



more sensors, more solutions



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Kit Contents



DXM Wireless Gateway

Expedite your Industrial Internet of Things (IIoT) solution with a powerful wireless gateway that is available in an industry-hardened package for tough environments or a DIN rail version for factory floor enclosures.

The DXM Gateway offers seamless connectivity by creating a robust wireless network that will host the sensor radios used to acquire and transmit data from assets within the industrial application. The on-board display is used to bind the radios to the wireless network while pre-configured Ethernet communication delivers the data to Banner's Cloud software.

Authorization Card

Express activation and connectivity.

Our Direct-to-Cloud solution is pre-configured with a unique code generated for each individual kit. All kits include a 90-day prepaid trial account for Banner Cloud Data Services.



Power Supply

Eliminates wiring and provides immediate power.

A wall mount power supply is provided to get your system running immediately. A multi-blade outlet plug and 100-240 V AC 50/60 Hz input provides a suitable power source for any application.



Q45 Sensor Nodes (sold separately)

Q45 Sensor Nodes are self-contained wireless solutions for battery powered monitoring.

Q45 Series Wireless Nodes combine a wireless ISM radio, sensor, and battery power supply in one easy-to-deploy device that monitors assets and equipment in remote and hard-to-access locations.

Measure phenomena such as rotary equipment vibration, temperature and relative humidity, material levels, and pressure with industrial grade sensors. The Banner Cloud ID™ Kit is pre-configured to process data from up to 40 of these devices, which allows you to scale the system and adapt or personalize for your application with additional sensors.

Sensor Nodes to Customize your Banner Cloud ID™ Kit

Use the simple binding process to join up to 40 Sensor Nodes per Gateway that monitor tank level, ambient temperature and humidity, the health of rotating machines and pressurized systems.

Radio Frequency of compatible sensors must match the radio frequency of the DXM1200 or DXM700 Controller (or some other designator).



Banner Engineering has hundreds of sensor solutions to meet your needs. Please visit BannerEngineering.com to discover the right solution for your specialized applications.



All-in-One Vibration Sensor Node

Vibration and temperature sensors that monitor the health and performance of motors, pumps, and similar equipment with rotating motion; mounting kits with magnetic and non-magnetic brackets are available

Radio Frequency	Power Supply	Inputs	Models
900 MHz ISM Band	C Cell Lithium Battery	Vibration and temperature detection	DX80N9Q45VAC
2.4 GHz ISM Band			DX80N2Q45VAC



Wireless Node and Compact Vibration Sensor (must be purchased together)

Communication	Radio Frequency	Power Supply	Inputs	Models
ISM Radio Band	900 MHz	D Cell Lithium Battery	Vibration and temperature detection	DX80N9Q45VTPD
	2.4 GHz			DX80N2Q45VTPD
1-Wire Serial	—	—		QM30VT1 QM30VT1-SS*

*316 Stainless Steel Model



All-in-One Temperature and Humidity Sensor Node

Temperature and humidity wireless node monitors environmental conditions in a variety of applications, such as refrigerators or chillers, warehouses, cleanrooms, incubators, storage rooms, and distribution centers

Radio Frequency	Measurement Range	Inputs	Models
900 MHz ISM Band	−40 to +85 °C (−40 to +185 °F)	Temperature and relative humidity (%)	DX80N9Q45THA
2.4 GHz ISM Band	0 to 100% Relative Humidity		DX80N2Q45THA



All-in-One Temperature Probe Sensor Node

Thermistor nodes measure temperature in key areas or processes like air- and liquid- handling applications

Radio Frequency	Measurement Range	Inputs	Models
900 MHz ISM Band	−20 to +105 °C (−4 to +221 °F)	Temperature	DX80N9Q45TA
2.4 GHz ISM Band			DX80N2Q45TA



All-in-One Dual Temperature Probe Sensor Node

Radio Frequency	Measurement Range	Inputs	Models
900 MHz ISM Band	−20 to +105 °C (−4 to +221 °F)	Temperature	DX80N9Q45DT
2.4 GHz ISM Band			DX80N2Q45DT

All models include a battery of respective size. To order an integrated battery model without the battery, add a NB to the model number.



All-in-One Ultrasonic Sensor Node

Ultrasonic sensor nodes monitor the level or position of fluid or dry assets in tanks, totes, and containers

Radio Frequency	Ultrasonic input Range and Frequency	Inputs	Models
900 MHz ISM Band	Range: 100 mm to 1 m (3.94 in to 39.4 in) Frequency: 240 kHz	One Ultrasonic Input One Thermistor Input	DX80N9Q45UAA
2.4 GHz ISM Band			DX80N2Q45UAA
900 MHz ISM Band	Range: 300 mm to 3 m (11.8 in to 118 in) Frequency: 114 kHz		DX80N9Q45UAC
2.4 GHz ISM Band			DX80N2Q45UAC



Wireless Node and Quick-Disconnect Pressure Sensor (must be purchased together)

Wireless node and pressure transducer accessories measure air, gas, and fluid pressure of systems and equipment

Communication	Pressure Range	Inputs	Models
900 MHz ISM Frequency Band	Universal	Pressure	DX80N9Q45UPSD
2.4 GHz ISM Frequency Band			DX80N2Q45UPSD
Analog Voltage	0-50 PSI		BWA-PRESSURE-SENSOR-50
	0-150 PSI		BWA-PRESSURE-SENSOR-150
	0-500 PSI		BWA-PRESSURE-SENSOR-500
	0-3000 PSI		BWA-PRESSURE-SENSOR-3000



Wireless Node and Quick-Disconnect Differential Pressure Sensor (must be purchased together)

Wireless node and differential pressure accessories provide the ability to monitor low pressure applications such as filter and vacuum lines, HVAC and duct pressure, dust collectors, clean rooms, fume hoods, and air flow

Communication	Pressure Range	Inputs	Models
900 MHz ISM Frequency Band	Universal	Low pressure differential sensor	DX80N9Q45DPSD
2.4 GHz ISM Frequency Band			DX80N2Q45DPSD
1-Wire Serial	±1 inches of water column		QM42-DPS1-1Q
	±5 inches of water column		QM42-DPS5-1Q
	±20 inches of water column		QM42-DPS20-1Q



All-in-One Current Sensor Node

Wireless node uses a current transformer to measure current draw, helping to reveal issues with critical motor performance

Radio Frequency	Measurement Range	Inputs	Models
900 MHz ISM Band	0-20 or 0-150 Amps	Amperage (Two Current Transformers Included)	DX80N9Q45CT
2.4 GHz ISM Band	0-20 or 0-150 Amps		DX80N2Q45CT

Configuring the System

1 Supply power to all devices

The Banner Cloud ID™ Kit arrives with a DC power supply to get the system operating quickly. Unless specified otherwise, the Q45 Wireless Nodes arrive with batteries included.

DXM Wireless Gateway

1. Connect the power supply to the DXM using the Euro-style or barrel jack connector of the cable assembly.
2. Insert the wall plug end of the power supply into a power outlet using the appropriate plug adapter for your region.

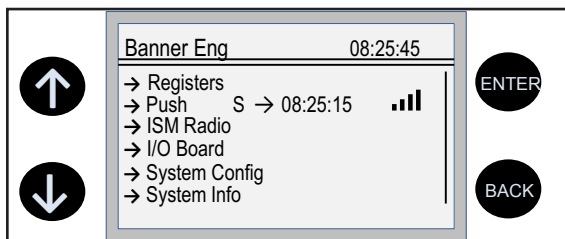
Q45 Wireless Sensor Nodes

1. Loosen the clamp plate on the top of the Q45 and lift the cover.
2. Slide the battery holder out of the Q45 housing.
3. Use two 3.6 V AA, one 3.6 V C-cell, or one 3.6 V D-cell lithium batteries (device dependent).
4. Verify the positive and negative terminals of each battery align to the positive and negative terminals of the battery holder mounted within the case. Caution: There is a risk of damage if the battery is installed incorrectly.
5. Slide the board containing the batteries back into the Q45 housing and verify the arrows on the board are pointing down into the housing. If the device does not automatically power on, press the button down for 5 seconds or until the LED starts flashing red.

The LED flashes red every three seconds to indicate the device is ready. DO NOT fasten the lid closed until instructed.

2 Form the Sensor Network

The Banner Cloud ID™ Kit is specially designed to offer easy binding of sensor radios to the wireless network. Use the DXM's on-board LCD, buttons, and menu system to complete this process. Follow these instructions to bind each Q45 Sensor Node.



The top-level menu always displays the time in a 24-hour format.

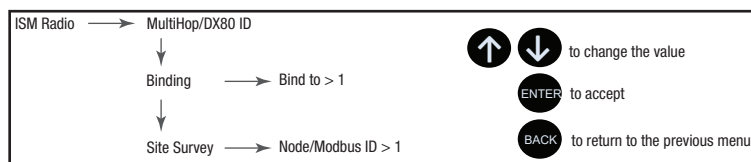
- The up and down arrows scroll through display items.
- The enter button selects the highlighted items on the display
- The back button returns to a previous menu option.

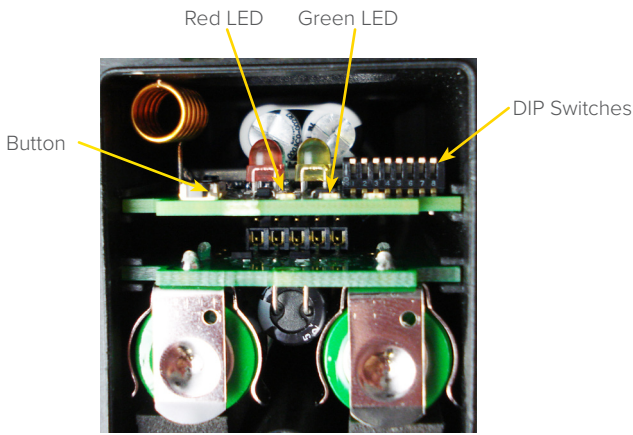
In the left column, an arrow indicates the menu has sub-menus. The right column shows a vertical line with an arrow at the bottom if the user can scroll down to see more menu items.

Enter Binding Mode on the DXM

Before beginning the binding procedure, verify power is applied to all devices. Separate DXM and Sensor Node radios by a minimum of 4.5 m (15 ft) when running the binding procedure. If multiple DXMs are available, put only one into binding mode at a time to prevent a Sensor Node from binding to an undesired network.

1. On the DXM: Use the arrow keys to select the **ISM Radio** menu on the LCD and click **ENTER**.
2. Highlight the **Binding** menu and click **ENTER**.
3. Use the arrow keys to select the Node Address you intend to assign to the Q45. You may only use Node IDs 1–40 with a Banner Cloud ID™ Kit. Banner suggests selecting Node ID 1 for the first device, then incrementing for each additional device.
4. Press **ENTER**. The DXM display should now indicate the device is binding.
5. On the Q45: Enter binding mode on the Q45 by triple-clicking the power/binding button.





The red and green LEDs flash alternately as the sensor searches for a DXM in binding mode. After the Q45 binds, the LEDs stay solid momentarily, then flash together four times. The Q45 exits binding mode.

6. Label the Q45 with the assigned Node Address.
7. Close the cover of the Q45 and tighten the clamp plate securely.
8. On the DXM: Click **BACK** to exit binding for that specific Node Address.
9. Repeat steps 3 through 8 for as many Q45s as are needed for the network. Assign a unique Node Address for each Sensor Node as you repeat these steps.
10. After all Q45s have completed the binding procedure, click **BACK** on the DXM until you have returned to the main menu.

After all radios have been bound to the wireless network, the next section guides you through the process of communicating the sensor data to the Cloud platform. This is achieved by connecting the DXM to the local enterprise network and then accessing the data by completing the activation of the Cloud services.

3 Connect to the Local Network

By default, the DXM Controllers within the Banner Cloud ID™ Kit Series are intended to push data to the Banner Cloud Data Services platform using a local area network. A specialized Ethernet adapter cable is included for those kits containing a DXM1200 (sealed) Controller. A common RJ45 unshielded twisted pair (UTP) cable can be used with those kits containing the DXM700.

Configuring Ethernet Communication

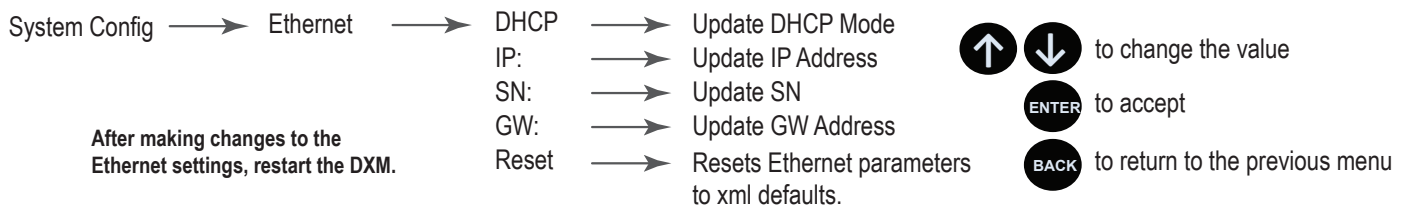
- Insert the end of the cable with the RJ45 connector into a port on the local area network.
- Connect the other end to the corresponding port on the DXM gateway device.

Default Settings

The DXMs are factory set to communicate to a local network using the Dynamic Host Configuration Protocol (DHCP) setting and act as a client on the network. This setting may work for most applications and no further configuration may be needed. Contact your IT professional to ensure the device is not blocked from the local network.

Set a Static IP Address

In some applications, your IT professional may prefer to attribute a static IP Address to the DXM gateway device. This may be done using the LCD menu system.



1. On the DXM, use the arrows and move to the **System Config** menu. Press **ENTER**.
2. Use the arrow keys to select the **Ethernet** menu. Press **ENTER**.
3. Highlight the **DHCP** selection and press **ENTER**. Set **DHCP** to **Off**.
4. The system will request a restart, press **ENTER** to confirm.
5. Follow steps 1 and 2 to reenter the **Ethernet** menu. Use the arrow keys to select **IP**. Press **ENTER**.

The octet of the IP address displays (for example, 192.168.10.1).

6. Use the up and down arrows to change the IP address as desired. Press **ENTER** to move to the next octet.
7. Press **ENTER** on the final octet to accept the changes.
8. Cycle power to the DXM.

The changes are saved on the DXM and the new IP address will be used.

Use the same procedures to set the subnet mask (SN) and default gateway (GW) to match your network requirements. Your IT department can provide these settings if needed.

Configuring the Cellular Communication

The Banner Cloud ID™ Kit is intended for deployment primarily using Ethernet communication. In some cases, it may be preferable to use cellular communication to overcome complications with adding the device to the local area network.

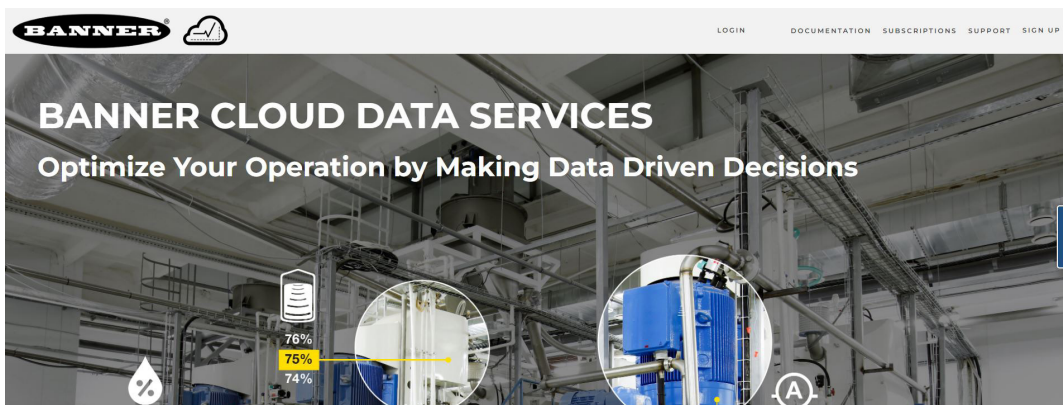
Please visit the Banner Cloud ID™ Kit Series page at www.bannerengineering.com and consult the Configure a Banner Cloud ID™ Kit for Cellular Communication technical note for instructions on how to configure the kit for cellular communication.

Activating the Services

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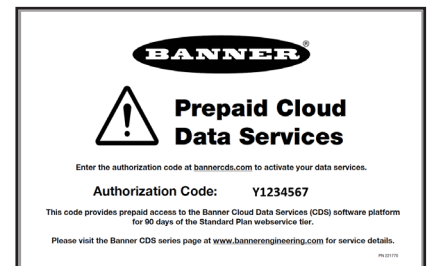
Banner Cloud Data Services (Banner CDS)

Using a web browser, navigate to bannercds.com.



Enter Your Authorization Code

1. Register your account by going to the **Sign Up** menu.
2. Enter the Authorization Code, Email, Company Name, and desired Login Credentials. The authorization code is on the Authorization Card included with the Banner Cloud ID™ Kit.



Connecting the Data

5 Add a New Device

After launching the CDS webpage, the **Overview** screen appears. Use the **Overview** or **Device Management** screen to add the DXM to the Cloud application and generate a Dashboard.

1. Click on **New Device** in the top right corner of the **Overview** page.
2. Create a new device for each DXM Controller that will be sending data to the web server.
3. A **New Device** prompt appears.
4. Verify that **Cloud ID (Auto-Discovery)** is selected as the **Gateway Type**.
5. Enter a **Gateway Name**.
6. Select the **Company** from the drop-down menu.
7. Enter the **DXM Serial** into the entry field. The DXM serial number is indicated on a label on the gateway or can be found by navigating the DXM menu system to **System Info > Controller > Serial**.

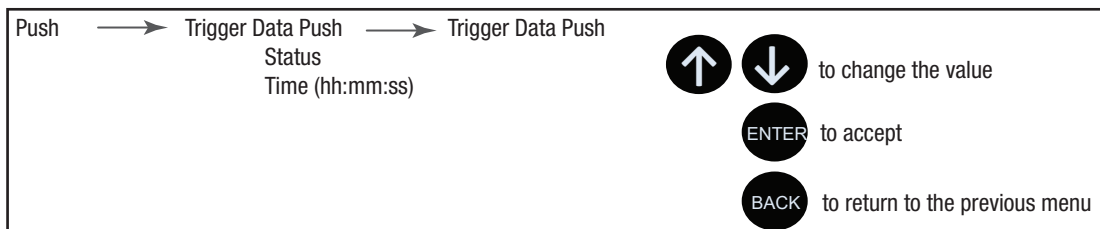
The Banner CDS application creates a storage location for the system and begins searching for a data push from the DXM. The Banner Cloud ID™ Kit is designed to push data once every five minutes with Ethernet communication or once every ten minutes with cellular communication.

The DXM could take 5-10 minutes to complete recognition by the system. To reduce this detection period, perform a manual Data Push using the DXM's on-board LCD, buttons, and menu system or simply wait for the data push to occur. Please see step six for instructions on how to perform a data push manually or skip to step seven.

6 Perform a Manual Data Push (Optional)

1. On the DXM, use the arrow keys to scroll to the **Push** menu.
2. Press **ENTER** three times (through the menu shown) to trigger a Data Push. This manual push may take 1-2 minutes to complete.
3. After the Data Push is completed, the Banner CDS application detects the DXM and creates a Dashboard containing an icon for each Sensor Node bound to the DXM.

Performing a manual data push supersedes the auto node discovery feature within the DXM. If all Nodes currently bound to the DXM do not appear on the dashboard upon the initial push, please allow the DXM to push automatically before attempting to rebind the Nodes.



Services Access and Use Agreement

Read and accept the Services Access and Use Agreement.

7

View Dashboard and Set Parameters

After Banner CDS has detected the device and data appears within the **Device Management** page (may require a page refresh), click **Dashboards** on the left-hand side of the website. A list of Dashboards for the selected company will appear.

Click on the **Dashboard Name** for the Banner Cloud ID Kit which will automatically be the **Gateway Name** ascribed earlier in step five of section five. A **Dashboard** appears with icons representing each sensor node bound to the gateway device.

Hover over and click the icons to view the default alarms currently established for each Wireless Node, along with the latest value submitted by the DXM. Edit these alarms as needed by clicking the **Edit** button next to each alarm or by navigating to the **Alerts** page and filtering the alert list to the appropriate gateway.

Navigate to the **Device Management** page and click on the **Details** next to the **Gateway Name**. This **Device Details** page provides a list of registers for each sensor node bound to the DXM. The model number, connection status, and relevant data for each sensor is listed. Edit the register names as desired by clicking on the **Edit** icon next to each register.

For instructions regarding all features for the Banner Cloud Data Services platform, please navigate to the [How-To Guides for Web Services](#) page at www.bannerengineering.com.

Congratulations! You have successfully set up your Banner Cloud ID™ Kit. Please visit www.bannerengineering.com for detailed information regarding the DXM Controller/Gateway, Q45 Wireless Nodes, and Banner Cloud Data Services.

Banner Engineering is available to assist with all your predictive maintenance and condition monitoring endeavors. After the Banner Cloud ID™ Kit has allowed you to gain insight into your operation and provided the value that Industrial IoT has to offer, please contact our applications team to assist in continuing services after the trial period has concluded.

Contact Banner Engineering's support team at 1-888-373-6767 or fill out the [Contact an Engineer](#) form at www.bannerengineering.com.



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222401 Rev D

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