

# Dew-Point Measurement Solutions



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## Special Features

- **No downtime** – Michell Instruments offers a unique sensor exchange programme, which means that you will never need to be without fast and accurate humidity measurement.
- **Speed** – Ceramic Sensors yield the fastest response time.
- **Resilience** – Ceramic Sensors are very robust and offer excellent corrosion resistance as well as being highly resistant to sudden pressure changes.
- **Safety** – Michell's Impedance range offers intrinsically safe versions of each instrument.
- **Low Cost** – Michell's Easidew range of hygrometers is one of the most affordable on the market.
- **Calibration** – All Michell's instruments are supplied complete with calibration certificates traceable to national standards, to ensure accurate and stable measurements.



## Background to Michell Instruments

Michell Instruments is the global leader in moisture and humidity measurement solutions. With over 30 years of experience, Michell Instruments designs and manufactures a wide range of transmitters, instruments and system solutions capable of measuring trace moisture, humidity, dew point and oxygen in a vast range of applications and industries ranging from compressed air dryers, power generation, process, natural gas, pharmaceutical, plastics and many more.

With a fast growing international subsidiary and distribution network, Michell Instruments provides cost effective measurement solutions for the most demanding applications around the world.

Michell uses four key dew-point measurement technologies in their products:

- Impedance method using a ceramic tile which delivers unrivalled speed of response and robustness.
- Chilled mirror method which has been incorporated into advanced, precision instruments for industrial and laboratory use.
- Dark spot technology, which was developed in partnership with Shell, to offer a world-class solution for the measurement of hydrocarbon dew point.
- Quartz crystal technology for a high-precision, fast responding moisture measurement with self-calibration.

## Applications

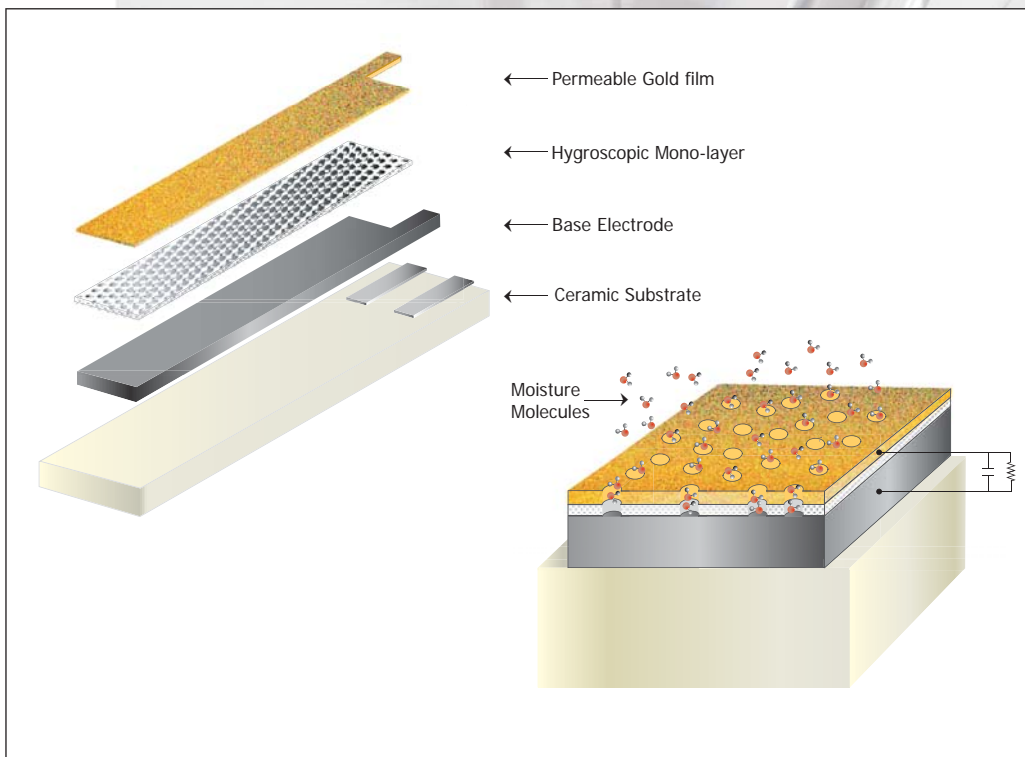
- Air Dryers
- Environmental Chambers
- Power Generation
- Natural Gas
- Pure Gases
- Metrology Laboratories
- Pharmaceutical
- Plastics
- Fuel Cells
- Aerospace
- Food/Beverage Processes
- Chemical
- Metallurgy/Heat Treating
- Petrochemical
- Automotive
- Drying Processes
- Semiconductor Fabs
- ... and many more

## Sensor Technology

All Michell dew-point transmitters use the Advanced Ceramic Moisture Sensor. The operation of this sensor depends on the dielectric property of water molecules absorbing onto an active porous insulating layer sandwiched between two layers of conductive material deposited on a ceramic substrate.

Water has a very high dielectric compared to the dielectric of the active layer and the background of the carrier gas so it can be detected easily.

The active layer is very thin – less than one micron and the porous top conductor that allows water molecules to penetrate into the active layer is less than 0.1 micron thick. This allows the sensor to respond very rapidly to changes in the moisture surrounding it both when moisture decreases (drying) and increases in the sensor environment.



Michell ceramic sensor tile layers





### Transmitters

- Fast response time (T90 in 4 min)
- High accuracy ( $\pm 1^{\circ}\text{C}$  available )
- Unique Michell calibration exchange programme – no downtime
- Linear 0-20 and 4-20 mA output
- Multiple ranges within the total range of  $-100$  to  $+20^{\circ}\text{C}$  ( $-120$  to  $-40^{\circ}\text{C}$  for Pura)
- Work in pressures from vacuum to 45 MPa (450 Barg)
- FM, CSA and ATEX certified
- Small and easy to install
- Semiconductor industry surface preparation (Pura)



### On-line Hygrometers

- $^{\circ}\text{C}$  , dew point & ppm, moisture content
- User configurable alarms and outputs
- Analog and digital outputs
- 4 or 5-Digit red sunlight readable display
- For additional specifications, request a specific data sheet



### Sampling Systems

- Sample filtration to avoid contamination and ensure reliable measurements
- Flow Control
- IP66 enclosures
- Pressure or atmospheric dew point



## Easidew Transmitter

2-wire loop powered dew-point transmitter



Range	-100 to +20°C dew point
Accuracy	±2°C dew point
Connection	2-wire loop powered
Output	4-20 mA
Power Supply	12-28 VDC

## Easidew On-Line

Dew-point measurement and display instrument



Range	-100 to +20°C dew point
Alarms	2 user configurable set points
Output	4-20 mA
Display	4 digit red LED
Ingress Protection	IP65 (front panel)
Power Supply	85-265 VAC, 24 VDC

## Easidew TX I.S.

ATEX certified dew-point transmitter



Range	-100 to +20°C dew point
Accuracy	±2°C dew point
ATEX Certification	Ex II 1 G Ex ia IIC T4
Connection	2-wire loop powered
Output	4-20 mA
Power Supply	12-28 VDC

## Easidew PRO I.S

ATEX certified dew-point transmitter



Range	-100 to +20°C dew point
Accuracy	±1°C dew point
Certification	ATEX – Ex II 1 G Ex ia IIC T4 FM – I.S. I 1 ABCD T4 (Ta = +60°C) CSA – IS Class 1 Div 1 Groups ABCD T4
Connection	2-wire loop powered
Output	4-20 mA
Power Supply	12-28 VDC

## Easidew Sampler

Self-contained sampling block with filter



Pressure	0-1 MPa (0-10 Barg)
Flow Rate	1-5 l/min
Gas Connections	Quick Connect for 6 mm OD PTFE Tube
Filter	99.95 % retention of 0.3 microns

## Pura

Trace moisture measurement transmitter with integral sampling block



Range	-120 to -40°C dew point
Accuracy	±1 to ±4°C (range dependant)
Output	4-20 mA or RS485
Pressure Rating	10 <sup>-9</sup> torr to 240 Barg
Flow Rate	1-5 l/min

## Cermet II

On-Line Hygrometer with multiple units of measurement



Range	-100 to +20°C dew point
Output Parameters	°C / °F dew point, ppm, g/m <sup>3</sup>
Alarms	Up to 4 user configurable set points
Display	5 digit red LED
Power Supply	85-265 VAC, 24 VDC

## ES10

Simple sampling systems for Easidew instruments



Dew Point Range	-60 to +40°C dew point
Pressure Range	0-1 MPa (0-10 Barg)
Flow Rate	1-10 l/min
Filtration	Particulate or coalescing
Ingress Protection	Up to IP66

# Michell Instruments operates in the following markets:

- Compressed Air Dryers
- Pharmaceutical
- Standards Laboratories and Metrology
- Semiconductors
- Natural Gas and Petrochemicals
- Industrial and Pure Gas Production
- Power Generation

## Other Product Ranges

### Portable Instruments

Michell's range of easy-to-operate portable instruments provides fast, accurate and stable measurement of dew point, relative humidity and moisture concentration. They are designed to satisfy the most demanding industrial conditions, and are unique in the market for giving repeatedly fast response to low dew points.

### Chilled Mirror Instruments

Chilled Mirror is a fundamental measuring technology offering the user exceptionally accurate, reliable and repeatable measurements from trace moisture to high humidity. Michell offers a range of instruments based on a rugged sensor design that is equally suitable for installation in demanding process environments or for use as an accurate reference instrument in a National Standards Laboratory.

### Process Analyzers

Michell's range of analyzers is specifically designed to provide reliable online measurement in process applications such as dedicated water and hydrocarbon dew-point determination in natural gas. Three sensing technologies are used: the Ceramic Impedance sensor for measurements in gas and liquid phase; Quartz Crystal Microbalance for trace moisture in process gases and the Dark Spot Chilled Mirror for hydrocarbon dew point.

### Calibration Instruments

Michell has a wide offering of calibration equipment for the verification of trace moisture, dew point and relative humidity sensors. A modular concept means that Michell's engineers can build a customised calibration solution that meets your exact needs. Components may include air compressor and dryer; low range or high range humidity generator; simple sensor housing or environmentally controlled test chamber and finally, verification using a traceable Michell Chilled Mirror Hygrometer.

### Oxygen Analyzers

Michell brings you the very latest technologies in oxygen measurement, designed to give years of reliable and accurate service in laboratory, process and flue gas applications. From instruments featuring a unique sealed reference zirconia sensor to a transmitter with the latest generation thermo-paramagnetic oxygen technology, all Michell oxygen analyzers are available in a range of different configurations.

### Relative Humidity Instruments

Michell's own RH sensing technology provides excellent resolution, long-term stability and speed of response. We offer a wide range of humidity and temperature measuring sensors and instruments, including relative humidity transmitters, humidity and temperature transmitters as well as handheld indicators. The humidity generator range includes the most stable humidity generator on the market.

**Michell Instruments** 48 Lancaster Way Business Park, Ely, Cambridgeshire, CB6 3NW

Tel: +44 (0) 1353 658000, Fax: +44 (0) 1353 658199, Email: [uk.info@michell.com](mailto:uk.info@michell.com), Web: [www.michell.com/uk](http://www.michell.com/uk)

Michell Instruments adopts a continuous development programme which sometimes necessitates specification changes without notice.  
Issue no: Dew Point Transmitters\_97139\_V5\_UK\_0112