

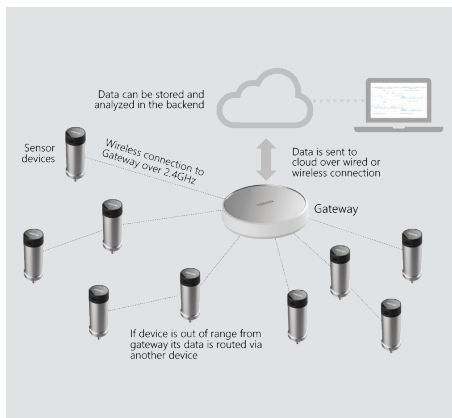
CLOUD

CLOUD



# WIRELESS IOT VIBRATION MONITORING SOLUTION

Smart industrial IoT measurement solution for condition monitoring applications.

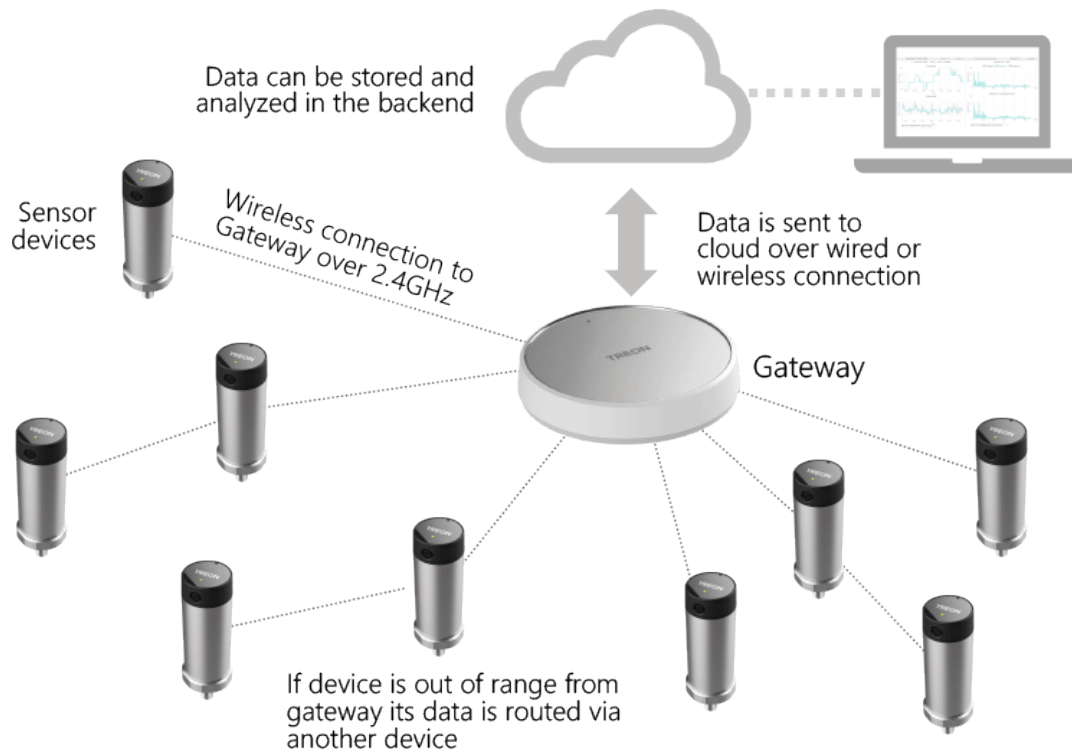


## Your expert partner in sensors & controls

[althensensors.com](http://althensensors.com)

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# VIBRATION AND TEMPERATURE DATA WIRELESSLY SENT TO THE CLOUD



## BUILT FOR WIRELESS MESH NETWORK

Abnormal vibrations or high temperatures give early signs of machine failure due to component imbalance, misalignment, wear or improper use of equipment. Those can be now effortlessly identified without manual measurements or expensive wired equipment to increase machine uptime and extend mean time between failures.

Industrial Node is a wireless battery-operated condition monitoring device that measures tri-axial vibration and surface temperature of rotating equipment, such as pumps, motors and compressors.

Together with our technology partner Treon we supply a smart industrial IoT measurement solution for condition monitoring applications. The system consists of wireless battery powered industrial sensor nodes and a gateway for communication to transmit data to the cloud.

## FEATURES

- Most cost-efficient way to capture vibration and temperature data continuously for predictive maintenance from large numbers of rotating equipment.
- Easy deployment to existing or new machinery. Fully wireless, no need for wiring. Just attach the sensor and the data starts flowing.
- Industrial Sensor Node has been designed for demanding industrial conditions. It is dust and waterproof and can operate in -40°C to +85°C temperature range.

## ADDITIONAL INFORMATION

- [althensensors.com/custom-solutions](http://althensensors.com/custom-solutions)
- [althensensors.com/industries](http://althensensors.com/industries)



# OVERVIEW OF PRODUCTS



## INDUSTRIAL VIBRATION & TEMPERATURES SENSOR NODE

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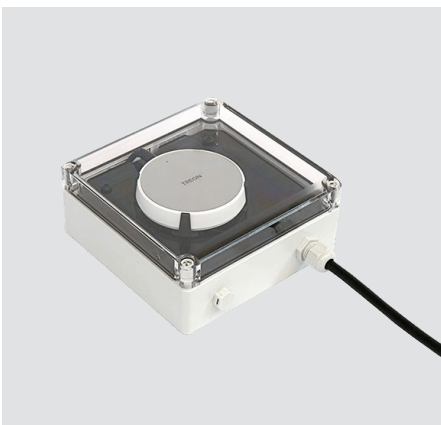
## AMBIENT SENSOR NODE

Wireless Ambient Sensor Node is packed with a variety of sensors to monitor indoor environmental quality. It keeps track of air quality index (via measuring a broad range of gases including Volatile Organic Compounds), temperature, humidity, ambient light, noise and barometric pressure.



## INDUSTRIAL IOT GATEWAY

Industrial IoT Gateway connects a mesh from a few to hundreds of sensor nodes to backends. It collects, processes and transmits data to the cloud. Industrial IoT Gateway supports a wide range of wired and wireless connectivity, can integrate with any cloud platform, is extendable and runs edge applications.



## WATER AND DUST PROOF ENCLOSURE FOR INDUSTRIAL IOT GATEWAY

Industrial IoT Gateway Water and Dust proof enclosure has been designed to protect the Industrial IoT Gateway (model 1111) in outdoor or industrial indoor conditions.

Enclosure includes gateway AC/DC power supply, DC cable and gateway holder. Class II design (no FG pin).

## AMBIENT CONDITIONS

Ambient temperature -20-50 °C  
Storage temperature -40-85 °C  
Relative humidity 20-90 %, noncondensing  
Flammability rating: UL 746C

# WIRELESS CONDITION MONITORING

The system consists of wireless battery powered industrial sensor nodes and a gateway for communication to transmit data to the cloud.

COST-EFFICIENT WAY TO CAPTURE VIBRATION AND TEMPERATURE DATA CONTINUOUSLY FOR PREDICTIVE MAINTENANCE



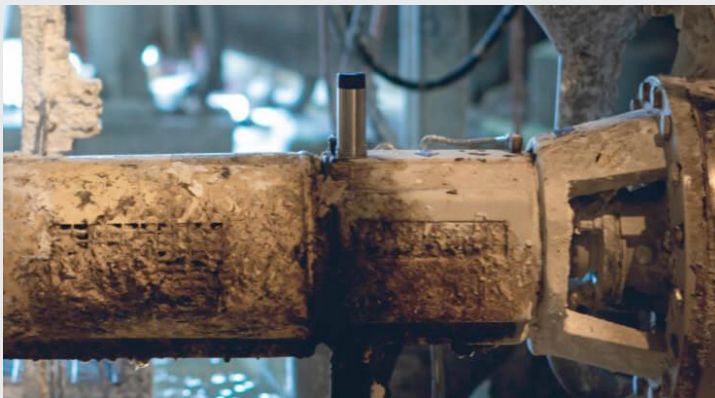
m/s<sup>2</sup>



Wireless Industrial IoT Vibration Sensor Node

Wireless IoT Vibration and Temperature Measurement Solution

EASY DEPLOYMENT TO EXISTING OR NEW MACHINERY. FULLY WIRELESS, NO NEED FOR WIRING.



1010



Industrial IoT Gateway

For a wired or wireless connection of sensor nodes to backends

INDUSTRIAL NODE DESIGNED FOR DEMANDING INDUSTRIAL CONDITIONS.



m/s<sup>2</sup>



Wireless Industrial IoT Vibration Sensor Node

Wireless IoT Vibration and Temperature Measurement Solution

# INDUSTRIAL VIBRATION & TEMPERATURE SENSOR NODES

Industrial Nodes operate in a wireless mesh network for easy, cost efficient deployment and continuous monitoring of tens or hundreds of machines.

Industrial Sensor Node is a wireless battery-operated condition monitoring device that measures tri-axial vibration and surface temperature of rotating equipment, such as pumps, motors and compressors.



CONFIGURABLE DATA DELIVERY	
CHOOSE	NODE SENDS
CALCULATIONS IN THE BACKEND	Raw triaxial vibration data Temperature
and/or	
CALCULATIONS IN THE NODE	Kurtosis, Peak-to-peak / zero, RMS, FFT Temperature
WHEN TO SEND DATA	On timed intervals On demand On alerts

## FOR MESH TO ANY CLOUD PLATFORM

Industrial Sensor Nodes operate in a wireless mesh network for easy, cost efficient deployment and continuous monitoring of tens or hundreds of machines. Nodes send data directly or via other nodes to Gateways that connect the mesh to any cloud platform over wired or wireless network.

## CONFIGURABLE TO ANY NEED

Industrial Sensor Node can measure acceleration and temperature on configurable intervals or on request. Node can send raw acceleration data for post-processing in the cloud or it can perform mathematical calculations already on the edge and provide per axis RMS, Kurtosis and FFT (1Hz/bin).

## SPECIFICATIONS

### VIBRATION SPECIFICATIONS

- 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 SPECIFICATIONS

- Measurement range -40°C to +85°C
- Resolution 0.1°C
- Accuracy +/- 2°C (mounting dependent)
- Repeatability +/- 0.1°C

### WIRELESS COMMUNICATION

- 4GHz / Wirepas Mesh

### BATTERY

- 3.6V lithium thionyl chloride
- Battery lifetime est. 3 years (battery life is dependent on operating temperature and configuration)

### CERTIFICATIONS

- CE, FCC, ISED

# AMBIENT SENSOR NODE

The Ambient Sensor Node is packed with sensors to measure data from environmental quality to machine vibrations. It is powered with 1000mAh battery or optionally via USB-cable.



The Ambient Sensor Node has been designed to be powerful, easily customizable, beautiful and is able to withstand conditions. It runs Wirepas Mesh connectivity software making it the perfect choice for large-scale mesh networks for sensor data collection and asset management in smart buildings, cities and factories.

## PRODUCT FEATURES

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### HARDWARE

- 2.4GHz / Wirepas Mesh
- Dual-MCU
- NRF52 (connectivity)
- STM32 (application)
- Battery CR2477, 1000 mAh
- Operating temp -20 to +70c
- Size: ø41,5mm x 14,9mm

### SUPER-SET OF SENSORS

- 3-axis accelerometer
- Air Quality (VOC)
- Temperature and Humidity
- Barometric pressure and altitude
- Ambient noise and light
- HAL-sensor

### CUSTOMIZATION OPTIONS

- BT LE or BT mesh
- IP67 protection
- Branding and color
- USB-powering

### FIXING METHODS

- Integrated magnets
- Attachment plates
- Adhesive

## SPECIFICATIONS OF SENSORS IN NODE

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### ACCELEROMETER

- High-performance 3-axis linear accelerometer
- ±2g/±4g/±8g/±16g dynamically selectable full scales
- Measuring accelerations with data rates of 1 Hz to 5 kHz
- 6D/4D orientation detection, Free-fall detection, Motion detection
- "Sleep-to-wake" and "Return-to-sleep"

### BAROMETER

- Pressure range 300 - 1100 hPa, -40 - 85°C (battery range limiting)
- Typical error +/- 1hPa.

### HUMIDITY

- 0 to 100% RH operating range, +/- 4% typical accuracy error.

### TEMPERATURE

- High-precision temperature sensor with operational range -55°C up to +150 °C (battery range limiting)
- Sensor accuracy, max +/- 0.2°C

### AMBIENT LIGHT

- Approximate the human-eye response.
- High accuracy requires a direct line of sight to the sensor (on the right side of the node button)

### AIR QUALITY (VOC)

- Detects a broad range of gases to measure air quality, including Volatile Organic Compounds.

### AMBIENT NOISE (BETA)

- Approximate to human-ear noise range, output in dB
- Acoustic sensor, a low noise input buffer and an output amplifier
- Omnidirectional with RF immunity
- -40 to +100°C operating range (battery range limiting)

### HAL

- Magnet proximity binary detection.

# INDUSTRIAL IOT GATEWAY

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



Industrial IoT Gateway supports a wide range of wired and wireless connectivity and is able to integrate with any 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. Treon Gateway comes with preloaded support for Wirepas Mesh and its hardware is ready to support Bluetooth Mesh.

## EDGE COMPUTING

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

## FULL CONNECTIVITY

Treon Gateway provides a connectivity option for any deployment from wired Ethernet to wire-less with Bluetooth, Wi-Fi and cellular connection. Easy integration with Microsoft Azure and Amazon Web Services is included and with our integration service the gateway can be connected to any cloud backend.

## HARDWARE SPECIFICATIONS

### HARDWARE

- ARM Cortex-A8
- 1GHz Processor
- 1 GB DDR3L RAM
- 16 GB eMMC Storage
- Power supply 5V DC
- Size: ø95mm x 18,3mm

### CONNECTIVITY

- USB A Host Port
- Ethernet
- 2G, LTE CAT M1 / NB-IOT
- Wi-Fi, BT & BT LE
- 2.4GHz / Wirepas

### CUSTOMIZATION OPTIONS

- Branding and color

### FIXING METHODS

- Wall/ceiling mount

### CERTIFICATIONS

- CE, FCC, ISSED

## SOFTWARE

### 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
- BlueZ
- Wirepas Connectivity Library

### CLOUD SUPPORT

- Microsoft Azure
- Amazon Web Services
- Integration service to connect the gateway with any cloud



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