

## Using the AcuDew Dewpoint Transmitter

The **AcuDew Transmitter** is a two wire, 4-20 mA loop powered transmitter for continuous moisture measurement in process gases, glove box environments, compressed air, and many other applications. It has a linear 4-20 mA output signal corresponding to the moisture measurement. The AcuDew Transmitter can be factory configured to output a 4-20 mA linear signal for several moisture units including dew/frost point ( $^{\circ}\text{C}$  or  $^{\circ}\text{F}$ ), PPMv, and PPBv.



The high capacitance sensing element of the AcuDew Transmitter provides outstanding sensitivity, repeatability, and speed of response. Each transmitter is supplied with a Certificate of Calibration, traceable to NIST.

### The AcuDew offers many standard features including:

- 2 Wire Loop Powered Dew/Frost Point Transmitter
- Overall Range  $-120^{\circ}\text{C}$  to  $+20^{\circ}\text{C}$  Dew/Frost Point Temperature
- Dew/Frost Accuracy:
  - Range  $-90$  to  $+20$ :  $\pm 2^{\circ}\text{C}$
  - Range  $-120$  to  $-90$ :  $\pm 3^{\circ}\text{C}$
- Field Span Verification (FSV)
- Configured for Linear 4-20 mA Signal In  $^{\circ}\text{C}$  or  $^{\circ}\text{F}$  Dew/Frost Point, PPMv, or PPBv
- Sample Flow Independent
- Failure Diagnostics
- Long Term Stability
- Fast Response
- NEMA 4X Protection
- Standard 6-foot Connecting Cable with Terminations
- Supplied with Calibration Certificate Traceable to National and International Humidity Standards

The advanced electronic design of the AcuDew Moisture Transmitter utilizes microprocessor circuitry and a high capacitance moisture sensor to provide superior performance. The AcuDew is easy to install and operate using a loop-powered 7 to 28 Vdc source. The calibration, unique to the sensor, is stored on-board, providing a 4-20 mA output linear to the moisture measurement range. Little to no maintenance is required in most inert gas applications. The mechanical design is of sturdy stainless steel and dependable industrial-grade electrical connections providing NEMA 4X protection. The AcuDew is designed for use in a broad spectrum of applications including those with

operating pressures from vacuum conditions to 5000 psi. The transmitter cable length can be up to 3000 feet, connecting the transmitter to its power supply and/or panel meter console. The FSV (Field Span Verification) feature of the AcuDew Moisture Transmitter allows for the user to ensure accuracy to the laboratory calibration by checking the span of the transmitter and correcting for any deviation, in between annual factory recalibration. The FSV feature should be used periodically, every 2 to 3 months, or when verification of the AcuDew Transmitter is required.

### Basic Specifications

<b>Operating Pressure:</b>	From 7.5 mm Hg (0.01 barA) to Maximum 5,000 psig (350 barA)
<b>Operating Flow:</b>	Flow independent; Recommended flowrate 4 to 10 SCFH (2 to 5 Liters/Min) Maximum Flow: Approximately 45 cm/sec linear velocity
<b>Range:</b>	-120 to +20°C dew/frost point (Other units available, °F D/F Point, PPMv, etc.)
<b>Sensor:</b>	High-capacitance aluminum oxide; Transmitter shipped with 6 foot (2m) cable.
<b>Power:</b>	Standard is 24 Vdc
<b>Interface:</b>	4-20 mA current loop
<b>Optional Displays:</b>	1) Blind transmitter – no display 2) AD-LPD: Local loop-powered “plug-on” LCD display 3) AcuVu 100: NEMA 4 panel meter/24 Vdc power supply - 4-20 mA retransmitted analog output - 2 field adjustable alarm relays 4) AcuTrak 1000: NEMA 4 panel meter/24 Vdc power supply - 4-20 mA retransmitted analog output - 2 field adjustable alarm relays - Programmable pressure for PPMv calculation & display - RS485 communication to panel for remote programming

## TO ORDER:

1. Determine dew/frost point or moisture content range:

**1** = -80 to +20°C D/F Point

**2** = -100 to 0°C D/F Point

**3** = -120 to -20°C D/F Point

**4(a-b)** = 1 to 1000 PPMv

*a*: Specify System Pressure

*b*: Specify Pressure Units:

P = PSIG

B = BARG

**5(a-b)** = 0.1 to 100 PPMv

*a*: Specify System Pressure

*b*: Specify Pressure Units:

P = PSIG

B = BARG

**6(a-b)** = 0.01 to 10 PPMv

*a*: Specify System Pressure

*b*: Specify Pressure Units:

P = PSIG

B = BARG

**7(a-b)** = 1 to 1000 PPBv

*a*: Specify System Pressure

*b*: Specify Pressure Units:

P = PSIG

B = BARG

**8** = Custom moisture range

2. List as separate line items additional choices such as MB, SMU, Filter Kit, and Extended Warranty.

**AD -** 

Examples:

AD – 2 would be a standard AcuDew with a -100 to 0°C dew/frost point range.

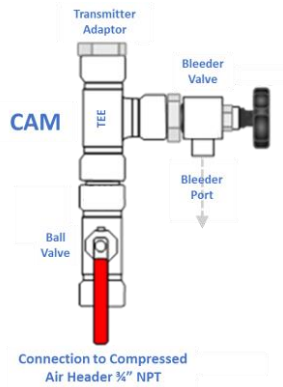
AD – 4(100/P) would be a standard AcuDew with a 0 to 1000 PPMv range (programmed for use at 100 PSIG).

**Accessories Available:**

Part Number	Part Description
AD-SC-4	Sample Cell with 1/4" compression tube fittings
AD-SC-8	Sample Cell with 1/8" compression tube fittings
AD-OR	Spare 3/4" Viton O-ring
AD-EC-10	10-Foot AcuDew Transmitter cable
AD-EC-20	20-Foot AcuDew Transmitter cable
AD-EC-30	30-Foot AcuDew Transmitter cable
AD-EC-50	50-Foot AcuDew Transmitter cable
AD-EC-100	100-Foot AcuDew Transmitter cable
AD-CONN	AcuDew Transmitter cable connector
AD-NPTA	3/4" NPT Adaptor for the AcuDew Transmitter

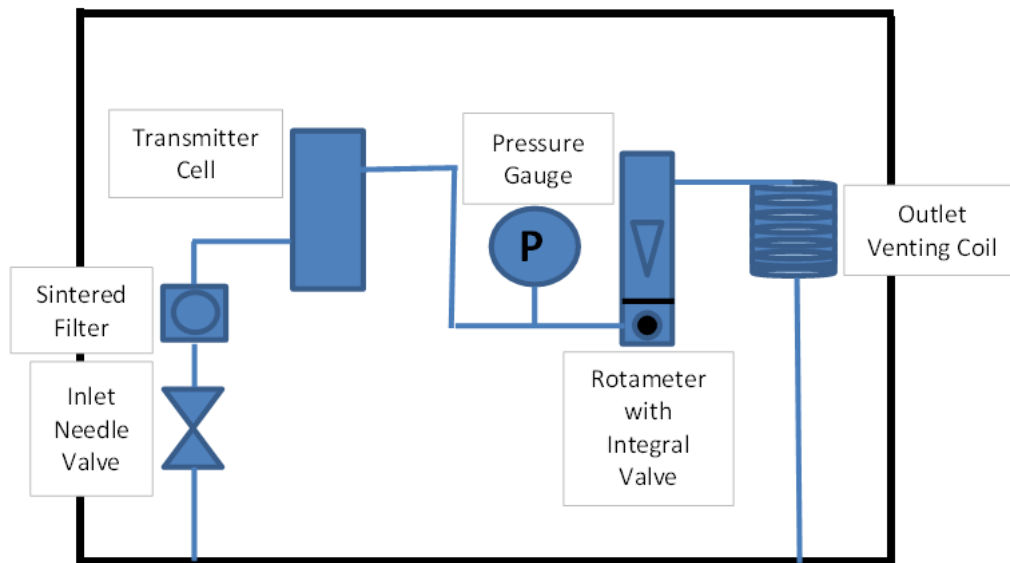
## Potential Sample System Configurations: Compressed Gas/Instrument Air

- A. No particulates/No entrained liquids: CAM (Compressed Air Module)



**CAM Part Number: AD-CAM**

- B. Particulates/No entrained liquids: Typical Sample System



**Sample System Part Number: SCS+1A-1-1-1-3-1-0-1-1-0**

### Sample System Design Notes:

- 1) Sample Inlet Needle Valve - This is a recommended item as it allows access to the sample system without interrupting the main process line and can be used to drop the process pressure if an atmospheric dew point measurement is preferred.

- 2) Sample Tube – This should be stainless steel for dry air or gas applications. If any section of the sample tube must be flexible, then PTFE should be used. In most cases, 1/4" (6 mm) O.D. is sufficient as it provides good system response time within minimum flow. Where 1/8" (3 mm) O.D. tube is desired, consult Edgetech Instruments.
- 3) Sintered Filter– A filter is recommended when the samples are likely to contain particulate matter. If the air/gas sample contains any type of condensate, the filter must be of the coalescing type with a drain. The filter unit should be positioned as close to the sample point as practical.
- 4) If the sample is to be measured at atmospheric pressure, the inlet needle valve should be used to set the desired flow rate on the rotameter, while the integral valve on the rotameter should be set fully open. If the sample is to be measured at full line pressure, the inlet needle valve should be opened fully and the flow rate set using the integral valve on the rotameter.
- 5) Sample Pressure Gauge – This becomes a critical part of the sample system when moisture measurements are to be made at higher than atmospheric pressure.
- 6) Rotameter with Integral Control Valve – The recommended sample flow is 4 to 10 SCFH (typically 5 SCFH). The rotameter and flow control valve can be separate items, the valve does not need to be integral to the rotameter.
- 7) Outlet Venting Coil – This coil of tubing helps prevent the back-diffusion of ambient moisture into the sample system. If the exhaust is returned to the process line, the coil is not normally required.

**NOTE:** Most AcuDew applications are for inert gases. For this reason, this potential sample system will be the common sample system for most AcuDew applications. However, the design notes point out variations to the sample system that might be necessary depending on the application details. To insure the proper sample system design, we recommend you contact Edgetech Instruments. The most efficient way to proceed is to complete an Application Support Request Form and submit it to Edgetech Instruments at [h2o@edgetechinstruments.com](mailto:h2o@edgetechinstruments.com). We will then evaluate your application and reply with our recommendations. For your convenience, a blank Application Support Request Form is attached below.

# Application Support Request Form

## General Moisture Applications

Please help us guide you towards the proper product/service for your application by completing the form below. The **blue shaded areas** indicate the cells that should to be populated. Please fill out the worksheet as completely as possible.

To provide this information, please complete the form and click "Submit". If you prefer, feel free to print it and email (H2O@edgetechinstruments.com), or fax (508-486-9348) a copy to us. Also we can be reached by telephone for further discussion at 508-263-5900.

Company Name:		<i>Click or tap here to enter text.</i>	
Address: Street		<i>Click or tap here to enter text.</i>	
City, State, Zip Code, Country		<i>Click or tap here to enter text.</i>	
Contact Name:		<i>Click or tap here to enter text.</i>	
Telephone No.:		<i>Click or tap here to enter text.</i>	
Cell Phone No.:		<i>Click or tap here to enter text.</i>	
Email Address:		<i>Click or tap here to enter text.</i>	
Installation Site Address: City, State, Country		<i>Click or tap here to enter text.</i>	
<b>Application Specifications / Details</b>			
Application Name/Description:	<i>Click or tap here to enter text.</i>		
Tag Number(s)	<i>Click or tap here to enter text.</i>		
Background Gas Composition:	<i>Click or tap here to enter text.</i>		
Particulate Matter	Yes <input type="checkbox"/> No <input type="checkbox"/>		
Entrained Liquids	Yes <input type="checkbox"/> No <input type="checkbox"/>		
Contaminants/Corrosives	<i>Click or tap here to enter text.</i>		
Application Type:	Process Monitoring <input type="checkbox"/> Process Control <input type="checkbox"/> Laboratory <input type="checkbox"/> Calibration Lab <input type="checkbox"/> Metrology Lab <input type="checkbox"/> Other <input type="checkbox"/> ; <i>Click or tap here to enter text.</i>		
Specification (Select Unit)	Minimum	Normal	Maximum
<b>Dew/Frost Point/Content</b> (°C <input type="checkbox"/> or °F <input type="checkbox"/> or PPMv <input type="checkbox"/> or PPBv <input type="checkbox"/> )	<i>Click or tap here to enter text.</i>	<i>Click or tap here to enter text.</i>	<i>Click or tap here to enter text.</i>
<b>Temperature</b> (°C <input type="checkbox"/> or °F <input type="checkbox"/> )	<i>Click or tap here to enter text.</i>	<i>Click or tap here to enter text.</i>	<i>Click or tap here to enter text.</i>
<b>Pressure</b> (psig <input type="checkbox"/> or barg <input type="checkbox"/> or psia <input type="checkbox"/> or bara <input type="checkbox"/> )	<i>Click or tap here to enter text.</i>	<i>Click or tap here to enter text.</i>	<i>Click or tap here to enter text.</i>
<b>Flow Rate</b> (SCFH <input type="checkbox"/> or cc/m <input type="checkbox"/> or L/m <input type="checkbox"/> )	<i>Click or tap here to enter text.</i>	<i>Click or tap here to enter text.</i>	<i>Click or tap here to enter text.</i>

Installation Site Information			
Location	Indoor <input type="checkbox"/>		Outdoor <input type="checkbox"/>
Ambient Conditions	Minimum	Normal	Maximum
Temperature (°C <input type="checkbox"/> or °F <input type="checkbox"/> )	Click or tap here to enter text.	Click or tap here to enter text.	Click or tap here to enter text.
Relative Humidity (%)	Click or tap here to enter text.	Click or tap here to enter text.	Click or tap here to enter text.
Direct Sunlight	Yes <input type="checkbox"/>		No <input type="checkbox"/>
Area Classification	Safe/General Purpose <input type="checkbox"/> Hazardous <input type="checkbox"/> ; Classification: Class: Click or tap here to enter text. Division: Click or tap here to enter text. Group(s): Click or tap here to enter text. Other: Click or tap here to enter text.		
Process Line Pipe Size	Click or tap here to enter text.		
Preferred Installation:	Sample Line <input type="checkbox"/> (Recommended) or In Situ (Direct Insertion) <input type="checkbox"/>		
Instrumentation Preferences			
Local Display?	No <input type="checkbox"/> (Sensor/Transmitter Only)		Yes <input type="checkbox"/> (Display Required)
Remote Sensor Required?	No <input type="checkbox"/> (with Electronics)		Yes <input type="checkbox"/> (Remote from Electronics)
Required Cable Length:	Click or tap here to enter text.		Feet <input type="checkbox"/> or Meters <input type="checkbox"/>
Output / Interface	Analog: 4-20 mA <input type="checkbox"/> or Other <input type="checkbox"/> : Click or tap here to enter text. Serial: RS232 <input type="checkbox"/> or RS485 <input type="checkbox"/> Alarm Relays/Contacts <input type="checkbox"/> Other <input type="checkbox"/> : Click or tap here to enter text.		
Measurement Technology Preference:	Chilled-Mirror <input type="checkbox"/> (High Accuracy, LDL -90°C D/F P) Aluminum-Oxide <input type="checkbox"/> (Wide Application Scope, -110 to +20°C D/F P) Electrolytic (P2O5) <input type="checkbox"/> (Trace Moisture, 0.1 to 1250 PPMv) Polymer <input type="checkbox"/> (Relative Humidity) Other <input type="checkbox"/> ; Click or tap here to enter text.		
Preferred Measurement Units:	Dew/Frost Point <input type="checkbox"/> Relative Humidity <input type="checkbox"/> PPMv <input type="checkbox"/> PPBv <input type="checkbox"/> Other <input type="checkbox"/> : Click or tap here to enter text.		
Required Certifications:	Calibration: NIST <input type="checkbox"/> : Click or tap here to enter text. ISO/IEC 17025 <input type="checkbox"/> : Click or tap here to enter text. Electronics: FM <input type="checkbox"/> : Click or tap here to enter text. UL <input type="checkbox"/> : Click or tap here to enter text. CSA <input type="checkbox"/> : Click or tap here to enter text. ATEX <input type="checkbox"/> : Click or tap here to enter text. Other <input type="checkbox"/> : Click or tap here to enter text.		



<b>Site Utilities</b>	
Power	120 Vac / 60 Hz <input type="checkbox"/> ; Click or tap here to enter text. 220 Vac / 50 Hz <input type="checkbox"/> ; Click or tap here to enter text. 24 Vdc <input type="checkbox"/> ; Click or tap here to enter text. Other <input type="checkbox"/> ; Click or tap here to enter text.
Instrument Air	Specifications: Click or tap here to enter text.
Cooling Water	Specifications: Click or tap here to enter text.
<b>Miscellaneous</b>	
Is there interest in a specific Edgetech Inst. Product(s)?	Click or tap here to enter text.
Other Requirements:	Click or tap here to enter text.
Additional Notes:	Click or tap here to enter text.