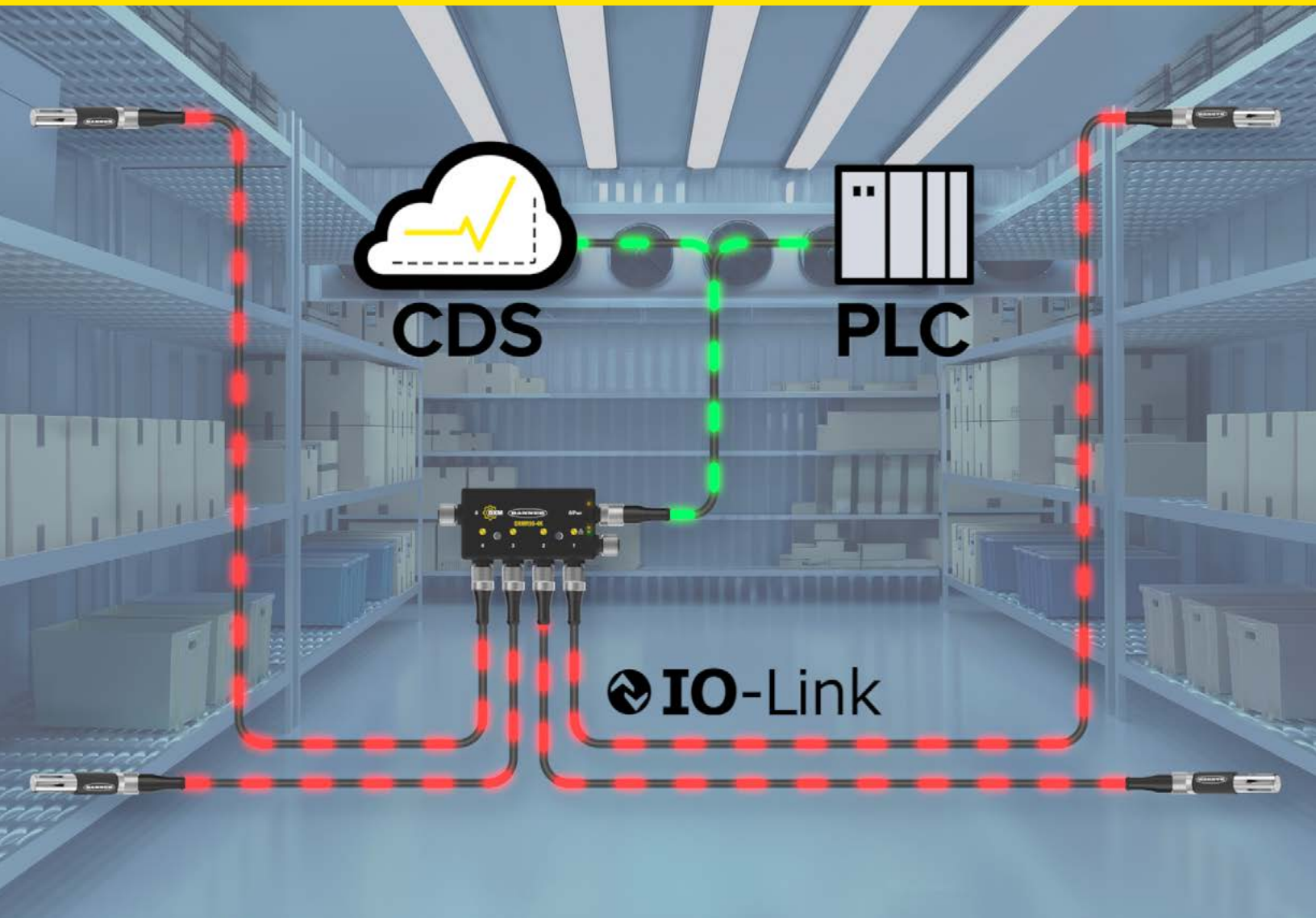


Environment Monitoring Solutions



Monitor essential parts of your operation's environment

Monitoring environmental conditions is essential to maintaining the efficiency and longevity of industrial and commercial operations. By continuously tracking key parameters such as temperature, humidity, pressure, and electrical performance, businesses can prevent costly equipment failures, optimize energy use, and ensure product quality. Additionally, proactive monitoring can detect irregularities early, allowing timely interventions that reduce downtime and maintenance costs.

Wireless and Wired Sensors Offer Maximum Flexibility

In a monitoring system, there are two key components, the sensors and the gateway. Banner offers both wireless and wired sensors that can connect to the same gateway for maximum flexibility when building the monitoring system you need for your plant. Wireless sensors offer great battery life and easy mounting due to their self-contained design, while wired sensors offer faster sample rates for more data.

Ambient Temp/Humidity Sensors

Ideal for monitoring conditions in environments like refrigerated rooms, HVAC systems, and control panel cabinets, this sensor precisely measures both temperature and humidity. Continuous monitoring can detect fluctuations in these environmental conditions that may lead to condensation, worker discomfort, or equipment overheating. Operators can be easily alerted to provide proactive maintenance, helping prevent equipment failure, ensure product integrity, and maintain comfort.



Description	Range	Frequency	Model
Wireless (2 AA) battery powered temperature and humidity sensor	-40°C to 85°C	900 GHz	DX80N9Q45THA
	-40°F to 185°F	2.4 GHz	DX80N2Q45THA NB
Wired temperature and humidity sensor with Modbus	-40°C to 85°C	–	S15S-TH-MQ
Wired temperature and humidity sensor with IO-Link	-40°F to 185°F	–	M12FTH3Q
		–	S15S-TH-KQ

Temperature Differential Sensors

A temperature differential sensor compares the difference in measured temperature between two thermistors, helpful for detecting potential issues so they can be addressed early, monitor multiple points in a process such as in furnaces and refrigeration units, and optimize energy efficiency and performance across industrial processes and equipment.



Description	Frequency	Model
Wireless (2 AA) battery powered node with tethered dual temperature sensor	900 GHz	DX80N9Q45DT
	2.4 GHz	DX80N2Q45DT NB
Wired dual temperature sensor	–	S15C-DTMS-MQ

Temperature Sensors

Track temperature differences across various parts of systems or environments with temperature sensors. These sensors are ideal for identifying inefficiencies in heat exchange systems, detecting thermal leaks, and ensuring balanced temperatures in multi-zone HVAC systems or industrial processes.



Description	Range	Frequency	Model
Wireless AA battery powered temperature sensor	-20 to +105 °C (-4 to +221 °F)	900 MHz	DX80N9Q45TA
		2.4 GHz	DX80N2Q45TA NB
Wired temperature sensor	-20 to +320 °C (-4 to +608 °F)	–	S15S-T-MQ



Current Sensors

A current sensor monitors AC amperage and provides insights into machine health and system performance. When used with a voltage sensor, it can help track overall energy use. Even if you choose to only monitor current, it can still help you understand the performance of equipment such as air exchangers and cooling systems. Current sensors can detect unusual power consumption levels, whether high or low, which can help identify poor-performing equipment that requires maintenance.

Description	Range	Frequency	Model
Wireless (2 AA) battery powered node with tethered current transformer sensor	20 and 150 Amps	900 GHz	DX80N9Q45CT
		2.4 GHz	DX80N2Q45CT NB
Wired current transformer sensor	0-20 Amps		S15C-CT20A-MQ
	0-150 Amps	–	S15C-CT150A-MQ
	0-600 Amps		S15C-CT600A-MQ

High Current Sensors

Easily installed on conductors without having to remove wires, Rogowski coil current sensors provide critical data about the health and performance of AC-powered equipment. They can measure current as great as 6000 amps, making them useful in power distribution systems, large industrial motors, welding equipment, and other high-current environments where traditional current measurement techniques might be impractical or less accurate.



Description	Range	Model
Wired high current sensor	500 Amps	S15S-R500-MQ
	1000 Amps	S15S-R1000-MQ
	3000 Amps	S15S-R3000-MQ
	6000 Amps	S15S-R6000-MQ

Voltage Sensors

This sensor detects voltage variations that could lead to equipment damage or operational inefficiencies, providing the opportunity to take proactive measures before issues arise. Used in conjunction with a current sensor, it provides critical power usage information that can be used to minimize energy inefficiencies and optimize equipment performance.



Description	Range	Model
Wired voltage sensor	0-460 V AC	S15C-UT460-MQ-1

Wireless and Wired Sensors Continued



Wireless



Wired

Dew Point Sensors

A dew point sensor is essential for monitoring environments in which moisture control is critical, such as refrigerated rooms or sensitive manufacturing processes. By accurately measuring the humidity and the temperature at which condensation forms, this sensor helps prevent corrosion and product spoilage, ensuring the longevity and quality of your assets.

Description	Range	Frequency	Model
Wireless D-cell battery powered dew point sensor	-116°C to 85°C	900 GHz	DX80N9Q45DEW
	-176°F to 185°F	2.4 GHz	DX80N2Q45DEW NB
Wired dew point sensor	-116°C to 85°C -176°F to 185°F	–	S24AS-D-MQP

Differential Pressure Sensors

Maintain optimal airflow and pressure balance in HVAC systems, clean rooms, and industrial processes with a differential pressure sensor. This sensor is key for ensuring efficient system performance, preventing contamination, and maintaining a safe and comfortable environment by detecting even slight pressure changes between two points.



Wireless



Wired

Description	Range	Frequency	Model
Wireless D-cell battery powered node with tethered differential pressure sensor	±1 in. of water column	900 GHz	DX80N9Q45DPSD-DP1
	±5 in. of water column		DX80N9Q45DPSD-DP5
	±20 in. of water column		DX80N9Q45DPSD-DP20
Wired differential pressure sensor	±1 in. of water column	–	QM42-DPS1-2Q
	±5 in. of water column		QM42-DPS5-2Q
	±20 in. of water column		QM42-DPS20-2Q

Pressure Sensors

Real-time data from pressure sensors maximizes consistency, quality, and uptime in equipment that rely on specific pressures. By monitoring and addressing abnormal pressure changes in processes like vacuum seal effectiveness, pneumatic conveyance flow rates, and fuel-to-air ratios for combustion, facilities can boost efficiency and equipment longevity.



Wireless



Wired

Description	Range	Frequency	Model
Wireless D-cell battery powered node with tethered pressure sensor	0–150 PSI	900 MHz	DX80N9Q45UPSD-PS150
		2.4 GHz	DX80N2Q45UPSD-PS150 NB
Wired pressure sensor with Modbus	0–150 PSI	–	S15C-PS150C-MQ
	0–150 PSIG	–	PGPS150PSIG-C-I-Q
	0–5000 PSIG	–	PGPS5000PSIG-C-I-Q

Vibration and Temperature Sensors

Combining vibration and temperature monitoring in one device, this sensor tracks the data most vital to predictive maintenance systems that monitor motors, pumps, and other rotating equipment. It detects early signs of mechanical issues and overheating, allowing maintenance to be scheduled before costly failures occur. This ultimately extends equipment life and reduces downtime.



Description	Frequency	Model
Wireless C-cell battery powered node with tethered vibration and temperature sensor	900 GHz	DX80N9Q45VTPD
	2.4 GHz	DX80N2Q45VTPD NB
Wireless C-cell battery powered vibration and temperature sensor	900 MHz	DX80N9Q45VAC
	2.4 GHz	DX80N2Q45VAC NB
Wired vibration and temperature sensor	–	QM30VT2

Ultrasonic Sensors

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



Description	Range	Frequency	Model
Wireless all-in-one ultrasonic sensor	100 mm to 1 m	240 kHz	DX80N9Q45UAA
	300 mm to 3 m	114 kHz	DX80N2Q45UAA NB
			DX80N9Q45UAC
Wired ultrasonic level sensor	300 mm to 3 m	114 kHz	DX80N2Q45UAC NB
	100 mm to 1 m	224 kHz	K50UX2CRA

In-Line Converters

Can be used to collect signals from other devices currently on or planning to be used with your equipment. For more converter options visit bannerengineering.com.



Description	Female Port	Model
Wired in-line converter with Modbus	Discrete input	S15C-B22-MQ
	Analog current	S15C-I-MQ
	Analog voltage	S15C-U-MQ
	RTD	S15C-RTD-MQ

Connect Your Sensors and Send Data Where You Need It



Asset Monitoring Gateway with SNAP ID

Get real-time insights into the operation and performance of the assets in your facility with the Asset Monitoring Gateway with SNAP ID. By collecting and analyzing data from up to 20 wired sensors, the Asset Monitoring Gateway helps you make informed decisions about an asset: decisions that can increase productivity, save energy, and prevent unexpected maintenance issues.

Network	Cloud and Cellular	Models
Ethernet	No cloud or cellular	AMG-SNAP-ID
	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



DXMR90 Industrial Controllers

- Configurable industrial controller works with a wide range of wired Serial and wired IO-Link devices
- Local control or connectivity with automation protocols, including EtherNet/IP, Modbus/TCP, and PROFINET
- Internal logic controller with simple action rules for programming, logging, and data manipulation
- Compact housing saves space and weight compared to traditional block style form factors

Ethernet Connection	Modbus Connections	Other Connections	Models
One female M12 D-Code Ethernet connector	Four female M12 connections for Modbus master connections	One male M12 (Port 0) for incoming power and Modbus RS-485, one female M12 for daisy chaining Port 0 signals	DXMR90-X1
One female M12 D-Code Ethernet connector	Four female M12 connections for IO-Link master connections		DXMR90-4K
Two female M12 D-Code Ethernet Connector	Four female M12 connections for Modbus client connections	One male M12 (Port 0) for incoming power and Modbus RS-485, one female M12 for outgoing power and daisy chaining Port 0 signals	DXMR90-X1E



DXMR110 IO-Link Master

- Local control or connectivity with automation protocols, including EtherNet/IP, Modbus/TCP, and PROFINET
- Logic processing and problem-solving capable of deploying solutions to process and control data from eight wired IO-Link devices
- IP67 housing simplifies installation in any location by eliminating the need for a control cabinet

Ethernet Connection	Other Connections	IO-Link Master Connections	Models
Two female M12 D-Code Ethernet connectors	One male M12 for incoming power, one female M12 for daisy chaining power	Eight female M12	DXMR110-8K
		Four female M12	DXMR110-4K



DXM1200-X2 IIoT Gateway

- Connect up to 40 of your wireless environment monitoring sensors and up to 200 wired sensors to this single gateway
- On-board display for checking sensor signal and other diagnostics
- Connect to SCADA systems, industrial control systems, and Banner Cloud Data Services (CDS) via the standard Ethernet connection
- Optional cellular modems provide a great alternative when corporate IT policies restrict Ethernet connections

Description	Models
900 MHz, 500 mW PE5 Performance Radio	DXM1200-X2R1
2.4 GHz, 65 mW PE5 Performance Radio	DXM1200-X2R3



Asset Monitoring Gateway with CLOUD ID

The Asset Monitoring Gateway with CLOUD ID from Banner Engineering provides real-time insights about the operation and performance of the assets in your facility. This helps you make informed decisions to increase productivity, save energy, and prevent unexpected maintenance issues. The gateway features a user-friendly, no-code setup and the ability to automatically recognize an array of compatible sensor nodes that can measure vibration, differential pressure, temperature and humidity, tank level, and a lot more. Easily select wireless nodes that fit your application and monitor almost any asset in your facility; examples include conveyor systems, industrial fans, pumps, electric motors, compressed air systems, and dust-collection units.

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



DXM1200-B2 Industrial Wireless Gateway

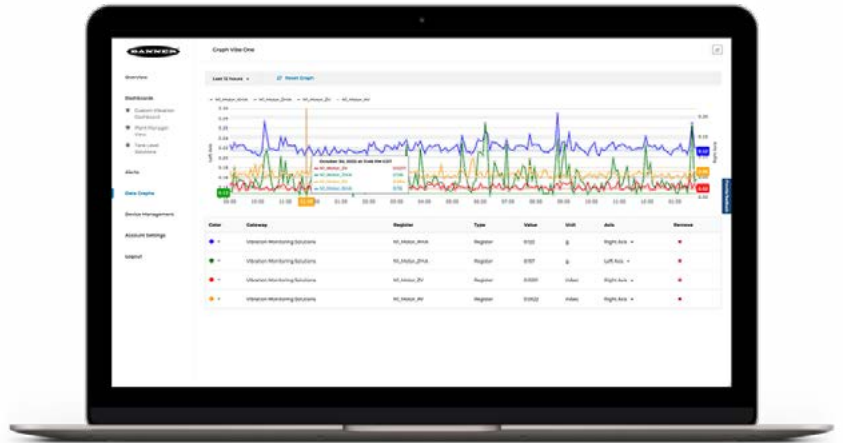
The DXM1200-B2 Wireless Controller allows users to seamlessly connect an array of wireless sensors and nodes by Banner for machine monitoring and control. Operating on 900 MHz or 2.4 GHz ISM bands, it provides robust and long-range communication capabilities to ensure stable and efficient connectivity, even in the most challenging environments. Users can transform data in the controller itself before sending it elsewhere, including cloud platforms such as Banner's Cloud Data Services (CDS).

Description	Models
Wireless Controller with DX80 ISM 900 MHz radio	DXM1200-B2R1
Wireless Controller with DX80 ISM 900 MHz MultiHop radio	DXM1200-B2R2
Wireless Controller with DX80 ISM 2.4 GHz radio	DXM1200-B2R3
Wireless Controller with DX80 ISM 2.4 GHz MultiHop radio	DXM1200-B2R4

Consume Data to Optimize Productivity

Monitor your environment from anywhere with a convenient dashboard

Banner Cloud Data Services (CDS) helps facility operators easily monitor environmental conditions and more from anywhere in the world via a user-friendly interface. Banner CDS sets up quickly so it can be running within minutes, not months. With drag-and-drop widgets such as gauges, tables, and graphs, users can easily build dashboards to display data and manage alerts.



SNAP SIGNAL

The data gathered from the system needs to be displayed so machine operators, maintenance staff, and plant managers can make data-driven decisions. The data can be consumed via HMIs, PLCs, SCADA, or cloud platforms including Banner's Cloud Data Services (CDS), offering customizable dashboards for simultaneous and comprehensive online monitoring of devices in Snap Signal systems. Ultimately, the goal of Snap Signal is to make data available to the people who need it, so they can make informed decisions about improving processes or troubleshooting problems, thereby improving production throughput, quality, and uptime.

IO-Link[®]

In recent years, IO-Link systems have become widespread within industrial automation. IO-Link is an open standard serial communication protocol that allows for the bi-directional exchange of data from IO-Link-supported sensors that are also connected through a master. There are many advantages to using an IO-Link system, including standardized wiring, remote configuration, simple device replacement, advanced diagnostics, and increased data availability. Because IO-Link systems use an open standard, the devices can be integrated in almost any fieldbus or automation system.

CLOUD ID[™]

CLOUD ID technology from Banner Engineering 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.



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