SureCross™ DX80K Wireless Configured Kit

Discrete I/O between a Gateway and 4 Nodes

Features

The SureCross™ DX80 is a radio frequency network system built around a Gateway and one or more Nodes. Configured kits are packaged in a box with the preset Gateway, Node(s), accessories, and hardware to get up and running quickly.

- Gateway input-to-output mapping provides one discrete (sourcing) I/O for each Node
- +10 to 30V dc power input
- Proprietary radio optimized for effective power management
- Frequency Hopping Spread Spectrum (FHSS) technology and Time Division Multiple Access (TDMA) control architecture combine to ensure reliable data delivery within the unlicensed Industrial, Scientific, and Medical (ISM) bands
- Transceivers provide two-way communication between the Gateway and Node, including fully acknowledged data transmission
- Site Survey analyzes the network's signal strength and reliability
- Lost RF links are detected and relevant outputs set to predefined conditions

For additional information and a complete list of accessories, including FCC approved antennas, please refer to Banner Engineering's website, www.bannerengineering.com/surecross.

Models

| Model	Frequency	Power	I/O Mapping	I/O	Devices
DX80K9M6DP4	900 MHz ISM Band	+10 to 30V dc	Configured (See hookup diagram)	Discrete (Sourcing)	1 Gateway 4 Nodes
DX80K2M6DP4	2.4 GHz ISM Band				

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Configured input/output mapping

I/O Point	Terminal Block Label	DX80 Gateway		DX80 Node	Terminal Block Label	I/O Point	
1	DI1	Discrete IN 1	→	Discrete OUT 1	DO1	9	Node 1
2	DI2	Discrete IN 2	→	Discrete OUT 1	DO1	9	Node 2
3	DI3	Discrete IN 3	→	Discrete OUT 1	DO1	9	Node 3
4	DI4	Discrete IN 4	→	Discrete OUT 1	DO1	9	Node 4

I/O Point	Terminal Block Label	DX80 Gateway		DX80 Node	Terminal Block Label	I/O Point	
9	DO1	Discrete OUT 1	←	Discrete IN 1	DI1	1	Node 1
10	DO2	Discrete OUT 2	←	Discrete IN 1	DI1	1	Node 2
11	DO3	Discrete OUT 3	←	Discrete IN 1	DI1	1	Node 3
12	DO4	Discrete OUT 4	←	Discrete IN 1	DI1	1	Node 4

These are the I/O points as displayed on the device LCD. Any I/O points not shown in the chart are not enabled for this kit.
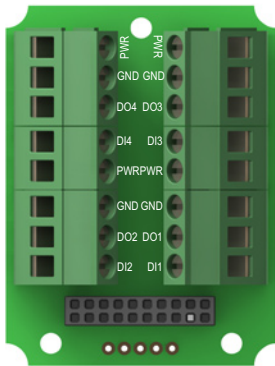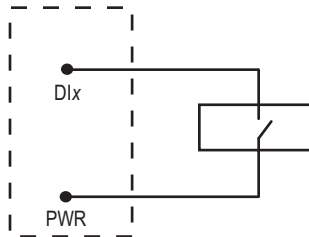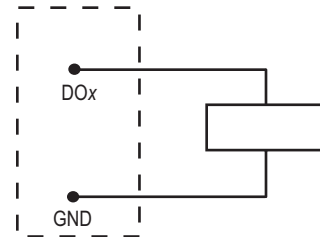

5-pin Euro-style Hookup (RS-485)

	Wire Color	Gateway	10–30V dc Node
1	Brown	+10 to 30V dc Input	+10 to 30V dc Input
2	White	RS485 / D1 / B / +	
3	Blue	dc common (GND)	dc common (GND)
4	Black	RS485 / D0 / A / −	
5	Gray	Comms grnd	

* Connecting dc power to the communication pins will cause permanent damage.
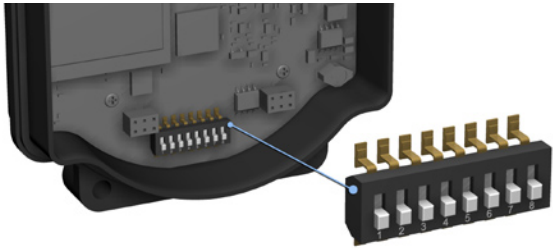

Sourcing Input Wiring

Sourcing Output Wiring

For additional information, including installation and setup, weatherproofing, device menu maps, troubleshooting, and a list of accessories, please refer to the SureCross™ DX80 Wireless I/O Network product manual, Banner p/n 132607.

Device Configuration

Cycle Power

After making any changes to the DIP switch positions, cycle power to the device to activate the changes. For devices with batteries integrated into the housing, remove the battery for one minute to cycle power to the device.

	Switches			
Device Settings	**1**	**2**	**3**	**4**
Rotary Switch Address Mode	OFF*			
Extended Address Mode	ON			

* Default configuration

Do not change the position of any DIP switch other than DIP switch 1. This kit is configured at the factory.

Accessing the DIP Switches

To access the DIP switches, follow these steps:

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.
4. Remove the black cover plate from the bottom of the device's cover.

The DIP switches are located behind the rotary dials. After making the necessary changes to the DIP switches, place the black cover plate back into position and gently push into place. Plug the ribbon cable in after verifying that the blocked hole lines up with the missing pin. Mount the cover back onto the housing.

Address Mode

The SureCross wireless devices may use one of two types of addressing modes: rotary switch addressing or extended addressing. In rotary switch address mode, the left rotary dial establishes the network ID and the right rotary dial sets the device ID. The wireless network is restricted to a maximum of 16 devices.

Extended address mode binds Nodes to a specific Gateway, allowing network expansion to more than 16 devices in a wireless network. For more information on extended address mode, refer to the SureCross™ Wireless I/O Network product manual.

The device ships in rotary switch address mode by default, with the DIP switch in the OFF position. To use extended address mode, change the DIP switch to the ON position.

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Rotary Dial Positions

Rotary Dial Addressing Mode

When using Rotary Dial Addressing Mode, the Gateway's and Node's rotary dials are in the correct position. The left rotary dial establishes the Network ID and the right dials establish the Device ID.

When using multiple networks within range of each other, set each network to a different Network ID using the left rotary dial. DO NOT change the position of the right rotary dials or your network and its preconfigured mapping will not work.
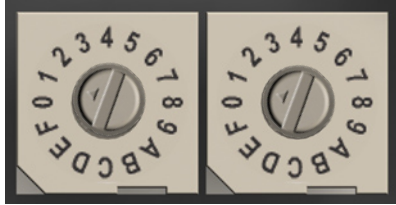
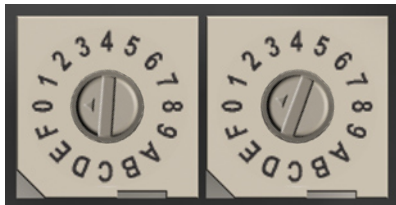Gateway rotary dial positions, from the factory.
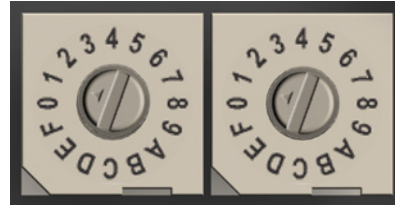
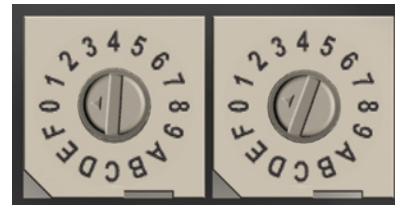Node rotary dial positions, from the factory.

Extended Addressing and Binding Mode

When using binding to establish your networks, the rotary dial positions on the Gateway indicate which Node's I/O values are displayed on the Gateway's LCD. Adjust the left rotary dial to zero and the right rotary dial to one.

For the Nodes, set the left rotary dial position to zero, and DO NOT change the position of the right rotary dial or your network and its preconfigured mapping will not work.

Gateway rotary dial positions.

Node 1's rotary dial positions.

Do not change the position of the right rotary dial on the Node(s) in this kit. The factory configured this kit and assigned a device ID to the Node(s) based on the kit configuration requirements. If you change the Node's right rotary dial, your kit will not work.

Specifications

Many parameters are configurable. The values in the tables represent factory defaults unless otherwise noted.

Radio	
Range*	**900 MHz**: Up to 4.8 kilometers (3 miles) **2.4 GHz:** Up to 3.2 kilometers (2 miles)
Transmit Power	**900 MHz:** 21 dBm Conducted **2.4 GHz:** 18 dBm Conducted, ≤ 20 dBm EIRP
Spread Spectrum Technology	FHSS (Frequency Hopping Spread Spectrum)
Antenna Connector	Ext. Reverse Polarity SMA, 50 Ohms
Antenna Max. Tightening Torque	0.45 N•m (4 in•lbf)
Link Timeout	8 seconds

* With the standard 2 dB antenna. High-gain antennas are available, but the range depends on the environment and line of sight. To determine the range of your wireless network, perform a Site Survey.

General	
Power*	+10 to 30V dc For European applications: +10 to 24V dc, ± 10%
Power Consumption	Less than 1.4 W (60 mA) at 24V dc
Mounting	#10 or M5 (M5 hardware included)
M5 Fasteners Max. Tightening Torque	0.56 N•m (5 in•lbf)
Case Material	Polycarbonate
Weight	0.26 kg (0.57 lb.)
Indicators	Two LED, bi-color
Switches	Two Push Buttons
Display	Six Character LCD
External Cable Glands	Four PG-7 type, One 1/2 NPT type
Cable Glands Max. Tightening Torque	0.56 N•m (5 in•lbf)

*   For European applications, power the DX80 from a Limited Power Source as defined in EN 60950-1.

Inputs	
Discrete Inputs	Four Sourcing
Discrete Input Rating	3 mA max current at 30V dc
Discrete Input Sample Rate	62.5 milliseconds
Discrete Input Report Rate	On Change of State
Discrete Input ON Condition	Greater than 8V
Discrete Input OFF Condition	Less than 5V

Outputs

Discrete Outputs	Four Sourcing
Discrete Output Rating	100 mA max current at 30V dc **ON-State Saturation:** Less than 3V at 100 mA **OFF-state Leakage:** Less than 10 µA
Discrete Output ON Condition	Supply minus 2V
Discrete Output OFF Condition	Less than 2V
Maximum End-to-end Latency**	200 milliseconds
Discrete Output State Following Timeout	De-energized (OFF)

** From the sample point and with a good RF signal.

Environmental

Environmental Rating*	IEC IP67; NEMA 6
Operating Temperature**	−40 to +85° C (Electronics); −20 to +80° C (LCD)
Operating Humidity	95% max. relative (non-condensing)
Radiated Immunity	10 V/m, 80-2700 MHz (EN61000-6-2)
Shock and Vibration	IEC 68-2-6 and IEC 68-2-7 **Shock**: 30g, 11 millisecond half sine wave, 18 shocks **Vibration**: 0.5 mm p-p, 10 to 60 Hz

* Please refer to the SureCross™ DX80 Wireless I/O Network product manual, Banner 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.

Certifications, Radio

900 MHz Models	FCC ID TGUDX80: This device complies with FCC Part 15, Subpart C, 15.247 IC: 7044A-DX8009	CE
2.4 GHz Models	FCC ID UE300DX80-2400: This device complies with FCC Part 15, Subpart C, 15.247 ETSI/EN: In accordance with EN 300 328: V1.7.1 (2006-05) IC: 7044A-DX8024	CE

It is Banner Engineering's 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 that the device is approved in the destination country. A list of approved countries appears in the SureCross DX80 Wireless Product Manual, in the Agency Certifications section. Consult with Banner Engineering if the destination country is not on this list.

Notes

SureCross™ DX80K Wireless Configured Kit

For more information: **Contact your local Banner representative** or **Banner Corporate Offices around the world.**	**Corporate Headquarters**	**Europe**	**Latin America**
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The manufacturer does not take responsibility for the violation of any warning listed in this document.

⚠ **CAUTION . . .**
Make no modifications to this product.

Any modifications to this product not expressly approved by Banner Engineering could void the user's authority to operate the product. Contact the Factory for more information.

Always use lightning arrestors/surge protection with all remote antenna systems to avoid invalidating the Banner Engineering Corp. warranty. No surge protector can absorb all lightning strikes. Do not touch the SureCross device or any equipment connected to the SureCross device during a thunderstorm.

WARRANTY: Banner Engineering Corp. warrants its products to be free from defects for one year. Banner Engineering Corp. will repair or replace, free of charge, any product of its manufacture found to be defective at the time it is returned to the factory during the warranty period. This warranty does not cover damage or liability for the improper application of Banner products. This warranty is in lieu of any other warranty either expressed or implied.

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