

# Optidew

## Chilled Mirror Hygrometer

The Optidew is a fast-responding chilled mirror hygrometer, equally at home in both industrial humidity control and precision laboratory applications. It is available in bench top and wall mount configurations, and features an intuitive touch screen interface for easy local operation. Using the latest developments in chilled mirror technology, it has a response speed comparable to polymer relative humidity sensors, combined with the reliability of drift-free measurements common to all chilled mirror instruments.



### Highlights

- New chilled mirror hybrid sensor gives fast dynamic response to changes in humidity
- Accurate to  $\pm 0.15^{\circ}\text{C}$  ( $\pm 0.27^{\circ}\text{F}$ ) dew point,  $\pm 0.1^{\circ}\text{C}$  ( $\pm 0.18^{\circ}\text{F}$ ) temperature
- Wide measurement range from  $-40$  to  $+120^{\circ}\text{C}$  ( $-40\dots+248^{\circ}\text{F}$ ) dew point
- Choice of communication methods, including Modbus TCP over Ethernet communication for easy networking
- Optional pressure transmitter for accurate calculation of  $\text{ppm}_v$  &  $\text{g/kg}$

### Applications

- Reference humidity instrument for climatic and environmental chambers
- Inlet air measurement for engine testing
- HVAC testing
- Environmental monitoring in clean rooms
- Coating process monitoring—for confectionary and pharmaceuticals
- Control of humidity for metallurgical processes

# Optidew Chilled Mirror Hygrometer

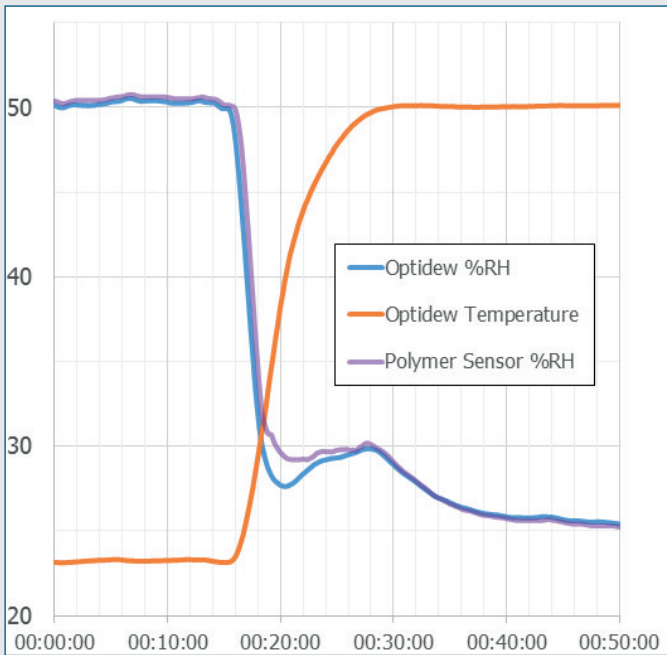
The Optidew series is both robust and adaptable, designed for dependable performance, whether it's in a harsh industrial environment or in a laboratory.

## New design of chilled mirror sensor: fast response speed with drift-free reliability

The Optidew uses a new design of cooled mirror sensor which gives a fast response speed coupled with the accuracy and reliability of the fundamental chilled mirror technique (see opposite page).

Measuring in climatic chambers, the Optidew is able to directly track changes in temperature and humidity without experiencing time-consuming loss of control like traditional chilled mirrors.

This chart shows a transition from a starting condition of 50% rh at 23°C (73.4°F) to 25% rh at 50°C (122°F). The transition time shown is purely that of the climatic chamber: no time is wasted waiting for the Optidew to stabilize.



## Choice of sensors to suit different applications

The dual-stage harsh environment sensor is designed for tough industrial conditions and allows high temperature measurements up to 120°C (248 °F), for applications in metallurgy and fuel cell testing.

The standard sensor is available with single- or dual-stage cooling and is a reliable and cost-effective option for many environmental control applications.

The optional pressure sensor gives additional detail about the measurement. You can now clearly see whether changes in dew point are related to moisture content or pressure. If moisture content needs to be displayed in ppm<sub>v</sub> or g/kg, any live pressure changes will be compensated for.

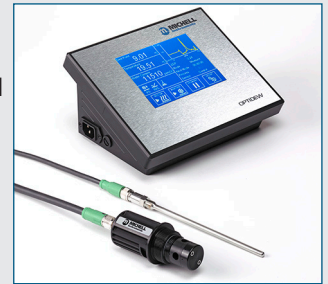
## Touch-screen HMI for easy operation

Both the wall mounted and bench top models are available with a 5.7" color touch screen display to make local operation and interrogation quick and simple to carry out.

## Three housing configurations

### Optidew 401:

A bench top instrument, the Optidew 401 has a simple, intuitive touch-screen HMI which for easy configuration and operation. This version includes a USB port and SD card slot for easy data logging.



Ideal for use as an easily transportable reference hygrometer. Either as a transfer standard to make field calibrations of climatic chambers, or in combination with a Michell HygroCal100 for validation of RH probes.

The optional transport case allows use of the instrument without even unpacking it—great for field service work.

### Optidew 501 – with display

The wall mounted Optidew 501 is designed for continuous measurements of humidity in industrial environments. Modbus over RS485 is provided as standard, with the option of Modbus TCP over Ethernet for simple networking of multiple instruments.



A 316 stainless-steel sensor block is available to connect the sensor to a flowing sample. It features an additional port so that a pressure transmitter can be installed directly at the point of measurement.

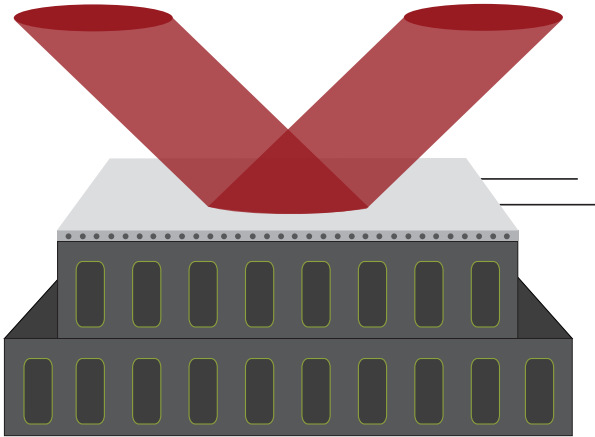
The Optidew 501 has the same touch-screen interface as the bench-mount version. Operators can easily interrogate and configure the instrument locally or remotely via the application software.

### Optidew 501 – transmitter

The most cost-effective option is the wall-mounted Optidew 501 blind transmitter. All the features of the other models are available when connected to a PC and operated via Michell's universal software. The multi-color LED indicator also displays the instrument's status.



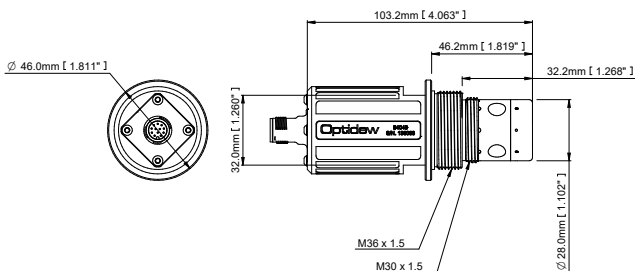
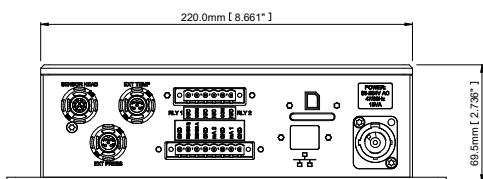
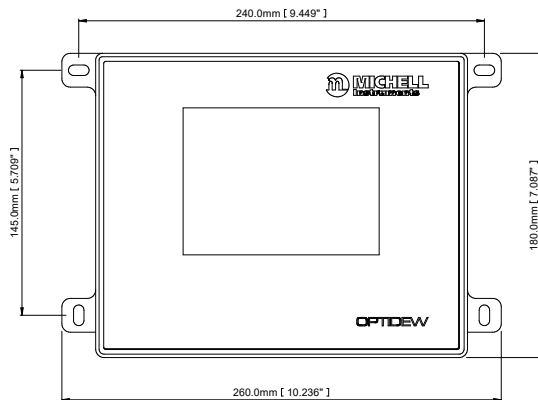
## Fast-responding chilled mirror technology



All chilled mirror sensors measure the actual temperature that moisture condenses to provide a reading of dew point. This fundamental technique gives unparalleled accuracy and reliability. Chilled mirror hygrometers are commonly used as secondary or transfer calibration standards for humidity.

The new design uses a thin, fast-responding hybrid mirror that is highly resistant to corrosion from acids and other gas contaminants, outlasting any traditional cooled mirror sensor design.

## Dimensions

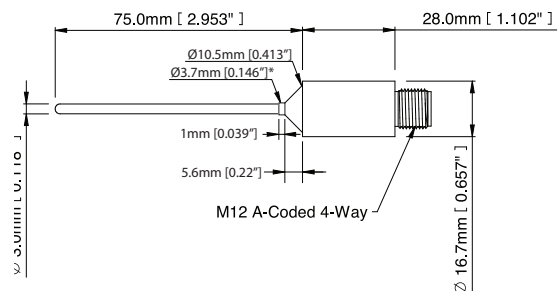
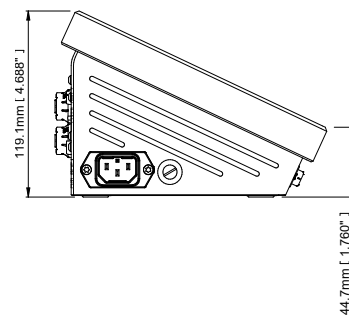
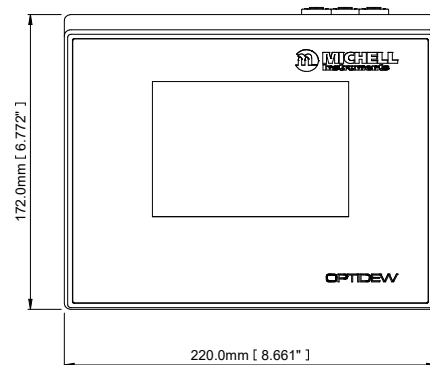


## Dynamic Contamination Control (DCC) Plus

DCC Plus is an improved version of our Dynamic Contamination Control. This feature is designed to manage the contamination on the mirror surface, extending operation in harsh or dirty environments without the need to stop the process to manually clean the mirror.

## Improved frost assurance Increased reliability at low dew points

It is possible for water to exist in liquid phase below 0°C (32°F) as super-cooled water. When using a chilled mirror instrument, liquid water may exist at temperatures down to -30°C (-22°F) in certain conditions. The difference in vapor pressure between condensed water and ice formed on a chilled mirror can introduce dew-point errors of up to 10% of reading. The new adaptive FAST system gives certainty about the state of the mirror condensate, detecting when supercooled water could form during measurement, and cooling the mirror sufficiently to freeze it, without the need for a DCC.



Weld burr may extend 1mm from collar to towards tip of probe

# Technical Specifications

Performance			
Dew Point Measurement Accuracy	±0.15°C (±0.27°F)		
Repeatability	±0.05°C (±0.09°F)		
Sensitivity	±0.01°C (±0.018°F)		
Response	Stable measurement at +10°C (+50°F) dp within 1 minute		
Dew-Point Sensor			
Sensor	Single Stage	Dual Stage	Harsh Environment
Dew Point Range (°C)	-25...+90°C (-13...+194°F)	-40...+90°C (-40...+194°F)	-40...+120°C (-40...+248°F)
Temperature Range (°C)	-40...+90°C (-40...+194°F)	-40...+90°C (-40...+194°F)	-40...+120°C (-40...+248°F)
% rh Range @ 23°C	2.25...100% rh	0.45...100% rh	0.45...100% rh
Material	POM (head) Aluminum (body)	POM (head) Aluminum (body)	PEEK (head) Aluminum (body)
Corrosion & Saturation Protection	Active Component Isolation System		
Mirror Temperature Measurement	Pt1000, Class A		
Recommended Sample Flow	Ambient (environmental measurements) to 2NI/min (flowing sample)		
Pressure	2500 kPa max		
Process Connection	M36x1.5		
Remote PRT			
Temperature Measurement Accuracy	±0.1°C (±0.18°F)		
Temperature Measurement	Pt100, Class A		
Cables			
Cable Length	0.3, 3, 5, 10 and 20m (11.81", 9.84, 16.4, 32.81 and 65.62 ft) lengths available (cables can be combined)		
Minimum operating temperature	Standard: -25°C (-13°F) High temperature: -40°C (-40°F)		
Maximum operating temperature	Standard: +90°C (+194°F) High temperature: +120°C (+248°F)		
Remote Pressure Sensor (Optional)			
Pressure Measurement Accuracy	±0.25% FS		
Pressure Measurement Range	0-160 kPa OR 0-2500 kPa		
Process Connection	1/8" NPT-M		
Control Unit			
Resolution	1 or 2 decimal places selectable		
Measurement Units	°Cdp or °Fdp, Relative humidity - %, Absolute humidity - g/m <sup>3</sup> , ppm <sub>v</sub> , Mixing Ratio - g/kg, Wet Bulb Temperature (Twb) - °C, °F, Water Vapor Pressure (wvp) - Pa, Ambient Temperature - °C, °F, Pressure converted DP - °C, °F, Pressure - kPa, Bara, Barg, Psia, Psig		
Enclosure	Wall Mount - Optidew 501	Bench Top - Optidew 401	
Material	ABS	ABS	
Analog Outputs	Two 0/4–20 mA outputs (maximum load 500Ω)	Two 0/4–20 mA outputs (maximum load 500Ω)	
Digital Communications	Modbus RTU over RS485 (standard) Modbus TCP over Ethernet (optional)	Modbus RTU over: USB (standard) RS485 (standard) Modbus TCP over Ethernet (optional)	
Alarms	1x Process Relay, 1x Alarm Relay, Both Form C, 1A, 30 V dc	1x Process Relay, 1x Alarm Relay, Both Form C, 1A, 30 Vdc	
Inputs	4–20 mA for pressure sensor	4–20 mA for pressure sensor	
Data Logging	SD card slot (optional)	SD card slot (standard)	
Ingress Protection	IP54 (standard), IP65 (optional)	IP54	
Dimensions	220 x 175 x 75 mm (8.66" x 6.89" x 3")	220 x 175 x 118 mm (8.66" x 6.89" x 4.65")	
Weight	Control unit: 1.5 kg (3.3 lb), Sensor: 200 g (7.05 oz)	Control unit: 1.5 kg (3.3 lb), Sensor: 200 g (7.05 oz)	
Display	5.7" color touch screen (optional)	5.7" color touch screen	
Environmental Conditions	-20...+50°C (-4...+122°F), up to 100% rh non-condensing (optional) 100% rh condensing with IP65 connector version		
Supply Voltage	100...240 V AC, 50...60 Hz		
Power Consumption	30 VA max		

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Michell Instruments adopts a continuous development programme which sometimes necessitates specification changes without notice.  
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