



## *Clarion™ Optical Seismic Accelerometer*

Weatherford's *Clarion* optical accelerometer enables reliable, high-sensitivity single- or multi-component, permanent in-well seismic applications. This rugged, fit-for-purpose miniature opto-mechanical device delivers high performance for long-term deployment in hostile well environments and is suitable for vertical, deviated, or horizontal wells. The state-of-the-art optical sensors are compatible with *Clarion* seismic instrumentation and can be multiplexed to form in-well arrays without the use of downhole electronics.

### *Applications*

- High-sensitivity single- or multi-component, permanent in-well seismic applications
- Time-lapse vertical seismic profiling (VSP)
- Calibration of 4D surface seismic surveys
- Continuous seismic monitoring (microseismic monitoring, hydraulic fracture mapping, seismic while drilling, and vibration monitoring)
- Cross-well seismic profiling
- High-temperature/high-pressure (HTHP) wells
- Vertical, deviated, or horizontal wells



Three-component accelerometer package

### *Features, Advantages and Benefits*

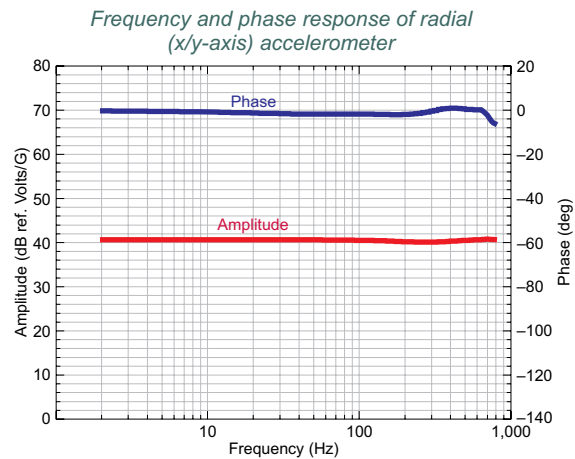
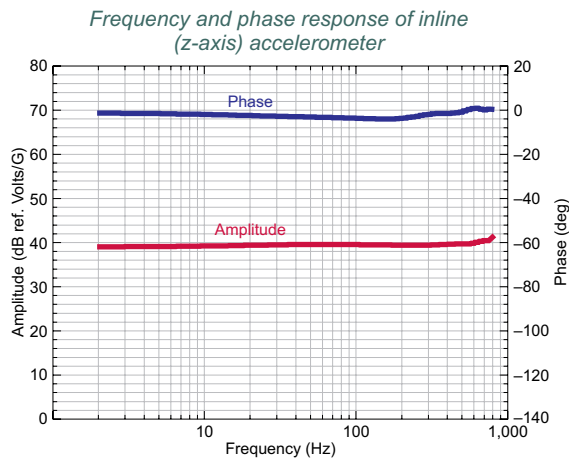
- Miniature in-axis (z) and cross-axis (x/y) sensors and slim packaging enable installation of the accelerometer in tight annular spaces. This advantage ensures long-term operation at high pressures and temperatures without constraining other completion objectives.
- As an opto-mechanical device, the accelerometer is extremely rugged and reliable, capable of withstanding the high shock and vibration environments related to transportation and installation into wellbores.
- Requiring no downhole electronics, the accelerometer can operate long term in hostile well environments, such as high temperatures and high continuous operating pressures.



# Clarion™ Optical Seismic Accelerometer

## Features, Advantages and Benefits (continued)

- Optical in-well sensors are electrically passive, eliminating the risk of interference with other electric- or magnetic-signal sources and ensuring the integrity of seismic data.
- Single-axis (1-C) or triaxial (3-C) configurations, with high in-axis sensitivity and low off-axis sensitivity, offer high vector fidelity for precise directional accuracy and wavefield discrimination.
- Omni-directional tilt is ideal for vertical, deviated, or horizontal wells.
- Large, dynamic range with flat broadband response offers excellent seismic fidelity, covering a wide range of in-well seismic applications.



## Specifications

Bandwidth	1 Hz to 800 Hz
Sensor configuration	Single-axis (1-C) or orthogonal, triaxial (3-C)
Cross-axis sensitivity	1% (-40 dB) typical
Maximum operating temperature	347°F (175°C)
Maximum operating pressure	14,500 PSI (1,000 bar)
Dimensions	
Outer diameter	0.95 in. (24.2 mm)
Length	10.55 in. (268 mm)
Vibration	15 Grms random (Navmat P9492 profile)
Shock	420G peak, 3 ms half sine