# Sure Cross® Performance P8 Node

## Datasheet

The Sure Cross® wireless system is a radio frequency network with integrated I/O that operates in most environments to eliminate the need for wiring runs.

- Wireless industrial I/O device with up to 12 sourcing discrete inputs or outputs. Default configuration is set to 6 inputs and 6 outputs (without bit-packing).
- Selectable transmit power levels of 250 mW or 1 Watt for 900 MHz models and 65 mW for 2.4 GHz models
- 10 V DC to 30 V DC power input
- DIP switches for user configuration
- Frequency Hopping Spread Spectrum (FHSS) technology ensures reliable data delivery within the unlicensed Industrial, Scientific, and Medical (ISM) band
- Transceivers provide bidirectional communication between the Gateway and Node, including fully acknowledged data transmission
- Lost RF links are detected and relevant outputs set to user-defined conditions

For additional information, updated documentation, and a list of accessories, refer to Banner Engineering's website, www.bannerengineering.com.

**Important:** Please download the complete Performance Gateway or Node technical documentation, available in multiple languages, from www.bannerengineering.com for details on the proper use, applications, Warnings, and installation instructions of this device.

**Important:** Por favor descargue desde www.bannerengineering.com toda la documentación técnica de los Performance Gateway or 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 Performance Gateway or Node sur notre site 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:**

- **Never operate a 1 Watt radio without connecting an antenna**
- Operating 1 Watt radios without an antenna connected will damage the radio circuitry.
- To avoid damaging the radio circuitry, never apply power to a Sure Cross® Performance or Sure Cross MultiHop (1 Watt) radio without an antenna connected.

**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.

## Models

| Models | Frequency | I/O |
|---|---|---|
| DX80N9X6S-P8 | 900 MHz ISM Band | Discrete I/O: Up to 12 PNP inputs or up to 12 PNP outputs (for a total of 12 I/O)<br>(Default configuration is 6 IN and 6 OUT, without bit-packing) |
| DX80N2X6S-P8 | 2.4 GHz ISM Band | |

DX80...C (IP20; NEMA 1) models are also available. To order this model with an IP20 housing, add a C to the end of the model number: DX80N9X6S-P8C.

# Configuration Instructions

## Setting Up Your Wireless Network

To set up and install your wireless network, follow these steps.

Disconnect the power from your Sure Cross devices.

1. Configure the DIP switches of all devices.
2. If your device has I/O, connect the sensors to the Sure Cross devices. If your device does not have I/O, skip this step.
3. Refer to the wiring diagrams to apply power to all devices.
   - For housed models, the Gateway's LED 1 is solid green and the Node's LED 2 flashes red to indicate there is no radio link to the Gateway.
   - For board-level models, the Gateway's LED is solid green and the Node's LED flashes red to indicate there is no radio link to the Gateway.
4. Form the wireless network by binding the Nodes to the Gateway. If the binding instructions are not included in the datasheet, refer to the product manual for binding instructions.
5. Observe the LED behavior to verify the devices are communicating with each other.
   - For housed models, the Gateway's LED 1 is solid green and the Node's LED 1 flashes green to indicate it is communicating with the Gateway.
   - For board-level models, the Gateway's LED is solid green and the Node's LED flashes green to indicate it is communicating with the Gateway.
6. Configure any I/O points to use the sensors connected to the Sure Cross devices.
7. Conduct a site survey between the Gateway and Nodes. If the site survey instructions are not included in this datasheet, refer to the product manual for detailed site survey instructions.
8. Install your wireless sensor network components. If installation instructions are not included in this datasheet, refer to the product manual for detailed installation instructions.

For additional information, including installation and setup, weatherproofing, device menu maps, troubleshooting, and a list of accessories, refer to one of the following product manuals.

- Sure Cross® Quick Start Guide (p/n 128185)
- Sure Cross® Wireless I/O Network Instruction Manual (p/n 132607)

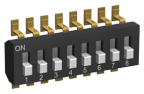
## Configure the DIP Switches

Before changing DIP switch positions, disconnect the power. Any changes made to the DIP switches are not recognized until after power is cycled to the device.

For parameters not set via DIP switches, use the User Configuration Software to make configuration changes. For parameters set using the DIP switches, the DIP switch positions override any changes made using the User Configuration Software.

### Access the Internal DIP Switches

Follow these steps to access the internal DIP switches.



1. Unscrew the four screws that mount the cover to the bottom housing.
2. Remove the cover from the housing without damaging the ribbon cable or the pins the cable plugs into.
3. Gently unplug the ribbon cable from the board mounted into the bottom housing. For integrated battery models (no ribbon cable), C housing models (ribbon cable is glued down), and Class I, Division 2 certified devices (ribbon cable is glued down), skip this step.
4. Remove the black cover plate from the bottom of the device's cover.
   The DIP switches are located behind the rotary dials.
5. Make the necessary changes to the DIP switches.
6. Place the black cover plate back into position and gently push into place.
7. If necessary, plug the ribbon cable in after verifying that the blocked hole lines up with the missing pin.
8. Mount the cover back onto the housing.

### DIP Switch Settings

* Default configuration

| Device Settings | DIP Switches | |
|---|---|---|
| | 1 | 2 |
| Transmit power level: 1 Watt (30 dBm) | OFF* | |
| Transmit power level: 250 mW (24 dBm), DX80 compatibility mode | ON | |
| Modbus or software configured (overrides switches 5-8) | | OFF* |
| DIP switch configured (Uses 5-8 for I/O configuration) | | ON |

When DIP switch 2 is in its default position (OFF), the I/O is set to 6 discrete inputs and 6 discrete outputs, non–bit-packed. DIP switches 5 through 8 are ignored.

For this 6 IN/6 OUT non bit-packed configuration, the discrete INs use I/O points 1 through 6 and the discrete OUTs use I/O points 9 through 14.

| Device Settings | DIP Switches | | | |
|---|---|---|---|---|
| | 5 | 6 | 7 | 8 |
| 12 inputs, 0 outputs | OFF* | OFF* | OFF* | OFF* |
| 11 inputs, 1 output | OFF | OFF | OFF | ON |
| 10 inputs, 2 outputs | OFF | OFF | ON | OFF |
| 9 inputs, 3 outputs | OFF | OFF | ON | ON |
| 8 inputs, 4 outputs | OFF | ON | OFF | OFF |
| 7 inputs, 5 outputs | OFF | ON | OFF | ON |
| 6 inputs, 6 outputs | OFF | ON | ON | OFF |
| 5 inputs, 7 outputs | OFF | ON | ON | ON |
| 4 inputs, 8 outputs | ON | OFF | OFF | OFF |
| 3 inputs, 9 outputs | ON | OFF | OFF | ON |
| 2 inputs, 10 outputs | ON | OFF | ON | OFF |
| 1 input, 11 outputs | ON | OFF | ON | ON |
| 0 inputs, 12 outputs | ON | ON | OFF | OFF |
| 6 inputs, 6 outputs (non bit-packed) | ON | ON | OFF | ON |
| 8 bit-packed inputs, 4 non bit-packed outputs | ON | ON | ON | OFF |
| 4 non bit-packed inputs, 8 bit-packed outputs | ON | ON | ON | ON |

For DIP switches 5 through 8 to be recognized, DIP switch 2 must be in the ON position.

For the 8 bit-packed IN/4 non bit-packed OUT configuration, all discrete INs use I/O point 1 and the discrete OUTs use I/O points 9 through 12.

For the 4 non bit-packed IN/8 bit-packed output configuration, the discrete INs use I/O points 1 through 4 and all bit-packed outputs use I/O point 9.

### Modbus/Software Configured or DIP Switch Configured for I/O Configuration

In the OFF position, this device is configured for six discrete inputs and six discrete outputs (non-bit packed) for products built after May 2011. For products built before May 2011, this default position configures the device for 12 inputs and zero outputs (bit packed). In the OFF position, users can send commands directly from the host system to the devices to select custom I/O configuration. Users may also use the User Configuration Software to write custom configuration

In the ON position, use DIP switches 5 through 8 to select one of the pre-programmed discrete I/O configurations shown in the DIP Switch Settings table.

### Transmit Power Levels

The 900 MHz radios transmit at 1 Watt (30 dBm) or 250 mW (24 dBm). While the Performance radios operate in 1 Watt mode, they cannot communicate with the older 150 mW radios. To communicate with 150 mW radios, operate this radio in 250 mW mode. For 2.4 GHz models, this DIP switch is disabled. The transmit power for 2.4 GHz is fixed at about 65 mW EIRP (18 dBm), making the 2.4 GHz Performance models automatically compatible with older 2.4 GHz models.

### User Defined Configuration of Discrete I/O on the 12 I/O Devices

The 12 I/O device can be configured into any combination of 12 discrete inputs or outputs. Inputs are stored in a bit packed form in I/O point 1, device register 1. Outputs are stored in a bit packed form in I/O point 9, device register 9.

**Defining Inputs and Outputs**— To define which of the 12 I/O points are inputs, adjust the bit field stored as I/O 1's threshold parameter [15:0]. Set bit 0 of the 16-bit parameter data word to define I/O 1 as an input, set bit 1 to define I/O 2 as an input, et cetera. Each bit position of the parameter is associated to a I/O point. In the example below, the first five I/O points are defined as inputs.

| Input Parameter | Bit 15 | 14 | 13 | 12 | 11 | 10 | 09 | 08 | 07 | 06 | 05 | 04 | 03 | 02 | 01 | 00 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Input Point # | | | | | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |
| Parameter Data | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 |

Define outputs the same way by adjusting the bit field stored in I/O 9's threshold parameter [15:0]. Verify the bit pattern for outputs does not overlap the input pattern. In the example below, I/O points 6-12 are set as outputs.

| Input Parameter | Bit 15 | 14 | 13 | 12 | 11 | 10 | 09 | 08 | 07 | 06 | 05 | 04 | 03 | 02 | 01 | 00 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Input Point # | | | | | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |
| Parameter Data | | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |

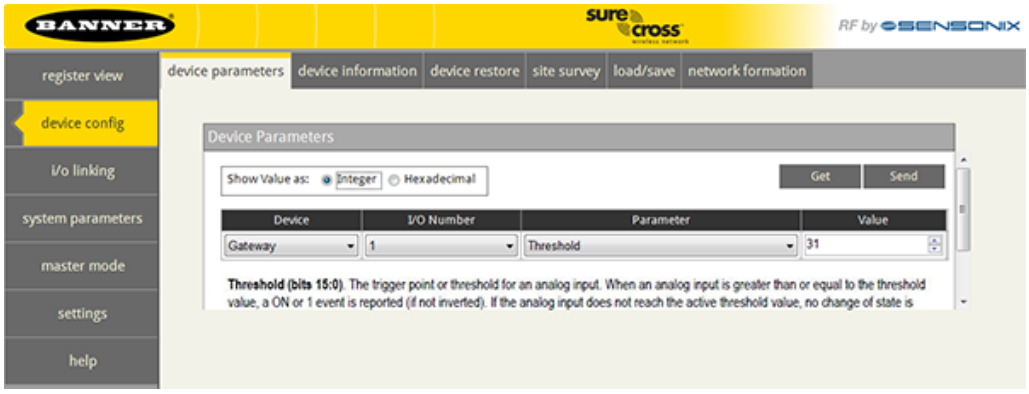
For inputs, the first I/O point selected as an input is placed in bit position 0 in register 1. The second input point is in bit position 1, et cetera. Likewise, for outputs, the first I/O point selected as an output is placed in bit position 0 in register 9, the second input point is in bit position 2. The bit-packed values are stored in right-justified format.

| Input Parameter | Bit 15 | 14 | 13 | 12 | 11 | 10 | 09 | 08 | 07 | 06 | 05 | 04 | 03 | 02 | 01 | 00 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Input Point # | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | IN 5 | IN 4 | IN 3 | IN 2 | IN 1 |
| Parameter Data | | | | | 0 | 0 | 0 | 0 | 0 | OUT 7 | OUT 6 | OUT 5 | OUT 4 | OUT 3 | OUT 2 | OUT 1 |

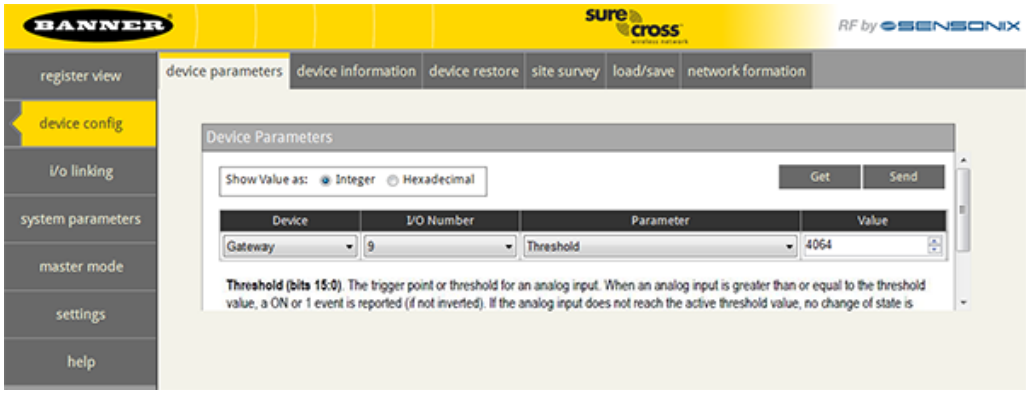
#### *Defining Inputs and Outputs Using the UCT*

To configure either a Gateway or Node, select the Gateway or specific Node from the drop-down list. To configure a DX85 Remote I/O model, set the DX85's Slave ID to 01 and select the Gateway from the drop-down list.

To define which of the 12 I/O points are inputs for the selected device, adjust the threshold parameter for I/O point 1. Set bit 0 of the 16-bit parameter data word to define I/O 1 as an input, set bit 1 to define I/O 2 as an input, et cetera. Each bit position of the parameter is associated to a I/O point. In the example below, the first five I/O points are defined as inputs (0000 0001 1111 = 0x001F = 0031).




To define which of the 12 I/O points are outputs for the selected device, adjust the threshold parameter for I/O point 9. In the example below, bits 11 through 5 are used to set seven outputs (1111 1110 0000 = 0x0FE0 = 4064)




## Mixing Performance and Non-Performance (150 mW) Radios in the Same Network

To comply with federal regulations, the 150 mW radios and 1 Watt radios communicate differently. All Performance models offer the ability to select between 250 mW and 1 Watt operation using the DIP switches. To mix Performance radios with non-Performance radios, refer to the product datasheet and:

- Operate Performance radios in 250 mW mode, not 1 Watt mode
- Set non-Performance (150 mW) radios to use Extended Address Mode

The 150 mW, 250 mW, and 1 Watt networks operate when collocated, but verify the antenna separation distance between a Gateway and Node or between two Gateways is at least 10 feet apart. For more detailed instructions about setting up your wireless network, refer to the following documents:

- DX80 Performance Quick Start Guide (p/n 128185)
- DX80 Performance Wireless I/O Network Instruction Manual (p/n 132607)

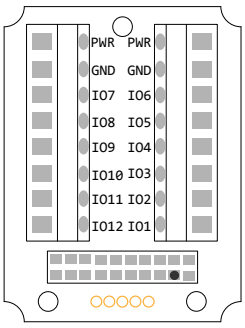
# Wire Your Sure Cross® Device

Use the following wiring diagrams to first wire the sensors and then apply power to the Sure Cross devices.

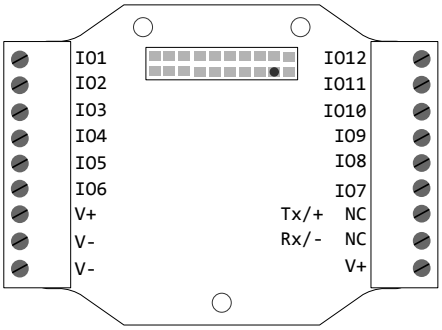
## Terminal Blocks and Wiring

Refer to the Class I Division 2/Zone 2 control drawings (p/n 143086) for wiring specifications and limitations.

**IP67 Wiring Board (P8 Models)**




**IP20 Wiring Board (P8C Models)**

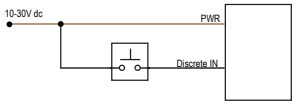



IOx. Input or output (depending on configuration)
GND. Ground/DC common connection
PWR. 10 to 30 V DC power connection
RX/-. Serial communication line for the Gateway. No connection for Nodes
TX/+. Serial communication line for the Gateway; no connection for Nodes
V+. 10 to 30 V DC power connection
V–. Ground/DC common connection

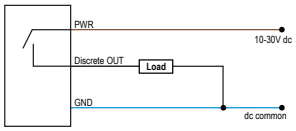
When using the DIP switches to configure the input and output selection, wire the inputs beginning with IO1. After all inputs are wired, begin using the remaining IOx as outputs. For example, if you are using 10 inputs and 2 outputs, use terminals IO1 through IO10 for the inputs and terminals IO11 and IO12 for the outputs.

For the default configuration of 6 IN and 6 OUT, use IO1 through IO6 to wire the inputs and IO7 through IO12 to wire the outputs.

**Discrete Input Wiring for PNP Sensors**



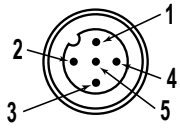

**Discrete Output Wiring (PNP)**




The DIx and DOx of these wiring diagrams correspond to the IOx on the terminal block.

## Apply Power to the Node

Integral 5-pin M12/Euro-style male quick disconnect wiring depends on the model and power requirements of the device. Not all models can be powered by 10 to 30 V DC and not all models can be powered by 3.6 to 5.5 V DC. Refer to to verify the power requirements of your device. For *Flex*Power devices, do not apply more than 5.5 V to the gray wire.

| 5-pin M12/Euro-style (male) | Pin | Wire Color | Nodes Powered by 10 to 30 V DC | Nodes Powered by Battery or Battery Pack |
|---|---|---|---|---|
|  | 1 | Brown | 10 to 30 V DC | |
| | 2 | White | | |
| | 3 | Blue | DC common (GND) | DC common (GND) |
| | 4 | Black | | |
| | 5 | Gray | | 3.6 to 5.5 V DC |



## DX80...C Wiring

Wiring power to the DX80...C models varies depending the power requirements of the model. Connecting DC power to the communication pins (Tx/Rx) causes permanent damage. For *Flex*Power devices, do not apply more than 5.5 V to the B+ terminal.

| Terminal Label | Gateway and DX85 | 10 to 30 V DC Powered Nodes | Battery Powered Nodes |
|---|---|---|---|
| V+ | 10 V DC to 30 V DC | 10 V DC to 30 V DC | |
| Tx/+ | RS485 / D1 / B / + | | |
| V– | DC common (GND) | DC common (GND) | DC common (GND) |
| Rx/– | RS485 / D0 / A / - | | |
| B+ | | | 3.6 to 5.5 V DC |

## LED Behavior for the Nodes

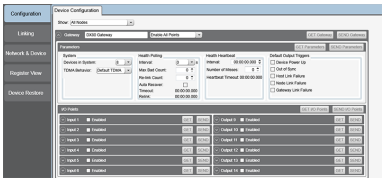
Nodes do not sample inputs until they are communicating with the Gateway. The radios and antennas must be a minimum distance apart to function properly. Recommended minimum distances are:

900 MHz 150 mW and 250 mW radios: 6 feet
900 MHz 1 Watt radios: 15 feet
2.4 GHz 65 mW radios: 1 foot

| LED 1 | LED 2 | Node Status |
|---|---|---|
| Flashing green | | Radio Link Ok |
| Flashing red | Flashing red | Device Error |
| | Flashing red, 1 per 3 sec | No Radio Link |

## Sure Cross® User Configuration Software

The User Configuration Software offers an easy way to link I/O points in your wireless network, view I/O register values, and set system communication parameters when a host system is not part of the wireless network. The software runs on any computer with the Windows Vista, Windows 7, Windows 8, or Windows 10 operating system.



Use a USB to RS-485 adapter cable to connect a standalone DX80 Gateway to the computer. For DXM Controllers with an internal DX80 radio, connect a computer to the DXM Controller using a USB or Ethernet connection. Download the most recent revisions of the configuration software from Banner Engineering's website: www.bannerengineering.com/wireless.
The USB to RS-485 adapter cable is not required for the DXM Controller. For standalone DX80 Gateway devices use:

- USB to RS-485 adapter cable model BWA-UCT-900 for 1 Watt radios
- USB to RS-485 adapter cable model BWA-HW-006 for all other radios

## Installing Your Sure Cross® Radios

Please refer to one of the following instruction manuals for details about successfully installing your wireless network components.

- Performance Wireless I/O Network Instruction Manual: 132607

## Holding Registers

| Modbus Registers | | EIP Registers | | I/O Type | | Holding Register Representation (Dec.) | |
|---|---|---|---|---|---|---|---|
| Gateway / DX85 | Node | Node | | Bit-Packed | Non Bit-Packed (default configuration) | Min. | Max. |
| 1 | 1 + (Node# × 16) | 0 + (Node# × 8) | Instance 100 / N7 | Bit-Packed Discrete IN (IO1–IO12) | Discrete IN 1 (IO1) | 0 | 4095 |
| 2 | 2 + (Node# × 16) | 1 + (Node# × 8) | | | Discrete IN 2 (IO2) | 0 | 1 |
| 3 | 3 + (Node# × 16) | 2 + (Node# × 8) | | | Discrete IN 3 (IO3) | 0 | 1 |
| 4 | 4 + (Node# × 16) | 3 + (Node# × 8) | | | Discrete IN 4 (IO4) | 0 | 1 |
| 5 | 5 + (Node# × 16) | 4 + (Node# × 8) | | | Discrete IN 5 (IO5) | 0 | 1 |
| 6 | 6 + (Node# × 16) | 5 + (Node# × 8) | | | Discrete IN 6 (IO6) | 0 | 1 |
| 7 | 7 + (Node# × 16) | 6 + (Node# × 8) | | Reserved | | | |
| 8 | 8 + (Node# × 16) | 7 + (Node# × 8) | | Device Message | | | |
| 9 | 9 + (Node# × 16) | 0 + (Node# × 8) | Instance 112 / N14 | Bit-Packed Discrete OUT (IO1–IO12) | Discrete OUT 1 (IO7) | 0 | 4095 |
| 10 | 10 + (Node# × 16) | 1 + (Node# × 8) | | | Discrete OUT 2 (IO8) | 0 | 1 |
| 11 | 11 + (Node# × 16) | 2 + (Node# × 8) | | | Discrete OUT 3 (IO9) | 0 | 1 |
| 12 | 12 + (Node# × 16) | 3 + (Node# × 8) | | | Discrete OUT 4 (IO10) | 0 | 1 |
| 13 | 13 + (Node# × 16) | 4 + (Node# × 8) | | | Discrete OUT 5 (IO11) | 0 | 1 |
| 14 | 14 + (Node# × 16) | 5 + (Node# × 8) | | | Discrete OUT 6 (IO12) | 0 | 1 |
| 15 | 15 + (Node# × 16) | 6 + (Node# × 8) | | Control Message | | | |
| 16 | 16 + (Node# × 16) | 7 + (Node# × 8) | | Reserved | | | |

For other non bit-packed configurations, the inputs begin at I/O point 1 and the outputs begin after the last input.
For DIP switches 5 through 8 to be recognized, DIP switch 2 must be in the ON position.
For the 4 non bit-packed IN/8 bit-packed output configuration, the discrete INs use I/O points 1 through 4 and all bit-packed outputs use I/O point 9.

## Specifications

### Performance Radio Specifications

**Radio Range**[1]
900 MHz, 1 Watt: Up to 9.6 km (6 miles)
2.4 GHz, 65 mW: Up to 3.2 km (2 miles)

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

**Radio Transmit Power**
900 MHz, 1 Watt: 30 dBm (1 W) conducted (up to 36 dBm EIRP)
2.4 GHz, 65 mW: 18 dBm (65 mW) conducted, less than or equal to 20 dBm (100 mW) EIRP

**Spread Spectrum Technology**
FHSS (Frequency Hopping Spread Spectrum)

**900 MHz Compliance (1 Watt)**
FCC ID UE3RM1809: FCC Part 15, Subpart C, 15.247
IC: 7044A-RM1809
IFT: RCPBARM13-2283

**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

**Antenna Connection**
Ext. Reverse Polarity SMA, 50 Ohms
Max Tightening Torque: 0.45 N·m (4 lbf·in)

**Link Timeout**
Gateway: Configurable via User Configuration Software
Node: Defined by Gateway

### P8 Node Specifications

**Supply Voltage**
10 V DC to 30 V DC (Outside the USA: 12 V DC to 24 V DC, ± 10%) [2]

**Power Consumption**
900 MHz Consumption: Maximum current draw is < 40 mA and typical current draw is < 30 mA at 24 V DC. (2.4 GHz consumption is less.)

**Wiring Access**
DX80 models: Four PG-7, One 1/2-inch NPT, One 5-pin threaded M12/Euro-style male quick disconnect
DX80...C models: External terminals

**Housing**
Polycarbonate housing and rotary dial cover; polyester labels; EDPM rubber cover gasket; nitrile rubber, non-sulphur cured button covers
Weight: 0.26 kg (0.57 lbs)
Mounting: #10 or M5 (SS M5 hardware included)
Max. Tightening Torque: 0.56 N·m (5 lbf·in)

**Interface**
Two bi-color LED indicators, Two buttons, Six character LCD

[1] Radio range is with the 2 dB antenna that ships with the product. High-gain antennas are available, but the range depends on the environment and line of sight. Always verify your wireless network's range by performing a Site Survey.
[2] For European applications, power this device from a Limited Power Source as defined in EN 60950-1.

**Discrete Inputs**
Rating: 3 mA max current at 30 V DC
Sample Rate: 62.5 milliseconds
Report Rate: On change of state
ON Condition (PNP): Greater than 4.5 V
OFF Condition (PNP): Less than 4 V

**Discrete Outputs**
Update Rate: Up to 62.5 milliseconds
ON Condition (PNP): Supply minus 2 V
OFF Condition (PNP): Less than 2 V
Output State Following Timeout: OFF

**Discrete Output Rating (PNP)**
100 mA max current at 30 V DC
ON-State Saturation: Less than 3 V at 100 mA
OFF-state Leakage: Less than 10 µA

**Certifications**

(CE approval only applies to 2.4 GHz models)

(NOM approval only applies to 900 MHz models)

**Certifications for DX8x...C (External Wiring Terminal) and DX8x...E Models**

CSA: Class I Division 2 Groups ABCD, Class I Zone 2 AEx/Ex nA II T4 — Certificate: 1921239

ATEX: II 3 G Ex nA IIC T4 Gc (Group IIC Zone 2) — Certificate LCIE 10 ATEX 1012 X

Refer to the Class I Division 2/Zone 2 control drawings (p/n 143086) for wiring specifications and limitations. Install the device in a suitable enclosure with provision for connection of Division 2 / Zone 2 wiring methods in accordance with local codes, as acceptable to the local inspection authority having jurisdiction. All battery-powered devices must only use the lithium battery manufactured by Xeno, model XL-205F (Banner model number **BWA-BATT-001**).

## Environmental Specifications

**Operating Conditions**
–40 °C to +85 °C (–40 °F to +185 °F) (Electronics); –20 °C to +80 °C (–4 °F to +176 °F) (LCD)
95% maximum relative humidity (non-condensing)
Radiated Immunity: 10 V/m (EN 61000-4-3)

**Shock and Vibration**
All models meet IEC 60068-2-6 and IEC 60068-2-27 testing criteria
Shock: 30G 11 ms duration, half sine wave per IEC 60068-2-27
Vibration: 10 Hz to 55 Hz, 0.5 mm peak-to-peak amplitude per IEC 60068-2-6

**Environmental Ratings**
IEC IP67; NEMA 6
Refer to the Sure Cross® Wireless I/O Networks Instruction Manual (p/n 132607) for installation and waterproofing instructions.

Operating the devices at the maximum operating conditions for extended periods can shorten the life of the device.

## Environmental Specifications for the C Housings

**Operating Conditions**
–40 °C to +85 °C (–40 °F to +185 °F) (Electronics); –20 °C to +80 °C (–4 °F to +176 °F) (LCD)
95% maximum relative humidity (non-condensing)
Radiated Immunity: 10 V/m (EN 61000-4-3)

**Shock and Vibration**
All models meet IEC 60068-2-6 and IEC 60068-2-27 testing criteria
Shock: 30G 11 ms duration, half sine wave per IEC 60068-2-27
Vibration: 10 Hz to 55 Hz, 0.5 mm peak-to-peak amplitude per IEC 60068-2-6

**Environmental Ratings**
"C" Housing Models/External wiring terminals: IEC IP20; NEMA 1
Refer to the Sure Cross® Wireless I/O Networks Instruction Manual (p/n 132607) for installation and waterproofing instructions.

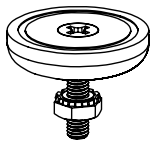
Operating the devices at the maximum operating conditions for extended periods can shorten the life of the device.

# Accessories

## Mounting Brackets

**BWA-BK-020**

- Includes two 80-lb pull rare-earth magnet mounts and two #10-32 × 1 inch screw mounts
- Used on multiple mounting brackets
- 31.75 mm (1.25 inch) diameter



# Warnings

**Install and properly ground a qualified surge suppressor when installing a remote antenna system.** Remote antenna configurations installed without surge suppressors invalidate the manufacturer's warranty. Keep the ground wire as short as possible and make all ground connections to a single-point ground system to ensure no ground loops are created. No surge suppressor can absorb all lightning strikes; do not touch the Sure Cross® device or any equipment connected to the Sure Cross device during a thunderstorm.

**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 that 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.

## 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.

**THIS LIMITED WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES WHETHER EXPRESS OR IMPLIED (INCLUDING, WITHOUT LIMITATION, ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE), AND WHETHER ARISING UNDER COURSE OF PERFORMANCE, COURSE OF DEALING OR TRADE USAGE.**

This Warranty is exclusive and limited to repair or, at the discretion of Banner Engineering Corp., replacement. **IN NO EVENT SHALL BANNER ENGINEERING CORP. BE LIABLE TO BUYER OR ANY OTHER PERSON OR ENTITY FOR ANY EXTRA COSTS, EXPENSES, LOSSES, LOSS OF PROFITS, OR ANY INCIDENTAL, CONSEQUENTIAL OR SPECIAL DAMAGES RESULTING FROM ANY PRODUCT DEFECT OR FROM THE USE OR INABILITY TO USE THE PRODUCT, WHETHER ARISING IN CONTRACT OR WARRANTY, STATUTE, TORT, STRICT LIABILITY, NEGLIGENCE, OR OTHERWISE.**

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For patent information, see www.bannerengineering.com/patents.

## Notas Adicionales

Información México: La operación de este equipo está sujeta a las siguientes dos condiciones: 1) es posible que este equipo o dispositivo no cause interferencia perjudicial y 2) este equipo debe aceptar cualquier interferencia, incluyendo la que pueda causar su operación no deseada.

Banner es una marca registrada de Banner Engineering Corp. y podrán ser utilizadas de manera indistinta para referirse al fabricante. "Este equipo ha sido diseñado para operar con las antenas tipo Omnidireccional para una ganancia máxima de antena de 6 dBd y Yagi para una ganancia máxima de antena 10 dBd que en seguida se enlistan. También se incluyen aquellas con aprobación ATEX tipo Omnidireccional siempre que no excedan una ganancia máxima de antena de 6dBd. El uso con este equipo de antenas no incluidas en esta lista o que tengan una ganancia mayor que 6 dBd en tipo omnidireccional y 10 dBd en tipo Yagi, quedan prohibidas. La impedancia requerida de la antena es de 50 ohms."

| Antenas SMA | Modelo |
|---|---|
| Antena, Omni 902-928 MHz, 2 dBd, junta de caucho, RP-SMA Macho | **BWA-9O2-C** |
| Antena, Omni 902-928 MHz, 5 dBd, junta de caucho, RP-SMA Macho | **BWA-9O5-C** |

| Antenas Tipo-N | Modelo |
|---|---|
| Antena, Omni 902-928 MHz, 6 dBd, fibra de vidrio, 1800mm, N Hembra | **BWA-9O6-A** |
| Antena, Yagi, 900 MHz, 10 dBd, N Hembra | **BWA-9Y10-A** |

## Mexican Importer

Banner Engineering de Mèxico, S. de R.L. de C.V.
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