# Monitoring Solutions





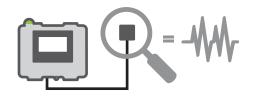
# Monitoring Solutions from Banner

Are you doing enough to optimize and protect your plant's critical assets? Monitoring Solutions from Banner Engineering provide data you can use to ensure your equipment continues to deliver consistent, high-quality output with maximum uptime and optimal performance. Prevent unexpected maintenance issues from interrupting production.

- Automatically recognizes an array of compatible sensors—deploys in mere minutes
- No programming or coding required
- Performance monitoring of almost any equipment in your facility via customizable dashboards
- Manage locally with the onboard touchscreen display or remotely via Banner Cloud Data Services

# **Technologies from Banner that Simplify Machine Monitoring**

# **SNAP ID** Recognizes an Array of Compatible Wired Sensors



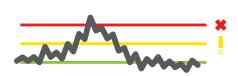
SNAP ID enables our gateways to automatically identify a wired sensor, understand what data it is able to share, and present the data in easy-to-understand units such as pressure and current. This technology is found in many of our wired sensors that can monitor vibration, temperature, humidity, current, pressure, level, and dew point.

# CLOUD Recognizes an Array of Compatible Wireless Sensors



CLOUD ID is a technology that allows gateways to automatically recognize sensors and configure a cloud dashboard. This technology is found in many of our wireless sensor nodes that measure vibration, differential pressure, temperature and humidity, tank level, and more.

# اراً...\IBE-IQ° Takes the Complexity out of Vibration Monitoring



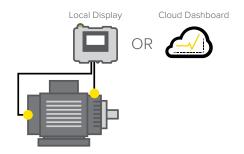
VIBE-IQ vibration monitoring software uses machine learning to simplify the process of setting warning and alarm thresholds for rotating assets like motors and gearboxes. The software continuously monitors vibration for changes and sends warnings and alarms automatically to ensure optimal performance and prevent unplanned downtime. VIBE-IQ does all the complicated analytical work, making the process effortless for users.

# **Monitoring Gateways**

Monitoring gateways gather data from our compatible sensors to give you a comprehensive understanding of how well equipment is performing. Banner offers monitoring gateways that connect to either wired sensors via our SNAP ID technology, or our wireless sensors via our CLOUD ID technology.

# Asset Monitoring Gateway with





# For wired monitoring of one or more local assets in your facility.

- Serves as a hub for up to 20 wired condition monitoring sensors to track a variety of components
- Touchscreen display provides easy access to data, sensor alerts, and alarms
- Local operators can view critical system information or send data to the cloud for remote monitoring
- Banner Cloud Data Services offers preconfigured online dashboards that users can easily customize

# Asset Monitoring Gateway with





For wireless monitoring of multiple remote assets in your facility.

- Serves as a hub for up to 40 wireless condition monitoring sensors to track machine performance
- Banner CDS enables access to data, sensor alerts and alarms, and setup via preconfigured (yet customizable) online dashboards
- Set condition-based alerts in the cloud to notify users via email or SMS

# **Compatible Sensors**

Banner offers a variety of sensor types to monitor any piece of equipment. Below are some of the common sensor measurements for condition monitoring, and the sensors compatible with our monitoring gateways provide access to all of this critical performance data.



<u>Q</u>

Pressure









Vibration

Level

**Dew Point** 



# Asset Monitoring Gateway with ® SNAP ID™

SNAP ID is our technology that simplifies setup and eliminates the need for programming. It enables our gateways to automatically recognize a wired sensor and understand what data it is able to share, automatically scaling the data into more easily understood units of pressure and current instead of milliamps or volts.

### Pick Your Gateway, Pick Your Sensors

There is no guesswork when it comes to creating a monitoring solution for your equipment with SNAP ID. All you do is pick the gateway you need along with up to 20 sensors to monitor the points on your equipment.

### Set Up in Three Simple Steps:

- 1. Install and power up the Asset Monitoring Gateway
- 2. Connect and address the sensors
- 3. Install sensors on equipment and commission the system

### **Local Display**

Critical system information is easily viewed locally via the onboard touchscreen display. It can also be sent to the cloud for remote monitoring.



# Machine Learning with VIBE-IQ™

VIBE-IQ continuously monitors vibration on your rotating equipment like motors, bearings, and pumps. It does all the complicated analytical work, making the process simple for users by providing a "check engine light" to signal maintenance teams when potential problems arise.

# Select Your Asset Monitoring Gateway with SNAP ID

Options are based on your data connectivity needs.

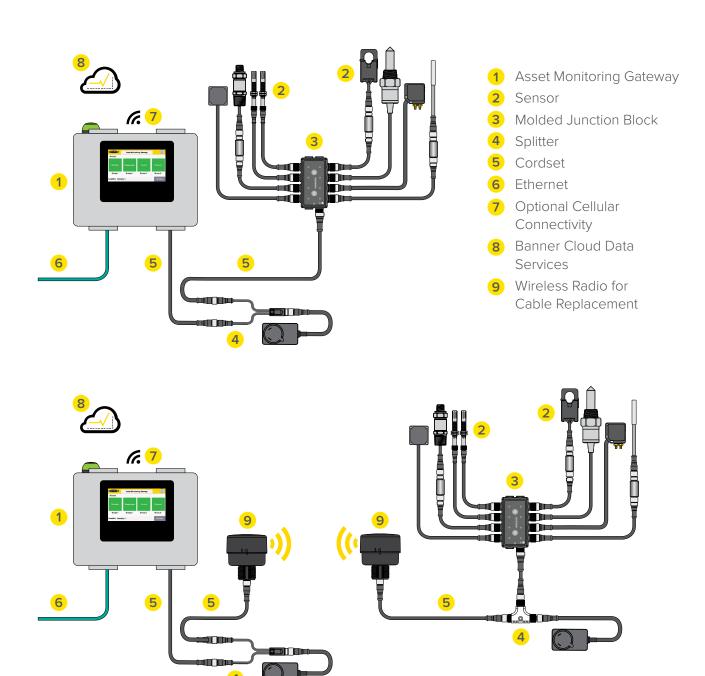
Description	Network	Cloud and Cellular	Models
	Ethernet	No cloud or cellular	AMG-SNAP-ID
Asset Monitoring Gateway with SNAP ID (See last page for dimensions, specifications, and included accessories)	Ethemet	Includes 1 year of Banner Cloud Data Services	AMG-SNAP-ID-C
	AT&T (SIM)	Includes 1 year of Banner Cloud Data Services and 1 year of cellular network connectivity	AMG-SNAP-ID-A
	Verizon (SIM)		AMG-SNAP-ID-V
	Multi-carrier (SIM)		AMG-SNAP-ID-W

# Think Big, Start Small, Scale Fast

Equal parts brains and beating heart, Banner's Asset Monitoring Gateway helps optimize and maintain your critical equipment. Start with a few connected sensors, then simply add more as your needs grow. Additional Asset Monitoring Gateways can be plugged in to accommodate even more sensors. Your asset monitoring system can be as big—or as small—as you need it to be, and it always assembles quickly and simply, and operates with ease.

# **Monitoring Solution Examples**

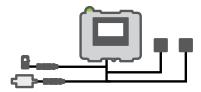
The diagrams illustrate some of the nearly limitless combinations of SNAP ID sensors and connectivity accessories that can be used with the Asset Monitoring Gateway.



# Compatible Sensors for Your Asset Monitoring Gateway

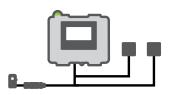
You can have up to 20 sensors connected to one Asset Monitoring Gateway with SNAP ID. Select from the list of compatible sensors below to begin monitoring more equipment.

# Compressed Air System Example



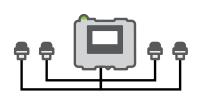
1 Asset Monitoring Gateway 2 Vib. and Temp. Sensors 1 Current Transformer 1 Pressure Sensor

# Motor and Gearbox System Example



1 Asset Monitoring Gateway 2 Vib. and Temp. Sensors 1 Current Transformer

# Fill Level System Example



1 Asset Monitoring Gateway 4 Ultrasonic Sensors

### Vibration and Temperature Sensors



Input	Output	Housing Type	Connection	Models		
Vibration and temperature	Modbus	Aluminum	150 mm cable with M12 male	QM30VT3-MQP		
		316L Stainless Steel	quick disconnect	QM30VT3-SS-MQP		
	Accessories	Accessories				
		Curved surface magnet mount  Flat surface magnet mount  Flat surface screw mount with rapid release set screw		BWA-QM30-CMAL		
				BWA-QM30-FMSS		
				BWA-QM30-FSALR		

### Infrared Non-Contact Temperature Sensor



Input	Output	Measurement Range	Connection	Model
Temperature	Modbus	-20 to +320 °C (-4 to +608 °F)	Integral M12 male quick disconnect	S15S-T-MQ
	Brackets			
	A STATE	Stainless steel mounting fla	nge with M5 screw holes	SMB-S15S-SWIVEL
	4630	Stainless steel mounting flange with M5 screw holes and mounting magnets included		SMB-S15S-SWIVEL-MAG

### In-Line Converter with Thermistor



Input	Output	Measurement Range	Connection	Model
Thermistor	Ma alla coa	-20 to 105 °C (-4 to +221 °F)	2.9 m cable with	S15C-TMS-MQ
2 x Thermistor	Modbus	(+/-1.5C, 10K ohm thermistor, Beta Constant = 3575K (G-Curve))	M12 male quick disconnect	S15C-DTMS-MQ

# Temperature and Humidity Sensor





Input	Output	Measurement Range	Connection	Model
Temperature	Temperature	Temperature: -40 to +85 °C	Integral M12 male	S15S-TH-MQ
Temperature and humidity Modbu	Modbus	(-40 to +185 °F) Humidity: 0 to 100%	quick disconnect	M12FTH3Q

### **Dew Point Sensor**



Input	Output	Measurement Range	Connection	Model
Temperature and humidity	Modbus	Temperature: -40 to +85 °C (-40 to +185 °F) Humidity: 0 to 100% Dew point: -116 to +85 °C (-176 to +185 °F)	Integral M12 male quick disconnect	S24AS-D-MQP

### Differential Pressure Sensors



Input	Output	Measurement Range	Connection	Models
		±1 inches water column		QM42-DPS1-2Q
Pressure	Pressure Modbus	±5 inches water column	2.09 m M12 pigtail quick disconnect	QM42-DPS5-2Q
		±20 inches water column		QM42-DPS20-2Q

#### Brackets



Magnetic bracket with screws

BWA-BK-001



Center mounting bracket with screws

BWA-BK-005



Duct pressure probe

BWA-DPS-PROBE

### Pressure Sensor



Input	Output	Measurement Range	Connection	Models
Pressure sensor	Modbus	0–150 PSI*	M12 male quick disconnect, 1/4-inch NPT fitting	S15C-PS150C-MQ

# Compatible Sensors for Your Asset Monitoring Gateway

### **Current Transformers**



Input	Output	Measurement Range	Connection	Model
		0-20A	1 m cable with	S15C-CT20A-MQ
Current transformer	Modbus	0–150A	M12 male quick disconnect	S15C-CT150A-MQ
		0-600A		S15C-CT600A-MQ

#### Ultrasonic Sensors



Input	Output	Range	Frequency	Connection	Models
Ultrasonic	Madhua	300 mm to 3 m	114 kHz	230 mm integral 5-pin M12	K50UX2CRA
level	Modbus	100 mm to 1 m	224 kHz	male quick disconnect	K50UX2ARA

#### Brackets



Mounts the K50U Ultrasonic sensor

BWA-BK-004



Right-angle, low profile

LMB30LP

### In-Line Converters

Can be used to collect signals from other devices currently on or planning to be used with your equipment.



Female	Male	Connection	Models
Discrete input		5-pin M12 male quick disconnect	S15C-B22-MQ
Analog current	N.A. II		S15C-I-MQ
Analog voltage	Modbus	4-pin M12 female/male quick disconnect	S15C-U-MQ
RTD			S15C-RTD-MQ

### Compatible Wire Replacement

If you are ever unable to run cable between two devices, use our R70 serial data radios for simple wire replacement. These radios are pre-bound and ready to connect to the end point of each network you are trying to join. For individual units, refer to instruction manual 234288 for wireless configuration and implementation. External power supply (PSW-24-1) required.



Description	Transmit Power	Frequency	Models
Due le cond elient/sensensein	1 Watt	900 MHz ISM Band	R70KSR9MQ
Pre-bound client/server pair	65 mW (100 mW EIRP)	2.4 GHz ISM Band	R70KSR2MQ
	1 Watt	900 MHz ISM Band	R70SR9MQ
One individual unit	65 mW (100 mW EIRP)	2.4 GHz ISM Band	R70SR2MQ
Brackets			



Right-angle, low profile

LMB30LP

# AC Voltage Sensors



Input	Output	Connection	Model
Voltage transformer	Modbus	M12 integral quick disconnect	S15C-UT460-MQ-1



# Rogowski Coil Current Sensors

AC Current Range (A)	Coil Diameter (mm)	Model
500	50	S15S-R500-MQ
1000	50	S15S-R1000-MQ
3000	200	S15S-R3000-MQ
6000	200	S15S-R6000-MQ

Included Accessories \_\_\_\_\_









STP-M12D-406 6 ft Ethernet Cordset (included with Ethernet models only)



LMBS15MAG
Attaches to S15C
(magnetic)



**BWA-M12CAB-MAG** Attaches to M12 cable (magnetic, pack of 10)



BWA-BK-020 Two 80 lb magnetic mounts (to mount gateway order two sets)

Connectivity \_\_\_\_

### Molded Junction Blocks



Trunk	Branches	Connection	Models
No Trunk/Integral QD (male)	4 x No Branch/Integral QD (female)	MQ suid discourse	R50-4M125-M125Q-P
	8 x No Branch/Integral QD (female)	M12 quick disconnect	R95-8M125-M125Q-P

### Splitters



Trunk	Branches	Models
No Trunk/Integral QD (female)	2 x No Branch/Integral QD (female and male)	CSB-M1250M1250-T
No Trunk/Integral QD (male)	2 x 0.3 m (female)	S15YB-M124-M124-0.2M

### Cordsets



Description	Length	Connection	Models
	1 ft	M12 quick disconnect	MQDEC-401SS
Daulala andad aardaat	3 ft		MQDEC-403SS
Double-ended cordset  6 ft  10 ft	6 ft		MQDEC-406SS
	10 ft		MQDEC-410SS

# Asset Monitoring Gateway with CLOUD / II



CLOUD ID is a technology from Banner Engineering that simplifies IIoT projects by providing a no-code platform where wireless sensor nodes are automatically recognized by compatible gateways. CLOUD ID also automatically configures dashboards based on the sensor nodes connected to the gateway.

### Pick Your Gateway, Pick Your Sensor Nodes

There is no guesswork when it comes to creating a monitoring solution for your equipment with CLOUD ID. All you do is pick the gateway you need along with up to 40 sensor nodes to monitor the points on your equipment.

# Set Up in Four Simple Steps:

- 1. Install and power up the Asset Monitoring Gateway
- 2. Bind and address the sensor nodes
- 3. Install sensor nodes on equipment
- 4. Connect and gain insights



### **Enables Data-Driven Decision Making**

CLOUD ID solutions combine both hardware and software as part of a comprehensive condition monitoring strategy. With wireless and cloud technology, you can actively track machine performance online, conduct predictive maintenance, and improve operational efficiency. This approach is a prime application of IIoT (the Industrial Internet of Things).

# Machine Learning with VIBE-IQ™

VIBE-IQ continuously monitors vibration on your rotating equipment like motors, bearings, and pumps. It does all the complicated analytical work, making the process simple for users by providing a "check engine light" to signal maintenance teams when potential problems arise.

# Select Your Asset Monitoring Gateway with CLOUD ID

Options are based on your data connectivity needs.

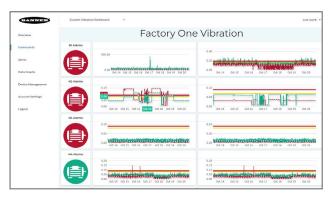
Description	Models
ISM 900 MHz radio; preconfigured device detection and Ethernet communication with Verizon cellular module and SIM	DXM1200-CK9-V
ISM 900 MHz radio; preconfigured device detection and Ethernet communication with AT&T cellular module and SIM	DXM1200-CK9-A
ISM 2.4 GHz radio; preconfigured device detection and Ethernet communication with multi-carrier cellular module and SIM	DXM1200-CK2-W

### Think Big, Start Small, Scale Fast

The Asset Monitoring Gateway with CLOUD ID can deliver value in minutes with a simple curated setup and commissioning process. Choose from a family of industrial-grade sensor nodes that are compatible with these gateways, and adapt the system for the specific requirements of the application or facility.

#### Features:

- Up to 40 sensor nodes can be connected for your specific application needs
- Preconfigured gateway provides timesaving direct-to-cloud functionality
- Wireless gateway rated for indoor and outdoor applications
- 90-Day prepaid trial for Banner Cloud Data Services platform, which delivers valuable insights and alerts
- 900 MHz or 2.4 GHz ISM radio for longrange communication with wireless sensor nodes
- On-board display for wireless sensor network commissioning and configuring the solution for Ethernet or optional cellular connectivity

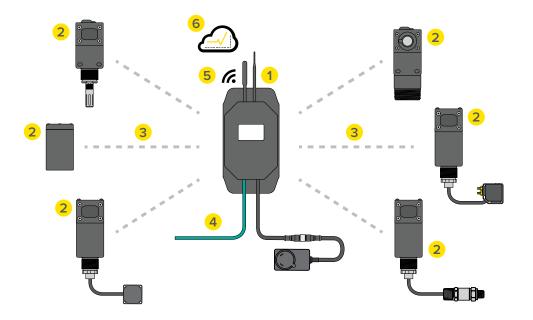




Banner Cloud Data Services Dashboards

# **Monitoring Solution Example**

This diagram illustrates one of the nearly limitless combinations of CLOUD ID sensor nodes that can be used with the Asset Monitoring Gateway.



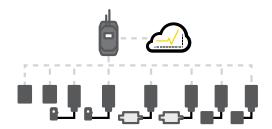
- 1 Asset Monitoring Gateway
- 2 Battery-Powered Sensor Node
- 3 900 MHz or 2.4 GHz Wireless Technology
- 4 Ethernet
- **5** Cellular Connectivity
- 6 Banner Cloud Data Services

# Simple Facility System Example



1 Asset Monitoring Gateway
1 Vibration Sensor
1 Current Transformer
1 Pressure Sensor

## Complex Facility System Example



1 Asset Monitoring Gateway2 Vibration Sensors2 Current Transformers2 Pressure Sensors2 Vib. and Temp. Sensors



# Compatible Sensor Nodes for Your Asset Monitoring Gateway

Use the simple binding process to bind sensor nodes to a gateway, and monitor tank level, ambient temperature and humidity, and the health of rotating machines and pressurized systems.

The radio frequency of compatible sensors must match the radio frequency of the gateway controller (or some other designator).

### All-in-One Vibration Sensor Node



Vibration and temperature sensors monitor the health and performance of motors, pumps, and similar equipment with rotating motion. Available accessories are shown below.

Radio Frequency	Power Sup	ply	Inputs	Models
900 MHz ISM band	C cell lithium battery (included)		Vibration and	DX80N9Q45VAC
2.4 GHz ISM band	C cell lithium battery (sold separately)		temperature detection	DX80N2Q45VAC NB
Includes mounting bracket BWA	A-Q45VAC-FESS.			
Accessories				
	Curved-surface ma		gnet mount	BWA-Q45VAC-CMSS
		Flat-surface epoxy	mount	BWA-Q45VAC-FESS
	(Care of Care	3.6 V C cell lithium	replacement battery	BWA-BATT-013

### Wireless Node and Compact Vibration Sensor



Vibration and temperature sensors monitor the health and performance of motors, pumps, and similar equipment. Available accessories are shown below.

Radio Frequency	Power Supply	Inputs	Models
900 MHz ISM ban	D cell lithium battery	Vibration and temperature (QM30VT1 sold separately)	DX80N9Q45VTPD

# Accessories QM30VT1 Vibration and temperature sensor Right-angle, low profile bracket LMB30LP Curved-surface magnet mount BWA-QM30-CMAL for sensor BWA-QM30-FMSS Flat-surface magnet mount for sensor Flat-surface screw mount with BWA-QM30-FSALR rapid-release set screw for sensor 3.6 V D cell lithium BWA-BATT-011 replacement battery

# Compatible Sensor Nodes for Your Asset Monitoring Gateway



### All-in-One Temperature and Humidity Sensor Node

Temperature and humidity wireless nodes monitor environmental conditions in a variety of applications, such as refrigerators or chillers, warehouses, cleanrooms, incubators, storage rooms, and distribution centers. Available accessories are shown below.

centers. Avai	valiable decessories are shown below.			
Radio Frequency	Power Supply	Measurement Range	Inputs	Models
900 MHz ISM band	AA lithium cell batteries	-40 to +85 °C (-40 to +185 °F)	Temperature and	DX80N9Q45THA
2.4 GHz ISM band	AA lithium cell batteries (sold separately)	O to 100% relative relative humidity (%)		DX80N2Q45THA NB
	Accessories			
		Right-angle, low profile		LMB30LP
		Backside magnet mour	nt	BWA-Q45VA-FMSSB
		2 x 3.6 V 2.4 Ah AA lithium cell replacement batteries		BWA-BATT-006



### All-in-One Temperature Probe Sensor Node

**Power Supply** 

Radio Frequency

Thermistor nodes measure temperature in key areas or processes like air- and liquid-handling applications. Available accessories are shown below.

Measurement Range

Inputs

Models

900 MHz ISM band	AA lithium cell batteries	-20 to +105 °C	Temperature	DX80N9Q45TA
2.4 GHz ISM band	AA lithium cell batteries (sold separately)	(-4 to +221 °F)		DX80N2Q45TA NB
	Accessories			
		Right-angle, low profile  Backside magnet mount		LMB30LP
				BWA-Q45VA-FMSSB
	O TO THE PROPERTY OF THE PROPE	2 x 3.6 V 2.4 Ah AA li replacement batterie		BWA-BATT-006



### All-in-One Dual Temperature Probe Sensor Node

Dual Thermistor nodes measure two temperatures in key areas of processes like air- and liquid-handling applications and also report the differential between them. Available accessories are shown below.

Radio Frequency	Power Supply	Measurement Range	Inputs	Models
900 MHz ISM band	AA lithium cell batteries	-20 to +105 °C		DX80N9Q45DT
2.4 GHz ISM band	AA lithium cell batteries (sold separately)	(-4 to +221 °F)	Temperature	DX80N2Q45DT NB
	Accessories			
		Right-angle, low profile		LMB30LP
	0	Backside magnet mount		BWA-Q45VA-FMSSB
		2 x 3.6 V 2.4 Ah AA lith replacement batteries	ium cell	BWA-BATT-006

### All-in-One Ultrasonic Sensor Node

Ultrasonic sensor nodes monitor the level or position of fluid or dry assets in tanks, totes, and containers. Available accessories are shown below.



Radio Frequency	Power Supply	Ultrasonic Input Range and Frequency	Inputs	Models
900 MHz ISM band	AA lithium cell batteries	Range: 100 mm to 1 m	One ultrasonic input and one thermistor input	DX80N9Q45UAA
2.4 GHz ISM band	AA lithium cell batteries (sold separately)	(3.94 in to 39.4 in) Frequency: 240 kHz		DX80N2Q45UAA NB
900 MHz ISM band	AA lithium cell batteries	Range: 300 mm to 3 m		DX80N9Q45UAC
2.4 GHz ISM band	AA lithium cell batteries (sold separately)	(11.8 in to 118 in) Frequency: 114 kHz		DX80N2Q45UAC NB

#### Accessories

	Backside magnet mount	BWA-Q45VA-FMSSB
O C C C C C C C C C C C C C C C C C C C	2 x 3.6 V 2.4 Ah AA lithium cell replacement batteries	BWA-BATT-006



### All-in-One Current Sensor Node

This wireless node uses a current transformer to measure current draw, helping to reveal issues with critical motor performance. Available accessories are shown below.

Radio Frequency	Power Supply	Measurement Range	Inputs	Models
900 MHz ISM band	AA lithium cell batteries	0–20 or 0–150 Amps	Amperage (two current transformers included)	DX80N9Q45CT
2.4 GHz ISM band	AA lithium cell batteries (sold separately)			DX80N2Q45CT NB
	Accessories			

Accessories				
6	Right-angle, low profile	LMB30LP		
0	Backside magnet mount	BWA-Q45VA-FMSSB		
O GRANDO	2 x 3.6 V 2.4 Ah AA lithium cell replacement batteries	BWA-BATT-006		

# Compatible Sensor Nodes for Your Asset Monitoring Gateway

### Wireless Node and Pressure Sensor

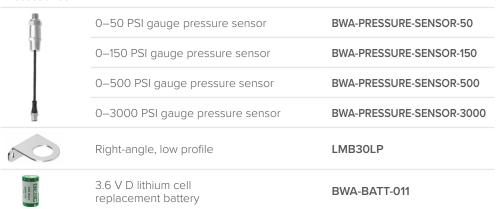
Wireless node and pressure transducers measure air, gas, and liquid pressure systems and equipment. Available accessories are shown below.





Communication	Power Supply	Pressure Range	Inputs	Models
900 MHz ISM band	D cell lithium battery	Depends on sensor	Pressure (BWA- PRESSURE-SENSOR sold separately)	DX80N9Q45UPSD
900 MHz ISM band		0–150 PSI	Pressure	DX80N9Q45PSD150G
2.4 GHz ISM band				DX80N2Q45PSD150G

#### Accessories



### Wireless Node and Differential Pressure Sensor

Wireless node and differential pressure sensors provide the ability to monitor low-pressure applications such as filter and vacuum lines, HVAC and duct pressure, dust collectors, clean rooms, and fume hoods. Available accessories are shown below.



Communication	Power Supply	Pressure Range	Inputs	Models
900 MHz ISM band	D cell lithium battery	Depends on sensor	Low-pressure differential (QM42-DPS1 sold separately)	DX80N9Q45DPSD

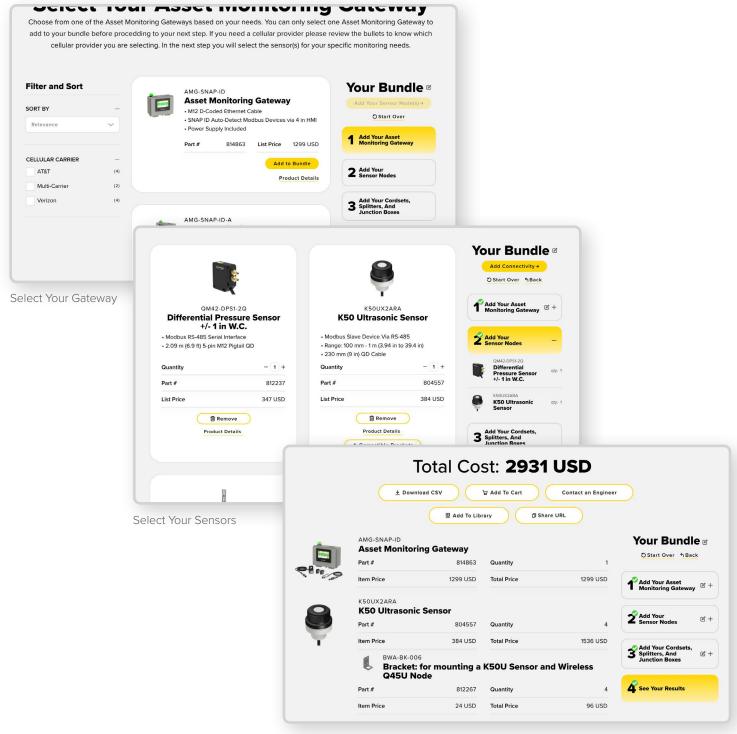
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	±1 inches of water column low-pressure differential sensor	QM42-DPS1-1Q
	±5 inches of water column low-pressure differential sensor	QM42-DPS5-1Q
	±20 inches of water column low-pressure differential sensor	QM42-DPS20-1Q
0	Right-angle, low profile	LMB30LP
GENC Marie Ma Marie Ma Ma Marie Ma Ma Ma Ma Ma Ma Ma Ma Ma Ma Ma Ma Ma	3.6 V D lithium cell replacement battery	BWA-BATT-011

# **Build Your Bundle**

This tool will help you build out your monitoring bundle with either SNAP ID or CLOUD ID. Pick from either the Asset Monitoring Gateway with SNAP ID or CLOUD ID, and choose either sensor(s) or sensor node(s) to monitor all of your critical assets in your process. If you have any questions, please contact a trained engineer to help build your solution with you on the phone or via chat.

Go to <u>bannerengineering.com/monitoringsolutions</u> to start building your bundle.



Purchase From Your Bill of Materials

# View Your Equipment's Data Remotely with Banner Cloud Data Services (CDS)



### **Enables Data-Driven Decision-Making**

Banner's Asset Monitoring Gateway with SNAP ID and Asset Monitoring Gateway with CLOUD ID are designed to begin collecting data and providing value on day one. With more information on the health and productivity of your equipment, you can make more informed decisions about maintenance, where to assign production based on availability and throughput, and more.

#### **Provides End-to-End IIoT Solutions**

Both Banner monitoring gateways are preconfigured to easily connect with a wide variety of our compatible sensors right out of the box. Because there is no programming needed, you spend less time setting up and commissioning the system. It also means that more people across your organization can deploy the system, with less reliance on your most technical personnel.

#### **Reduces Installation Time and Cost**

Set up your entire end-to-end condition monitoring solution in a few simple steps: apply power, bind sensors to the gateway, activate the data services, then install sensors on your equipment and immediately push data to the cloud.

### Maximizes Uptime and Increases Efficiency

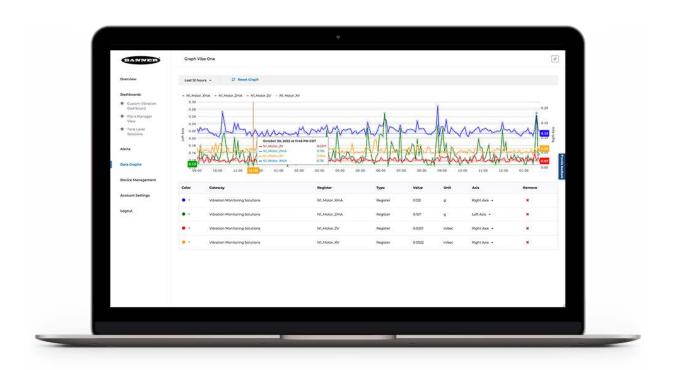
Condition monitoring for predictive maintenance is a key capability of Banner monitoring gateways. Our Banner Cloud Data Services (CDS) platform allows users to access, store, protect, and export critical data collected by Banner's wireless sensors. Device data is actionable, making it easy to identify trends, predict maintenance requirements, avoid costly equipment failures, and prevent unplanned downtime.

### **Preconfigured Web Dashboards**

Banner CDS lets users set condition-based alerts from the cloud using multiple metrics of event severity and duration of time. These provide remote users with email or SMS notifications, based on parameters set in the cloud. Running multiple shifts? Set time constraints so the right people get notified at the right time.

#### **Customizable Dashboards and Alerts**

If you want a more customized look, building a dashboard in Banner CDS is easy. Drag-and-drop widgets and the ability to load images to your dashboard let you build exactly what you need to visualize your operation. Create alarms and alerts for the measurement sensors installed on your equipment.



# Smarter Automation. Better Solutions.™

Banner Engineering designs and manufactures industrial automation products including sensors, smart IIoT and industrial wireless technologies, LED lights and indicators, measurement devices, machine safety equipment, as well as barcode scanners and machine vision. These solutions help make many of the things we use every day, from food and medicine to cars and electronics. A high-quality, reliable Banner product is installed somewhere around the world every two seconds. Headquartered in Minneapolis since 1966, Banner is an industry leader with more than 10,000 products, operations on five continents, and a worldwide team of more than 5,500 employees and partners. Our dedication to innovation and personable service makes Banner a trusted source of smart automation technologies to customers around the globe.

