SureCross Temperature and Humidity Sensor

Datasheet

The SureCross Temperature and Temperature/Humidity Sensor works in a variety of environments to provide temperature and humidity measurements.

- Manufactured with a robust metal housing
- Connects via a 1-wire serial interface
- Designed to work with FlexPower 1-Wire Serial Interface Node models DX80N9X1S-P6 and DX80N2X1S-P6, MultiHop M-H6 radios, and the Wireless Q45 Sensor Node DX80N2Q45TH
- Ships with aluminum grill filter cap; optional stainless steel 10 micrometer sintered filter available separately

WARNING: Not To Be Used for Personnel Protection

Never use this device as a sensing device for personnel protection. Doing so could lead to serious injury or death. This device does not include the self-checking redundant circuitry necessary to allow its use in personnel safety applications. A sensor failure or malfunction can cause either an energized or de-energized sensor output condition.

For additional information, updated documentation, and accessories, refer to Banner Engineering's website, *www.bannerengineering.com/surecross*.

Model	Power Requirements	I/O
M12FTH4Q	3.6 to 5.5 V dc	Temperature and relative humidity via a 1-wire serial interface
M12FT4Q		Temperature via a 1-wire serial interface

Configure this sensor using the *Temperature and Humidity Configuration Tool* and adapter cable BWA-USB1WIRE-001 (datasheet *170020*).

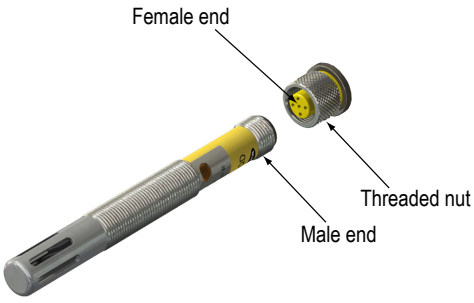
Banner Humidity Sensor Calibration Statement. This calibration statement (also available online) lists the chain with which the calibration of Banner humidity sensors is traceable to NIST standards.

A Certificate of Factory Calibration ships with every temperature/humidity or temperature sensor. Although your certificate will be specific to your product, a sample certificate is available for *download*.

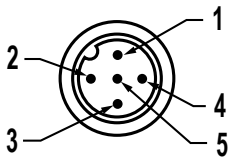
Connecting the Temperature/Humidity Sensor

To install the sensor to a device with a 5-pin Euro-style female end, follow these instructions:

1. Align the notch in the female connector with the key in the sensor's male connector.
2. Gently slide the sensor end into the connector.
3. Rotate the threaded nut to tighten the sensor down. DO NOT attempt to rotate the sensor after it is connected to the device or the cable end because this will damage the sensor.



Wiring

5-pin M12/Euro-style Male Connector	Pin	Wire Color	Sensor Connection
	1	Brown	Power IN (+), 3.6 to 5.5 V dc
	2	White	1-Wire serial device select (sinking input to sensing device)
	3	Blue	Ground (-)
	4	Black	Not used/reserved
	5	Gray	1-Wire serial communications

This sensor is designed to be plugged directly into compatible Nodes. The Node powers the sensor and periodically requests data using the 1-wire serial interface.

Modbus Registers

The temperature = (Holding register value) ÷ 20.

Sensor Register	Description	I/O Range		Holding Register Representation	
		Min	Max	Min (Dec)	Max (Dec)
1	Humidity (%RH) [1]	0	100.00%	0	10,000
2	Temperature (°C)	–1638.4	1638.3	–32768	32767
3	Temperature (°F)	–1638.4	1638.3	–32768	32767

Specifications

Supply Voltage
3.6 to 5.5 V dc

Current
Default sensing: 28 µAmps
Disabled sensing: 15 µAmps
Active comms: 4.7 mA

Mounting Threads
M12 x 1

Indicators
Green flashing: Power ON
Red flicker: Serial Tx

Communication Hardware
Interface: 1-wire serial interface
Baud rates: 9.6k, 19.2k (default), or 38.4k
Data format: 8 data bits, no parity (default), 1 stop bit (even or odd parity available)

Communication Protocol
SureCross DX80 Sensor Node 1-Wire Serial Interface

Communications Line
Level Receive ON: Greater than 2 V
Level Receive OFF: Less than 0.7 V
Level Transmit ON: 2.7 to 3 V
Level Transmit OFF: 0 V (pulldown resister of 10 kOhm

Compatible Nodes
DX80N9X1S-P6
DX80N2X1S-P6
DX80DR9M-H6
DX80DR2M-H6
DX80N2Q45TH

Humidity
Humidity measurements are only available with the M12FTH4Q model. The M12FT4Q model does not include the humidity sensor.
Measuring Range: 0 to 100% relative humidity
Resolution: 0.1% relative humidity
Accuracy: ±2% relative humidity at 25 °C

Temperature
Measuring Range: –40 °C to +85 °C (–40 °F to +185 °F)
Resolution: 0.1 °C
Accuracy: ±0.3 °C at 25 °C

Environmental Rating
IEC IP67; NEMA 6

Operating Temperature
–40 °C to +85 °C (–40 °F to +185 °F) [2]

Shock and Vibration
IEC 68-2-6 and IEC 68-2-27
Shock: 30g, 11 millisecond half sine wave, 18 shocks
Vibration: 0.5 mm p-p, 10 to 60 Hz

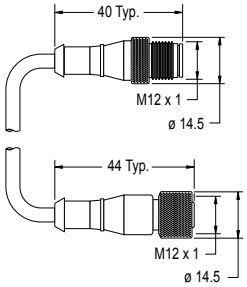
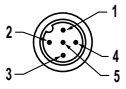
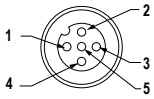
[1] Only available on the M12FTH4Q model. Humidity sensor is not included with the M12FT4Q model.
[2] Operating the devices at the maximum operating conditions for extended periods can shorten the life of the device.

Replacement Filters

Replacement Filters	Description	
FTH-FIL-001	Aluminum grill filter cap (factory default, ships with M12FT*Q sensors)	
FTH-FIL-002	Stainless steel, sintered to 10 micrometer porosity (for high dust environments.)	

Euro-Style Cordsets - Double Ended

When using the FlexPower Node with integrated battery, use a double ended cordset. When using a FlexPower Node with external power supply, use a single ended cordset. If using the communication lines, the cable length cannot exceed 3 meters (10 ft).

5-Pin Threaded M12/Euro-Style Cordsets (Double Ended and Less Than 3 m Long)				
Model	Length	Style	Dimensions	Pinout
DEE2R-51D	0.31 m (1 ft)	Female Straight/ Male Straight		Male  Female  1 = Brown 2 = White 3 = Blue 4 = Black 5 = Green/Yellow
DEE2R-53D	0.91 m (3 ft)			
DEE2R-58D	2.44 m (8 ft)			

Warnings

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