents	YES	NO
Hazardous chemicals	YES	NO
Radioactive substances	YES	NO
Other hazards	YES	NO

Please provide details of any hazardous materials used with this equipment as indicated above (use continuation sheet if necessary)

Your method of cleaning/decontamination

Has the equipment been cleaned and decontaminated?	YES	NOT NECESSARY

Michell Instruments will not accept instruments that have been exposed to toxins, radio-activity or bio-hazardous materials. For most applications involving solvents, acidic, basic, flammable or toxic gases a simple purge with dry gas (dew point <-30°C) over 24 hours should be sufficient to decontaminate the unit prior to return.
Work will not be carried out on any unit that does not have a completed decontamination declaration.

Decontamination Declaration

I declare that the information above is true and complete to the best of my knowledge, and it is safe for Michell personnel to service or repair the returned instrument.

Name (Print)		Position	
Signature		Date	

F0121, Issue 2, December 2011