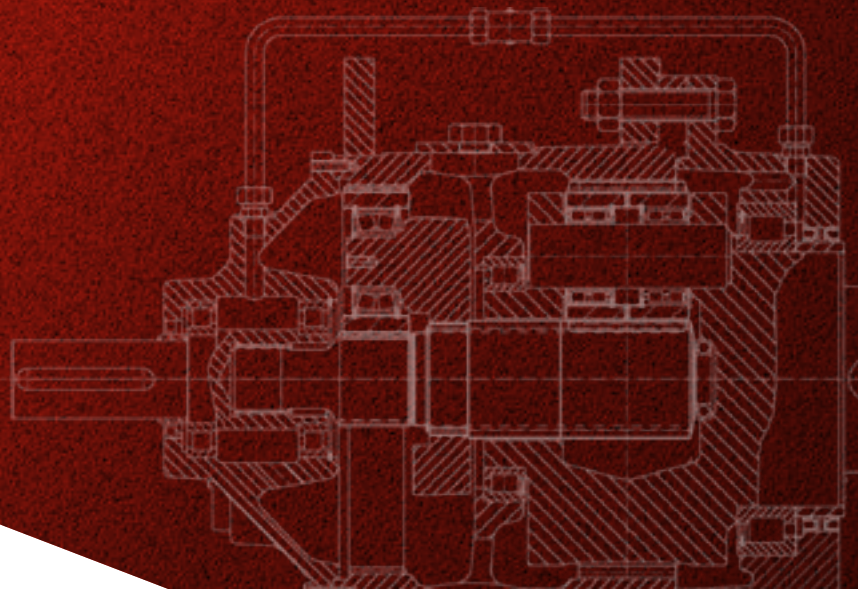


GEARWATCH CONDITION MONITORING

**Proactive and customisable remote
monitoring services for industrial gears**

Cement
Chemicals
Defence
Fibre, paper & tissue
Food & beverage
Marine & port operations
Metals
Mining & minerals

Oil & gas
Panelboard
Power generation
Rail
Rubber
Sugar
Water & wastewater



Our GearWatch condition monitoring system is a smart, compact and value-adding tool for predictive remote process equipment monitoring

GearWatch is available as ready-made packages or customised according to the customer's actual needs:

GearWatch Vibration Easy and Vibration

High quality vibration analysis for all rotating devices with wired or wireless vibration sensors.

- Wireless vibration sensors in the **GearWatch Vibration Easy** package provide an automated, easy and inexpensive way to implement a condition monitoring system. Wireless vibration sensors measure vibration in three directions up to 6 kHz and surface temperature. This solution offers the easiest and fastest installation.
- **GearWatch Vibration** provides a high quality vibration monitoring system and includes GearWatch Premium Vibration Sensors, DBS200 Smart Terminal and rpm-sensors. The system includes a combination of the automated vibration trend monitoring and the most sophisticated tools for vibration experts to analyse spectrums and vibration raw data.

GearWatch Standard

Earliest detection of the gear unit wear process with oil particle counting. Most compact and cost efficient condition monitoring method available for gear units. Very simple measurement results to analyse. Detection of potential failures months or even a year in advance, allows you to plan maintenance activities around your operational requirements.

GearWatch Oil Monitoring

The Oil analysing unit combines particle measurements with oil quality measurements. The system includes the same benefits as GearWatch Standard, with the addition of an oil quality sensor, which detects oil ageing, oil temperature, relative moisture content and possible mixing with other liquids.

GearWatch Oil Monitoring with off-line filter system

This system combines the benefits of the GearWatch Oil Monitoring system with an off-line oil filtering system. The off-line filtration system includes a motor, pump and filter. This improves the oil cleanliness level of the gear units and thus the life time of the gear units will be extended. One investment, two systems.

GearWatch Pro

The most versatile high-end condition monitoring system for gear units and drive trains with tailored parameters:

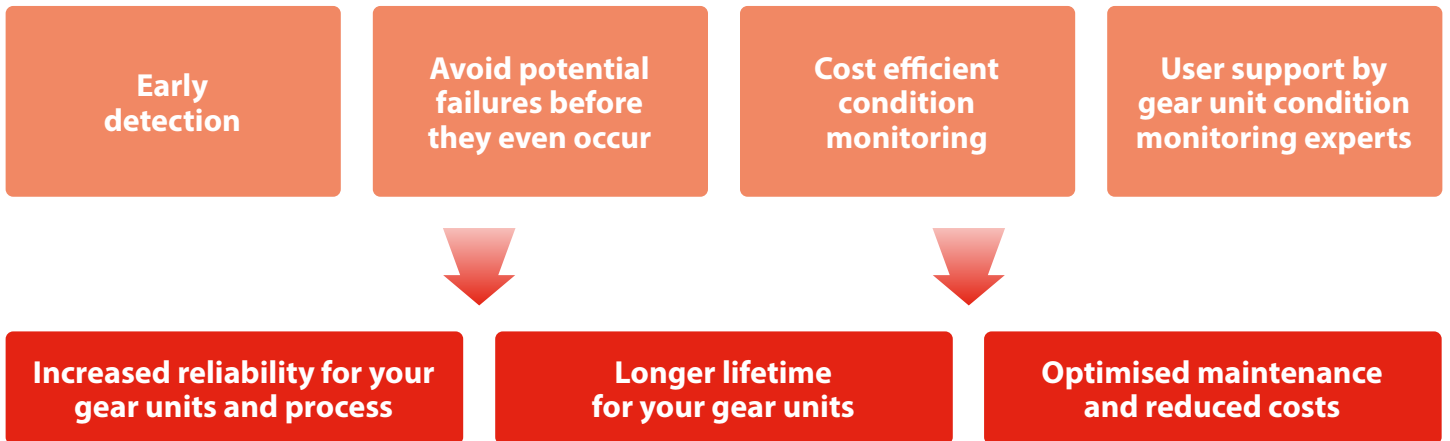
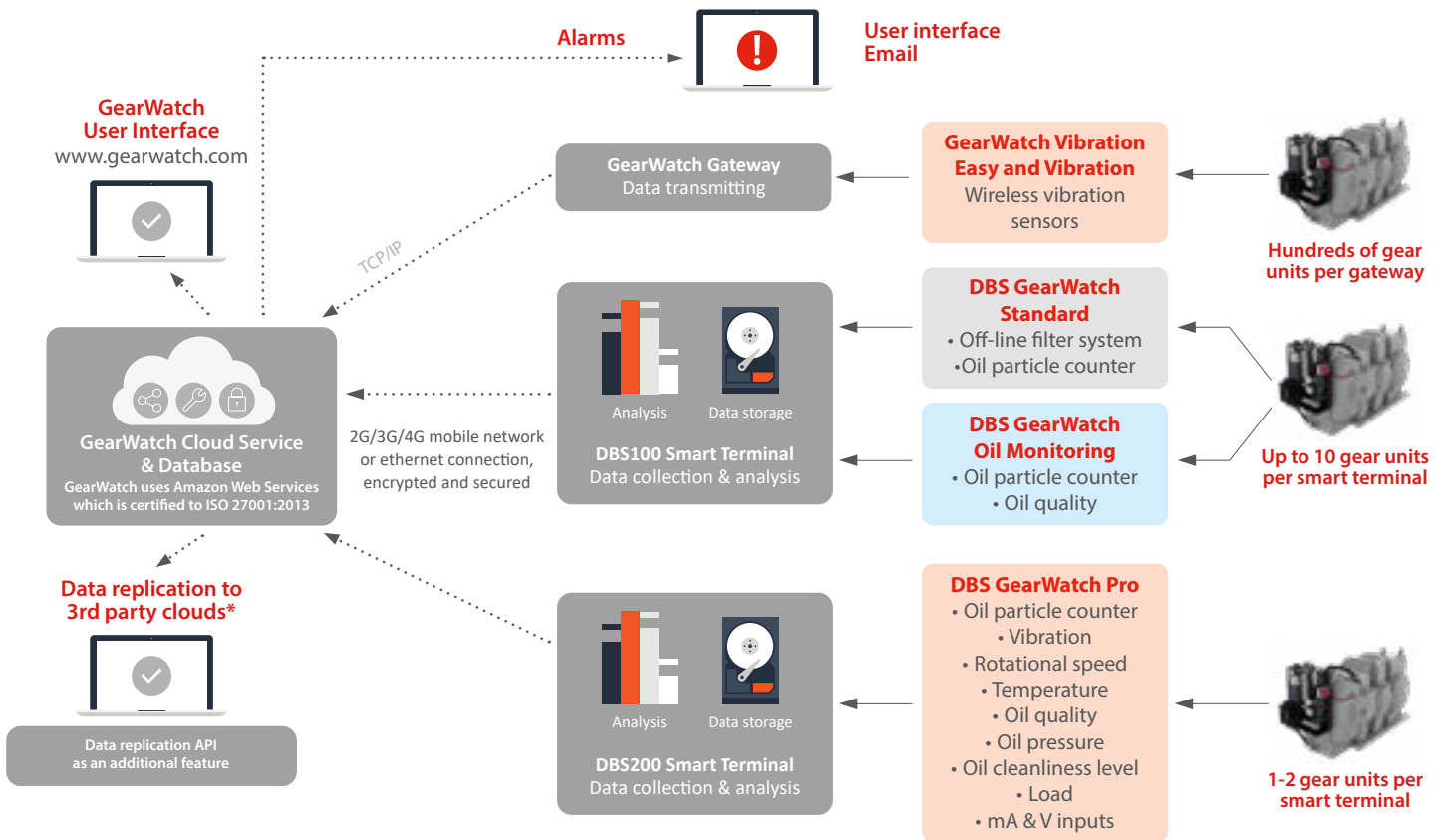
- Inductive particle counter for wear process monitoring
- Optical particle counter for oil cleanliness level monitoring
- Vibration sensors
- Rpm-sensors
- Temperature
- Oil pressure
- Oil colour
- Oil flow
- Force detection sensor to fluid film bearings
- Distance sensors
- Analog inputs to import mA & V signals
- Load

How GearWatch works

GearWatch measures, records and analyses data, reporting changes in measured parameters in real time, 24/7 via the internet.

GearWatch can be tailored to your operating parameters and all data is monitored by gearbox experts at our control centre. Not only does it measure changes within the gearbox, it can also monitor a full range of equipment including motors, hydraulic systems and bearings, as required.

The GearWatch process



Adding value to your process

Real time information transmission enables quick recognition of problems, meaning fast corrective action is taken before downtime occurs. The system is constantly observing process parameters and equipment operation online.

Key features

Proactive approach to operation and maintenance

- Increases production and running time of drive train components by reducing risk of unplanned shutdown
- Operation and maintenance cost savings
- Longer lifetime for the gear units
- Optimised spare parts stock

Early detection of potential gear failures with simple and cost efficient measurements

- Oil particle content measurements make it possible to detect failures months or even a year before
- Corrective actions can be planned in advance
- Defects also detected on slow rotating component(s)

Analysis support by gearbox and drive train experts

- DBSantasalo condition monitoring engineers are certified to vibration analyst (ISO 18436.2) and lubricant analyst (ISO 18436.4) standards
- Clear recommendations and estimation of running time before service is required

Oil quality sensor

- Monitors oil condition online like oil ageing or mixing with other fluids
- Oil ageing monitoring helps to perform oil changes according to actual need, not periodically

Cost efficient and easy installations

- No need for factory specific server
- Ethernet or 2G/3G/4G connection to the secured and highly available cloud server
- Quick return on investment

Web based user-friendly application for analysis

- Access to data from everywhere where there is an internet connection
- Data replication to 3rd party cloud as an additional feature



A
Smart Terminal



E
Oil temperature Sensor



B
Oil Particle Counter



F
Oil Pressure Sensor



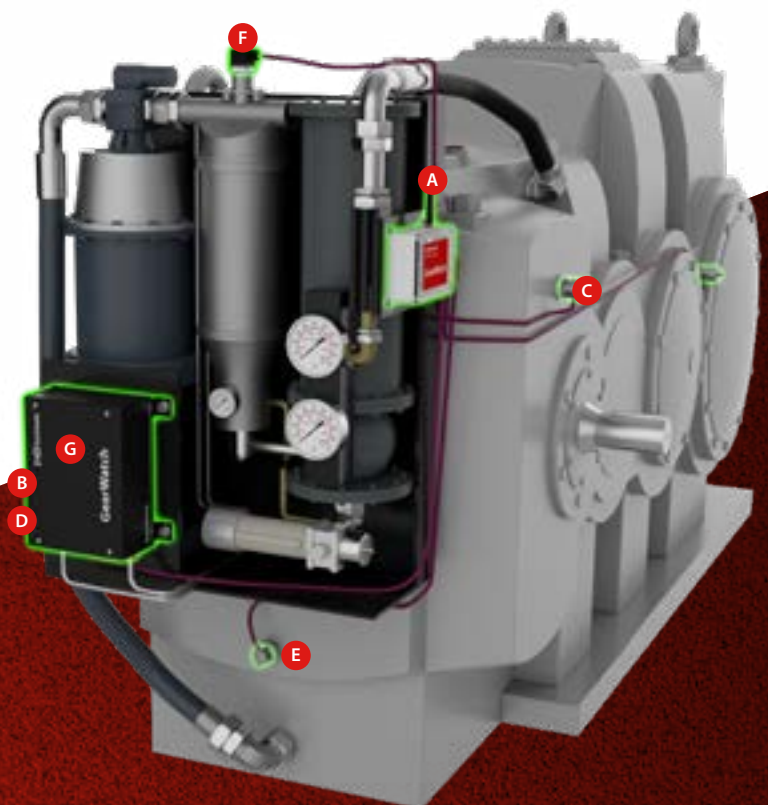
C
Vibration Sensors



G
Oil Quality Sensor



D
Oil Analysing Unit



Supporting process critical industries, globally



Mining & Minerals



Fibre, Paper and Tissue



Cement



Sugar & Food Processing



Metals



Rubber Processing



Hydro



Cranes & Ports



Case studies



Hydropower

- GearWatch Pro condition monitoring system was installed to the 2-stage star-planetary gear unit in 2016
- The amount of metal particles in the lubrication oil remained low for next three years, but by the end of 2019, the amount of the particles started to rise
- A visual inspection was performed on the gear unit and minor micropitting on the planetary wheels was detected as the source of the particles
- The customer had a spare gear unit, which they decided to use to avoid more severe problems

The early warning was made possible due to the installation of our GearWatch Pro condition monitoring system, which avoided production losses and major failures occurring. The savings the customer made were several hundreds of thousands!



Mining & Minerals

- GearWatch Pro condition monitoring system was installed to the 3-stage bevel helical gear unit in 2014
- Gear unit was 20 years old, and particles caused by the normal wear process were detected as soon as the system was installed. Vibration levels remained low
- Higher particle levels were detected from summer 2016. The reason for the rise in particle levels were cracks on two teeth of the LSS gear wheel
- The customer didn't have spare parts or a spare gear unit
- Under close monitoring of our GearWatch system, the customer was able to continue operations of the gear unit for half a year, until their planned shutdown. This minimised downtime, as the spare parts were manufactured during normal production time and the overhaul was well prepared for.

The savings for the customer were several millions!





Rubber

- GearWatch Oil Monitoring condition monitoring system was installed to the 2-stage helical gear unit in 2013
- Until summer 2017 all measured values remained in normal range, but suddenly relative oil humidity levels raised to 100%
- Gear unit was stopped immediately for the visual inspection. The reason for the high humidity levels was identified as a water leakage from the cooler
- As a corrective action, the oil cooler was renewed and oils were changed

Normal operation of the gear unit is still continuing in 2023 without any problems! The savings for the customer were several hundreds of thousands!



Pulp & Paper

- GearWatch Standard condition monitoring system was installed to the 4-stage helical gear unit in 2019
- The amount of the particles remained low for first three years, but by the end of year 2022 the amount of the particles started to rise
- Early stage bearing failure was confirmed with visual inspection
- The customer had a spare gear unit and they decided to use it to avoid more severe problems.

The early warning made it possible to avoid production losses and major failures! The savings for the customer were several hundreds of thousands!



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