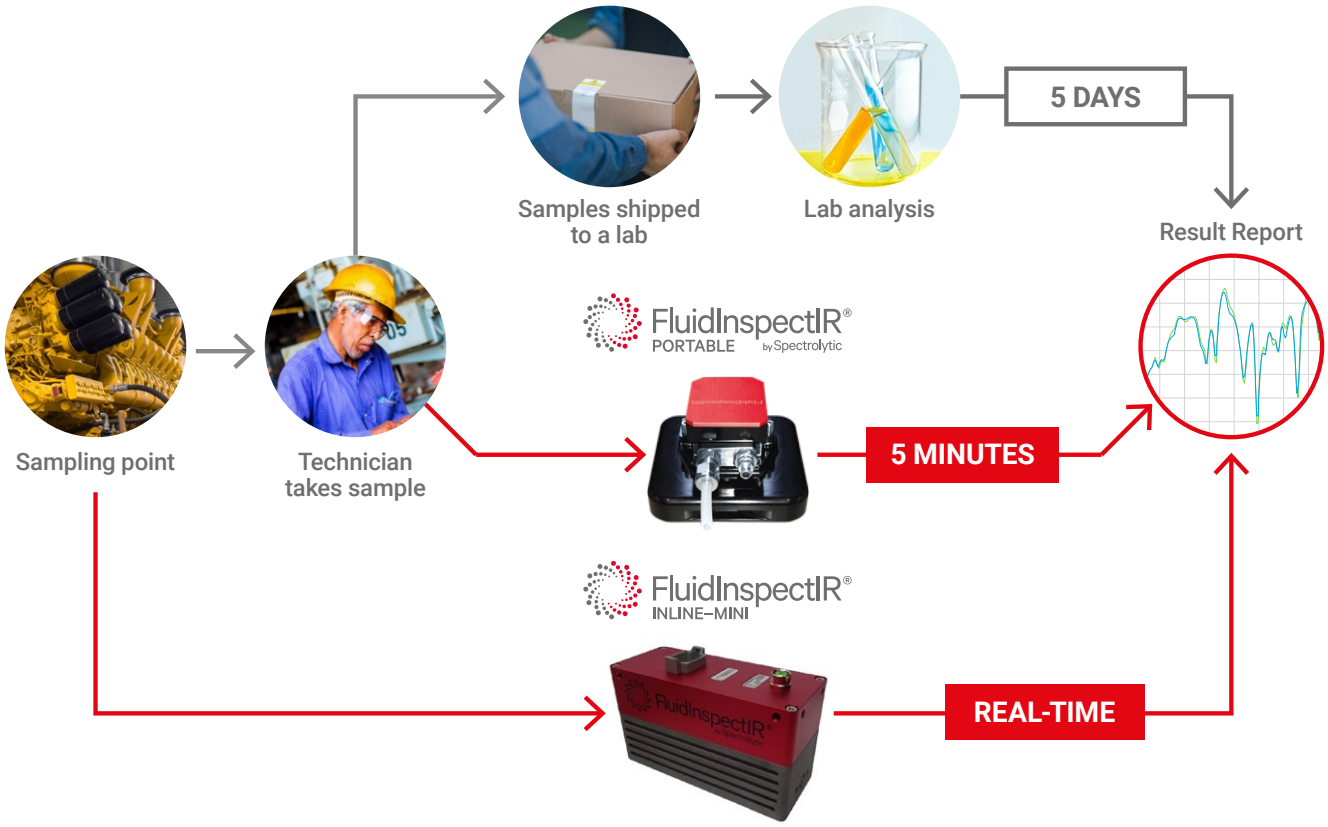
Spectrolytic

Innovative Solutions in Spectroscopy

FluidInspectIR®
Oil Condition Monitoring

World Class Oil Condition Monitoring

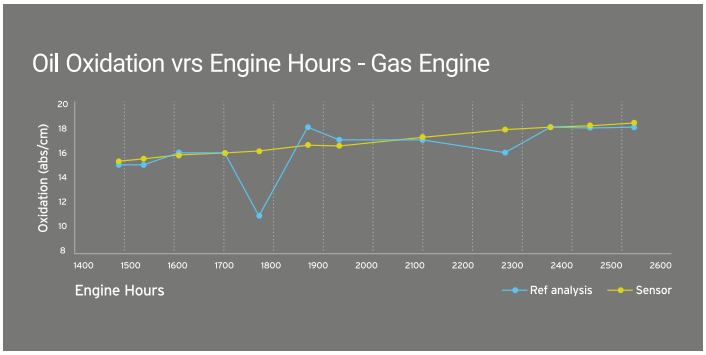
Spectrolytic's Oil Condition Monitoring systems (FluidInspectIR®) are a robust and affordable range of oil condition monitoring systems that gives our customers accurate real time oil condition data as per their periodical oil laboratory analysis. These systems provide the customer the comfort of having quantitative and accurate key oil condition data at the touch of a button. The use of inline, real-time data trending allows our customers to move into a powerful realm of data driven predictive maintenance where the reduction in unplanned downtime, Cost Of Ownership and CO2 footprint can be achieved.

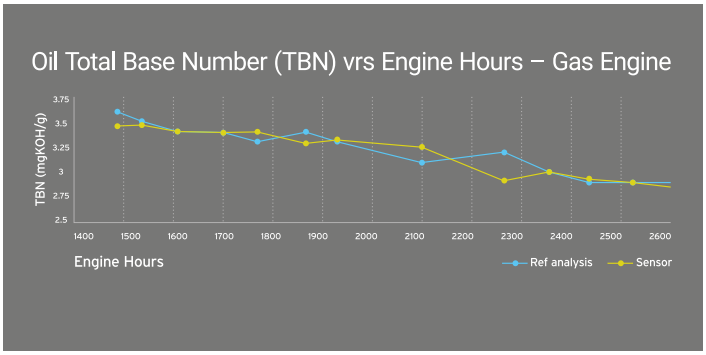


- Reduce unplanned downtime
- Safely change oil drain intervals
- Reduction in H&S Hazards
- Data driven maintenance
- Reduction of CO2 footprint
- Support for warranty claims

Lab accurate results without human error

The FluidInspectIR® Inline removes all human involvement from the oil analysis process resulting in lab accurate results, in the same units as oil lab reports that are easy for a Field Application Engineer to interpret.





- No sample taking required
- No shipment required
- No human involvement

FluidInspectIR® validated together with Exxon Mobil

Meet Rudiger Kempf, one of Mobil's most experienced Field Lubrication Engineers. In many ways, he's like a roving CSI, except the "crime scenes" he investigates are customers' operational emergencies – from worrying wear to costly breakdowns.

Rudiger typically spends 3 days a week in the field, conducting forensic lubrication analysis in industries as diverse as steel and paper. His tools? A laptop, mobile and oil sampling equipment – giving him critical evidence on machines inner workings without taking them apart.

"My job is fascinating! Each day is different and when I come across a really challenging problem, I can call upon specialist colleagues from our Mobil Service Lubricant Analysis unit or Equipment Builder department to help me dig into the causes and solutions. Customers really appreciate solutions that have been tailored to their operation."

mtu A Rolls-Royce solution · MAK · Solar Turbines A Caterpillar Company · JENBACHER · CATERPILLAR®

WÄRTSILÄ · MAN Energy Solutions · GE Power · ABB · ACHENBACH

Monitor critical plant assets

Gas Engine
Real-time monitoring of TAN, TBN, ipH, oxidation, nitration, sulphation, soot, water on natural gas, biogas and landfill gas engines.

Mobile machinery
Engines, gears, transmission and hydraulic systems in heavy machinery.

Metal working
Oil and water-based metal working fluids like cooling and cleaning agents in automotive lines, lubricant and rolling emulsions in steel and Aluminium milling. Measurement of key additives, contamination and oil degradation.

Gear Oils
Real-time monitoring of TAN,oxidation, water and EP additives in gear systems like wind Turbines, steel plants etc.

Marine
Real-time Monitoring of TBN, water, sulphation, oxidation on diesel engine systems and water, TAN, oxidation on EAL (environmentally acceptable lubricants) on ship propulsion systems.

Turbine Oils
Monitoring of oxidation, Anti-oxidants on gas and steam turbines.

Many More Applications
Hydraulic and transmission oils, compressors oils, EHC fluids. The technology platform can be configured for most fluid applications to solve most measurements problems.
Get in touch for application feasibility.

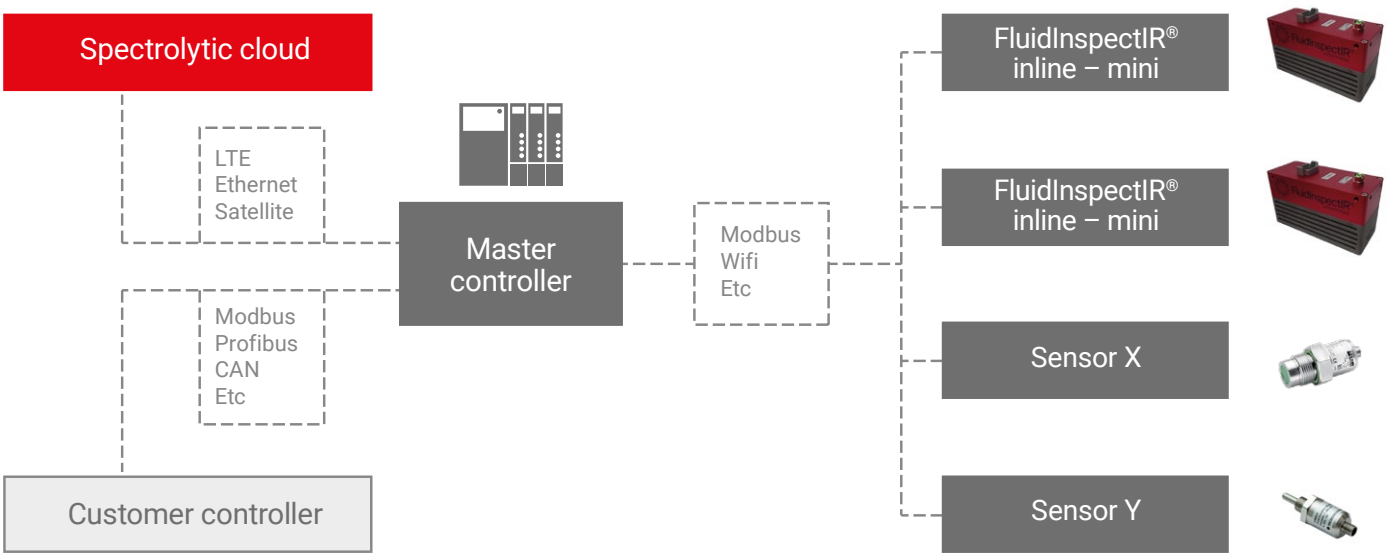
Optional Extras
Optional Extras Optional extras include wear sensor, viscometer and particle counter depending on the application requirement.

Explosion Proof Solutions
Explosion proof systems available for Oil and Gas and Chemical sectors. ATEX certified for Zone 0, Group 1, T3.

Distributed Sensor Network

The FluidInspectIR® inline can be used as stand-alone system for a single asset or for multiple assets we have developed a distributed sensor network that allows multiple systems to be installed at different points in a plant area covering numerous pieces of equipment.

We can also work with any sensors such as optical particle counting sensors, wear sensors, viscosity sensors and the Data transfer is either to the cloud or directly to the customer PLC.



STRATEGIC PARTNERSHIP

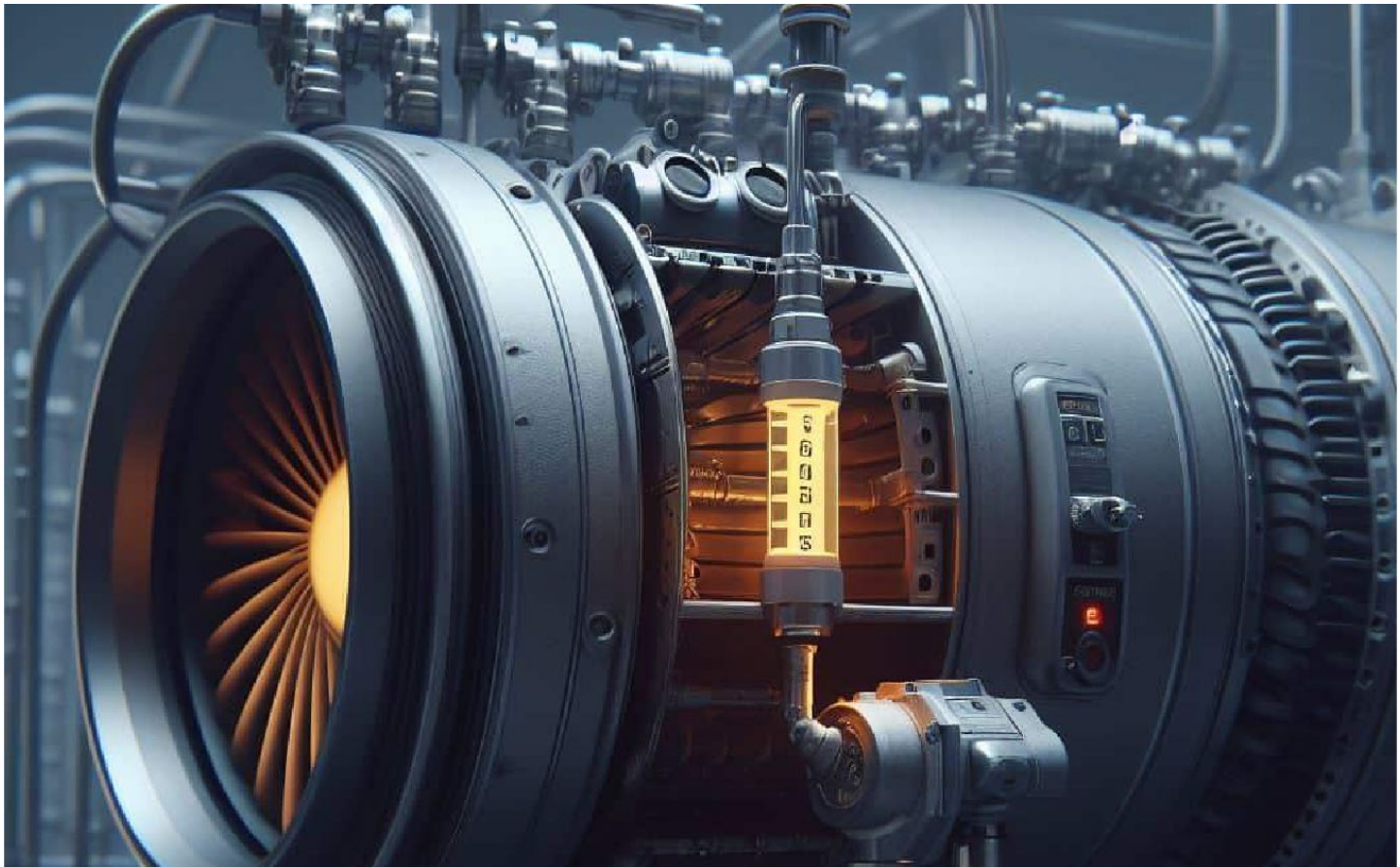
Turbine and compressor oils

Spectrolytic has joined forces with Fluitec, a pioneer in climate solutions and oil degradation management. Together, we aim to revolutionize industrial lubricant management, enhancing environmental sustainability and operational efficiency. This partnership promises laboratory-level analysis for oil degradation parameters in turbomachinery and compressors, marking a significant step towards sustainable industrial practices.

This collaboration focusses on applications in turbomachinery and compressors to advance the life cycle management of industrial lubricants, thereby contributing to environmental sustainability and operational efficiency

Fluitec's Fill4Life™ solutions have been instrumental in transforming the conventional, linear lubricant business model into a circular economy. Their expertise lies in identifying oil degradation and proposing effective solutions to prolong the lifespan of oil and reduce waste. This aligns seamlessly with Spectrolytic's mission to offer laboratory-accurate measurement solutions for in-line and at-line industrial processes.

Fluitec has selected Spectrolytic's sensor technology based on its exceptional flexibility, scalability, and ease of calibration. The collaboration ensures laboratory-equivalent analysis of key oil and lubricant degradation parameters, a crucial aspect in maintaining the longevity and efficiency of industrial machines.



FluidInspectIR® series of inline oil condition monitoring systems

FluidInspectIR® Series

A multi-sensor system for real-time monitoring of the oil condition. The system is either installed in the main oil circuit via a bypass system or it takes the oil from a reservoir (sump, tank) using an integrated pump. Additional functionality can be provided by integrating an optical particle or wear sensor. The FluidInspectIR® – Inline is a plug & play analyser and can be installed remotely. It provides the user with key oil degradation parameters in the same format, units and accuracy as per standard oil analysis laboratory reports.

	FluidInspectIR® INLINE	FluidInspectIR® INLINE–MINI
		
Performance	++++	+++++
Size (L,W,H)	285*200*160mm	160*70*200mm
Distributed Network	NO	YES
Integrated Pump of Valve Option	YES	YES

Summary Information

- Measurement of key parameters in oils and lubricants in assets such as gears, engines, turbines, hydraulic and transmission systems, metal working (Steel and Aluminium)
- Oil Condition sensor (degradation parameters, Additive packages, contamination)
  - Correlates to ASTM / DIN
- Master Module with optional series unit for housing viscometer, wear sensor
- Distributed network with master module and multiple mini units.
- All data in conventional laboratory Units and same accuracy as in an oil laboratory
- Cloud Dashboard Capability
- Plug and Play remote installation of system

Key Benefits

- Reduce unplanned downtime
- Safely change oil drain intervals
- Reduction in H&S Hazards
- Data driven maintenance
- Reduction of CO2 footprint
- Support for warranty claims

Electrical / mechanical

- Voltage: 85V to 240V AC or 24V DC
- Power: 60W Max
- Interfaces: Ethernet, RS485
  - Optional external LTE / WiFi
- Fluid Connections : G1/4 Female Thread
  - Optional quick release connectors (ISO 7241-A)

Communication

- MODBUS (RTU, TCP), Profibus, OCOM
- Master or Slave device
- Cloud integration via MQTT or Web API
- Azure &AWS integration, others optional;
- Direct integration into on-side controllers

Oil Condition Sensor Parameters

- Measurable Parameters: Note that not all of these parameters can be measured all at once with same device
- Repeatability: <+-5% of measured value
- Accuracy: <+-5% of measured value
- Methodology Default: DIN 51453/51451 – can be calibrated to ASTM/DIN
- Configurations available in common metal working applications for specialised additive packages and accurate water in oil measurements

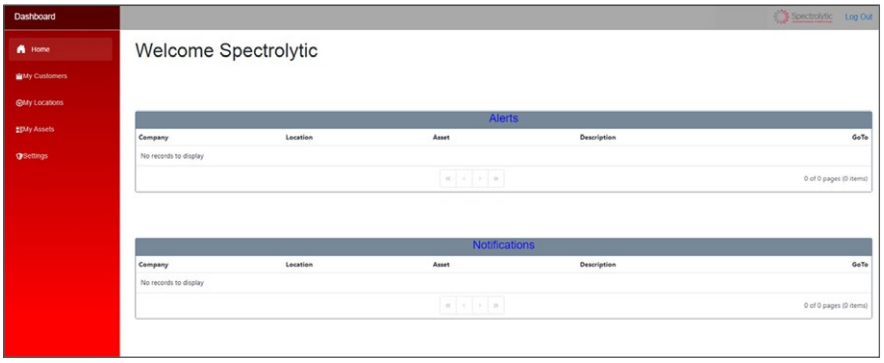
Measurable Parameters	Correlates to Standard	Unit
Group I-IV Oils including PAO (PolyAlphaOlefins)		
Base Oil Changes		
Oxidation	ASTM E2412, DIN 51453	A/cm or A/0.1mm
Nitration	ASTM E2412, DIN 51453	A/cm or A/0.1mm
Suplhation	ASTM E2412, D7415	A/cm or A/0.1mm
Properties		
TBN	ASTM D664	mgKOH/g
TAN	ASTM D2896	mgKOH/g
ipH		
Viscosity	ASTM D445	mm^2/s
Additives		
ZDDP AW	ASTM E2412	A/cm or A/0.1mm
Phenol / Amine AO	/	%
Others Upon Request	Correlates to reference analysis	A/cm or A/0.1mm, mg/kg or %
Contaminants		
Soot	ASTM E2412	A/cm or A/0.1mm, wt%
Water	ASTM E2412	A/cm or A/0.1mm, wt% or ppm
Ethylene Glycol	ASTM E2412	A/cm or A/0.1mm, wt%
Diesel	ASTM E2412	A/cm or A/0.1mm, wt%
Gasoline	ASTM E2412	A/cm or A/0.1mm, wt%
Group V Polyolester and Phosphate Ester		
Ester Breakdown 1	ASTM E2412	A/cm or A/0.1mm
Water	ASTM E2412	A/cm or A/0.1mm, ppm
Phenol AO	/	%
Amin AO	/	%
TAN	ASTM D2896	mgKOH/g

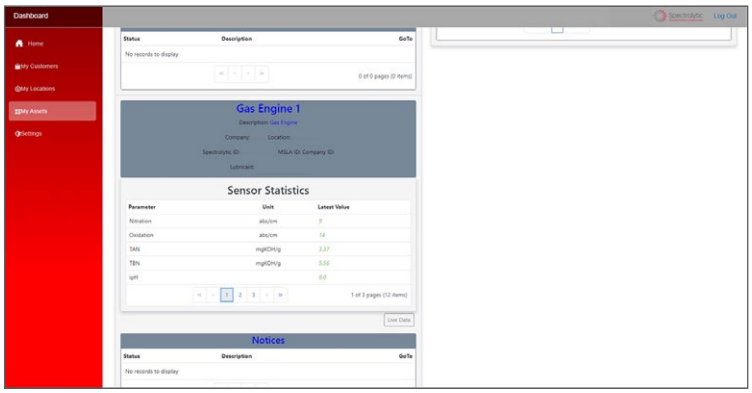
In-depth data analytics

DataInspectIR

DataInspectIR is Spectrolytic's data analysis hub. We provide cloud data services and in-depth data analytics based on our inline, real-time sensor data – this will give our customers an enhanced level of understanding on their equipment and allow them to efficiently manage lube cycles, reduce emissions, save costs and increase asset uptime.

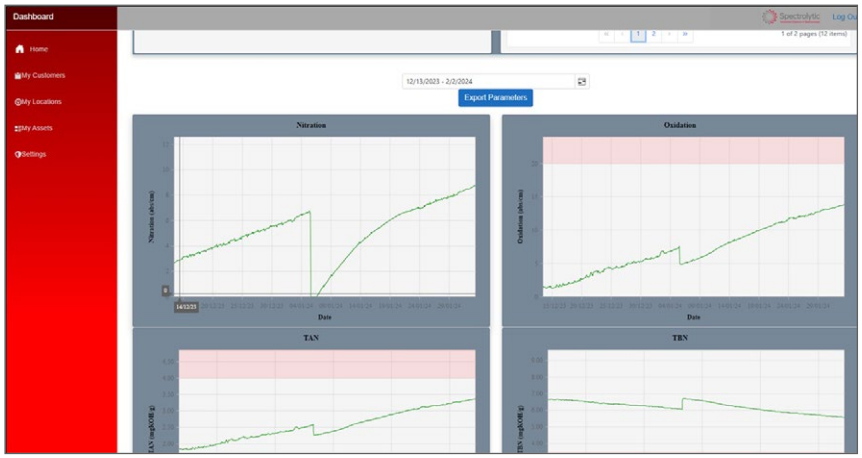
Data is sent to Spectrolytic's cloud. Option to view/download data via a dashboard.





We support customer's cloud (Azure, AWS) via MQTT or Web API protocols.

Direct integration available with on-site controller systems.



Robust portable measurement system

FluidInspectIR® Portable

- Robust measurement system
- Small footprint and maintenance free
- Battery powered
- Used with tablet or PC
- Oil condition, FAME, ethanol in Gasoline and oil in water analyser options
- Other applications easily configured upon request

System variants

Portable Oil Condition Monitoring

System which can measure degradation, contamination and additive depletion on multiple oil types. Set up for specific oil and enhanced accuracy for slow degrading oils with flexible flow-cell pathlength.

Portable Oil in water

Oil in water with use of solvent S-316 to extract oil from waste water samples. Measurement down to 0ppm.

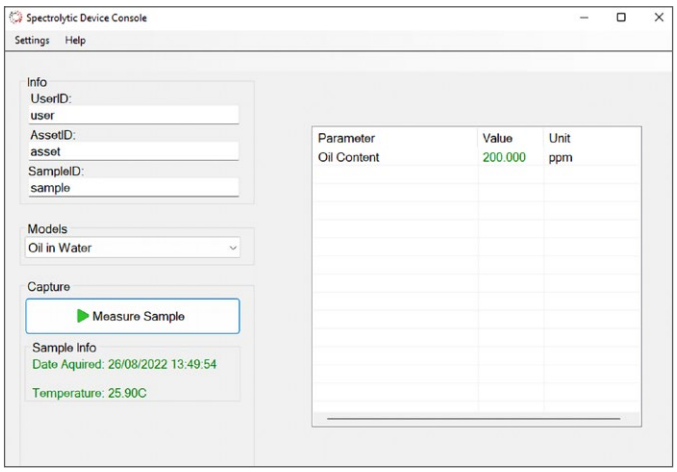
Portable FAME analyser

Measurement of Fatty-Acid-Methyl-Ester content in biodiesel.

Portable ethanol in Gasoline

Measurement of ethanol content in petrol / gasoline samples.

Portable system can be configured for many novel and niche measurement applications get in touch with your measurement problem.



Specifications

GUI: Software Console provided for running on windows 10 based laptop / tablet (tablet can be provided as option)

Ambient operating temperature and humidity range: 0-70C non-condensing

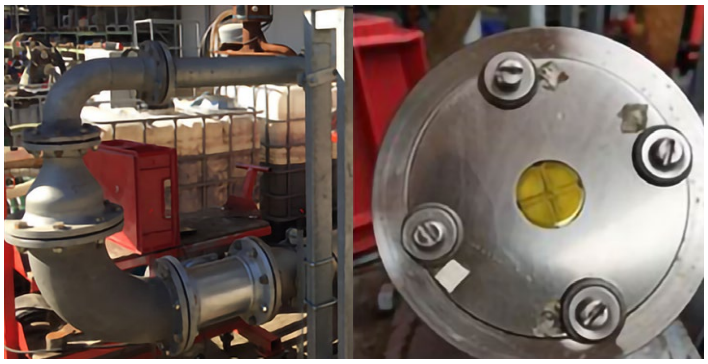
Internal battery capability typical runtime: 250 sample measurements between charge

Complete cost-effective product design

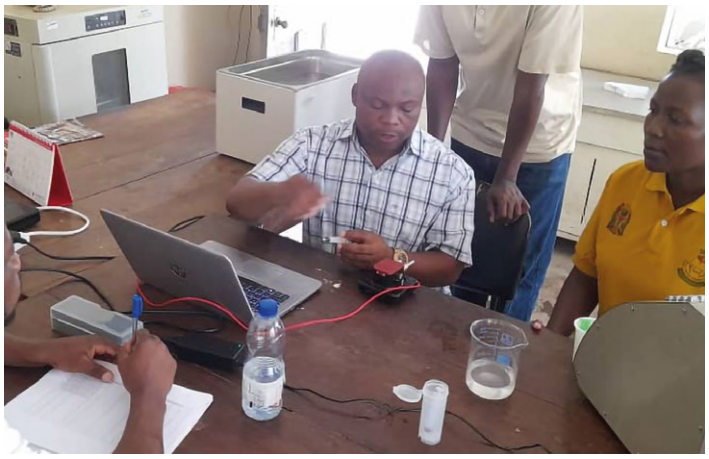
Spectrolytic's core expertise is the manufacture and development of sensor systems for Oil Condition Monitoring. Our core technology allows us to work outside of this market sector with external customers to develop measurements system and sensors in a broad range of industries.

We offer a complete cost-effective product design package for a customised solution that will be manufactured in an ISO 9001 qualified manufacturing environment we provide a complete design solution from application feasibility to mass manufacturing after prototype testing.

Next-generation Capnography devices for anaesthesia process control.



Manure analysis in agro industry.



Mobile milk analysis for centralized digital data collection in remote farms.

Manufacturing capabilities

The high quality of the entire Spectrolytic production chain is not just proven by our certification, which is in accordance with DIN EN ISO 9001: 2015.

The comprehensive control and testing procedures, which we have implemented at all stages of production, ensure continuous compliance with all required specifications.

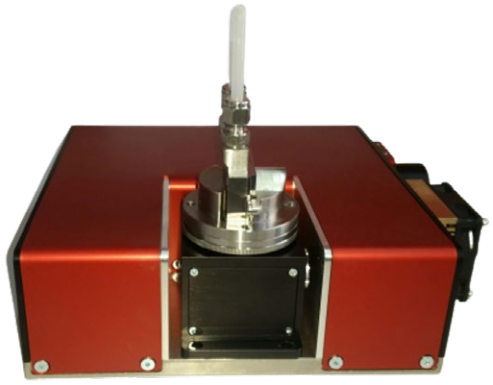
In our manufacturing plant we offer full scalability from low volume high complexity to high volume serial production and with the in-House production of key components ensures a fast response time.

In-house competencies are:

- Optical hardware design and layout
- Electronic & Mechanical design using state of the art tools
- Manufacture of non-standard cabling and connectors
- Configuration of Control boxes
- Customized metal works

QUALITÄTS-MANAGEMENT
Wir sind zertifiziert
Regelmäßige freiwillige Überwachung nach ISO 9001

Solutions for more demanding applications

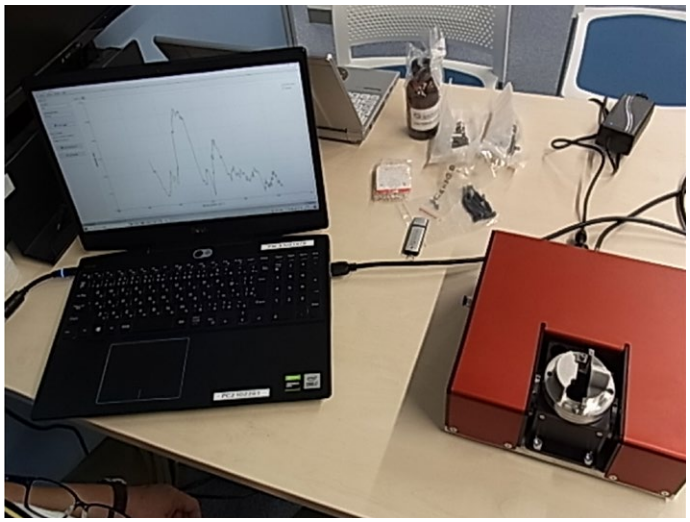


IRGriffin
Static FTIR (sFTIR)

The IRGriffin static FTIR (sFTIR) spectrometer has been developed without having any moving parts and its spectral performance compares favourably with many conventional FTIR systems.

The sFTIR does not use any internal laser or rotating mirrors and it is the ideal choice for process control applications in harsh environments as no re-calibration and/or maintenance is generally required.

The system is optimised to analyse liquid or gaseous sample in transmission mode, where the sample is passed through a flow cell. Alternative sample interfaces such as ATR crystals can be implemented on request.



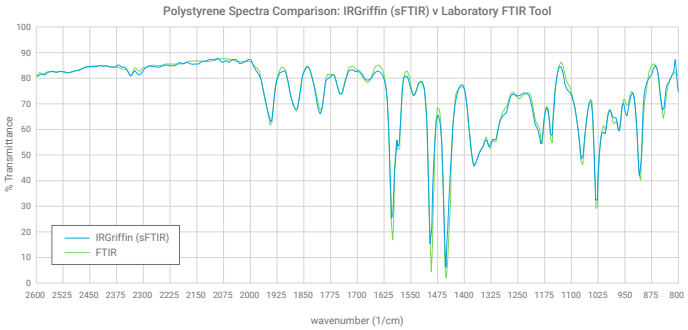
Used here for highly accurate fluid compositional measurement in biochemical / pharmaceutical processing.

Specifications

Configurations:	Transmission, ATR (also compatible with PIKE ATR), Open Path, Gas
Spectral range:	3.5um to 14.0 um
Spectral resolution:	4-10cm-1
Measurement time:	1Hz to 40Hz
Operating temp:	-10 - 60˚C
Power:	12V DC, 50W
Protection class:	IP64
Interface:	USB3
Size/Weight:	220mm(L)*100m(D)*233mm(W) / 6kgs

Performance

The plot below displays a spectrum comparison of the IRGriffin (sFTIR) versus a laboratory FTIR tool for polystyrene calibration card.



Key Application Examples

Liquid Analysis:

- High speed medical analysis
- Real time process monitoring
- Measurement of fast-moving samples
- Liquid pumping systems

Gas Analysis:

- Shipping container degassing
- Multi-gas application (semiconductor OEM industry)
- Oil platform, Explosive detection

FluidInspectIR® Inline installation examples

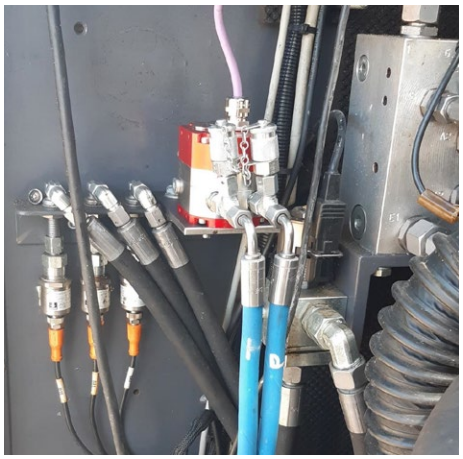
Natural Gas Engine

Steel work Roller

Marine Diesel Engine

Gear System

Gas Turbine



Mobile Piledriver diesel engine

Testimonials

"A laptop, a mobile and oil sampling equipment (FluidInspectIR®) gives critical evidence on machines inner workings without taking them apart. Customers really appreciate solutions that have been tailored to their operation".

ExxonMobil Field Application Engineer

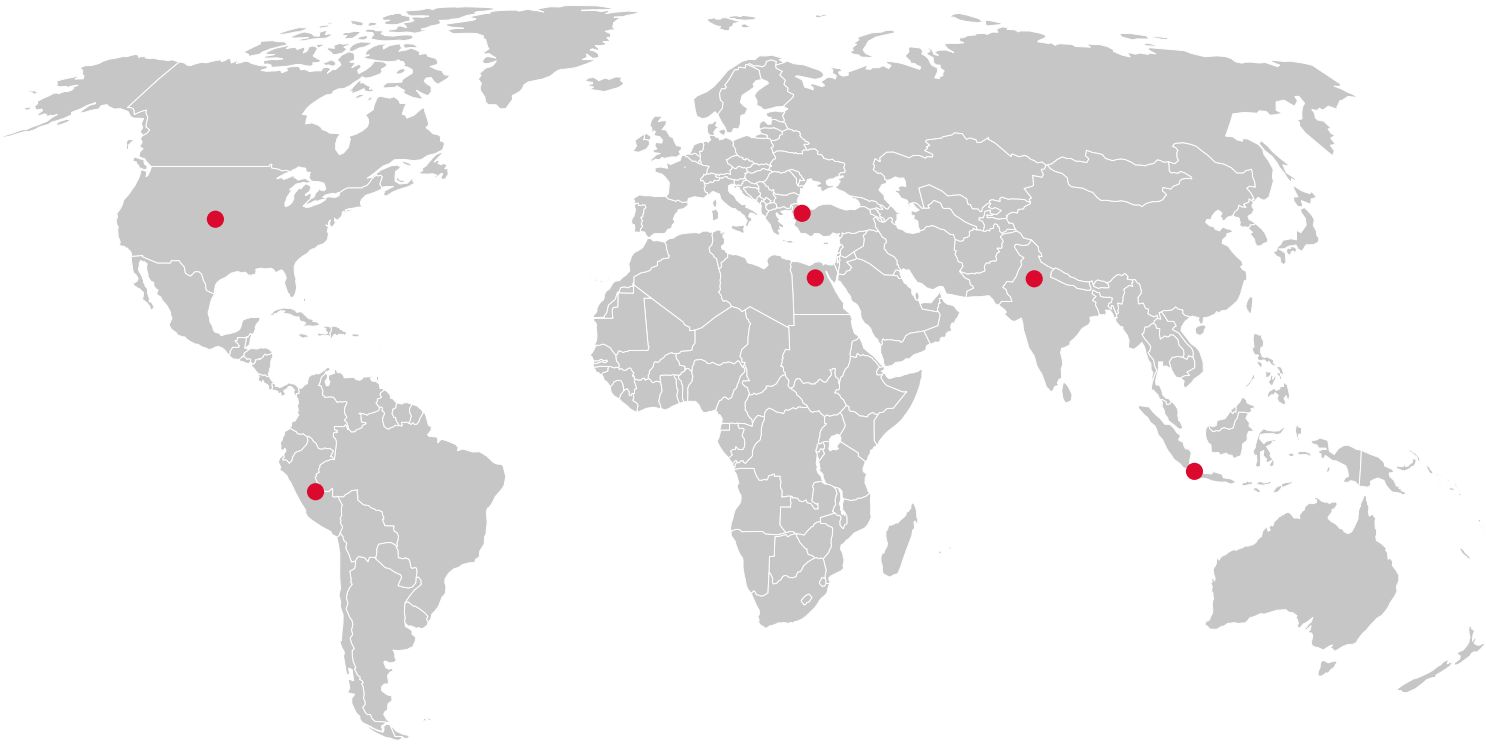
"Procurement of the FluidInspectIR® – Oil Condition Analyser has influenced significant cost savings in a variety of ways by reducing the costs of laboratory analysis, engine oil itself and maintenance services"

Expert for technical maintenance,
Gas Engines Combined Heat & Power Plant, Serbia

"The Static FTIR (IRGriffin) enables us to perform time-resolved mid-ir spectroscopy of fluids and gases at measurement rates of up to 40 Hz. In addition, it is substantially less expensive, more compact and more robust than our conventional FTIR laboratory instruments, which makes it particularly interesting for both research and teaching."

Institute for Measurement Systems and Sensor Technology, Technical University of Munich (TUM)

Our partners and distributors



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