

Sure Cross® Wireless Q45 Sensor Node - Temperature/Humidity



Datasheet

Sure Cross® Wireless Q45 Sensors combine the best of Banner's flexible Q45 sensor family with its reliable, field-proven, Sure Cross 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/yellow/blue LED that can be used to provide local visual indication of change in environmental conditions

Available Models

- DX80N9Q45TH - 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

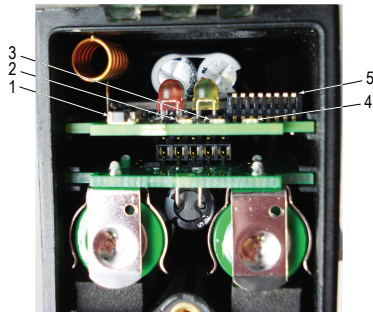
While in storage mode, the Wireless Q45 Sensor's radio does not operate. All Wireless Q45 Sensors ship from the factory in storage mode to conserve the battery. To wake the device, press and hold the button for five seconds. To put any Wireless Q45 Sensor into storage mode, press and hold the button 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
11	11	11 + (Node# × 16)	Discrete OUT 3 (Yellow Light)	0	1	0	1
12	12	12 + (Node# × 16)	Discrete OUT 4 (Blue 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 Red LED (flashing) indicates a radio link error with the Gateway.
- 3 Green LED (flashing) indicates a good radio link 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. 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	5	6	7	8
Transmit power: 1 Watt	OFF *							

Description	DIP Switches							
	1	2	3	4	5	6	7	8
Transmit power: 250 mW (compatible with 150 mW radios)	ON							
Reserved		OFF *	OFF *	OFF *				
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

Bind the Q45s to the Gateway and Assign the Node Address

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

- Enter binding mode on the Gateway.
 - For single-button models, triple-click the button.
 - For two-button models, triple-click button 2.

On the board modules, the green and red LED flashes. On the housed Gateway models, both LEDs flash red.
- Assign the Q45 a Node address using the Gateway's rotary dials. Use the left rotary dial for the left digit and the right rotary dial for the right digit. For example, to assign your Q45 to Node 01, set the left dial to 0 and the right dial to 1. Valid Node addresses are 01 through 47.
- Loosen the clamp plate on the top of the Wireless Q45 Sensor and lift the cover.
- Enter binding mode on the Wireless Q45 Sensor by triple-clicking the button. For the opposed mode sensor, the button is on the receiver.

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.
- Label the sensor with the Q45's Node address number and place the sticker on the Wireless Q45 Sensor.
- Repeat steps 2 through 5 for as many Wireless Q45 Sensors as are needed for your network.
- After binding all Wireless Q45 Sensors, exit binding mode on the Gateway.
 - For single-button models, double-click the button.
 - For two-button models, double-click button 2.

For Gateways with LCDs, after binding your Wireless Q45 Sensors to the Gateway, make note of the binding code displayed under the Gateway's *DVCFG menu, XADR submenu on the LCD. Knowing the binding code prevents having to re-bind all Q45s if your Gateway is ever replaced.

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.

Specifications

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

<p>Radio Range 900 MHz, 1 Watt (Internal antenna): Up to 3.2 km (2 miles)²</p> <p>Minimum Separation Distance 900 MHz, 1 Watt: 4.57 m (15 ft)</p> <p>Transmit Power 900 MHz, 1 Watt (Internal antenna): 25 dBm Conducted</p> <p>900 MHz Compliance (1 Watt) FCC ID UE3RM1809: This device complies with FCC Part 15, Subpart C, 15.247 IC: 7044A-RM1809</p> <p>Spread Spectrum Technology FHSS (Frequency Hopping Spread Spectrum)</p> <p>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.</p> <p>Connection One 5-pin threaded M12/Euro-style female quick disconnect</p> <p>Indicators Red and green LEDs (radio function)</p>	<p>Typical Battery Life Up to 1.5 years, typical Battery life is reduced to 9 months when the sample/report rate is increased to 16 seconds</p> <p>Default Sensing Interval 64 seconds</p> <p>Temperature Sensor Measuring Range: -40 °C to +85 °C (-40 °F to +185 °F) Resolution: 0.1 °C Accuracy: ±0.3 °C</p> <p>Humidity Sensor Measuring Range: 0% to 100% relative humidity Resolution: 0.1% relative humidity Accuracy: ±2% relative humidity at 23 °C</p> <p>Environmental Rating NEMA 6P, IEC IP67</p> <p>Operating Conditions -40 °C to 70 °C (-40 °F to 158 °F); 90% relative humidity at 50 °C (non-condensing)</p>
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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		Male
DEE2R-53D	0.91 m (3 ft)			Female
DEE2R-58D	2.44 m (8 ft)			<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.)	

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

Warnings

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Exporting Sure Cross® Radios

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