

Q: What is the Guardian monitoring system?

A: The Guardian monitoring system is a complete, online condition monitoring system that uses wireless IIoT (Industrial Internet of Things) sensors. Sensor data is uploaded to a cloud-based software platform that leverages machine learning to evaluate asset health and provides real-time alerts.

Q: What measurements do the Guardian wireless sensors take?

A: The sensors measure tri-axial vibration and surface temperature. The Guardian Pro wireless sensors also measure magnetic flux (running speed).

Q: What is the difference between the Guardian and Guardian Pro wireless sensors?

A: The Guardian Pro wireless sensor has the same benefits of the Guardian wireless sensor with some extra advantages, including:

1. Higher frequency response (6 kHz) than the Guardian sensor (1.6 kHz), which makes it better suited for detecting early bearing and gear defects.
2. Magnetic flux detection for monitoring running speed.
3. Bluetooth capability for on-demand measurements and sensor-to-sensor synchronization, which enables coordinated measurements of sensors on an asset train based on the operating speed or when a machine is on.

Q: Are the Guardian wireless sensors protected against water and particulate contamination?

A: Both the Guardian and Guardian Pro wireless sensors have an IP67 ingress protection rating, meaning that they are completely dustproof and can withstand water jets, splashes, rain, and short-term immersion.

Q: How many sensors are required to monitor a machine?

A: The number of sensors required will vary based on the size, type, and complexity of a machine. For simpler, single-shaft machines (such as common motors, pumps, and fans), two sensors are often recommended, although one sensor may suffice for smaller machines. For larger or more complex machines, two or more sensors may be required to properly monitor the machine. NTN Engineering can assist with recommendations on sensor requirements for given applications.



Q: How are the sensors installed?

A: Wireless sensors allow for quick and easy installation, which can be accomplished within several minutes. The installation process generally involves cleaning and preparing the mounting surface, inserting the batteries, and affixing the sensor to the machine using adhesive or stud mounting. NTN can provide customers with detailed instructions and guidance on best practices.

Q: What is the size of the sensor?

A: The envelope dimensions of the Guardian wireless sensors with the mounting base installed are 44 mm (L) x 39 mm (W) x 90 mm (H).

Q: How long do the batteries in the wireless sensors last?

A: The battery life of the sensor is primarily dependent on the measurement schedule set by the user and Wi-Fi signal strength. A typical battery life should be between one to five years depending on configuration.

Q: Are the batteries replaceable?

A: Yes, the Guardian wireless sensors use CR123 batteries, which can be replaced by simply removing the cover and changing the batteries.

Q: How do you know when the batteries need to be replaced?

A: The user can check the battery level of sensors in the software and can also set up alerts to notify appropriate personnel when batteries are low.

Q: What is the communication range of the sensors?

A: The sensors have a theoretical line-of-sight maximum communication of 300 feet. However, it ultimately depends on the signal strength at a particular location, which may vary based on factors including the router specifications, line of sight, obstructions, and background interference noise. As a rule of thumb, it is generally recommended that the sensors be mounted within 150 feet of an access point or repeaters.

Q: Is data lost if the plant network goes down?

A: Sensors are equipped with onboard storage, which can store measurement data and report it once network connection is restored.

Q: Do gateways or other specialized equipment need to be purchased to transmit data?

A: The Guardian wireless sensors are designed to connect directly to a facility's network via Wi-Fi without the need for additional specialized gateways or equipment. In the case where there is not sufficient signal at a particular machine location, the customer may need to install additional access points or extenders.

Q: Can this system be used with other wired industrial sensors?

A: Yes, NTN offers Transmitters, which are sensor input modules that can be used with hundreds of different types of wired industrial sensors. The Transmitter accepts 4-20 mA or 0-30 V sensors, and sends measurement data to the network via Wi-Fi. The Transmitter can be powered using AA batteries or an external power source.

Q: What is included with an annual software subscription?

A: The software subscription includes access to both the web and mobile applications (including asset health scores, digital twins, vibration analysis tools, notifications and more), data storage, automated software updates with the most up-to-date features, firmware updates, phone/email support and more.

Q: What is the benefit of Machine Learning (ML)?

A: Machine Learning allows for the real-time analysis of millions of data points, with multiple parameters being analyzed simultaneously. Machine learning algorithms can detect anomalies in the data, and physics-based models can identify the underlying causes. Analysts can use ML to reduce analysis time and allow for more focus on problem solving for machines that require attention.

Q: Can the Guardian monitoring system diagnose machine problems?

A: The Guardian monitoring software has dozens of predefined diagnostic rules that can identify dozens of common machine problems, including misalignment, unbalance, soft foot, bearing defects and gear tooth failures.

Q: How am I notified if there is a machine problem?

A: Alerts are immediately sent to the appropriate personnel through email, SMS, and/or notifications from the mobile app.

Q: Can the Guardian monitoring system be integrated with existing plant systems?

A: Yes, RESTful APIs are available to integrate with third-party systems, including process historians, CMMS, EAM, and SCADA systems.

Q: Does NTN provide support services for this system?

A: Yes, NTN services include onboarding support (including assistance with equipment surveys, network planning, sensor placement, software configuration and training), installation support, bearing failure analysis, and monitoring & reporting services.

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