



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 504**

WIRELESS SENSORS **page 512**

NETWORK RADIOS **page 522**

WIRELESS CONTROLLERS **page 528**

OTHER AVAILABLE MODELS



TL70 **page 414**

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		Inputs/Outputs	Page
PM Series	PM2: 4 selectable discrete/ 2 analog inputs 4 selectable discrete/ 2 analog outputs	<div>NodeGateway</div> 	PM2: 4 selectable discrete/ 2 analog inputs 4 selectable discrete/ 2 analog outputs	505
	PM8: 6 sourcing discrete inputs 6 sourcing discrete outputs		PM8: 6 sourcing discrete inputs 6 sourcing outputs	506
PB2	2 selectable discrete & 2 analog inputs 2 selectable discrete & 2 analog outputs	<div>NodeGateway</div> 	2 selectable discrete & 2 analog inputs 2 selectable discrete & 2 analog outputs	508
Serial Radio	RS-232 or RS-485	<div>SlaveMaster</div> 	RS-232 or RS-485	509
Ethernet Radio	Ethernet TCP/IP, RS-232 or RS-485	<div>SlaveMaster</div> 	Ethernet TCP/IP, RS-232 or RS-485	510
DXER9	Ethernet TCP/IP	<div>SlaveMaster</div> 	Ethernet TCP/IP	511



PM2 Series

Digital Wire Replacement

- The Sure Cross® 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

PM2 Gateway, 10-30 V DC

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

PM2 Node, 10-30 V DC

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

PM2 Kits (Includes PM2 Gateway & PM2 Node, 10-30 V DC)

	Frequency	Range*	Environmental Rating	Models
Inputs: Four selectable discrete & Two 0-20 mA analog	900 MHz	6 miles	IP67, NEMA 6	DX80K9M6-PM2
Outputs: Four sourcing discrete & Two 0-20 mA analog	2.4 GHz	2 miles	IP67, NEMA 6	DX80K2M6-PM2

For accessories see page 530.

* Line of sight with included 2 dB antenna. High-gain antennas available for increased range. See accessories page 530.



PM8 Series

Digital Wire Replacement

- The Sure Cross® 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

	Frequency	Range†	Environmental Rating	LCD Screen	Models
Inputs: Six sourcing discrete Outputs: Six sourcing discrete	900 MHz	6 miles	IP67, NEMA 6	Yes	DX80G9X6S-PM8
	2.4 GHz	2 miles	IP67, NEMA 6	Yes	DX80G2M6S-PM8

PM8 Node, 10-30 V DC

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

PM8L Node, 10-30 V DC

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

PM8 Kits (Includes one PM8 Gateway, and one PM8 Node), 10-30 V DC

	Frequency	Range†	Environmental Rating	Models
Inputs: Six sourcing discrete Outputs: Six sourcing discrete	900 MHz	6 miles	IP67, NEMA 6	DX80K9M6-PM8
	2.4 GHz	2 miles	IP67, NEMA 6	DX80K2M6-PM8

For accessories see page 530.
* 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 accessories page 530.



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 530.
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

- Easy-to-Use
- 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

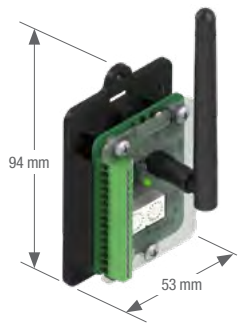
I/O	Frequency	Range*	Environmental Rating	Models
Inputs: Two sourcing discrete & Two 0-20 mA analog	900 MHz	6 miles	IP67, NEMA 6	DX80N9X6S-PB2
Outputs: Two sourcing discrete & Two 0-20 mA analog	2.4 GHz	2 miles		DX80N2X6S-PB2

For accessories see page 530.
* Line of sight with included 2 dB antenna. High-gain antennas available for increased range. See accessories page 530.

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 530.
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: Aprox. 30 mA 900 MHz, 250 mW: Aprox. 25 mA 2.4 GH, 65 mW: Aprox. 20 mA

See Bannerengineering.com for more detailed specifications.



Serial Data Radio

Serial Wire Replacement



- Easy-to-Use
- 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

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

For accessories see page 530.
^{*} Must be used with 900 MHz Serial Data Radio
^{**} Must be used with 2.4 GHz Serial Data Radio
[†] Line of sight with included 2 dB antenna. High-gain antennas available for increased range. See accessories page 530.

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 530.
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



- Sure Cross® 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

For accessories see page 530.
* Must be used with 900 MHz Ethernet Data Radio
** Must be used with 2.4 GHz Ethernet Data Radio
† Line of sight with included 2 dB antenna. High-gain antennas available for increased range. See accessories page 530.



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.
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	IP20, NEMA 1

See Bannerengineering.com for more detailed specifications.



DXER9 Ethernet Data Radio

Ethernet Wire Replacement

- The Sure Cross® 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 Power	Range	Models*
IP55	125 mW	40 miles LOS with 15 dBi antenna	DXER9

For accessories see page 530.
* Available in 900 MHz frequency only. Must be used with 900 MHz Gateway
** Must be used with 2.4 GHz Gateway
† Line of sight with included 15 dBi antenna. High-gain antennas available for increased range. See accessories page 530.

DXER9 Specifications

Range	900 MHz: Up to 40 miles† † Line of sight with included 15 dBi antenna.
Output Power	+21 dBm (4 Watts EIRP used with 15 dBi antenna)
Power Consumption	Transmit: 1.7 Watts Receiver: 0.8 Watts
Power	10 to 30 V dc (For European applications: 12 to 24 V dc, +/- 10%)
Environmental Rating	IP65

See Bannerengineering.com for more detailed specifications.



Wireless Q45 Series

Digital Wire Replacement



- Solve challenging applications or add sensing to existing industrial systems
- 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

Wireless Q45 Series

Description	I/O	Range	Environmental Rating	Models
900 MHz Remote Device	Inputs: two discrete or one NAMUR proximity sensor	up to 3.2 km	IP67, NEMA 6	DX80N9Q45RD
2.4 GHz Remote Device	Inputs: two discrete or one Namur proximity sensor	up to 1,000 m	IP67, NEMA 6	DX80N2Q45RD
900 MHz Push Button	Inputs: one button Outputs: two color light	up to 3.2 km	IP67, NEMA 6	DX80N9Q45BL-RYGB
2.4 GHz Push Button	Inputs: one button Outputs: two color light	up to 1,000 m	IP67, NEMA 6	DX80N2Q45BL-YG DX80N2Q45BL-RY DX80N2Q45BL-RG DX80N2Q45BL-RG-L
Temperature & Humidity	Inputs: temp & humidity Outputs: 4 – 20 mA	up to 3.2 km	IP67, NEMA 6	M12FTH4Q + DX80N9Q45TH
Temperature & Humidity	Inputs: temp & humidity Outputs: 4 – 20 mA	up to 1,000 m	IP67, NEMA 6	M12FTH4Q + DX80N2Q45TH
Temperature	Inputs: temperature Outputs: 4 – 20 mA	up to 3.2 km	IP67, NEMA 6	M12FT4Q + DX80N9Q45TH
Temperature	Inputs: temperature Outputs: 4 – 20 mA	up to 1,000 m	IP67, NEMA 6	M12FT4Q + DX80N2Q45TH

For accessories see page 530

† With included 2 dB antenna and a Q45 Wireless Node. High-gain antennas available for increased range. See accessories page 530



Q45 Remote Device



Q45 Push Button



Q45 Temp & Humidity

Q45 Wireless Specifications

Range	900 MHz: Up to 3.2 km* 2.4 GHz: Up to 1,000 m* * With line of sight
Transmit Power	900 Mhz: 25 dBm conducted 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.

Wireless Q120 Node

Six-Button and Light Pendant



- DIP switch configurable
- Six push-button inputs with momentary or toggle operation
- Six sets of red and green LED indicator lights with solid or flashing operation
- Reliable, field-proven Sure Cross wireless architecture operates in the globally accepted 2.4 GHz frequency band or the long-range 900 Mhz frequency band, depending upon model

Q120 Node

Frequency	Range	Models*
900 MHz	Up to 3.2 km	DX80N9Q120BL-RG
2.4 GHz	Up to 1000 m	DX80N2Q120BL-RG



Q120 Specifications

Power Supply	Integrated Battery; D-Cell lithium
Typical Battery Life	Up to 3 years, typical
Range	900 MHz: Up to 3.2 km 2.4 GHz: Up to 1,000 m
Indicators	Red and Green LEDs
Operating Conditions	-40 to +70 °C (-40 to +158 °F) 90% at +50 °C maximum relative humidity (non-condensing)
Spread Spectrum Technology	FHSS (Frequency Hopping Spread Spectrum)

See Bannerengineering.com for more detailed specifications.

QM42VT

Vibration and Temperature Sensor



- Avoid machine failures and delays by detecting problems early
- Paired with a Banner wireless node, it can monitor remote machines and provide local indication, wirelessly send the signal to a central location, and send the vibration and temperature data to the Gateway for collection and trending
- Reduce downtime and plan maintenance more efficiently
- Monitor a variety of machines to suit your needs

Sensor with Serial Interface

Description	Model
Vibration and temperature sensor via a 1-wire serial interface	QM42VT1
Vibration and temperature sensor that functions as a modbus slave device via RS-485	QM42VT2





5-Pin

Euro-Style
Double-ended
male/female

DEE2R-51D
0.3 m (1')
DEE2R-53D
0.9 m (3')
DEE2R-58D
2.4 m (8')

Adapter Cables
USB to RS-485

USB-to-RS-232 1-Wire

BWA-HW-006

BWA-USB1WIRE-001

Additional cordset information is available.
See page 758



BWA-BK-002



BWA-BK-001

QM42VT Vibration and Temperature Sensor Specifications

Supply Voltage	3.6 to 5.5 V dc	
Current	QM42VT1 Active comms: 11.9 mA at 5.5 V dc	QM42VT2 Active comms: 8.8 mA at 24 V dc
Communication Hardware	QM42VT1 Interface: 1-wire serial interface Baud rates: 9.6k, 19.2k (default), or 38.4k Data format: 8 data bits, no parity (default), 1 stop bit (even or odd parity available)	QM42VT2 Interface: RS-485 serial Baud rates: 9.6k, 19.2k (default), or 38.4k Data format: 8 data bits, no parity (default), 1 stop bit (even or odd parity available)
Communication Protocol	QM42VT1: Sure Cross® DX80 Sensor Node 1-wire serial Interface QM42VT2: Modbus RTU	
Communications Line	Level Receive ON: Greater than 2 V Level Receive OFF: Less than 0.7 V	Level Transmit ON: 2.7 to 3 V Level Transmit OFF: 0 V (pulldown resistor of 10 kOhm)
Vibration Sensor	QM42VT1 mounted base resonance: 5.5 kHz nominal QM42VT1 frequency range: 10–1000 Hz Measuring Range: 0–46 mm/sec or 0–1.8 in/sec Accuracy: ±10% and 25 °C	QM42VT2 mounted base resonance: 4.5 kHz nominal QM42VT2 frequency range: 10–4 kHz Measuring Range: 0–46 mm/sec or 0–1.8 in/sec Accuracy: ±10% and 25 °C
Connector	3 m cable with 5-pin M12 fitting	
Indicators	Green flashing: Power ON	Amber flicker: Serial Tx
Temperature Sensor	Measuring range: –40 to +105 °C (–40 to +221 °F) Resolution: 0.1 °C Accuracy: ± 3 °C	
Environmental Rating	NEMA 6P, IEC IP67	
Operating Conditions	QM42VT1: –40 to 85 °C (–40 to +185 °F)	QM42VT2: –40 to 105 °C (–40 to +221 °F)
Shock and Vibration	400G	
Mounting Options	Can be mounted using a variety of methods, including 1/4 inch 28 hex screw, epoxy, thermal tape, or magnetic mount	



K50U Series

Wireless Ultrasonic Sensor

- Provides a distance measurement from the target to the sensor
- Three meter sensing range with a 300 mm dead zone
- Built-in temperature compensation
- Rugged design for demanding sensing environments; rated IEC IP67, NEMA 6P
- Two sensor models available; one with a 1-wire serial interface and one that functions as a Modbus slave via RS-485

K50U Ultrasonic Sensor

Description	Models
Ultrasonic sensor with 1-wire serial interface	K50UX1RA
Ultrasonic sensor that functions as a modbus slave device via RS-485	K50UX2RA



Additional cordset information is available.
See page 758



BWA-BK-006
shown with: K50U and Q45U



BWA-BK-004
use with: K50U and DX80 or Q45U



K50U Ultrasonic Sensor Specifications

Supply Voltage	3.6 to 5.5 V dc or 10 to 30V dc	
Current	K50UX1A active comms: 3.3 mA	K50UX2A active comms: 11.3 mA
Communication Hardware	K50UX1A Interface: 1-wire serial interface Baud rates: 9.6k, 19.2k (default), or 38.4k Data format: 8 data bits, no parity (default), 1 stop bit (even or odd parity available)	K50UX2A Interface: RS-485 serial Baud rates: 9.6k, 19.2k (default), or 38.4k Data format: 8 data bits, no parity (default), 1 stop bit (even or odd parity available)
Communication Protocol	K50UX1A: Sure Cross® DX80 Sensor Node 1-wire serial Interface	K50UX2A: Modbus RTU
Communications Line	Level Receive ON: Greater than 2 V Level Receive OFF: Less than 0.7 V	Level Transmit ON: 2.7 to 3 V Level Transmit OFF: 0 V (pulldown resistor of 10 kOhm)
Connector	Integral 5-pin M12/Euro-style male quick disconnect (QD)	
Indicators	Two LEDs	
Construction	Housing: PBT polyester Transducer: epoxy/ceramic composite	
Environmental Rating	Leakproof design, rated IEC IP67 (NEMA 6)	
Operating Conditions	Temperature: -40 to 70 °C (-40 to 158 °F) Relative humidity: 95% at +50 °C maximum (non-condensing)	
Shock and Vibration	All models meet Mil Std. 202F requirements. Method 201A (vibration: 10 Hz to 60 Hz max., double amplitude 0.06 inch, maximum acceleration 10G). Also m meets IEC 947-5-2 requirements: 30G 11 ms duration, half sine wave	



Temp and Humidity Solutions

1-Wire Serial or Modbus RTU, RS-485 interface

- Reliable environmental measurements without the need for costly wiring runs to the monitoring points
- Achieves humidity accuracy of $\pm 2\%$ relative humidity and temperature accuracy of $\pm 0.3\text{ }^{\circ}\text{C}$.
- 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

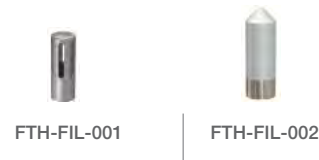
Description	Models
Temperature sensor with 1-wire serial interface	M12FT4Q
Temperature and humidity sensor with 1-wire serial interface	M12FTH4Q

Sensors with a Modbus RTU, RS-485 interface

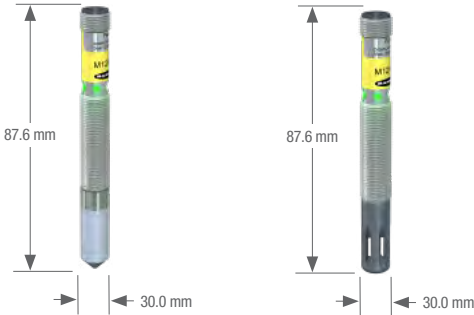
Description	Models
Temperature sensor with Modbus RTU, RS-485 interface	M12FT3Q
Temperature and humidity sensor with Modbus RTU, RS-485 interface	M12FTH3Q

For accessories see page 530.

Replacement Filters



Additional accessory information is available.
See page 541



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 to +85 $^{\circ}$ C (-40 to +185 $^{\circ}$ F) Resolution: 0.1 $^{\circ}$ C Accuracy: \pm 0.3 $^{\circ}$ C at 25 $^{\circ}$ C
Humidity*	Measuring range: 0 to 100% relative humidity Resolution: 0.1% relative humidity Accuracy: \pm 2% relative humidity at 25 $^{\circ}$ C
Environmental Rating	IEC IP67, NEMA 6
Operating Temperature**	-40 to +85 $^{\circ}$ C (-40 to +185 $^{\circ}$ 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

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 to +85 $^{\circ}$ C (-40 to +185 $^{\circ}$ F) Resolution: 0.1 $^{\circ}$ C Accuracy: \pm 0.3 $^{\circ}$ C at 25 $^{\circ}$ C
Humidity*	Measuring range: 0 to 100% relative humidity Resolution: 0.1% relative humidity Accuracy: \pm 2% relative humidity at 25 $^{\circ}$ C
Environmental Rating	IEC IP67; NEMA 6
Operating Temperature**	-40 $^{\circ}$ C to +85 $^{\circ}$ C (-40 $^{\circ}$ F to +185 $^{\circ}$ 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 and 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.

DX80 Performance Series

Gateways and Nodes



- 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 2.4 GHz	Low Profile	DX80G9M2S-P 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 2.4 GHz	IP67	DX80G9M6S-P2 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 2.4 GHz	IP67	DX80G9M2S-P7 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 2.4 GHz	IP67	DX80G9M6S-P8 DX80G2M6S-P8

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 2.4 GHz	Board Module	DX80G9M6S-PB2 DX80G2M6S-PB2

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 2.4 GHz	Board Module	DX80N9X2S-PB1 DX80N2X2S-PB1
Inputs: Two PNP discrete, two 0-20 mA analog Outputs: Two PNP discrete, two 0-20 mA analog	900 MHz 2.4 GHz	Board Module	DX80N9X6S-PB2 DX80N2X6S-PB2

DX80 Performance nodes, 10-30 V DC (“E” models have integrated batteries)

I/O	Frequency	Models*
Discrete Mode Inputs: Two selectable discrete and two thermistor Outputs: Two NMOS discrete Switch Power: Two 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	DX80N9X2S-P1
	2.4 GHz	DX80N2X2S-P1
	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
Discrete Mode Inputs: One configurable discrete, one thermistor, one asynchronous counter Switch Power Outputs: One Analog Mode: Inputs: One configurable discrete, one configurable analog, one thermistor, one asynchronous counter Switch Power Outputs: One	900 MHz	DX80N9X1S-P14
	2.4 GHz	DX80N2X1S-P14
Inputs: Two selectable discrete Outputs for DC Latch: DC Latch	900 MHz	DX80N9X2S-DCLATCHE
	2.4 GHz	DX80N2X2S-DCLATCHE

DX80 Performance Series Specifications

Range	900 MHz, 1 Watt: Up to 9.6 km (6 miles) 2.4 GHz, 65 mW: Up to 3.2 km (2 miles)
Minimum Separation Distance	900 MHz, 1 Watt: 4.57 m (15 ft) 2.4 GHz 65 mW: 0.3 m (1 ft)
Transmission 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
Communication Hardware (RS-485)	Interface: 2-wire half-duplex RS-485 Baud rates: 9.6k, 19.2k (default), or 38.4k Data format: 8 data bits, no parity, 1 stop bit
Supply Voltage	10 to 30 V dc
Interface	Indicators: Two bi-color LEDs Buttons: Two Display: Six character LCD
Operating Conditions	-40 to +85 °C (-40 to +185 °F) (Electronics); -20 to +80 °C (-4 to +176 °F) (LCD) 95% maximum relative humidity (non-condensing) Radiated Immunity: 10 V/m (EN 61000-4-3)
Environmental Rating	DX80 Models: IEC IP67; NEMA 6 “C” Models: IP20; NEMA 1 “E” Models: IP65; NEMA 4X

See Bannerengineering.com for more detailed specifications.





MultiHop Modbus

Modbus Radios and Boards with I/O

- MultiHop Modbus data radios extend the range of Modbus or other Serial communication networks
- 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, 10-30 V DC
("E" and "H6" models have integrated batteries)


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
		IP67	DX80DR2M-H2
	2.4 GHz	IP67	DX80DR2M-H2
		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
	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 Serial interface: RS-232	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



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

MultiHop Modbus Specifications

Radio Range	900 MHz, 1 Watt: Up to 9.6 km (6 miles)	2.4 GHz, 65 mW: Up to 3.2 km (2 miles)
Minimum Separation Distance	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
Power	FlexPower models: 10 to 30 V dc (Outside the USA: 12 to 24 V dc, $\pm 10\%$) on the brown wire, or 3.6 to 5.5 V dc low power option on the gray wire 6 Integrated battery models: 3.6 V dc low power option from an internal battery or 10 to 30 V dc 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)	
Compliance	900 MHz Compliance (1 Watt) FCC ID UE3RM1809: This device complies with FCC Part 15, Subpart C, 15.247 IC: 7044A-RM1809	2.4 GHz Compliance FCC ID UE300DX80-2400 - This device complies with FCC Part 15, Subpart C, 15.247 ETSI/EN: In accordance with EN 300 328: V1.8.1 (2012-04) IC: 7044A-DX8024
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)	
Interface	Indicators: Two bi-color LEDs Buttons: Two Display: Six character LCD	
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 Tool Data format: 8 data bits, no parity, 1 stop bit	
Packet Size (MultiHop)	900 MHz: 175 bytes (85 Modbus registers)	2.4 GHz: 75 bytes (37 Modbus registers)
Intercharacter Timing (MultiHop)	3.5 milliseconds	
Housing	Polycarbonate housing and rotary dial cover; polyester labels; EDPM rubber cover gasket; nitrile rubber, non-sulphur cured button covers Weight: 0.26 kg (0.57 lbs) M-Hx and M-HxC models: Mounting: #10 or M5 (SS M5 hardware included) M-HxE models: Mounting: 1/4-in or M7 (SS M7 hardware included) Max. Tightening Torque: 0.56 N-m (5 lbf-in)	
Wiring Access	M-Hx models: Four PG-7, One 1/2-in NPT, One 5-pin threaded M12/Euro-style male quick-disconnect M-HxC models: External terminals M-HxE models: Two 1/2-in NPT ports	
Environmental Rating	M-Hx: IEC IP67; NEMA 6 "C" Housing Models: IEC IP20; NEMA 1 "E" Housing Models: IEC IP65; NEMA 4X	
Operating Conditions	M-Hx and M-HxC models: -40 to +85 °C (-40 to +185 °F) (Electronics); -20 to +80 °C (-4 to +176 °F) (LCD) M-HxE models: -40 to +65 °C (-40 to +149 °F) (Electronics); -20 to +80 °C (-4 to +176 °F) (LCD) 95% maximum relative humidity (non-condensing) Radiated Immunity: 10 V/m (EN 61000-4-3)	
Shock and 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	
Certifications		



Sure Cross® DX99

Intrinsically Safe Star I/O Network Nodes



- 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
		10 V	DX99N9X1S2N0V2X0D1
		18 V	DX99N9X1S2N0V2X0D2
Discrete: Two inputs Analog: Two inputs (0-10 V)	2.4 GHz	10 V	DX99N2X1S2N0M2X0D1
		18 V	DX99N2X1S2N0M2X0D2
		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

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

Sure Cross® 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	Sure Cross Performance or Sure Cross DX80 Gateway required	
Power	3.6 V low power option from an internal battery	
Power Consumption	Application Dependent	
Environmental Rating	IEC IP68	
Certifications	DX99, Intrinsically Safe, Metal Housing <div style="display: flex; justify-content: space-between;"> <div> 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 LCIE/ATEX Zone 0 (Group IIC) and Zone 20 (Group II) II 1 GD Ex ia IIC T4 Ex iaD 20 IP68 T82°C </div> <div style="text-align: center;"> Certificate 2008243(LR 41887)  Certificate LCIE 08 ATEX 6098X  </div> </div>	

See Bannerengineering.com for more detailed specifications.





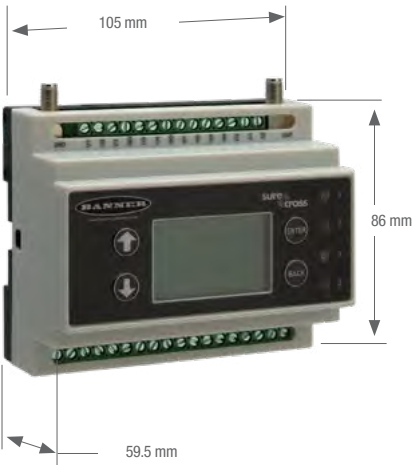
DXM100 Wireless Controller

Industrial Wireless Controller


- ISM radios available in 900 MHz and 2.4 GHz for local wireless network
- Converts Modbus RTU to Modbus TCP/IP or Ethernet I/P
- Logic controller can be programmed using action rules and text language methods
- Cellular connectivity
- Micro SD card for data logging
- Email and text alerts
- Local I/O options: universal inputs, NMOS outputs, and analog outputs
- Powered by 12 to 30 V dc, 12 V dc solar panel, or battery backup
- RS-232, RS-485, and Ethernet communications ports; and a USB configuration port
- LCD display for I/O information and user programmable LED's

DXM Controllers

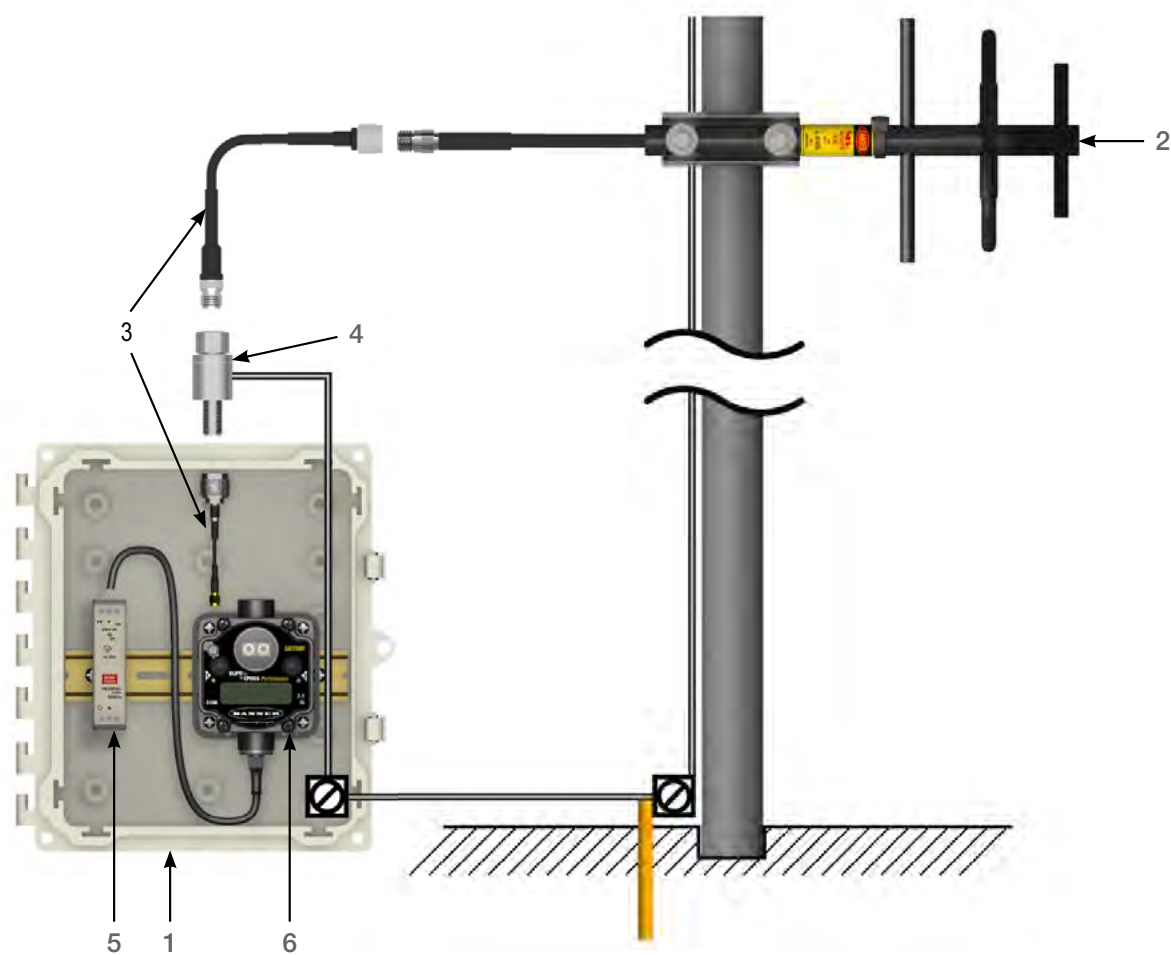
Description	Frequency	Models
DXM100 Controller, with DX80 Gateway, preconfigured as a protocol converter	900 MHz	DXM100-B1R1
DXM100 Controller, with DX80 Gateway, preconfigured as a protocol converter	2.4 GHz	DXM100-B1R3
DXM100 Controller with MultiHop Data Radio	900 MHz	DXM100-B1R2
DXM100 Controller with MultiHop Data Radio	2.4 GHz	DXM100-B1R4
DXM100 Controller with DX80 Gateway and CDMA cellular module, preconfigured as a protocol converter	900 MHz	DXM100-B1C1R1
DXM100 Controller with DX80 Gateway and CDMA cellular module, preconfigured as a protocol converter	2.4 GHz	DXM100-B1C1R2



DXM100 Controllers

Supply Voltage	12 to 30 V dc or 12 V dc solar panel and 12 V sealed lead acid battery	
Power Consumption	35 mA average at 12 V	
Solar Power Battery Charging	1 Amp maximum with 20 Watt solar panel	
Radio (ISM Band) Transmit Power	900 MHz at 1 Watt	2.4 GHz at 65 mW
Radio Range	900 MHz, 1 Watt: Up to 9.6 km (6 miles)	2.4 GHz, 65 mW: Up to 3.2 km (2 miles)
Minimum Separation Distance	900 MHz, 1 Watt: 4.57 m (15 ft)	2.4 GHz, 65 mW: 0.3 m (1 ft)
Antenna Connection	Ext. Reverse Polarity SMA, 50 Ohms Max Tightening Torque: 0.45 N-m (4 lbf-in)	
Radio Transmit Power	900 MHz, 1 Watt: 30 dBm (1 Watt) 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)
Compliance	900 MHz Compliance (1 Watt) FCC ID UE3RM1809: This device complies with FCC Part 15, Subpart C, 15.247 IC: 7044A-RM1809	2.4 GHz Compliance FCC ID UE300DX80-2400 - This device complies with FCC Part 15, Subpart C, 15.247 ETSI/EN: In accordance with EN 300 328: V1.8.1 (2012-04) IC: 7044A-DX8024
Spread Spectrum Technology	FHSS (Frequency Hopping Spread Spectrum)	
Logging	8 GB maximum; removable Micro SD card format	
Protocols	Modbus RTU Master/Slave, Modbus TCP, and Ethernet/IP	
Construction	Polycarbonate; DIN rail mount option	
Communication Hardware (RS-732)	4-wire full duplex; flow control -15 to +15 Volts signaling Baud rates: 9.6k, 19.2k (default), or 38.4k Data format: 8 data bits, no parity, 1 stop bit	
Communication Hardware (RS-485)	2-wire half duplex RS-485 Baud rates: 9.6k, 19.2k (default), or 38.4k Data format: 8 data bits, odd, even or no parity, 1 stop bit	
Universal Inputs	Discrete sinking/sourcing, 0 to 20 mA analog, 0 to 10 V analog, 10k thermistor, counter	
Courtesy Power	One; output at 5 volts , 500 mA maximum	
Switched Power Outputs	5 V/400 mA maximum; 16 V/125 mA maximum	
Environmental Rating	IP20	
Operating Conditions	-40 to +85 °C (-40 to +185 °F) (Electronics); -20 to +80 °C (-4 to +176 °F) (LCD) 95% maximum relative humidity (non-condensing) Radiated Immunity: 10 V/m, 80-2700 MHz (EN 61000-4-3)	
Shock and Vibration	IEC 68-2-6 and IEC 68-2-27 Shock: 30g, 11 millisecond half sine wave, 18 shocks Vibration: .5 mm p-p, 10 to 60 Hz	
Analog Outputs	0 to 20 mA or 0 to 10 V dc output Accuracy: 0.1% of full scale +0.01% per °C Resolution: 12 bit	
NMOS Outputs	Less than 1 A max current at 30 V dc ON-state saturation: less than 0.7 V at 20 mA ON condition: Less than 0.7 V Off condition: Open	
Certifications		

Accessories



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

(1) Enclosures	511
(2) Antennas	533
(3) Antenna Cables.....	534
(4) Surge Supressors.....	535
(5) Power Supplies	535
(6) Brackets	537
Cables	538
Cordsets.....	539
Hardware and Replacement Parts.....	541
Replacement Filters	541
Cable Glands and Plugs.....	542
Metal Housing Accessories	542

(1) Enclosures



Polycarbonate Enclosures

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

Swing Panel Kits

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

Back Panel Kits

BWA-BP66A	Back Panel, aluminum, 6 × 6 in
BWA-BP86A	Back Panel, aluminum, 8 × 6 in
BWA-BP108A	Back Panel, aluminum, 8 × 10 in
BWA-BP1210A	Back Panel, aluminum, 12 × 10 in
BWA-BP1412A	Back Panel, aluminum, 14 × 12 in
BWA-BP1614A	Back Panel, aluminum, 16 × 14 in
BWA-BP1816A	Back Panel, aluminum, 18 × 16 in

(1) Enclosures, continued



Fiberglass Enclosures

BWA-EF14128	Enclosure Fiberglass Hinged 14 × 12 × 8 in
BWA-EF1086	Enclosure Fiberglass Hinged 10 × 8 × 6 in
BWA-EF866	Enclosure Fiberglass Hinged 8 × 6 × 6 in
BWA-PA1412	Panel, 14 × 12 in
BWA-PA108	Panel, 10 × 8 in
BWA-PA86	Panel, 8 × 6 in
BWA-PM12	Pole Mount, 12 in
BWA-PM8	Pole Mount, 8 in
BWA-PM6	Pole Mount, 6 in

Mounting Accessories

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

DIN Rail Kits

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

DIN Rail Kits

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

(2) Antennas



Omni-Directional Antennas with RP-SMA Male Connections

BWA-902-C	900 MHz	2 dBi, Rubber swivel (ships with 900 MHz radios)
BWA-905-C		5 dBi, Rubber swivel
BWA-202-C	2.4 GHz	2 dBi, Rubber swivel, 3 1/4 in (ships with 2.4 GHz radios)
BWA-205-C		5 dBi, Rubber swivel, 6 1/2 in
BWA-207-C		7 dBi, Rubber swivel, 9 1/4 in
BWA-902-RA	900 MHz	2 dBi, Rubber fixed right-angle



BWA-201-001 2.4 GHz 1 dBi, Rubber, 1 inch tall

Omni-Directional Dome Antennas

BWA-902-D	900 MHz	2 dBi, 18 inch cable	RP-SMA Box Mount
BWA-202-D	2.4 GHz	2 dBi, 18 inch cable	RP-SMA Box Mount



Other

BWA-205-M	2.4 GHz	5 dBi, Magnetic whip antenna, 12 ft cable	RP-SMA Male
-----------	---------	---	-------------



(2) Antennas, continued



Omni-Directional Fiberglass Antennas with N-Type Female Connections

BWA-9O6-A	900 MHz	2 dBi, Rubber swivel (ships with 900 MHz radios)
BWA-2O8-A	2.4 GHz	8.5 dBi, Fiberglass, 24 in
BWA-2O6-A		6 dBi, Fiberglass, 16 in (shown)
BWA-9O6-AS	900 MHz	6 dBi, Fiberglass, 1/4 Wave, 23.6 in (1.3 inch diameter)
BWA-9O8-AS		8 dBi, Fiberglass, 3/4 Wave, 63 in (1.5 inch diameter)

Directional (Yagi) Antennas with N-Type Female Connection

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

(3) Antenna Cables



Antenna Cables: RP-SMA to RP-SMA

BWC-1MRSFRSB0.2	RG58, RP-SMA Male to RP-SMA Female Bulkhead, 0.2 m
BWC-1MRSFRSB1	RG58, RP-SMA Male to RP-SMA Female Bulkhead, 1 m
BWC-1MRSFRSB2	RG58, RP-SMA Male to RP-SMA Female Bulkhead, 2 m
BWC-1MRSFRSB4	RG58, RP-SMA Male to RP-SMA Female Bulkhead, 4 m
BWC-2MRSFRS3	LMR200, RP-SMA Male to RP-SMA Female, 3 m
BWC-2MRSFRS6	LMR200, RP-SMA Male to RP-SMA Female, 6 m
BWC-2MRSFRS9	LMR200, RP-SMA Male to RP-SMA Female, 9 m
BWC-2MRSFRS12	LMR200, RP-SMA Male to RP-SMA Female, 12 m

Antenna Cables: RP-SMA to N-Type

BWC-1MRSMN05	LMR100 RP-SMA to N-Type Male, 0.5 m
BWC-1MRSMN2	LMR100 RP-SMA to N-Type Male, 2 m

Antenna Cables: N-Type

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

(4) Surge Suppressors

**BWC-LFNBMN-DC**

Surge Suppressor, bulkhead, N-Type Female, N-Type Male, dc Blocking

**BWC-LMRSFRPB**

Surge Suppressor, bulkhead, RPSMA to RP-SMA

(5) Power Supplies

DC Power Supplies**PS24W**

DC Power Supply, 500 mA, 24 V dc, Demo kit power supply

**PSDINP-24-06**

DC Power Supply, 0.63 Amps, 24 V dc, with DIN Rail Mount, Class I Division 2 (Groups A, B, C, D) Rated

PSDINP-24-13

DC Power Supply, 1.3 Amps, 24 V dc, with DIN Rail Mount, Class I Division 2 (Groups A, B, C, D) Rated

PSDINP-24-25

DC Power Supply, 2.5 Amps, 24 V dc, with DIN Rail Mount, Class I Division 2 (Groups A, B, C, D) Rated

FlexPower Supplies and Replacement Batteries**DX81-LITH**

Battery Supply Module with mounting hardware

**DX81H**

Battery Supply Module with mounting hardware, for DX99 polycarbonate housing

DX81P6

Battery Supply Module, six "D" cells, with mounting hardware

**BWA-BATT-001**

Lithium "D" cell, single, for DX81-LITH and DX81H Battery Supply Module

BWA-BATT-006

Lithium "AA" cell, single, for Wireless Q45 Sensors for DX81x models

(5) Power Supplies, continued



Solar Panels

BWA-SOLAR PANEL 3W	Solar Panel, 12 V, 3 W, Multicrystalline, 188 × 195 × 15, Wall/ Pole clamp style mounting bracket included
BWA-SOLAR PANEL 5W	Solar Panel, 12 V, 5 W, Multicrystalline, 270 × 222 × 17, Wall/ Pole clamp style mounting bracket included
BWA-SOLAR PANEL 20W	Solar Panel, 12 V, 20 W, Multicrystalline, 573 × 357 × 30, “L” mounting bracket included
BWA-SOLAR CNTRL-12V	Solar Controller, 6 A Load Current 12 V System Voltage, recommended for 20 watts or less solar panel AND Sealed Lead Acid Battery (SLA)



Relays

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

(6) Brackets

Mounting Kit

BWA-HW-001	<ul style="list-style-type: none">• 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-in, SS (4)
------------	---

Brackets



SMBDX80DIN	<ul style="list-style-type: none">• Black reinforced thermoplastic bracket for mounting on a 35 mm DIN rail
------------	---



BWA-HW-034	<ul style="list-style-type: none">• DIN rail clip, black plastic• Used with the M-HBx MultiHop and -PBx Performance board modules
------------	--



Hole center spacing: A = 26.0, A to B = 13.0
Hole size: A = 26.8 x 7.0, B = ø 6.5, C = ø 19.0

SMBAMS18RA	<ul style="list-style-type: none">• Right-angle SMBAMS series bracket with 18 mm hole• Articulation slots for 90+° rotation• 12-ga. (2.6 mm) cold-rolled steel
------------	--



Hole center spacing: 35.1
Hole size: 25.4 x 5.3

DIN-35-70 = 70 mm	<ul style="list-style-type: none">• 35 mm DIN Rail
DIN-35-105 = 105 mm	
DIN-35-140 = 140 mm	

Cables

Ethernet Cables

Use a crossover cable to connect the GatewayPro or DX83 Ethernet Bridge to a host system without using an Ethernet switchbox or hub. When using a switchbox or hub, use a straight cable.

BWA-E2M	Ethernet cable, RSCD RJ45 440, 2 m
BWA-E8M	Ethernet cable, RSCD RJ45 440, 8 m
BWA-EX2M	Ethernet cable, crossover, RSCD RJ45CR 440, 2 m



Adapter Cables

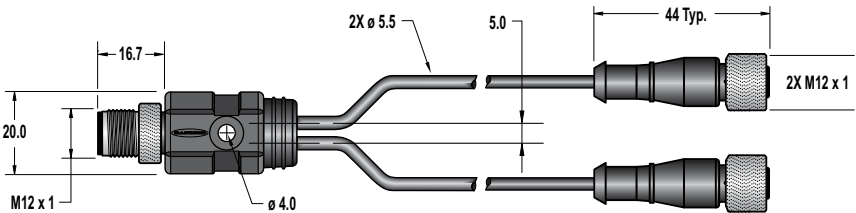
BWA-HW-006	Adapter cable, USB to RS-485, for use with the User Configuration Tool software (UCT)
BWA-UCT-900 (shown)	Adapter cable with power, USB to RS-485, for use with the User Configuration Tool software (UCT), supplies power to 1 Watt radios

Splitter Cables

Use **CSRB-M1250M125.47M125.73** to split power between two *FlexPower*® or solar powered devices. DO NOT use this cable to connect a *FlexPower* devices to a 10 to 30 V dc powered device.

Use **CSRB-M1253.28M1253.28M1253.28** to connect one *FlexPower* device (data radio, *FlexPowered* Gateway, etc) to two power sources, such as the *FlexPower* Solar Supply and **DX81P6** Battery Pack.

Model	Length	Style	Pinout
CSRB-M1250M125.47M125.73	Trunk: 0 m (male) Branches: 0.14 m and 0.22 m (female)	Straight	<div><div>Male</div><div>Female</div><div>1 = Brown 2 = White 3 = Blue 4 = Black 5 = Green/Yellow</div></div>
CSRB-M1253.28M1253.28M1253.28	Trunk: 1 m (female) Branches: 1 m (male)		

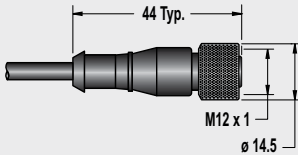
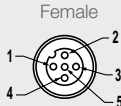
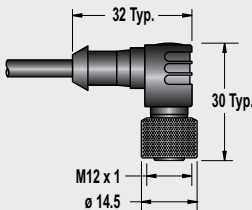


Cordsets

Euro-Style — Single-Ended

When facing the Node or Gateway toward you and the quick-disconnect connection is facing down, the right-angle cables exit to the right.

When using the *FlexPower*® Node with integrated battery, use a double-ended cordset. When using a *FlexPower* Node with external power supply, use a single-ended cordset. If using the communication lines, the cable length cannot exceed 3 meters (10 ft).

Model	Length	Style	Dimensions	Pinout	
MQDC1-501.5	0.50 m (1.5 ft)	Straight		<p>Female</p>  <p>1 = Brown 2 = White 3 = Blue 4 = Black 5 = Gray</p>	
MQDC1-506	1.83 m (6 ft)				
MQDC1-515	4.57 m (15 ft)				
MQDC1-530	9.14 m (30 ft)				
MQDC1-506RA	1.83 m (6 ft)	Right-Angle			
MQDC1-515RA	4.57 m (15 ft)				
MQDC1-530RA	9.14 m (30 ft)				

Model	Length	Style	Description
BWA-QD5.5	—	—	Prewired 5-pin Euro connector, 1/2-14 NBSM
BWA-QD8.5	—	—	Prewired, 8-pin Euro connector, 1/2-14 NBSM
BWA-QD12.5	—	—	Prewired 12-pin Euro connector, 1/2-14 NBSM
FIC-M12F4	—	Straight	Euro-Style Field-Wireable Connector 4-pin Female Straight
MQDMC-401	0.5 m	Straight	Cordset, 4-pin Euro-style, single ended, male, longer pigtails for DX80...C models

Euro-Style — Double-Ended

When using the *FlexPower*® Node with integrated battery, use a double-ended cordset. When using a *FlexPower* Node with external power supply, use a single-ended cordset. If using the communication lines, the cable length cannot exceed 3 meters (10 feet).

Model	Length	Style	Dimensions	Pinout
DEE2R-51D	0.31 m (1 ft)	Female Straight/ Male Straight		 1 = Brown 2 = White 3 = Blue 4 = Black 5 = Green/Yellow
DEE2R-53D	0.91 m (3 ft)			
DEE2R-58D	2.44 m (8 ft)			

Other Cordsets

BWA-RIBBON-001	Ribbon cable, 20-pin DBL socket
BWA-HW-010	Cable, <i>FlexPower</i> Current Monitoring

Hardware and Replacement Parts

Model	Description
BWA-HW-002	DX80 Access Hardware Kit: Plastic threaded plugs, PG-7 (4) Nylon gland fittings, PG-7 (4) Hex nuts, PG-7 (4) Plug, 1/2-in NPT Nylon gland fitting, 1/2-in NPT
BWA-HW-003	PTFE Tape, 1/4-in wide, 600-in long
BWA-HW-004	Replacement Seals: O-ring, rotary access cover, PG21 (2) O-ring, body gasket (2) Access cover, rotary dials, clear plastic (2)
BWA-HW-009	Solar assembly hardware pack, includes brackets, bolts, and set screws
BWA-HW-007	Housing Kit, DX80, top and bottom, 10 pieces
BWA-HW-008	Housing Kit, DX81, top and bottom, 10 pieces
BWA-HW-044	Terminal header for the MultiHop Ethernet Data Radio
BWA-HW-011	Terminal Block Headers, IP20, 2 pack
BWA-HW-012	DX99 Antenna Extension Pack: Screw, M4-0.7 x 20, pan head, black steel Flexible Antenna Cable, 12 in, SMA male to SMA female
BWA-HW-032	Access hardware for the E housing, one 1/2-in plug, one 1/2-in gland
BWA-HW-037	Clear plastic retaining ring for DX99 metal housings, 10 pack

Replacement Filters



Model	Description
FTH-FIL-001	Aluminum grill filter cap (factory default, ships with M12FT*Q sensors)
FTH-FIL-002	Stainless steel, sintered to 10 micrometer porosity (for high dust environments)

Cable Glands and Plugs

Model	Description
BWA-HP5-10	Dummy Hole Plugs, 1/2-in NPT, 10 pieces
BWA-HW-031	Vent Plug, 1/2-in NPT, IP67
BWA-CG.5-10	Cable Glands, 1/2-in NPT, Cordgrip for 3 holes of 2.8 to 5.6 mm diameter, 10 Pack
BWA-CG.5-3X5.6-10	Solar assembly hardware pack, includes brackets, bolts, and set screws
BWA-CG.5-2X2.5-10	Cable Glands, 1/2-in NPT, Cordgrip for 2 holes of 1.2 to 2.5 mm diameter, 10 Pack
BWA-CG.5-6X4.0-10	Cable Glands, 1/2-in NPT, Cordgrip for 6 holes of 2 to 4 mm diameter, 10 Pack
BWA-CG.5-6X3.0-10	Cable Glands, 1/2-in NPT, Cordgrip for 6 holes of 1.5 to 3 mm diameter, 10 Pack

Metal Housing Accessories



Model	Description
BWA-HW-016	Antenna Feedthrough, Stainless Steel, 1/2-in NPT
BWA-HW-017	Antenna Feedthrough, Stainless Steel, 3/4-in NPT
BWA-HW-012	DX99 Antenna Extension Pack (M4-0.7 × 20 black steel pan head screw, flexible antenna cable 12-in SMA male to SMA female)
BWA-HW-037	Clear plastic retaining ring for DX99 metal housings (10 pack)
BWA-AXFS0130	AXF™ Explosion-Proof Antenna Coupler



Omni-Directional Dome Antennas

Models	Frequency	Description	Connection
BWA-9O2-001	900 MHz	2 dBi, 18 inch cable	1/2-in SS NPT Port
BWA-9O2-002			3/4-in SS NPT Port
BWA-2O2-001	2.4 GHz		1/2-in SS NPT Port
BWA-2O2-002			3/4-in SS NPT Port

OTHER AVAILABLE MODELS



Q45 Wireless

see website

Sure Cross® Wireless Q45 Sensors combine the best of Banner's flexible Q45 sensor family with its reliable, field-proven, Sure Cross® wireless architecture.