

WIRELESS CONDITION MONITORING WITH **sightprobe**

Keep your machines up and running

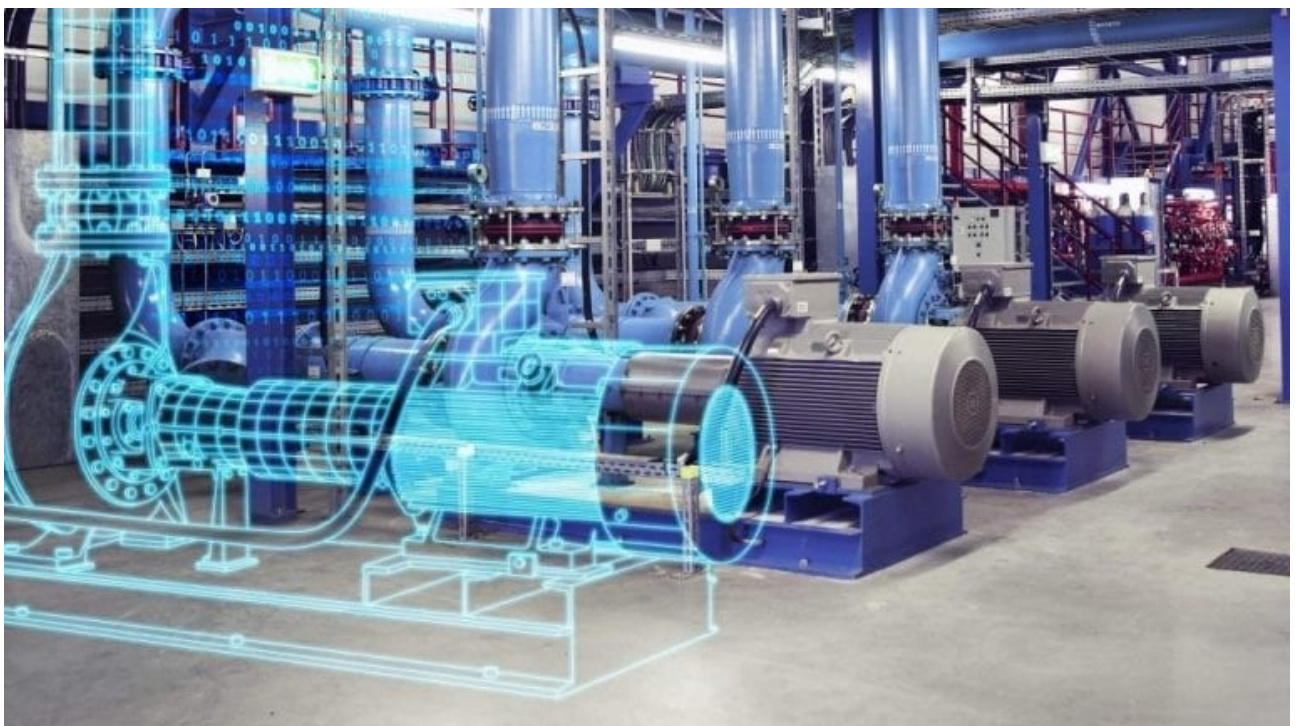
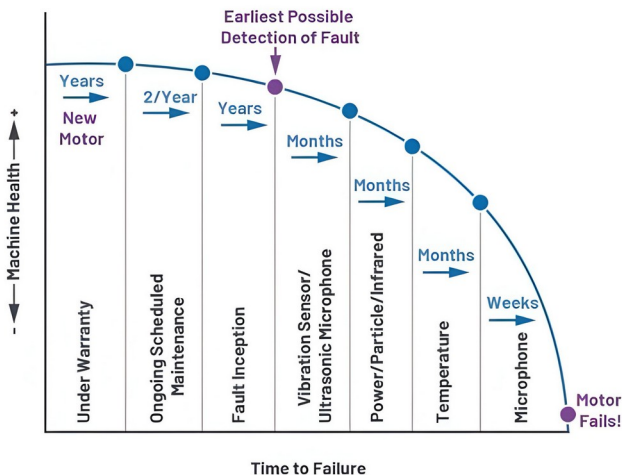


Table of Contents

What is Condition Monitoring?	2
Preventative, Predictive & Reactive Maintenance	2
Techniques Used in Condition Monitoring	2
Implementing Condition Monitoring	3
Key Benefits of Condition Monitoring	4
How does Sightprobe work?	5
Route of data in Sightprobe	5
Wireless Communication Topology	6
Wirepas Mesh	6
Products Overview	7
Possible Applications	8
Software Details	10
IoT Platform Features for Condition Monitoring	10
Measurements and Calculations	11
Hardware Details	13
Wireless Industrial Vibration Sensor 1kHz	13
PRODUCT FEATURES	13
SPECIFICATIONS	13
Wireless Industrial Vibration Sensor 6kHz	14
PRODUCT FEATURES	14
SPECIFICATIONS	14
Wireless Industrial EX-Proof Vibration Sensor	15
PRODUCT FEATURES	15
SPECIFICATIONS	15
Sensor Accessories	16
Industrial Wirepas Gateway	17
HARDWARE SPECIFICATIONS	17
SOFTWARE SPECIFICATIONS	17
Wirepass Gateway With IP67 Enclosure	18
SPECIFICATIONS	18
Planned Software Road-map	18
Unplanned System Road-map	18

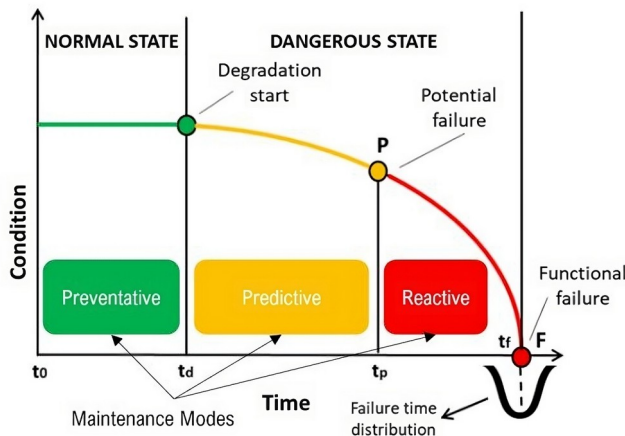
What is Condition Monitoring?



Condition monitoring is a proactive approach used in managing the performance and reliability of machinery and equipment. It involves the regular measurement and analysis of key indicators to predict and prevent equipment failures. By detecting changes or anomalies in equipment operation, condition monitoring allows for timely maintenance, reducing the likelihood of unexpected breakdowns and costly repairs.

Preventative, Predictive & Reactive Maintenance

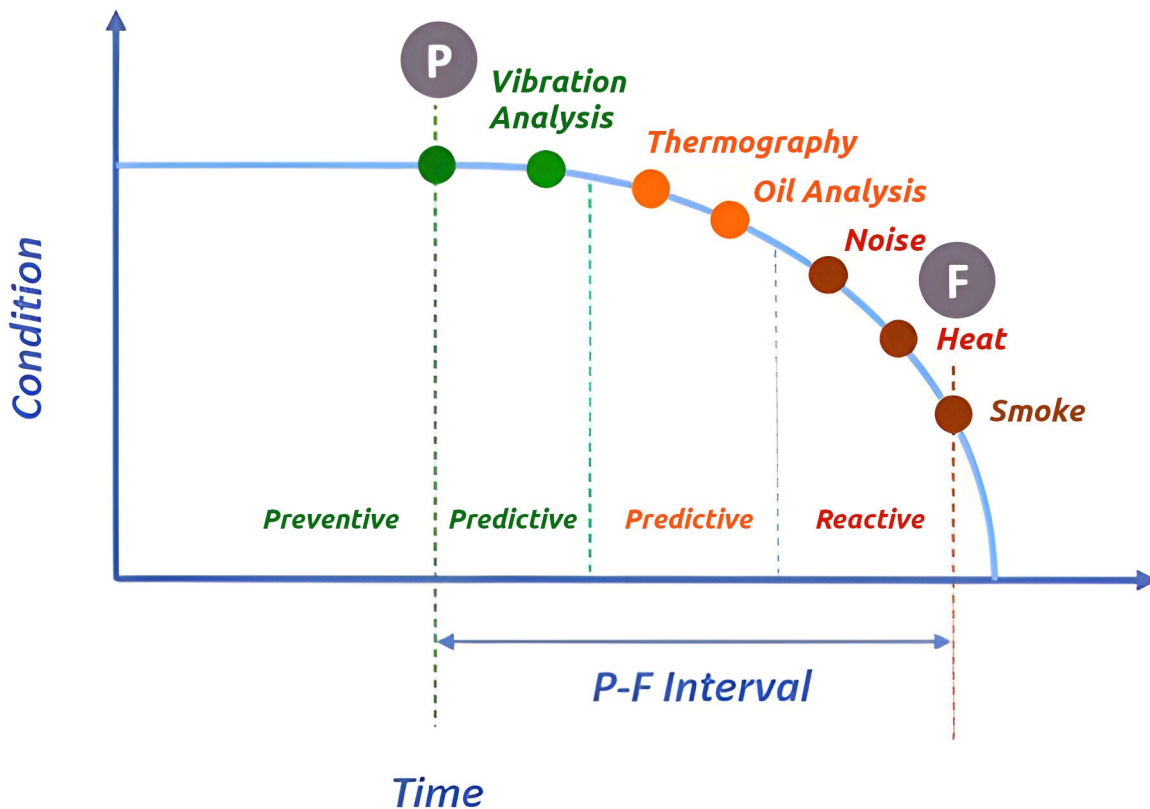
A maintenance program's ideal timing is situated between a machine's "degradation start" and its "potential failure" points (refer to below image). Conducting maintenance on equipment in its "normal state" might contribute positively to the asset's health and the facility's operational time, achieving the intended results. Nevertheless, this approach is somewhat inefficient as it involves allocating maintenance resources to machines that might not urgently need them, leading to some degree of wasteful expenditure.



On the other hand, if a machine's condition deteriorates past the "potential failure" point, maintenance activities become more of a reactive response. At this stage, maintenance teams often find themselves addressing severe issues in machine performance, with a high likelihood of facility downtime. The costs of maintenance in this phase tend to rise sharply, compounded by the losses the company incurs from diminished production and output.

Techniques Used in Condition Monitoring

- **Vibration Analysis:** Measures vibrations in equipment to identify imbalances, misalignments, or wear.
- **Thermal Imaging:** Detects heat anomalies in machinery, indicating potential electrical or mechanical issues.
- **Oil Analysis:** Examines lubricants for contaminants and metal particles to assess internal wear.
- **Ultrasonic Testing:** Uses high-frequency sound waves to detect cracks or flaws in materials.
- **Motor Current Analysis:** Monitors electrical characteristics of motors to identify issues like power supply problems or deteriorating insulation.



P: The point at which you can recognize a potential failure

F: The point at which the failure occurs

Implementing Condition Monitoring

Implementing a condition monitoring system involves several steps:

1. **Assessment of Equipment:** Identifying critical equipment that would benefit most from condition monitoring.
2. **Selection of Appropriate Techniques:** Choosing the right monitoring techniques based on equipment type and usage. Sightprobe provides vibration analysis and surface temperature monitoring which is the very beginning of the potential failure.
3. **Data Collection and Analysis:** Regularly collecting and analyzing data to track equipment health.
4. **Maintenance Planning:** Using data insights to plan and execute maintenance activities.
5. **Continuous Improvement:** Regularly reviewing and improving the condition monitoring process for optimal results.

Condition monitoring is an essential component of modern maintenance strategies. It not only ensures the longevity and reliability of equipment but also contributes significantly to the efficiency and profitability of operations. By adopting condition monitoring, businesses can move away from reactive maintenance models towards a more predictive and proactive approach, ensuring smoother, safer, and more cost-effective operations.

Key Benefits of Condition Monitoring



⦿ **Predictive Maintenance:** Enables the prediction of equipment failures before they occur, allowing for planned interventions. In essence, condition monitoring employs various indicators to forecast three key aspects. Firstly, it predicts if an asset is likely to fail. Secondly, it determines the manner of potential failure, and thirdly, it estimates the available window to repair or replace the asset before it ceases to function. This knowledge enables the scheduling of maintenance to align with production demands.

⦿ **Reduced Downtime:** Minimizes unplanned downtime by identifying potential issues early. The capability to schedule downtime in industrial settings is extremely advantageous, given the often grossly underestimated true cost of unplanned downtime from asset failure. Several often overlooked cost elements include:

- The actual expense of unexpected production delays,
- The necessity of paying maintenance staff overtime for asset replacement,
- The potential for other machines to be damaged due to the severity and nature of the machine failure,
- The expense involved in maintaining a large inventory of spare parts in anticipation of any asset malfunction.

With Sightprobe, you're alerted in advance about any impending asset failures, sometimes 6 months ahead, allowing for the strategic procurement of replacement parts only when necessary.

⦿ **Cost Savings:** Prevents costly repairs and extends the lifespan of equipment. Predictive maintenance using condition monitoring allows you to maximize the return on investment in your mechanical assets. By monitoring the actual condition of your machine, you can inspect, fix or replace the machine only when it's necessary, and not before.

⦿ **Safety and Compliance:** Enhances workplace safety and ensures compliance with industry regulations.

⦿ **Operational Efficiency:** Improves overall efficiency and productivity by maintaining equipment in optimal condition.

How does Sightprobe work?



- **(Wireless) sensor** collects surface temperature, triaxial vibration data and calculate time domain KPIs, frequency domain spectrum, transmits to the gateway via wireless mesh network.
- **Gateway** transfers data from the sensors to the IoT cloud platform through Ethernet, WIFI or GSM/LTE.
- **IoT Cloud Platform;**
 - decodes, processes, analyzes and stores the data received,
 - visualizes analyzed data to users on dashboards,
 - executes user rules based on both periodic controls and event based where new data received. These rules check data validity and create violation records and notifications upon any anomaly detected,
 - creates scheduled reports as attachment of emails or allows users instant download.

Route of data in Sightprobe

1. Data Collection →→→→ 2. Cloud Analysis →→→→ 3. Get Notified



Wireless sensors are battery operated, most of the time they sleep. Internal timers wake sensor up for specific

periods of time to measure surface temperature and vibration. Math calculations of measured data take place at edge and sent directly to gateway or through another neighbor node. Gateway forwards data to cloud through WAN connection.



IoT Cloud Platform accepts, extracts, stores and analyzes both time and frequency domain data.

Time domain data (KPIs) consist surface temperature, 3-axis RMS, peak to peak, zero to peak of vibration velocity and acceleration, kurtosis and crest factor. Frequency domain data consist triaxial FFT conversion of vibration RMS acceleration calculations.



Users can create rules from off-the-shelf templates in order to trigger notification upon an anomaly detected.

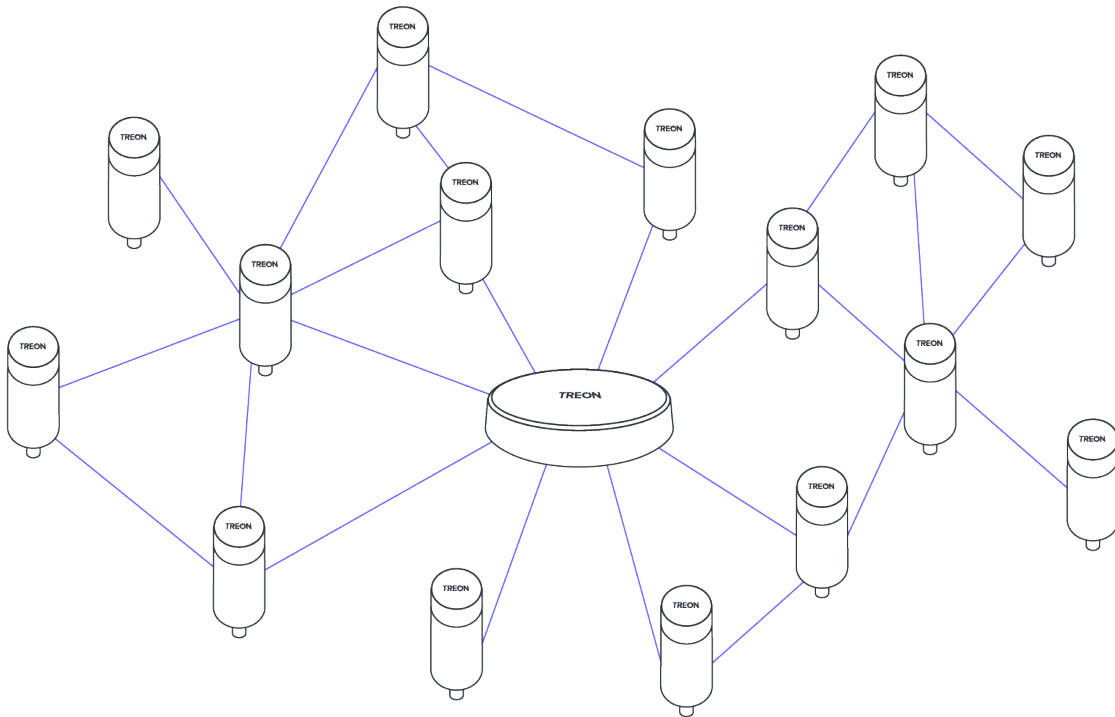
Rules can be applied for whole organization, just for specific facilities, even for specific asset groups or just assets. Reports can be generated instantly or can be scheduled to be received as email attachments.

Wireless Communication Topology

Wireless Sensor Networks (WSN) refer to a group of spatially distributed and dedicated sensors for monitoring and recording the physical conditions of the environment and organizing the collected data at a central location.

Wirepas Mesh

Wirepas Mesh is a unique technology in the field of WSN. It's a decentralized network solution, meaning that each node in the network makes its own decisions regarding the best route for data transfer. This approach offers several benefits:



- **Scalability:** Wirepas Mesh can easily scale from a few devices to thousands, making it suitable for large-scale deployments.
- **Reliability:** With each node capable of determining its own path, the network can adapt to changes and obstacles, ensuring consistent data transmission.
- **Energy Efficiency:** The decentralized nature of the network allows for efficient use of power, extending the battery life of sensor nodes.
- **Flexibility:** It's versatile and can be used in a variety of applications, from industrial monitoring to smart lighting systems.

WSNs are crucial for collecting and transmitting data. The choice of topology in a WSN, be it star, tree, or mesh, greatly influences the network's efficiency and reliability. Wirepas Mesh, in particular, stands out for its decentralized approach, offering items above. Our sensors and gateways are communicating with each other using Wirepas mesh network. Our Wirepas enabled vibration sensors can work more than 5 years depending on network design and traffic density on the node.

Products Overview

Our solution has both hardware and software components:



Wireless Industrial Vibration Sensor 1kHz

Cost-efficient and easy to deploy sensor measures tri-axial vibration and surface temperature of rotating equipment, such as pumps, motors, and compressors. It enables identifying abnormal vibrations or high temperatures, which are early signs of machine failure due to component imbalance, misalignment, wear, or improper use of equipment.



Wireless Industrial Vibration Sensor 6kHz

Measures vibration up to 6kHz, identifying abnormal vibrations, which are early signs of machine failure due to component imbalance, misalignment, wear, or improper use of equipment. 6KHz vibration sensor provides the required high resolution data to not only identify emerging issues but also do root-cause analysis.



Wireless Industrial EX-Proof Vibration Sensor

Ex-proof wireless sensor is battery-operated condition monitoring device, certified to be safely used in potentially explosive environments (ATEX/IECEx certifications). It measures surface temperature and tri-axial vibration of a rotating equipment, such as pumps, motors, and compressors, with a frequency range up to 6.3kHz.



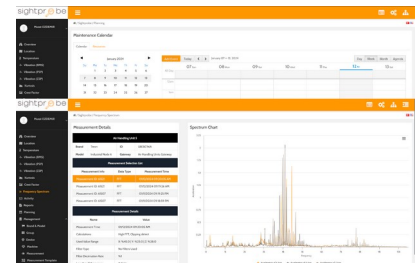
Industrial Wirepas Gateway

A critical part of any IoT solution. Industrial Wirepas Gateway collects, processes, and transmits data from sensors to any cloud backend over a wide range of wired and wireless connectivity. It can be freely configured, extended, and run customer edge applications to enable any IoT solution.



Wirepass Gateway With IP67 Enclosure

Industrial Wirepas Gateway water and dustproof IP67 enclosure is designed to protect the Gateway in outdoor or harsh indoor conditions. The enclosure includes a gateway AC/ DC power supply and DC cable.

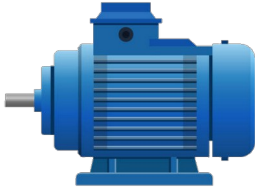


Bienport IoT Cloud Platform

Bienport is a web-based software platform that does not require any initial investment cost for its users, is constantly updated, does not require any maintenance, IT/support workforce and provides end-to-end solution where you can remotely track, monitor and control your assets, sensors and machines.

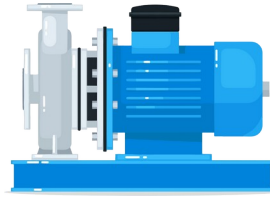
Possible Applications

Condition monitoring has a wide range of applications right across industry wherever there is machinery in use. Here are some common applications:



Electric Motors

Motors are an essential part of most productions. They are highly important to production uptime, as they ensure everything else is running smoothly.



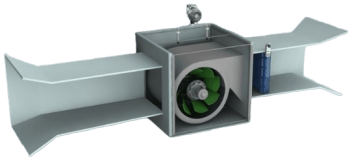
Pumps

Pumps are one of the most critical asset types in most industries. By monitoring patterns in vibration, it becomes possible to prevent expensive pump failures.



Compressors

Compressors play a vital role in many industries. Monitoring the vibration patterns in these machines is crucial in preventing costly failures and ensuring smooth operation.



H.V.A.C.

H.V.A.C. systems comprise several critical asset types, and monitoring them can enhance reliability, minimize downtime, and streamline the maintenance process.



Conveyor Belts

Belts are used primarily for transporting materials such as ore, coal, and other mined resources over short or long distances in a continuous and efficient manner.



Gears & Bearings

Across all asset types, machine failures are often caused by mis-installation or wear in gears and bearings. By predicting these types of faults you avoid expensive downtime.

ECONOMICAL METHOD FOR RECORDING VIBRATION AND TEMPERATURE INFORMATION IN FULLY FUNCTIONING PUMPS



The economical method for recording vibration and temperature information in fully functioning pumps refers to an efficient and cost-effective approach designed to monitor and gather critical data on operational pumps. This method involves the use of advanced sensors. Such monitoring is crucial in maintaining the optimal performance of pumps, as it allows for early detection of potential issues or malfunctions. By focusing on cost-efficiency, this approach ensures that businesses can maintain high operational standards without incurring significant expenses. The data collected through this method is invaluable for predictive maintenance, ensuring the longevity and reliability of the pumps.

SIMPLE INSTALLATION ON CURRENT EQUIPMENT. COMPLETELY WIRELESS, WIRING UNNECESSARY. PLUG AND PLAY.



This approach emphasizes the ease of deployment, highlighting that the installation requires minimal effort and technical know-how. Being completely wireless, it eliminates the need for complex wiring setups, which often pose a challenge in terms of time, cost, and space. The “plug and play” aspect underscores the user-friendly nature of the technology, suggesting that it is designed for immediate use without the need for extensive configuration or specialized skills. This streamlined integration process is particularly advantageous in industrial or commercial settings where reducing downtime and simplifying operations are crucial.

INDUSTRIAL ATEX SENSOR ENGINEERED FOR CHALLENGING SETTINGS LIKE EXPLOSION PROOF ENVIRONMENTS.



Highly specialized and robust sensor designed for extremely hazardous conditions. Meets the stringent requirements of ATEX, a key regulatory directive for equipment intended for use in explosive environments. Its engineering is tailored to withstand and function reliably within environments having high risk of explosions, such as in chemical plants, oil refineries, or gas pipelines. The design and materials used in this sensor ensure that it does not initiate an explosion, even in the presence of flammable gases or dust. The sensor's capability to perform advanced safety features and durability in high-risk industrial operations.

PRE-CALCULATED VIBRATION KEY PARAMETERS FOR MONITORING MOVING BELTS IN FACTORY PROCESSES.



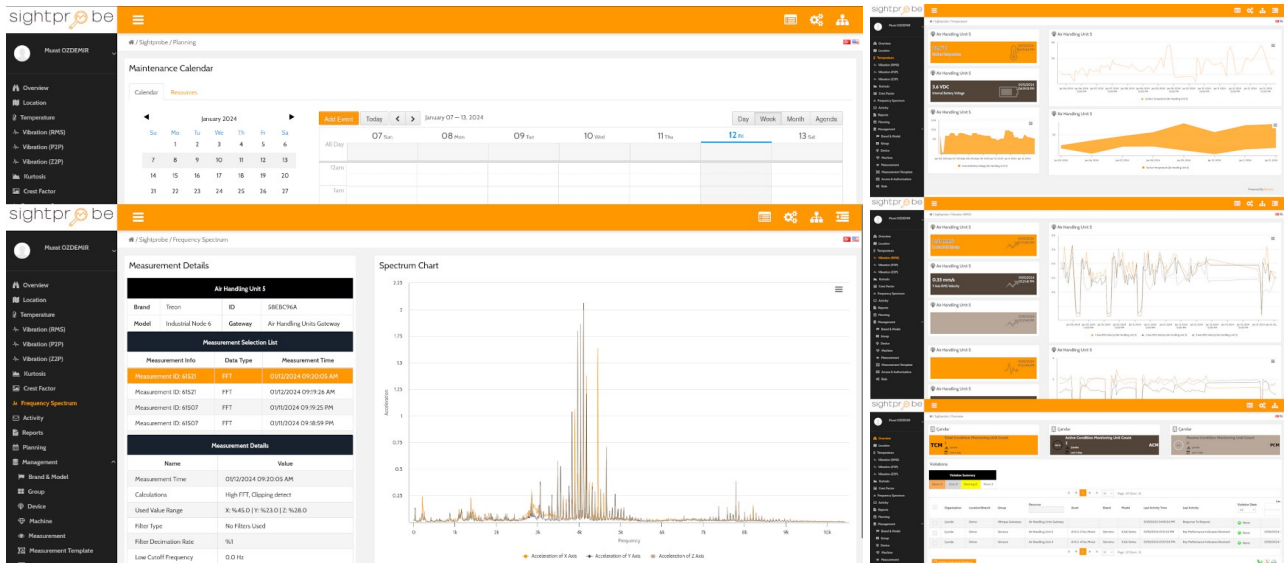
Sophisticated approach to maintaining and overseeing the operation of industrial conveyor belts. This method involves using predetermined, critical parameters related to the vibrations of these belts. By pre-calculating these key vibration metrics, system can effectively monitor health and performance of moving belts, which are integral to various factory processes. This proactive monitoring is crucial in detecting irregularities, potential malfunctions, or wear and tear in the belts, thereby preventing downtime and ensuring smooth operation, allows for a more efficient and precise assessment. This technique is vital in industries where conveyor belt systems play a critical role, ensuring that production lines are uninterrupted and efficient.

AVOID INTERRUPTIONS AND ENHANCE PERFORMANCE OF AIRFLOW AND COOLING SYSTEMS



This strategy focuses on maintaining and enhancing HVAC systems by preventing disruptions and inefficiencies. Emphasizing regular maintenance and prompt repairs, it ensures seamless operation of airflow and cooling systems. Performance enhancement extends beyond repairs to include efficiency and effectiveness improvements, like component upgrades and energy-efficient practices for optimal temperature and air quality control. These improvements make operations more reliable, cost-effective, and eco-friendly, crucial for comfortable and healthy indoor environments in various settings.

Software Details



IoT Platform Features for Condition Monitoring

- Overview of asset inventory (including instant and historic violations monitor)
- Asset locations of on map with markers indicating normal, warning, error, alarm status
- Temperature analysis
- Time domain calculated data (Key Performance Indicators) analysis. Vibration velocity and acceleration data in the form of;
 - RMS (Root Mean Square)
 - P2P (Peek-to-Peek)
 - Z2P (Zero-to-Peek)
 - Kurtosis
 - Crest Factor
- Frequency domain spectrum analysis
 - Triaxial acceleration amplitude versus frequency
 - Low band FFT (10 - 1.000 Hz)
 - Full band FFT (10 - 10.000 Hz)
- Activity Monitor including device (sensor, gateway) and asset (pump, compressor, etc.) label details
- Maintenance Planning Calendar
- Reporting
 - Activity Details Report
 - Violation Details Report
 - Violation Summary Report

Management

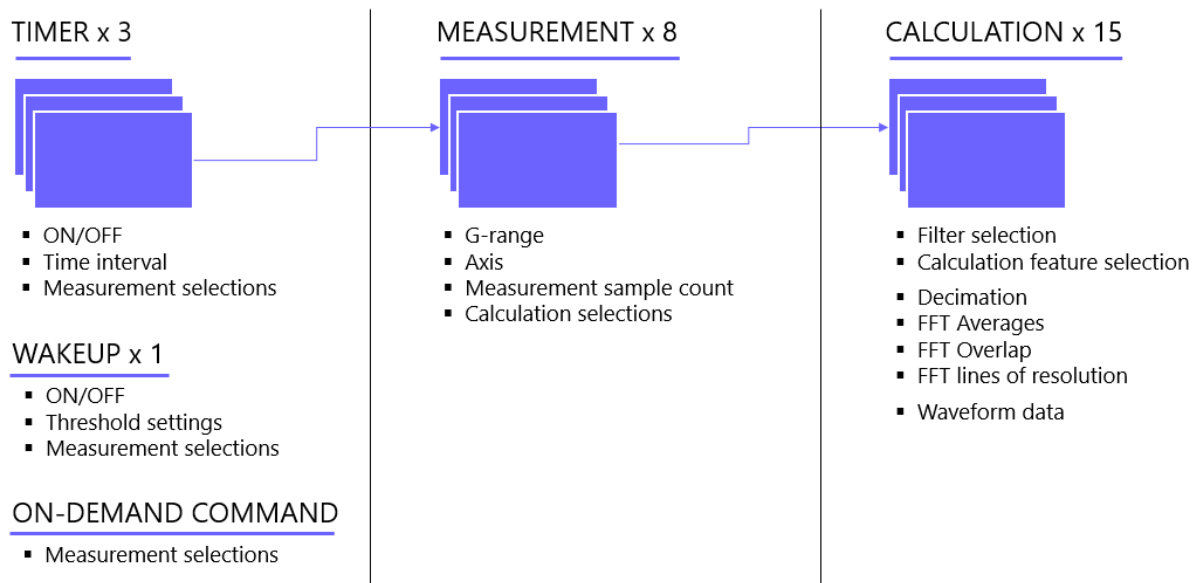
- Group
- Device
- Asset/Machine
- Rule
- Access & Authorization

Control Panel

- User & Organization Management
- User Group Management
- Role Management
- Password Policy Management

Measurements and Calculations

Measurements and calculations take place at the edge (sensors) and are periodically transmitted to the IoT platform in accordance with their timer interval. Sensors generally sleep to ensure maximum battery life. There are 3 ways to wake sensors up; timer interrupt, meet wake-up condition, on-demand command. By default wake-up conditions are set as OFF but can be fully configurable upon customer requests.



Timer Parameters

Timers	Time	ON/OFF	Measurement Selection
Timer 1	1h	ON	0
Timer 2	6h	ON	1
Timer 3	24h	OFF	2 & 3
Status Interval	3h	ON	-

Measurement Parameters

Measurement ID	0	1	2	3	Default
Axis	3	3	3	X-Axis	All
G-Range	4	4	4	4	4
Sample Amount	36.864	36.864	36.864	68.268	110.592
Calculations	1 & 3	2 & 4	5	6	0

Measurements are triggered by timer interrupt and/or wake-up conditions and/or on-demand commands. There are 3 timers for triggering different measurements and additional timer for sensor status notification as given above table. Default measurement table is also given above, in default configuration measurements with ID between 0 to 3 is pre-defined measurements with given parameters in same table rows. There are totally 8 available measurement definitions on sensors. Measurements with ID between 4 to 7 are available customer specific customization.

Total of 15 calculation definitions are available (IDs between 1 to 6), 6 of which are configured as default with the given settings in below table. Calculations with ID between 7 to 15 are available customer specific customization. Remember that default calculations are take place after relevant measurements given in the table above.

Calculation Parameters

Calculation ID	1	2	3	4	5	6	Default
Calculations	v-RMS, v-PEAK, v-P2P	Low FFT	a-RMS, a-PEAK, a-P2P, Kurtosis, Crest Factor	High FFT	Raw data	Raw data	FFT, aRMS, aPEAK
Low cut-off	10 Hz	10 Hz	No filter	No filter	-	-	No filter
High cut-off	1000 Hz	1333 Hz	No filter	No filter	-	-	No filter
Decimation	-	9	-	0	-	-	1
Averages	-	0	-	9	-	-	0
Overlap %	-	0	-	0	-	-	0
Window	-	Hanning	-	Hanning	-	-	Hanning
Lines of resolution	-	1600	-	1600	-	-	1600
FFT format	-	Variable	-	Variable	-	-	Auto (constant)

a-*: acceleration v-*: velocity

Wake-up Parameters

Parameters	Pre-configured	Default
Feature Enable	OFF	OFF
Wake-up G-range	4G	4G
Wake-up threshold	2	8
Wake-up Action Delay	5 sec	30 sec
Wake-up Blank-time	3600 sec	900 sec
Action measurement	ON	ON
Action Indication	ON	OFF
Action LED	OFF	ON
Measurements to be triggered	1	1

Hardware Details

Wireless Industrial Vibration Sensor 1kHz

Wireless industrial vibration sensors operate in a wireless mesh network for easy, cost efficient deployment and continuous monitoring of tens or hundreds of machines.

A wireless industrial vibration sensor that is cost-efficient and easy to deploy. It measures tri-axial vibration and surface temperature of rotating equipment, such as pumps, motors, and compressors. Industrial Node enables identifying abnormal vibrations or high temperatures, which are early signs of machine failure due to component imbalance, misalignment, wear, or improper use of equipment.



PRODUCT FEATURES

- ⦿ **EDGE CALCULATION**
Choice to process the vibration data already in the sensor, send less data but get the same value.
- ⦿ **LONG BATTERY LIFE**
Large battery, with an estimated lifetime of up to 5 years, depending on the configuration and operating environment.
- ⦿ **CONFIGURABLE**
Select your own measurement parameters, update intervals and what data to send to make it your own. One size does not fit all.
- ⦿ **DURABLE**
Marked with an IP67 rating, which allows the device to withstand harsh factory conditions.
- ⦿ **PLUG & PLAY**
Fast and easy to deploy on a large scale. Mount the sensors, and just press the on button. That's it.

SPECIFICATIONS

VIBRATION

- ⦿ Acceleration measurement on 3-axis; Axial, Horizontal and Radial.
- ⦿ Dynamic range +/- 4G (configurable to 2, 4, 8 or 16)
- ⦿ Frequency range 10-1000Hz
- ⦿ Sampling rate 6600Hz
- ⦿ Resolution 16-bit
- ⦿ FFT resolution 1Hz/bin

TEMPERATURE

- ⦿ Measurement range -40°C to +150°C
- ⦿ Resolution 0.1°C
- ⦿ Accuracy +/- 0.3°C (mounting dependent)
- ⦿ Repeatability +/- 0.1°C

WIRELESS COMMUNICATION

- ⦿ 2.4GHz / Wirepas Mesh

BATTERY

- ⦿ 3.6V lithium thionyl chloride
- ⦿ Battery lifetime up to 5 years (Battery life is dependent on operating temperature and configuration)

DIMENSIONS

- ⦿ 78.5 x 28 mm
- ⦿ Mounting to M8 thread
- ⦿ Weight 129g
- ⦿ Cover material 316 ss
- ⦿ Top cap material PE HD

ENVIRONMENT

- ⦿ Operating -40°C to +85°C
- ⦿ Storage 30°C maximum
- ⦿ IP67

ENVIRONMENT

- ⦿ CE, FCC, ISED, BIS (India)

SOFTWARE

- ⦿ Fully configurable data delivery and integration to Bienport IoT Platform
- ⦿ Device management

Wireless Industrial Vibration Sensor 6kHz

A higher-resolution vibration data capturing device. Made for condition monitoring on a massive scale.

Industrial vibration sensor 6kHz measures vibration up to 6kHz, identifying abnormal vibrations, which are early signs of machine failure due to component imbalance, misalignment, wear, or improper use of equipment. It provides the needed high resolution data to not only identify emerging issues but also do root-cause analysis.



PRODUCT FEATURES

- ⦿ **TRIAxIAL MEASUREMENT OVER ULTRA-WIDE BANDWIDTH**
Frequency range up to 6.3kHz (+/-3dB) with 26.667Hz sampling rate.
- ⦿ **CONFIGURABLE DATA ACQUISITION AND ADVANCED DATA PROCESSING**
Configurable measurement sample amount, filtering and decimation
- ⦿ **PRE-CALCULATED KEY PARAMETERS FOR FAST ASSESSMENT**
Based both on velocity and acceleration. Fully configurable FFT calculation on the edge
- ⦿ **HIGH RESOLUTION MEASUREMENT DATA**
For advanced backend diagnostics. High frequency, high resolution waveform up to over 100.000 measurement samples

SPECIFICATIONS

VIBRATION

- ⦿ Acceleration measurement on 3-axis; Axial, Horizontal and Radial.
- ⦿ Dynamic range +/- 4G (configurable to 2, 4, 8 or 16)
- ⦿ Frequency range 10-6300Hz (-3dB)
- ⦿ Sampling rate 26.7 kHz
- ⦿ Resolution 16-bit
- ⦿ FFT resolution 1Hz/bin

TEMPERATURE

- ⦿ Measurement range -40°C to +150°C
- ⦿ Resolution 0.1°C
- ⦿ Accuracy +/- 0.3°C (mounting dependent)
- ⦿ Repeatability +/- 0.1°C

WIRELESS COMMUNICATION

- ⦿ 2.4GHz / Wirepas Mesh

BATTERY

- ⦿ 3.6V lithium thionyl chloride
- ⦿ Battery lifetime up to 5 years (Battery life is dependent on operating temperature and configuration)

DIMENSIONS

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- ⦿ Weight 129g
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ENVIRONMENT

- ⦿ Operating -40°C to +85°C
- ⦿ Storage 30°C maximum
- ⦿ IP67

ENVIRONMENT

- ⦿ CE, FCC, ISED, BIS (India)

SOFTWARE

- ⦿ Fully configurable data delivery and integration to Bienport IoT Platform
- ⦿ Device management

Wireless Industrial EX-Proof Vibration Sensor

Predictive maintenance for explosive atmospheres.

Industrial Ex-Proof vibration sensor measures vibration up to 6kHz, delivering data to identify abnormal vibrations. These vibrations indicate possible future machine failure because of various possible reasons like: wear, component imbalance, misalignment, or potential improper use of the machine. ATEX certification allows measuring vibration in potentially explosive atmospheres. It provides the needed high-resolution wide bandwidth data to identify emerging issues.



PRODUCT FEATURES

- ⊙ **ATEX CERTIFIED**
Certified for the use in potentially hazardous areas. ATEX certificate for explosive atmospheres.
- ⊙ **TRIAxIAL MEASUREMENT OVER ULTRA-WIDE BANDWIDTH**
Frequency range up to 6.3kHz (+/-3dB) with 26.667Hz sampling rate.
- ⊙ **HIGH RESOLUTION MEASUREMENT DATA**
High frequency, high resolution waveform up to over 100000 measurement samples.
- ⊙ **CONFIGURABLE DATA ACQUISITION AND ADVANCED DATA PROCESSING**
Configurable measurement, sample amount, filtering and decimation.

SPECIFICATIONS

VIBRATION

- ⊙ Acceleration measurement on 3-axis; Axial, Horizontal and Radial.
- ⊙ Dynamic range +/- 4G (configurable to 2, 4, 8 or 16)
- ⊙ Frequency range 10-6300Hz (-3dB)
- ⊙ Sampling rate 26.7 kHz
- ⊙ Resolution 16-bit
- ⊙ FFT resolution 1Hz/bin

TEMPERATURE

- ⊙ Measurement range -40°C to +150°C
- ⊙ Resolution 0.1°C
- ⊙ Accuracy +/- 0.3°C (mounting dependent)
- ⊙ Repeatability +/- 0.1°C

WIRELESS COMMUNICATION

- ⊙ 2.4GHz / Wirepas Mesh

BATTERY

- ⊙ 3.6V lithium thionyl chloride
- ⊙ Battery lifetime up to 5 years (Battery life is dependent on operating temperature and configuration)

DIMENSIONS

- ⊙ 78.5 x 28 mm
- ⊙ Mounting to M8 thread
- ⊙ Weight 129g
- ⊙ Cover material 316 ss
- ⊙ Top cap material PE HD

ENVIRONMENT

- ⊙ Operating -40°C to +85°C
- ⊙ Storage 30°C maximum
- ⊙ IP67

ENVIRONMENT

- ⊙ CE, FCC, ISSED, BIS (India)
- ⊙ ATEX II 2 G Ex ib IIC T4 Zone 1 & 2 -40°C ≤ Ta ≤ +60°C

SOFTWARE

- ⊙ Fully configurable data delivery and integration to Bienport IoT Platform
- ⊙ Device management

Sensor Accessories



Using a nut adapter enables attaching the Industrial Vibration Sensor to a spot with small space in diameter and short M8 opening with less threading. It requires a flat surface of 25mm diameter. You can even out slight roughness of the surface by using additional epoxy.

Please note, when attaching the nut adapter to the Industrial Vibration Sensor thread, the nut adapter can be tightened to max. 8 Nm torque. Then, when attaching the sensor-adapter combination to the surface, the sensor should be screwed with 22mm torque wrench to max. 8 Nm torque.

If additional epoxy glue is used to attach the sensor-adapter combination to the surface of the machine, the sensor can be hand-tightened and then the epoxy is left to harden.

Using a magnetic mount adapter enables attaching the Industrial Vibration Sensor to an uneven surface, without an opening for a bolt. It requires epoxy glue and surface of 32mm diameter. The magnet inside the adapter will keep the Industrial Vibration Sensor attached to the surface while the epoxy hardens.

Please note, when attaching the magnetic mount adapter to the Industrial Vibration Sensor thread, the magnetic adapter can be tightened to max. 8 Nm torque.

Industrial Wirepas Gateway

Industrial Wirepas Gateway connects a mesh from few to hundreds of sensor nodes to IoT cloud platform. It collects, processes and transmits data to the cloud.



Industrial Wirepas Gateway supports a wide range of wired and wireless connectivity and integrated with IoT cloud platform, is extendable and runs edge applications. Stylish in design and compact in size, it fits any indoor environment and can be branded for customer.

FOR MESH NETWORKS

When there is a need for high density of connected devices, a mesh network is the perfect solution for connectivity. Industrial Wirepas Gateway comes with preloaded support for Wirepas Mesh and its hardware is ready to support Bluetooth Mesh.

EDGE COMPUTING

Industrial Wirepas Gateway provides a powerful ARM-based Linux platform for running edge compute applications. Developers can easily deploy and execute Python, Node.js, native GCC and other compiled applications. Provides 16GB of storage and it can be further extended via USB.

FULL CONNECTIVITY

Industrial Wirepas Gateway provides a connectivity option for any deployment from wired Ethernet to wireless with Bluetooth, Wi-Fi and cellular (GSM/LTE) connection. Integrated with Bienport IoT cloud platform.

HARDWARE SPECIFICATIONS

HARDWARE

- ⊙ ARM Cortex-A8 1GHz Processor
- ⊙ 1 GB DDR3L RAM
- ⊙ 16 GB eMMC Storage

POWER

- ⊙ Power supply 5V DC

CERTIFICATIONS

- ⊙ CE, FCC, ISED, India, Brazil

CONNECTIVITY

- ⊙ Wirepas Mesh 2.4GHz
- ⊙ 2G, LTE CAT M1 / NB-IOT
- ⊙ Wi-Fi 2.4GHz
- ⊙ Ethernet RJ45
- ⊙ USB A Host Port

ENVIRONMENT

- ⊙ IP20 indoors protection class
- ⊙ Operating temperature 0°C to +50°C

DIMENSIONS

- ⊙ Size: ø95mm x 18,3mm

FIXING METHODS

- ⊙ Wall/ceiling mount available

SOFTWARE SPECIFICATIONS

DEVELOPMENT ENVIRONMENT

- ⊙ ARM-based Linux OS (Yocto)
- ⊙ Pre-loaded Python and Node.js
- ⊙ SDK, Native GCC
- ⊙ Optional tools on request

NETWORKING

- ⊙ Firewall (iptables)
- ⊙ Linux TCP/IP stack
- ⊙ MQTT (paho)
- ⊙ Bluetooth (bluez)
- ⊙ Wirepas Connectivity Library

CLOUD SUPPORT

- ⊙ Integrated with Bienport IoT cloud platform
- ⊙ Integration service to connect the gateway with any cloud

Wirepass Gateway With IP67 Enclosure



Wirepass Gateway With IP67 Enclosure Water and Dust proof enclosure has been designed to protect the Wirepass Gateway With IP67 Enclosure in outdoor or industrial indoor conditions. Enclosure includes gateway AC/DC power supply and DC cable. Class II design (no FG pin).

FOR MESH NETWORKS

When there is a need for high density of connected devices, a mesh network is the perfect solution for connectivity. Industrial Wirepas Gateway comes with preloaded support for Wirepas Mesh and its hardware is ready to support Bluetooth Mesh.

EDGE COMPUTING

Industrial Wirepas Gateway provides a powerful ARM-based Linux platform for running edge compute applications. Developers can easily deploy and execute Python, Node.js, native GCC and other compiled applications. Provides 16GB of storage and it can be further extended via USB.

FULL CONNECTIVITY

Industrial Wirepas Gateway provides a connectivity option for any deployment from wired Ethernet to wireless with Bluetooth, Wi-Fi and cellular (GSM/LTE) connection. Integrated with Bienport IoT cloud platform.

SPECIFICATIONS

AMBIENT CONDITIONS

- ⊙ Ambient temperature -20-50°C
- ⊙ Storage temperature -40-85°C
- ⊙ Relative humidity 20-90%, noncondensing
- ⊙ Pressure equalizer

RATINGS

- ⊙ Enclosure IP66/IP67
- ⊙ Integrated power cord IP44
- ⊙ Flammability rating: UL 746C 5"
- ⊙ Impact Resistance (EN 62262): IK08

MATERIALS

- ⊙ Material polycarbonate
- ⊙ Base color RAL 7035 - light grey
- ⊙ Cover color Smoked Grey
- ⊙ TPE gasket

DIMENSIONS

- ⊙ Size: 180 x 130 x 81 mm
- ⊙ Excluding cable sealing clamps

MOUNTING

- ⊙ Wall mounting with wall mounting lugs

POWER SUPPLY

- ⊙ Voltage Range 85-264VAC
- ⊙ Frequency Range 47-440Hz
- ⊙ Power Consumption 30VA Max
- ⊙ Electrical connection variants:
 - ✓ EURO TYPE F UNGROUNDED 2 WIRE
 - ✓ NEMA 1-15 Class II Power Cords
- ⊙ SAFETY and EMC:
 - ✓ Safety UL60950-1, TUV EN60950-1
 - ✓ EMC immunity EN61000 1,2,3,5,6,8,11
 - ✓ Surge L-N 1kV

Planned Software Road-map

1. Machine Health Scoring (*Expected Release: 2024 Q2*)
2. Machine Risk Scoring (*Expected Release: 2024 Q3*)
3. A.I. Root Cause Analysis using Frequency Spectrum Data (*Expected Release: 2025 Q1*)

Unplanned System Road-map

1. Wirepas pressure sensor integration
2. Wirepas level sensor integration
3. Wirepas pulse counter (for flow-meter) integration
4. Wirepas general purpose single/multi channel sensor interface integration