

## SpectraSensors Natural Gas Quality Analytical Measurements

The most reliable solutions for accurate analysis of H<sub>2</sub>O, H<sub>2</sub>S, CO<sub>2</sub>, and O<sub>2</sub> in natural gas



# Laser-based analyzers for natural gas

Laser spectroscopy – a better solution for challenging conditions

**The SpectraSensors advantage** Tunable diode laser absorption spectroscopy (TDLAS) analyzers from SpectraSensors perform on-line, real-time measurements of impurities in natural gas streams from sub-ppm levels to percentage levels. The unique design of SpectraSensors' analyzers provide significant advantages over other technologies for monitoring H<sub>2</sub>O, H<sub>2</sub>S, CO<sub>2</sub>, and O<sub>2</sub> in natural gas and natural gas liquids (NGLs).

### Technology drives reliability and availability

- ▶ No Contamination of Sensors by Glycols, Methanol, Corrosives
- ▶ Fast Speed of Response
- ▶ Lowest Cost of Ownership
- ▶ Remote Monitor, Diagnose and Repair
- ▶ Immune to Interferences from Components in Gas Sample

**Trace H<sub>2</sub>S analyzers** The SpectraSensors H<sub>2</sub>S analyzer system retains the analytical benefits and reliability known by TDL moisture users.

This translates into...

- ▶ No Light Source Replacements
- ▶ No Tape
- ▶ No Field Calibration. Only Validation
- ▶ Reduced Cost of Ownership
  - Training Requirements Simplified
  - Remote Diagnostics and Repair - Analyzer Management Software
  - Simplification via One Technology for Main Measurements
  - Reduced Footprint

**Selective and specific moisture measurement** TDLAS analyzers selectively measure the spectroscopic signature of H<sub>2</sub>O, H<sub>2</sub>S, and CO<sub>2</sub> in natural gas. Electrochemical sensors and Quartz Crystal Microbalances cannot distinguish between H<sub>2</sub>O and methanol and give a false reading when methanol is present in natural gas as a hydrate inhibitor.



TDLAS Analyzers for Natural Gas

# SpectraSensors: A leading global provider of laser-based process instrumentation

**SpectraSensors' mission** SpectraSensors specializes in the design and manufacture of optical technology-based analyzers for on-line, real-time measurement of contaminants in process gas streams. Bringing together individuals from diverse scientific and engineering disciplines has enabled us to solve real-world problems and become the recognized leader in TDLAS technology with an unmatched portfolio of patents. Our commitment to providing accurate and reliable solutions for measuring contaminants in process gas streams is evidenced by an installed base of 7,500+ TDLAS analyzers around the world.

**Industries served** SpectraSensors' analyzers are used in the natural gas, gas processing, liquefied natural gas (LNG), petrochemical, refining, and atmospheric testing industries.

**SpectraSensors' organization** SpectraSensors, Inc. was formed in 1999 as a technology spin-off of the NASA / Caltech Jet Propulsion Laboratory (JPL) in Pasadena, California. Technology development and analyzer manufacturing are based in Rancho Cucamonga, California, and the company headquarters is in Houston, Texas. A regional Center-of-Competence (CoC) is located in Compiegne, France to provide technical support to European customers.

SpectraSensors was acquired by Endress+Hauser in 2012. Endress+Hauser is a global leader in instrumentation for process automation based in Switzerland which has built an unsurpassed reputation for producing high quality instruments for measurement and control of liquid phase processes. Acquisition of SpectraSensors extends Endress+Hauser's presence into gas phase measurements and strengthens SpectraSensors' ability to support customers globally. In late 2013, Kaiser Optical Systems, Inc, the company which developed the Raman-based Optograf spectrometer, was also acquired by Endress+Hauser, further solidifying the company's position in gas analytics.



Natural Gas



Gas Processing



Liquefied Natural Gas (LNG)



Petrochemical



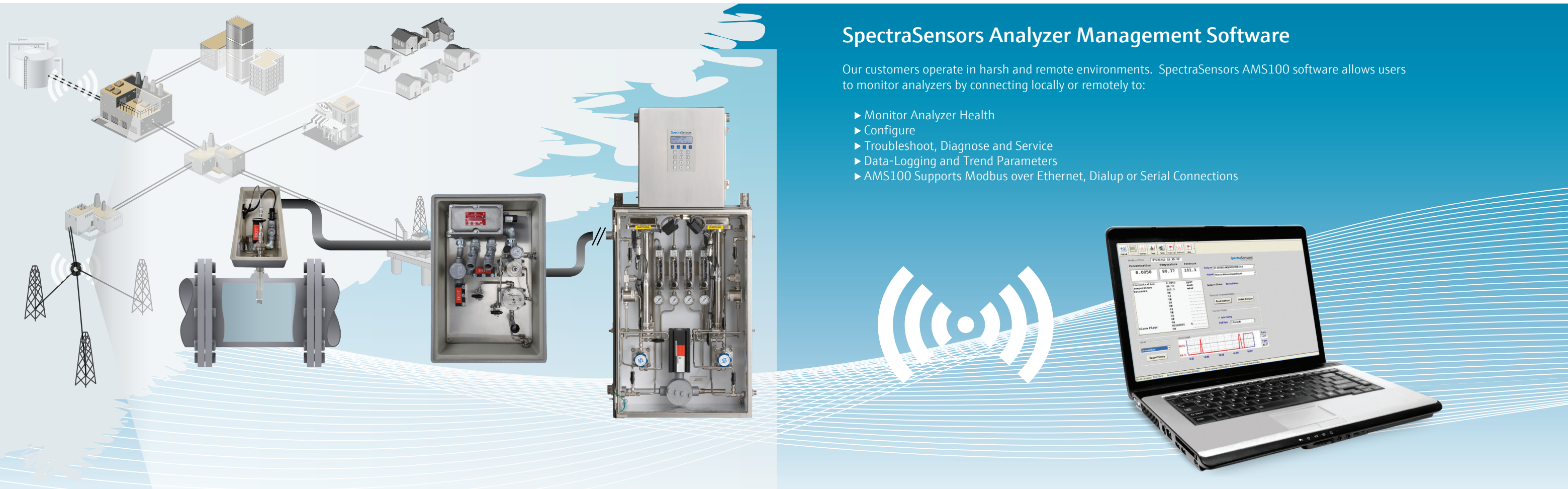
Refining



Atmospheric Testing

# Tap-to-Pixel measurement system

Sample extraction, sample conditioning, gas analyzer and software interface for natural gas quality measurements



## SpectraSensors Analyzer Management Software

Our customers operate in harsh and remote environments. SpectraSensors AMS100 software allows users to monitor analyzers by connecting locally or remotely to:

- ▶ Monitor Analyzer Health
- ▶ Configure
- ▶ Troubleshoot, Diagnose and Service
- ▶ Data-Logging and Trend Parameters
- ▶ AMS100 Supports Modbus over Ethernet, Dialup or Serial Connections



Sample Extraction and Preconditioning Products



SS2000e



SS1000 Portable



SS3000



SS2000XP



SS2100a



SS2100



SS2100i-2



OXY5500



SS2100r Rack Mount



SS2100i-1

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 analyzer into the product portfolio further solidifying Endress+Hauser's position in process gas analytics.

[www.addresses.endress.com](http://www.addresses.endress.com)

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