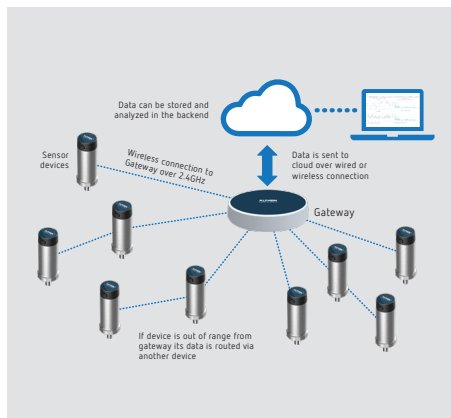




WIRELESS IOT VIBRATION MONITORING SOLUTION

Smart industrial IoT measurement solution for condition monitoring applications.

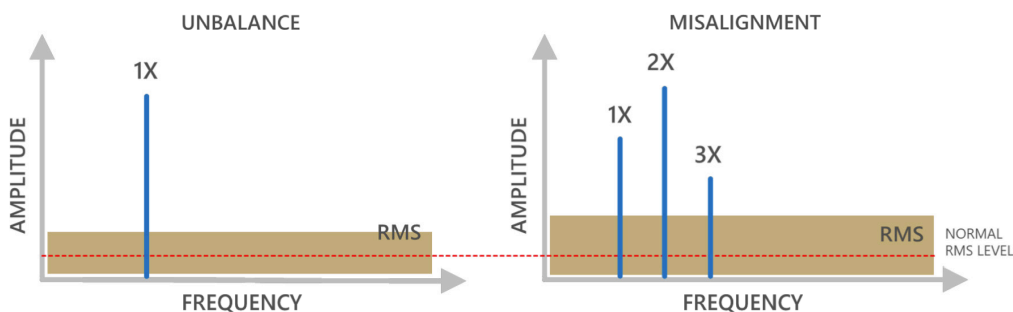
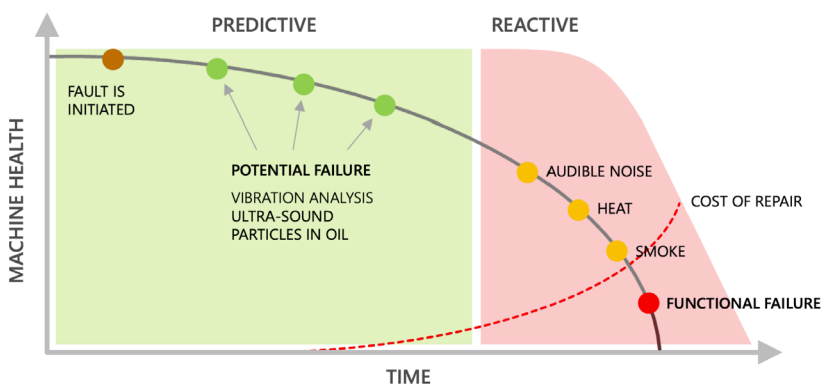


We provide confidence for visionary engineers

CONDITION MONITORING

Condition monitoring is the process of monitoring a particular condition in machinery such as for instance vibration and temperature to identify changes that could indicate a developing fault. It is a major part of predictive maintenance as implementing condition monitoring allows for maintenance to be scheduled and preventive actions taken to prevent damage, future failure and subsequent unplanned downtime of the machinery.

Condition monitoring with vibration sensors is one of the most innovative ways that businesses and manufacturing companies can save money. Condition monitoring techniques are used on a range of equipment, including rotating machinery, auxiliary systems and parts such as compressors, pumps, motors and presses.



REPAIRS AND REACTIVE MAINTENANCE

Manufacturing companies are majorly dependent on heavy machinery on-site, but also across large distances and sometimes at remote locations. These machines like: pumps, turbines, boilers and conveyors, need to be maintained. Manhours are invested for engineers to stay on-site all the time. Even then the machines will break down over time. Repairs and reactive maintenance must be carried out by the engineers.

INCREASE EFFICIENCY WITH PREDICTIVE MAINTENANCE

Management and maintenance of machines are crucial for manufacturing industries. Investments in new advanced machinery are big and depreciation costs are high.

Machine faults and operational stoppages cost companies incredible sums of money. The longer the downtime and the bigger the company, the greater the revenue loss and operating cost. To maintain and even improve efficiency predictive maintenance is essential.

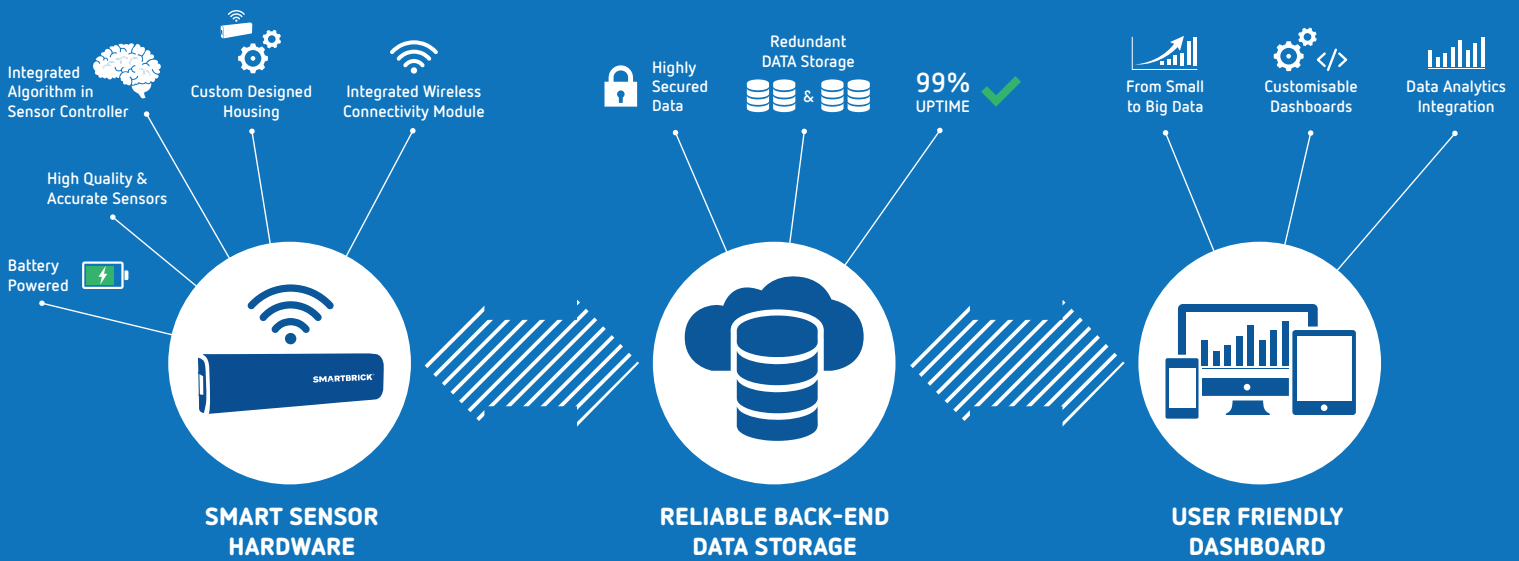
INDICATIONS FOR FUTURE MACHINE FAILURE

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.







WE LOVE SOLVING CHALLENGES

Althen develops, produces and implements custom hardware solutions to solve problems. By implementing these devices and coupling them with our secure back-end and easy-to-use dashboard, we help our customer to get started. This helps us to solve our customers problems, whether it's their goal to reduce costs, improve quality, increase safety or control their operations.

YOUR END-TO-END INDUSTRIAL IOT SOLUTION PARTNER



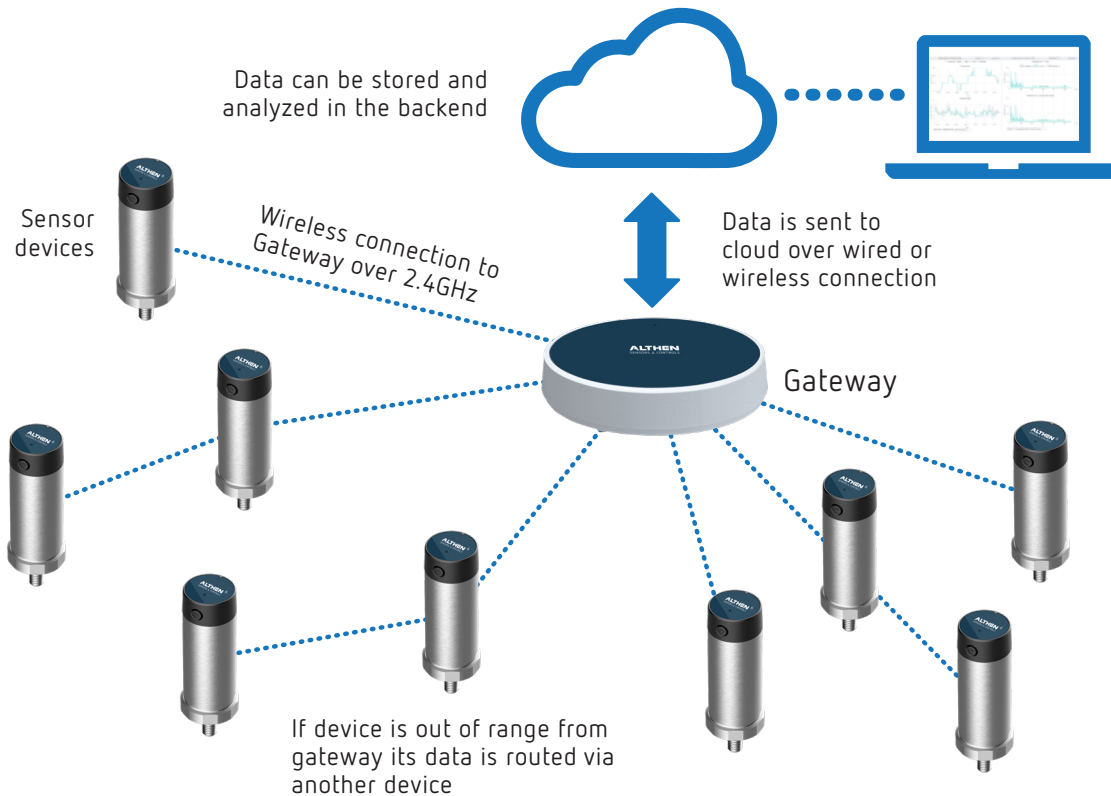
BENEFITS OF CONDITION MONITORING WITH VIBRATION SENSORS

-  Reduce machine faults
-  Cut downtime machinery
-  Reduce maintenance costs
-  Increase energy efficiency
-  Increase company yield
-  Increase plant throughput

WIRELESS IOT CONDITON MONITORING SOLUTION FROM ALTHEN SENSORS & CONTROLS

Together with our technology partner Treon, we developed a smart industrial Internet of things (IoT) measurement solution for condition monitoring applications. The wireless IoT vibration and temperature sensor measurement solution consists of wireless battery powered industrial sensor nodes, and a gateway for communication to transmit data to the cloud.

VIBRATION AND TEMPERATURE DATA WIRELESSLY SENT TO THE CLOUD



BUILT FOR WIRELESS MESH NETWORK

The wireless IoT monitoring system consists of a network of sensor nodes, which can send their data via an IoT gateway to any computer network or cloud platform. We offer two different nodes: the industrial sensor nodes measure and monitor tri-axial vibrations and surface temperature of (rotating) equipment, such as pumps, motors, agitators and mixers. The ambient nodes monitor air quality, temperature, humidity, ambient light, noise level and air pressure.

The wireless battery-operated nodes can be easily and cost-efficiently mounted on existing equipment, but can also be part of large-scale mesh networks for collecting sensor data in smart buildings, cities and factories.

Together with our technology partner Treon we supply a smart industrial IoT measurement solution for condition monitoring applications.

BENEFITS

- **Cost-efficient**
Low installation & maintenance cost, which make this the most cost-efficient solution in the market to monitor every machine in the factory.
- **Scalable**
Tens to many thousands of wireless sensors can work together in an intelligent mesh network to enable condition monitoring at scale.
- **Widely compatible**
Can be integrated with any cloud backend, which makes it extremely convenient to include in a wide range of IIoT solutions.
- **Fully configurable**
Performance indicators such as RMS, PEAK and Kurtosis, along with FFT or high resolution acceleration waveform when needed for analysis with external tools.

ADDITIONAL INFORMATION

- althensensors.com/custom-solutions
- althensensors.com/industries



OVERVIEW OF PRODUCTS



INDUSTRIAL VIBRATION & TEMPERATURES SENSOR NODE

A wireless condition monitoring sensor that is cost-efficient and easy to deploy. It measures tri-axial vibration and surface temperature of rotating equipment, such as pumps, motors, and compressors. Industrial Sensor Node enables identifying abnormal vibrations or high temperatures, which are early signs of machine failure due to component imbalance, misalignment, wear, or improper use of equipment.



INDUSTRIAL VIBRATION & TEMPERATURES SENSOR NODE 6

Industrial Sensor Node 6 measures vibration up to 6kHz, identifying abnormal vibrations, which are early signs of machine failure due to component imbalance, misalignment, wear, or improper use of equipment. Industrial Node 6 provides the needed high resolution data to not only identify emerging issues but also do root-cause analysis.



INDUSTRIAL VIBRATION & TEMPERATURES SENSOR NODE 6 Ex

Industrial Node 6 Ex is a wireless battery-operated condition monitoring device, certified to be safely used in potentially explosive environments (ATEX and IECEx certifications). It measures surface temperature and tri-axial vibration of a rotating equipment, such as pumps, motors, and compressors, with a frequency range up to 6.3kHz.



AMBIENT SENSOR NODE

A compact sensor that measures air quality index, temperature, humidity, ambient light, and barometric pressure. Ambient Sensor Node includes an accelerometer for measuring vibration and movement as well as a HAL-sensor for magnet proximity detection to make it a complete platform to trial or deploy a wide range of IoT-use cases.



INDUSTRIAL IOT GATEWAY

A critical part of any IoT solution. Industrial IoT Gateway collects, processes, and transmits data from sensors to any cloud backend over a wide range of wired and wireless connectivity. It can be freely configured, extended, and run customer edge applications to enable any IoT solution.



INDUSTRIAL IOT GATEWAY PROTECTIVE ENCLOSURE

Industrial IoT Gateway water and dust-proof enclosure is designed to protect the Industrial IoT Gateway in outdoor or harsh indoor conditions. The enclosure includes a gateway AC/DC power supply and DC cable.

WIRELESS CONDITION MONITORING APPLICATIONS

The system consists of wireless battery powered industrial sensor nodes and a gateway for communication to transmit data to the cloud. On this page you can find some examples of applications where the sensor system could be of value and improve you operational maintenance.

COST-EFFICIENT WAY TO CAPTURE VIBRATION AND TEMPERATURE DATA ON FULL OPERATIONAL PUMPS.



Wireless Industrial IoT
Vibration Sensor Node

Wireless IoT Vibration and Temperature
Measurement Solution

EASY DEPLOYMENT TO EXISTING MACHINERY. FULLY WIRELESS, NO NEED FOR WIRING. PLUG AND PLAY.



Industrial IoT Gateway

For a wired or wireless connection
of sensor nodes to backends

INDUSTRIAL ATEX NODE DESIGNED FOR DEMANDING CONDITIONS SUCH AS EXPLOSION PROOF ENVIRONMENTS.



Wireless Industrial IoT
Vibration Sensor Node 6Ex

Wireless IoT Vibration and Temperature
Measurement Solution

NINE PRE-CALCULATED VIBRATION KEY PARAMETERS FOR MONITORING MOVING BELTS IN FACTORY PROCESSES.



Wireless Industrial IoT
Vibration Sensor Node 6

Wireless IoT Vibration and Temperature
Measurement Solution

PREVENT DOWNTIME AND IMPROVE EFFICIENCY OF VENTILATION AND AIR INSTALLATIONS.



Wireless Industrial IoT
Vibration Sensor Node 6

Wireless IoT Vibration and Temperature
Measurement Solution

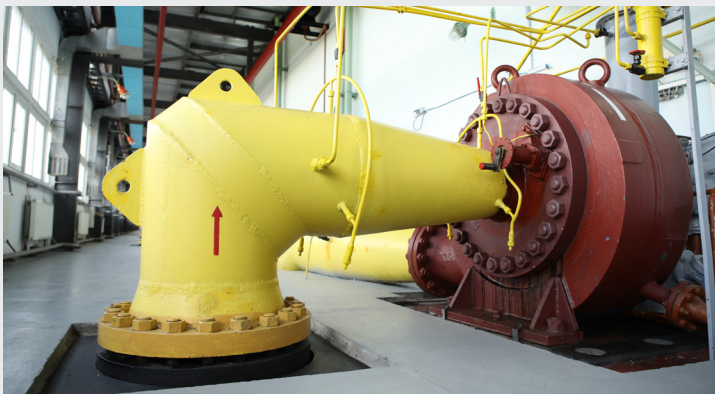
COST-EFFICIENT, SCALABLE, AND EASY IMPLEMENTABLE SENSORS FOR PAPER PRODUCTION MACHINES.



Wireless Ambient Sensor Node

Environmental quality from
offices to data centers

WATER & DUST PROOF PROTECTIVE ENCLOSURE. PRACTICAL FOR INDUSTRIAL USE AND DEMANDING ENVIRONMENTS.



Industrial IoT Gateway
Protective Disclosure

When surrounding are harsh

WHY WE DO, WHAT WE DO

We provide confidence for visionary engineers

coming together is
a beginning, keeping
together is progress,
working together
is success

Henry Ford

DASHBOARDING & ANALYTICS

Our user-friendly data analytic and machine learning solutions assist in keeping you on top of things and your business running smoothly.



DASHBOARD FEATURES

RICH DATA VISUALIZATION

- A great choice of widgets for different visualizations
- Clear (and fast) overviews for subjects and events
- Powerful filter and aggregation options

POWERFUL ANALYTICS

- Easy-to-use data explorer to uncover new patterns
- Drill-down on events to more granular levels
- Give everyone in the company a tool to explore and analyze the data

TO MEET YOUR MEASUREMENT NEEDS

ON
DEMAND
MEASUREMENT

Measurement executed immediately on command

Can trigger up to 8 different measurements

3
TIMED INTERVALS

Configurable timers to execute measurements

Can trigger up to 8 different measurements

8
MEASUREMENT SETTINGS

Pre-configured sets of measurement parameters

- G-range
- Axis
- Sample amount
- Select calculations

Measurement setting can be associated with time interval/s or on-demand measurement

15
CALCULATION SETTINGS

Pre-configured sets of calculation parameters

- What is calculated
- Filters
- FFT parameters

Calculation setting can be associated with one or more measurements

1
AT
HOUR INTERVAL

KEY TREND VALUES

Triaxial
v-RMS, PEAK, P2P
▪ 10-1000Hz
a-RMS, PEAK, P2P
CREST, KURTOSIS
▪ 10-6300Hz
From 34134 samples

6
AT
HOUR INTERVAL

LOW RANGE FFT

Triaxial
Fmax 2604Hz
Averages 3
Overlap 40%
Hanning window
From 4096 samples
LOR 1600 / Bin 1.6Hz
From 36045 samples

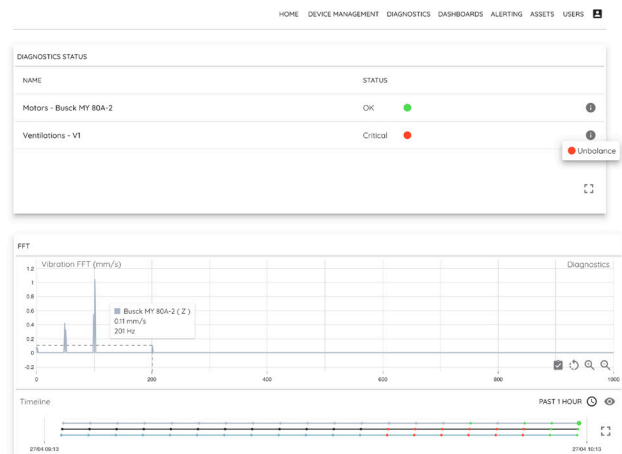
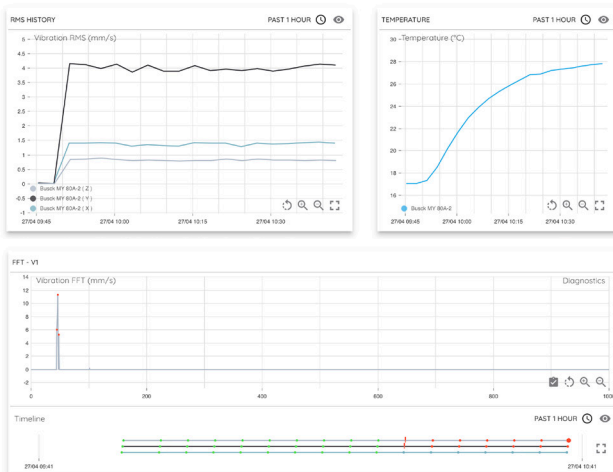
FULL SPECTRUM FFT

Triaxial
Fmax 10417Hz
Averages 6
Overlap 40%
Hanning window
From 4096 samples
LOR 1600 / Bin 1.6Hz
From 16484 samples

ON
WITH
DEMAND

RAW DATA SAMPLES

Triaxial, 34134 samples
▪ 1.28s sampling time
and/or
Vertical, 68268 samples
▪ 2.56s sampling time



INDUSTRIAL VIBRATION & TEMPERATURE SENSOR NODE

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

A wireless condition monitoring sensor that is cost-efficient and easy to deploy. It measures tri-axial vibration and surface temperature of rotating equipment, such as pumps, motors, and compressors. Industrial Node enables identifying abnormal vibrations or high temperatures, which are early signs of machine failure due to component imbalance, misalignment, wear, or improper use of equipment.



PRODUCT FEATURES

- **EDGE CALCULATION**
Choice to process the vibration data already in the Industrial Node, send less data but get the same value.
- **LONG BATTERY LIFE**
Large battery, with an estimated lifetime of up to 6 years, depending on the configuration and operating environment.
- **CONFIGURABLE**
Select your own measurement parameters, update intervals and what data to send to make it your own. One size does not fit all.
- **DURABLE**
Marked with an IP67 rating, which allows the device to withstand harsh factory conditions.
- **PLUG & PLAY**
Fast and easy to deploy on a large scale. Mount the sensors, and just press the on button. That's it.

SPECIFICATIONS

VIBRATION

- 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

- Measurement range -40°C to +150°C
- Resolution 0.1°C
- Accuracy +/- 0.3°C (mounting dependent)
- Repeatability +/- 0.1°C

WIRELESS COMMUNICATION

- 2.4GHz / Wirepas Mesh

BATTERY

- 3.6V lithium thionyl chloride
- Battery lifetime up to 8 years (Battery life is dependent on operating temperature and configuration)

DIMENSIONS

- 78.5 x 28 mm
- Mounting to M8 thread
- Weight 129g
- Cover material 316 ss
- Top cap material PE HD

ENVIRONMENT

- Operating -40°C to +85°C
- Storage 30°C maximum
- IP67

CERTIFICATIONS

- CE, FCC, ISED, BIS (India)
- ATEX II 2 G Ex ib IIC T4 Zone 1 & 2 -40°C ≤ Ta ≤ +60°C

SOFTWARE

- Fully configurable data delivery and integration to major clouds
- Customer cloud application
- Device management

INDUSTRIAL VIBRATION & TEMPERATURE SENSOR NODE 6

A higher-resolution vibration data capturing device. Made for condition monitoring on a massive scale.

Industrial Node measures vibration up to 6kHz, identifying abnormal vibrations, which are early signs of machine failure due to component imbalance, misalignment, wear, or improper use of equipment. Industrial Node 6 provides the needed high resolution data to not only identify emerging issues but also do root-cause analysis.



PRODUCT FEATURES

- **TRIAxIAL MEASUREMENT OVER ULTRA-WIDE BANDWIDTH**
Frequency range up to 6.3kHz (+/-3dB) with 26667Hz sampling rate.
- **CONFIGURABLE DATA ACQUISITION AND ADVANCED DATA PROCESSING**
Configurable measurement sample amount, filtering and decimation
- **PRE-CALCULATED KEY PARAMETERS FOR FAST ASSESSMENT**
Based both on velocity and acceleration. Fully configurable FFT calculation on the edge.
- **HIGH RESOLUTION MEASUREMENT DATA**
For advanced backend diagnostics. High frequency, high resolution waveform up to over 100000 measurement samples

SPECIFICATIONS

VIBRATION

- Acceleration measurement on 3-axis Axial, Horizontal and Radial.
- Dynamic range +/- 4G (configurable to 2, 4, 8 or 16)
- Frequency range 10-6300Hz (-3dB)
- Sampling rate 26.7 kHz
- Resolution 16-bit
- FFT resolution 1Hz/bin

TEMPERATURE

- Measurement range -40°C to +150°C
- Resolution 0.1°C
- Accuracy +/- 0.3°C (mounting dependent)
- Repeatability +/- 0.1°C

WIRELESS COMMUNICATION

- 2.4GHz / Wirepas Mesh

BATTERY

- 3.6V lithium thionyl chloride
- Battery lifetime up to 6 years (Battery life is dependent on operating temperature and configuration)

DIMENSIONS

- 78.5 x 28 mm
- Mounting to M8 thread
- Weight 129g
- Cover material 316 ss
- Top cap material PE HD

ENVIRONMENT

- Operating -40°C to +85°C
- Storage 30°C maximum
- IP67

CERTIFICATIONS

- CE, FCC, ISED, BIS (India)
- ATEX II 2 G Ex ib IIC T4 Zone 1 & 2
-40°C ≤ Ta ≤ +60°C

SOFTWARE

- Fully configurable data delivery and integration to major clouds
- Customer cloud application
- Device management

INDUSTRIAL VIBRATION & TEMPERATURE SENSOR NODE 6

Predictive maintenance for explosive atmospheres.

Industrial Node 6 Ex measures vibration up to 6kHz, delivering data to identify abnormal vibrations. These vibrations indicate possible future machine failure because of various possible reasons like: wear, component imbalance, misalignment, or potential improper use of the machine. ATEX certification allows measuring vibration in potentially explosive atmospheres. Industrial Node 6 Ex provides the needed high-resolution wide bandwidth data to identify emerging issues.



PRODUCT FEATURES

- **ATEX CERTIFIED**
Certified for the use in potentially hazardous areas. ATEX certificate for explosive atmospheres.
- **TRIAXIAL MEASUREMENT OVER ULTRA-WIDE BANDWIDTH**
Frequency range up to 6.3kHz (+/-3dB) with 26667Hz sampling rate
- **HIGH RESOLUTION MEASUREMENT DATA**
High frequency, high resolution waveform up to over 100000 measurement samples
- **CONFIGURABLE DATA ACQUISITION AND ADVANCED DATA PROCESSING**
Configurable measurement, sample amount, filtering and decimation

SPECIFICATIONS

VIBRATION

- 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

- Measurement range -40°C to +150°C
- Resolution 0.1°C
- Accuracy +/- 0.3°C
(mounting dependent)
- Repeatability +/- 0.1°C

WIRELESS COMMUNICATION

- 2.4GHz / Wirepas Mesh

BATTERY

- 3.6V lithium thionyl chloride
- Battery lifetime up to 8 years
(Battery life is dependent on operating temperature and configuration)

DIMENSIONS

- 78.5 x 28 mm
- Mounting to M8 thread
- Weight 129g
- Cover material 316 ss
- Top cap material PE HD

ENVIRONMENT

- Operating -40°C to +85°C
- Storage 30°C maximum
- IP67

CERTIFICATIONS

- CE, FCC, ISED, BIS (India)
- ATEX II 2 G Ex ib IIC T4 Zone 1 & 2
-40°C ≤ Ta ≤ +60°C

SOFTWARE

- Fully configurable data delivery and integration to major clouds
- Customer cloud application
- Device management

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

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

FIXING METHODS

- Integrated magnets
- Attachment plates
- Adhesive

SPECIFICATIONS OF SENSORS IN NODE

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)

HAL

- Magnet proximity binary detection.

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)

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. Industrial IoT Gateway comes with preloaded support for Wirepas Mesh and its hardware is ready to support Bluetooth Mesh.

EDGE COMPUTING

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

FULL CONNECTIVITY

Industrial IoT 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

- Power supply 5V DC

CERTIFICATIONS

- CE, FCC, ISED, India, Brazil

CONNECTIVITY

- Wirepas Mesh 2.4GHz
- 2G, LTE CAT M1 / NB-IOT
- Wi-Fi 2.4GHz
- Ethernet RJ45
- USB A Host Port

ENVIRONMENT

- IP20
- Operating temperature 0°C to +50°C

DIMENSIONS

- Size: ø95mm x 18,3mm

FIXING METHODS

- Wall / ceiling mount available

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 (paho)
- Bluetooth (bluez)
- Wirepas Connectivity Library

CLOUD SUPPORT

- Microsoft Azure integrated
- Integration service to connect the gateway with any cloud

INDUSTRIAL IOT GATEWAY IN PROTECTIVE ENCLOSURE



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 and DC cable. Class II design (no FG pin).

SPECIFICATIONS

AMBIENT CONDITIONS

- Ambient temperature -20-50°C
- Storage temperature -40-85°C
- Relative humidity 20-90%, noncondensing
- Pressure equalizer

RATINGS

- Enclosure IP66/IP67
- Integrated power cord IP44
- Flammability rating: UL 746C 5"
- Impact Resistance (EN 62262): IK08

MATERIALS

- Material polycarbonate
- Base color RAL 7035 -light grey
- Cover color Smoked Grey
- TPE gasket

DIMENSIONS

- Size: 180 x 130 x 81 mm
- Excluding cable sealing clamps

MOUNTING

- Wall mounting with wall mounting lugs

POWER SUPPLY

- Voltage Range 85-264VAC
- Frequency Range 47-440Hz
- Power Consumption 30VA Max
- Electrical connection variants:
 - EURO TYPE F UNGROUNDED 2 WIRE
 - NEMA 1-15 Class II Power Cords
- SAFETY and EMC:
 - Safety UL60950-1, TUV EN60950-1
 - EMC immunity EN61000 1,2,3,5,6,8,11
 - Surge L-N 1kV

OTHER INDUSTRIAL IOT PRODUCTS: ASSET NODE



Asset Node enables identifying, monitoring and locating assets in harsh conditions. Asset Node supports a battery assisted global RFID, captures shocks up to 200G, monitors temperature accurately and reports any abnormal behavior wirelessly over a Wirepas Mesh network.

SPECIFICATIONS

CPU

- Nordic Semiconductor nRF52840

WIRELESS COMMUNICATION

- 2.4GHz / Wirepas Mesh
- BT Beacon: Eddystone
- NFC: ISO/IEC 14443

RFID

- ISO/IEC 18000-63 (Gen2)
- Passive/battery-assisted
- Global band 860-960
- Optimized for on-metal surface

SHOCK DETECTION

- Measurement range [g] 200
- Measurement accuracy [%] +/- 0.5
- Frequency range 200Hz - 3200Hz (max. 6400Hz)

TEMPERATURE SENSOR

- Range [°C] -40 to +125
- Accuracy typ. +/- 0,3 max. +/- 0.4
- Resolution 0.1

BATTERY

- 3.6V lithium thionyl chloride
- Lifetime estimate: up to 6 years

ENVIRONMENT

- IP68
- Polycarbonate UL94-V0
- Operating temperature -30°C to +85°C

DIMENSIONS

- 185.6 x 35.6 x 24mm

ATTACHMENT

- 2 x rivet / screw (max. 6mm)
- Distance between openings 150mm



ALTHEN SENSORS & CONTROLS

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Further information can be found at althen-iot.com and althensensors.com