



Vibration Monitoring Sensor

The iQunet Wireless Vibration Sensor combines a sensor, data collector and radio into one compact, battery-operated device that measures both vibration and temperature data. The iQunet Wireless Machine Condition Sensor uses a very powerful communication protocol, offering a simple, reliable and secure means of expanding condition based maintenance into plant areas where the cost to install wired systems is prohibitive. At the same time data is available to existing process control and information systems. To extend the wireless communication range, a repeater can be used.

Applications

The low deployment costs make this wireless solution ideal for:

Expanding walk-around routes

Collect data automatically and more frequently from plant areas where it is uneconomic, impractical or unsafe to retrieve data manually.

Troubleshooting

Temporarily install the sensor on suspect equipment to more closely track failing components.

Difficult to reach areas

Collect basic vibration data in locations that are difficult to monitor with fixed wired systems or hand-held devices.

A complete system

The iQunet sensors are designed for use in a system consisting of the following components:

- iQunet Wireless Asset Health Monitoring Sensors
- iQunet Base Station
- iQunet small format Data Management Server
- iQunet Repeater/Actuator (optional)
- iQunet Web based Software (management, analytics,...)
- iQunet OPC UA embedded server
- iQunet Sheets/Excel export function
- iQunet GraphQL API (+200 documented instructions)

Mounting

The sensor is mounted with a M3 screw (e.g. Hex Socket Cap Stainless Steel Plain Socket Screw, M3 x 16mm). For permanent mount, the use of epoxy adhesive between the sensor back and the machine surface is recommended, before applying the M3 screw. The marked antenna area shall remain free, therefore this area shall not be mounted against metal objects according to the mounting instructions. It is advised to mount the sensor in the way that the battery compartments remain accessible.

Hardware and Software features

- Time series and overall vibration data capturing
- Velocity and Acceleration measurements for detecting faults such as imbalance, misalignment and looseness
- iQunet waterfall trending FFT graphs for detecting bearing and other impact type faults
- Tri-axial RMS, Kurtosis, ... trend graphs
- Integrated temperature sensor
- Adjustable automatic periodic measurements
- Longest battery life on 2 easy replaceable standard batteries
- Unlimited number of sensor nodes in one iQunet sensor network
- Powerful network protocol for best wireless connection in industrial environment



Robust and secure wireless system

The iQunet Wireless Vibration Monitoring Sensor is mounted on rotating equipment. A network, which navigates around obstacles, is formed automatically and connects to the Base Station. The DIN-rail mount small format Data Management Server continuously analyzes and optimizes the network to implement the most efficient paths.

Key advantages of the iQunet communication protocol are:

- Reliability – even in the presence of interference, the network provides 99.9% end-to-end reliability in challenging radio environments.
- Security and Privacy – network communications are secured through industry-standard practices of authentication, encryption and verification to ensure the highest level of security.
- Effective power management – making low power consumption and long battery life possible.

An important benefit is that vibration time series and temperature data collected with the iQunet Wireless Vibration Monitoring Sensor is available to the customer's existing process monitoring and control systems via OPC Unified Architecture (UA).

Wireless Sensor Dashboard Software

The iQunet Wireless Sensor Dashboard is a web based software which communicates to the local iQunet Data Management Server. ("computing in the edge") This software is used to manage sensor status information, to set time intervals for vibration measurements, to visualize and to analyze data and to relay information to the OPC UA embedded server. The Wireless Sensor Dashboard software also processes user requests for "live" data and is able to export to analytical software from third parties.

Consulted, Installed & followed up by:



Vibration Monitoring Sensor

Specifications Data Acquisition and Export

- Triple axis vibration measurement
 - Time series of max. 8192 samples at sampling rate of max. 3200 Hz
 - Post processed frequency and waterfall plots
 - Acceleration/velocity data
 - Selectable activity threshold
 - Trend tracking (RMS/Kurtosis)
 - Averaging for noise reduction
- Temperature measurements
- Data Acquisition modes (via Dashboard, OPC UA or API)
 - triggered
 - programmable time interval
- Data export modes
 - OPC UA Server
 - GraphQL Server
 - Google Sheets / Excel / csv
- Machine Learning ready

Measurements

- Temperature
 - Range: -20 to +70°C
 - Accuracy: +/- 0.5 °C (max)
- Vibration
 - Acceleration/Velocity
 - Units: g or mm/s
 - Amplitude range: 2G, 4G, 8G or 16G
 - Sampling frequency: 12 Hz to 3200 Hz
 - Number of samples: 32 to 8192
 - Activity threshold: 0G to 1G
 - Vibration lab
 - Time series, frequency or waterfall plots
 - Acceleration or velocity data
 - Units: g or mm/s
 - 1/f flicker noise detrending for velocity spectra
 - DFT averaging for noise reduction
 - Statistics lab
 - Recorded trend values during selectable time interval
 - Selectable trend: RMS or kurtosis
 - Acceleration or velocity based
 - Units: g or mm/s
 - Configurable high pass cut off filter

Wireless Communications

- Battery saving iQunet protocol
- Unlimited number of nodes
- Range: up to 50 m in plant (actual range depends on specific site topology and device placement)

Certifications

- CE
- ATEX / IECEx certification

Physical

- Dimensions (mm): 57 x 47 x 14
- Weight: 35 g
- Case material: Thermoplastic
- Sealing: IP 65 (IP68 available 2019)

Environmental

- Operating temperature: -20 to +70 °C
- Recommended storage temperature: +30 °C maximum

Power

- 2 x 3V primary CR2032 replaceable coin cell (note 1)
- 24V (6-60VDC) powered wireless vibration sensor available (incl. always on function)
- Up to 10 year battery life (note 2), depending on settings, usage and operating temperature

Note 1 : Battery surface may not be touched when installed. Touching the batteries will considerably reduce battery life time due to induced leakage current. Preassembled battery holders are available for easy battery replacement.

Note 2 : up to 10 years for multiple temperature measurement every hour. Up to 5 years bat-tery life time for vibration monitoring depending i.a. on measuring frequency, ambient temper-ature, RSSI (Received Signal Strength). See iQunet support pages for more info.

DSIVIB190320 - Subject to reasonable modifications due to technical advances)

