

Fizix OMax Datasheet



Optimize Operations and Minimize Downtime, Maximize Lifetime with Intelligent Machine Health Sensor OMax

Fizix OMax is a smart sensor to monitor rotating or moving systems such as motors, pumps, compressors, fans, turbines, cooling towers, crushers, boilers, engines, conveyors systems, textile machines, etc. It communicates wirelessly and sends data directly to the monitoring platform without the need for a gateway. This provides ease of integration and freedom.

The OMax smart sensor has many benefits, here are the main ones:



Safe Working Environment

Remotely and securely monitor your hard-to-access or dangerous/risky machines.



Ease of Use at Every Stage

Plug-and-play installation, automatic data collection and analysis, remote monitoring for better maintenance decisions.



Increased Uptime

Uninterrupted production and optimum resource utilization through advance planning. The right maintenance decisions at the right time.



Reduction in Energy Consumption

Healthy machines consume less energy. OMax keeps your machines healthy.

General Specifications

- Tri-Axial Vibration (Accelerometer), Acoustics, Magnetic Flux and Temperature
- IP67 environmental protection options
- Wide operating temperature range from -40°C to +85°C (ATEX versions from -40°C to +72°C)
- Direct wireless connection to the network without an additional device
- Widely used 2.4 GHz 802.11 b/g/n wireless communication
- Wireless power (3VDC Battery)
- Mounting options: Screwing (M8), industrial adhesive, magnetic mounting
- Stay updated with remote sensor firmware updates (OTA)
- Up to 5 years of standard usage (up to 4 years of standard usage in ATEX versions)

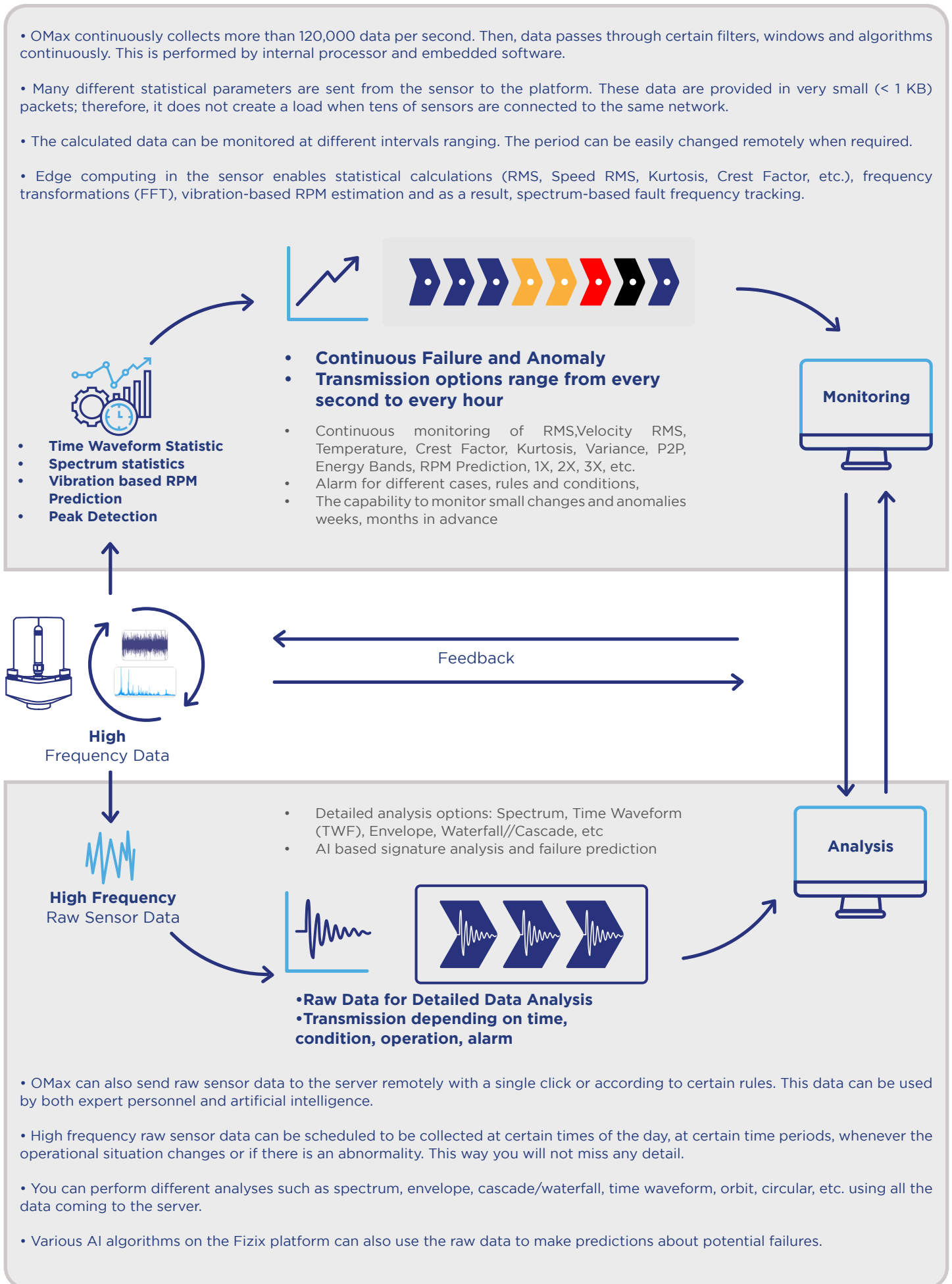
Sensor Data Collection and Edge Computing Features

OMax smart sensors can perform different calculations on the sensitive and complex vibration, acoustics, magnetic flux data they collect from machines. This enables meaningful, fault-based monitoring rather than simply transmitting raw sensor data.

OMax sends this meaningful data directly to the server via wireless communication. OMax can also send high frequency raw vibration data to the server. You can receive this data at desired periods, depending on a predefined condition or instantly by pressing a button on platform interface.

All data transferred to the server via secure protocols are processed, stored and displayed on the interfaces according to automated rules. In addition to high-level facility health monitoring, there are also detailed data analyses options with different platforms provided on the server side.

As can be seen in the data flow graph from the sensor to the server below, the data is sent in an optimised way. While continuous and meaningful data can be monitored with the upper stream, raw data is sent with the lower stream to increase the capabilities of the artificial intelligence and expert user on the platform.



Mate: Smart Machine Health Monitoring Platform

Dashboards, Notifications and Reporting



Comprehensive Summary Screens: Provide historical and real-time data on overall reliability.

Health Score-Based Monitoring: Provides clear and focused insights

Automatic Notifications: Weekly and monthly reports with critical updates.

Notification System: Ensures no important changes are missed. Alarms and notifications can be sent via email, phone apps, or other applications.

Customized Screens: Tailored dashboards for managers, operations personnel, and maintenance staff.

Real-Time Data Monitoring: Specialized screens for monitoring data flow and changes.

Live Data Access: Maintenance personnel can access detailed data without being physically present at the machines.

Next Generation Platform

User-Friendly Interface: Simplifies your workflow.

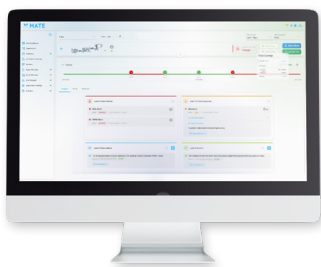
One-Click Machine Health View: Instant access to machine health status.

Dark Mode & Light Mode: Customize your viewing experience.

Mobile Applications: Available for iOS and Android, access from anywhere, anytime.



Forecasts, Fault Diagnosis with Algorithms, AI, and Experts



Digital Twin-Based Interfaces: Next-generation interfaces for accurate simulations and visualizations.

Automated Fault Detection: Utilizing multiple levels of algorithms and AI systems.

Planned Maintenance: Early detection of potential failures facilitates planned maintenance activities.

Predictive Insights: Trend and forecast analyses offer guidance on potential future conditions.

Certified Expert Support: Available at your chosen parameters/time intervals (monthly, upon alarm, etc.). Provides detailed reports and insights from certified professionals.

Advanced Sensor Data Analysis for Predictive Maintenance

Comprehensive and Detailed Analysis: Enables trend analysis and anomaly detection.

Statistical Parameters: Includes Accel. RMS, Velocity RMS, Crest Factor, Kurtosis, Spectrum Energy Bands, Spectrum Peak Diagnosis, etc.

High-Frequency Data Analysis: Utilizes time waveform, spectrum, envelope, circular, and waterfall/cascade plots for in-depth insights

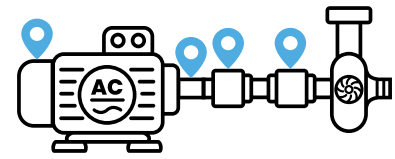




Safe Predictive Maintenance Solution

The Fizix OMax system makes your predictive maintenance easy, fast and expandable with its optimised sensors, embedded software and intelligent interface. Simply stick or screw OMax onto your machines and start monitoring instantly.

Monitor hard-to-reach or hazardous points so that your personnel are safe. You can be notified of changes in the status of your machines and systems at the warning levels in the standards or at the limits you set yourself.



Motor Pump Group



Motor Fan Group

Vibration measurements can be monitored to detect faults such as unbalance, misalignment, looseness, bearing issues, gear problems, and more. The Fizix monitoring system evaluates and rates asset health based on standards, user-defined specifications, or AI-driven criteria. This enables timely interventions and maximizes equipment uptime.

With OMax, various types of industrial machines can be monitored. High-frequency data collection and analysis are performed directly at the machine's location, allowing for uninterrupted, 24/7 monitoring throughout the year.



Alarms and Warnings

By following the limits defined in ISO standards specific to your machine on the platform, it sends alerts to your mobile phone, computer within seconds when there is an unexpected change / abnormality in the general condition of your machines. In addition, you can also easily define your own alarm limits and create more detailed warning criteria.



Types of Data Sent by the Sensor

OMax smart sensor can collect and process high frequency sensor data simultaneously by its processor and embedded software. Thanks to its processing capacity, it can obtain very different statistical parameters, especially from vibration sensor data such as;

- Triaxial acceleration RMS, velocity RMS, Crest Factor, Kurtosis, Peak to Peak, Standard Deviation, Skewness, Minimum, Maximum, and many other parameters are calculated using the high frequency time waveform received from the vibration sensor.
- Frequency domain data is calculated by Fast Fourier Transformation (FFT) using vibration data. By using both time and frequency domain vibration data, the rotational speed (RPM) of the machine can be estimated. Sensor send the estimated RPM value continuously. Thanks to the RPM estimation, it can also provide RPM information to the sensor from outside.
- Thanks to RPM estimation, it also provides spectrum-based fault monitoring. It can calculate the values at rotational speed multiples used in the diagnosis of unbalance, misalignment, looseness, and similar common faults. In this way, it offers users the opportunity to monitor these faults instantly from the beginning to the growth process.
- In addition, depending on the user's request or Fizix's suggestion, different regions in the frequency domain can be monitored. For example, to monitor the line frequency fault zone or another fault zone, the sensor can be instructed accordingly. This setting can be configured by filling out a simple web-based form.



Wireless Communication

It is of great importance that there are no interruptions in communication as well as the sensors receiving accurate data. The antenna of the OMax sensor was intentionally left out during the design phase. Thus, more powerful antenna or adjustable angle antenna can be used at areas with reception problems.

In addition, for the assets working in a completely closed environment, antenna extension cables that can be extended up to 10 metres can be used to connect to wireless networks outside. All these advantages ensure continuous connectivity.

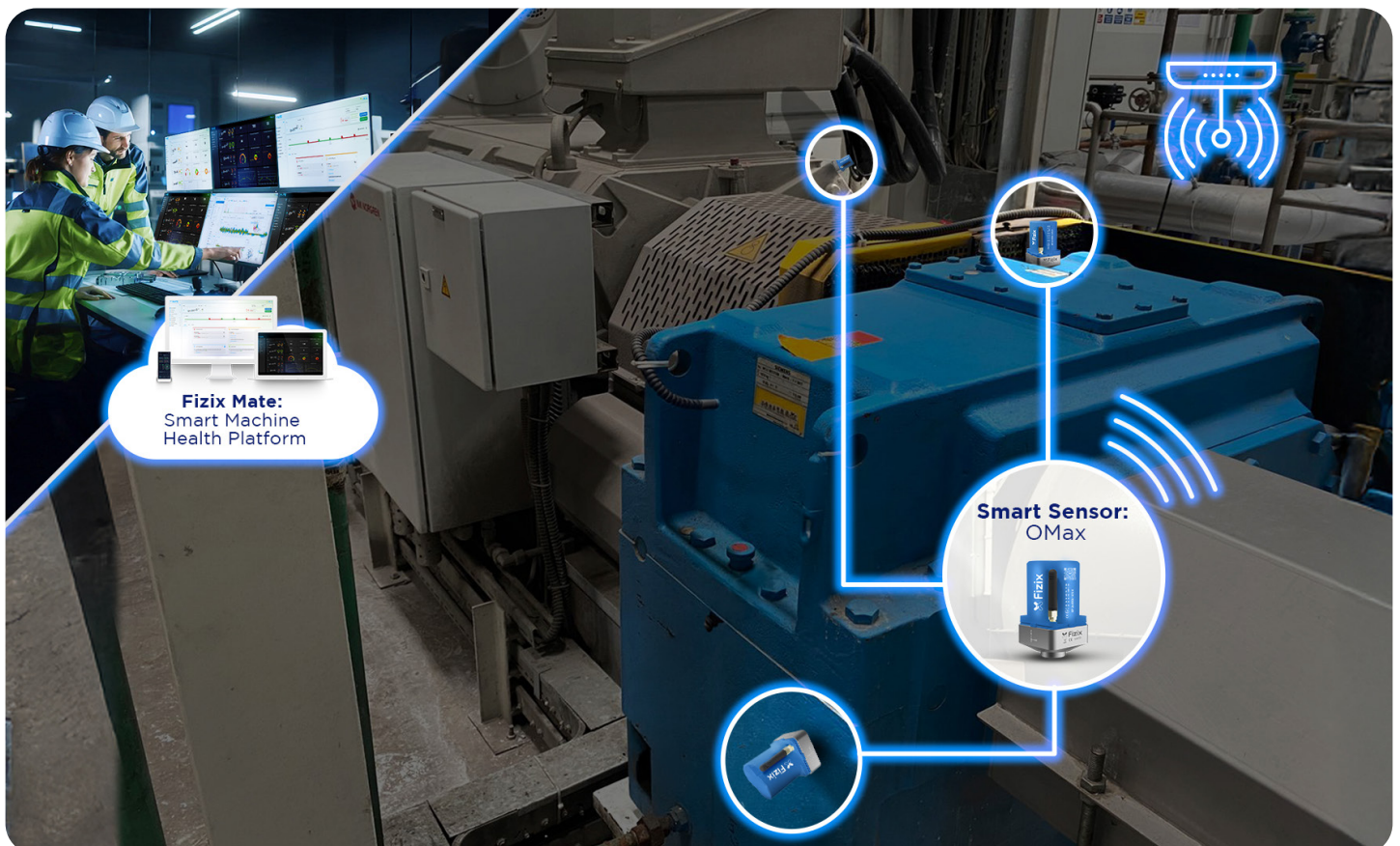


Data Communication Protocol and Data Format

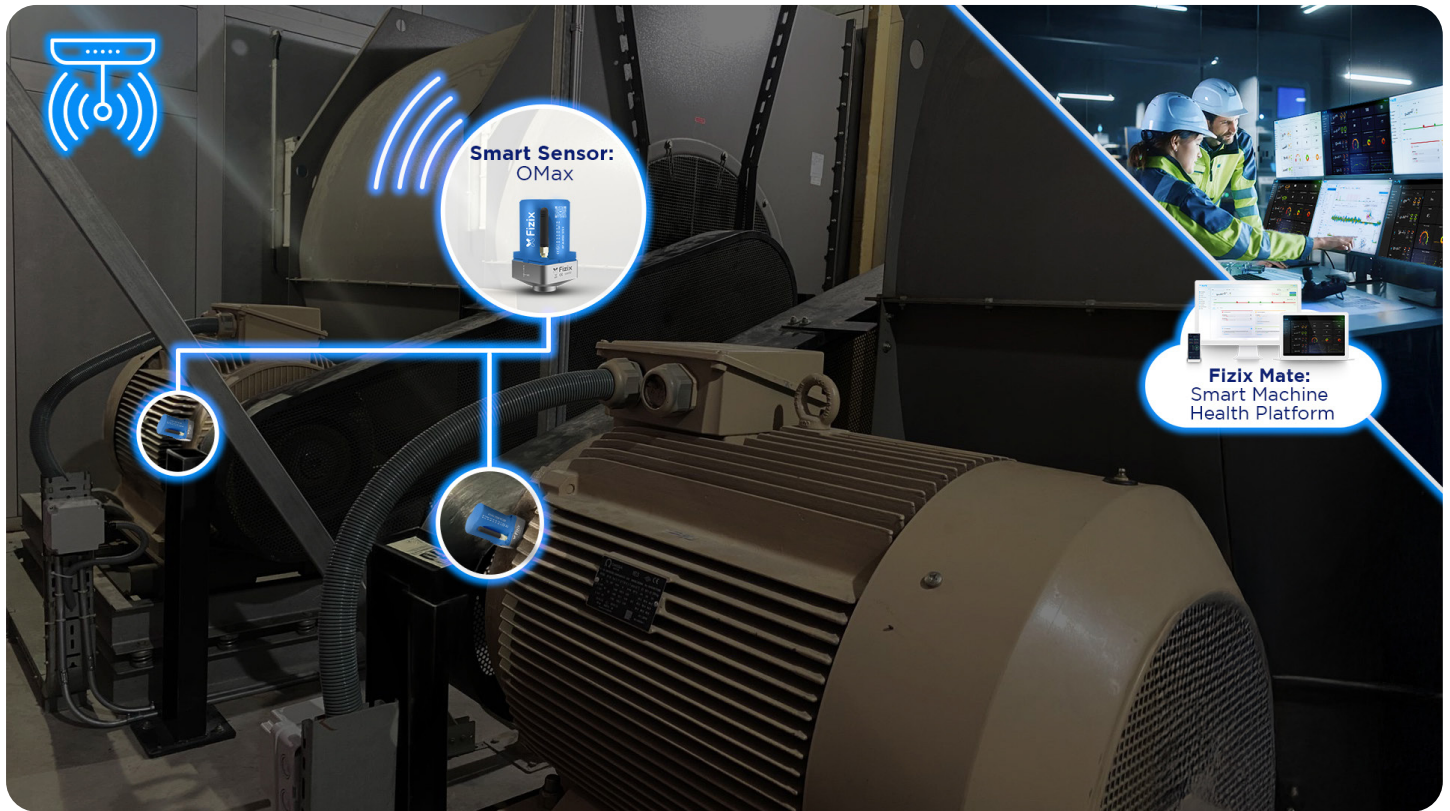
The OMax smart sensor has two-way communication using MQTT, one of the most popular IOT protocols. It provides high level secure communication, thanks to the 'MQTT over SSL' option.

In addition, you can remotely change many of its features at any time through two-sided communication.

The OMax sensor delivers all statistical data and calculation results from the collected sensor data directly in readable JSON format. In this way, this enables easy monitoring without the need for special data conversion



Some Assets You Can Monitor with Fizix



Turbine

In many power plants operating in the energy sector such as hydroelectric, wind, etc., turbines and rotors in general.

Fans

Radial, axial, cell and snail type high speed fans for ventilation and air conditioning used in almost every industrial applications.

Blowers

Belt or direct drive multistage centrifugal or roots-type blowers, commonly used for efficient air movement in industrial applications

Centrifugal Pumps

Vertical pumps, horizontal centrifugal suction pumps, turbine or engine driven boiler feed pumps, etc.

Tidal Pumps

Tidal pumps, including horizontal piston and horizontal gear pumps, are designed for efficient water movement in tidal environments

Air Compressors

Reciprocating, rotary screw, with or without internal/external gearbox, etc.

Gearboxes

In various industries, gearboxes with single, two, or multiple stages are commonly used for power transmission and torque conversion.

Motors

Used in a wide range of industries, motors of various types such as AC, DC, and servo motors are essential for driving mechanical systems

Spindles

Spindles, essential in CNC machines and lathes, provide high-precision rotational motion for efficient manufacturing operations.

Technical Specifications

The OMax system offers different solutions with sensor options to meet your various needs. You can find solutions that suit your requirements using the sensor options listed in the table below.

Technical Specifications		OMax	OMax-Ex
Integrated Sensor Types		Tri-axial MEMS Accelerometer (Vibration) + Temperature + Accustics (Ultrasound) + Magnetic Flux	
Body Material		Aluminium	
Base Screw Hole		M8x1	
IP Rating		IP67	
Wireless Communication		2.4 Ghz-802.11 b/g/n	
Battery Life		Standard usage, up to 5 years* ¹	Standard usage up to 4 years* ²
Size		□=53 mm h=95mm	
Weight		290 g	287 g
Operating Temperature Range		-40 °C - +85 °C	-40 °C - +72 °C
MEMS Accelerometer - Vibration	Number of axes	3 (x/y/z)	
	Measurement level	2g, 4g, 8g, 16g	
	Sensitivity Between Axes	1%	
	Sampling Range	0.1 Hz-26.6kHz	
	Noise Density (Under 2g Vibration)	80 micro-g/sqrt (Hz)	
Magnetic Flux	Range	± 2 mT (Maks)	
	Bandwidth	32 kHz	
	Noise	1.5 nT/√Hz (typ.)	
Acoustic Emission	Type	MEMS Microfon	
	Sampling Range	100 Hz – 80 kHz	
	SNR	64.3 dB	
Battery	Nominal Voltage	3.0 V	
	Nominal Capacity	7.4 Ah	5.6 Ah
	Operating Temperature range	-40 / +85 °C	-40 / +72 °C
Antenna	Frequency	2400-2500 MHz	
	Power	2.15 dBi	
Temperature Sensor		Analog output, accuracy 0.1 °C, accuracy 0.5 °C (typ.)	

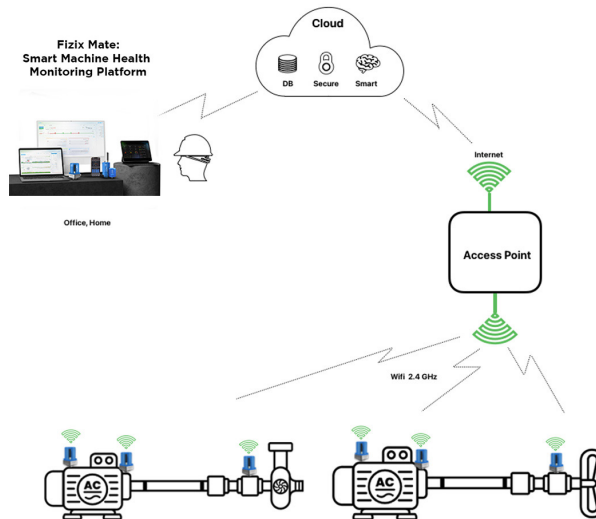
*1*2 The standard usage involves collecting data 4 times a day and sending calculated statistical parameters from this data. This allows for a battery life of up to 5 years. These settings can be easily adjusted by the user. For optimal battery life, it performs best at temperatures between 20°C and 60°C with a stable Wi-Fi connection.

Multiple OMax Integration Options

OMax sensors can use the same wireless network with light data packets without causing load on network. Each OMax can easily connect to a wireless modem, router or access point up to 30 metres away in an open area. Usage cases are given below.

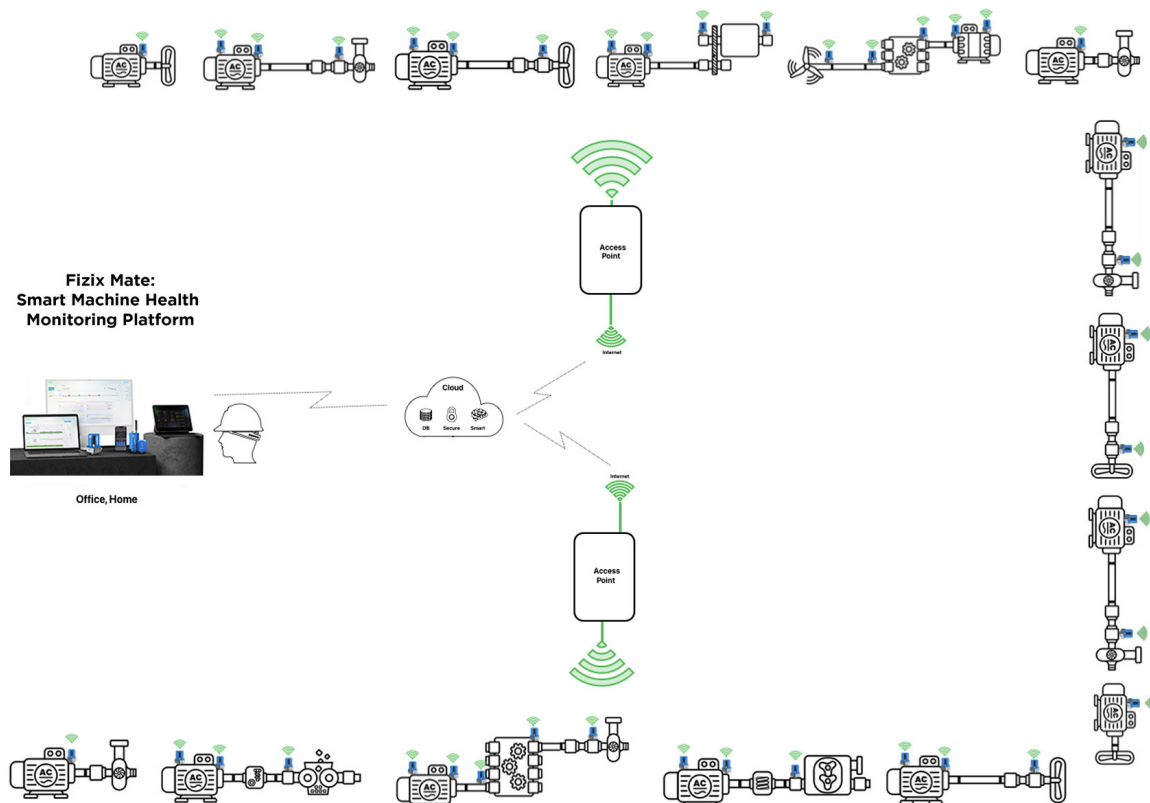
Example 1

- You can monitor your critical assets consisting of motors and connected sub-systems with sensors installed at different points.



Example 2

- You can monitor your non-critical assets by installing one sensor on each subsystem.

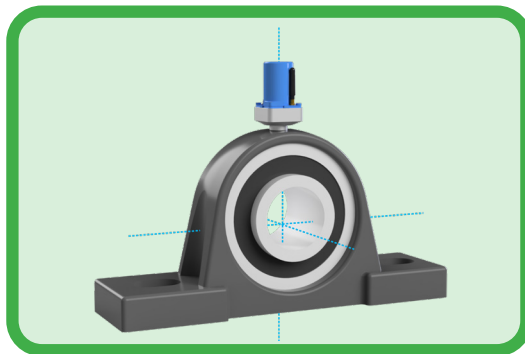
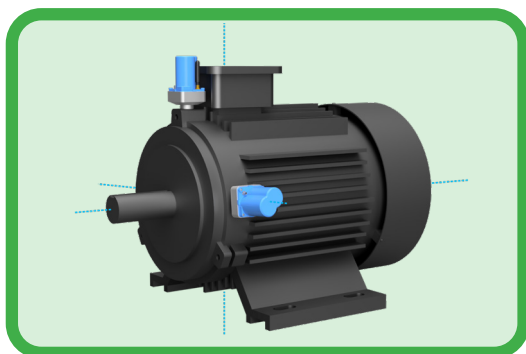
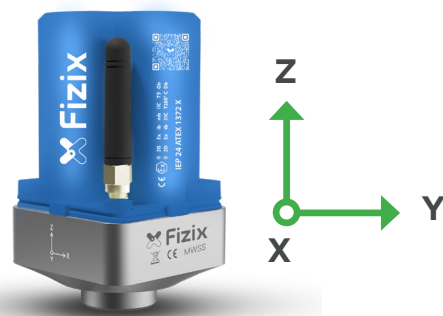


Proper Installation & Accurate Measurement

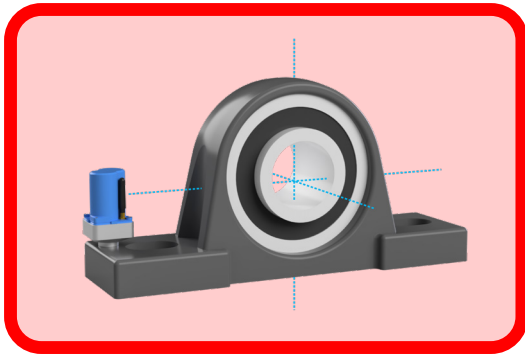
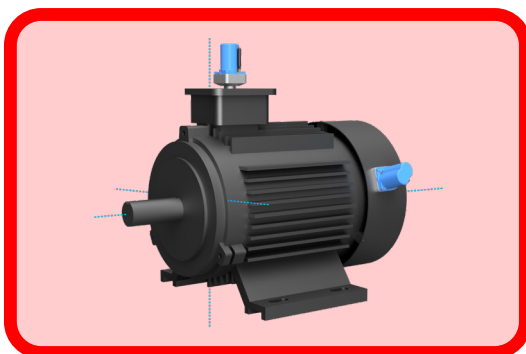
General Rules for Mounting

- Identify the critical points of the machine to be monitored for vibration.
- Only one sensor per measurement point is sufficient.
- The sensor should be mounted on rigid and stiff surfaces to ensure accurate vibration transmission.

Examples: bearing housings, motor casings, gearbox housings



The sensor axes (X-Y-Z) should be aligned with the actual vibration directions of the machine.



Installation on cooling fins, covers, and thin sheet-metal surfaces is not recommended.

Note: In motor applications, if possible, separate measurement points are recommended for the drive side (DS) and the non-drive side (NDS).



Preparations Before Order and Integration

- How many assets do you want to monitor?
- How many of your assets are critical, and from which points do you want to monitor them?
- Is your wireless communication infrastructure adequate?

If you're unsure, you can email hello@fizix.ai for free technical support



Box Contents

- 1-piece OMax
- 1 wake-up button (for configuration settings) *

*For bulk purchases, 1 wake-up button will be provided for every 20 sensors.



FAQ

- **What is the warranty for the sensor?**
OMax systems come with a 2 (two) years warranty.
- **Can we use 2.4 GHz standard modems, access points, extenders, or routers for wireless connection?**
Yes, OMax easily connects wirelessly to a 2.4 GHz Wi-Fi device. In an open area, a Wi-Fi modem (or GSM modem) can be used up to a maximum distance of 30 meters.
- **How can we configure the sensor? What data does the sensor send?**
OMax systems can send vibration (Acceleration and Velocity RMS, impact rate, etc.), acoustic (ultrasound), magnetic, and temperature data according to the desired data frequency. The data transmission interval can be easily adjusted. Additionally, each OMax system can send high-frequency data upon request.
- **Do we need a specialist for sensor installation?**
It has an interface that can be easily integrated and used by personnel with vibration-based maintenance training certification.
- **Do we need a gateway to connect the sensors to Wi-Fi?**
There is no need for an additional gateway or hardware when using OMax systems.
- **How can we mount the sensors to the machines?**
OMax has an M8 screw hole at the bottom. If your machine has a set screw, you can apply adhesive to the screw to prevent loosening and screw it in. If you prefer not to use screws, you can quickly attach the device directly to your machine using industrial metal-to-metal adhesives.

Contact Us!



Fizix



@fizix_ai



Fizix ai



fizix_ai_



fizix.ai



hello@fizix.ai



Manchester, UK



Ankara, Türkiye