

# DXM150-B1 Wireless Controller



## Datasheet

The DXM150-B1 Wireless Controller is a communications gateway that interfaces local serial ports, local I/O ports, and local ISM radio devices to the Internet using either a cellular connection or a wired network connection.



- Powered by 12 to 30 V dc, 12 V dc solar panel, or battery backup
- RS-232, RS-485, Ethernet, and USB communication ports
- Local I/O options: isolated discrete inputs, universal inputs, SPDT (Form C) relay outputs, NMOS outputs, and Analog outputs (0 to 10 V)
- Display options include an interactive LCD display for I/O information and user programmable LED functions
- ISM radios available in either a 900 MHz band or 2.4 GHz band for local wireless networks
- Internal cellular radio



**WARNING: Not To Be Used for Personnel Protection**

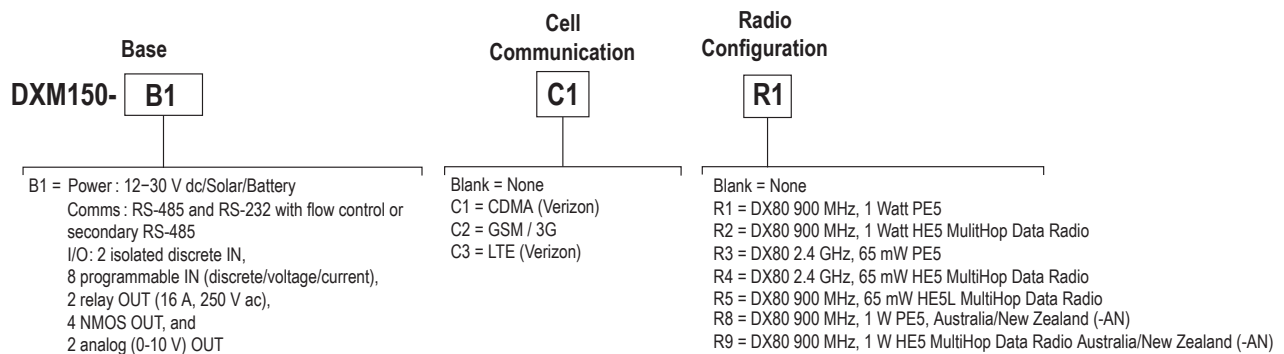
Never use this device as a sensing device for personnel **protection**. Doing so could lead to serious injury or death. This device does not include the self-checking redundant circuitry necessary to allow its use in personnel safety applications. A sensor failure or malfunction can cause either an energized or de-energized sensor output condition.



**CAUTION: Electrostatic Discharge (ESD)**

ESD **Sensitive** Device. Use proper handling procedures to prevent ESD damage to these devices. The module does not contain any specific ESD protection beyond the structures contained in its integrated circuits. Proper handling procedures should 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.

## Models



Some example models include, but are not limited to, the following:

Models	Description
DXM150-B1C1	DXM150-B1 Wireless Controller with CDMA cellular radio
DXM150-B1R1	DXM150-B1 Wireless Controller with DX80 ISM 900 MHz radio
DXM150-B1R2	DXM150-B1 Wireless Controller with Data Radio ISM 900 MHz radio
DXM150-B1C1R1	DXM150-B1 Wireless Controller with CDMA cellular radio and DX80 ISM 900 MHz radio
DXM150-B1C1R2	DXM150-B1 Wireless Controller with CDMA cellular radio and MultiHop ISM 900 MHz radio



## DXM150 Documentation List

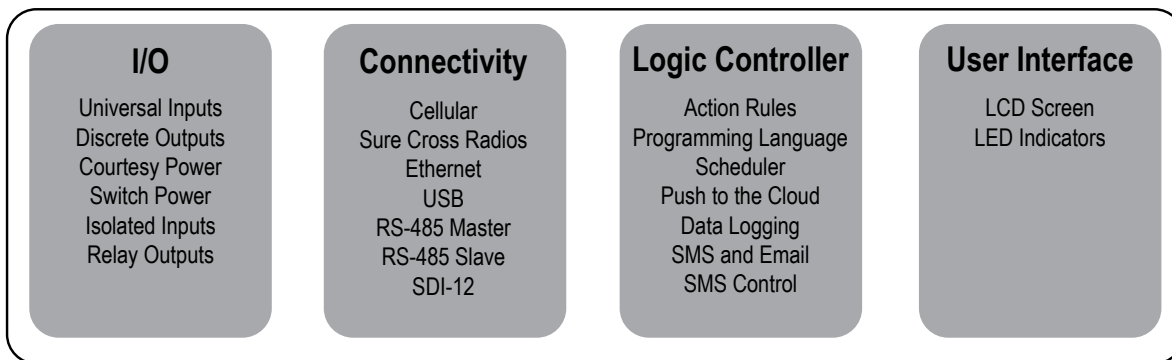
For more information about the DXM Wireless Controller family of products, please see additional documentation and videos on the Banner website: [www.bannerengineering.com/wireless](http://www.bannerengineering.com/wireless).

- DXM Wireless Controller Sell Sheet, p/n [194063](#)
- DXM150-B1 Wireless Controller Datasheet, p/n [178136](#)
- DXM150-B2 Wireless Controller Datasheet, p/n [195952](#)
- DXM150-Bx Wireless Controller Instruction Manual, p/n [190038](#)
- DXM150-S1 Modbus Slave Datasheet, p/n [160171](#)
- DXM150-Sx Modbus Slave Instruction Manual, p/n [195455](#)
- DXM ScriptBasic Instruction Manual, p/n [191745](#)
- DXM Controller Configuration Quick Start, p/n [191247](#)
- DXM Configuration Tool software
- DXM Configuration Tool Instruction Manual, p/n [158447](#)
- DXM EDS Configuration file
- Tech Note: Activating and Provisioning Cellular Service
- Additional technical notes and videos

Technical notes, configuration examples, and ScriptBasic program examples are available at <http://www.bannerengineering.com>.

## DXM150-B1 System Overview

Banner's DXM Logic Controller integrates Banner's wireless radio, cellular connectivity, and local I/O to provide a platform for the Industrial Internet of Things (IIoT). Various combinations of I/O and connectivity are available based on the different models.



**Inputs/Outputs**—On-board universal and programmable I/O ports connect to local sensors, indicators, and control equipment.

- Universal Inputs
- Discrete outputs
- Courtesy power
- Switch power
- Isolated inputs
- Relay outputs
- Battery backup
- Solar controller

**Connectivity**—The DXM Wireless Controller's wired and wireless connectivity options make it easy to share data between local and remote equipment. The cellular modem option eliminates the need for IT infrastructures to connect remote equipment for sensing and control. The integrated Sure Cross® wireless radio enables Modbus connectivity to remote sensors, indicators, and control equipment.

### Wired **Connectivity**

Ethernet: Modbus TCP or Ethernet/IP  
 Field Bus: Modbus RS-485 Master/Slave or CAN

### Wireless **Connectivity**

Sure Cross Wireless Radio: DX80 900 MHz, DX80 2.4 GHz,  
 MultiHop 900 MHz, or MultiHop 2.4 GHz  
 Cellular modem: CDMA (Verizon), GSM 3G, LTE (Verizon)

**Logic Controller**—Program the DXM Wireless Controller's logic controller using action rules and/or ScriptBasic language, which can execute concurrently. The control functions allow freedom when creating custom sensing and control sequences. The logic controller supports the Modbus protocol standards for data management, ensuring seamless integration with existing automation systems.

**Action Rules**

- Supports simple logic, arithmetic and thresholding
- Low complexity solutions
- SMS text message Notifications
- E-mail Notifications
- Push data on conditions
- Text Programming Language
  - ScriptBasic
  - Medium complexity solutions

**Scheduler**

- Time/calendar-based events
- Astronomical clock
- Data Logging
  - Cyclic Data/Event logging
  - E-mail log files
- SMS Commanding
  - Read/Write Local Registers
  - Force a push to the cloud
  - Reboot controller

User Interface—A simple user interface consists of an LCD screen and four LED indicators. Use the LCD to access system status and setup, view user selectable events or data, and to bind and perform site surveys for Sure Cross radios. Configure the user programmable LEDs to indicate the status of the DXM Wireless Controller, processes, or equipment.

- User programmable LCD
  - Bind Sure Cross Radios
  - Site Survey
  - View Sensor Information
  - System Status

**User Defined LED indicators**

## Applications Overview

---

The DXM150-B1 Wireless Controller is ideal for smart factory and facilities applications, including:

- Productivity solutions, such as
  - Call for parts, service, or maintenance
  - Pick-to-light
  - Tank level monitoring
- Predictive maintenance and continuous monitoring using
  - Vibration and temperature monitoring
  - Non-contact temperature monitoring
- Environmental monitoring and control, such as
  - Temperature and humidity monitoring

The DXM150-B1 Wireless Controller can provide visual indication using indicator lights, send text or email alerts, collect data, and interface with automation systems.

## Specifications

---

Supply Voltage 12 to 30 V dc (use only with a suitable Class 2 power supply (UL) or a SELV (CE) power supply) or 12 V dc solar panel and 12 V sealed lead acid battery	Counters, Synchronous 32-bits unsigned 10 ms clock rate minimum
Radio (ISM Band) Transmit Power 900 MHz at 1 Watt 2.4 GHz at 65 mW	Discrete Inputs Optically isolated AC input type Input to output isolation: 2.5 kV
900 MHz Compliance (1 Watt) FCC ID UE3RM1809: This device complies with FCC Part 15, Subpart C, 15.247 IC: 7044A-RM1809	Universal Inputs Sinking/Sourcing discrete, 4–20 mA analog, 0–10 V analog, counter, and temperature 10 kOhm thermistor
2.4 GHz Compliance FCC ID UE300DX80-2400 - This device complies with FCC Part 15, Subpart C, 15.247 ETSI EN 300 328 V1.8.1 (2012-06) IC: 7044A-DX8024	Analog Outputs (DAC) 0 to 10 V dc output Accuracy: 0.1% of full scale +0.01% per °C Resolution: 12-bit
Indicators Four LEDs, four control buttons, one LCD	Discrete Output <b>Rating</b> (NMOS) 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
	Relay Outputs SPDT (Form C) relay 250 V ac, 16 A

## Accessories

For a complete list of all the accessories for the Sure Cross wireless product line, please download the [Accessories List](#) (p/n b\_3147091)

### Cordsets

MQDC1-506—5-pin M12/Euro-style, straight, single ended, 6 ft  
 MQDC1-530—5-pin M12/Euro-style, straight, single ended, 30 ft  
 MQDC1-506RA—5-pin M12/Euro-style, right-angle, single ended, 6 ft  
 MQDC1-530RA—5-pin M12/Euro-style, right-angle, single ended, 30 ft

### Static and Surge Suppressor

BWC-LFNBMN-DC—Surge Suppressor, bulkhead, N-Type, dc Blocking, N-Type Female, N-Type Male

### Short-Range Omni Antennas

BWA-202-D—Antenna, Dome, 2.4 GHz, 2 dBi, RP-SMA Box Mount  
 BWA-902-D—Antenna, Dome, 900 MHz, 2 dBi, RP-SMA Box Mount  
 BWA-902-RA—Antenna, Rubber Fixed Right Angle, 900 MHz, 2 dBi, RP-SMA Male Connector

### Medium-Range Omni Antennas

BWA-905-C—Antenna, Rubber Swivel, 900 MHz 5 dBi, RP-SMA Male Connector  
 BWA-205-C—Antenna, Rubber Swivel, 2.4 GHz 5 dBi, RP-SMA Male Connector

### Enclosures and DIN Rail Kits

[BWA-AH864](#)—Enclosure, Polycarbonate, with Opaque Cover, 8 × 6 × 4  
[BWA-AH1084](#)—Enclosure, Polycarbonate, with Opaque Cover, 10 × 8 × 4  
[BWA-AH12106](#)—Enclosure, Polycarbonate, with Opaque Cover, 12 × 10 × 6  
 BWA-AH8DR—DIN Rail Kit, 8", Includes 2 Trilobular/Self-Threading Screws, and DIN Rail  
 BWA-AH10DR—DIN Rail Kit, 10", Includes 2 Trilobular/Self-Threading Screws, and DIN Rail  
 BWA-AH12DR—DIN Rail Kit, 12", Includes 2 Trilobular/Self-Threading Screws, and DIN Rail

### Misc Accessories

BWA-CG-5-3X5-6-10—Cable Glands: 1/2-inch NPT, Cordgrip for 3 holes of 2.8 to 5.6 mm diam, 10 Pack  
 BWA-HW-052—Cable Gland Pack: 1/2-inch NPT gland, 1/2-inch NPT multi-cable gland, and 1/2-inch NPT vent plug

### Antenna Cables

BWC-1MRSMN05—LMR100 RP-SMA to N-Type Male, 0.5 m  
 BWC-2MRSFRS6—LMR200, RP-SMA Male to RP-SMA Female, 6 m  
 BWC-4MNFN6—LMR400 N-Type Male to N-Type Female, 6 m

### Long-Range Omni Antennas

BWA-908-AS—Antenna, Fiberglass, 3/4 Wave, 900 MHz, 8 dBi, N-Type Female Connector  
 BWA-208-A—Antenna, Fiberglass, 2.4 GHz, 8 dBi, N-Type Female Connector

### Long-Range Yagi Antennas

BWA-9Y10-A—Antenna, 900 MHz, 10 dBd, N-Type Female Connector

### Power Supplies

[PSD-24-4](#)—DC Power Supply, Desktop style, 3.9 A, 24 V dc, Class 2, 4-pin M12/Euro-style quick disconnect (QD)  
[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  
[BWA-SOLAR PANEL 20W](#)—

## 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. A list of approved countries appears in the *Radio Certifications* section of the product manual. 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. Consult with Banner Engineering Corp. if the destination country is not on this list.

## 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.

THIS LIMITED WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES WHETHER EXPRESS OR IMPLIED (INCLUDING, WITHOUT LIMITATION, ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE), AND WHETHER ARISING UNDER COURSE OF PERFORMANCE, COURSE OF DEALING OR TRADE USAGE.

This Warranty is exclusive and limited to repair or, at the discretion of Banner Engineering Corp., replacement. IN NO EVENT SHALL BANNER ENGINEERING CORP. BE LIABLE TO BUYER OR ANY OTHER PERSON OR ENTITY FOR ANY EXTRA COSTS, EXPENSES, LOSSES, LOSS OF PROFITS, OR ANY INCIDENTAL, CONSEQUENTIAL OR SPECIAL DAMAGES RESULTING FROM ANY PRODUCT DEFECT OR FROM THE USE OR INABILITY TO USE THE PRODUCT, WHETHER ARISING IN CONTRACT OR WARRANTY, STATUTE, TORT, STRICT LIABILITY, NEGLIGENCE, OR OTHERWISE.

Banner Engineering Corp. reserves the right to change, modify or improve the design of the product without assuming any obligations or liabilities relating to any product previously manufactured by Banner Engineering Corp. Any misuse, abuse, or improper application or installation of this product or use of the product for personal protection applications when the product is identified as not intended for such purposes will void the product warranty. Any modifications to this product without prior express approval by Banner Engineering Corp will void the product warranties. All specifications published in this document are subject to change; Banner reserves the right to modify product specifications or update documentation at any time. Specifications and product information in English supersede that which is provided in any other language. For the most recent version of any documentation, refer to:

[www.bannerengineering.com](http://www.bannerengineering.com).