

## High Performance, Reliable All-Optical Geophone for Permanent Oilfield Monitoring

Finally, a replacement is available to the traditional magnet/coil geophones that have been used by the oil industry for almost 50 years, with superior performance in every critical operating parameter.

### Featuring:

- **Wider Useable Operating Bandwidth**
- **No Sensor Electronics**
- **High Dynamic Range**
- **Lower System Cost**
- **Lower Noise Floor**
- **Higher Sensitivity**



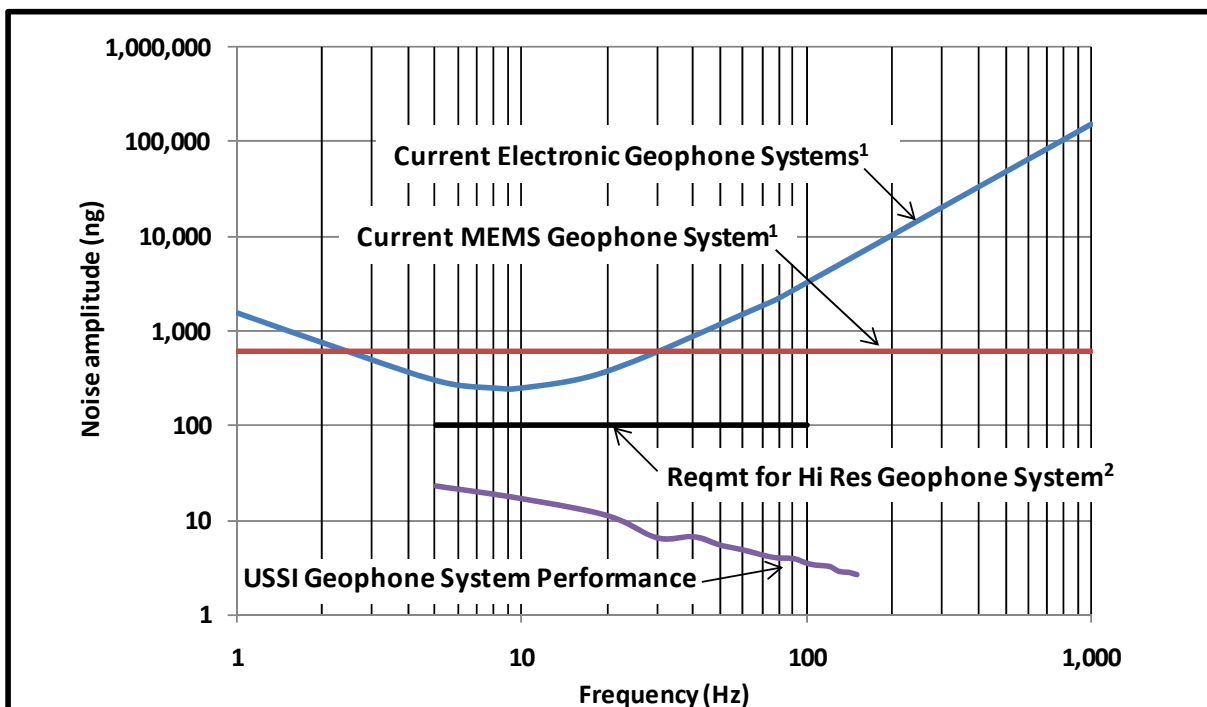
The USSI All-Optical Geophone\* is a small, ultra-reliable fiber optic geophone designed for oilfield seismic exploration and production with demonstrated performance that is superior to the magnet/coil geophones that have been used by the oil industry for almost 50 years. The all-optical, omni-directional sensor, which requires no in-situ electronics, copper conductors, or electrical power, is designed to meet the demanding permanent monitoring performance requirements needed for 4D seismic monitoring. It is specifically designed for permanent installations in the oilfield, be it downhole, buried (for surface seismic), or on the ocean bottom. The USSI system eliminates the need for electronics, electrical connectors, batteries, and heavy copper cables in the field.



**\*Patent Pending**

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**USSI System.** The USSI geophone system includes a fully self-contained optical interrogation unit with integrated laser sources, as well as the receiver electronics that demodulate the optical signals from the geophones, translating them into digital electronic signals. The optical interrogator uses an optical Time Division Multiplexing (TDM) methodology. A fiber optic telemetry cable provides the data path to and from the individual geophones. All of the system electronics reside in the optical interrogator. A single optical interrogator can address up to 128 individual geophones. Since the optical interrogation units are modular, multiple units can be mounted in an equipment rack to increase the number of sensors being monitored.



**USSI Geophone System has the Lowest Noise Floor vs. all Competing Systems**

1. **Geophone and MEMS Accelerometer Comparison at Spring Coulee, Alberta**, Canadian Society of Petroleum Geologists (CSPG), Canadian Society of Exploration Geophysicists (CSEG) and the Canadian Well Logging Society (CWLS) *Convention*, Calgary, Alberta 2009

2. **Characterization of a High Resolution Acquisition System For Marine Geophysical**

**Applications**, Instrumentation and Measurement Technology Conference, Sorrento, Italy, April 2006

The chart above shows how the performance of the USSI fiber optic geophone compares with other oilfield geophone sensor technologies and with industry requirements.

**About US Sensor Systems** - US Sensor Systems Inc. designs, integrates, manufactures, and sells fiber optic sensing systems and solutions for the energy, defense and security markets. US Sensor Systems utilizes All-Optical sensing technology for their state-of-the-art sensing systems. The optical fiber itself is the sensor and it is designed to replace the legacy electronic-based sensor systems that are more costly and less reliable. Rev. 7/09