Recording of 6 parameters
Viscosity-independent measuring
Integrated gear status analysis
GearControl-SoT PC software for configuration and evaluation
Green/amber/red LED battery status indicator
Green/amber/red LED gear status indicator
Electronic gear data plate

Protection class: IP54
Internal control voltage: 4xAA special batteries
External power supply (optional): 10 - 30 VDC
Bus interface: RS485
Output warning/alarm thresholds: 2xtransistor output
Safeguard production, extend maintenance intervals and service life, plan downtime – these were the requirements facing the Eisenbeiss development department. The result is a completely new sensor that not only generates figures but also interprets the data independently to specify the status of the gearing. Eisenbeiss GearControl-Oil and the PC software GearControl-SofT give you continuous and autarkic analysis of your gear unit.

GearControl-Oil® from Eisenbeiss

What GearControl-Oil measures.

General functions
- Calculates real operating hours
- Sets warning/alarm thresholds
- Controls signal equipment

Temperature
- Oil temperature
- Ambient temperature
- Usage for calculation modes

Time
- Records date and time
- Time stamp for every individual measurement
- Measuring intervals can be set

Conductance
- Measuring process in picosiemens range
- Galvanic gold-plated sensors
- Gives information on impurities, water content, acidic reaction products, oxidation

Transmittance
- 2 LED photo lines to measure differences
- Differentiation of oil additives through transmittance
- Elaborate development
- Gives information on oxidation, impurities, additive degradation, water content

Permittivity
- Detects oil type, oil change and oil mixture, major oil loss

Moisture, relative
- Determines water content

What GearControl-SofT can do.

Offline mode
- Displays stored data in time sequence
- Analyses recorded data with zoom function

Online mode
- Online display of data both individually and in time sequence
- Sets alarm thresholds
- Displays sensor data and alarm data in various formats
- Displays oil quality (green/amber/red)
- Reads electronic data plate
- Carries out firmware update

Monitoring Edition
- Continuous data recording for manual gear status analysis
- Configurable warning/alarm thresholds for measuring parameters
- Autonomous operation for over 2 years
- User friendly operation
- Periodical preventive maintenance
- Installation recommendation

Expert Edition
- Automatic gear status analysis and thus continuous safeguarding of production
- On-demand maintenance intervals based on the particular condition of the gearing
- Straightforward and fast warning and alarm indications
- Displays all gear-related information in one spot
- Professional application advice from gear experts
The sensor that makes sense

Over 80% of gear damage which occurs can be traced back to inadequate lubrication. As damage of this nature often leads to expensive production outages, Eisenbeiss has set itself the target of identifying such lubrication problems early on to prevent gear failure. Eisenbeiss has put its over 100 years of experience in manufacturing and repairing high-performance gear systems in the development of a new type of measuring sensor. The result is GearControl-Oil and it stands for harnessed gear know-how from the specialists, packed in ultramodern sensor technology.

GearControl-Oil Monitoring Edition

Thanks to the constant monitoring of six specific oil status parameters, GearControl-Oil identifies any nonconforming status of the lubricant reliably and early on. As a result, the plant operator can take action in good time before any severe damage to the gear system occurs. This means not only maximum operational reliability but also the easy and exact planning of maintenance work and preventive measures to avoid gear system failure.

The constant supervision of the oil status ensures you get the full benefit and use of the lubricant. Based on the measuring data you can prolong the oil change cycle without having to make any sacrifices in terms of operational reliability.

One small investment in GearControl-Oil gives you maximum production reliability. In most cases (depending on the amount of oil used) the investment pays for itself within a matter of only months simply through the prolonging of the oil change intervals. But any plant operator will tell you that it is the prevention of just one single production outage that makes investing in GearControl-Oil so worthwhile. The sensor can not only be used in new gear units but can also be easily retrofitted at any time to existing gear systems – regardless of what make they are.

GearControl-Oil is designed for industrial use

In developing the multi-parameter sensor Eisenbeiss attached great importance from the beginning to industrial compatibility and user friendliness. The sensor is extremely robust and is convenient to handle. The housing is 100% stainless steel and protects the sensor and sensor electronics against water, dust and other contaminants.
**GearControl-Oil® at a glance**

- Continuous data recording
- Configurable warning and alarm thresholds
- Integration in existing control systems
- Robust stainless steel design
- User-friendly operation
- Autonomous operation for up to two years

<table>
<thead>
<tr>
<th>Protection type</th>
<th>IP54</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal power supply</td>
<td>4xAA special batteries</td>
</tr>
<tr>
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</tr>
<tr>
<td>Bus interface</td>
<td>RS485</td>
</tr>
<tr>
<td>Output warning/alarm thresholds</td>
<td>2 x transistor output</td>
</tr>
</tbody>
</table>

**GearControl-Oil measures all important oil status parameters continuously**

The evaluation of the oil status is based on the continuous and simultaneous measuring of temperature, operating time, transmission, permittivity, relative moisture and the conductivity of the lubricant.

By defining thresholds for the relative moisture content of the gear oil, the sensor can be set so that warning LEDs on the sensor come on if values become critical and alarm messages can be sent to the measuring station via two digital outputs.

**GearControl-Oil is a multi-parameter measuring instrument and measured data storage unit all in one**

The measuring intervals can be set as you wish; the measured data are saved in an integrated ring store with time stamp for up to two years.

It is also possible to analyse the measured data pattern over a longer period without having to have a bus connection for this.

With the help of the GearControl-Soft software which comes with GearControl-Oil, the data can be visualised, evaluated and archived conveniently on a PC or laptop. Additionally, data can be put into a report in pdf-format or converted to csv/xls for further processing.

**GearControl-Oil can be integrated in existing control systems with no trouble at all**

The sensor can be integrated in an industry-standard RS485 field bus for the constant monitoring of the parameters measured.

**GearControl-Oil can be operated without an external power supply**

The batteries supplied and the intelligent energy management system enable battery intervals of up to two years. This means that besides the industry-standard 24V power supply, GearControl-Oil can also be operated in a completely energy self-sufficient way.
**CLASSIFICATION**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. Operating Pressure</td>
<td>15 bar</td>
</tr>
<tr>
<td>Operating Temperature Liquid</td>
<td>-20 ... +90 °C</td>
</tr>
<tr>
<td>Temperature (^{(1)})</td>
<td>-20 ... +60 °C</td>
</tr>
<tr>
<td>Protection Class</td>
<td>IP54</td>
</tr>
<tr>
<td>Measurement Medium</td>
<td>gearbox oil on mineral-basis according to DIN51517 part 3 - CLP</td>
</tr>
<tr>
<td>Wetted Materials and Sealants</td>
<td>Polyurethane, FR4, Au, lead-free solder, Sealing Ring (Klingersil® or similar), Stainless Steel (1.4571)</td>
</tr>
<tr>
<td>Self-sufficient Operation</td>
<td>battery pack 4 x 1.5 V DC</td>
</tr>
<tr>
<td>External supply</td>
<td>10 ... 30 VDC</td>
</tr>
<tr>
<td>Power input if external power supply</td>
<td>&lt; 300 mA</td>
</tr>
<tr>
<td>Visual Display</td>
<td>3 x LED (green, orange, red)</td>
</tr>
<tr>
<td>Bus- Interface</td>
<td>RS485 - (USB via converter)</td>
</tr>
<tr>
<td>Digital Control Signals</td>
<td>2 transistor outputs open collector, galvanically isolated vin max. 30 V DC 20mA</td>
</tr>
<tr>
<td>Thread Connector</td>
<td>G 3/4&quot; Male Thread</td>
</tr>
<tr>
<td>Width Across Flats (SW)</td>
<td>36 mm</td>
</tr>
</tbody>
</table>

**Measurement Range/Accuracy**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Range / Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conductivity</td>
<td>0 ... 5000 / ± 2 pS/m / % [FS], at 25 °C oil temperature</td>
</tr>
<tr>
<td>Transmission (Haze)</td>
<td>5000 ... 50,000 / ± 2 pS/m / % [FS], at 25 °C oil temperature</td>
</tr>
<tr>
<td>Relative Permittivity</td>
<td>0 ... 100 / ± 3 % / % [FS]</td>
</tr>
<tr>
<td>Relative Humidity</td>
<td>1 ... 10 / ± 2 % / % [FS]</td>
</tr>
<tr>
<td>Medium Temperature</td>
<td>0 ... 100 / ± 3 °C / % [FS]</td>
</tr>
<tr>
<td>Ambient Temperature</td>
<td>-20 ... +120 / ± 1 °C / % [FS]</td>
</tr>
<tr>
<td>Time</td>
<td>0 ... 2^32 / 50 ppm (Time &amp; Date 01.01.2000 to 31.12.2134)</td>
</tr>
</tbody>
</table>

[1] If power supply through battery: ambient temperature should be <50 °C in regards to durability of battery, external supply advisable

[2] Important note: use of recommended batteries vital! Check for correct polarity, do not disassemble, recharge or dispose of in fire!

[3] Comply with national regulations, only use authorized power supply units (SELV, PELV) - connection and installation only by trained electrically qualified person!

[4] Precision of permittivity within the specified tolerance until conductance of max. 5,000 pS/m