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 (see page 6) 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
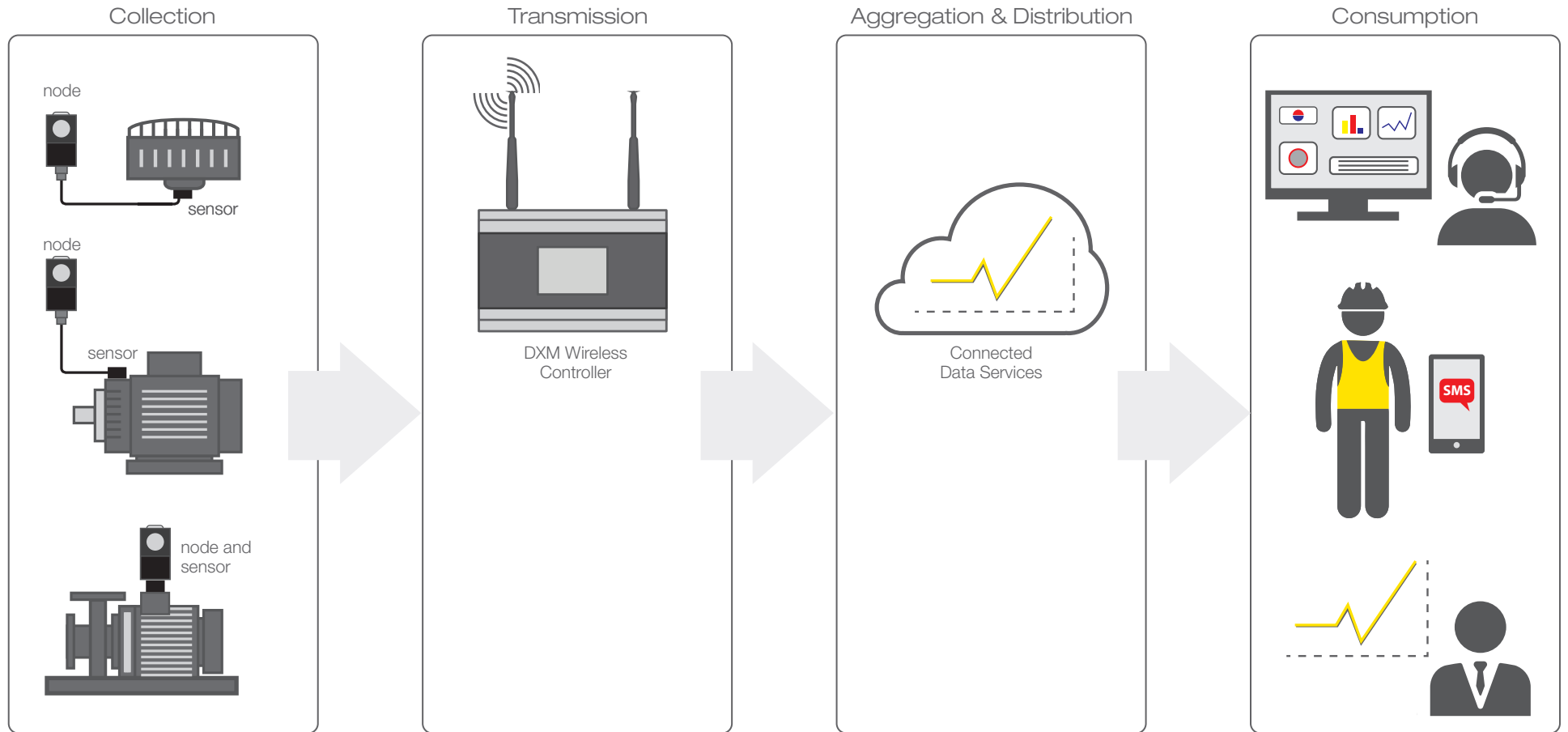
What to Monitor

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

Collection

node

sensor

node

sensor

node and sensor

Transmission

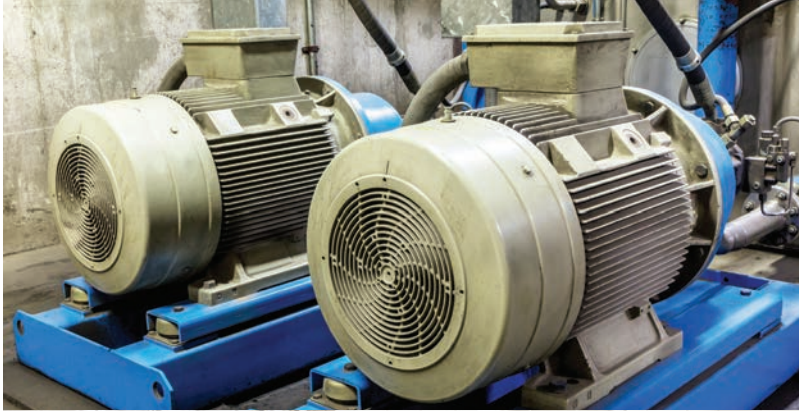DXM Wireless
Controller

Aggregation & Distribution

Connected
Data Services

Consumption

SMS

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 Services (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 and temperature sensor/node
- Uses a 1-wire serial interface
- Easy-to-deploy

OR

QM30VT1

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

Select One Wireless Node

OR

QM30VT2

- Functions as a modbus slave device via RS-485
- Can be connected via a wireless or wired modbus network
- Aluminum and stainless steel housings available

Select Modbus Radio

Modbus TCP/IP or Ethernet IP

Cloud

Solutions Kit

PLC

DXM100

Local
Wireless
Network

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

Performance Series Nodes

- Expandable up to 47 Nodes
- Cover large areas with 900 MHz, 1 Watt power
- D-cell lithium battery or 10 to 30 V dc
- Models available that also monitor current

Select One

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

Cloud

DXM100

Local
Wireless
Network

PLC
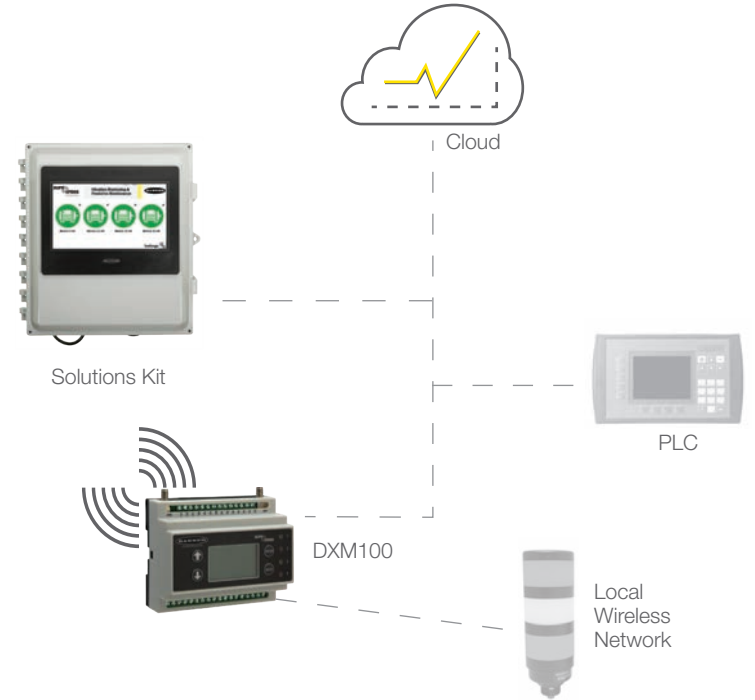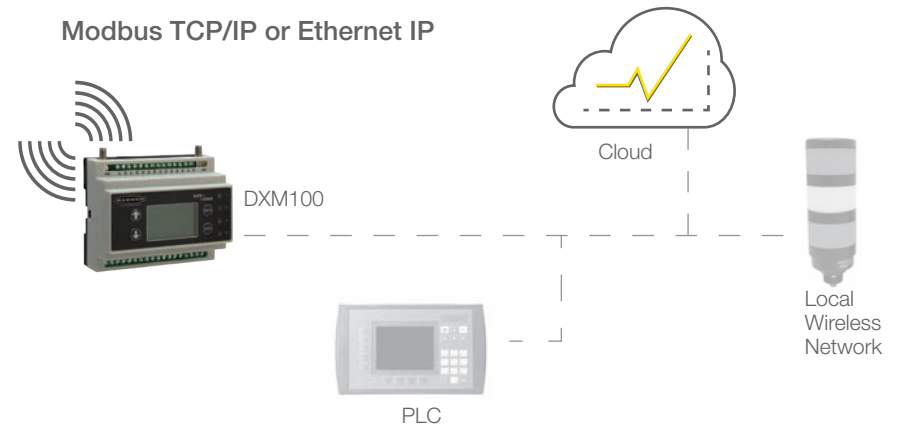
QM30VT Series Sensor

QM30VT1

- Vibration & temperature sensor
- One sensor per node
- Uses a 1-wire serial interface
- Dual axis vibration sensing
- Sealed aluminum housing

QM30VT2

- Vibration & temperature sensor
- Functions as a Modbus slave device via RS-485
- Dual axis vibration sensing
- Sealed aluminum and stainless steel housings
- Can connect to a wireless or wired Modbus network

Models	Description
QM30VT1	Vibration and temperature sensor with 1-wire serial interface; 2.09 m QD cable
QM30VT2	Vibration and temperature sensor that functions as a modbus slave device via RS-485; 2.09 m QD cable
QM30VT2-SS-9M	Vibration and temperature sensor with stainless steel housing that functions as a modbus slave device via RS-485; 9 m cable with flying leads

Q45VA Sensor/Node

- Vibration and temperature 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 and Temperature sensor – 900 MHz
DX80N2Q45VA	All-in-one Vibration and Temperature sensor – 2.4 GHz

Vibration Solutions Kit

- Monitor vibration and temp on up to 40 assets
- Pre-programmed DXM700 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
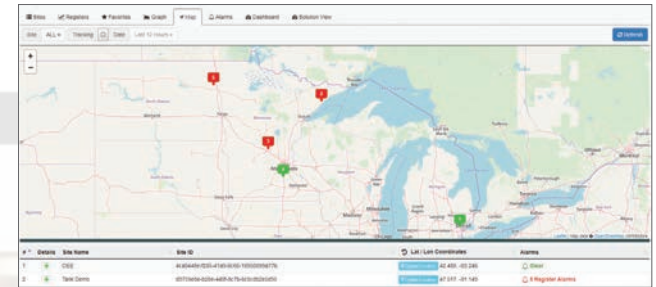- Use Virtual Network Computing (VNC) to emulate the HMI screen on computers and mobile devices

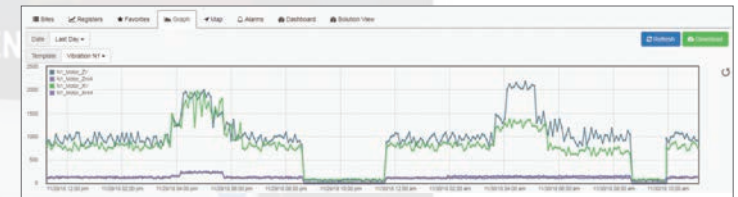| Models	Description
SOLUTIONSKIT2-VIBE	2.4 GHz; Enclosure, DXM700
SOLUTIONSKIT2-VIBE-Q	2.4 GHz; Enclosure, DXM700, one DX80N9Q45VT Node and one QM30VT1 Sensor
SOLUTIONSKIT2-VIBEMETRIC	2.4 GHz; Enclosure, DXM700 (metric)
SOLUTIONSKIT9-VIBE	900 MHz; Enclosure, DXM700
SOLUTIONSKIT9-VIBE-Q	900 MHz; Enclosure, DXM700, one DX80N9Q45VT Node and one QM30VT1 Sensor
SOLUTIONSKIT9-VIBEMETRIC	900 MHz; Enclosure, DXM700 (metric)

Connected Data Services (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

For use with VT1 Sensors

Models	Description	Frequency
DX80N9Q45VTP	Q45 Vibration and Temperature Node with 1-wire serial interface	900 MHz
DX80N2Q45VTP		2.4 GHz
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
DX80N9X1W-P6L	1-wire Serial Performance Node with integrated battery, internal antenna, no LCD or rotary dials	900 MHz
DX80N2X1W-P6L		2.4 GHz
DX80N9X1W-CM1L	Condition Monitoring Node Input: VT1Vibration sensor and Current Transformer	900 MHz
DX80N2X1W-CM1L		2.4 GHz
DX80DR9M-H6	1-wire Serial Modbus MultiHop Slave with integrated battery	900 MHz
DX80DR2M-H6		2.4 GHz

Data Radios

For Use with VT2 Sensors

Models	Description	Frequency
DX80DR9M-H	MultiHop Modbus Radio with RS-485	900 MHz
DX80DR2M-H		2.4 GHz
DX80DR9M-H1	MultiHop Modbus Radio with RS-485 and counter input	900 MHz
DX80DR2M-H1		2.4 GHz
DX80DR9M-H1E	MultiHop Modbus Radio with RS-485 and counter input — battery	900 MHz
DX80DR2M-H1E		2.4 GHz

See website for other models

Wireless Gateways/Controllers

DXM700 Controller

Models	Description	Frequency
DXM700-B1R1	DXM700 Controller with DX80 Gateway Performance	900 MHz
DXM700-B1R3		2.4 GHz
DXM700-B1R2	DXM700 Controller with MultiHop Data Radio	900 MHz
DXM700-B1R4		2.4 GHz

See website for other models

Connected Data Services (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-013
Magnet

BWA-BK-012
Stainless Steel

BWA-BK-014
Aluminum

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

1-888-373-6767
www.bannerengineering.com

BANNER®
more sensors, more solutions