

# PROGNOST<sup>®</sup>-Wireless

Wireless Sensor Add-On









*PROGNOST®-Wireless is designed as a cost-effective solution for signal acquisition in connection with an PROGNOST®-NT. Sensor data is transmitted wirelessly via a gateway directly to the PROGNOST®-NT. There is no need for cables or terminal boxes.*

*The wireless system enables continuous monitoring of less process-critical equipment or machine parts. PROGNOST®-Wireless offers crucial benefits to the industry. It replaces handheld measuring devices and is due to the lower investment in infrastructure an attractive option for use in cases where the wiring effort of a conventional sensor installation is too complex or would be cost prohibitive.*



# Your easy way to predictive maintenance

*PROGNOST and Treon start a prosperous partnership to combine the wireless sensor capabilities of Treon with the functionality and data processing opportunities of PROGNOST®-NT.*



**The most commonly used signals for condition assessment are vibration and temperature measurements on mechanical components.**

Continuous monitoring enables the operator to plan and anticipate maintenance, resulting in a reduction of unscheduled downtime as well as an extension of service life. The machine diagnosis is also useful following overhauls or a new commissioning: Monitoring the machine in the first few days afterwards helps to detect typical machine faults such as imbalances, shaft misalignment or loose fastenings at an early stage.

By doing this, consequential damage can be minimized and greater process insights into the plant operations are attainable. In fact, once the infrastructure is in place, wireless sensors scale very easily and flexibly across the site, enabling measurements that were previously too difficult or uneconomical to implement.

**The continuous acquisition of the vibration signals by PROGNOST®-Wireless in combination with the process values, enables automated signal analysis and visualization within the user interface PROGNOST®-NT VISU.**

Process values such as temperatures, pressures, flow rates and valve control variables are transmitted to PROGNOST®-NT. The transmission is carried out via an interface to the process control system (DCS) where the process values are recorded and stored.

All machines including the associated sensors and process values are displayed, compared, and analyzed time-synchronized within the PROGNOST®-NT VISU in a clear tree structure. All values can be monitored with warning thresholds. An integrated piping and instrumentation diagram (P&ID) provides an overview of all machines, sensors, and the associated process values.

**Only a high-quality monitoring system allows meaningful failure analysis. Therefore, PROGNOST®-Wireless relies on highly efficient communication channels.**

The sensors transmit to the gateway via an interactive Mesh network either directly or via other sensors, which ensures reliable connectivity and security of the connections. The connection is established via a 2.4 MHz Wirepas radio network and can bridge a distance of up to 80 meters, depending on the ambient conditions.

The Wirepas connection is an energy-efficient wireless connection based on Bluetooth Low Energy (BLE) technology, which, depending on the measurement cycle, enables sensor battery life of up to 5 years. The PROGNOST®-Wireless gateway transfers the sensor data to the PROGNOST®-NT by an ethernet connection using the MQTT protocol. The protocol uses the secure port 8883 with TLS encryption.

**Depending on the configuration, the sensors transmit their measured values to the PROGNOST®-NT in a fixed configured cycle and/or on an event basis.**

With the fixed configured cycle, the sensors connect and transmit data for example once an hour or once a day. The measuring interval can be set easily and conveniently via the PROGNOST®-NT VISU client software.

For components that are only used infrequently and irregularly, the measurements can also be triggered via process values. An example of this would be fire extinguishing pumps, fans, coolers, etc. where the measurement can be activated via the motor current or line pressure to extend the battery lifetime of the wireless sensor maximally.

The sensors measure on three axes at a sampling rate of 26.667 kHz supporting a signal frequency range up to 6.3 kHz. Depending on the application, different measurement intervals are configured when a measurement is executed and transmitted.

Data for all axes RMS, PEAK, P2P, kurtosis, crest as well as FFT calculations are transmitted. The available analyses not only provide information about the general vibration behavior and the temperature at the measuring point. They can also identify impacting acceleration vibrations in the signal by calculating the kurtosis and crest factor. This makes it possible to detect damage in axial and radial bearings with one sensor.

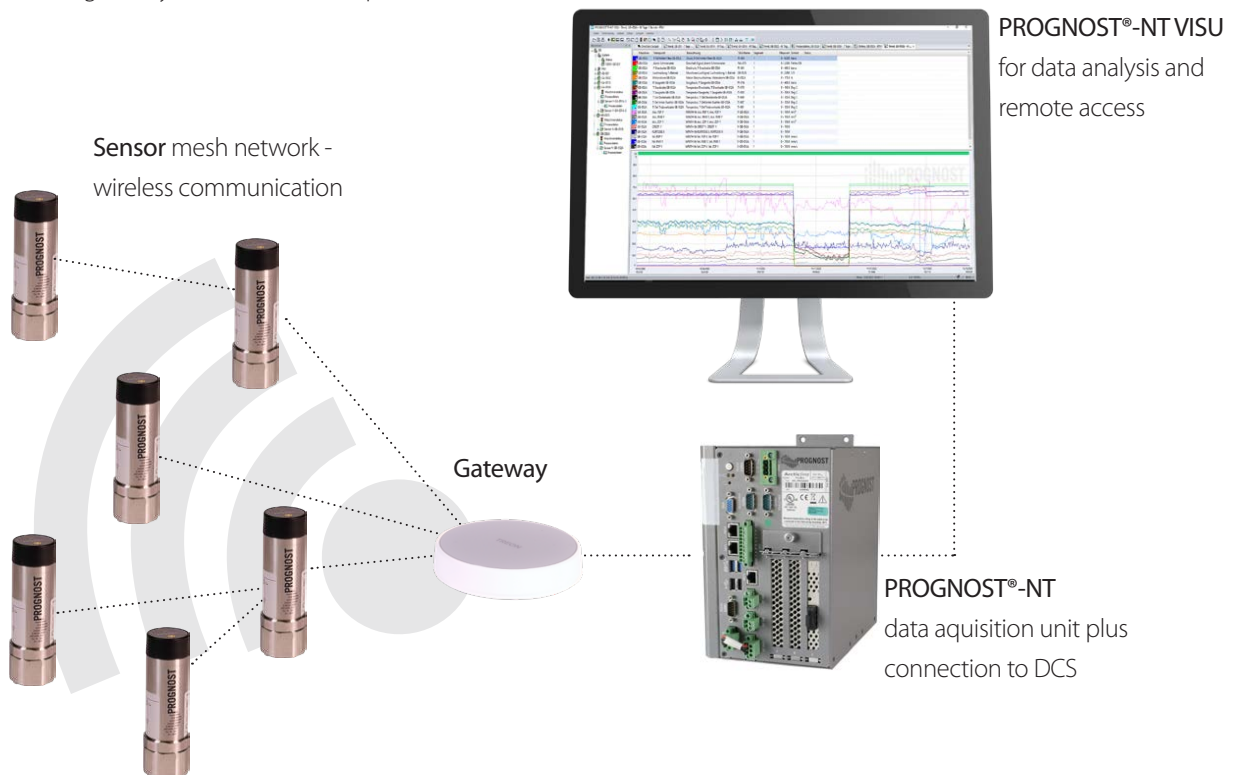
The PROGNOST®-Wireless sensor meets ATEX/IECEX/north american approvals allowing installation in the hazardous area of zone 1 (gas) or 21 (dust) at ambient temperatures between -40 and +60 °C.

There are two housing variants for the gateway installation: One for the non-hazardous area and one for Ex zone 2 (gas) or 22 (dust). When installed in a non-hazardous area, an IP66/IP67 enclosure is available for the gateway at an ambient tempera-

ture between -20 °C and +50 °C. If the installation location is in Ex zone 2 or 22, the gateway must be installed in a enclosure with Ex nR vapor safety protection. With this installation, ambient temperatures between -20 °C to +50 °C are feasible.

**Major system advantages:**

- Cost-effective monitoring of less critical machines in connection with PROGNOST®-NT benefits
- Ready to use system
- Wireless sensor data transmission to gateway
- Use in hazardous area
- Integration of process values
- Configurable measurement intervals via PROGNOST®-NT VISU
- Measurement intervals triggered by DCS/PCS values



Sensor mesh network - wireless communication

Gateway

PROGNOST®-NT VISU for data analysis and remote access

PROGNOST®-NT data acquisition unit plus connection to DCS

#### Technical Data Sensor

- Treon Industrial Node 6 Ex
- Size 78.5 x 28 mm
- Weight 129 g
- Battery lifetime up to 5 years
- 2.4 GHz Wirepas Mesh
- Operating frequencies: 2400 - 2483.5 MHz
- Maximum power: +4 dBm
- Operating in potentially explosive atmospheres -40 to +60 °C
- In other environments -40 to +85 °C
- Storage temperature is +0 to +30 °C.
- Protection class  
IP68 (dust-tight and water resistant)
- IECEx Certificate of Conformity  
IECEx EESF 21.0009X
- EU-TYPE EXAMINATION CERTIFICATE  
EESF 21 ATEX 014X
- North America Certificate E1 15489 HAZloc



#### Technical Data Gateway

- Size: ø95 mm x 18,3 mm
- Weight: 84 g
- Up to 12 sensors per gateway
- Connectivity  
Ethernet RJ45  
Wi-Fi, BLE 2.4 GHz / Wirepas



#### Gateway housing for non explosive atmospheres

- IP66, -20 °C to +50 °C
- Polycarbonate
- Power Supply 85 - 264 VAC
- Power consumption <30 VA
- Size 180 x 130 x 81 mm



#### Gateway housing for explosive atmospheres

- Certification ATEX, IECEx (US/CSA pending)
- Ex ec nR IIB T4 Gc, Zone 2
- IP66, -20 °C to 50 °C
- Glass fiber housing
- Power Supply 100 – 240 VAC Fuse B10A
- Power consumption < 30VA
- Size 250 x 400 x 120 mm



## **Imprint**

### **Picture Credits:**

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