

VBTX, DEFECT CLASSIFICATION, AND FOREMAN XAI

Automating Intelligent Predictive Maintenance with the Vibration & Temperature Node, Defect Classification Toolkit, and Foreman XAI Maintenance Assistant

In the modern industrial environment, most manufacturers desire an easy way to (a) continuously monitor critical equipment, (b) detect equipment defects as they emerge, and (c) empower their maintenance teams to quickly resolve equipment problems before they result in costly downtime. To this end, our VBTx Vibration & Temperature Nodes work to wirelessly deliver best-in-class vibration analyses to our cloud-hosted Defect Classification toolkit, while our new Foreman XAI web application provides AI-enabled assistance that can help maintenance teams work more efficiently to prevent downtime.

The VBTx Vibration & Temperature Node: Always-On Vibration Analysis

Perhaps the most effective way to detect early-stage faults in rotating equipment is to look for vibration signatures that can indicate both the type and severity of mechanical defects like misalignment or bearing degradation. Many facilities utilize a monthly or quarterly service for these assessments, but the VBTx Vibration & Temperature Node enables always-on, 24/7 monitoring of your critical rotating equipment.

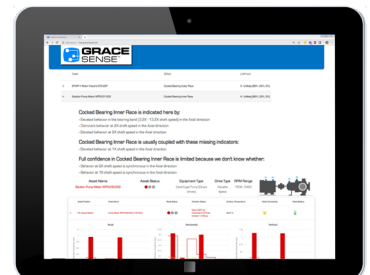
- **Usage:** Each VBTx node periodically captures, processes, and wirelessly communicates tri-axial temperature and vibration data much like what is collected during a routine vibration analysis.
- **Features:** When battery-powered, this node can provide hourly temperature, shaft speed and frequency-based vibration amplitude information for up to 10-years. Our battery less design can function indefinitely by harvesting energy from any temperature gradient 20°C or greater.
- **Benefits:** This fully configurable and easy-to-deploy solution provides always-on vibration and temperature monitoring for your most critical assets.



Defect Classification Toolkit: Interpreting Vibration Data So You Don't Have To

Data collected by any VBTx Node can be transmitted to our cloud-hosted Defect Classification system, where our vibration-focused analytics provide detailed insight into the health of your industrial assets.

- **Usage:** Our Defect Classification toolkit scrutinizes amplitude, frequency, and phase data as it arrives from each Vibration & Temperature Node, looking for elevated vibration levels in certain frequency ranges and providing real-time assessment of likely defects in monitored equipment.



- **Features:** This toolkit can distinguish between 19 distinct types of degradation (such as alignment and bearing issues) and delivers results via web application or API.
- **Benefits:** When coupled with our cloud-based alerting package or integrated with an existing CMMS via API, this toolkit helps maintenance teams quickly pinpoint and address issues.

Foreman XAI: AI-Assisted Maintenance Support

Vibration-based defect assessment is not always an easy concept to understand. Fortunately, in scenarios where a maintenance team encounters uncertainties in how to handle a given maintenance issue, Foreman XAI can step in to provide AI-assisted expertise and guidance.

- **Usage:** After receiving an alert regarding a defect from our system, maintenance personnel can hold a chat-based conversation with Foreman XAI, which can provide advice on interpreting data, executing repairs, and optimizing future maintenance actions.
- **Features:** Foreman XAI has a tremendous amount of base-level knowledge about most important maintenance issues, and its advice can be further improved by uploading manuals and other documentation related to the maintenance of monitored devices.
- **Benefits:** Foreman XAI provides an AI-assisted expert that is available 24/7 to help with your maintenance needs. Through our document upload capabilities, this technology nullifies the need to sift through extensive data and manuals during critical repair scenarios.

