# Sure Cross® Performance All-in-One Pressure Sensor Node

**BANNER**
*more sensors, more solutions*

## Datasheet

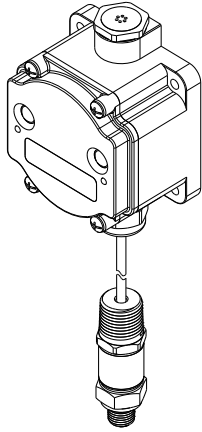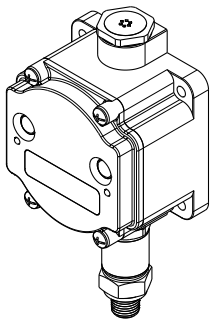*Figure 1. PSx1 model with cable*

The Sure Cross® Performance Series All-in-One Pressure Sensor Node combines a media-isolated pressure sensor with the reliable, field-proven, Sure Cross wireless architecture into one package, eliminating the need for ordering multiple components and reducing the physical design of the device. This solution allows monitoring of pneumatic systems, cooling systems, etc. in remote locations without human intervention. The industrial-grade, battery-powered device can be used to wirelessly transmit pressure levels to a wireless controller/gateway for remote monitoring of critical systems.

### Benefits

- Provides for the ability to deliver factory automation and IIoT solutions for many applications including, but not limited to monitoring:
  - Water pressure
  - HVAC systems
  - Pneumatic systems
  - Cooling systems/compressors/chillers fluid pressure
  - Hydraulic system pressure
  - Supply tank level measurements using head pressure
- **Eliminate control wires**—The Sure Cross wireless system is a radio frequency network with integrated I/O that removes the need for power and control wires
- **Reduce complexity**—Machine or process reconfiguration made easier; great for retrofit applications
- **Deploy easily**—Simplify installation on existing equipment to enable deployment in remote and hard-to-access locations where implementing a wired solution would be difficult, impractical, or not cost-effective
- Selectable transmit power levels of 250 mW or 1 Watt for 900 MHz models
- 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
- Diagnostics allow user-defined output settings in the unlikely event of a lost radio signal

*Figure 2. PS model with embedded sensor*

**Important:** Please download the complete Performance PS All-in-One Sensor 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 PS All-in-One 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 Performance PS All-in-One Sensor 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

| Model | Frequency | Inputs |
|---|---|---|
| DX80N9X1W-PS50G | | 0-50 PSI Gauge Pressure Sensor in the housing port pre-wired to the Node |
| DX80N9X1W-PS50G1 | | 0-50 PSI Gauge Pressure Sensor with 1 meter cable pre-wired to the Node |
| DX80N9X1W-PS150G | | 0-150 PSI Gauge Pressure Sensor in the housing port pre-wired to the Node |
| DX80N9X1W-PS150G1 | 900 MHz ISM Band | 0-150 PSI Gauge Pressure Sensor with 1 meter cable pre-wired to the Node |
| DX80N9X1W-PS500S | | 0-500 PSI Sealed Gauge Pressure Sensor in the housing port pre-wired to the Node |
| DX80N9X1W-PS500S1 | | 0-500 PSI Sealed Gauge Pressure Sensor with 1 meter cable pre-wired to the Node |
| DX80N9X1W-PS3000S | | 0-3000 PSI Sealed Gauge Pressure sensor in the housing port pre-wired to the Node |
| DX80N9X1W-PS3000S1 | | 0-3000 PSI Sealed Gauge Pressure Sensor with 1 meter cable pre-wired to the Node |

Gauge Pressure Transducer—Measures the pressure relative to the ambient pressure, and the sensor diaphragm is vented to the atmosphere. When the pressure port is exposed to the atmosphere, the transducer indicates 0 PSIG.

Sealed Gauge Pressure Transducer—Measures the pressure relative to the atmospheric pressure, generally at sea level. The sensor diaphragm is sealed from ambient pressure at atmospheric pressure conditions and there are no vent holes or tubes present. These sensors are more commonly used in high-pressure applications where atmospheric pressure changes have negligible effects on gauge pressure. These sensors may also be useful for applications where moisture or submergence occur.

This model can be configured to supply continuous power. For detailed instructions, refer to the technical note Configuring for Continuous Switch Power or Host Controlled Switch Power (p/n b_3099584).

To order an integrated battery model without the battery, add a **-NB** to the model number. If you purchase a model without the battery, Banner Engineering recommends battery mode **BWA-BATT-001**. For Class I Division 1/Zone 0 and Class I Division 2/Zone 2 environments, only battery **BWA-BATT-001** is certified.

## Storage and Sleep Modes

**Storage Mode** (applies to battery-powered models only)—While in **storage mode**, the radio does not operate. To put any integrated battery Sure Cross radio into storage mode, press and hold button 1 for 5 seconds. To wake the device, press and hold button 1 for 5 seconds. The radio is in storage mode when the LEDs stop blinking, but in some models, the LCD remains on for an additional minute after the radio enters storage mode. After a device has entered storage mode, you must wait 1 minute before waking it.

**Sleep Mode** (applies to both battery and 10–30 V DC powered models)—During normal operation, the Sure Cross radio devices enter **sleep mode** after 15 minutes of operation. The radio continues to function, but the LCD goes blank. To wake the device, press any button.

## Slow Scan Mode

In slow scan mode, the Pressure Sensor Node enters a deeper sleep mode to conserve battery power 15 minutes after the Pressure Sensor Node loses its communication link with its parent or master radio. The Pressure Sensor Node wakes up every 12.5 minutes to search for its parent radio. If a parent or master radio is not found, the Pressure Sensor Node goes back to sleep for another 12.5 minutes. If the parent or master radio is detected, the Pressure Sensor Node exits slow scan mode. To manually exit slow scan mode, press the Pressure Sensor Node's binding button.

# 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 using the DIP switches, use the DX80 User Configuration Software to make configuration changes. For parameters set using the DIP switches, the DIP switch positions override any changes made using the DX80 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. 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

The analog configuration pairs the switch power output with the analog input and is programmable using switches four through eight.

| Descriptions | DIP Switches | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Transmit power level: 1 Watt (30 dBm) | OFF* | | | | | | | |
| Transmit power level: 250 mW (24 dBm), DX80 compatibility mode | ON | | | | | | | |
| Analog configuration | | OFF* | | | | | | |
| Reserved | | | OFF* | | | | | |
| Sensor switched power voltage: 10 V (to Analog IN 1) | | | | OFF* | | | | |
| Sensor switched power voltage: 15 V (to Analog IN 1) | | | | ON | | | | |
| Warm-up time 15 milliseconds | | | | | OFF* | | | |
| Warm-up time 500 milliseconds | | | | | ON | | | |
| Modbus or software configured (overrides DIP switches) | | | | | | OFF* | OFF* | OFF* |
| Sample/report rate 15 minutes | | | | | | OFF | OFF | ON |
| Sample/report rate 5 minutes | | | | | | OFF | ON | OFF |
| Sample/report rate 64 seconds | | | | | | OFF | ON | ON |
| Sample/report rate 16 seconds | | | | | | ON | OFF | OFF |
| Sample/report rate 4 seconds | | | | | | ON | OFF | ON |
| Sample/report rate 2 seconds | | | | | | ON | ON | OFF |
| Sample/report rate 1 second | | | | | | ON | ON | ON |

* Factory default setting

The default sample rate is 16 seconds and the default report rate is 1 minute.

## 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.

## Sensor Switched Power Voltage

The sensor switched power voltage is the power supplied by the Node to the sensor.

## Modbus/Software or DIP Switch Configured

In Modbus/Software Configured mode, use the DX80 User 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.

## Sample and Report Rates

The sample interval, or rate, defines how often the Sure Cross device samples the input. For battery-powered applications, setting a slower rate extends the battery life.

The report rate defines how often the Node communicates the I/O status to the Gateway. For *Flex*Power® applications, setting the report rate to a slower rate extends the battery life.

## Warm-Up Time

The warm-up time defines how long the device must power up the sensor before a stable sensor reading is taken.

## Wire for Power and I/O

The All-in-One Pressure Sensor Node comes pre-wired and pre-configured to work with the supplied pressure sensor. No additional wiring is required. The following wiring diagram is for reference only. Do not re-wire the Node.

| Input Configuration | Jumper Setting | Wiring Terminals | Wiring Diagram Label | Description |
|---|---|---|---|---|
| Reserved | J1 set to 5 | | | Reserved |
| Reserved | J1 set to 8 | 1 | | Reserved |
| | | 2 | GND | Ground |
| | | 3 | SPx | Sensor Switched Power 1 (3.6 to 24 V) |

| Input Configuration | Jumper Setting | Wiring Terminals | Wiring Diagram Label | Description |
|---|---|---|---|---|
| Reserved | J2 set to C | | | Reserved |
| Analog Voltage Input | J2 set to V | 4 | Analog IN | Analog Input (0-10 V) |
| | | 5 | GND | Ground |
| Reserved | J3 set to 4 | | | Reserved |
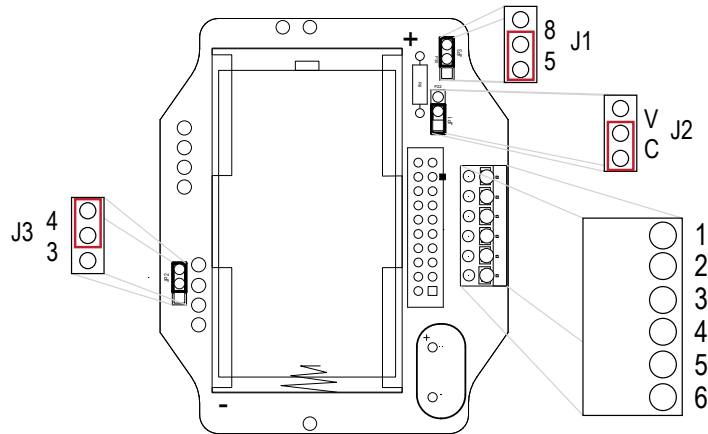


### Analog Input Wiring
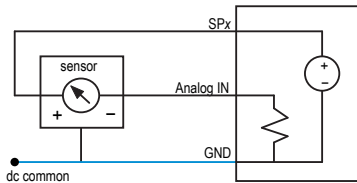


Do not exceed analog input ratings for analog inputs. Only connect sensor outputs to analog inputs.

## Bind a DX80 Node to a Gateway and Assign the Node Address

Follow these instructions to bind a Node that does not have rotary dials to any Gateway.

Binding Nodes to a Gateway ensures the Nodes only exchange data with the Gateway they are bound to. For a more detailed definition of binding mode, refer to the Sure Cross Performance DX80 Wireless I/O Networks instruction manual (p/n 132607).

1. Apply power to the Gateway and Nodes.
2. On the Gateway: Enter binding mode.
   - If you have a two-button Gateway, triple-click button 2
   - If you have a one-button Gateway, triple-click the button



*Figure 3. Two-button Gateway*



*Figure 4. One-button Gateway*
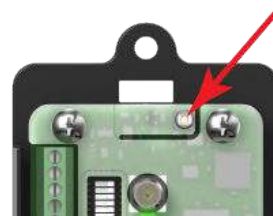
The LEDs flash alternately when the Gateway is in binding mode. Any Node entering binding mode will bind to this Gateway.

3. Using the Gateway's rotary dials, select the Node address to assign to the Node. Use the left rotary dial for the left digit and the right rotary dial for the right digit. For example, to assign your Node to address 10, set the left dial to 1 and the right dial to 0. (Address 00 is reserved for the Gateway. Nodes assigned to 00 will not bind to a Gateway.)

4. On the Node: Enter binding mode.
   - If you have a two-button Node, triple-click button 2.
   - If you have a one-button Node, triple-click the button.

   The Node enters binding mode and locates the Gateway in binding mode.

   For two LED models, the red LEDs flash alternately. After binding is complete, both LEDs are both solid red for a few seconds.

   For one-LED models, the red and green LED flashes alternately while the Node searches for the Gateway. After binding is complete, the LED is red and green for four seconds (looks amber), then the red and green flash simultaneously (looks amber) four times.

   The Node automatically exits binding mode, cycles its power, then enters RUN mode.
5. Repeat these steps for all Nodes that will communicate to this Gateway.
6. On the Gateway: Exit binding mode.
   - If you have a two-button Gateway, single-click either button.
   - If you have a one-button Gateway, single-click the button.

## Bind a DX80 Node to a DXM and Assign the Node Address

Binding Nodes to a Gateway ensures the Nodes only exchange data with the Gateway they are bound to. After a Gateway enters binding mode, the Gateway automatically generates and transmits a unique extended addressing (XADR), or binding, code to all Nodes within range that are also in binding mode. The extended addressing (binding) code defines the network, and all radios within a network must use the same code.

1. Apply power to all the devices.

   Separate radios by two meters when running the binding procedure. Put only one DXM Gateway into binding mode at a time to prevent binding to the wrong Gateway.
2. Enter binding mode on the DXM radio:
   a) Use the arrow keys to select the **ISM Radio** menu on the LCD and press **ENTER**.
   b) Highlight the **Binding** menu and press **ENTER**.
3. Assign the Node address to the Node.
   - For Nodes without rotary dials: Use the DXM arrow keys to select the Node address to assign to the DX80 Node about to enter binding mode. The DXM assigns this Node address to the next Node that enters binding mode. Only bind one Node at a time.
   - For Nodes with rotary dials: Use the Node's rotary dials to assign a valid decimal Node Address (between 01 and 47). The left rotary dial represents the tens digit (0 through 4) and the right dial represents the ones digit (0 through 9) of the Node Address. You can leave the DXM "Bind to" address set to 1 because the Node's rotary dials will override that setting.
4. Start binding mode on the DXM radio by pressing **ENTER** on the DXM radio.
5. Enter binding mode on the DX80 Node.
   - For housed radios, triple-click button 2.
   - For board-level radios, triple-click the button.
   - For Nodes without buttons, refer to the Node's datasheet for instructions on entering binding mode.

   The left and right LEDs flash alternately and the Node searches for a Gateway in binding mode. After the Node binds, the LEDs stay solid momentarily, then they flash together four times. The Node automatically exits binding mode and reboots.
6. Label the Node with the assigned address number for future reference.
7. Press **BACK** on the DXM to exit binding mode for that specific Node address.
   The Node LEDs continue to flash red until the DXM exits binding mode with that Node address.
8. Repeat these steps for as many DX80 Nodes as are needed for your network.
9. When you are finished binding, press **BACK** on the DXM until you return to the main menu.

## 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 DX80 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 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 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 | | I/O Range | | Holding Register Representation (Dec) | |
|---|---|---|---|---|---|---|---|---|
| Gateway | Node | Node | | | Min. | Max. | Min. | Max. |
| 1 | 1 + (Node# × 16) | 0 + (Node# × 8) | | | | | | |
| 2 | 2 + (Node# × 16) | 1 + (Node# × 8) | | Analog IN 1 (V) | 0.0 | 10.0 | 0 | 65535 |
| 3 | 3 + (Node# × 16) | 2 + (Node# × 8) | Instance 100 / N7 | | | | | |
| 4 | 4 + (Node# × 16) | 3 + (Node# × 8) | | | | | | |
| 5 | 5 + (Node# × 16) | 4 + (Node# × 8) | | | | | | |
| 6 | 6 + (Node# × 16) | 5 + (Node# × 8) | | | | | | |
| 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 | | | | | |
| 15 | 15 + (Node# × 16) | 6 + (Node# × 8) | | Control Message | | | | |
| 16 | 16 + (Node# × 16) | 7 + (Node# × 8) | | Reserved | | | | |

### Examples

The PS Series Node is equipped with a 0–5 V DC pressure sensor. The Node's register 2 reports this output as a raw value ranging from 0 to 32767, where 0 V is a holding register value of 0 and 5 V is a holding register value of 32767. Use the following equations to interpret the raw value in PSIG or PSIS.

When using the 0–50 PSIG model, divide the value in register 2 by 655.35. For example: PSI = 13265 (holding register 2 in decimal) ÷ 655.35 = 20.2 PSIG

When using the 0–150 PSIG model, divide the value in register 2 by 218.45. For example: PSI = 13265 (holding register 2 in decimal) ÷ 218.45 = 60.7 PSIG

When using the 0–500 PSIS model, divide the value in register 2 by 65.535. For example: PSI = 13265 (holding register 2 in decimal) ÷ 65.535 = 202.4 PSIS

When using the 0–3000 PSIS model, divide the value in register 2 by 10.9225. For example: PSI = 13265 (holding register 2 in decimal) ÷ 10.9225 = 1214.5 PSIS

## Install or Replace the Battery for a DX80 Integrated Battery Model

To install or replace the 3.6 V lithium "D" cell battery in any model with a battery integrated into the housing, follow these steps.

1. Remove the four screws mounting the face plate to the housing and remove the face plate.
2. Remove the discharged battery.
3. Install the new battery, verifying the battery's positive and negative terminals align to the positive and negative terminals of the battery holder mounted within the case.
4. After installing the battery, allow up to 60 seconds for the device to power up.
5. 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.
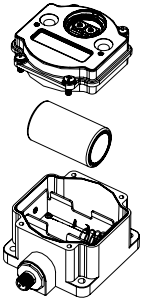


**CAUTION:** There is a risk of explosion if the battery is replaced incorrectly.

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.

For non-hazardous locations, the replacement battery is model **BWA-BATT-011**. For non-hazardous or hazardous locations, the replacement battery is Xeno model XL-205F, Banner model **BWA-BATT-001**. For pricing and availability, contact Banner Engineering.

## Specifications

### Performance 900 MHz Radio Specifications for Internal Antennas

**Radio Range**
900 MHz, 1 Watt (Internal antenna): Up to 3.2 km (2 miles) with line of sight

**Antenna Minimum Separation Distance**
900 MHz, 1 Watt: 4.57 m (15 ft)

**Radio Transmit Power**
900 MHz, 1 Watt (Internal antenna): 25 dBm Conducted

**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

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

### Environmental Specifications

**Operating Conditions**
–40 °C to +85 °C (–40 °F to +185 °F)
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.

## Pressure Series Model Specifications

**Supply Voltage**
3.6 V DC low power option from an internal battery

**Current Draw at 3.6 V dc**
900 MHz, 1 Watt: Approximately 1 mA
900 MHz, 250 mW: Approximately 0.5 mA

**Pressure Sensor**
Range: 0–50 PSIG, 0–150 PSIG, 0–500 PSIS
Proof Pressure: 2× FS
Burst Pressure: 3× FS
Fatigue Life: > 4 million cycles
Output: 0–5 V DC
Accuracy: ± 1.4% FS

**Pressure Sensor Mechanical**
Pressure Fitting: 1/4"-18NPT
Rating: IP65
Housing: 304 Stainless Steel
Wetted Material: 316 Stainless Steel

**Housing**
Polycarbonate housing and rotary dial cover; polyester labels; EDPM rubber cover gasket; nitrile rubber, non-sulphur cured button covers
Weight: 0.30 kg (0.65 lbs)
Mounting: #10 or M5 (SS M5 hardware included)
Max. Tightening Torque: 0.56 N·m (5 lbf·in)

**Interface**
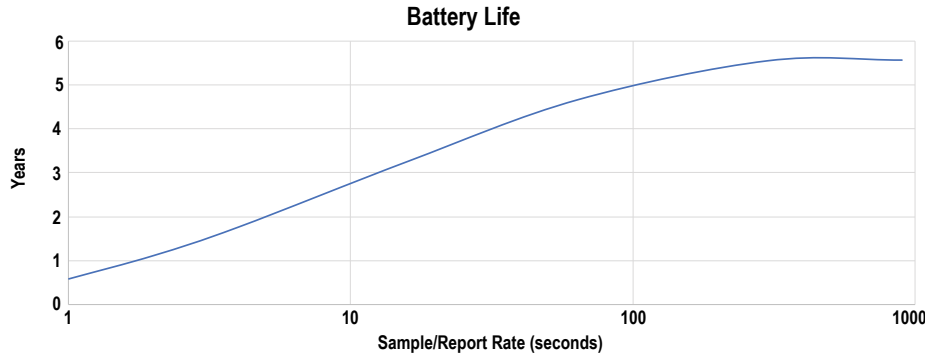Two bi-color LED indicators; Two buttons

**Sensor Switched Power Outputs**
One (SP1)

**Certifications**

NOM
NYCE

(NOM approval only applies to 900 MHz models)

## Performance Curve



**Battery Life**

| Sample/Report Rate (sec) | Time (years) |
|---|---|
| 1 | 0.58 |
| 2 | 1.11 |
| 4 | 1.76 |
| 16 | 3.26 |
| 64 | 4.67 |
| 300 | 5.55 |
| 900 | 5.57 |

The battery life is about 4.67 years with good signal quality and at the default settings.

## 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.

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## 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 | Antenas Tipo-N | Modelo |
|---|---|---|---|
| Antena, Omni 902-928 MHz, 2 dBd, junta de caucho, RP-SMA Macho | BWA-9O2-C | Antena, Omni 902-928 MHz, 6 dBd, fibra de vidrio, 1800mm, N Hembra | BWA-9O6-A |
| Antena, Omni 902-928 MHz, 5 dBd, junta de caucho, RP-SMA Macho | BWA-9O5-C | Antena, Yagi, 900 MHz, 10 dBd, N Hembra | BWA-9Y10-A |

## Mexican Importer

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