Wireless Vibration and Temperature Monitoring

Vibration monitoring and predictive maintenance made easy with a full solution from Banner

- Detect problems early
- Prevent unexpected downtime
- Plan maintenance efficiently

BANNER®

Vibration Monitoring for Predictive Maintenance

Why Monitor Vibration?

- Reduce downtime – eliminate unexpected failures
- Detect problems early – avoid additional damage to machines
- Efficiently manage replacement parts
- Track machine faults and warranty

How Does It Work?

- Banner vibration sensors measure several vibration characteristics and wirelessly sends the data to the DXM controller
- The DXM controller collects the data and can be programed to automatically establish baselines and set warning and alarm thresholds
- The Vibration Solutions Kit is completely pre-programmed and displays data locally on the HMI or can send data to the network or the cloud
- Banner's wireless vibration monitoring system easily integrates with legacy machines

Machine Learning

- Banner's machine learning algorithm automatically establishes a machines baseline using the first 300 data samples
- It then sets warning and alarm thresholds for both acute and chronic conditions for each machine

What to Monitor

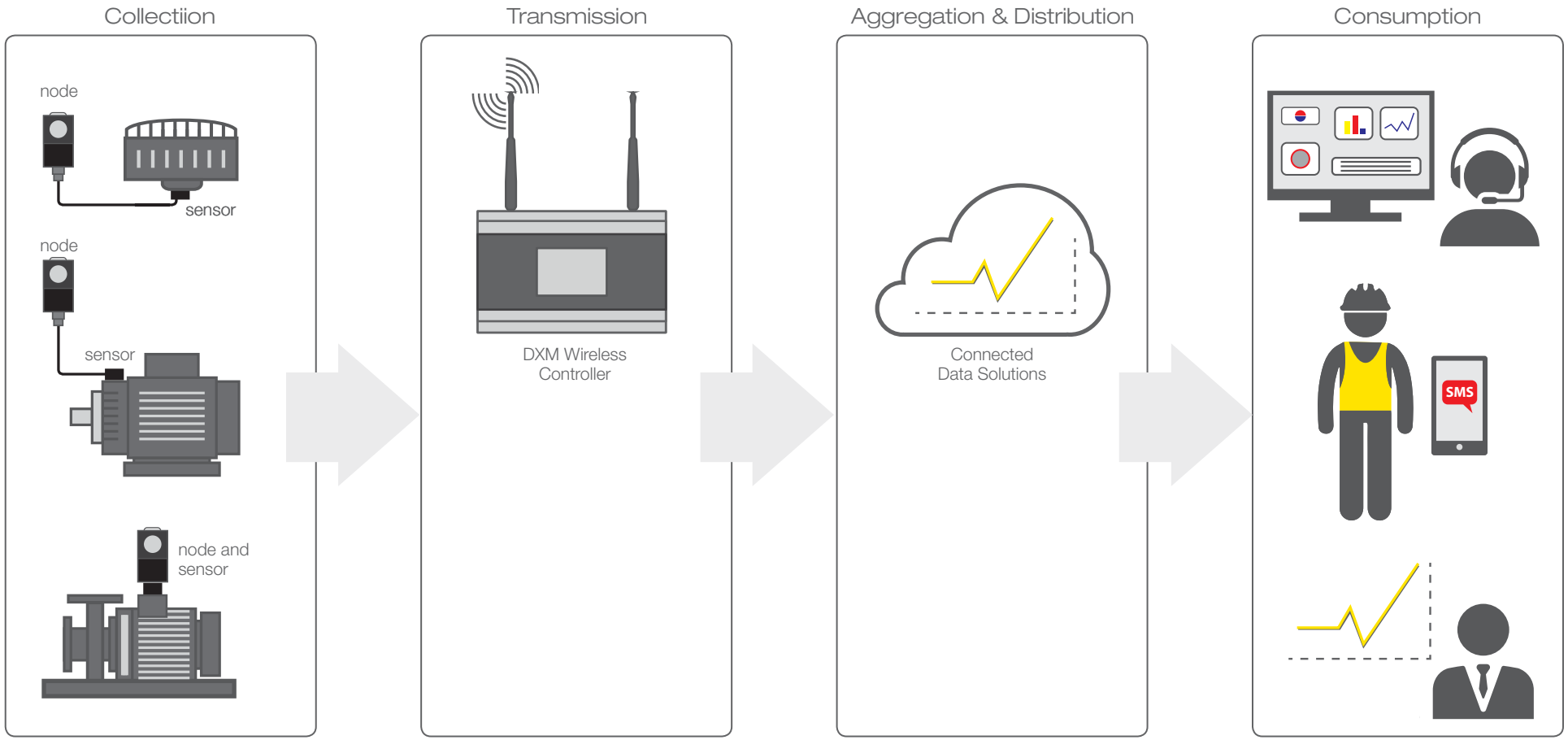
Vibration Characteristics:

- RMS velocity = general machine health
- High frequency RMS acceleration = early bearing wear

Common Equipment:

Motors	Compressors
Pumps	Gear boxes
Exhaust fans	Spindles
HVAC	Any rotating equipment

End-to-End Vibration Monitoring Solution



IIoT Condition Monitoring

All of the critical components of condition monitoring are provided by Banner Engineering and designed to work seamlessly together. Solution Guides are available that make it easy to setup a complete system in days, not weeks or months. Banner Connected Data Solutions (CDS) provides a codeless environment and easily interfaces with the DXM controller to receive vibration data from Banner vibration sensors via wireless nodes. The DXM controller, using a machine learning algorithm, establishes vibration baselines and automatically sets warning and alarm thresholds.

Easy Installation of Wireless Remote Monitoring

Q45VA
- All -in-one vibration sensor and node
- Uses a 1-wire serial interface
- Easy-to-deploy

OR

QM42VT1
- 1-wire serial interface
- One vibration sensor to one node with 1-wire serial interface

Select One Wireless Node

OR

QM42VT2
- Functions as a modbus slave device via RS-485
- Can be connected via a wireless or wired modbus network

Select Modbus Radio

Select
Q45VA

Simple Monitoring

Q45VTP

- Easy-to-use without software
- Two AA lithium batteries
- DIP switch configurable for vibration characteristics and sample intervals

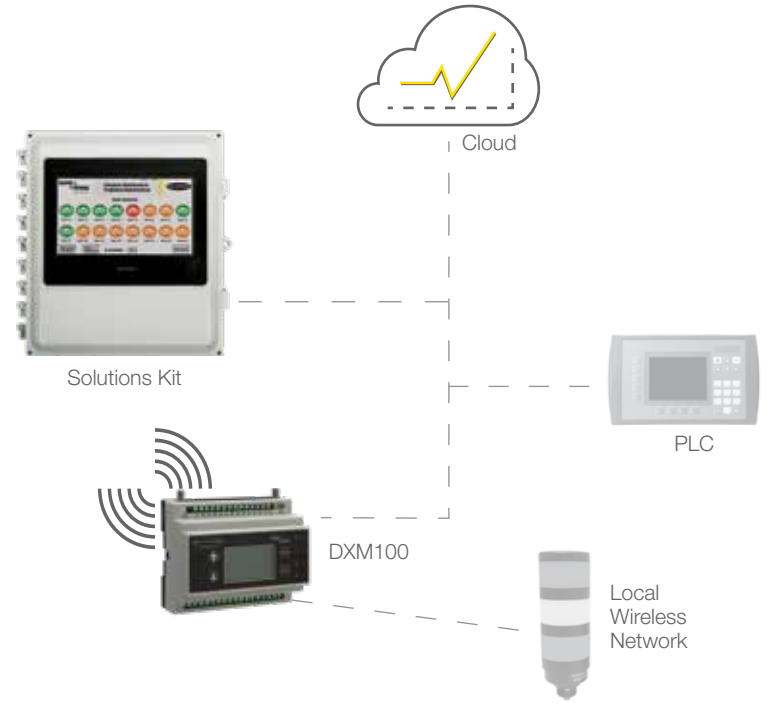
Monitor Many Sensors Over Long Distances

P6 Performance Node

- Expandable up to 47 Nodes
- Cover large areas with 900 MHz, 1 Watt power
- LCD screen displays register values
- D-cell lithium battery or 10 to 30 V dc

Select One

Modbus TCP/IP or Ethernet IP



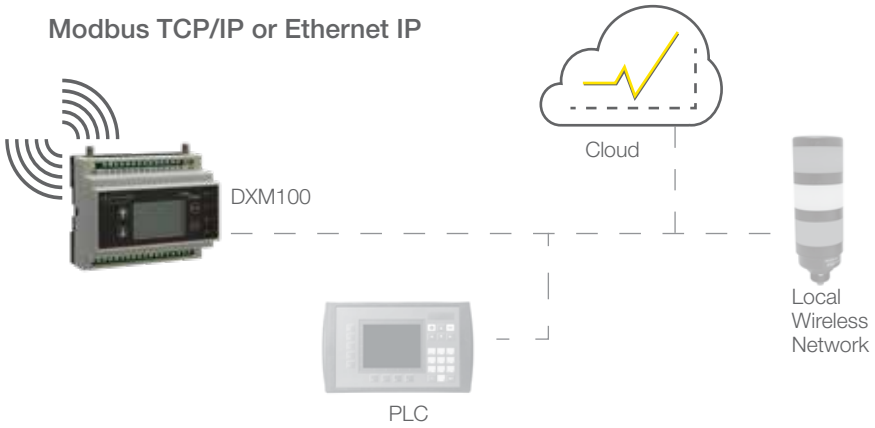
Modbus Slave

MultiHop Modbus Slave with RS-485

- Connect to any modbus network
- Expanable up to 100 slave radios
- Use repeaters to extend range and circumvent obstacles
- Modbus host controller required

Select One

Modbus TCP/IP or Ethernet IP



QM42VT Series Sensor

QM42VT1

- Vibration & temperature sensor
- One sensor per node
- Uses a 1-wire serial interface
- Dual axis vibration sensing
- Robust zinc alloy housing

QM42VT2

- Vibration & temperature sensor
- Functions as a Modbus slave device via RS-485
- Dual axis vibration sensing
- Robust zinc alloy housing
- Can connect to a wireless or wired Modbus network

Models	Description
QM42VT1	Vibration and temperature sensor with 1-wire serial interface; 3 m QD cable
QM42VT2	Vibration and temperature sensor that functions as a modbus slave device via RS-485; 3 m QD cable
QM42VT1QP	Vibration and temperature sensor with 1-wire serial interface; 150 mm QD cable
QM42VT2QP	Vibration and temperature sensor that functions as a modbus slave device via RS-485; 150 mm QD cable

Q45VA Sensor/Node

- Vibration sensor and node in one compact package
- Uses a 1-wire serial interface
- Easy-to-order
- Easy-to-deploy
- DIP switch configurable for vibration characteristics and sample intervals
- Dual-axis vibration sensing

Models	Description
DX80N9Q45VA	All-in-one Vibration sensor – 900 MHz
DX80N2Q45VA	All-in-one Vibration sensor – 2.4 GHz

Vibration Solutions Kit

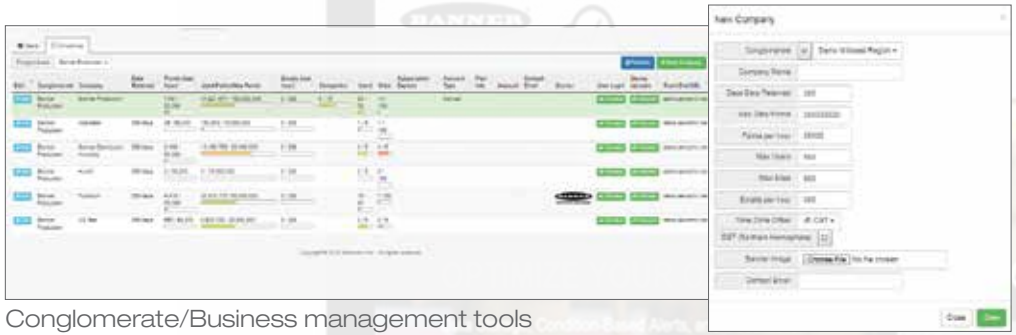
- Monitor vibration and temp on up to 16 assets
- Pre-programmed DXM100 and HMI for easy setup – no programming required
- Simply bind nodes using the HMI screen, install sensors (sold separately), and start collecting data
- Machine learning algorithm automatically sets baselines and thresholds
- Visualize data and alarms on the HMI, or send it to the network or the cloud
- Use Virtual Network Computing (VNC) to emulate the HMI screen on computers and mobile devices

Models	Description
SOLUTIONSKIT2-VIBE	2.4 GHz; Enclosure, DXM100
SOLUTIONSKIT2-VIBE-Q	2.4 GHz; Enclosure, DXM100, one DX80N9Q45VT Node and one QM42VT1 Sensor
SOLUTIONSKIT2-VIBEMETRIC	2.4 GHz; Enclosure, DXM100 (metric)
SOLUTIONSKIT9-VIBE	900 MHz; Enclosure, DXM100
SOLUTIONSKIT9-VIBE-Q	900 MHz; Enclosure, DXM100, one DX80N9Q45VT Node and one QM42VT1 Sensor
SOLUTIONSKIT9-VIBEMETRIC	900 MHz; Enclosure, DXM100 (metric)

Connected Data Solutions (CDS)

Banner CDS is a cloud-based software platform that allows users to access, store, protect, and export critical data collected by Banner's wired and wireless sensors.

Device geo information with health status

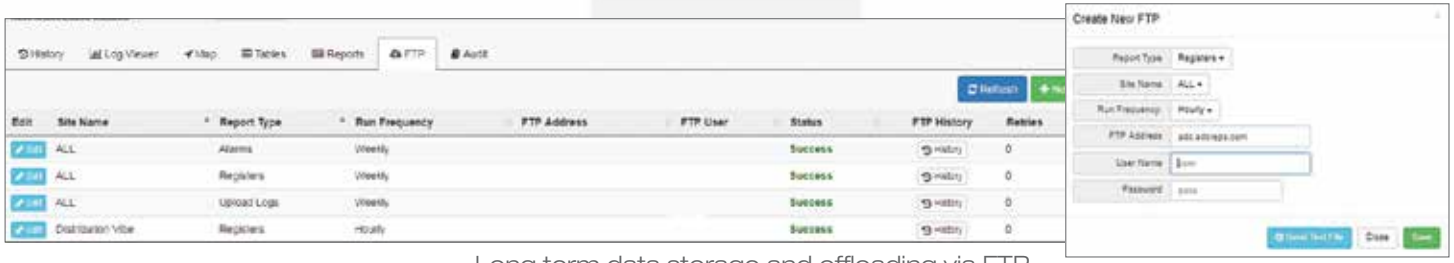


Conglomerate/Business management tools

Custom graphing with alert baselines

Customizable and codeless dashboards

Condition-based alerts and notifications (e-mail, SMS)



Long term data storage and offloading via FTP

Nodes and Data Radios

Nodes with 1-Wire Serial Interface

Models	Description	Frequency
DX80N9Q45VTP	Q45 Vibration and Temperature Node	900 MHz
DX80N2Q45VTP		2.4 GHz

Models	Description	Frequency
DX80N9X1S-P6	1-wire Serial Performance Node with integrated battery	900 MHz
DX80N2X1S-P6		2.4 GHz
DX80N9X6S-P6	1-wire Serial Performance Node 10 to 30 V dc	900 MHz
DX80N2X6S-P6		2.4 GHz

Models	Description	Frequency
DX80N9X1W-P6L	1-wire Serial Performance Node with integrated battery, internal antenna, no LCD or rotary dials	900 MHz
DX80N2X1W-P6L		2.4 GHz

Models	Description	Frequency
DX80DR9M-H6	1-wire Serial Modbus MultiHop Slave with integrated battery	900 MHz
DX80DR2M-H6		2.4 GHz

MultiHop Modbus Radios

Models	Description	Frequency
DX80DR9M-H	MultiHop Modbus Radio	900 MHz
DX80DR2M-H		2.4 GHz
DX80DR9M-H1E	MultiHop Modbus Radio with I/O — battery	900 MHz
DX80DR2M-H1E		2.4 GHz
DX80DR9M-HB1	MultiHop Modbus Radio with I/O — Board model	900 MHz
DX80DR2M-HB1		2.4 GHz

See website for other models

Wireless Controllers and Gateways

DXM100 Controller

Models	Description	Frequency
DXM100-B1R1	DXM100 Controller with DX80 Gateway preconfigured as a protocol converter	900 MHz
DXM100-B1R3		2.4 GHz
DXM100-B1R2	DXM100 Controller with MultiHop Data Radio	900 MHz
DXM100-B1R4		2.4 GHz

See website for other models

PM Gateways (10-30 V dc)

Models	Description	Frequency
DX80G9M6S-PM2	4 Discrete in, 4 Discrete out 2 Analog in, 2 Analog out	900 MHz
DX80G2M6S-PM2		2.4 GHz
DX80G9M6S-PM8	6 Discrete in, 6 Discrete out	900 MHz
DX80G2M6S-PM8		2.4 GHz

See website for other models

Connected Data Soutions (CDS) Software Packages

Models	Description
806252	Starter Package 1,000 Data Points per hour Total Storage: 2 million Data Points
806253	Standard Package 4,000 Data Points per hour Total Storage: 20 million Data Points
806254	Premium Package 12,000 Data Points per hour Total Storage: 100 million Data Points

Accessories

BWA-BK-001 (magnet)

BWA-BK-005

BWA-BK-008 (magnet)

BWA-BK-009

BWA-BK-010 (magnet)

5-Pin M12/Euro-Style—Double-Ended

Length	Model
0.31 m (1 ft)	DEE2R-51D
0.91 m (3 ft)	DEE2R-53D
2.44 m (8 ft)	DEE2R-58D

PN 209132 rev. A

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