



## On-Line Sensor Suite

- ✔ Real-time condition monitoring on critical plant
- ✔ Make frequent inspections of remote oil and machine health
- ✔ Sensor data can be streamed via any network system

A combination of the sensor range, the 'sensor suite' has been developed to offer real-time monitoring on critical plant such as wind turbine gearboxes. Using its own piston pump, the sensor suite makes frequent inspection of remote oil and machine health a feasible option. The risk of sampling error is eliminated and data from the sensors can be streamlined via any network

Designed for mounting into the lubrication system of a machine, the suite reports metallic ferrous wear debris, oil condition and moisture content of the oil. Housed in a robust box, it includes the Total Ferrous Sensor (piston version), Moisture Sensor and Oil Condition Sensor.



Technical Specification	
<b>Ambient Operating Temperature:</b>	0 to 70°C (32 to 158°F)
<b>Temperature Heated Vesion:</b>	-20 to 70°C (-4 to 158°F)
<b>Analogue Communication Interfaces:</b>	-20 to 70°C (-4 to 158°F)
<b>Detection:</b>	0-2000 parts per million (ppm) un-combined ferrous debris by weight, oil quality units - index scale, 0 - 100 % RH, -20 to 120°C temperature
<b>Digital Communication Interfaces:</b>	RS232, RS485, CAN Bus
<b>Fluid Compatibility:</b>	Petroleum, synthetic oils - not ester based
<b>IP Rating:</b>	IP65
<b>Max. System Fluid Pressure:</b>	10 bar (145 psi)
<b>Max. Fluid Viscosity:</b>	350 cSt
<b>Permitted Fluid Temperatures:</b>	10 to 70°C (50 to 158°F)
<b>Power Consumption:</b>	0.8 A
<b>Power Input:</b>	18 - 30 V DC
<b>Weight:</b>	15 kg (33lbs)

Ordering Information	
<b>Product Code</b>	<b>Description</b>
<b>FG-K16521-KW</b>	Standard Sensor Suite
<b>FG-K16567-KW</b>	Heated Sensor Suite
All sensors come complete with software for data downloading and trending.	
Contact Kittiwake for information about the wide range of installation accessories and alternative options that are available to suit your specific application.	



## Case Study: Wind Turbine Gearbox

As wind turbines become larger and more complex, the power produced from them increases, but so can the maintenance costs. There have been many well publicised failure events which have been very costly to the owners and manufacturers, and damaging to the general perception of wind as a renewable energy source. One such event was the failure of all 30 2 MW turbines installed at Scroby Sands in the UK. All failures occurred within one year of installation. Data provided from a gearbox manufacturer shows that the total cost of removing, overhauling and reinstalling a gearbox can be up to £450,000\*. This can be due to inaccessibility of the turbine, crane rental, man hours used and loss of earnings on the turbine. Using sensor equipment, potentially serious problems can be detected before they become too advanced. Consequently, the repair could happen without the need for a crane, and the repair bill could be a fraction of this cost. If oil contamination such as water in the oil or oxidation, both of which could lead to a serious failure, is detected by the sensor, then the turbine could be saved by just replacing the oil. This could result in as much as a £450,000 saving.



\*Data taken from "the industrial gearbox life cycle and the total cost of ownership" by Gary Bills - Hansen Transmissions - BGA Gears 2006 Seminar



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