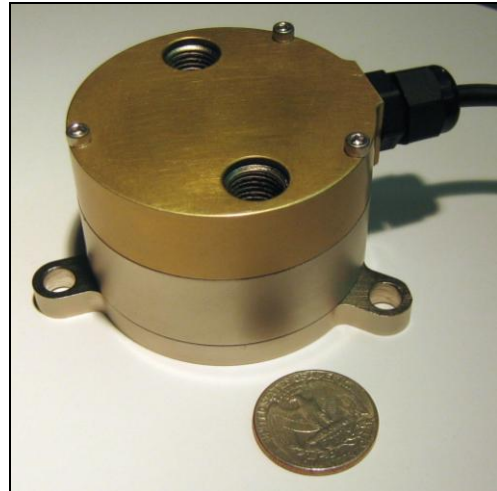


Micro-ESR™ Automated Oil Analysis

The Active Spectrum Micro-ESR™ Oil Condition Sensor provides real-time, embedded electronic detection of lubricant condition.

Lubricating oil wear results from several processes including oxidation, depletion of additives, soot buildup and water contamination. Active Spectrum's lubricant condition sensor uses the principle of **Electron Spin Resonance (ESR)** to measure each of these quantities in real time to predict the optimum oil change interval and alert the operator to impending lubricant failure.

Existing machines can easily be retrofitted to use the Micro-ESR™ sensor.



Micro-ESR™ Oil Condition Sensor

Benefits

- On-board oil condition sensing helps optimize engine lubricant and filter life.
- Manual sampling and off-line lab analysis are minimized.
- The interval between oil changes can be extended without compromising machine life.
- Reduced lubricant consumption offers environmental and economic benefits.

Availability

The Active Spectrum Micro-ESR™ Oil Condition Sensor is currently available for purchase in pre-production quantities for evaluation purposes. Please contact Dr. James White at +1 650-610-0720 or jwhite@activespectrum.com to order a sample kit or discuss your application.

Specifications

The Active Spectrum Micro-ESR™ Oil Condition Sensor uses a microwave resonance signal to measure the concentration of free radicals in engine oil.

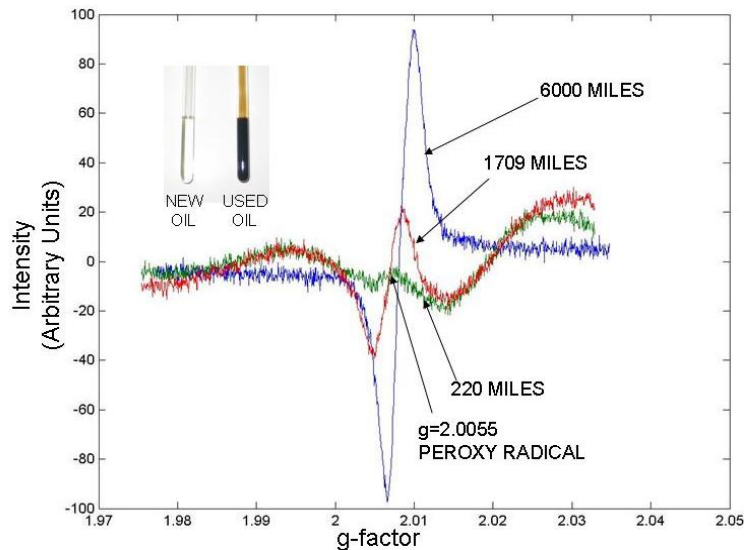
Supply Voltage	+12V-30VDC
Sensor Output Options	Modbus®, RS-232, Ethernet, CAN J1939. Additional communication standards are available according to customer specifications.
Dimensions:	2.25" ϕ x 1.5" tall cylindrical metal package with hydraulic and electrical connections.
Fittings	JIC, NPT, others available according to customer specifications.
Quantities Measured	Oxidation and Soot (Peroxy Radical and Carbon Radical), Water Content, fuel dilution (marine applications only), iron sulphides, RF dielectric permittivity.

Operating Temperature Range **-30°C to +120°C**
 Max. Inlet Oil Temperature **160°C+**

Applications

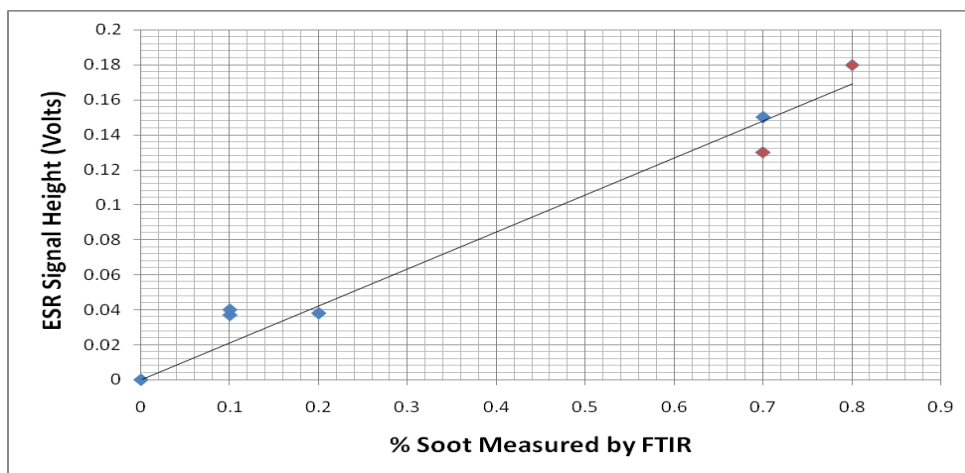
The Active Spectrum Micro-ESR™ Oil Condition Sensor is targeted for use in vehicle fleets including military vehicles, heavy trucking, shipping, rail, heavy equipment, power generation and wind turbines. Any industrial machinery with stringent lubrication requirements could benefit from accurate, automated oil analysis.

Sample Results



Peroxy Radical Concentration* vs. Mileage

*The intensity of the measured free-radical resonance is correlated to *both* mileage and driving conditions.



Soot Concentration measured by ESR and FTIR