



T9501 Humidity & Temperature Sensor



Telaire T9501 Humidity & Temperature Sensor provides cost-effective humidity and temperature sensing via MODBUS communication protocol for virtually any type of application. Designed to withstand challenging environments, the IP67 rated transmitter utilizes an individually calibrated and tested ChipCap 2 sensor and is ready to integrate into control/monitoring systems without further calibration or temperature compensation.

Applications

Energy Saving HVAC Control:

- Air Conditioning
- Refrigeration
- Indoor Air Quality
- Vent Fans
- Home Appliances
- Humi/Dehumidifiers
- Marine Environments

Process Control & Instrumentation:

- Agriculture and Indoor Growing
- Medical Instruments
- Handheld Devices
- Weather Stations
- Food Processing

Features

- Fully calibrated and temperature compensated
- Water resistant (IP 67)
- Digital RS485 Modbus communication
- Precision and accuracy ($\pm 2\%$ RH at 20% to 80%, $\pm 0.5^{\circ}\text{C}$ Temperature, 14 bit resolution)
- Low current consumption
- Reliable in harsh environments
- “Heater Mode” capability for condensation recovery

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T9501 Accuracy Specifications

Relative Humidity (RH%)

Resolution	14 bit (0.01% RH)
Accuracy ¹	±2.0% RH (20~80% RH) ±3.5% RH (0% to 20%) and (80% to 100%)
Repeatability	±0.2% RH
Hysteresis	±1.0% RH
Linearity	<2.0% RH
Response Time ²	≤ 100 sec (63%)
Temp Coefficient	0.13% RH/°C (at 10~60°C, 10~90% RH)
Operating	0 ~ 95% RH
Long Term Drift	<0.5% RH/year (normal conditions)

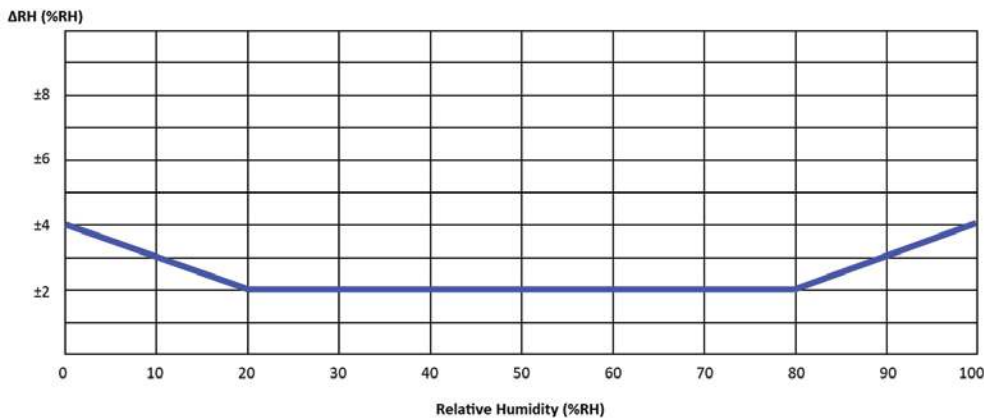
1. Accuracies measured at 25°C, nominal voltage.
2. 30% RH step response, measured at 25°C in a 1 m/sec air flow.

Temperature (°C)

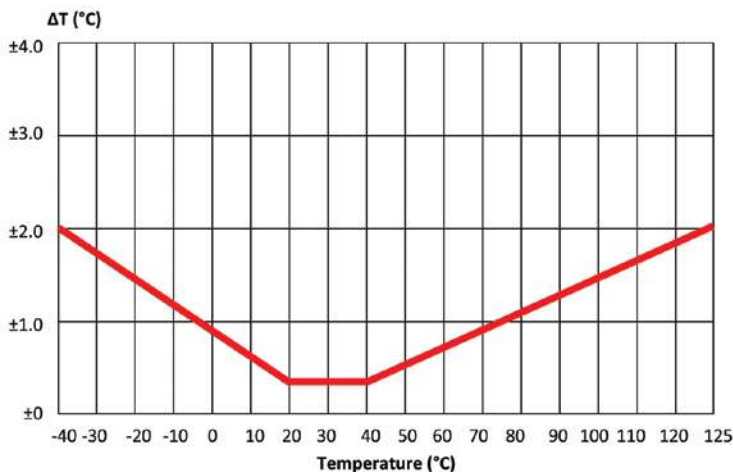
Resolution	14 bit (0.01°C)
Accuracy ¹	±0.5°C
Repeatability	±0.1°C
Response Time ²	≤600 sec (63%)
Operating Range ³	-20°C to 70°C
Long Term Drift	<0.05°C/year (normal conditions)

1. Accuracies measured at 25°C, nominal voltage.
2. 25°C step response in a 1 m/sec air flow.
3. Minimum design range, documented testing 0°C to 50°C.

Typical %RH Accuracy



Typical Temperature Accuracy



T9501 Hardware and Environmental Specifications

Method

Capacitive polymer RH Sensor, PTAT (Proportional to Absolute) integrated temperature sensor

Operating Conditions

- -30°C to 70°C
- 0% to 100% Relative Humidity (RH) Non-Condensing

Storage Conditions

- -40°C to 85°C

Output Modes

- RS485 MODBUS - Configurable, 115,200 baud 8E1 Fault Protection (SN65HVD1781)

Power Supply Requirements

- 8-32 VDC (12 VDC) with polarity protection

Current Consumption

- < 10mA average typical (bus Rx mode)
- 70 mA Peak typical (bus Tx mode / Heat mode)

Cable

- Outer Diameter: 8.00 ± 0.20mm, 4 Core, unshielded
- Length: 0.09m (0.3 ft)

Connector

- Manufacturer: Deutsch
- Sensor Connector Housing: PN DT04-4P
- Sensor Connector Pins: PN 1060-16-0622

Mounting Options

- #10/M5 Bolt/Screw or equivalent (qty 2)

Approvals and Qualifications

- RoHS / REACH
- IP67 – IEC 60529
- Halogen Free Design
- EN6100063 Emissions, EN6100063 Immunity
- IEC 60068-2-64 Vibration
- IEC 60068-2-27, IEC 61373 Shock
- ASTM B117 Salt Spay
- IEC 60068-2-30 Damp Heat

Warranty Terms

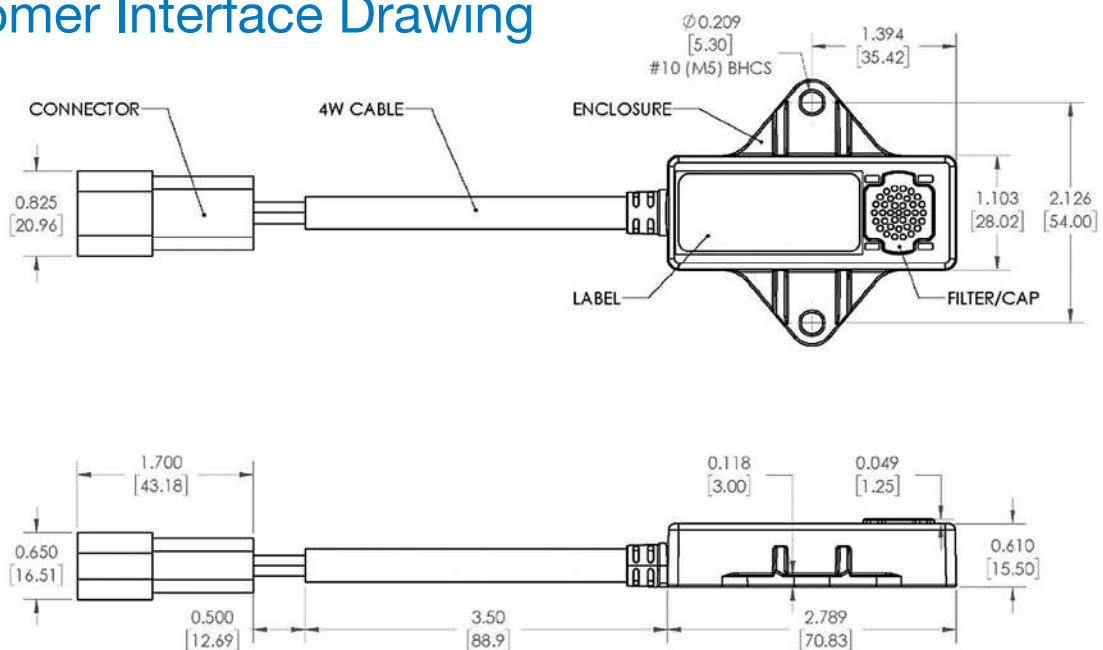
- 12 months on manufacturer defects

Sensor Pinout

1. V+
2. Ground
3. RS485 A+
4. RS485 B-



Customer Interface Drawing



NOTES:

- 1) UNITS: IN (mm)
- 2) DIMENSIONS ARE REFERENCE ONLY

Ordering Information

Part Number	Output	Operating Voltage	Cable Length
T9501	RS485	12V	0.09m (0.3 ft)

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