Distributed Fiber-Optical Sensing for Leak Detection & Third-Party Interference Monitoring

Leading the Way with Passion.
AP Sensing is the Distributed Temperature Sensing (DTS) and Distributed Acoustic Sensing (DAS) solution provider for your pipeline needs. Our products are used in a wide range of critical safety applications, such as oil & gas reservoir monitoring, special hazard fire detection and power cable monitoring.

AP Sensing was founded on the heritage of HP/Agilent technologies, the market leader in fiber-optic test & measurement for over 35 years. With thousands of installations, our Distributed Fiber-Optical Sensing (DFOS) technologies are known for their outstanding quality, reliability and performance.

With our expertise in pipeline applications, project management and well-engineered solutions, we are monitoring prestigious and challenging projects. Our capabilities go beyond fiber-optic sensing. With our management software SmartVision™, we can integrate other sensors and Leak Detection Systems (LDS) such as Mass Balance and Negative Pressure Wave LDS, providing a comprehensive view on critical infrastructure.
Pipelines are long underground structures, subject to sophisticated pipeline theft actions, malicious interference or unauthorized construction work.

It is important for modern pipeline management to ensure pipeline integrity, immediate leakage detection and risk mitigation. AP Sensing’s pipeline monitoring solution provides the capabilities to monitor the entire downstream process 24/7.

Our monitoring solutions are based on Distributed Fiber-Optical Sensing, which is rapidly becoming the detection method of choice for pipeline protection and leak detection.

With our solution, pipeline operators can convert their existing telecommunication fiber-optic cables into sensing cables or install new dedicated cables nearby to protect the pipelines.

DFOS advantages

- DAS and DTS use fiber-optic cables to monitor the entire pipeline
- Real-time and accurate data acquisition along the entire optical sensor cable
- The fiber is completely passive, immune to EMI and non-intrusive
- Long measurement range, virtually maintenance-free for decades
- DAS/DTS technologies are not influenced by the hydraulic conditions of the pipeline such as transients, slack flow or multiphase flow conditions

DFOS applications

- FOLDS – Fiber-Optic Leak Detection System for detection/location of gases, water, liquid hydrocarbons, LNG, LGP, and multiphase pipelines
- Third-party interference monitoring prevents damage or theft to the pipeline
- Pipeline rupture and ignition detection
- Temperature monitoring of pipe wall temperature for heated pipelines
- Leak detection and slug tracking of multiphase lines
- Pig tracking
AP Sensing’s pipeline solution

Our pipeline leak detection systems can be used singularly or in conjunction with internal leak detection methods. The systems reduce response time by providing fast leak alarm confirmation, accurately detecting event locations and helping to close false alarms caused by the internal leak detection system.

Thanks to the distributed measurement and the leading measurement range of AP Sensing’s pipeline solution, leaks or intrusion events are precisely detected and located along pipelines of hundreds of kilometers length.

Third-party threats to a pipeline – either accidental or intentional – are detected using distributed acoustic information and leaks are detected using a unique combination of distributed acoustic & temperature measurements.

“The SIL-2 (Safety Integrity Level) rating that AP Sensing has achieved on its DTS gives us the confidence that their solution is going to work as planned, day in and day out, in high-risk environments. Our LNG terminal operators sleep better at night knowing that our assets are protected and security standards are met.”

Dr. Stephan Grosswig, GESO
Maximum safety and protection for your pipelines

AP Sensing’s pipeline monitoring solution is based on two stand-alone technologies (DAS & DTS) that can be used together to provide redundancy and fast leak alarm confirmation.

DTS detects pipeline leaks by analyzing temperature variations on adjacent ground caused by the leak. The pipeline is divided into several zones to ensure different tunings and alarm thresholds can be applied.

DAS detects leaks by the associated noise/vibration, immediate change in temperature (DTGS) and Negative Pressure Wave (NPW). Furthermore, DAS tracks the progress of the position of pigs or scrapers in real time, showing the position of interactions with welds, liquid accumulation and other restrictions. The level of vibration due to localized restrictions can be monitored, helping to identify waxing, liquid accumulation and slug formation.

Instrument features

DTS – leak detection:
Detects pipeline leaks by analyzing temperature and precisely detecting and localizing any hot spot or cold spot.

DAS – leak detection:
Detects leaks by noise and vibrations generated by the leak
Detects change in temperature generated by the leak
Detects the Negative Pressure Wave generated by the onset of the leak

DAS – third-party intrusion:
Detects manual or mechanical digging, construction work and pipeline drilling
Detects dropped objects, anchor drop/drag, fishing trawl gear impact, and dredging works

Real-time pig tracking
Flow assurances

Finite Element Modeling Tool for Leak-Detection Simulation
Reducing response time through excellent data presentation & management

AP Sensing’s SmartVision™ management suite shows the condition of your circuits at a glance, controlled by an easy-to-use graphical interface. It seamlessly integrates many DAS, DTS, CCTV and other sensors into a single platform. Superior event visualization reduces the time needed to reach informed decisions and further reduces response times by providing accurate locations.

SmartVision™ provides a clear overview with an integrated map, asset view, waterfall diagrams, and several analysis functions. A modern client-server architecture allows installation on virtualized IT networks and offers a comprehensive range of protocols for interfacing with SCADA/DCS systems.

Our proprietary SmartAlarm™ technology offers unique methods and algorithms to detect even small leaks. SmartAlarm™ analyzes patterns providing fast and dependable event classification & alarming.

“Knowing the technology and market, it is evident to me that AP Sensing is the forerunner in distributed optical sensing. Their solutions reflect a combination of experience and creativity. Experience comes from their HP/Agilent heritage, the leader in test and measurement equipment, with decades of experience in developing and manufacturing extremely reliable and high-quality products. The creativity comes from their passion and commitment to solving real customer problems.”

David Orr, Protex Systems

SmartVision™ features
- Integrated management solution
- Asset visualization for complete plant overview 24/7
- Reporting and analysis capabilities
- Alarm management
- Central database
- Easy integration into control and management systems

SmartVision™ Asset Visualization and Analysis of a Leak
AP Sensing is your long-term partner for pipeline monitoring. We listen to your challenges and strive to provide the best distributed fiber-optic solution for your pipeline project. Our complete offering fits your pipeline monitoring demands and protects your valuable assets.

AP Sensing provides a complete turn-key package that includes: system design built around proven components; customized software function and graphics as required; project management and engineering; installation and commissioning plus through-life support.

Our international project teams consist of multi-disciplined, highly skilled and passionate engineers and field support who combine their experience and expertise to deliver on our commitments.

Why choose AP Sensing?

- Best measurement performance due to unique technologies such as code correlation and 2P squared technology
- No drift & no recalibration; low maintenance costs thanks to features like patented single-receiver design
- Large investments in innovation and product development guarantee high quality and a long product life
- Market’s most complete set of test reports and certifications
- Support for project planning, design, installation, and commissioning
- Solid project management and execution
- A worldwide network of regional partners and experts

DAS - The Fifth Generation

DTS N45-Series in Rack
Our mission is to ensure your success

Drawing on our HP/Agilent heritage in optical testing, we have established ourselves as the leading solution provider for Distributed Fiber-Optical Sensing.

We remain committed to delivering well-designed, comprehensive solutions to our customers.

We have worldwide offices with highly qualified and motivated employees and a network of expert regional partners.

At AP Sensing, we recognize that we can only be successful when our customers and partners are successful. Therefore, we take a respectful and proactive role in all our commitments.

With the industry’s most complete set of tests and certifications, AP Sensing helps you comply to relevant security standards and ensures environmental and employee safety.

Contact us for more information!

info@apsensing.com
www.apsensing.com

Product specification and descriptions in this document are subject to change without notice and are not binding to AP Sensing.
© AP Sensing GmbH, 2019 / Printed in Germany / English