

## 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 two NPN discrete inputs, two NMOS discrete outputs, and four 0 to 20 mA analog inputs
- Selectable transmit power levels of 250 mW or 1 Watt for 900 MHz models and 65 mW for 2.4 GHz models
- *FlexPower*® power options allow for 10 V DC to 30 V DC, solar, and battery power sources for low power applications.
- DIP switches for user configuration
- Frequency Hopping Spread Spectrum (FHSS) technology ensures reliable data delivery
- 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](http://www.bannerengineering.com).

## Models

Models	Frequency	I/O
DX80N9X2S-P5	900 MHz ISM Band	<b>Inputs:</b> Two NPN discrete, four selectable analog (0 to 20 mA or 0 to 10 V) <b>Outputs:</b> Two NMOS discrete
DX80N2X2S-P5	2.4 GHz ISM Band	<b>Switch Power Outputs:</b> Two <sup>1</sup>



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: DX80N9X2S-P5C.

## Configuration Instructions

### Setting Up Your Wireless Network

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

For complete instructions, including binding, configuration, installation, weatherproofing, device menu maps, troubleshooting, and a list of accessories, refer to Sure Cross® Wireless I/O Network Instruction Manual (p/n [132607](#))

1. Disconnect the power from your Sure Cross devices.
2. Configure the DIP switches of all devices. DIP switch configurations are always listed in the product's datasheet.
3. If your device has I/O, connect the sensors to the Sure Cross devices. Available I/O is always listed in the product's datasheet. If your device does not have I/O, skip this step.
4. 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.
5. Form the wireless network by binding the Nodes to the Gateway.
6. 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.
7. Configure any I/O points to use the sensors connected to the Sure Cross devices.
8. Conduct a site survey between the Gateway and Nodes.
9. Install your wireless sensor network components.

<sup>1</sup> To configure the switch power outputs, use the User Configuration Tool (UCT). Refer to the [UCT Instruction Manual](#) (p/n 140628) for instructions.



## Configure the DIP Switches

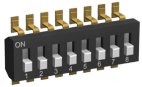
Before changing DIP switch positions, disconnect the power. Any changes made to the DIP switches are not recognized until after power is cycled to the device.

For devices powered by batteries integrated into the housing, triple-click button 2, then double-click button 2 to reset the device without removing the battery.

For parameters not set using the DIP switches, use the configuration software to make configuration changes. For parameters set using the DIP switches, the DIP switch positions override any changes made using the 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. Skip this step if there is no ribbon cable (integrated battery models) or the ribbon cable is glued down (C housing models).
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

	Switches							
Device Settings	1	2	3	4	5	6	7	8
Transmit power level (900 MHz): 1 W (30 dBm)	OFF*							
Transmit power level (900 MHz): 250 mW (24 dBm), DX80 compatibility mode	ON							
Modbus or software configured (overrides DIP switches 3-8)		OFF*						
DIP switch configured		ON						
Link loss output: OFF or 0 mA				OFF*	OFF*			
Link loss output: ON or 20 mA				OFF	ON			
Link loss output: hold last state				ON	OFF			
Reserved				ON	ON			
0–20 mA scale <sup>2</sup>						OFF*		
4–20 mA scale <sup>2</sup>						ON		

\* Default configuration

### Analog Input and Output Scale

Use the DIP switch to select which current scale to use for all the device's analog inputs and outputs: 0 to 20 mA or 4 to 20 mA. When using a 4-20 mA sensor with a 0-20 mA input, the sensor uses the 4-20 mA section of the total range. Using a 4-20 mA with a 0-20 mA input allows you to determine when you have an error condition with the sensor. A normal input reading between 4 and 20 mA indicates a functioning sensor whereas a value below 4 mA indicates an error condition, such as a broken wire or loose connection. This DIP switch is used only on the 0 to 20 mA models, not the 0 to 10V models.

### Link Loss Outputs

The Sure Cross® wireless devices use a deterministic radio link time-out method to address RF link interruption or failure. When a radio link fails, all pertinent wired outputs are set to defined states until the link is recovered, ensuring that disruptions in the communications link result in predictable system behavior.

Following a radio link time-out, all outputs linked to the Node in question are set to de-energize (discrete outputs to zero, analog outputs to 0 mA or 4 mA), energize (discrete outputs to one, analog outputs to 20 mA), or hold the last stable state/value. Use the DIP switches to select the link loss output state.

### Modbus/Software or DIP Switch Configured

In Modbus/Software Configured mode, use the DX80 Performance Configuration Software or a Modbus command to change the device parameters. DIP switch positions 3 through 8 are ignored. In DIP Switch Configured mode, use the DIP switches to configure the parameters listed in the table.

### Transmit Power Levels

The 900 MHz radios transmit at 1 Watt (30 dBm) or 250 mW (24 dBm). The 250 mW mode reduces the radio's range but improves the battery life in short range applications. 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).

<sup>2</sup> Not used for 0–10 V analog I/O models

### 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

Figure 1. P5 model

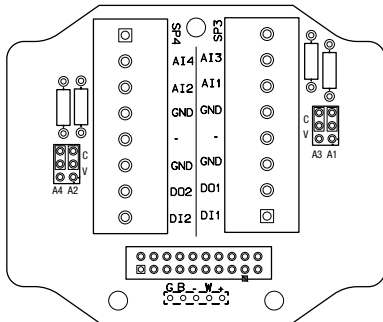
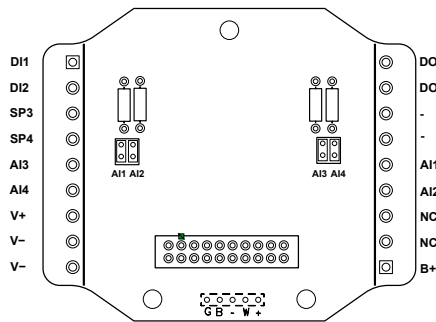


Figure 2. P5C model



AIx or Ax. Analog IN x  
 B+. 3.6 V DC to 5.5 V DC (use for battery powered models only)  
 DIx. Discrete IN x  
 DOx. Discrete OUT x

GND. Ground/DC common connection  
 NC. No connection  
 SPx. Switch Power; provides variable power sources for external devices  
 V+. 10 V DC to 30 V DC power connection  
 V-. Ground/DC common connection

Connecting power to the communication pins will cause permanent damage. For the DX8x...C models, PWR in the wiring diagram refers to V+ on the wiring board and GND in the wiring diagram refers to V- on the wiring board. Do not exceed analog input ratings for analog inputs. Only connect sensor outputs to analog inputs.

To power the sensor using the switch power output (SPx), replace the PWR with SPx in these wiring diagrams. Use the User Configuration Tool (UCT) to select the switch power voltage and warm-up time for your radio. For instructions, refer to the [UCT Instruction Manual](#), p/n 140628)

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

Figure 3. Discrete Input Wiring for PNP Sensors

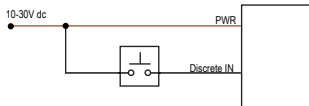


Figure 4. Discrete Input Wiring for NPN Sensors

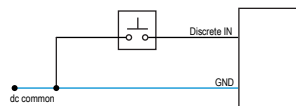


Figure 5. Discrete Output Wiring (NPN or NMOS)

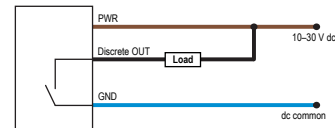


Figure 6. Analog Input Wiring (10–30 V DC Power)

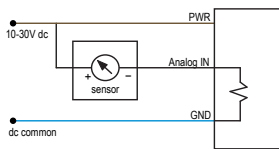
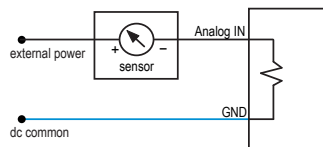


Figure 7. Analog Input Wiring (4–20 mA, 2-Wire, Externally-Powered Sensors)



### DX80...C Wiring

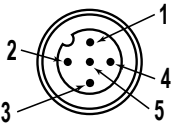
Wiring power to the DX80...C models varies depending the power requirements of the model. Connecting DC power to the communication pins (Tx/Rx) causes permanent damage. For FlexPower devices, do not apply more than 5.5 V to the B+ terminal.

Table 1: Wiring for the C housing models

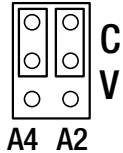
Terminal Label	Gateway and DX85	10 V DC to 30 V DC Powered Nodes	Battery-Powered Nodes
V+	10 V DC to 30 V DC	10 V DC to 30 V DC	
Tx/+	RS485 / D1 / B / +		
V-	DC common (GND)	DC common (GND)	DC common (GND)
Rx/-	RS485 / D0 / A / -		
B+			3.6 V DC to 5.5 V DC

## Apply Power to the Node

Integral 5-pin M12 male quick-disconnect connector 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 *FlexPower* devices, do not apply more than 5.5 V to the gray wire.

5-pin M12 (male) Quick Disconnect Connector	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

## Configuring the Universal Analog Input



By default, the analog input jumpers are set to use current (0–20 mA). To use the voltage (0–10 V) analog input, follow these instructions:

1. Disconnect the power from the device.
2. Open the housing and access the wiring board.
3. Move the jumper for the desired analog input (shown are analog 2 and analog 4) from the C position (shown) to the V position. For the board models with two pins instead of three, remove the jumper to select 0–10 V configuration.
4. Close the housing and reconnect the power.

Complete the configuration change using the User Configuration Tool.

1. With the Gateway connected to your computer, launch the User Configuration Tool software.
2. From the **Device > Configuration Settings** menu, select **Comm Port** and click **Connect**.
3. Go to the **Configuration > Device Configuration** screen.
4. Click the arrow next to the Node number to view its parameters.
5. Click **GET Node**.
6. Under **Analog Signal Conditioning**, change the **Units** from 0–20mA to 0–10V.
7. Click **SEND**.

To change the inputs from 0–20 mA to 0–10 V on models without jumpers, cut out and remove the resistor.

## LED Behavior for the Gateways

Verify all devices are communicating properly. 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

Table 2: LEC behavior for the Gateway

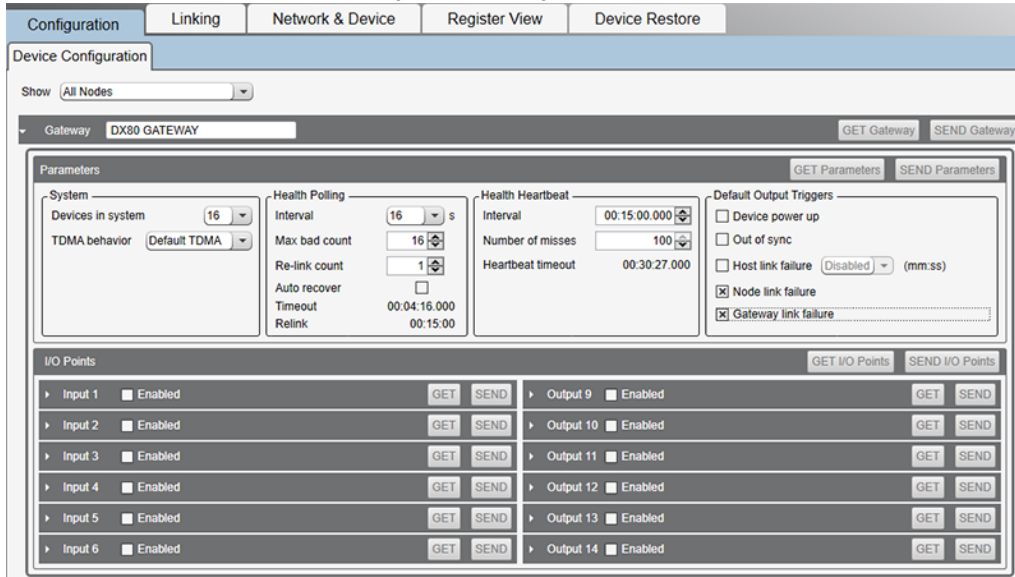
LED 1	LED 2	Gateway Status
Solid green		Power ON
Flashing red	Flashing red	Device Error
	Flashing amber	Modbus Communication Active
	Flashing red	Modbus Communication Error

For Gateway and Ethernet Bridge systems, active Modbus communication refers to the communication between the Gateway and the Ethernet Bridge. For GatewayPro systems, the Modbus communication LEDs refer to the communication internal to the GatewayPro. For Gateway-only systems, the Modbus communication LEDs refer to the communication between the Gateway and its host system (if applicable).

## Sure Cross® DX80 Performance Configuration Software

The 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.

Figure 8. Device Configuration screen



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 the supplied USB or Ethernet connection. Download the most recent revisions of the configuration software from Banner Engineering's website: <https://www.bannerengineering.com/us/en/products/wireless-sensor-networks/reference-library/software.html>.

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 these instruction manuals to install your wireless network components.

- Performance Wireless I/O Network Instruction Manual: [132607](#)
- MultiHop Data Radio Instruction Manual: [151317](#)

## Holding Registers

Modbus Registers		EIP Registers		I/O Type	I/O Range		Holding Register Representation (Dec)		Terminal Block Labels
Gateway	Node	Node	Node		Min.	Max.	Min.	Max.	
1	1 + (Node# × 16)	0 + (Node# × 8)	Instance 100 / N7	Analog IN 1 (mA)	0	20	0	65535	AI1
2	2 + (Node# × 16)	1 + (Node# × 8)		Analog IN 2 (mA)	0	20	0	65535	AI2
3	3 + (Node# × 16)	2 + (Node# × 8)		Analog IN 3 (mA)	0	20	0	65535	AI3
4	4 + (Node# × 16)	3 + (Node# × 8)		Analog IN 4 (mA)	0	20	0	65535	AI4
5	5 + (Node# × 16)	4 + (Node# × 8)		Discrete IN 1	0	1	0	1	DI1
6	6 + (Node# × 16)	5 + (Node# × 8)		Discrete IN 2	0	1	0	1	DI2
7	7 + (Node# × 16)	6 + (Node# × 8)		Reserved					
8	8 + (Node# × 16)	7 + (Node# × 8)		Device Message					
9	9 + (Node# × 16)	0 + (Node# × 8)		Discrete OUT 1	0	1	0	1	DO1
10	10 + (Node# × 16)	1 + (Node# × 8)		Discrete OUT 2	0	1	0	1	DO2
...	...	...	Instance 112 / N14						
15	15 + (Node# × 16)	6 + (Node# × 8)		Control Message					
16	16 + (Node# × 16)	7 + (Node# × 8)		Reserved					

## Specifications

### Performance Radio Specifications

#### Radio Range<sup>3</sup>

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)

#### Link Timeout (Performance)

Gateway: Configurable via User Configuration Software  
Node: Defined by Gateway

#### Antenna Connection

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

#### 900 MHz Compliance (1 Watt)

FCC ID UE3RM1809: FCC Part 15, Subpart C, 15.247  
IC: 7044A-RM1809  
IFT: RCPBARM13-2283



(NOM approval only applies to 900 MHz models)

#### 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/)

### 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  
For installation and waterproofing instructions, go to [www.bannerengineering.com](http://www.bannerengineering.com) and search for the complete instruction manual (p/n 132607)

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.

### Specifications for the P5/P5C Node

#### Supply Voltage

10 V DC to 30 V DC or 3.6 V DC to 5.5 V DC low power option  
Outside the USA: 12 V DC to 24 V DC, ±10% or 3.6 V DC to 5.5 V DC low power option; For European applications, power this device from a Limited Power Source as defined in EN 60950-1.

#### 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 M12 male quick-disconnect connector  
DX80...C models: External terminals

#### Discrete Inputs (NPN)

Rating: 3 mA max current at 30 V DC  
Sample Rate: 125 milliseconds  
Report Rate: On change of state  
ON Condition (NPN): Less than 0.7 V  
OFF Condition (NPN): Greater than 2 V or open

#### Analog Inputs

Rating (mA): 24 mA  
Rating (V): 10 V  
Impedance: Approximately 220 Ohms  
Sample Rate: 62.5 milliseconds  
Report Rate: 1 second or On Change of State (1% change in value)  
Accuracy: 0.2% of full scale +0.01% per °C  
Resolution: 12-bit

#### 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

#### Discrete Outputs (NMOS)

Update Rate: 1 second  
ON Condition (NMOS): Less than 0.7 V  
OFF Condition (NMOS): Open  
Output State Following Timeout: OFF

#### Discrete Output Rating (Performance NMOS)

Less than 1 A max current at 30 V DC  
ON-State Saturation: Less than 0.7 V at 20 mA

#### Switch Power Outputs

Two (SP3 and SP4)  
Output voltage: Selectable using the User Configuration Tool (UCT) or Modbus commands

<sup>3</sup> 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.

**Certifications**



**Banner Engineering Europe**  
 Park Lane, Culliganlaan 2F  
 bus 3, 1831 Diegem,  
 BELGIUM

(CE approval only applies  
 to 2.4 GHz models)

**Turck Banner LTD** Blenheim  
 House, Blenheim Court,  
 Wickford, Essex SS11 8YT,  
 Great Britain

**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

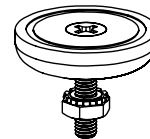
Refer to the Class I Division 2/Zone 2 control drawings (p/n 143086) for wiring specifications and limitations. Install the device in a suitable enclosure with provision for connection of Division 2 / Zone 2 wiring methods in accordance with local codes, as acceptable to the local inspection authority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

Accessories

Mounting Brackets

**BWA-BK-020**

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



Included with the DX80 and DX80...C Models

- **BWA-HW-002:** DX80 Access Hardware Kit, containing four PG-7 plastic threaded plugs, four PG-7 nylon gland fittings, four PG-7 hex nuts, one 1/2-inch NPT plug, and one 1/2-inch nylon gland fitting. (Not included with IP20 DX80...C models)
- **BWA-HW-001:** Mounting Hardware Kit, containing four M5-0.8 x 25mm SS screws, four M5-0.8 x 16 mm SS screws, four M5-0.8 mm SS hex nuts, and four #8-32 x 3/4" SS bolts
- **BWA-HW-003:** PTFE tape
- **BWA-902-C** (900 MHz) or **BWA-202-C** (2.4 GHz): Antenna, 2 dBd Omni, Rubber Swivel RP-SMA Male (not included with internal antenna models)
- **MQDC1-506:** 5-pin M12 (single ended) straight cordset, 2 m (not included with FlexPower devices)
- **BWA-HW-011:** IP20 Screw Terminal Headers (2 pack) (included only with the IP20 DX80...C models)
- Product datasheet and product family Quick Start Guide ([128185](#) for Performance models or [152653](#) for MultiHop models)

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 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 Performance Gateway or 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.



**Important:** Por favor descargue desde [www.bannerengineering.com](http://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](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.