

SureCross Wireless Q45 Sensor Node - Temperature/Humidity



Datasheet

SureCross® Wireless Q45 Sensors combine the best of Banner's flexible Q45 sensor family with its reliable, field-proven, SureCross wireless architecture to solve new classes of applications limited only by the user's imagination. Containing a variety of sensor models, a radio, and internal battery supply, this product line is truly plug and play.



(Shown with the temperature/humidity sensor connected)

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

The Wireless Q45 Temperature and Relative Humidity Sensor Node:

- Works with one of two sensor options: temperature and relative humidity or temperature only
- Provides high accuracy temperature and humidity measurements
- Achieves humidity accuracy of $\pm 2\%$ relative humidity and temperature accuracy of $0.3\text{ }^{\circ}\text{C}$
- Houses the sensor element in a robust stainless steel case
- Includes a red/green LED that can be used to provide local visual indication of change in environmental conditions

Available Models

- DX80N2Q45TH - Must be paired with M12FTH4Q Temperature and Humidity Sensor or M12FT4Q Temperature Sensor (sold separately)

[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.



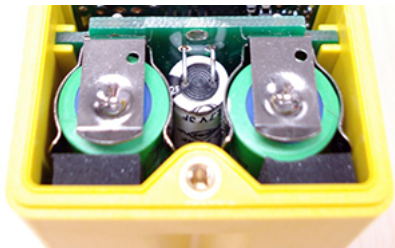
WARNING: Not To Be Used for Personnel Protection

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.

Replacing the Batteries

To replace the lithium "AA" cell battery, follow these steps.

As with all batteries, these are a fire, explosion, and severe burn hazard. Do not burn or expose them to high temperatures. Do not recharge, crush, disassemble, or expose the contents to water. Properly dispose of used batteries according to local regulations by taking it to a hazardous waste collection site, an e-waste disposal center, or other facility qualified to accept lithium batteries.



1. Lift the plastic cover.
2. Slide the board containing the batteries out of the Q45 housing.
3. Remove the discharged batteries and replace with new batteries. Use two 3.6 V AA lithium batteries, such as Xeno's XL-60F or equivalent.
4. Verify the battery's positive and negative terminals align to the positive and negative terminals of the battery holder mounted within the case. Caution: There is a risk of explosion if the battery is replaced incorrectly.
5. Slide the board containing the new batteries back into the Q45 housing.

Replacement battery model number: BWA-BATT-006. For pricing and availability, contact Banner Engineering.



Storage Mode for the Wireless Q45 Sensors

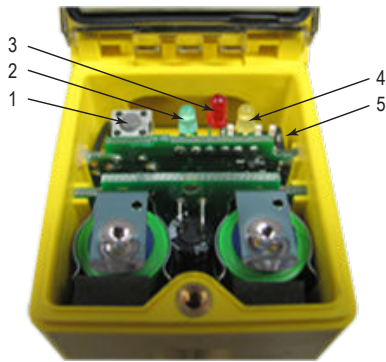
While in storage mode, the Wireless Q45 Sensor's radio does not operate. All Wireless Q45 Sensors ship from the factory in storage mode to conserve the battery. To wake the device, press and hold the button for five seconds. To put any Wireless Q45 Sensor into storage mode, press and hold the button for five seconds. The Wireless Q45 Sensor is in storage mode when the LEDs stop blinking.

Modbus Register Table

The temperature = (Holding register value) ÷ 20.

I/O #	Modbus Holding Register		I/O Type	I/O Range		Holding Register Representation	
	Gateway	Any Node		Min. Value	Max. Value	Min. (Dec.)	Max. (Dec.)
1	1	1 + (Node# × 16)	Humidity (%RH)	0	100.00%	0	10,000
2	2	2 + (Node# × 16)	Temperature (°C)	-1638.3	1638.4	-32768	32767
3	3	3 + (Node# × 16)	Temperature (°F)	-1638.3	1638.4	-32768	32767
		...					
7	7	7 + (Node# × 16)	Reserved				
8	8	8 + (Node# × 16)	Device Message				
9	9	9 + (Node# × 16)	Discrete OUT 1 (Red Light)	0	1	0	1
10	10	10 + (Node# × 16)	Discrete OUT 2 (Green Light)	0	1	0	1
		...					
15	15	15 + (Node# × 16)	Control Message				
16	16	16 + (Node# × 16)	Reserved				

Button, LEDs, and DIP Switches



- 1 Button
- 2 Green LED (flashing) indicates a good radio link with the Gateway.
- 3 Red LED (flashing) indicates a radio link error with the Gateway.
- 4 Amber LED is not used.
- 5 DIP Switches

DIP Switch Settings

After making any changes to any DIP switch position, reboot the Wireless Q45 Sensor by triple-clicking the button, waiting a second, then double-clicking the button. You may also reboot the device by removing the battery pack, then re-installing it. As shown in the image above, the DIP switches are in the OFF position. To turn a DIP switch on, push the switch toward the battery pack. DIP switches one through four are numbered from left to right.

Description	DIP Switches			
	1	2	3	4
Sample/Report Rate: User configured (64 seconds by default)	OFF *	OFF *		
Sample/Report Rate: 16 seconds	OFF	ON		
Sample/Report Rate: 64 seconds	ON	OFF		
Sample/Report Rate: Sample on Demand	ON	ON		
Reserved (keep in OFF position)			OFF *	
Light mode: flash (recommended to conserve the battery) ¹				OFF *
Light mode: solid				ON

* Default position (as shown above)

Bind the Wireless Temperature/Humidity Q45 to the B2T Gateway and Assign the Node Address

Before beginning the binding procedure, apply power to all the devices.

1. Enter binding mode on the Gateway by triple-clicking the button.
The green and red LED flashes.
2. Assign the Q45 a Node address or 01 using the Gateway's rotary dials. Set the left dial to 0 and the right dial to 1.
3. Loosen the clamp plate on the top of the Wireless Q45 and lift the cover.
4. Enter binding mode on the Wireless Q45 by triple-clicking the button.
The red and green LEDs flash alternately and the sensor searches for a Gateway in binding mode. After the Q45 is bound, the LEDs stay solid momentarily, then they flash together four times. The Q45 exits binding mode.
5. After binding the Wireless Temperature/Humidity Q45, exit binding mode on the Gateway by double-clicking the button.

Specifications

The following specifications refer to both the radio and the wireless sensor.

Range 2.4 GHz: Up to 1000 m (3280 ft) with line of sight ²	Typical Battery Life Up to 2 years, typical Battery life is reduced to 1 year when the sample/report rate is increased to 16 seconds
Minimum Separation Distance 2.4 GHz (65 mW): 0.3 m (1 ft)	Default Sensing Interval 64 seconds
Transmit Power 2.4 GHz: 65 mW	Temperature Sensor Measuring Range: -40 °C to +85 °C (-40 °F to +185 °F) Resolution: 0.1 °C Accuracy: ±0.3 °C
2.4 GHz Compliance FCC ID UE300DX80-2400 - This device complies with FCC Part 15, Subpart C, 15.247 ETSI/EN: In accordance with EN 300 328: V1.7.1 (2006-05) IC: 7044A-DX8024	Humidity Sensor Measuring Range: 0% to 100% relative humidity Resolution: 0.1% relative humidity Accuracy: ±2% relative humidity at 23 °C
Spread Spectrum Technology FHSS (Frequency Hopping Spread Spectrum)	Environmental Rating NEMA 6P, IEC IP67
Construction Molded reinforced thermoplastic polyester housing, oring-sealed transparent Lexan® cover, molded acrylic lenses, and stainless steel hardware. Q45s are designed to withstand 1200 psi washdown.	Operating Conditions -40 °C to 70 °C (-40 °F to 158 °F): 90% relative humidity at 50 °C (non-condensing)
Connection One 5-pin M12 Euro-style female connector	
Indicators Red and green LEDs (radio function)	

¹ The light consumes most of the sensor's power. If the light remains off most of the time, the batteries will last much longer. In flashing mode, the light can be on for up to one year on a pair of batteries.

² The actual radio range significantly decreases without line of sight. Always verify your wireless network's range by running a site survey.

Accessories

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	<p>40 Typ. M12 x 1 ø 14.5</p>	Male
DEE2R-53D	0.91 m (3 ft)			Female
DEE2R-58D	2.44 m (8 ft)			<p>44 Typ. M12 x 1 ø 14.5</p>
				<p>1 = Brown 2 = White 3 = Blue 4 = Black 5 = Green/Yellow</p>

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.)	

Warnings

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Exporting SureCross Radios

Exporting SureCross Radios. It is our intent to fully comply with all national and regional regulations regarding radio frequency emissions. Customers who want to re-export this product to a country other than that to which it was sold must ensure the device is approved in the destination country. A list of approved countries appears in the *Radio Certifications* section of the product manual. The SureCross wireless products were certified for use in these countries using the antenna that ships with the product. When using other antennas, verify you are not exceeding the transmit power levels allowed by local governing agencies. Consult with Banner Engineering Corp. if the destination country is not on this list.

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