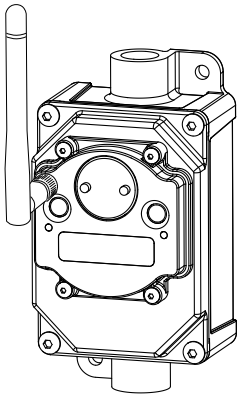
Sure Cross® MultiHop H15E Data Radio

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 MultiHop data radio networks are formed around a MultiHop master and one or more slaves and extend the range of a Modbus or other serial communication network. The MultiHop H15E slave radio can wirelessly control any ac-powered device, including lights (including dimming levels), fan speeds, and motors. For higher amperage applications, use relays to control contactors. The H15E radio can also act as a MultiHop repeater. By using a current transducer and its analog inputs, you can monitor energy/power levels for connected devices.

Benefits

- **Remotely control**—Lights, fans, and motors; use in conjunction with equipment health monitoring sensors to shut down motors remotely when potential issues are detected
- **Eliminate control wires**—The Sure Cross wireless system is a radio frequency network with integrated I/O that removes the need for control wires.
- **Reduce complexity**—Facility or machine reconfiguration made easier; great for retrofit applications
- **Deploy easily**—The relays and wireless radio are housed in a single device, simplifying installation on existing equipment and enabling deployments in remote and hard-to-access locations where implementing a wired solution would be difficult, impractical, or not cost-effective



- Wireless industrial I/O device with two AC/DC relay outputs, two discrete PNP outputs, two 0–10 V DC analog outputs, two discrete PNP inputs, and two 0–20 mA analog inputs
- Supply voltage of 100–277 V AC at 50/60 Hz
- Courtesy power output of 25 W (24 V DC)
- AC power field wireable through a 1/2-inch NPSM port using 1/2-inch conduit, cable gland, or quick-disconnect (QD) connector
- Selectable transmit power levels of 250 mW or 1 Watt for 900 MHz models and 65 mW for 2.4 GHz models
- DIP switches for user configuration
- Transceivers provide bidirectional communication between the master and slave radios, including fully acknowledged data transmission
- Out-of-sync slave devices are detected and relevant outputs are set to user-defined conditions
- Frequency Hopping Spread Spectrum (FHSS) technology ensures reliable data delivery
- Self-healing, auto-routing radio frequency network with multiple hops extends the network's range and improves radio link performance
- Serial and I/O communication on a Modbus platform

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

WARNING:

- **Risk of Electric Shock**
- Disconnect or turn off the power before installing, removing, or servicing the H15.
- Install and connect the H15 in accordance with the National Electrical Code (NEC) and any applicable local code requirements and supply the H15 with an appropriate fuse box or circuit breaker (see Supply Voltage rating in the Specifications).
- Install the H15 at the end of a conduit run.

Models

Models	Frequency	I/O
DX80DR9M-H15E	900 MHz ISM Band	Inputs: Two PNP discrete, two 0 to 20 mA analog Outputs: Two AC/DC relay (SPDT), two PNP discrete, two 0 to 10 V analog
DX80DR2M-H15E	2.4 GHz ISM Band	

Configuration Instructions

Setting Up Your MultiHop Network

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

1. If your radios have DIP switches, configure the DIP switches of all devices.
2. Connect the sensors to the MultiHop radios if applicable.
3. Apply power to all devices.
4. If your MultiHop radio has rotary dials, set the MultiHop Radio (Slave) ID. If your MultiHop radio has no rotary dials, continue to the next step.
5. Form the wireless network by binding the slave and repeater radios to the master radio. If the binding instructions are not included in this datasheet, refer to the quick start guide or product manual.
6. Observe the LED behavior to verify the devices are communicating with each other.
7. Configure any I/O points to use the sensors connected to the Sure Cross devices.
8. Conduct a site survey between the MultiHop radios. If the site survey instructions are not included in this datasheet, refer to the product manual.

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ПРОМЭЛЕКТРОНИКА/ sales@prom-elec.com

9. Install your wireless sensor network components. If the installation instructions are not included in this datasheet, refer to the product manual.

For additional information, refer to one of the following documents:

- MultiHop Data Radio Quick Start Guide: 152653
- MultiHop Data Radio Instruction Manual: 151317
- MultiHop Register Guide: 155289

Configure the DIP Switches

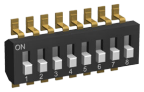
Before changing DIP switch positions, disconnect the power. Any changes made to the DIP switches are not recognized until after power is cycled to the device.

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 (MultiHop)

	Switches							
Device Settings	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Serial line baud rate 19200 OR User defined receiver slots	OFF [1]	OFF [1]						
Serial line baud rate 38400 OR 32 receiver slots	OFF	ON						
Serial line baud rate 9600 OR 128 receiver slots	ON	OFF						
Serial line baud rate Custom OR 4 receiver slots	ON [2]	ON [2]						
Parity: None			OFF [1]	OFF [1]				
Parity: Even			OFF	ON				
Parity: Odd			ON	OFF				
Disable serial (low power mode) and enable the receiver slots select for switches 1-2			ON [2]	ON [2]				
Transmit power 900 MHz radios: 1.00 Watt (30 dBm) 2.4 GHz radios: 0.065 Watts (18 dBm) and 60 ms frame					OFF [1]			
Transmit power 900 MHz radios: 0.25 Watts (24 dBm) 2.4 GHz radios: 0.065 Watts (18 dBm) and 40 ms frame					ON			
Application mode: Modbus						OFF [1]		
Application mode: Transparent						ON		
MultiHop radio setting: Repeater							OFF [1]	OFF [1]
MultiHop radio setting: Master							OFF	ON
MultiHop radio setting: Slave							ON [2]	OFF [2]
MultiHop radio setting: Reserved							ON	ON

[1] Default configuration

[2] Default configuration for the E housing models only

Application Mode

The MultiHop radio operates in either Modbus mode or transparent mode. Use the internal DIP switches to select the mode of operation. All MultiHop radios within a wireless network must be in the same mode.

Modbus mode uses the Modbus protocol for routing packets. In Modbus mode, a routing table is stored in each parent device to optimize the radio traffic. This allows for point to point communication in a multiple data radio network and acknowledgement/retry of radio packets. To access a radio's I/O, the radios must be running in Modbus mode.

In **transparent** application mode, all incoming packets are stored, then broadcast to all connected data radios. The data communication is packet based and not specific to any protocol. The application layer is responsible for data integrity. For one to one data radios it is possible to enable broadcast acknowledgement of the data packets to provide better throughput. In transparent mode, there is no access to the radio's I/O.

Baud Rate and Parity
The baud rate (bits per second) is the data transmission rate between the device and whatever it is physically wired to. Set the parity to match the parity of the device you are wired to.

Disable Serial
Disable an unused local serial connection to reduce the power consumption of a data radio powered from the solar assembly or from batteries. All radio communications remain operational.

Receiver Slots
The number of receiver slots indicates the number of times out of 128 slots/frames the radio can transmit to its parent radio. Setting a slave's receiver slots to four reduces the total power consumption by establishing that the slave can only transmit to its parent four times per 128 slots.

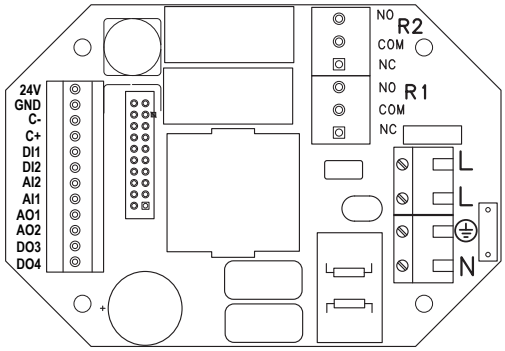
Transmit Power Levels/Frame Size
The 900 MHz data radios can be operated at 1 watt (30 dBm) or 0.250 watt (24 dBm). For most models, the default transmit power is 1 watt.

For 2.4 GHz radios, the transmit power is fixed at 0.065 watt (18 dBm) and DIP switch 5 is used to set the frame timing. The default position (OFF) sets the frame timing to 60 milliseconds. To increase throughput, set the frame timing to 40 milliseconds. For battery-powered devices, increasing the throughput decreases battery life.

Important: Prior to date code 15341 and radio firmware version 3.6, the frame timing was 40 ms (OFF) or 20 ms (ON).

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

Wiring for Power and I/O



24V. 24 V courtesy power output
GND. Ground/DC common connection
C+. Modbus RS-485+
C–. Modbus RS-485-
Com. Common
. AC Earth
DI1. Discrete IN 1
DI2. Discrete IN 2

AI1. Analog IN 1
AI2. Analog IN 2
AO1. Analog OUT 1
AO2. Analog OUT 2
DO3. Discrete OUT 3
DO4. Discrete OUT 4
L. AC line
N. AC neutral
NC. Normally Closed
NO. Normally Open
R1. Relay 1
R2. Relay 2

Connecting power to the communication pins will cause permanent damage. Do not exceed analog input ratings for analog inputs. Only connect sensor outputs to analog inputs.

Figure 1. Analog input wiring (24 V DC courtesy power)

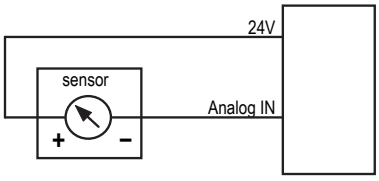
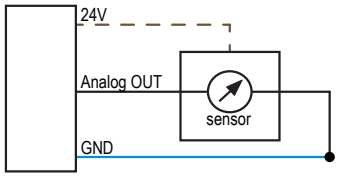


Figure 2. Analog output wiring (24 V DC courtesy power)



PWR for the discrete sensors may be 10 V DC to 30 V DC, or it may be wired to the 24 V DC (24V) courtesy power supplied by the device.

Figure 3. Discrete input wiring for PNP sensors

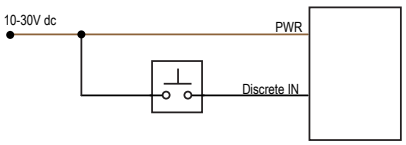


Figure 4. Discrete input wiring for NPN sensors

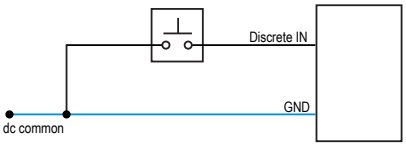
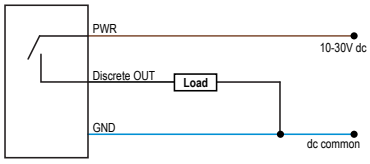


Figure 5. Discrete output wiring (PNP)



Wiring Diagrams for 24 DC Courtesy Power Out

Figure 6. Wiring for 24 V DC courtesy power out

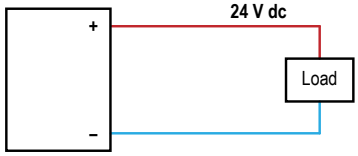
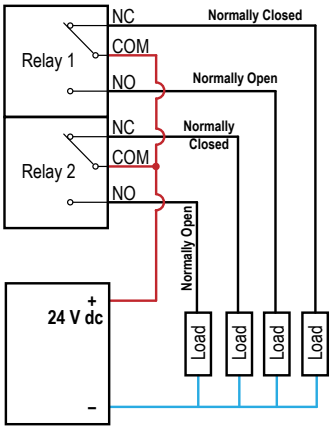


Figure 7. Wiring for switched 24 V DC power out



Use the access hole with the watertight gland or M12 quick-disconnect (QD) connector at the top of the housing to field-wire courtesy power to external field instruments.

Wiring Diagrams for AC Power

Figure 8. Wiring for power only

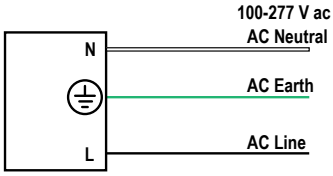
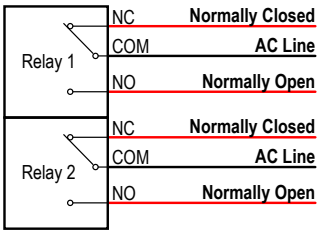
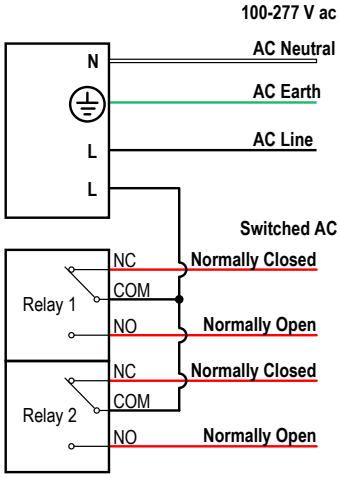


Figure 9. Wiring for switched AC relays



Nominal current per relay not to exceed 10 A.

Figure 10. Wiring for power and switched AC relays



Total nominal current not to exceed 10 A.

Connecting AC or DC power to the communication pins will cause permanent damage. Use the access hole with a 1/2-inch conduit fitting, cable gland, or quick-disconnect (QD) connector at the bottom of the housing to field-wire AC power and AC circuits.

Set the MultiHop Radio (Slave) ID

The slave ID is an identifying number used for devices within a Modbus system. When using more than one Modbus slave, assign each slave a unique ID number.

For MultiHop radios with rotary dials, use the rotary dials to set the device's MultiHop Radio ID. The left dial sets the left digit and the right dial sets the right digit.

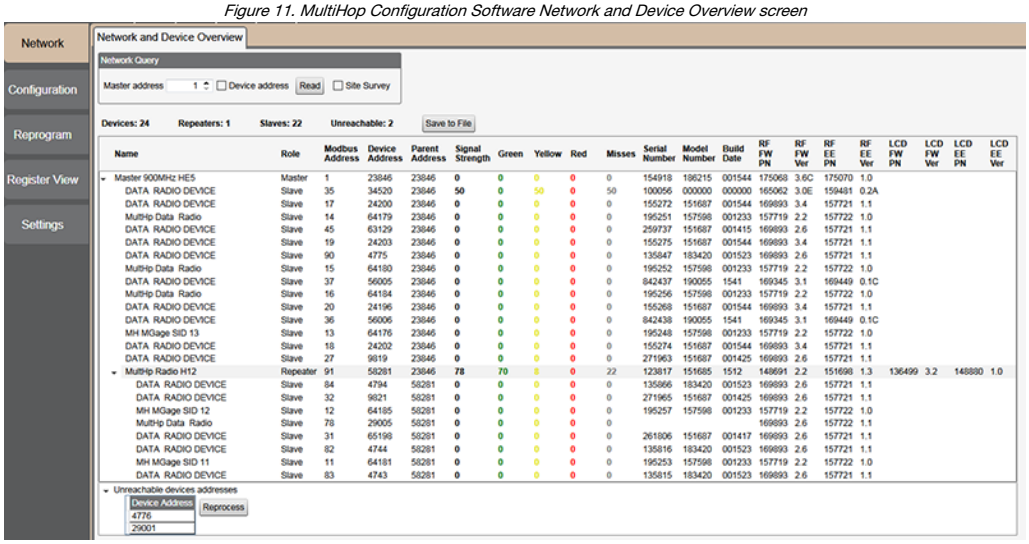
- Modbus Slave IDs 01 through 10—Reserved for slaves directly connected to the host (local I/O). Polling messages addressed to these devices are not relayed over the wireless link.
- Modbus Slave IDs 11 through 60—Use for MultiHop master, repeater, and slave radios. Up to 50 devices (local slaves and remote slaves) may be used in this system.

If your MultiHop radio does not have rotary dials, you must use the master radio to set the Slave ID during the binding process.

MultiHop Configuration Software

Use Banner's MultiHop Configuration Software to view your MultiHop radio network and configure the radio and its I/O.

Figure 11. MultiHop Configuration Software Network and Device Overview screen



The software connects to a MultiHop master radio using one of four methods.

- Serial; using a USB to RS-485 (for RS-485 radios) or a USB to RS-232 (for RS-232 radios) converter cable.
- Modbus TCP; using an Ethernet connection to an Ethernet radio master.
- Serial DXM; using a USB cable to a DXM Controller to access a MultiHop master radio.
- TCP DXM: using an Ethernet connection to a DXM Controller to access a MultiHop master radio.

For MultiHop DX80DR9* models, Banner recommends using **BWA-UCT-900**, an RS-485 to USB adapter cable with a wall plug that can power your 900 MHz 1 Watt MultiHop radio while you configure it. The adapter cable is not required when connecting to a DXM Controller.

Download the most recent software revision from the Wireless Reference Library on Banner Engineering's website: www.bannerengineering.com.

Modbus Registers

Register (4xxxx)	Input #	I/O Type	I/O Range		Holding Register Representation		Terminal
			Min. Value	Max. Value	Min. (Dec.)	Max. (Dec.)	
1	1	Discrete IN 1	0	1	0	1	DI1
2	2	Discrete IN 2	0	1	0	1	DI2
...							
5	5	Analog IN 1 (mA)	0.0	20.0	0	65535	AI1
6	6	Analog IN 2 (mA)	0.0	20.0	0	65535	AI2

Register (4xxxx)	Output #	I/O Type	I/O Range		Holding Register Representation		Terminal
			Min. Value	Max. Value	Min. (Dec.)	Max. (Dec.)	
501	1	Relay OUT 1	0	1	0	1	R1
502	2	Relay OUT 2	0	1	0	1	R2
503	3	Discrete OUT 3	0	1	0	1	DO3
504	4	Discrete OUT 4	0	1	0	1	DO4
505	5	Analog OUT 1 (V)	0.0	10.0	0	65535	AO1
506	6	Analog OUT 2 (V)	0.0	10.0	0	65535	AO2

* Relay Output Truth Table		
Relay Connection	I/O Value	
	0 (OFF)	1 (ON)
Normally Closed	Closed	Open
Normally Open	Open	Closed

Modbus Addressing Convention

All Modbus addresses refer to Modbus holding registers. When writing your own Modbus scripts, use the appropriate commands for interfacing to holding registers. Parameter description headings refer to addresses in the range of 40000 as is customary with Modbus convention.

Modbus Register Configuration

Change the factory default settings for the inputs, outputs, and device operations using the device Modbus registers. To change parameters, set the data radio network to Modbus mode and assign the data radio a valid Modbus slave ID.

Generic input or output parameters are grouped together based on the device input or output number: input 1, input 2, output 1 etc. Operation type specific parameters (discrete, counter, analog 4 to 20 mA) are grouped together based on the I/O type number: analog 1, analog 2, counter 1, etc. Not all inputs or outputs may be available for all models. To determine which specific I/O is available on your model, refer to the Modbus Input/Output Register Maps listed in the device's datasheet. For more information about registers, refer to the MultiHop Product Instruction Manual (p/n 151317).

Factory Default Configuration

Discrete Inputs (PNP)

Enable	Sample	Boost Enable	Boost Warmup	Boost Voltage	Extended Input Read	NPN/PNP	Sample High	Sample Low
ON	40 ms	OFF	OFF	OFF	OFF	PNP	OFF	OFF

Analog Inputs

Enable	Sample	Boost Enable	Boost Warmup	Boost Voltage	Extended Input Read	Analog Max	Analog Min	Enable Fullscale
ON	62.5 ms	OFF	OFF	OFF	OFF	20000	0	ON

Discrete Outputs

Enable	Flash Enable
ON	OFF

Analog Outputs

Enable	Analog Max	Analog Min	Enable Fullscale	Hold Last State Enable	Default Output State
ON	20000	0	ON	OFF	0

For accurate voltage scaling, divide the Analog Max by 2.

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

Specifications

MultiHop 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, 150 mW and 250 mW: 2 m (6 ft)
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)

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

Radio Packet Size (MultiHop)
900 MHz: 175 bytes (85 Modbus registers)
2.4 GHz: 75 bytes (37 Modbus registers)

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 (MultiHop)
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/

RS-485 Communication Specifications

Communication Hardware (MultiHop RS-485)
Interface: 2-wire half-duplex RS-485
Baud rates: 9.6k, 19.2k (default), or 38.4k via DIP switches; 1200 and 2400 via the MultiHop Configuration Software
Data format: 8 data bits, no parity, 1 stop bit

[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.

H15E Model Specifications

Supply Voltage and Current
Nominal voltage: 120–277 V AC at 60 Hz in North America
Nominal voltage: 100–277 V AC at 50/60 Hz outside North America
Maximum supply current: 0.37 A
Maximum power consumption: 25 W

Power Consumption
Master radio consumption (900 MHz): Maximum current draw is < 100 mA and typical current draw is < 30 mA at 24 V DC. (2.4 GHz consumption is less.)
Repeater/slave radio consumption (900 MHz): Maximum current draw is < 40 mA and typical current draw is < 20 mA at 24 V DC. (2.4 GHz consumption is less.)

Analog Input
0 to 20 mA
Input Rating: 24 mA
Impedance: Approximately 100 Ohms
Sample Rate: 1 second
Accuracy: 0.1% of full scale +0.01% per degree C
Resolution: 12-bit

Relay Outputs
SPDT (Form C) relay
277 V AC, 10 A
Minimum Mechanical Life: 10,000,000
Surge breakdown voltage [2] (Between contacts and coil) (Initial): 10,000 V

Analog Output
0 to 10 V
Update Rate: 125 milliseconds
Accuracy: 1.0% 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: 0.51 kg (1.13 lbs)
Mounting: 1/4-inch or M7
Max. Tightening Torque: 0.56 N·m (5 lbf·in)

Wiring Access
Two 1/2-inch NPSM ports, 14 threads/inch (1/2-14 NPSM)

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

Output State Following Timeout
De-energized (OFF)

Certifications
CE (CE approval only applies to 2.4 GHz models)

Environmental Specifications for the E Housing

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
IP65
Refer to the Sure Cross® MultiHop Product Instruction Manual (p/n 151317) for installation and waterproofing instructions.

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

Included with Model

The following items ship with the DX80 radios.

- BWA-HW-059—Access Hardware Kit for "E" Housing Models, containing one 1/2-inch vented plug and one 1/2-inch gland
- BWA-HW-003—PTFE tape
- BWA-9O2-C (900 MHz) or BWA-2O2-C (2.4 GHz)—Antenna, 2 dBd Omni, Rubber Swivel RP-SMA Male. (Not included with Internal antenna models)
- Quick Start Guide (128185 for DX80 Gateways 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 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.

Important: Please download the complete MultiHop H15 Radio 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 MultiHop H15 Radio, 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 MultiHop H15 Radio 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.

[2] Wave is standard shock voltage of ±1.2 × 50 µs according to JEC-212-1981

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.

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.

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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.
David Alfaro Siqueiros 103 Piso 2 Valle oriente
San Pedro Garza Garcia Nuevo Leòn, C. P. 66269

81 8363.2714

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