**TECHNOLOGY**
Uses latest MEMS sensing elements for reliable long-term measurement

**MEASUREMENTS**
Measures triaxial vibration, bearing condition and temperature

**DISPLAY MODES**
Provides overall vibration values and high resolution spectra

**COMMUNICATION**
Based on Bluetooth BLE technology for reliable connectivity and long range

**LONG BATTERY LIFE**
Field replaceable standard battery lasts up to 5 years

**RUGGED**
Stainless steel base with sealed body, wide temperature range

**EASY INSTALLATION**
SWIVEL lock mount option for easy shaft alignment, or fixed mount for tight locations

**SMALL SIZE**
Small footprint fits onto standard accelerometer mounting

**SOFTWARE**
*WiVibXTtrend* application supports both on-line and data collector modes

**LOW COST**
Uses IOT technology to drive down price

# WiVibX
## Wireless Monitoring

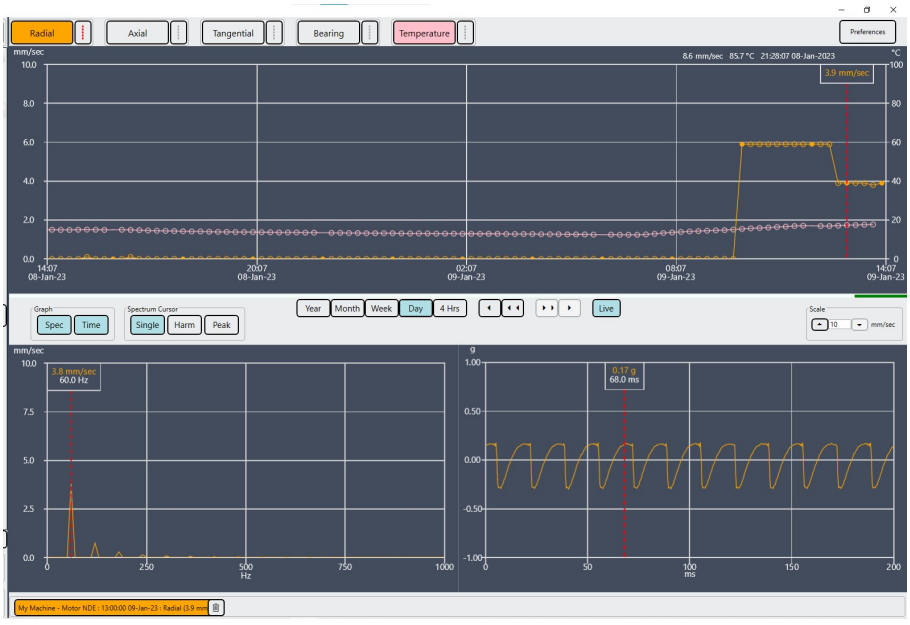
## *TWO MODES OF OPERATION*

***Permanently Installed On-Line Wireless Condition Monitoring***

***Walk-Around Route-Based Data Collector using Ruggedised Tablet***

Fixed Mount


SWIVEL Mount


ICON RESEARCH

# WiVib X Sensor Hardware

## WiVib X TRI-AXIAL MULTI-FUNCTION SENSOR

The *WiVibX* from Icon Research is a miniature machine monitoring device that measures triaxial vibration, bearing condition and temperature on rotating and reciprocating plant.

## OPERATION

*WiVib X's* can operate as part of an on-line system communicating via gateways, or as part of a route-based walk-around system where a ruggedised tablet is the data collector. Gateways and data collectors are available from Icon Research along with *WiVibXTrend* software that hosts either system. *WiVibXTrend* provides standard condition monitoring functions such as trending, alarming, archiving and displaying of spectral and time domain data. Communication is via Bluetooth BLE for reliable connectivity and long range. The gateway uses a REST API as its communications medium, details of which are available from Icon Research for users who wish to interface a *WiVibX* array to their own application.

Velocity and acceleration overall values together with high resolution spectra are available. The inbuilt HFE (high frequency enveloping) function provides clear indication of bearing condition and wear. Temperature measurement is also incorporated. Common machine issues can be tracked such as

- Unbalance
- Misalignment
- Looseness
- Early bearing wear
- Electrical problems

## INSTALLATION

Two options for mounting the devices are available. Both require a stud to be mounted on the machine using a hard-setting adhesive or a tapped hole. With a height of a little over 3" and a diameter of just over 1", the *WiVib X* can be fitted into the tightest of locations.

The fixed-mount version is small in diameter and fits on to the stud or machine using a standard 1/4-28" UNF thread.

The SWIVEL mount version allows the *WiVibX* to be rotated once it is mounted so that it aligns with the shaft.

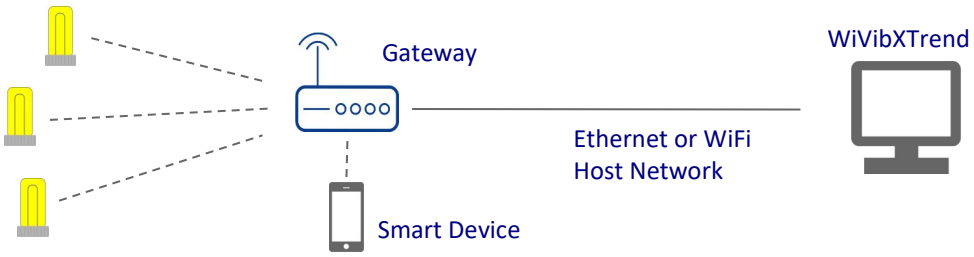
Two versions of the *WiVibX* sensor are available, namely:
**WiVib-X33F**—fixed mount
**WiVib-X33S** - swivel mount

## BATTERY

The *WiVibX* sensor is powered by a 2/3 AA size lithium battery rated at 3V or 3.6V. The popular CR123A from Duracell and other vendors, available in high street stores, is a good choice. For longer life and for operation at sub-zero temperatures, the LS17330 from SAFT can be used.

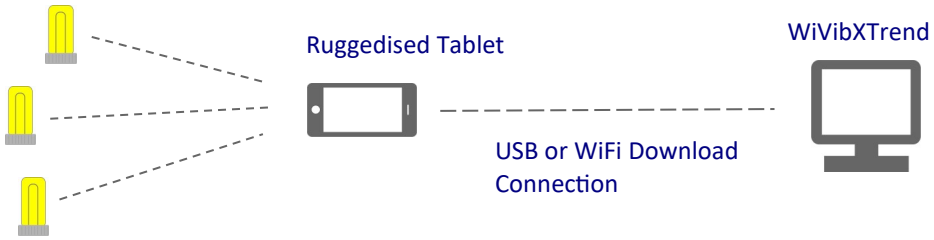
## ONLINE SYSTEM WITH GATEWAYS

In this mode of operation, *WiVibX* sensors communicate on a network using gateways. The gateway contains a web server and its network settings can be configured using a smart device (eg. tablet or phone) or via the host network. The gateway can link onto an existing ethernet or wifi network. Sensors are configured to take overall or spectral measurements at predetermined intervals, or can measure 'on demand' for machine investigation work. Machines are therefore monitored 24/7.




## WALK-AROUND DATA COLLECTOR OPERATION

A route is loaded into the data collector from the *WiVibXTrend* application. The operator progresses round the plant and, at each machinery area, the *WiVibX* sensors within range pair with the collector. Measurement data is then collected from all machines and stored for downloading to *WiVibXTrend*. Alarm status and measurement data can be viewed at the measurement location. This system has the advantage that no network infrastructure is required.

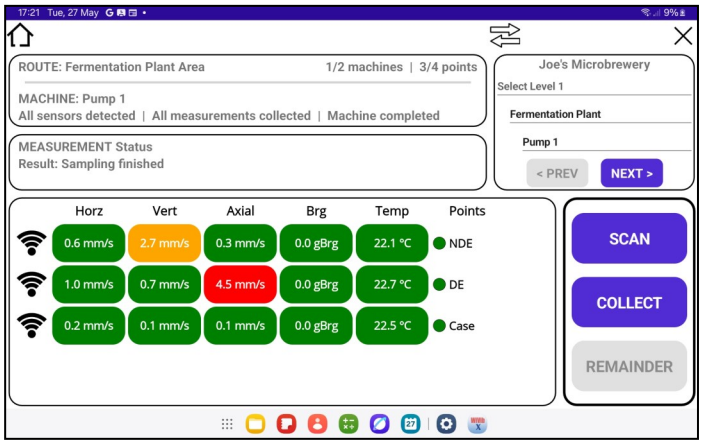


# Application Software for *WiVib X*

## *WiVib X Data Collector App*

### *Tablet-based data collector application*

The *WiVib X Data Collector* is a route-based application where measurements are collected from *WiVibX* sensors as the operator walks round a plant. The application runs on a ruggedised Android tablet. As the operator approaches a machinery area, the data collector scans for installed *WiVibX's* and then collects either overall or spectral data as specified by the route. Measurements can be viewed at the location and compared with alarm limits. Once the route is completed, it is downloaded to the *WiVibXTrend* application on the host computer for further analysis and archiving.

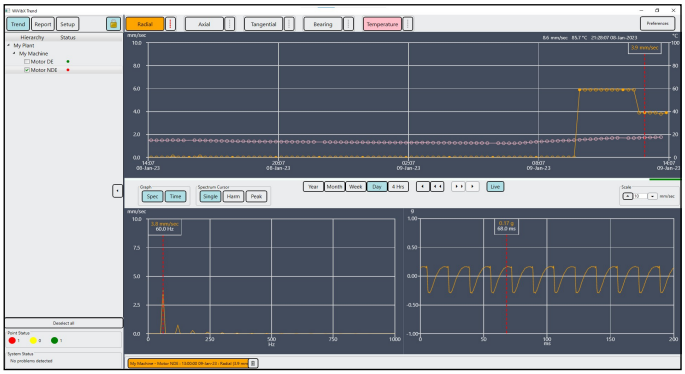



## *WiVibXTrend*

### *Easy plant monitoring and analysis*

*WiVibXTrend* provides the core functionality of on-line monitoring systems with features such as trending, alert/alarm indication and full analysis capability. It supports both data collector mode and on-line monitoring mode using *WiVibX* devices with multiple measurements (triax vibration, bearing condition and temperature) being available.

A moving chart-recorder updates current measurements while historical pan and zoom functions let you examine previously measured data.



*WiVibXTrend* supports a multi-level hierarchy that is user-definable between three and five levels. The application is therefore ideal for installations of any size. The SQL database ensures adequate storage capability. Alerts and alarms are indicated on the hierarchy and summarised in the table underneath. The red/yellow/green traffic light summary lets you know the status of your plant at a glance.

In on-line mode, the application allows you to specify the intervals for taking overall and spectral data so you can choose how often you want to scan your machinery. This can be from minutes to once a day. It also allows 'on demand' measurements to be taken. In data collector mode, routes are specified in the application. These are uploaded to the data collector for manual collection and subsequent download.

Historical traces, such as spectra, can be viewed by selecting the time at which they were gathered on the trend graph. Alternatively, live/latest spectra can be viewed with full cursor readout.

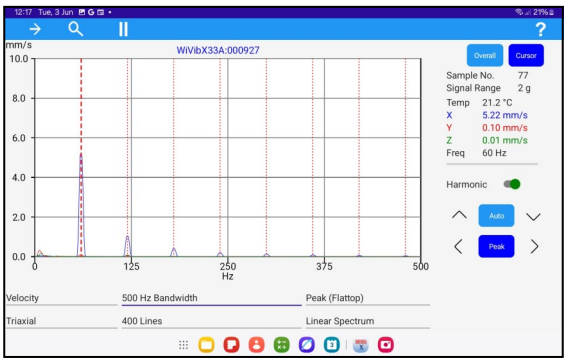
Comprehensive exception reports can be generated and hard copies of trends and traces can be printed to facilitate maintenance planning.

## *WiVibXScope*

### *Turns your WiVib X into a fully featured spectrum analyser*

*WiVibXScope* enables time and spectrum graphs to be displayed in real time from a selected *WiVibX* on an Android device. Triaxial acceleration/velocity and single-axis bearing spectra are available with selectable resolution and frequency ranges. Simply select the *WiVibX* from the list of scanned devices and live traces stream to the high-resolution display. No setup is required. Overall or cursor readout values are displayed for all three axes together with temperature.

*WiVibXScope* is ideal for detailed analysis, system checks and installation setup.



# WiVib-X33 Technical Specification

## VIBRATION MEASUREMENT

| | |
|---|---|
| No of Axes: | 3 |
| Accelerometer: | MEMS |
| Measurement Range (max): | +/-16g |
| Measurements: | acceleration, high frequency envelope, temperature (velocity by software integration) |
| Measurement Ranges: | +/-2g, +/-4g, +/-8g, +/-16g |
| Amplitude Accuracy: | 2% typical |
| Bearing Envelope (HFE) Function: | digital demodulator (HP and LP bandpass filter at 600Hz and 10kHz edges) |

## TEMPERATURE MEASUREMENT

| | |
|---|---|
| No of Channels: | 1 |
| Measurement Range: | -40ºC to +85ºC (-40ºF to +185ºF) |
| Measurement accuracy: | +/-0.5ºC (0ºC to +65ºC), +/-1ºC typical otherwise |

## PROCESSING

| | |
|---|---|
| Output Data Rate (max): | 26.667kHz |
| Bandwidth Ranges: | 0.5Hz–100Hz to 0.5Hz–10 kHz |
| Passband Flatness: | nominally flat to 6kHz approx, up to 10kHz for HFE processing |
| Data Block Lengths: | 256 to 8192 |
| Spectral Lines: | up to 3200 |
| Equivalent Resolution: | 16 bit |
| Dynamic Range (primary axis): | 68dB |
| Dynamic Range (secondary axes): | 63dB |

## COMMUNICATIONS

| | |
|---|---|
| Measurement Schedule: | request interval programmable from five minutes to one day, or on demand |
| Network: | Bluetooth BLE, sensor to gateway or sensor to data collector |
| Manual Restart: | magnetic switch |

## MECHANICAL

| | |
|---|---|
| Enclosure: | stainless steel base, plastic cap |
| Dimensions: | height 80mm (3.1”)<br>diameter 27mm (1.1”) - fixed mount<br>diameter 39mm (1.5”) - SWIVEL lock mount |
| Mounting: | ¼-28” UNF threaded hole |
| Weight (including battery): | 88g (3.1oz) approx - fixed mount<br>95g (3.3oz) approx - SWIVEL lock mount |

## ENVIRONMENTAL

| | |
|---|---|
| Operating Temperature: | -40ºC to +85ºC (-40ºF to +185ºF) |
| Sealing: | IP67 |
| Radio Compliance: | FCC, IC, ETSI |
| General Compliance: | CE, UKCA, RoHS |

## POWER

| | |
|---|---|
| Battery Type: | CR123A lithium, 3.0V nominal, 1500mAh, or<br>SAFT LS17330 lithium thionyl chloride, 2100mAh, recommended for low temperature operation (<0°C,<32°F) |
| Battery Monitor: | internal battery monitor and critical battery shutdown |
| Battery Replacement: | field replaceable |
| Battery Life: | up to 5 years depending on frequency of measurements |

*Icon Research Ltd*
*3 Raw Holdings*
*East Calder*
*West Lothian*
*EH53 0HY*
*UK*

*Tel: +44 (0)1506 885000*
*www.iconresearch.co.uk*

Authorised Agent