

SpectraSensors Gas Analytical Field Instruments

Measurement solutions for the
chemical and oil & gas industries



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SpectraSensors[®]
An Endress+Hauser Company

Solutions: our experts helping your experts

Providing expertise and experience for better measurement solutions

Gas analysis experts SpectraSensors engineered solutions ensure sample integrity so that measurements accurately represent the process gas stream and provide quality data with optimum analyzer availability. Better measurements enable users to optimize their operations by improving process control, product quality, throughput, and safety. Our solutions are engineered to provide lower installation and OPEX costs while delivering accurate and reliable measurements.

Quenched Fluorescence (QF) technology SpectraSensors QF analyzers perform on-line, real-time measurements of Oxygen (O₂) in gas streams from ppm levels to percentage levels. The technology has been rapidly adopted by natural gas companies and is used in a host of gas processing applications.

Laser spectroscopy technology SpectraSensors specializes in the design and manufacture of laser spectroscopy analyzers for on-line measurements of process gas streams. This core competency and world-class metrology form the foundation of the complete process gas measurement solutions we supply.

Tunable diode laser absorption spectroscopy (TDLAS) technology SpectraSensors TDLAS analyzers perform on-line, real-time measurements of impurities in process gas streams from sub-ppm levels to low percentage levels. The technology is widely used for measurements of moisture (H₂O), Carbon Dioxide (CO₂), Hydrogen Sulfide (H₂S), Ammonia (NH₃), Acetylene (C₂H₂) and other compounds.

Raman spectroscopy technology Raman Optograf analyzers perform on-line, real-time compositional analysis of process gas streams. The Optograf analyzer measures multiple-components in gas streams containing from 0.1% to 100% of Hydrogen (H₂), Nitrogen (N₂), Oxygen (O₂), Carbon Monoxide (CO), Carbon Dioxide (CO₂), Hydrogen Sulfide (H₂S), Methane (CH₄) and other components.



Industries served SpectraSensors analyzers are used in natural gas production, transport, processing, liquefied natural gas (LNG), refining, and petrochemical industries. Our commitment to providing accurate and reliable measurement solutions is evidenced by an installed base of 7,500 + analyzers around the world.

Comprehensive solutions for critical gas measurements

A cost-effective approach for your important projects



SpectraSensors has the capability to undertake projects encompassing:

- Up-front consultation for FEED
- Approval drawings
- Analyzer racks and cabinets
- Thermal-modeling of sample streams
- Sample probes
- Heated sample transport bundles
- Sample conditioning systems
- Stream switching hardware & controls
- Programmable logic controllers
- Power distribution and circuit protection
- Lighting
- As-built design documentation
- Analyzer calibration reports
- Factory acceptance tests (FATs)
- Site acceptance tests (SATs)

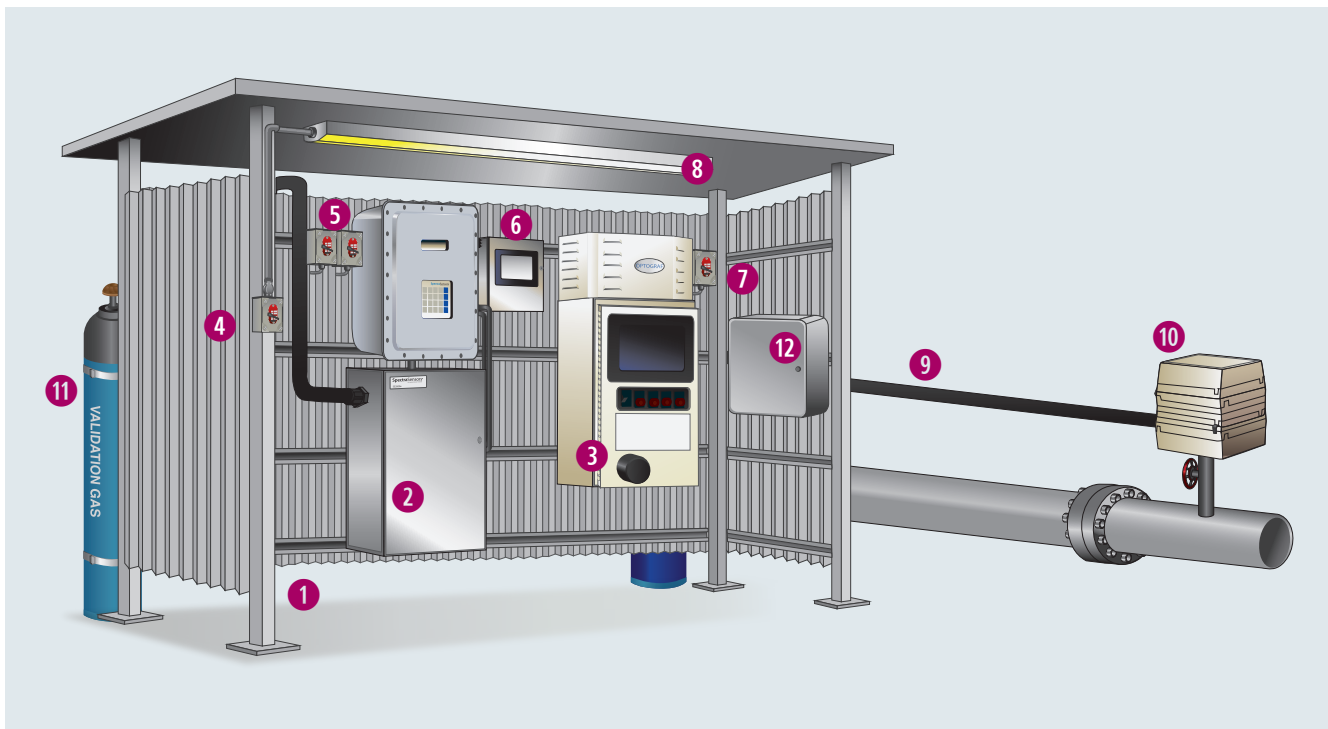
SpectraSensors can serve as a single point of contact to help your staff implement gas analysis projects on time, and in a convenient cost-effective manner.

Complete engineered solutions

The key to accurate, reliable measurements

Our engineered solutions encompass all components necessary to extract, transport, condition, and analyze samples to provide accurate and reliable process gas measurements. The diagram below depicts an engineered gas analysis station equipped with TDL and Raman analyzers and associated gas handling and electrical components.

1. Three sided shelter
2. SS2000i-1 TDL Analyzer and sample conditioning
3. Raman Optograf Analyzer
4. Light power switch
5. TDL analyzer and PLC power switch
6. Programmable logic controller (PLC)
7. Optograf analyzer power switch
8. Fluorescent light
9. Sample transport tubing bundle
10. Sample extraction system
11. Validation gas mounting
12. Power distribution junction box



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Optimizing measurement performance

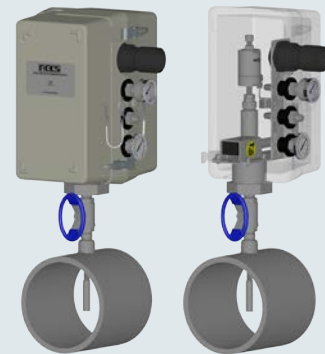
Sample extraction, pre-conditioning, transport, and metrology

Proven sample extraction, pre-conditioning, and transport solutions

Sample extraction Probes equipped with membrane separators and coalescing filters remove entrained particles, liquids and oil. A dynamic reflux sampler can be used in more challenging applications.

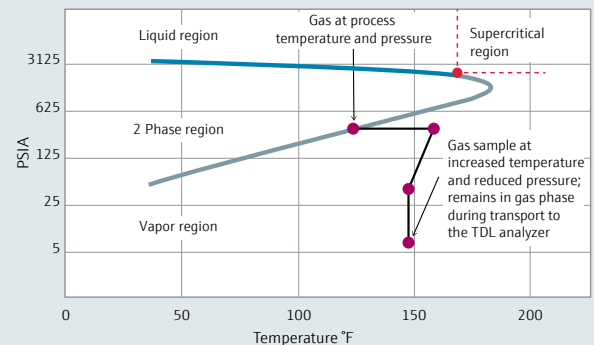
Pre-conditioning system Heated probes and pressure regulators designed for adiabatic sampling of process streams.

Sample transport Insulated, weather-resistant tubing assemblies transport gas samples at a controlled, uniform temperature from a process sampling point to the inlet of a gas analyzer. The construction of these tubing assemblies helps eliminate the effects of ambient temperature extremes and diurnal and seasonal temperature changes on gas samples.



Proprietary tools

SpectraSensors has developed proprietary tools to systematically evaluate and define sample conditioning needs based on specific stream composition and conditions provided by customers. One tool is a thermodynamic assessment tool which calculates the heating requirements necessary to achieve isothermal conditions during extraction and transport of gas samples. This tool generates a phase diagram and determines the appropriate system components to ensure the sample arrives at the analyzer in the gas phase.



Example of a phase diagram generated from proprietary thermal-modeling tools.

Expert metrology

Every SpectraSensors TDL and Kaiser Optical Systems Optograf analyzer is factory calibrated using certified/traceable chemical or hydrocarbon gas mixtures specifically blended to simulate the composition of the customer's process stream. This approach verifies spectroscopic performance and ensures stable, long-term operation in the field. Clients may opt for a factory acceptance test (FAT) to witness and sign off on performance of their analyzer.



Measurement solutions: service and support

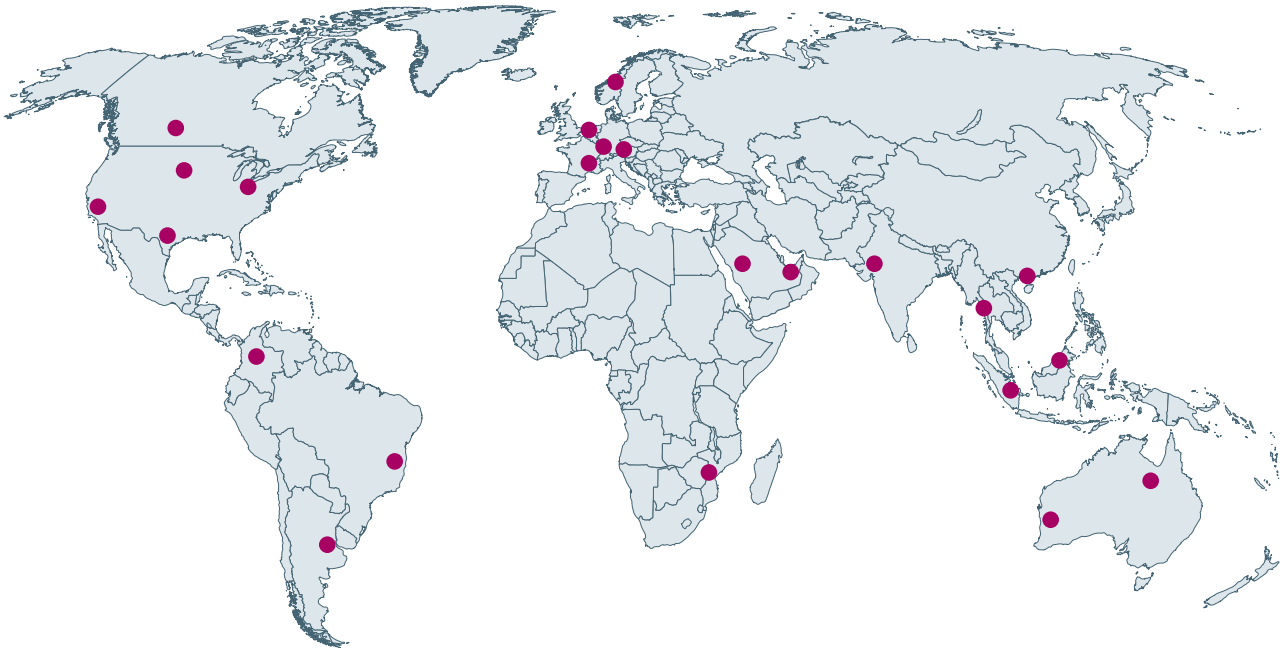
Maximizing analyzer reliability and availability

Maximizing the contribution of field instrumentation to your business and extending its lifetime is the job of a specialist. Proven success and many years of experience in process instrumentation means you can rely upon our global team of experts.

- Analyzer startup and commissioning
- On-site training for analyzer operations
- Remote technical support via phone and e-mail
- Spare parts recommendation and ordering



As part of Endress+Hauser, SpectraSensors has a network of highly trained gas analytical sales and service staff around the globe. Select Endress+Hauser Sales Centers as well as Independent Distributors and Representatives support our customers on a local level. Many of these partners offer Gas Analytical Measurement Solutions of their own to meet local or regional requirements. Whether you order an engineered solution directly through SpectraSensors or through one of our network partners, you can be assured of receiving a technically sound measurement solution that meets the accuracy, operational performance, long-term reliability, and project management requirements of your application.



Visit our website to locate your local service team.
www.spectrasensors.com/rep/

Measurement solutions

Project management experts helping your experts

SpectraSensors project management team members work closely with you to fulfill all project requirements in a timely and professional manner. They help ensure all phases of your project operate smoothly, including:

- Contract review
- Project planning and scheduling
- System design and integration documentation
- Approval drawings
- Project oversight during production
- Factory acceptance testing plan
- Site Acceptance Test (SAT) and Commissioning Handover
- Submittal of a final as-built documentation package



SpectraSensors analyzers are monitoring process gas streams in thousands of natural gas, gas processing, liquefied natural gas (LNG), petrochemical, and refining facilities around the world. We welcome the opportunity to assist you with a solution for your application.



Endress+Hauser is a global leader in measurement instrumentation, services and solutions for industrial process engineering. The company acquired SpectraSensors in 2012. Soon thereafter Kaiser Optical Systems was also acquired bringing the Raman-based Optograf spectrometer into the product portfolio further solidifying Endress+Hauser's position in process gas analytics.

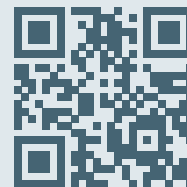
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