



Wireless

Banner Engineering's SureCross wire replacement products are designed to be easy to use. The most basic network includes a Gateway and one Node. Many of these simple-to-use models include pre-defined I/O mapping between two devices.

WIRELESS

Simple Wire Replacement **page 648**

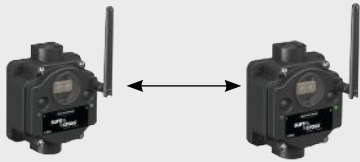
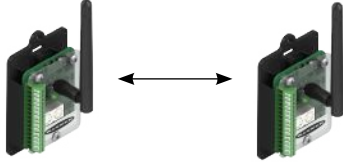
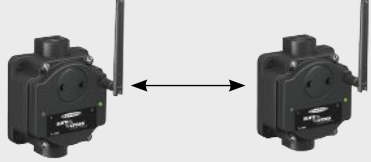
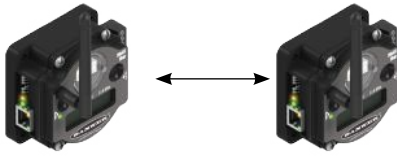

Wireless Sensors **page 658**

Network Radios **page 664**

Simple Wire Replacement

Extend your range and eliminate the need for wires for the most common communication signals including discrete, analog, serial and Ethernet.

- Easy to apply, use and support
- Simple yet highly expandable
- Easy to deploy

Model	Inputs/Outputs	Node	Gateway	Inputs/Outputs	Page
PM Series	PM2: 4 selectable discrete/ 2 analog inputs 4 selectable discrete/ 2 analog outputs			PM2: 4 selectable discrete/ 2 analog inputs 4 selectable discrete/ 2 analog outputs	649
	PM8: 6 sourcing discrete inputs 6 sourcing outputs			PM8: 6 sourcing discrete inputs 6 sourcing outputs	650
PB2	2 selectable discrete & 2 analog inputs 2 selectable discrete & 2 analog outputs			2 selectable discrete & 2 analog inputs 2 selectable discrete & 2 analog outputs	652
Serial Radio	RS-232 or RS-485			RS-232 or RS-485	654
Ethernet Radio	Ethernet TCP/IP, RS-232 or RS-485			Ethernet TCP/IP, RS-232 or RS-485	656
DXER9	Ethernet TCP/IP			Ethernet TCP/IP	657



PM2 Series

Digital Wire Replacement

The SureCross® PM Series radios easily replaces Discrete and Analog signal wires, and with no setup software needed, the radios are easy to apply, use and support.

- Simple yet highly expandable
- Eight LCD menu selectable I/O mapping options
- IP67 rated housing for use in demanding environments
- One Gateway can support up to 6 nodes

PM2 Gateway, 10-30 V DC

I/O	Frequency	Range†	Environmental Rating	Models*
Inputs: Four selectable discrete & Two 0-20 mA analog Outputs: Four sourcing discrete & Two 0-20 mA analog	900 MHz	6 miles	IP67, NEMA 6	DX80G9M6S-PM2
	2.4 GHz	2 miles		DX80G2M6S-PM2

PM2 Node, 10-30 V DC

I/O	Frequency	Range†	Environmental Rating	Models*
Inputs: Four selectable discrete & Two 0-20 mA analog Outputs: Four sourcing discrete & Two 0-20 mA analog	900 MHz	6 miles	IP67, NEMA 6	DX80N9X6S-PM2
	2.4 GHz	2 miles		DX80N2X6S-PM2

PM2 Kits, 10-30 V DC

I/O	Frequency	Range†	Environmental Rating	Description	Models*
Inputs: Four selectable discrete & Two 0-20 mA analog Outputs: Four sourcing discrete & Two 0-20 mA analog	900 MHz	6 miles	IP67, NEMA 6	Includes one PM2 Gateway, and one PM2 Node	DX80K9M6
	2.4 GHz	2 miles			DX80K2M6-PM2

For accessories see page 670.

* Must be used with 900 MHz Node

** Must be used with 2.4 GHz Node

† Line of sight with included 2 dB antenna. High-gain antennas available for increased range. See page 670.



PM8 Series Digital Wire Replacement

The SureCross® PM Series radios easily replaces Discrete and Analog signal wires, and with no setup software needed, the radios are easy to apply, use and support.

- Simple yet highly expandable
- Eight LCD menu selectable I/O mapping options
- IP67 rated housing for use in demanding environments
- One Gateway can support up to 6 nodes

PM8 Gateway, 10-30 V DC

I/O	Frequency	Range†	Environmental Rating	LCD Screen	Models
Inputs: Six sourcing discrete	900 MHz	6 miles	IP67, NEMA 6	Yes	DX80N9X6S-PM8
Outputs: Six sourcing discrete	2.4 GHz	2 miles			DX80G2M6S-PM8

PM8 Node, 10-30 V DC

I/O	Frequency	Range†	Environmental Rating	LCD Screen	Models
Inputs: Six sourcing discrete	900 MHz*	6 miles	IP67, NEMA 6	Yes	DX80N9X6S-PM8
Outputs: Six sourcing discrete	2.4 GHz**	2 miles			DX80N2X6S-PM8

PM8L Node, 10-30 V DC

I/O	Frequency	Range†	Environmental Rating	LCD Screen	Models
Inputs: Six sourcing discrete	900 MHz*	6 miles	IP67, NEMA 6	No	DX80N9X6S-PM8L
Outputs: Six sourcing discrete	2.4 GHz**	2 miles			DX80N2X6S-PM8L

PM8 Kits, 10-30 V DC

I/O	Frequency	Range†	Environmental Rating	Description	Models
Inputs: Six sourcing discrete	900 MHz	6 miles	IP67, NEMA 6	Includes one PM8 Gateway, and one PM8 Node	DX80K9M6-PM8
Outputs: Six sourcing discrete	2.4 GHz	2 miles			DX80K2M6-PM8

For accessories see page 670.

* Must be used with 900 MHz Gateway

** Must be used with 2.4 GHz Gateway

† Line of sight with included 2 dB antenna. High-gain antennas available for increased range. See page 670.

PM Series Specifications

Power	10 to 30 V dc (For European applications: 12 to 24 V dc, +/- 10%)
Radio Range	900 MHz: Up to 9.6 kilometers (6 miles)* 2.4 GHz: Up to 3.2 kilometers (2 miles)* * Line of sight with included 2 dB antenna. High-gain antennas available for increased range. See page 670.
Transmit Power	900 MHz (1 Watt): 30 dBm (1 W) conducted (up to 36 dBm EIRP) 2.4 GHz: 18 dBm (65 mW) conducted, less than or equal to 20 dBm (100 mW) EIRP
Network Size	1 Gateway and 1 Node, pre-mapped from factory Other advanced options available. See data sheet for more information.
I/O	Discrete and Analog depending on model
Power Consumption	900 MHz Consumption: Maximum current draw is <100 mA and typical current draw is <50 mA at 24 V dc. 2.4 GHz consumption is less
Environmental Rating	IEC IP67; NEMA 6

See Bannerengineering.com for more detailed specifications.





PB2 Board Module

Discrete & Analog Wire Replacement

SureCross® Performance embeddable board modules were specifically designed for the needs of industrial users to provide connectivity where traditional wired connections are not possible or cost prohibitive.

- Simple yet highly expandable
- Supports Point to Point and Star network topologies
- One Gateway can support up to 2 nodes

PB2 Gateway, 10-30 V DC

I/O	Frequency	Range†	Environmental Rating	Models
Inputs: Two sourcing discrete & Two 0-20 mA analog	900 MHz*	6 miles	IP67, NEMA 6	DX80G9M6S-PB2
Outputs: Two sourcing discrete & Two 0-20 mA analog	2.4 GHz**	2 miles		DX80G2M6S-PB2

PB2 Node, 10-30 V DC

I/O	Frequency	Range†	Environmental Rating	Models
Inputs: Two sourcing discrete & Two 0-20 mA analog	900 MHz*	6 miles	IP67, NEMA 6	DX80N9X6S-PB2
Outputs: Two sourcing discrete & Two 0-20 mA analog	2.4 GHz**	2 miles		DX80N2X6S-PB2

For accessories see page 670.

* Must be used with 900 MHz Gateway

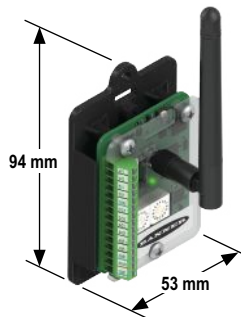
** Must be used with 2.4 GHz Gateway

† Line of sight with included 2 dB antenna. High-gain antennas available for increased range. See page 670.

PB2 Specifications

Range	900 MHz: Up to 9.6 kilometers (6 miles)* 2.4 GHz: Up to 3.2 kilometers (2 miles)* * Line of sight with included 2 dB antenna. High-gain antennas available for increased range. See page 670.
Transmit Power	900 MHz (1 Watt): 30 dBm (1 W) conducted (up to 36 dBm EIRP) 2.4 GHz: 18 dBm (65 mW) conducted, less than or equal to 20 dBm (100 mW) EI
Network Size	1 Gateway and 1 Node, pre-mapped from factory Other advanced options available. Contact factory for more information.
I/O	Discrete, Analog
Power	10 to 30 V dc (For European applications: 12 to 24 V dc, +/- 10%)
Power Consumption	900 MHz, 1 Watt: Approx. 30 mA 900 MHz, 250 mW: Approx. 25 mA 2.4 GHz, 65 mW: Approx. 20 mA

See Bannerengineering.com for more detailed specifications.





Serial Data Radio

Serial Wire Replacement

SureCross® MultiHop Serial Data Radios are wireless industrial communication devices used to extend the range of serial communication networks.

- DIP switches select operational modes
- FHSS radios operate and synchronize automatically
- Support RS-232 or RS-485

SR 900 MHz, 10-30 V DC

Environmental Rating	Protocol	Range	Models*
IP67, NEMA 6	RS-232 or RS-45	6 miles**	DX80SR9M-H

* Must be used with 900 MHz Node

SR 2.4 GHz, 10-30 V DC

Environmental Rating	Protocol	Range	Models*
IP67, NEMA 6	RS-232 or RS-45	2 miles**	DX80SR2M-H

* Must be used with 2.4 GHz Node

For accessories see page 670.

** Line of sight with included 2 dB antenna. High-gain antennas available for increased range. See page 670.

Serial Radio Specifications

Range	900 MHz: Up to 9.6 kilometers (6 miles)* 2.4 GHz: Up to 3.2 kilometers (2 miles)* * Line of sight with included 2 dB antenna. High-gain antennas available for increased range. See page 670.
Transmit Power	900 MHz (1 Watt): 30 dBm (1 W) conducted (up to 36 dBm EIRP) 2.4 GHz: 18 dBm (65 mW) conducted, less than or equal to 20 dBm (100 mW) EI
Network Size	One Master Radio and multiple Slave radios per network. Other advanced options available. Contact factory for more information.
Power	10 to 30 V dc (For European applications: 12 to 24 V dc, +/- 10%)
Environmental Rating	IEC IP67; NEMA 6

See Bannerengineering.com for more detailed specifications.



Ethernet Data Radio

Ethernet & Serial Wire Replacement

SureCross® MultiHop Ethernet Data Radios are wireless industrial communication devices used to extend the range of serial communication networks.

- No IP address configuration is required
- Built-in site survey mode enables rapid assessment of a location's RF transmission properties



ER 900 MHz, 10-30 V DC

Environmental Rating	Protocol	Range	Models*
IP20, NEMA 1	Ethernet	6 miles**	DX80ER9M-H

* MUST BE USED WITH 900 MHz MODELS

ER 2.4 GHz, 10-30 V DC

Environmental Rating	Protocol	Range	Models*
IP20, NEMA 1	Ethernet	2 miles**	DX80ER2M-H

* MUST BE USED WITH 2.4 GHz MODELS

Ethernet Radio Specifications

Range	900 MHz: Up to 9.6 kilometers (6 miles)* 2.4 GHz: Up to 3.2 kilometers (2 miles)* * Line of sight with included 2 dB antenna. High-gain antennas available for increased range. See page 670.
Transmit Power	900 MHz (1 Watt): 30 dBm (1 W) conducted (up to 36 dBm EIRP) 2.4 GHz: 18 dBm (65 mW) conducted, less than or equal to 20 dBm (100 mW) EI
Network Size	One Master Radio and multiple Slave radios per network. Other advanced options available. Contact factory for more information.
Power	10 to 30 V dc (For European applications: 12 to 24 V dc, +/- 10%)
Environmental Rating	IEC IP67; NEMA 6

See Bannerengineering.com for more detailed specifications.



For accessories see page 670.

** Line of sight with included 2 dB antenna. High-gain antennas available for increased range. See page 670.



DXER9 Ethernet Data Radio

Ethernet Wire Replacement

The SureCross® Ethernet radio is an industrial grade, long range, 900 MHz radio used to create point to multipoint configurations of wireless Ethernet networks.

- DIP switches select operational modes
- FHSS radios operate and synchronize automatically

DXER9 900 MHz, 10-30 V DC

Environmental Rating	Transmit Range	Range	Models*
IP55	125 mW	40 miles LOS with 15 dBi antenna	DXER9

* Available in 900 MHz frequency only

DXER9 Specifications

Range	900 MHz: Up to 40 miles* * Line of sight with 15 dBi antenna
Output Power	+21 dBm (4 Watts EIRP used with 15 dBi antenna)
Power Consumption	Transmit: 1.7 Watts Receive: 0.8 Watts
Power	10 to 30 V dc (For European applications: 12 to 24 V dc, +/- 10%)
Environmental Rating	IEC IP55; NEMA 4X

See Bannerengineering.com for more detailed specifications.





Q45 Family

Digital Wire Replacement

Solve challenging applications or add sensing to existing industrial systems. The Q45 nodes are the first self-contained wireless standard sensor solution designed for your most challenging control and monitoring applications.




- Simple yet highly expandable
- IP67 rated housing for use in demanding environments
- 2.4 GHz ISM band radio meets worldwide standards

2.4 GHz Node, battery power

Description	I/O	Range	Environmental Rating	Models*
Remote Device	Inputs: two discrete or one Namur proximity sensor	1,000 m	IP67, NEMA 6	DX80N2Q45-RD
Push Button	Inputs: one button Outputs: two color light	1,000 m	IP67, NEMA 6	DX80N2Q45BL-RG
Temperature & Humidity	Inputs: temp & humidity Outputs: 4 – 20 mA	1,000 m	IP67, NEMA 6	M12FTH4Q + DX80N2Q45TH
Temperature	Inputs: temperature Outputs: 4 – 20 mA	1,000 m	IP67, NEMA 6	M12FT4Q + DX80N2Q45TH

* Must be used with 2.4 GHz Gateway

2.4 GHz Gateway, 10-30 V DC

I/O	Range†	Environmental Rating	Housing	Models*
Inputs: Two sourcing discrete Outputs: Two sourcing discrete	1,000 m	—		DX80G2M6-B2Q
Inputs: Six sourcing discrete Outputs: Six sourcing discrete	1,000 m	IP20, NEMA 1		DX80G2M6-QC
Inputs: Six sourcing discrete Outputs: Six sourcing discrete	1,000 m	IP67, NEMA 6		DX80G2M6-Q

* Must be used with 2.4 GHz Node

† For accessories see page 670

† With included 2 dB antenna and a Q45 Wireless Node. High-gain antennas available for increased range. See page 670

Q45 Wireless Specifications

Range	2.4 GHz: Up to 1,000 meters* * With line of sight
Transmit Power	2.4 GHz: 65 mW EIRP
Network Size	1 Gateway and 1 Node, pre-mapped from factory Other advanced options available. Contact factory for more information.
Power	Two lithium AA batteries
Environmental Rating	IEC IP67; NEMA 6

See Bannerengineering.com for more detailed specifications.

PB2 Specifications

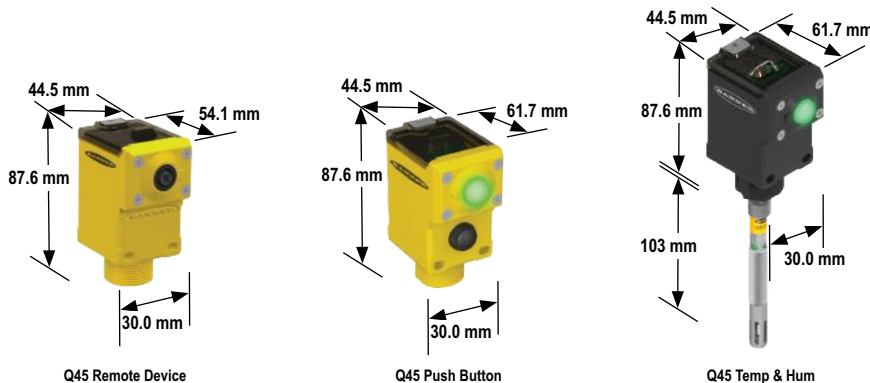
See PB2 spec for more information page 653

See Bannerengineering.com for more detailed specifications.

-Q Gateway for Q45 Specifications

Power	10 to 30 V dc (For European applications: 12 to 24 V dc, +/- 10%)
Range	2.4 GHz: Up to 1,000 m
Transmit Power	2.4 GHz: 65 mW conducted, less than or equal to 20 dBm (100mW) EIRP
Network Size	1 Gateway and 1 Node, pre-mapped from factory Other advanced options available. Contact factory for more information.
I/O	Discrete
Environmental Rating	IEC IP67; NEMA 6

See Bannerengineering.com for more detailed specifications.





Temp and Humidity Solutions

1-wire Serial interface

This temperature and humidity solution provides reliable environmental measurements without the need for costly wiring runs to the monitoring points. The internal lithium D-cell battery provides up to 5 years of life, and can be easily replaced.

- Achieves humidity accuracy of $\pm 2\%$ relative humidity and temperature accuracy of $\pm 0.3^\circ\text{C}$.
- Temperature and relative humidity sensing elements housed in a robust stainless steel probe
- Traceable to NIST standards
- Available in 900 MHz and 2.4 GHz

Sensors with a serial interface

Description	Models*
Temperature sensor with 1-wire serial interface	M12FT4Q
Temperature and humidity sensor with 1-wire serial interface	M12FTH4Q

* Must be used with 2.4 GHz Gateway

Radios with a serial interface

Description	Frequency	Housing	Models*
1-wire serial Performance Node	900 MHz (1 W)	IP67	DX80N9X1S-P6
1-wire serial Performance Node	2.4 GHz (65 mW)	IP67	DX80N2X1S-P6
1-wire Modbus MultiHop Slave	900 MHz (1 W)	IP67	DX80DR9M-H6
1-wire Modbus MultiHop Slave	2.4 GHz (65 mW)	IP67	DX80DR2M-H6

* Must be used with 2.4 GHz Gateway

For accessories see page 670.

† Line of sight with included 2 dB antenna. High-gain antennas available for increased range. See page 670.

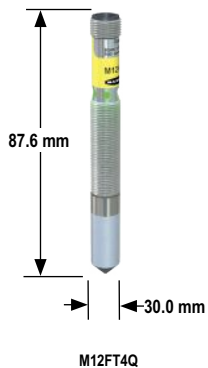
M12 Wireless 1-wire Serial interface Specifications

Supply voltage	3.6 to 5.5 V dc
Current	Default sensing: 28 μ Amps Disabled sensing: 15 μ Amps Active comms: 4.7 mA
Mounting threads	M12 x 1
Temperature	Measuring range: -40 °C to +85 °C (-40 °F to +185 °F) Resolution: 0.1 °C Accuracy: \pm 0.3 °C at 25 °C
Humidity*	Measuring range: 0 to 100% relative humidity Resolution: 0.1% relative humidity Accuracy: \pm 2% relative humidity at 25 °C
Environmental Rating	IEC IP67, NEMA 6
Operating temperature**	-40 °C to +85 °C (-40 °F to +185 °F)
Shock & vibration	IEC 68-2-6 and IEC 68-2-27 Shock: 30g, 11 millisecond half sine wave, 18 shocks Vibration: 0.5 mm p-p, 10 to 60 Hz

*M12FTH4Q only

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

See Bannerengineering.com for more detailed specifications.





Temp and Humidity Solutions

Modbus RTU, RS-485 interface

This temperature and humidity solution works in a variety of environments to wirelessly provide temperature and humidity measurements via Modbus RTU, RS-485.

- Achieves humidity accuracy of $\pm 2\%$ relative humidity and temperature accuracy of $\pm 0.3^{\circ}\text{C}$
- Manufactured with a robust metal housing
- Traceable to NIST standards
- Functions as a Modbus slave device via RS-485

Sensors with a Modbus RTU, RS-485 interface

Description	Models*
Temperature sensor with Modbus RTU, RS-485 interface	M12FT3Q
Temperature and humidity sensor with Modbus RTU, RS-485 interface	M12FTH3Q

* Must be used with 2.4 GHz Gateway

Radios with a Modbus RTU, RS-485 interface

Description	Frequency	Housing	Models*
Inputs: Four discrete, two 0 – 20 mA analog, one thermistor, one counter Outputs: Two NMOS discrete Switch Power Outputs: Two Serial interface: RS-485	900 MHz (1 W)	IP67	DX80DR9M-H1
	2.4 GHz (65 mW)	IP65	DX80DR2M-H1
	900 MHz (1 W)	IP67	DX80DR9M-H1E
	2.4 GHz (65 mW)	IP65	DX80DR2M-H1E
Inputs: Four discrete, two 0-20 mA analog Outputs: Four sourcing discrete, two 0-20 mA analog Serial interface: RS-485	900 MHz (1 W)	IP67	DX80DR9M-H2
	2.4 GHz (65 mW)	IP67	DX80DR2M-H2
Inputs: Two NPN discrete, two 0-20 mA analog Outputs: Two NMOS discrete Switch Power Outputs: Two	900 MHz (1 W)	Board module	DX80DR9M-HB1
	2.4 GHz (65 mW)	Board module	DX80DR2M-HB1
Inputs: Two PNP discrete, two 0-20 mA analog Outputs: Two PNP discrete, two 0-20 mA analog	900 MHz (1 W)	Board module	DX80DR9M-HB2
	2.4 GHz (65 mW)	Board module	DX80DR2M-HB2
Serial interface: RS-232, RS-485	900 MHz (1 W)	IP67	DX80SR9M-H
	2.4 GHz (65 mW)	IP67	DX80SR2M-H

* Must be used with 2.4 GHz Gateway

M12 Wireless Modbus Specifications

Supply voltage	12 to 24 V dc OR 3.6 to 5.5 V dc low power option
Current	Default sensing: 45 μ Amps Disabled sensing: 32 μ Amps Active comms: 4 mA
Mounting threads	M12 x 1
Temperature	Measuring range: -40 °C to +85 °C (-40 °F to +185 °F) Resolution: 0.1 °C Accuracy: \pm 0.3 °C at 25 °C
Humidity*	Measuring range: 0 to 100% relative humidity Resolution: 0.1% relative humidity Accuracy: \pm 2% relative humidity at 25 °C
Environmental rating	IEC IP67; NEMA 6
Operating temperature**	-40 °C to +85 °C (-40 °F to +185 °F)
Shock & vibration	IEC 68-2-6 and IEC 68-2-27 Shock: 30g, 11 millisecond half sine wave, 18 shocks Vibration: 0.5 mm p-p, 10 to 60 Hz

*M12FTH3Q only

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

See Bannerengineering.com for more detailed specifications.





DX80 Performance Series Gateways, Boards, Nodes, 10-30V DC

Create point to multi point networks that distribute I/O over large areas. Input and output types include discrete (dry contact, PNP/NPN), analog (0 to 10 V dc, 0 to 20 mA), temperature (thermocouple and RTD), and pulse counter.

- Enhanced gateways and nodes offer increased range in the 900 MHz frequency band
- High density I/O capacity provides up to 12 discrete inputs or outputs or a mix of discrete and analog I/O
- Universal analog inputs allow current or voltage to be selected in the field

DX80 Performance Gateways, 10-30 V DC

I/O	Frequency	Housing	Models*
N/A	900 MHz	Low Profile	DX80G9M2S-P
	2.4 GHz		DX80G2M2S-P
Inputs: Four selectable discrete, two 0–20 mA or 0–10 V analog Outputs: Four sourcing discrete, two 0–20mA analog	900 MHz	IP67	DX80G9M6S-P2
	2.4 GHz		DX80G2M6S-P2
Inputs/Outputs: Up to 12 NPN inputs or up to 12 NMOS outputs, or a mix of inputs and outputs not exceeding 12 I/O points	900 MHz	IP67	DX80G9M2S-P7
	2.4 GHz		DX80G2M2S-P7
Inputs/Outputs: Up to 12 PNP inputs or up to 12 PNP outputs, or a mix of inputs and outputs not exceeding 12 I/O points	900 MHz	IP67	DX80G9M6S-P8
	2.4 GHz		DX80G2M6S-P8

* Must be used with 2.4 GHz Gateway

DX80 Performance Gateways, board only models, 10-30 V DC

I/O	Frequency	Housing	Models*
Inputs: Two sourcing discrete, two 0-20 mA analog Outputs: Two sourcing discrete, two 0-20 mA analog	900 MHz	Low Profile	DX80G9M6S-PB2
	2.4 GHz		DX80G2M6S-PB2

* Must be used with 2.4 GHz Gateway

DX80 Performance nodes, board only models, 10-30 V DC

I/O	Frequency	Housing	Models*
Inputs: Two NPN discrete, two 0-20 mA analog Outputs: Two NMOS discrete Switch Power: Two	900 MHz		DX80N9X2S-PB1
	2.4 GHz		DX80N2X2S-PB1
Inputs: Two PNP discrete, two 0-20 mA analog Outputs: Two PNP discrete, two 0-20 mA analog	900 MHz		DX80N9X6S-PB2
	2.4 GHz		DX80N2X6S-PB2

* Must be used with 2.4 GHz Gateway

DX80 Performance nodes, 10-30 V DC

I/O	Frequency	Models*
Discrete Mode Inputs: Two selectable discrete and two thermistor Outputs: Two NMOS discrete Switch Power: Two	900 MHz	DX80N9X2S-P1
	2.4 GHz	DX80N2X2S-P1
Analog Mode Inputs: Two selectable discrete, two analog (0-20 mA or 0-10 V), and two thermistor Outputs: Two NMOS discrete Switch Power: One	900 MHz	DX80N9X1S-P1E
	2.4 GHz	DX80N2X1S-P1E
Inputs: Four selectable discrete, two 0-20 mA or 0-10 V (universal) analog Outputs: Four PNP discrete, two 0-20mA analog	900 MHz	DX80N9X6S-P2
	2.4 GHz	DX80N2X6S-P2
Inputs: Two selectable discrete, four thermocouple, one thermistor for CJC Outputs: One NMOS discrete	900 MHz	DX80N9X2S-P3
	2.4 GHz	DX80N2X2S-P3
	900 MHz	DX80N9X1S-P3E
	2.4 GHz	DX80N2X1S-P3E
Inputs: Four 3-wire RTDs	900 MHz	DX80N9X2S-P4
	2.4 GHz	DX80N9X1S-P4E
Inputs: Two NPN discrete, four selectable analog (0-20 mA or 0-10 V) Outputs: Two NMOS discrete Switch Power: Two	900 MHz	DX80N9X2S-P5
	2.4 GHz	DX80N2X2S-P5
Inputs: 1-Wire serial interface for one serial sensing device	900 MHz	DX80N9X1S-P6
	2.4 GHz	DX80N2X1S-P6
Inputs/Outputs: Up to 12 NPN inputs or up to 12 NMOS outputs, or a mix of inputs and outputs not exceeding 12 I/O points	900 MHz	DX80N9X2S-P7
	2.4 GHz	DX80N2X2S-P7
Inputs/Outputs: Up to 12 PNP inputs or up to 12 PNP outputs, or a mix of inputs and outputs not exceeding 12 I/O points	900 MHz	DX80N9X6S-P8
	2.4 GHz	DX80N2X6S-P8
Inputs: Two selectable discrete Outputs for DC Latch: DC Latch	900 MHz	DX80N9X2S-DCLATCHE
	2.4 GHz	DX80N2X2S-DCLATCHE

* Must be used with 2.4 GHz Gateway

10 to 30 V dc, solar, or battery power sources



DX80 Performance Series Specifications

Range	900 MHz: Up to 40 miles* * Line of sight with 15 dBi antenna
Output Power	+21 dBm (4 Watts EIRP used with 15 dBi antenna)
Power Consumption	Transmit: 1.7 Watts Receive: 0.8 Watts
Power	10 to 30 V dc (For European applications: 12 to 24 V dc, +/- 10%)
Environmental Rating	IEC IP55; NEMA 4X

See Bannerengineering.com for more detailed specifications.



Mulithop Modbus Modbus Radios and Boards with I/O

MultiHop Modbus data radios extend the range of Modbus or other Serial communication networks. Each radio may be set to act as either a master, repeater or slave. Models are available with built in discrete and analog I/O, which can be accessed using the Modbus protocol.

- Self-healing, auto routing RF network with multiple hops extends the network's range
- Flexible: dip switch selectable to be a master, repeater or slave
- User selectable communication between RS-485 and RS-232

MultiHop Modbus radios with I/O

I/O	Frequency	Housing	Models*
Inputs: Four discrete, two 0-20 mA analog, one thermistor, one counter Outputs: Two NMOS discrete Switch Power: Two Serial interface: RS-485	900 MHz	IP67	DX80DR9M-H1
		IP54	DX80DR9M-H1E
	2.4 GHz	IP67	DX80DR2M-H1
		IP54	DX80DR2M-H1E
Inputs: Four discrete, two 0-20 mA analog Outputs: Four sourcing discrete, two 0-20 mA analog Serial interface: RS-485	900 MHz	IP67	DX80DR9M-H2
	2.4 GHz	IP67	DX80DR2M-H2
Inputs: Two discrete, four thermocouple, one thermistor (internal) Outputs: Two NMOS discrete Serial interface: RS-232	900 MHz	IP67	DX80DR9M-H3
	2.4 GHz	IP54	DX80DR9M-H3E
	900 MHz	IP67	DX80DR2M-H3
	2.4 GHz	IP54	DX80DR2M-H3E
Inputs: Four 3-wire Pt100 RTD Serial interface: RS-232	900 MHz	IP67	DX80DR9M-H4
	2.4 GHz	IP54	DX80DR9M-H4E
	900 MHz	IP67	DX80DR2M-H4
	2.4 GHz	IP54	DX80DR2M-H4E
Inputs: Four sinking discrete, four 0-20 mA analog Outputs: Two NMOS discrete Switch Power: Two Serial Interface: RS-485	900 MHz	IP67	DX80DR9M-H5
	2.4 GHz		DX80DR2M-H5
Inputs: 1-Wire serial interface for one 1-wire serial sensing device	900 MHz	IP67	DX80DR9M-H6
	2.4 GHz		DX80DR2M-H6
Inputs: Two discrete, two 0-20 mA analog, one thermistor, one SDI-12 or counter Outputs: Two NMOS discrete Switch Power: Two Serial interface: RS-485	900 MHz	IP67	DX80DR9M-H12
	2.4 GHz		DX80DR2M-H12
Inputs: Two sinking discrete Outputs for DC Latch: DC Latch	900 MHz	IP54	DX80DR9M-DCLATCHE
	2.4 GHz		DX80DR2M-DCLATCHE

* Must be used with 2.4 GHz Gateway

Board level MultiHop Modbus Data Radios with I/O

I/O	Frequency	Models*
Inputs: Two NPN discrete, two 0 to 20 mA analog Outputs: Two NMOS discrete Switch Power Outputs: Two	900 MHz	DX80DR9M-HB1
	2.4 GHz	DX80DR2M-HB1
Inputs: Two PNP discrete, two 0 to 20 mA analog Outputs: Two PNP discrete, two 0 to 20 mA analog	900 MHz	DX80DR9M-HB2
	2.4 GHz	DX80DR2M-HB2

* Must be used with 2.4 GHz Gateway



MultiHop Modbus Specifications

Range	900 MHz: Up to 6 miles
Antenna	Ext. Reverse Polarity SMA, 50 Ohms Max Tightening Torque: 0.45 N m (4 in lbf)
Transmit Power	900 MHz: 30 dBm Conducted (up to 36 dBm EIRP)
Power	10 to 30 V dc (For European applications: 12 to 24 V dc, +/- 10%)
Environmental Rating	M-Hx Models: IEC IP67; NEMA 6

See Bannerengineering.com for more detailed specifications.



Intrinsically Safe Star I/O Network Nodes SureCross® DX99

- Both 900 MHz 150 mW and 2.4 GHz 63 mW models are available
- Networks formed using DX80 Performance Gateways installed beyond the hazardous area and one or more Nodes operating in the same frequency band
- The DX99 is a state-of-the-art combination of wireless communication, battery technology and intrinsically safe electronics
- All models are certified for operation in Class I, Division 1 and ATEX Zone 0 locations



DX99 Nodes, FlexPower™—Class I, Div 1 and Zone 0 (Metal Housing)

I/O	Frequency	Boost Power	Models*
Discrete: Two inputs Analog: Two inputs (0-20 mA)	900 MHz	10 V	DX99N9X1S2N0M2X0D1
		18 V	DX99N9X1S2N0M2X0D2
Discrete: Two inputs Analog: Two inputs (0-10 V)	900 MHz	10 V	DX99N9X1S2N0V2X0D1
		18 V	DX99N9X1S2N0V2X0D2
Discrete: Two inputs Analog: Two inputs (0-20 mA)	2.4 GHz	10 V	DX99N2X1S2N0M2X0D1
		18 V	DX99N2X1S2N0M2X0D2
Discrete: Two inputs Analog: Two inputs (0-10 V)	2.4 GHz	10 V	DX99N2X1S2N0V2X0D1
		18 V	DX99N2X1S2N0V2X0D2
Thermocouple: Three inputs, one thermistor input Discrete: Two (NPN) inputs	900 MHz	n/a	DX99N9X1S2N0T4X0D0
	2.4 GHz		DX99N2X1S2N0T4X0D0
RTD: Four inputs	900 MHz	n/a	DX99N9X1S0N0R4X0D0
	2.4 GHz		DX99N2X1S0N0R4X0D0
Bridge: Two inputs Discrete: Two inputs	900 MHz	n/a	DX99N9X1S2N0B2X0D0
	2.4 GHz		DX99N2X1S2N0B2X0D0
Inputs (Modbus Mode): One RS-485 Inputs (Voltage Mode): Two analog, one discrete	900 MHz	13V	DX99N9X1S1S0V2X0D4
	2.4 GHz		DX99N2X1S1S0V2X0D4
Inputs: One analog input with a 29 second warm-up time; one sinking discrete Additional Input Configurations: One 3-wire 100-Ohm Platinum RTD, one sinking discrete, and two analog (0-20 mA)	900 MHz	19V	DX99N9X1S1N0M3X0D5
	2.4 GHz		DX99N2X1S1N0M3X0D5

* Must be used with 2.4 GHz Gateway

Metal housing models are only available with external antennas and are powered by a 3.6V D cell lithium battery integrated into the housing. Mounting and intrinsically safe antenna installation accessories are available for the metal housing models.

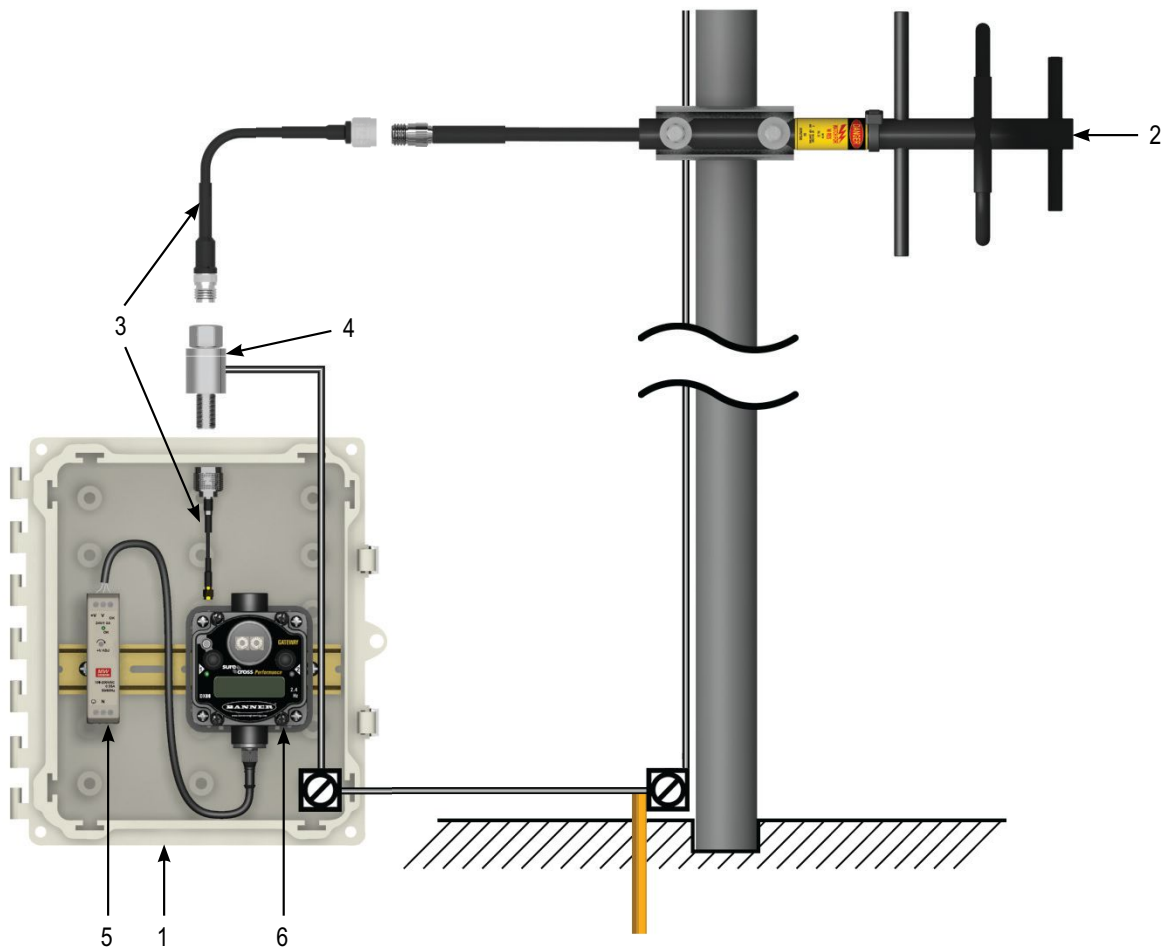
SureCross® DX99 Specifications

Range	900 MHz: Up to 4.8 kilometers (3 miles) 2.4 GHz: Up to 3.2 kilometers (2 miles)	
Transmit Power	900 MHz: 150 mW (21 dBm Conducted) 2.4 GHz: 65 mW (18 dBm Conducted)	
Network Size	One Gateway and up to 47 remotely located Nodes (SureCross Performance or SureCross DX80 Gateway required)	
I/O	Discrete, Analog, Temperature, Bridge	
Gateway Communications	SureCross Performance or SureCross DX80 Gateway required	
Power	3.6V low power option from an internal battery	
Power Consumption	Application Dependent	
Environmental Rating	IEC IP68	
Certifications	DX99, Intrinsically Safe, Metal Housing	
	Class I, Division 1, Groups A, B, C, D; Class II, Division 1, Groups E, F, G; Class III, Division 1 Ex ia IIC T4 AEx ia IIC T4	 Certificate 2008243(LR 41887)
	LCIE/ATEX Zone 0 (Group IIC) and Zone 20 (Group II) II 1 GD Ex ia IIC T4 Ex iaD 20 IP68 T82°C	 Certificate LCIE 08 ATEX 6098X

See Bannerengineering.com for more detailed specifications.

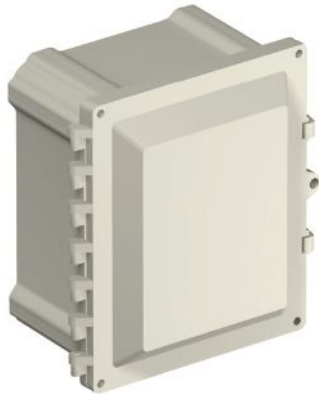


Accessories



NOTE: The Surecross® radio installation shown includes wireless accessories available from Banner. It is for illustration purposes only. Installations may vary.

(1) Enclosures



Description	Model
Enclosure, Polycarbonate, with Opaque Cover, 6 × 6 × 4 in.	BWA-AH664
Enclosure, Polycarbonate, with Opaque Cover, 8 × 6 × 4 in.	BWA-AH864
Enclosure, Polycarbonate, with Opaque Cover, 10 × 8 × 4 in.	BWA-AH1084
Enclosure, Polycarbonate, with Opaque Cover, 12 × 10 × 6 in.	BWA-AH12106
Enclosure, Polycarbonate, with Opaque Cover, 14 × 12 × 6 in.	BWA-AH14126
Enclosure, Polycarbonate, with Opaque Cover, 16 × 14 × 8 in.	BWA-AH16148
Enclosure, Polycarbonate, with Opaque Cover, 18 × 16 × 10 in.	BWA-AH181610
Enclosure, Polycarbonate, with Clear Cover, 6 × 6 × 4 in.	BWA-AH664C
Enclosure, Polycarbonate, with Clear Cover, 8 × 6 × 4 in.	BWA-AH864C
Enclosure, Polycarbonate, with Clear Cover, 10 × 8 × 4 in.	BWA-AH1084C
Enclosure, Polycarbonate, with Clear Cover, 12 × 10 × 6 in.	BWA-AH12106C
Enclosure, Polycarbonate, with Clear Cover, 14 × 12 × 6 in.	BWA-AH14126C
Enclosure, Polycarbonate, with Clear Cover, 16 × 14 × 8 in.	BWA-AH16148C
Enclosure, Polycarbonate, with Clear Cover, 18 × 16 × 10 in.	BWA-AH181610C

Swing Panel Kits

Description	Model
Swing Panel Kit, 6 × 6, Includes Mounts, Screws, and Panel	BWA-AH66SPK
Swing Panel Kit, 8 × 6, Includes Mounts, Screws, and Panel	BWA-AH86SPK
Swing Panel Kit, 8 × 10, Includes Mounts, Screws, and Panel	BWA-AH108SPK
Swing Panel Kit, 12 × 10, Includes Mounts, Screws, and Panel	BWA-AH1210SPK
Swing Panel Kit, 14 × 12, Includes Mounts, Screws, and Panel	BWA-AH1412SPK
Swing Panel Kit, 16 × 14, Includes Mounts, Screws, and Panel	BWA-AH1614SPK
Swing Panel Kit, 18 × 16, Includes Mounts, Screws, and Panel	BWA-AH1816SPK

Mounting Accessories

Description	Model
Slot Nut Kit, Includes 2 Nuts and 2 Screws	BWA-AHSNK
Swing Panel Mounts (4 per Kit)	BWA-AHSPM
Latch Kit, 2 Latches per Kit, Replacement Only	BWA-AHLK
Accessory Kit, Includes all screws, inserts, and mounting feet (Replacement Only)	BWA-AHAK
Screw 10-32 X .375 Phl Ph Zinc Self Threading	BWA-AHTBS


DIN Rail Kits


Description	Model
DIN Rail Kit, 6", Includes 2 Nuts, 2 Screws, and DIN Rail	BWA-AH6DRK
DIN Rail Kit, 8", Includes 2 Nuts, 2 Screws, and DIN Rail	BWA-AH8DRK
DIN Rail Kit, 10", Includes 2 Nuts, 2 Screws, and DIN Rail	BWA-AH10DRK
DIN Rail Kit, 12", Includes 2 Nuts, 2 Screws, and DIN Rail	BWA-AH12DRK
DIN Rail Kit, 14", Includes 2 Nuts, 2 Screws, and DIN Rail	BWA-AH14DRK
DIN Rail Kit, 16", Includes 2 Nuts, 2 Screws, and DIN Rail	BWA-AH16DRK
DIN Rail Kit, 18", Includes 2 Nuts, 2 Screws, and DIN Rail	BWA-AH18DRK


DIN Rail Kits

Description	Model
Din Rail Kit 6" (Includes 2 Tribolar Screws and DIN Rail)	BWA-AH6DR
Din Rail Kit 8" (Includes 2 Tribolar Screws and DIN Rail)	BWA-AH8DR
Din Rail Kit 10" (Includes 2 Tribolar Screws and DIN Rail)	BWA-AH10DR
Din Rail Kit 12" (Includes 2 Tribolar Screws and DIN Rail)	BWA-AH12DR
Din Rail Kit 14" (Includes 2 Tribolar Screws and DIN Rail)	BWA-AH14DR
Din Rail Kit 16" (Includes 2 Tribolar Screws and DIN Rail)	BWA-AH16DR
Din Rail Kit 18" (Includes 2 Tribolar Screws and DIN Rail)	BWA-AH18DR

(2) Antennas

Omni-Directional Antennas with RP-SMA Male Connections			Model
	900 MHz	2 dBi, Rubber swivel (ships with 900 MHz radios)	BWA-902-C
		5 dBi, Rubber swivel	BWA-905-C
	2.4 GHz	2 dBi, Rubber swivel, 3 1/4 inches (ships with 2.4 GHz radios)	BWA-202-C
		5 dBi, Rubber swivel, 6 1/2 inches	BWA-205-C
		7 dBi, Rubber swivel, 9 1/4 inches	BWA-207-C

Omni-Directional Dome Antennas			Model
	900 MHz	2 dBi, 18-inch cable	RP-SMA Box Mount BWA-902-D
	2.4 GHz	2 dBi, 18-inch cable	RP-SMA Box Mount BWA-202-D

Omni-Directional Magnetic Whip Antenna			Model
	2.4 GHz	5 dBi, Magnetic whip antenna, 12 ft cable	RP-SMA Male BWA-205-M

Omni-Directional Fiberglass Antennas with N-Type Female Connections



			Model
900 MHz	6 dBd, Fiberglass, 71.5 inches		BWA-906-A
	6 dBi, Fiberglass, 23.6 inches (1.3 inch dia.)		BWA-906-AS
	8 dBi, Fiberglass, 63 inches (1.5 inch dia.)		BWA-908-AS
2.4 GHz	8.5 dBi, Fiberglass, 24 inches		BWA-208-A
	6 dBi, Fiberglass, 16 inches (shown)		BWA-206-A

Directional (Yagi) Antennas with N-Type Female Connection




			Model
900 MHz	6.5 dBd, 6.8 × 13 inches Outdoor		BWA-9Y6-A
900 MHz	10 dBd, 6.8 × 24 inches Outdoor		BWA-9Y10-A


Solar Panels




			Model
12V 5W Multicrystalline	270 mm x 222 mm x 17 mm	Bracket mounting 5W solar panel wall / poll clamp style	BWA Solar Panel 5W-002
12V 20W Multicrystalline	573 mm x 357 mm x 30 mm	Bracket mounting 20W solar panel "L" style	BWA Solar Panel 20W-003



(3) Antenna Cables

Antenna Cables: RP-SMA to RP-SMA		Model
	RG58, RP-SMA Male to RP-SMA Female Bulkhead, 0.2 m	BWC-1MRSFRSB0.2
	RG58, RP-SMA Male to RP-SMA Female Bulkhead, 1 m	BWC-1MRSFRSB1
	RG58, RP-SMA Male to RP-SMA Female Bulkhead, 2 m	BWC-1MRSFRSB2
	RG58, RP-SMA Male to RP-SMA Female Bulkhead, 2 m	BWC-1MRSFRSB4
	LMR200, RP-SMA Male to RP-SMA Female, 3 m	BWC-2MRSFRS3
	LMR200, RP-SMA Male to RP-SMA Female, 6 m	BWC-2MRSFRS6
	LMR200, RP-SMA Male to RP-SMA Female, 9 m	BWC-2MRSFRS9
	LMR200, RP-SMA Male to RP-SMA Female, 12 m	BWC-2MRSFRS12



Antenna Cables: RP-SMA to N-Type		Model
	LMR100 RP-SMA to N-Type Male, 0.5 m	BWC-1MRSMN05

Antenna Cables: N-Type		Model
	LMR400 N-Type Male to N-Type Female, 3 m	BWC-4MNFN3
	LMR400 N-Type Male to N-Type Female, 6 m	BWC-4MNFN6
	LMR400 N-Type Male to N-Type Female, 15 m	BWC-4MNFN15
	LMR400 N-Type Male to N-Type Female, 30 m	BWC-4MNFN30


(4) Surge Suppressors

	Description	Model
	Surge Suppressor, bulkhead, N-Type Female, N-Type Male , dc Blocking	BWC-LFNBMN-DC
	Surge Suppressor, bulkhead, RPSMA to RP-SMA	BCW-LMRSFRPB



(5) Power Supplies

		Model
	DC Power Supply, 500 mA, 24 V dc, Demo kit power supply	PS24W
	DC Power Supply, 0.4 Amps, 24 V dc, with DIN Rail Mount	PSDINM-24-04
	DC Power Supply, 1.0 Amps, 24 V dc, with DIN Rail Mount	PSDINM-24-10
	DC Power Supply, 1.7 Amps, 24 V dc, with DIN Rail Mount	PSDINM-24-17
	DC Power Supply, 2.5 Amps, 24 V dc, with DIN Rail Mount	PSDINM-24-25

Relays

		Model
	Interface Relay Box, 18 to 26 V dc inputs, isolated relay outputs (not shown)	IB6RP
	Relay, Blade Style with Base, 12 V	BWA-RELAY-12V
	Relay, Blade Style with Base, 24 V	BWA-RELAY-24V
	Relay, Blade Style, No Base, 12 V (replacement part)	BWA-RH1B-UDC12V
	Relay, Blade Style, No Base, 24 V (replacement part)	BWA-RH1B-UDC24V
	Relay Base Only (replacement part)	BWA-SH1B-05

(6) Brackets

	Description	Model
	Black reinforced thermoplastic Bracket for mounting on a 35 mm DIN rail	SMBDX80DIN
	<ul style="list-style-type: none"> • DIN rail clip, black plastic • Used with the M-HBx MultiHop and -PBx Performance board modules 	BWA-HW-034

Mounting Kit

Description	Model
Screw, M5-0.8 x 25 mm, SS (4) Screw, M5-0.8 x 16 mm, SS (4) Hex nut, M5-0.8 mm, SS (4) Bolt, #8-32 x 3/4", SS (4)	BWA-HW-001