LONG RANGER™

Distributed Vibration Sensor for Point Intrusion Detection

A breakthrough in pipeline safety and preventive monitoring technology

In recent times, there have been numerous pipeline disasters that have endangered lives, property, and the environment with spills and explosions.

It is more imperative than ever that companies do all they can to monitor and protect their assets as well as the surrounding community and ecosystem.

The Fibersonics LONG RANGER™ Model LR50 Distributed Vibration Sensor (DVS) System is effective in the prevention of oil spills and/or gas explosions due to its unique ability to detect, locate and classify vibrations caused by physical activity (such as third party interference), while simultaneously monitoring for early-stage leaks, along the entire length of the pipeline in real time. It is also capable of early detection and location of dynamic geological hazards, such as landslides, or excavating activity (by equipment or hand) anywhere within the vicinity of a pipeline, and in many cases prior to the excavating operation within the right-of-way.

Incorporating the LONG RANGER™ system into a pipeline's operational control center can provide automated pipeline safety monitoring. The LONG RANGER™ system can quickly and accurately detect and locate a breach on the system at any point over the entire length of a pipeline and its networks, enabling the ability to include automation feedback to the SCADA system.

Return on your investment

Based on single-mode fiber-optic cable, the LONG RANGER™ system is the most economically competitive technology currently available in the world for this application. Moreover, oil and gas companies will have an opportunity to lease the extra available fiber-optic cable capacity of the LONG RANGER™ system to cable and telecommunications companies providing local communities with cable TV, telephone and internet services.

- The world's first locating, ultrasonic-capable distributed vibration sensor (DVS)
- Monitor up to 50 km of cable on a single channel, the LONG RANGER™ system offers the longest reach of any single controller in the world
- Detects and locates in real-time within 20 meters over the entire pipeline length
- Enables true remote control of monitoring system and straightforward integration with SCADA

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Features and Benefits of the LONG RANGER™ - DVS System for Point Intrusion Detection

The LONG RANGER™ system can be employed for real-time precise detection and location of dangerous events to pipelines. The core Ranger™ technology acts as a continuous microphone designed to "monitor" over a quasi-DC to 500 kHz bandwidth, to very distinctive frequencies generated by TPI and leak events, while discriminating between normal and ambient conditions.

Furthermore, with additional channels, the LONG RANGER™ system provides reliable perimeter security for processing plants, distribution or intermediate stations and storage sites. The LONG RANGER™ system can be integrated with video camera networks and with any operational pipeline management system, such as SCADA, utilizing the LONG RANGER™ SDK.

Advantages of the LR50 LONG RANGER™ DVS System for Point Intrusion Detection

- Single-channel alarm processing unit (APU) capable of monitoring up to 50 km of cable
- Hardware based on dedicated programmable microprocessor and DSP chips
- The longest range of real-time precision monitoring capability in the world with a single APU using single fiber-optic cable up to 50 km; daisy-chaining controllers provides unlimited reach
- Permits true remote control of monitoring system and integration with SCADA
- Extreme sensitivity; can be used with protective conduit
- Flexibility in configuration and actual physical sensitivity of the cable for unlimited number of zones
- Detects events over a very wide range of frequencies (from quasi-dc to 500 kHz)
- Immune to electromagnetic or radio frequency interference (EMI/RFI)
- No energy requirement in the field
- Optical self-calibration occurs continuously; requiring almost no maintenance
- Minimal communications bandwidth required; can operate on modern TCP/IP networks of any speed
- Robust with low energy consumption – APU produces nominal heat, eliminating need for air conditioned racks

LR50 Technical Specifications

Alarm Processing Unit (APU)

- Dimensions: 5.25"x 16.5" x 22" Weight: 12kg
- Power requirements: 80 W maximum
- Number of channels: 1
- Maximum cable monitoring range: 11dB maximum optical power loss, typically covering 50km of cable
- Detection is realized within very broad frequency bandwidth from 3Hz to 500 kHz, including those of leaks and of all possible TPI events
- Hardware platform: dedicated reprogrammable FPGA and DSP chips
- Programming input: firmware upgrading via TCP/IP
- Operating temperature range of 0-50°C – no air-conditioned rack is required
- Real-time self-calibration of optical system keeps system in optimum operating condition
- Advanced processing software operates automatically, in real-time, for minimizing nuisance alarms

Fiber-Optic Cable

- Type of sensor cable: single-mode, providing up to seven different levels of actual physical sensitivity of the cable in order to optimize system performance for different ground and environmental conditions
- More sensitive than traditional cable, permitting use of protective jackets and conduits without affecting required sensitivity
- Robust design includes protection against insects and rodents
- Sensing cable length per APU: MIN 500 m, MAX 50 km
- Maximum passive lead-in length per APU: unlimited to MAX range
- Maximum number of zones: unlimited, software adjustable
- Flexible unlimited zonal configuration, permitting flexibility in sensitivity for every zone
- Smaller diameter of cable and robust protective jackets permit additional installation flexibility and convenience