FiberVSP™ Distributed Acoustic Sensing (DAS) Interrogator System

DISTRIBUTED ACOUSTIC SENSING INTERROGATOR CRI-4400

OVERVIEW
The Halliburton FiberVSP™ DAS interrogator family reigns in the latest technology evolutions for Rayleigh-based time-domain sensing. The offering consists of a second-generation, high-performance, phase-sensitive DAS interrogator capable of covering a wide range of applications for distributed dynamic sensing. These units are highly configurable and provide for optimal interrogation performance for sensors ranging to 40 km. Operation is at the eye-safe 1550-nm band designed for compatibility with commonly available telecommunications fiber.

FiberVSP™ DAS System Offerings

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**Performance**
- Self Noise: -70 dB re 1 rad/√Hz
- Rayleigh Fading: ≤ 0.2%
- Laser Performance: Standard: 4 KHz linewidth, Phase Noise 8 uRad/√Hz @ 1m / Higher performance available

**Specifications**
- Operational / Storage Temperature / Humidity Altitude: 0°C to 45°C (32°F to 113°F) / 20°C to 70°C (-4°F to 158°F) / < 90% RH @ 30°C (no condensation) / 10,000 ft (3048 m)
- Signal Outputs (analog 100MHz): +/-1.7V into 50Ω, 4-chan (2 pair I & Q)
- Optical Frequency: Variable Dual Frequency
- Fiber Compatibility: Single Mode and Multimode fiber
- Optical Interface: Diamond E-2000PS connector
- Laser Safety: Class 1M to IEC60825-1:2014 / EX op pr
- Certification (pending): Low-voltage safety: IEC 61010-1 ed3.0 (2010-06) | EMC: IEC 61000-4-2 ed2.0 IEC EN 61000-4-3/3.2, IEC 61000-4-4 ed3.0, IEC 61000-4-6 ed4.0 | Output is inherently safe optical radiation. Or EX op pr

**Packaging**
- 3U, Rackmount, w x d x h: 482x508x133 mm (19x20x5.25 in.)

**Power (AC) / Fuse**
- 100 to 240 VAC: 50W peak, 33W Typical / Fuse: 1A/250V 5X20MM SLO-BLO

**Weight**
- 17 kg (38 lb)
Software and Communications

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REAR PANEL INTERFACES

Optical E-2000PS to sensor (1) USB Control Interface (1) Signal Out shown for DP1 (4) Two quadrature pairs I & Q

Data Markers In (2) Used for GPS time stamp or test tones Sample Trigger Out (1) DAQ trigger for data frame

Clk In/Out, Aux In/Out, Start In/Out (5) Used to synchronize to Host DAQ or other DAS interrogators Safety Interlock

PHASE-SENSITIVE DAS

The Halliburton Phase-Sensitive CRI-4400 Interrogator provides for exceptional performance, implementing a dual interferometer design, which reduces signal-fading degradation by an order of magnitude.

The plot to the right shows the self-noise histogram where the key features to observe are:

1. The data is tightly grouped.
2. The high noise populations shown (> - 50 dB) are small (< 0.2% in area), which is a key indicator for minimal fading.
3. The median value for self-noise is -69dB re 1 radian/rt-Hz equates to a 7-pico-strain-per-root Hz resolution to a sensor fiber, which represents a substantial improvement in DAS interrogation.
4. Fading is reduced to ≤ 0.2%. Also, a significant improvement over prior models.

For more information, contact your local Halliburton representative or visit us on the web at www.halliburton.com/FiberVSP

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