

## 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 Dual NAMUR model supports two Namur inputs.

Although this model supports two inputs, the default Gateway I/O mapping configuration of the Banner Q45 wireless system supports one input. To map the second input on the Q45, use the Gateway's DIP switches to map the I/O. See the Gateway's datasheet for details.

### Available Model

- **DX80N2Q45RD2** (2.4 GHz ISM radio frequency band)

## Storage Mode

While in **storage mode**, the device's radio does not operate, to conserve the battery. To put any device into storage mode, press and hold the binding button for five seconds. The device is in storage mode when the LEDs stop blinking. To wake the device, press and hold the binding button (inside the housing on the radio board) for five seconds.

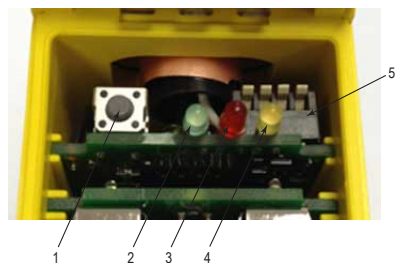
## Test Mode

The Wireless Q45 Sensor enters and remains in test mode for 15 minutes after the button is pushed, after the Wireless Q45 Sensor exits binding mode, or after the Q45 is powered up (battery replaced).

During test mode, the Q45's amber LED lights up when input 1 is active. After 15 minutes, the Wireless Q45 Sensor automatically exits test mode and begins normal operation. After the device begins normal operation, the amber sensor state LED is inactive. To exit test mode earlier, click the button five times.

## Configuration Instructions

### 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 Alignment or Test Mode: the amber LED indicates sensor function (optical sensor models) or when input 1 is active (dual dry contact model). The amber LED is not used during normal operation.
- 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. 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 as shown above.

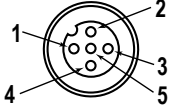
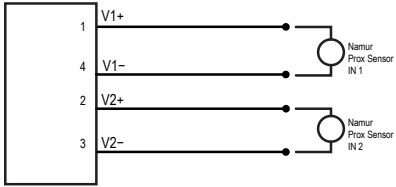
Description	DIP Switches			
	1	2	3	4
Reserved	OFF *			



Description	DIP Switches			
	1	2	3	4
5.5 V sensor voltage		OFF *		
8.2 V sensor voltage		ON		
Reserved			OFF *	OFF *

This model is designed to work with NAMUR two position valve sensors. It has been tested with Turck's Ni4-DSV35RC-2Y1X2 and Ni4-DS20-2Y1X2-H1140 sensors. The sensor is sampled every two seconds. Use cable MQDEC-406SS (male to female cable) to connect the Namur sensors to the Wireless Q45 Sensor.

### Wiring

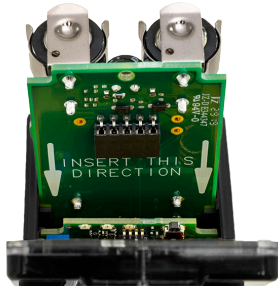
5-pin M12 Female Connection	Pin	Wire Color	Wireless Q45 Sensor	Wiring for Namur Sensors
	1	Brown	V <sub>1</sub> +	
	2	White	V <sub>2</sub> +	
	3	Blue	V <sub>2</sub> -	
	4	Black	V <sub>1</sub> -	
	5	Gray	-	

### Apply Power to the Q45

Follow these instructions to install or replace the lithium "AA" cell batteries.

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.

Figure 1. Q45 battery board



- Loosen the clamp plate with a small Phillips screwdriver and lift the cover.
- Slide the battery board out of the Q45 housing.
- If applicable, remove the discharged batteries.
- Install the new batteries. Use Banner's **BWA-BATT-006** replacement batteries or an equivalent 3.6 V AA lithium batteries, such as Xeno's XL-60F.
- 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.
- Slide the board containing the new batteries back into the Q45 housing.
- Close the cover and gently tighten the clamp plate with the small Phillips screwdriver.

### Bind to the Gateway and Assign the Node Address

Before beginning the binding procedure, apply power to all the devices. Separate the devices by two meters when running binding procedure. Put only one Gateway into binding at a time to prevent binding to the wrong Gateway.

- On the Gateway: Enter binding mode.
  - For housed DX80 Gateways, triple-click button 2 on the Gateway. Both LEDs flash red.
  - For Gateway board modules, triple-click the button. The green and red LED flashes.
- 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 10, set the Gateway's left dial to 1 and the right dial to 0. Valid Node addresses are 01 through 47.



- On the Q45: Loosen the clamp plate on the top of the Q45 and lift the cover.
- Enter binding mode on the Q45 by triple-clicking the Q45's 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.
- Label the sensor with the Q45's Node address number for future reference.
- Repeat steps 2 through 5 for as many Q45s as are needed for your network.

7. On the Gateway: After binding all Q45s, exit binding mode.
  - For housed DX80 Gateways, double-click button 2.
  - For board-level DX80 Gateways, double-click the button.

For Gateways with single-line 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 (4xxxx)		I/O Type	I/O Range Values		Holding Register Representation (Dec.)	
	Gateway	Any Node		Min.	Max.	Min.	Max.
1	1	1 + (Node# × 16)	Namur IN 1	0	1	0	1
2	2	2 + (Node# × 16)	Namur IN 2	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				

## Specifications

### Radio

Range: 2.4 GHz, 65 mW: Up to 1000 m (3280 ft) with line of sight (internal antenna) <sup>1</sup>  
 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: FCC Part 15, Subpart C, 15.247  
 Radio Equipment Directive (RED) 2014/53/EU  
 IC: 7044A-DX8024

ANATEL: 15966-21-04042 Este equipamento não tem direito à proteção contra interferência prejudicial e não pode causar interferência em sistemas devidamente autorizados. Para maiores informações, consulte o site da ANATEL [www.gov.br/anatel/pt-br/](http://www.gov.br/anatel/pt-br/)

### Indicators

Red and green LEDs (radio function); amber LED indicates when input 1 is active

### Construction

Molded reinforced thermoplastic polyester housing, oring-sealed transparent Lexan® cover, molded acrylic lenses, and stainless steel hardware.  
 Designed to withstand 1200 psi washdown.

### Spread Spectrum Technology

FHSS (Frequency Hopping Spread Spectrum)

### Typical Battery Life

Up to 2 years

### Inputs

Two NAMUR

### Default Sample Rate

2 seconds

### Report Rate

On Change of State

### Warm-up Time

5 milliseconds

### Environmental Rating

NEMA 6P, IP67

### Operating Conditions

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

## Warnings

**Exporting Sure Cross® 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.** The Sure Cross 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. This device has been designed to operate with the antennas listed on Banner Engineering's website and having a maximum gain of 9 dBm. Antennas not included in this list or having a gain greater than 9 dBm are strictly prohibited for use with this device. The required antenna impedance is 50 ohms. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen such that the equivalent isotropically radiated power (EIRP) is not more than that permitted for successful communication. Consult with Banner Engineering Corp. if the destination country is not on this list.



**Important:** Please download the complete Wireless Q45 Sensor Node technical documentation, available in multiple languages, from [www.bannerengineering.com](http://www.bannerengineering.com) for details on the proper use, applications, Warnings, and installation instructions of this device.

<sup>1</sup> Range depends on the environment and decreases significantly without line of sight. Always verify your wireless network's range by performing a Site Survey.



**Important:** Por favor descargue desde [www.bannerengineering.com](http://www.bannerengineering.com) toda la documentación técnica de los Wireless Q45 Sensor Node, disponibles en múltiples idiomas, para detalles del uso adecuado, aplicaciones, advertencias, y las instrucciones de instalación de estos dispositivos.



**Important:** Veuillez télécharger la documentation technique complète des Wireless Q45 Sensor Node sur notre site [www.bannerengineering.com](http://www.bannerengineering.com) pour les détails sur leur utilisation correcte, les applications, les notes de sécurité et les instructions de montage.

**WARNING:**

- **Do not use this device for personnel protection**
- Using this device for personnel protection could result in serious injury or death.
- This device does not include the self-checking redundant circuitry necessary to allow its use in personnel safety applications. A device failure or malfunction can cause either an energized (on) or de-energized (off) output condition.

**Important:**

- **Electrostatic discharge (ESD) sensitive device**
- ESD can damage the device. Damage from inappropriate handling is not covered by warranty.
- Use proper handling procedures to prevent ESD damage. Proper handling procedures include leaving devices in their anti-static packaging until ready for use; wearing anti-static wrist straps; and assembling units on a grounded, static-dissipative surface.

## Banner Engineering Corp. Limited Warranty

Banner Engineering Corp. warrants its products to be free from defects in material and workmanship for one year following the date of shipment. Banner Engineering Corp. will repair or replace, free of charge, any product of its manufacture which, at the time it is returned to the factory, is found to have been defective during the warranty period. This warranty does not cover damage or liability for misuse, abuse, or the improper application or installation of the Banner product.

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For patent information, see [www.bannerengineering.com/patents](http://www.bannerengineering.com/patents).

## ANATEL

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