

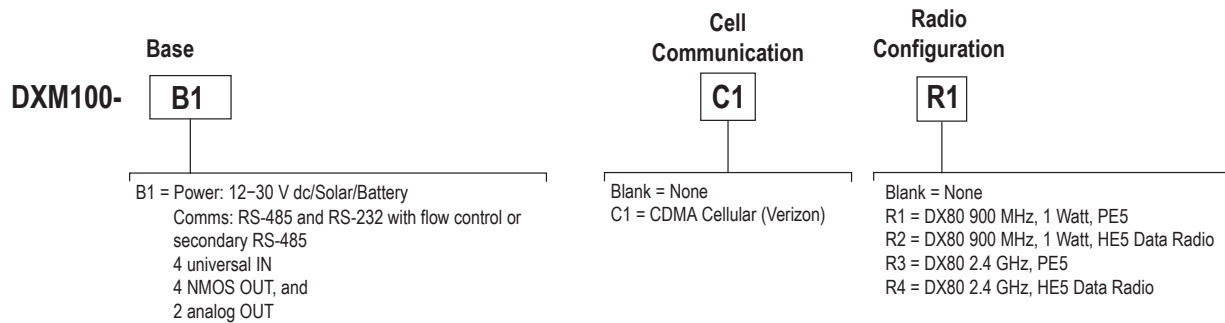
Datasheet

The DXM100-B1 Wireless Controller is an industrial wireless controller that facilitates Industrial Internet of Things (IIoT) applications. As a communications gateway, it interfaces local serial ports, local I/O ports, and local ISM radio devices to the internet using either a cellular connection or a wired Ethernet network connection.



- Sure Cross® DX80 Wireless Gateway or MultiHop radio with 900 MHz or 2.4 GHz ISM bands available
- Logic controller with action rules and ScriptBasic programming
- Cellular radio Internet connectivity
- Automation protocols include Modbus TCP, Modbus RTU, and EtherNet/IP™
- Secure email and text Internet messaging for alarms, alerts, and data log files
- Data logging with removable SD card
- Interactive programmable user interface with LCD and LED indicators
- Universal, on-board I/O with analog and discrete I/O
- Industry standard RS-485, Ethernet, and USB communication ports
- Multiple managed power options with battery backup

Models	Description
DXM100-B1R1	DXM100-B1 Wireless Controller with DX80 ISM 900 MHz radio
DXM100-B1R2	DXM100-B1 Wireless Controller with DX80 ISM 900 MHz MultiHop radio
DXM100-B1R3	DXM100-B1 Wireless Controller with DX80 ISM 2.4 GHz radio
DXM100-B1R4	DXM100-B1 Wireless Controller with DX80 ISM 2.4 GHz MultiHop radio
DXM100-B1C1R1	DXM100-B1 Wireless Controller with Cellular CDMA and DX80 ISM 900 MHz radio
DXM100-B1C1R2	DXM100-B1 Wireless Controller with Cellular CDMA and DX80 ISM 900 MHz MultiHop 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.



DXM Documentation

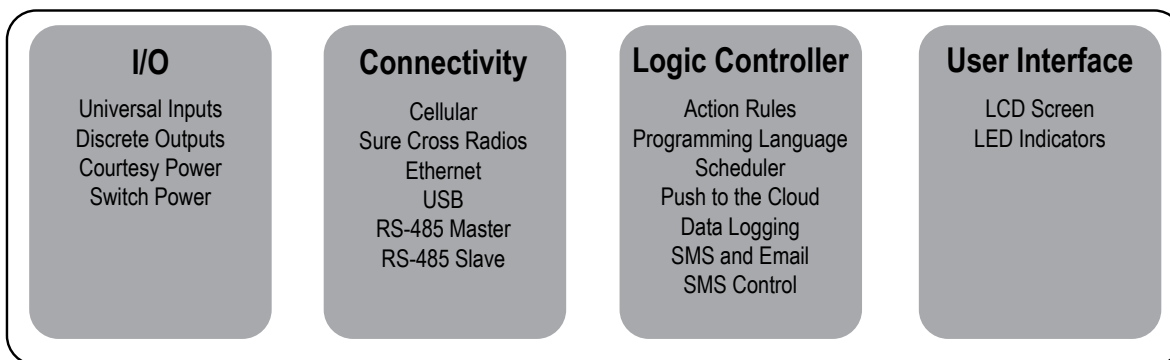
For more information about the DXM Controller family of products, please see additional documentation and videos on the Banner website: www.bannerengineering.com/en-US/wireless/surecross_web_dxm.

- DXM100 Sell Sheet, p/n [194063](#)
- DXM100-B1 Controller Datasheet, p/n [186724](#)
- DXM100 Controller Instruction Manual, p/n [190037](#)
- 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>.

DXM 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).



I 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
- Battery backup
- Solar controller

Connectivity—The DXM 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) or GSM

Logic Controller—Program the DXM 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 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 DXM100-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 DXM100-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 or
- 12 V dc solar panel and 12 V sealed lead acid battery

Courtesy Power Out

- One output at 5 Volts, 500 mA maximum
- No short circuit protection

Switched Power Outputs

- Two outputs at 5 or 16 Volts
- 5 V: 400 mA maximum
- 16 V: 125 mA maximum

Power Consumption

- 35 mA average at 12 Volts

Radio (ISM Band) Transmit Power

- 900 MHz at 1 Watt
- 2.4 GHz at 65 mW

Radio Range¹

- 900 MHz, 1 Watt: Up to 9.6 km (6 miles)
- 2.4 GHz, 65 mW: Up to 3.2 km (2 miles)

Minimum Radio Separation Distance

- 900 MHz, 1 Watt: 4.57 m (15 ft)
- 2.4 GHz, 65 mW: 0.3 m (1 ft)

Communication Hardware (RS-232)

- Baud rate: 9.6k or 19.2k (default)
- Data format: 8 bits; odd, even, or no parity; 1 stop bit

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

Counters, Synchronous

- 32-bits unsigned
- 10 ms clock rate minimum

Universal Inputs

- Sinking/Sourcing discrete, 4–20 mA analog, 0–10 V analog, counter, and temperature 10 kOhm thermistor

Operating Conditions²

- 40 °C to +85 °C (–40 °F to +185 °F) (Electronics); –20 °C to +80 °C (–4 °F to +176 °F) (LCD)
- 95% maximum relative humidity (non-condensing)
- Radiated Immunity: 10 V/m (EN 61000-4-3)

Shock and Vibration

- 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

Solar Power Battery Charging

- 1 Amp maximum with 20 Watt solar panel

Security Protocols

- VPN, SSL, and HTTPS

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

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 300 328 V1.8.1 (2012-06)
- 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)

Logging

- 8 GB maximum; removable Micro SD card format

Communication Protocols

- Modbus RTU Master/Slave, Modbus/TCP, and Ethernet/IP

Construction

- Polycarbonate; DIN rail mount option

Analog Outputs (DAC)

- 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

Environmental Rating

- IEC IP20

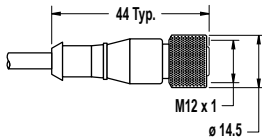
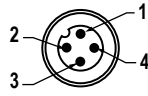
Certifications



¹ Radio range is with the 2 dB antenna that ships with the product. High-gain antennas are available, but the range depends on the environment and line of sight. Always verify your wireless network's range by performing a Site Survey.

² Operating the devices at the maximum operating conditions for extended periods can shorten the life of the device.

Accessories

4-Pin Threaded M12/Euro-Style Cordsets				
Model	Length	Style	Dimensions	Pinout (Male)
MQDMC-401	0.3 m (1 ft)	Straight		 <p>1 = Brown 2 = White 3 = Blue 4 = Black</p>

Power Supplies		
Models	Description	Datasheet
PSD-24-4	DC Power Supply, Desktop style, 3.9 A, 24 V dc, Class 2, 4-pin M12/Euro-style quick disconnect (QD)	173620
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	180340

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.

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