

Sure Cross® Wireless Q45 Sensor Node - Universal 1-Wire Serial



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.



The Sure Cross Universal 1-Wire Serial Sensor is designed to read the primary inputs of devices in the 1-Wire Serial Sensor family. The Wireless Q45 Universal 1-Wire Serial Sensor Node:

- Reads the 1-Wire Serial Interface sensor
- Determines an efficient power setting
- Includes a red/green/yellow/blue LED to provide local visual indication

Available Models

- DX80N9Q45U or DX80N2Q45U - Must be paired with a 1-Wire Serial interface sensor (sold separately)
- Supported 1-Wire Serial Interface sensors include but are not limited to: M12FT4Q, M12FTH4Q, QM42VT1, K50UX1RA



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.

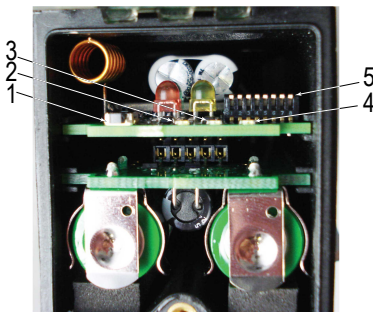
General Operation

For the first 15 minutes after power up, the Node samples the sensor every two seconds (fast sample mode). After 15 minutes, the Node defaults to 5 minute sample intervals. Activate fast sample mode by single clicking the button (the amber LED is solid).

Storage Mode for the Q45

While in storage mode, the Q45's radio does not operate. The Q45 ships 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 Q45 into storage mode, press and hold the button for five seconds. The Q45 is in storage mode when the LEDs stop blinking.

Button and LEDs



- 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 Switches

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.

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 *							
Transmit power: 250 mW (compatible with 150 mW radios)	ON							
Reserved		OFF *	OFF *	OFF *				
Sample/Report Rate: User configured (5 minutes 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 Q45 to the Gateway and Assign the Node Address

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

1. 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.

2. 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.

3. Loosen the clamp plate on the top of the Q45 and lift the cover.

4. Enter binding mode on the Q45 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.

5. Label the sensor with the Q45's Node address number and place the sticker on the Q45.

6. Repeat steps 2 through 5 for as many Q45 as are needed for your network.

7. After binding all Q45, 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 Q45 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.

Modbus Register Table

I/O #	Modbus Holding Register		I/O Type *	I/O Range		Holding Register Representation	
	Gateway	Any Node		Min.	Max.	Min.	Max.
1	1	1 + (Node# × 16)	1-Wire Serial Sensor Primary Input 1				
2	2	2 + (Node# × 16)	1-Wire Serial Sensor Primary Input 2				
3	3	3 + (Node# × 16)	1-Wire Serial Sensor Primary Input 3				

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.

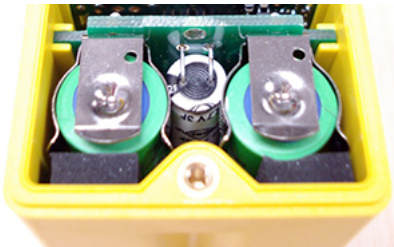
I/O #	Modbus Holding Register		I/O Type *	I/O Range		Holding Register Representation	
	Gateway	Any Node		Min.	Max.	Min.	Max.
4	4	4 + (Node# × 16)	1-Wire Serial Sensor Primary Input 4				
5	5	5 + (Node# × 16)	1-Wire Serial Sensor Primary Input 5				
6	6	6 + (Node# × 16)	1-Wire Serial Sensor Primary Input 6				
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: Yellow Light	0	1	0	1
11	11	11 + (Node# × 16)	Discrete OUT 3: Green 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				

* These are the default data types that output from the 1-Wire Serial Interface sensor, corresponding to inputs 1 through 6 of the Q45 Node. Refer to the datasheet of the 1-Wire Serial Interface sensor for information about the register function.

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.

Specifications

Radio Range²

900 MHz, 1 Watt: Up to 3.2 km (2 miles)
2.4 GHz, 65 mW: Up to 1 km (3280 feet)

Minimum Separation Distance

900 MHz, 1 Watt: 4.57 m (15 ft)
2.4 GHz, 65 mW: 0.3 m (1 ft)

Spread Spectrum Technology

FHSS (Frequency Hopping Spread Spectrum)

Default Sensing Interval

5 minutes

Indicators

Red and green LEDs (radio function)

900 MHz Compliance (1 Watt)

FCC ID UE3RM1809: This device complies with FCC Part 15, Subpart C, 15.247
IC: 7044A-RM1809

2.4 GHz Compliance

FCC ID UE300DX80-2400 - This device complies with FCC Part 15, Subpart C, 15.247
ETSI EN 300 328 V1.8.1 (2012-06)
IC: 7044A-DX8024

Typical Battery Life

See chart.

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

Connection
One 5-pin threaded M12/Euro-style female quick disconnect

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.

Environmental Rating
NEMA 6P, IEC IP67

Operating Conditions
-40 °C to 70 °C (-40 °F to 158 °F); 90% relative humidity at 50 °C (non-condensing)

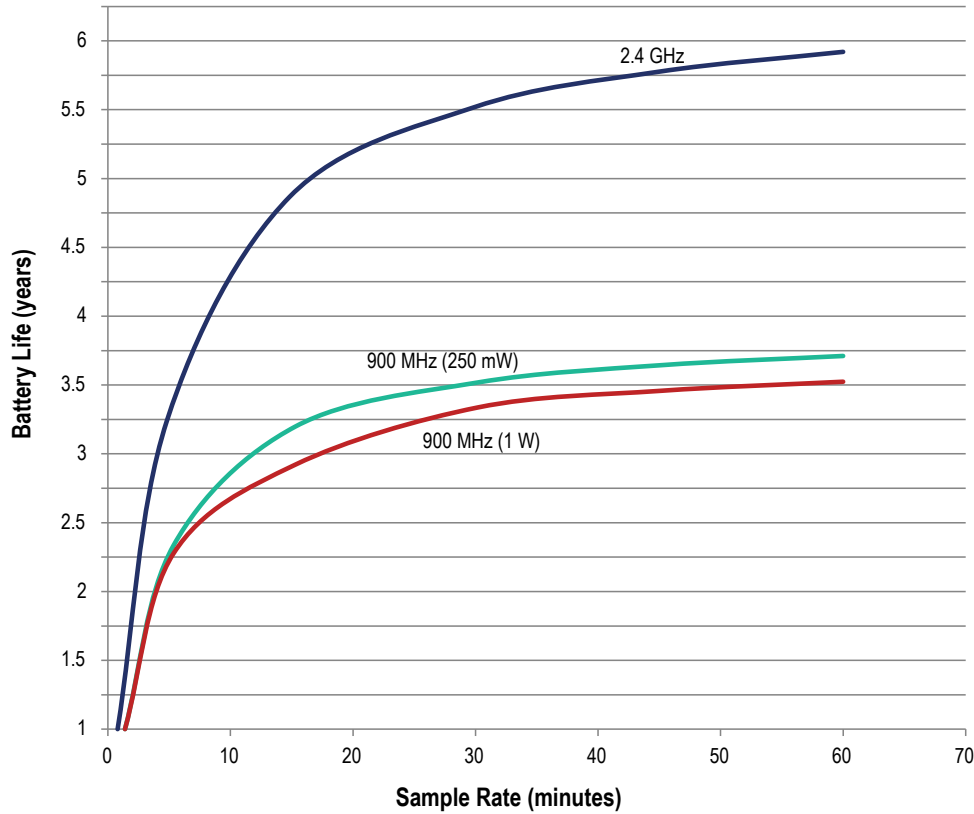


Figure 1. Battery Life of a Wireless Q45U Node Connected to a 1-Wire Serial Interface Sensor

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