Sure Cross® Wireless Q120 Node - **Button/Light**

Datasheet

Sure Cross® Wireless Q120 Nodes use the reliable, field-proven, Sure Cross wireless architecture to solve new classes of applications limited only by the user's imagination. Containing a radio, internal battery supply, and optional 10 to 30 V dc power terminals, this product line is truly plug and play.

The Wireless Q120 Node with Button and Light is a wireless node with six independently controlled push button inputs and six sets of LED indicator lights. The push buttons can be configured with DIP switches for either toggle or momentary operation; the red and green LED indicator light outputs can be configured for solid or flashing operation.

Available Models

- DX80N9Q120BL-RG with a 900 MHz radio
- DX80N2Q120BL-RG with a 2.4 GHz radio

WARNING: Not To Be Used for Personnel **Protection**

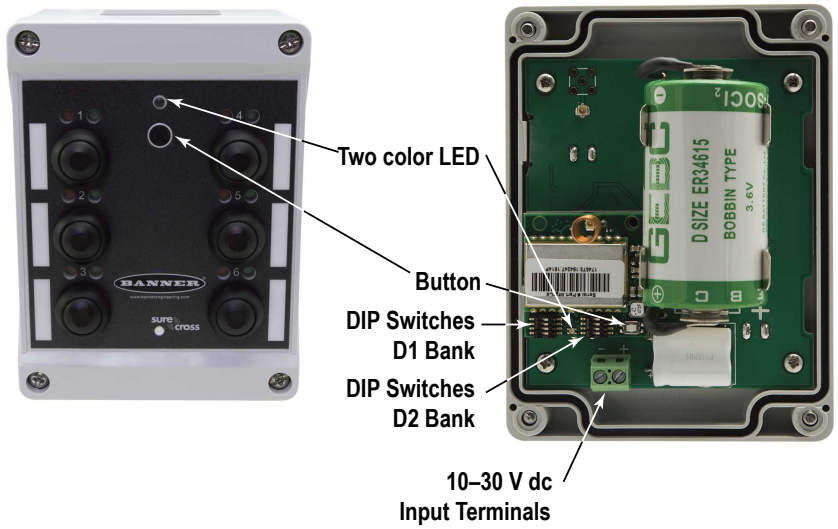
Never use this device as a sensing device for personnel **protection.** Doing so could lead to serious injury or death. This device does not include the self-checking redundant circuitry necessary to allow its use in personnel safety applications. A sensor failure or malfunction can cause either an energized or de-energized sensor output condition.

Storage Mode for the Wireless Q120 Node

While in storage mode, the Wireless Q120 Node's radio does not operate. The Wireless Q120 Node 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 Wireless Q120 Node into storage mode, press and hold the button for five seconds. The Wireless Q120 Node is in storage mode when the LEDs stop blinking.

Configuration Instructions

Button and LEDs



Red LED (flashing) indicates a radio link error with the Gateway. Green LED (flashing) indicates a good radio link with the Gateway.

DIP Switches

After making any changes to any DIP switch position, reboot the Wireless Q120 Node by triple-clicking the button, waiting a second, then double-clicking the button.

Description	D1 Bank			
	1	2	3	4
Transmit power: 1 Watt	OFF*			
Transmit power: 250 mW (compatible with 150 mW radios)	ON			
Reserved		OFF*	OFF*	OFF*

Description	D2 Bank			
	1	2	3	4
Low Speed Mode (Battery-powered)	OFF*			
High Speed Mode (10-30 V dc powered)	ON			
Button mode: toggle		OFF*		
Button mode: momentary		ON		
Reserved (keep in OFF position)			OFF*	OFF*

* Default position

Bind the Wireless Q120 Node 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 Wireless Q120 Node 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 Wireless Q120 Node 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 Q120 Node and lift the cover.
4. Enter binding mode on the Wireless Q120 Node 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 Wireless Q120 Node is bound, the LEDs stay solid momentarily, then they flash together four times. The Wireless Q120 Node exits binding mode.
5. Label the sensor with the Wireless Q120 Node's Node address number and place the sticker on the Wireless Q120 Node.
6. Repeat steps 2 through 5 for as many Wireless Q120 Node as are needed for your network.
7. After binding all Wireless Q120 Node, 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 Q120 Node 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 Wireless Q120 Nodes if your Gateway is ever replaced.

Modbus Registers

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)	Discrete IN 1	0	1	0	1
2	2	2 + (Node# × 16)	Discrete IN 2	0	1	0	1
3	3	3 + (Node# × 16)	Discrete IN 3	0	1	0	1
4	4	4 + (Node# × 16)	Discrete IN 4	0	1	0	1
5	5	5 + (Node# × 16)	Discrete IN 5	0	1	0	1
6	6	6 + (Node# × 16)	Discrete IN 6	0	1	0	1
7	7	7 + (Node# × 16)	Reserved				
8	8	8 + (Node# × 16)	Device Message				
9	9	9 + (Node# × 16)	Discrete OUT 1	0	65535	0	65535
10	10	10 + (Node# × 16)	Discrete OUT 2	0	65535	0	65535
11	11	11 + (Node# × 16)	Discrete OUT 3	0	65535	0	65535
12	12	12 + (Node# × 16)	Discrete OUT 4	0	65535	0	65535
13	13	13 + (Node# × 16)	Discrete OUT 5	0	65535	0	65535
14	14	14 + (Node# × 16)	Discrete OUT 6	0	65535	0	65535
15	15	15 + (Node# × 16)	Control Message				
16	16	16 + (Node# × 16)	Reserved				

Set the appropriate discrete output to the following values to control the LED. Values not listed are reserved for future support.

Discrete OUT Holding Register Value	LED **Operation**
0	LED Off
1	Green LED Flash
2	Green LED On

Discrete OUT Holding Register Value	LED **Operation**
5	Red LED Flash
6	Red LED On

Latch Table

To clear the latches, write to I/O 15 of the Node in question.

To clear the latch for I/O point	Write this decimal value
1	5377
2	5378
3	5380
4	5384

To clear the latch for I/O point	Write this decimal value
5	5392
6	5408
All I/O points	5439

Installation Instructions

Watertight Glands and NPT Ports

To make glands and plugs watertight, use PTFE tape and follow these steps.

1. Wrap four to eight passes of polytetrafluoroethylene (PTFE) tape around the threads as close as possible to the hexagonal body of the gland.
2. Manually thread the gland into the housing hole. Never apply more than 5 in-lbf of torque to the gland or its cable clamp nut. [1]

Seal any unused access holes with one of the supplied plastic plugs. To install a watertight plug:

1. Wrap four to eight passes of PTFE tape around the plug's threads, as close as possible to the flanged surface.
2. Carefully thread the plastic plug into the vacant hole in the housing and tighten using a slotting screwdriver. Never apply more than 10 in-lbf torque to the plastic plug.

If your device has an unused NPT port, install a watertight NPT plug:

1. Wrap 12 to 16 passes of PTFE tape evenly across the length of the threads.
2. Manually thread the plug into the housing port until reaching some resistance.
3. Using a crescent wrench, turn the plug until all the plug's threads are engaged by the housing port or until the resistance doubles. Do not over-tighten as this will damage the device. These threads are tapered and will create a waterproof seal without over-tightening.

Wiring for DC Power

The Wireless Q120 Node has terminal connections to operate from 10 to 30 V dc power. Connect the power wires through the housing to the terminals shown in *Button and LEDs* on page 1. The battery can be removed to operate only from 10 to 30 V dc power or the battery can provide battery backup power.

The Wireless Q120 Node can be put into high speed mode when using 10 to 30 V dc. This will allow for LED indicators to run up to 16 times faster than a battery-powered Node. Operating in high speed mode with battery power significantly reduces the battery life.

[1] This is equivalent to the torque generated without using tools. If a wrench is used, apply only very light pressure. Torquing these fittings excessively damages the device.

Replace the **Battery**

To replace the lithium "D" 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. Unscrew the four corner screws and open the box.
2. Remove the discharged battery and replace with a new battery. Use a 3.6 V D cell lithium battery, such as Xeno's XL-205 or equivalent.
3. 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.
4. Reassemble the box and tighten the four corner screws.

Specifications

Radio Range[2]
- 900 MHz, 1 Watt (Internal antenna): Up to 3.2 km (2 miles)
- 2.4 GHz, 65 mW (Internal antenna): Up to 1000 m (3280 ft) with line of sight

Minimum **Separation** Distance
- 900 MHz, 1 Watt: 4.57 m (15 ft)
- 2.4 GHz, 65 mW: 0.3 m (1 ft)

Typical **Battery** Life
- Up to 3.5 years, typical
- A typical battery life assumes an average of 60 seconds between sensor changes of state and the default 62.5 millisecond sample rate.
- Battery life with LEDs on or flashing:
  - One green LED flashing: 3.25 years
  - One green LED on: 1.75 years
  - All green LEDs flashing: 3 years
  - All green LEDs on: 1.25 years
  - One red LED flashing: 3.25 years
  - One red LED on: 1.25 year
  - All red LEDs flashing: 2.25 years
  - All red LEDs on: 0.5 years

Indicators
- Read and green LEDs (radio function)

Spread Spectrum Technology
- FHSS (Frequency Hopping Spread Spectrum)

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

Construction
- Polycarbonate housing; polyester labels; EDPM rubber cover gasket; nylon buttons
- Weight: 0.39 kg (0.85 lbs)
- Maximum Tightening Torque: 0.56 N·m (5 lbf·in)

Button Input
- Sample Rate: 62.5 milliseconds
- Report Rate: On Change of State
- ON Condition: Button pressed
- OFF Condition: Button not pressed

Environmental **Rating**
- IEC IP67; NEMA 6

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

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[2] Range depends on the environment and decreases significantly without line of sight. Always verify your wireless network's range by performing a Site Survey.