Simple Wire Replacement

Easy to deploy, simple to use, proprietary point-to-point bi-directional radio communication.

• Secure network

• Range from feet to miles

• 900 MHz or 2.4 GHz ISM Band

• No software required

• Discrete and analog I/O

• Scalable: Can support up to 47 nodes

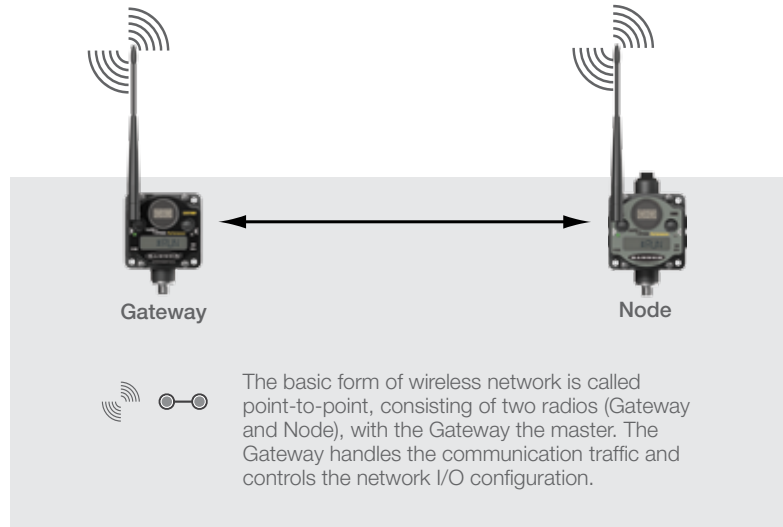secure wireless point-to-point roi pre-configured no software

BANNER ®

more sensors, more solutions

Easy to Deploy

Simply replaces discrete, analog, serial and Ethernet signal wires without setup software.

Banner Engineering's proprietary RF protocol coupled with license-free frequency hopping technology makes for reliable and secure communications.

Solutions for…

- Call for parts
- Machine status
- Remote indication
- Supervisory control
- Digital or analog wire replacement
- Level, pressure & temperature monitoring
- Robotic equipment monitoring
- Tank level monitoring
- Door monitoring
- Humidity monitoring
- Facility access
- Eyewash/safety shower monitoring
- Water flow and pressure
- Predictive maintenance
- Loading dock notification

Gateway   ←→   **Node**

The basic form of wireless network is called point-to-point, consisting of two radios (Gateway and Node), with the Gateway the master. The Gateway handles the communication traffic and controls the network I/O configuration.

Sure Cross® Model Series	I/O Signal Type	Preconfigured Network Size
PM Series	Discrete/Analog	1 Gateway Up to 2 Nodes (PM2) or up to 6 Nodes (PM8)
Performance Board Modules	Discrete/Analog	1 Gateway Up to 2 Nodes
Serial Data Radios	RS232 / RS485	1 Master Radio & 1 Slave Radio
Ethernet Data Radios	TCP/IP RS232/RS485	1 Master Radio & 1 Slave Radio

Application: Machine status monitoring

Components

DX80G9M6S-PM8 Gateway
DX80N9X6S-PM8L Node
TL50 Tower Lights
K50 Lights

PM gateway with K50 lights is installed in a plant's control room. The simple system gives management the status of any machine plant-wide, increasing production output by reducing down time.

Replacing Wire with Wireless

Banner Wireless provides reliable signal and data transfer over long distances. It's an ideal solution for remote places and where it is impractical or too costly to run wires and conduit.

Key Features

- Secure, proprietary protocol
- License-free operation
- 900 MHz and 2.4 GHz frequencies
- Ruggedized for extreme environments
- High interference immunity
- Communicate over distances of up to 6 miles

🔒 Secure Point-to-Point Network

To prevent networks from interfering with each other, the Gateway and Nodes exchange a binding code that blocks radios outside of the network from communicating with the Gateway. Additionally, Nodes and Gateways can be configured for multiple channel hop patterns to eliminate data collisions.

Node

Gateway
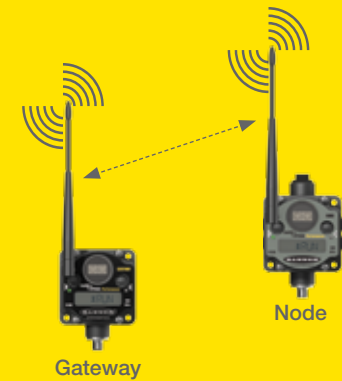
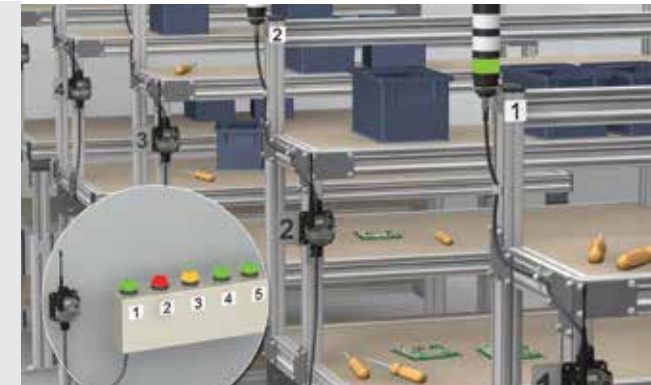# Application: Call for Assembly Parts

Challenge

Assemblers at work stations need a way to call for parts and service that keeps them productive at their stations.

Solution

A wireless node, light and push button at work cell locations allow workers to call for more parts without interrupting the workflow.

Application Notes

A wireless call for parts system eliminates the need for personnel to leave their workstations in search of parts. PM Nodes were installed at each operator station. The I/O from the Node was wired directly into a push button and light to allow the operator to send signals to the supervisor, and a PM Gateway allowed the supervisor to send signals back to the work station.

Application: Call for Assembly Parts

Components	Benefits
DX80G9M6S-PM8 Gateway DX80N9X6S-PM8L Node TL50 Tower Lights	Improved performance, reduced downtime, increased production, efficiency and the ability to provide accurate metrics.

Sure Cross®
PM SERIES

An I/O radio network that combines long range line-of-sight coverage with ease of deployment and use.

Banner's PM Series provides a flexible network that easily sets up without software. Setting-up a basic point-to-point network is as easy as pairing a cell phone to a headset. You can replace cables and extend the range of digital and analog signals with minimum effort.

Key Features

- Menu-driven LCD user interface
- No software needed
- IP67-rated housing for demanding environments
- One Gateway is preconfigured to support up to six nodes
- Choose from two I/O configurations
- Select from multiple I/O maps

Gateways

DX80G*M6S-PM2	4 Discrete IN, 4 Discrete OUT 2 Analog IN, 2 Analog OUT
DX80G*M6S-PM8	6 Discrete IN, 6 Discrete OUT

Nodes

DX80N*X6S-PM2	4 Discrete IN, 4 Discrete OUT 2 Analog IN, 2 Analog OUT
DX80N*X6S-PM8	6 Discrete IN, 6 Discrete OUT

* 9 for 900 MHz or 2 for 2.4 GHz

Application: Pick-to-Light System

Challenge

Reduce or eliminate human error inherent in bin-picking production parts and components.

Solution

The PM gateway sends a signal to the node which has the Banner EZ-LIGHT wired into it. Each node can handle up to six lights.

Application Notes

The PLC sends a signal that illuminates a Banner EZ-LIGHT to indicate from which bin a part should be selected. The line operator selects a part and pushes the button on the EZ-LIGHT which confirms to the controller that the correct part has been picked.

Application: Pick-to-Light System

Components	Benefits
DX80G9M6S-PM8 Gateway DX80N9X6S-PM8 Node K50L EZ-LIGHT	SureCross nodes can be equipped with up to six EZ-LIGHT operator indicator lights.

Sure Cross®
PM Kit

Simple wire replacement is even simpler with Banner's fully integrated kit.

Plug-and-play with one Gateway and one Node, pre-bound and mapped to solve your first wireless challenge, and provide the start of a flexible network that can be expanded as production needs change. Extend the range of digital and analog signals with minimum effort.

Key Features

- Pre-bound and mapped expandable bi-directional radios
- Eight LCD menu selectable I/O mapping options
- IP67-rated housing for demanding environments
- One Gateway is preconfigured to support up to six nodes

Kits

DX80K*M6-PM2	4 Discrete IN, 4 Discrete OUT 2 Analog IN, 2 Analog OUT
DX80K*M6-PM8	6 Discrete IN, 6 Discrete OUT

* 9 for 900 MHz or 2 for 2.4 GHz

Application: Call for Parts

Components

DX80G9M6S-PM8 Gateway
DX80N9X6S-PM8L Node
TL50 Signal Tower Light
K30 and K50 Illuminated
Touch Button

When a production line is in need of parts, the line operator flips a switch that turns on that line's color on a tower light in the warehouse. A forklift operator sees the signal tower light and retrieves parts for that line.

Sure Cross®
PB Board Module

Embeddable board modules for connectivity where wired connections are not possible.

Sure Cross PB wireless board-level nodes and gateways can be used in pairs to quickly and easily replace discrete or 4 to 20 mA signal cable and communicate with all Sure Cross radios.

Key Features

- Simple yet highly expandable bi-directional radio
- Map inputs and outputs with dip switches
- Two PNP inputs/outputs
- Two 0 to 20 mA analog inputs/outputs

Gateways

DX80G*M6S-PB2	2 Discrete IN, 2 Discrete OUT 2 Analog IN, 2 Analog OUT

Nodes

DX80N*X2S-PB1	2 Discrete IN, 2 Discrete OUT 2 Analog IN, 2 Switch Power
DX80N*X6S-PB2	2 Discrete IN, 2 Discrete OUT 2 Analog IN, 2 Analog OUT

* 9 for 900 MHz or 2 for 2.4 GHz

Application: Door Monitoring

Components

DX80G9M6S-PB2 Gateway
DX80N9X2S-PB1 Node
Magnetic Reed Switch

Reed switch status information is transmitted to a central location so that security personnel can monitor doors throughout the facility.

BANNER®

Sure Cross®
Serial Data Radio

An industrial serial radio that combines long distance coverage with ease of deployment and use.

Banner wireless Serial Data Radios extend the range of serial networks and are designed to affordably support communication protocols that use RS232 or RS485.

Key Features

- Two models available: 900 MHz and 2.4 GHz
- Flexible: can be a master, a slave or a repeater
- No software required for deployment

Serial Data Radios

DX80SR9M-H	900 MHz (1 W) 9.6 km (6 mi) range
DX80SR2M-H	2.4 GHz (65 mW) 3.2 km (2 mi) range

Application: Message Display Sign

Components
DX80SR9M-H — Master
DX80SR9M-H — Slave
Message Display Sign

A PLC monitors machine status and sends serial communications for display on a message display sign. Due to the expense of wiring and conduit, it is more cost effective to use serial data radios to send the data wirelessly.

Sure Cross®
Ethernet Data radio

An industrial Ethernet radio that combines long distance coverage with ease of deployment and use.

Banner Ethernet Data Radios are used to create point to multipoint wireless Ethernet networks, available in 900 MHz and 2.4 GHz.

Key Features

- *Flexible*: can be a master, a slave or repeater
- No software required for deployment
- *Multihop*: LCD interface for radio strength diagnostics
- *DXER9*: Moves large amounts of data over short ranges

Multihop Ethernet Data Radios

DX80ER9M-H	900 MHz (1 W) 9.6 km (6 mi) range
DX80ER2M-H	2.4 GHz (65 mW) 3.2 km (2 mi) range

Ethernet Data Radio

DXER9	900 MHz (1 W) 9.6 km (6 mi) range

Application: Ethernet Wire Replacement

Components
DX80SR9M-H — Master
DX80SR9M-H — Slave

The PLC in a food processing facility needs to get data back from a couple of machines in remote locations where it is too expensive to run Ethernet cables. Banner Ethernet Data Radios were a more cost effective solution.

Sure Cross®
Replacing Wire with Wireless Data Radio

For a complete listing of accessories, including the printable Antenna and Accessory Specifier's Guide, please go to our website at www.bannerengineering.com/accessories.

🟠 Antennas

BWA-902-D	Dome Antenna, 900 MHz, 2 dBi, SMA Box Mount
BWA-905-C	Antenna Omni, 902-928 MHz, 5 dBd, Rubber Swivel, RP-SMA Male
BWA-906-AS	Fiberglass Antenna, 900 MHz, 6 dBi, N Female, 1.3" dia., 23.6" long
BWA-908-AS	Fiberglass Antenna, 900 MHz, 8 dBi, N Female, 1.5" dia., 63" long
BWA-9Y6-A	Antenna, Yagi, 900 MHz, 6.5 dBd, N Female
BWA-9Y10-A	Antenna, Yagi, 900 MHz, 10 dBd, N Female
BWA-206-A	Antenna, Omni, 2.4 GHz, 6 dBi, N Female, Fiberglass 16"
BWA-208-A	Antenna, Omni, 2.4 GHz, 8.5 dBi, N Female, Fiberglass 24"

🟢 Cables

BWC-4MNFN3	LMR400 Cable, N-Male to N-Female, 3 m
BWC-4MNFN6	LMR400 Cable, N-Male to N-Female, 6 m
BWC-4MNFN15	LMR400 Cable, N-Male to N-Female, 15 m
BWC-1MRSMN05	LMR200 Cable, RP-SMA to N-Male, 0.5 m
BWA-CG.5-10	Cable gland, 1/2-inch NPT, 10 pack

🟡 Power Supplies

PSDINM-24-10	DC Power Supply, 1.0 Amps, 24 V dc, with DIN Rail Mount

🔴 Other Accessories

BWC-LFNBMN-DC	Surge Suppressor, Bulkhead, N-Type, 900 MHz/2.4 GHz, dc blocking
DIN-35-105	DIN Rail Section, 35mm x 105mm Long
SMBDX80DIN	DIN Rail Bracket Assembly for PM, Ethernet, and Serial radios
BWA-AH12106C	Enclosure, Polycarbonate, with Clear Cover, 12" × 10" × 6"
BWA-HW-034	DIN Bracket and screws for M-HBx
BWA-AH10DRK	10" DIN Rail Kit, includes two nuts, two screws and DIN Rail

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Simple Wire Replacement

Sure Cross Wireless uses a proprietary protocol to provide the highest level of data security and integrity. Time Division Multiple Access, and Frequency Hopping Spread Spectrum communication technologies work together to ensure the transfer of signals is reliable. This allows Sure Cross to be used effectively in both data monitoring and control applications and can result in significant cost savings.

What is the benefit of Banner's proprietary protocol?
Banner Engineering's proprietary communication protocol ensures that only I/O data is transmitted within the deterministic Sure Cross wireless network.

How do I know my data is secure?
The Sure Cross protocol only carries I/O data, making it impossible for a malicious executable file to be transmitted. This protocol does not operate as an open protocol such as WiFi and is not subject to the same security risks.

Will it interfere with existing wireless networks?
To prevent networks from interfering with each other, the gateway and all its nodes exchange a binding code that prevents radios outside the network from communicating with the gateway (similar to pairing a headset to a phone, but more secure). Additionally, gateways and nodes can be configured for multiple channel hop patterns to eliminate data collisions.

What are the advantages of a deterministic system?
Banner's deterministic system defines how network endpoints behave during the loss of communications. The network identifies when the communications link is lost and sets relevant outputs to user defined conditions. Once the radio signal is re-established, the network returns to normal operation.

How far can the signal travel?
Banner's wireless network is designed for long distance applications. The signal for 1 Watt radios will travel up to 6 miles and 250 mW radios will travel up to three miles line-of-sight. To verify range, Banner integrates a site survey tool that displays real-time signal quality results.

What does "line of sight" mean?
Line of sight is the unobstructed path between radio antennas; however, signals can penetrate walls, floors and other indoor obstructions. Buildings, trees and large metal objects will impact signal strength in outdoor applications. Always conduct a site survey prior to installing a wireless network.

How scalable is a Sure Cross wireless network?
Simple wire replacement products come preconfigured to handle up to 6 nodes (PM8) so that it is easy to set up your network without software. As your needs grow, the Sure Cross wireless network can be expanded to up to 47 nodes using the configuration software.

Talk with an app engineer. Get product specs. Order now.

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Minneapolis, MN

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more sensors, more solutions