

Fizix OLight Datasheet



Optimize Your Operations and Reduce Energy Consumption

Fizix OLight is a next-generation wireless monitoring sensor designed for predictive maintenance of industrial equipment, featuring a compact multi-sensor architecture.

By continuously monitoring the condition of rotating and moving assets—such as motors, pumps, fans, compressors, crushers, boilers, and conveyor systems—OLight provides real-time insights and early warnings before failures occur.

Integrating **tri-axial vibration, acoustic emission, magnetic flux, and temperature** sensing in a single robust housing, OLight enables simultaneous detection of multiple fault types, including imbalance, misalignment, looseness, bearing defects, and gear faults.

Powered by **Bluetooth® Low Energy (BLE 5.x)** communication, Fizix OLight operates with ultra-low power consumption and securely transmits data to the **Fizix Monitoring Platform** via the Fizix OGate Gateway.

The sensor is optimized for long-term operation using **two standard** CR123A batteries. Easily replaceable by the user, the batteries eliminate the need for special power solutions or maintenance procedures. Its compact and lightweight design allows seamless installation on various equipment types and mounting positions.

Thanks to its built-in processing capability, OLight analyzes raw measurement data locally before transmission. It extracts key condition indicators and anomaly metrics from vibration and acoustic signals and sends only meaningful summary data to the platform. This approach reduces data traffic, improves energy efficiency, and enhances the overall performance of predictive maintenance systems.

Key Advantages of the OLight Smart Device:



Safe Working Environment

By remotely and securely monitoring the condition of machines located in hazardous or hard-to-access areas, OLight minimizes on-site risks for maintenance personnel and enhances overall workplace safety.



Ease of Use at Every Stage

Designed for simple installation and operation, OLight enables fast deployment and effortless integration into existing maintenance workflows without complex setup or specialized training.



Reduced Unplanned Downtime

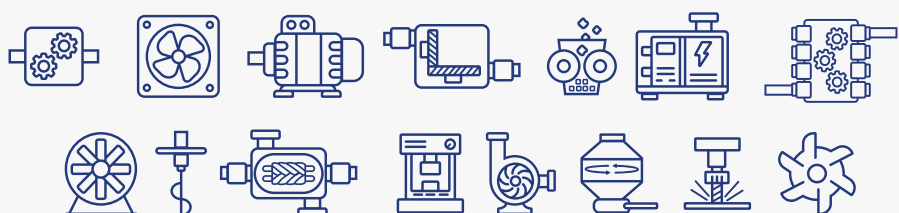
Thanks to integrated predictive maintenance algorithms, potential failures are detected at an early stage. This helps prevent unexpected breakdowns and ensures continuous and reliable production.



Improved Energy Efficiency

Equipment operating in healthy conditions consumes less energy. OLight supports efficient machine operation, contributing to lower energy consumption and reduced operating costs.

All Machines & Industries



General Settings

Sensors:

- **OLight-LBSS**

- Tri-axis vibration (accelerometer)
- Acoustic emission
- Magnetic flux
- Temperature measurement

- **Technical Specifications**

Ingress Protection: IP67-rated, fully protected against dust and water

Operating Temperature: Wide operating range from -40°C to +70°C

Wireless Communication: Low-power data transmission via Bluetooth® Low Energy (BLE 5.x), with platform connectivity through the Fizix OGate Gateway

Power Supply: 2 CR123A batteries (parallel configuration, 3 VDC, ~3100 mAh capacity) — standard, user-replaceable batteries

Mounting Options: Easy installation using M6 bolt mounting, industrial adhesive, or magnetic base

OTA (Over-The-Air): Firmware update support via the OLight mobile application

Battery Life: Up to three years of continuous operation under standard usage conditions (may vary depending on measurement frequency and environmental conditions)*

- **OLight-LBVS**

- Tri-axis vibration (accelerometer)
- Temperature measurement

Areas of Use and Typical Applications

Fizix OLight, is designed to monitor the health condition of both critical and auxiliary equipment in industrial facilities. By collecting vibration, acoustic, magnetic, and temperature data from rotating machinery, it enables early detection of potential faults. This helps optimize maintenance planning, ensure production continuity, and extend equipment lifespan.

OLight delivers high performance particularly in the following equipment and processes:

- Electric motors and drive systems
- Pumps and fans
- Compressors and vacuum systems
- Gearboxes, gear units, and shafts
- Crushers, conveyors, and material handling systems
- Boiler rooms, mixers, and process lines

Thanks to its compact and wireless design, OLight can be easily deployed in both new installations and existing production lines. It provides long-term, reliable data collection even under harsh environmental conditions.



Turbines

Turbine and rotor components of power plants in the energy sector, including hydroelectric, wind, and similar facilities.



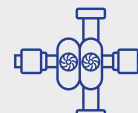
Fans

Radial, axial, and centrifugal (volute) fans used in industrial ventilation and HVAC systems.



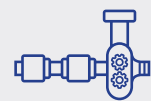
Blowers

Belt-driven or direct-driven blowers, including multi-stage centrifugal and Roots-type blowers.



Multi Stage Pumps

Vertical pumps, horizontal centrifugal pumps, and boiler feed pumps.



Gear Pumps

Horizontal piston pumps and horizontal gear pumps.



Air Compressors

Reciprocating, rotary screw, and internally geared compressor types.



Gearboxes

Single-stage, two-stage, and multi-stage gearboxes.



Motors

All types of AC and DC electric motors.



Spindles

Precision machining equipment and CNC spindles.

**Depending on customer requirements, the sensor can be configured to perform between 1 and 6 measurement cycles per day. Measurement intervals can be defined at second-level resolution.*

Data Acquisition, Edge Computing and Data Flow

Fizix OLight is a smart sensor with built-in **edge computing** capabilities, designed to process high-frequency sensor data locally. It analyzes multi-dimensional data collected from machines—including vibration, acoustic emission, magnetic flux, and temperature—to generate meaningful, fault-focused parameters from raw measurements.

Thanks to its integrated processing unit, OLight performs high-frequency signal analysis directly on the sensor without transmitting raw data to the platform. This approach minimizes data traffic while significantly extending battery life, enabling efficient and reliable long-term condition monitoring.

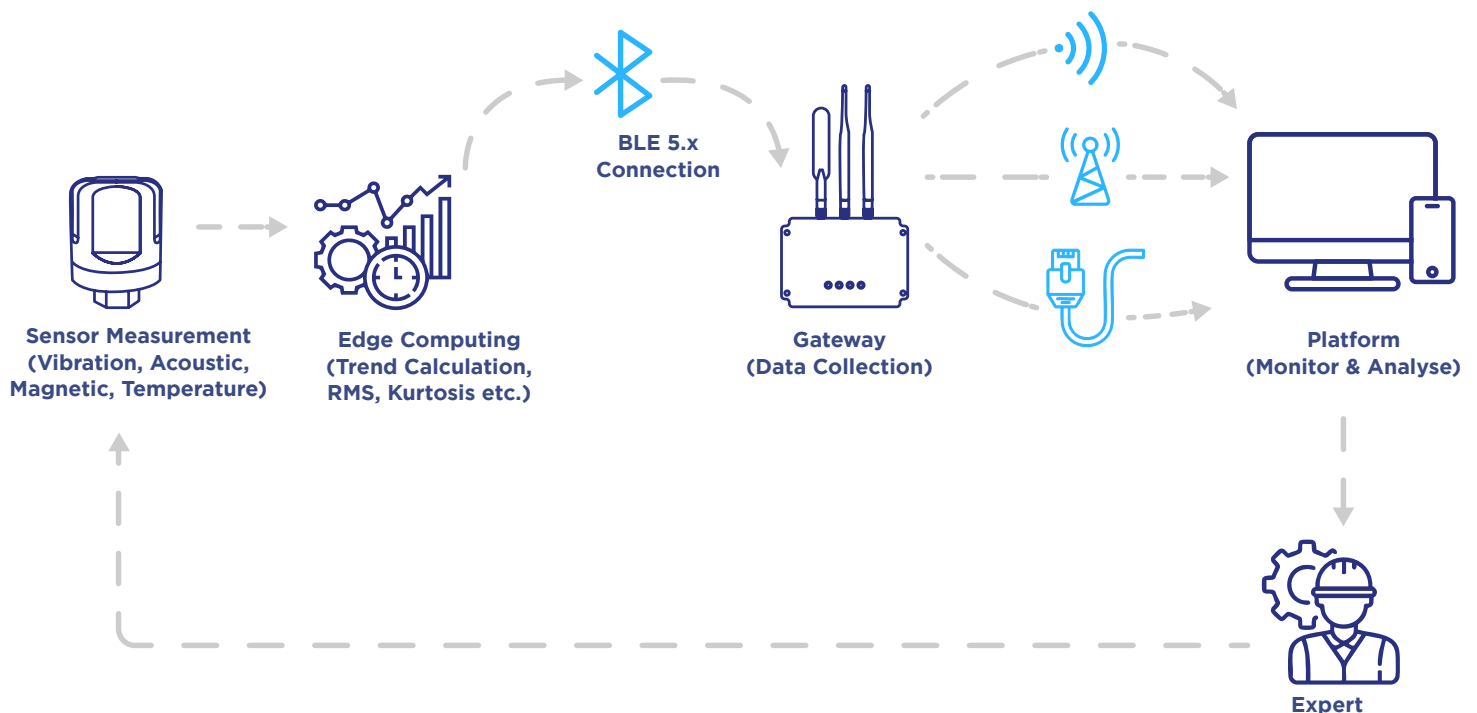
Based on the analysis performed on the collected data, indicators related to the following fault categories are calculated:

- **From vibration data:** imbalance, misalignment, looseness, bearing faults, and gear faults
- **From magnetic flux data:** motor winding defects, rotor-stator interaction issues, and air-gap imbalances
- **From acoustic emission data:** early-stage lubrication issues, bearing defects, and gear problems
- **From temperature data:** insufficient cooling, lubrication degradation, and excessive friction

The calculated parameters are transmitted by Fizix OLight via **Bluetooth® Low Energy (BLE 5.x)** to the **Fizix OGate Gateway**, and from there to the Fizix Monitoring Platform using secure and widely adopted industrial protocols such as **MQTT**.

The transmitted data packets are optimized and typically **smaller than 1 KB**, allowing dozens of sensors to **operate reliably on the same network** without performance degradation.

All data is transferred using secure communication protocols, stored and processed on the platform, and visualized through user interfaces. In addition, the Fizix platform operates in integration with **digital twin** and **advanced data** analytics modules, enabling holistic, plant-wide health monitoring.



Key Parameters Calculated on the Sensor

- **Vibration (3-axis):** Acceleration RMS, Velocity RMS, Crest Factor, Kurtosis, Peak-to-Peak, Dominant Peak Frequencies and Amplitudes, Low-Frequency Fault Level, Bearing and Gear Fault Levels
- **Acoustic Emission:** Acoustic Energy (dB), Acoustic Crest Factor
- **Magnetic Flux:** Magnetic Flux Energy, Magnetic Flux Crest Factor
- **Combined Calculations:** Machine RPM estimation based on combined analysis of vibration and magnetic flux data

Additional Features

- **Adjustable Data Transmission Interval:** Users can remotely modify the data reporting frequency via the monitoring platform.
- **Anomaly and Fault Monitoring:** Detects subtle changes in operating conditions and provides early warnings for potential failures.
- **Smart Wake-Up Mechanism:** Even in sleep mode, the sensor detects sudden changes, automatically wakes up, performs measurement and analysis, and transmits data to the platform.



Alarms and Alerts

- **Fizix OLight** detects abnormal changes in machine behavior by analyzing multi-sensor data and **instantly generates alarms** against potential failures.
- By jointly evaluating vibration, acoustic emission, magnetic flux, and temperature data, OLight provides **early warnings** for conditions such as imbalance, looseness, bearing defects, and gear faults.
- The sensor delivers **real-time alarms for sudden changes**, while also reporting **trend-based alerts** for slowly developing issues to the monitoring platform.
- Alarms transmitted to the gateway via Bluetooth® Low Energy (BLE 5.x) are displayed in detail on the Fizix monitoring platform.
- In addition, when a sudden change is detected during sleep mode, OLight automatically wakes up, performs rapid measurements, and **immediately reports critical conditions**.



Wireless Communication, Data Protocol, and Format

- **Fizix OLight** transmits data collected from machines using **Bluetooth® Low Energy (BLE 5.x)** technology. Thanks to BLE's ultra-low power consumption, OLight delivers reliable wireless communication while ensuring long battery life.
- OLight does not connect directly to the internet; data is first collected via the **Fizix OGate Gateway**. OGate centrally aggregates data from multiple OLight sensors operating in the same environment and securely forwards it to the cloud platform.
- OGate supports cloud connectivity via **Wi-Fi, Ethernet** or **GSM (LTE)** communication options.
- Data transmission from OGate to the platform is performed using secure, industry-standard IoT protocols such as **MQTT over SSL/TLS**.
- The gateway ensures that all sensor data is transferred **using widely accepted, globally recognized secure IoT communication protocols**.
- Sensor-generated data is delivered to the platform using **standardized data** structures, enabling seamless integration with third-party systems and enterprise applications.

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.

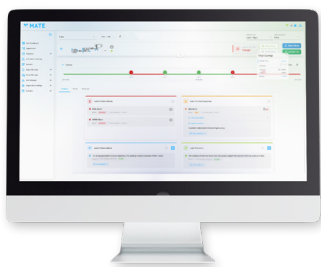
One-Click Machine Health View: Instant access to machine health status.

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.

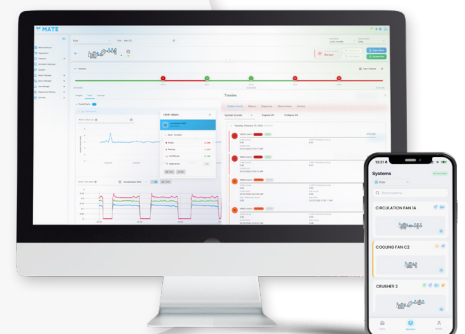
Certified Expert Support: Available at your chosen parameters/time intervals (monthly, upon alarm, etc.). Provides detailed reports and insights from certified professionals.

Advanced Sensor Data Analysis for Predictive Maintenance

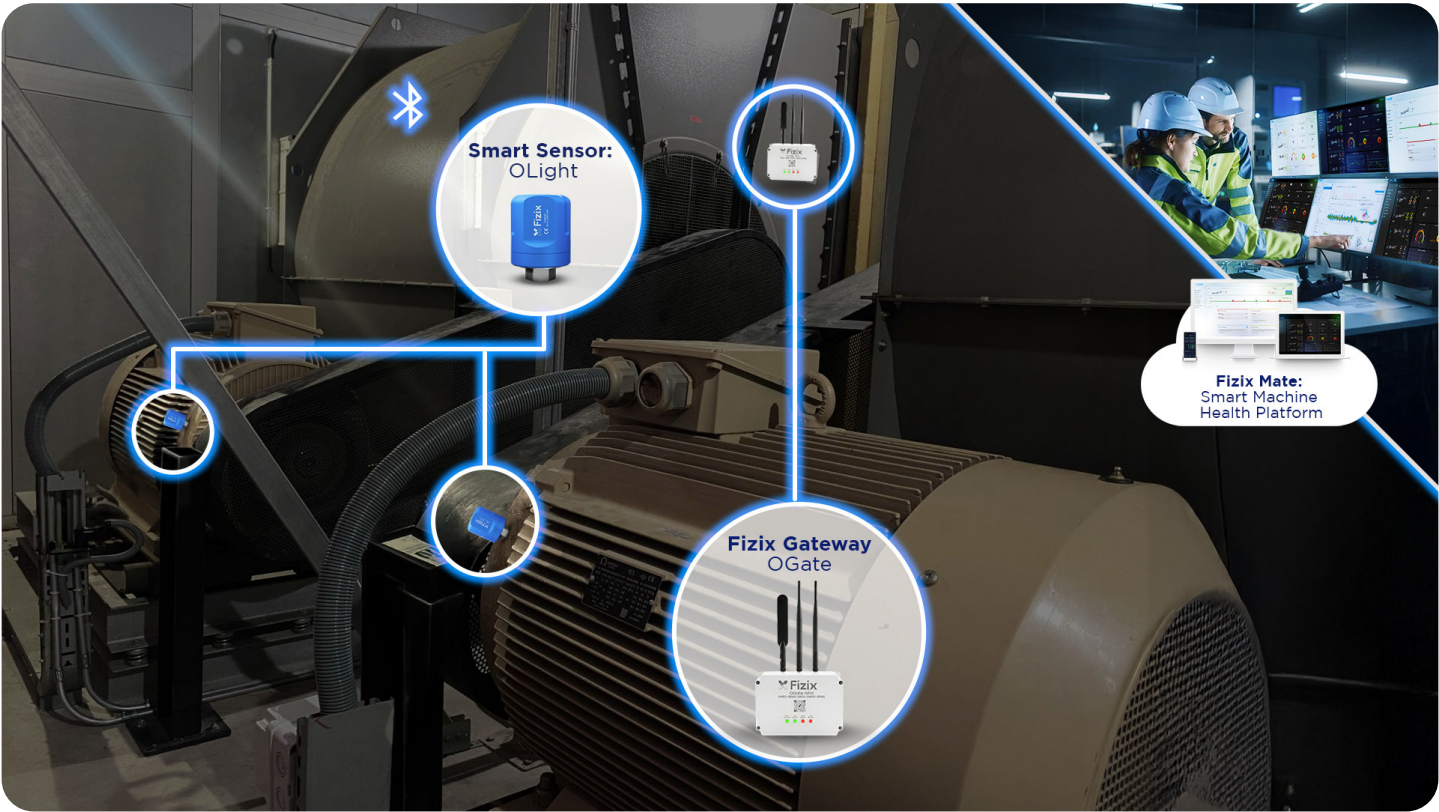
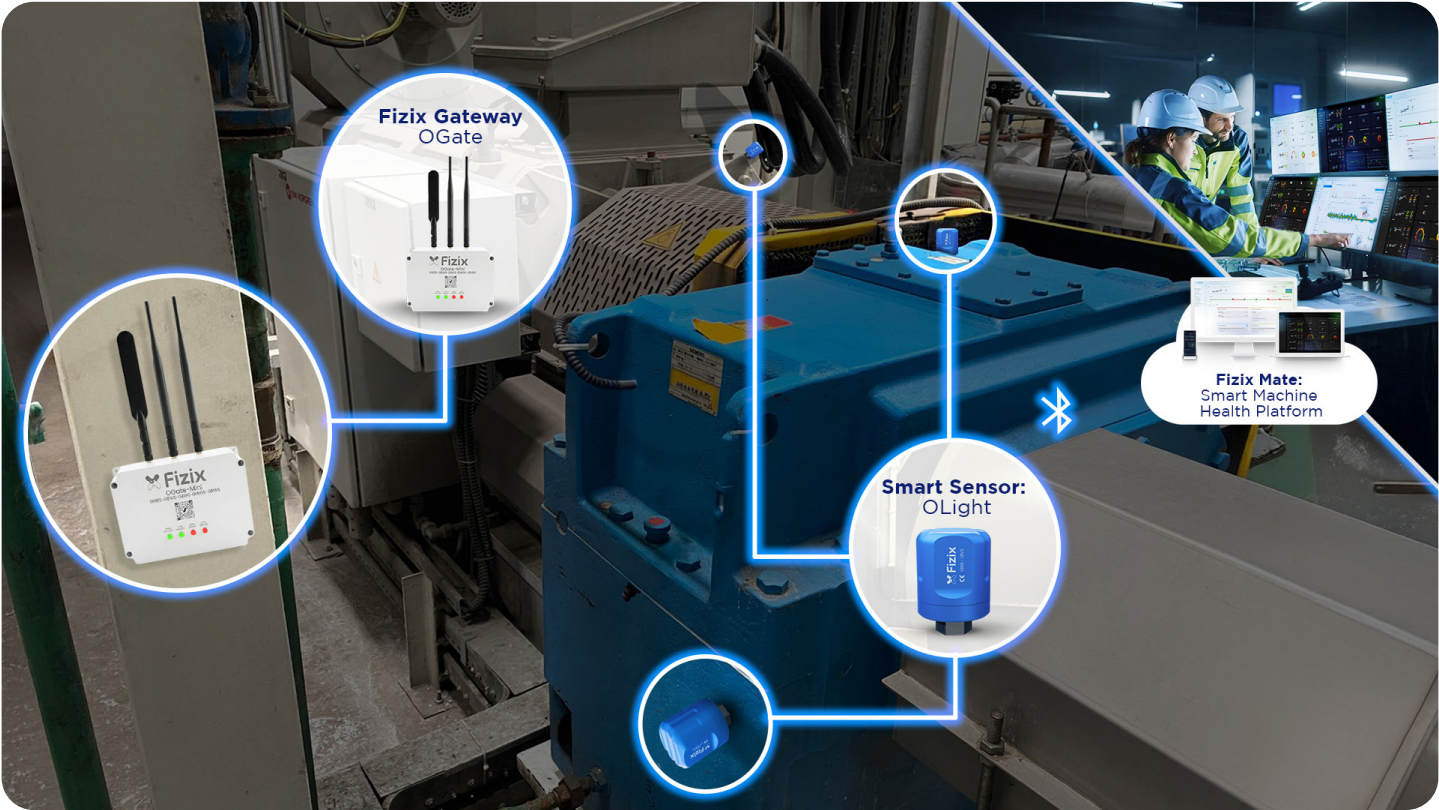
Comprehensive and Detailed Analysis: Enables trend analysis and anomaly detection.

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



Monitoring Examples with Fizix OLight



Technical Specifications

Technical Specifications		OLight-LBSS	OLight-LBVS
Integrated Sensor Types		3-axis MEMS accelerometer + Temperature sensor + Acoustic MEMS microphone +Magnetic flux sensor	3-axis MEMS accelerometer + Temperature sensor
Housing Material		Consists of four main parts: Bottom Cover: Aluminum Top Cover: Plastic Middle Cover: Plastic Battery Compartment: Plastic	
Mounting Thread		M6 base mounting hole	
Ingress Protection		IP67	
Wireless Communication		Bluetooth® Low Energy (BLE 5.x)	
Battery		2 × CR123A (parallel configuration), 3 V, total capacity 3100 mAh	
Battery Life		Up to three years under trend-based operation (depending on data transmission frequency)	
Dimensions		Diameter: 51.2 mm Height: 72.5 mm	
Weight		147 g	
Operating Temperature Range		-40 °C to +70 °C	
MEMS Accelerometer - Vibration	Number of Axes	3 (x/y/z),	
	Measurement Range	±2g, ±4g, ±8g, ±16g	
	Cross-axis	1%	
	Output Data Rate (ODR)	1.5625 Hz – 32 kHz	
	Noise Density	70 micro-g/sqrt (Hz)	
Acoustic Emission	Sensor Type	Digital MEMS	–
	Sampling Rate	100 Hz – 16 kHz	–
	SNR	64 dB	–
Magnetic Flux	Magnetic Field Range	Measurement range 3 1.3mT	–
	Bandwidth	32 kHz	–
	Noise	1.5 nT/√Hz (typical)	–
Data Transmission		BLE-based communication from sensor to gateway and platform Data Format: JSON	
OTA (Over-The-Air Updates)		Software update via mobile application	

Multiple OLight Integration Options

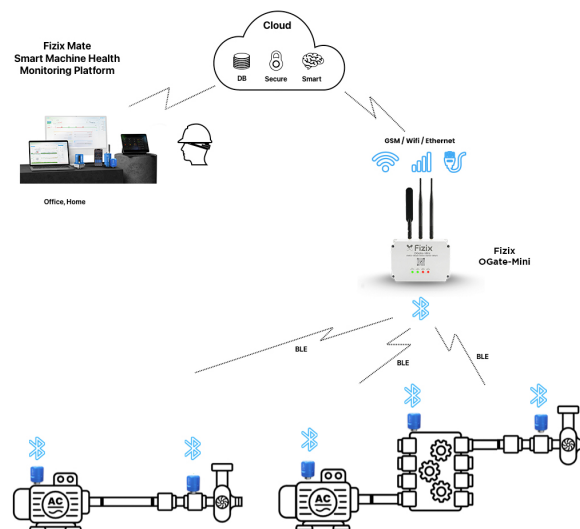
OLight sensors transmit their data to the gateway via **BLE 5.x**.

The gateway **can manage multiple OLight sensors** simultaneously and forwards all trend-based data to the platform.

This architecture enables monitoring of a large number of assets with low energy consumption.

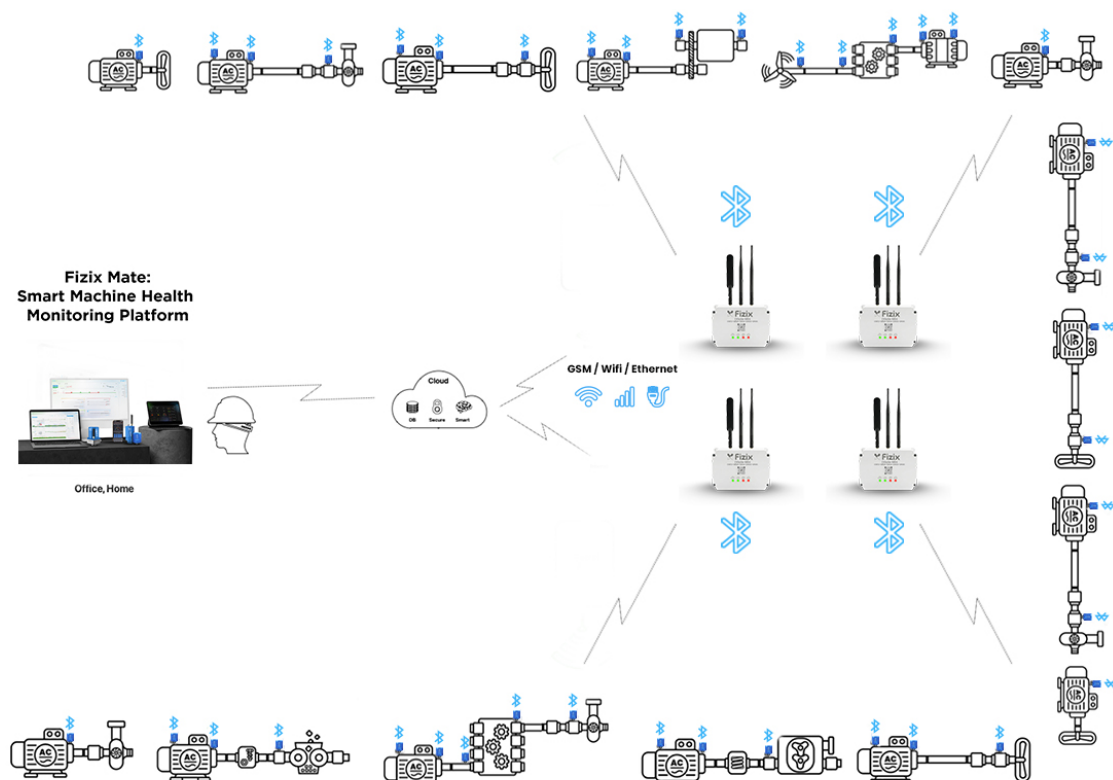
Example 1

- You can monitor your critical assets—consisting of motors and associated subsystems—using sensors installed at different locations.



Example 2

- Multiple assets can be easily monitored over the same wireless network.

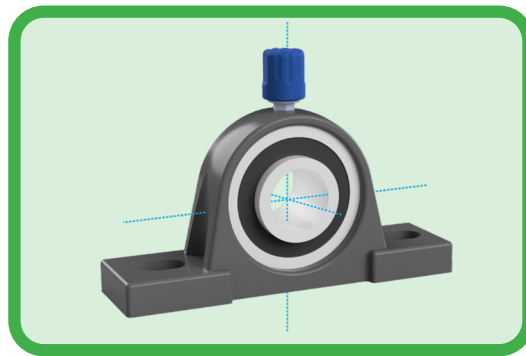
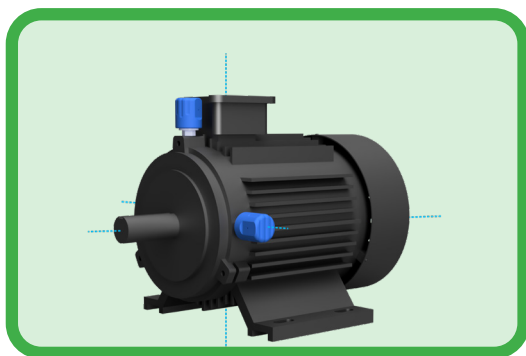


Correct Installation & Accurate Measurement

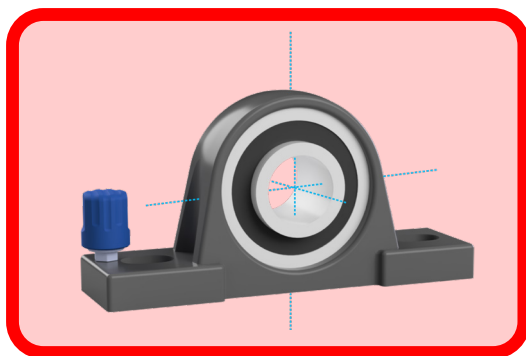
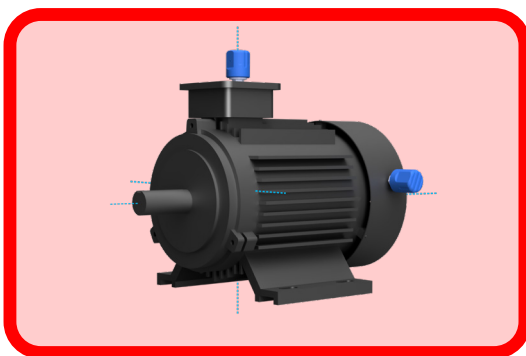
General Rules for Mounting

- 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?
 - Which of your assets are critical, and from which points do you plan to monitor them?
 - What will be the distance between the sensors and the gateway, and between the sensors themselves?
- (This information is essential for determining the correct number of gateways.)

If you are unsure, you can contact our technical team for free support by emailing hello@fizix.ai



Box Contents

- 4 adet OLight sensors
- 1 adet Gateway



FAQ

- **What is the warranty period of the sensor?**
OLight systems are covered by a 2 (two) year warranty.
- **How do OLight sensors communicate?**
OLight transmits its data to a gateway via Bluetooth® Low Energy (BLE 5.x). The gateway then forwards the data to the platform using secure IoT protocols. The sensor does not connect directly to Wi-Fi or a modem/router.
- **How is the sensor configured? What data does it transmit?**
The sensor is configured via the gateway. OLight transmits trend-based data only, such as RMS, velocity RMS, crest factor, temperature, average magnetic flux, and acoustic level. Raw data (FFT, spectrum, waterfall) is not transmitted.
- **Is an expert required for sensor installation?**
The system can be easily integrated by personnel holding certification or training in vibration-based maintenance.
- **Is a gateway required?**
Yes. OLight sensors operate using BLE 5.x and therefore require a gateway for data transmission.
- **How can the sensors be mounted on machines?**
OLight features an M6 mounting hole on its base. If a threaded hole is available on the machine, thread adhesive can be applied to prevent loosening. If screw mounting is not preferred, the sensor can be directly mounted using industrial metal-to-metal adhesive.

Contact Us!



Fizix



@fizix_ai



Fizix ai



fizix_ai_



fizix.ai



hello@fizix.ai



Manchester, UK



Ankara, Türkiye