Sure Cross® Wireless Q45 Sensor - Opposed

Datasheet

SureCross® Wireless Q45 Sensor Nodes 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.

In opposed-mode sensing, the sensor's emitter and receiver are housed in two separate units. The emitter is placed opposite the receiver, so that the light beam goes directly from the emitter to the receiver. An object is detected when it breaks the working part of the beam, known as the effective beam.

Available Models

- DX80N2Q45E (Emitter) and DX80N2Q45R (Receiver)

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.

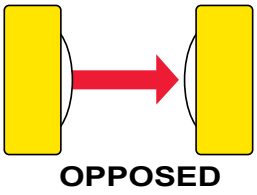
Storage Mode for the Wireless Q45 Sensors

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.

Optical Alignment Mode (Opposed)

The Wireless Q45 Sensor Node enters and remains in optical alignment mode for 15 minutes after the button is pushed, after the Wireless Q45 Sensor Node exits binding mode, or after the Q45 is powered up (battery replaced). During this alignment mode, the receiver sensor's amber LED lights up when it does not see the emitter.

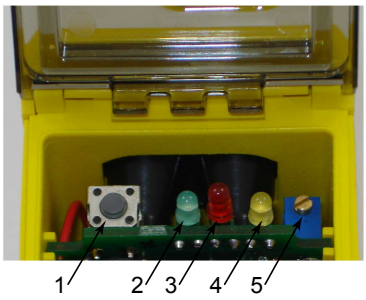
After 15 minutes, the Wireless Q45 Sensor Node automatically exits optical alignment mode and begins normal operation. After the sensor begins normal operation, the amber sensor state LED is inactive. To exit alignment mode earlier, click the button five times.



Modbus Register Table

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)	Sensor IN 1	0	1	0	1
7	7	7 + (Node# × 16)	Reserved				
8	8	8 + (Node# × 16)	Device Message				
15	15	15 + (Node# × 16)	Control Message				
16	16	16 + (Node# × 16)	Reserved				

Button and LEDs



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.

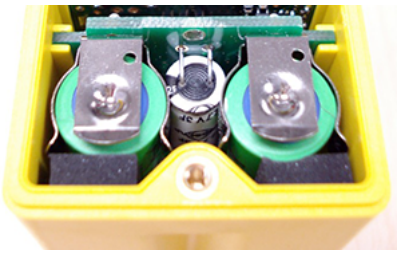
4 Alignment or Test Mode: the amber LED indicates sensor function (optical sensor models) or when input 1 is active (dry contact models). The amber LED is not used during normal operation.

5 Excess gain potentiometer. Turn clockwise to increase the gain.

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.

Bind the Q45s 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 Wireless Q45 Sensor and lift the cover.
4. 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.
5. Label the sensor with the Q45's Node address number and place the sticker on the Wireless Q45 Sensor.
6. Repeat steps 2 through 5 for as many Wireless Q45 Sensors as are needed for your network.
7. 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.

Specifications

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

Radio
Range: 2.4 GHz, 65 mW (Internal antenna): Up to 1000 m (3280 ft) with line of sight[1]
Transmit Power: 2.4 GHz: 65 mW EIRP

Minimum Separation Distance
2.4 GHz, 65 mW: 0.3 m (1 ft)

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

Spread Spectrum Technology
FHSS (Frequency Hopping Spread Spectrum)

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.

Indicators
Red and green LEDs (for radio function); amber LED (only for alignment mode)

Typical Battery Life
Up to 2 years, typical
A typical battery life assumes an average of 10 seconds between sensor changes of state and the default 62.5 millisecond sample rate.

Default Sensing Interval
62.5 milliseconds

Report Rate
On Change of State

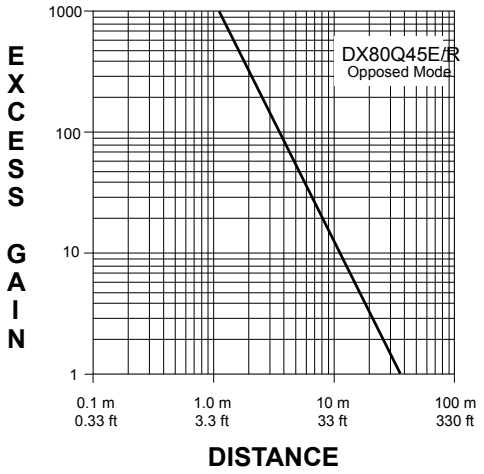
Optical Sensing Range
Up to 30 m (100 ft) depending on Excess Gain requirements

Adjustments
Multi-turn sensitivity control (allows precise sensitivity setting; turn clockwise to increase gain.

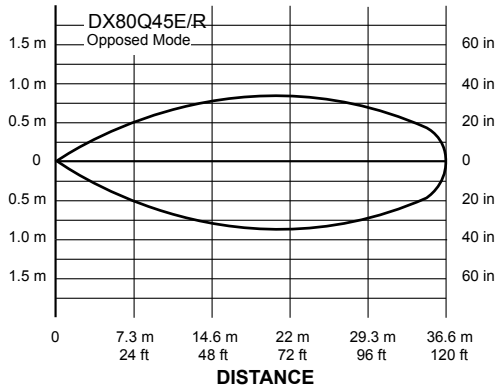
Environmental Rating
NEMA 6P, IEC IP67

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

Excess Gain



Beam Pattern



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

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