



Optical Distributed Sensor Interrogator (ODiSI Models A10 and A50)

The Luna ODiSI delivers fully distributed strain and temperature measurements with sub-mm spatial resolution.

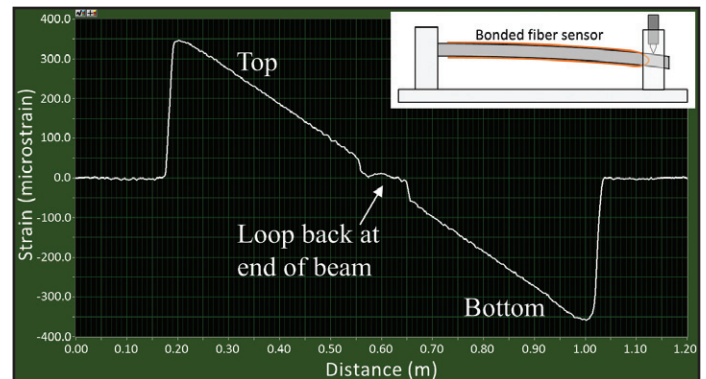
KEY FEATURES AND PERFORMANCE HIGHLIGHTS

- Inexpensive optical fiber sensors reduce material costs
 - Save time and labor by instrumenting many sensing locations using a single optical fiber
 - Interrogation of entire fiber and all sensing locations with a single scan
 - Software-controlled sensor locations and gage lengths
 - Measure temperature or strain with a single fiber
 - Industry-leading combination of measurement range and repeatability with extraordinary spatial resolution
- ▶ Measurement ranges of $\pm 15,000 \mu\text{Strain}$, -50 to $300 \text{ }^\circ\text{C}$
 - ▶ Repeatability of $\pm 2 \mu\text{Strain}$, $\pm 0.2 \text{ }^\circ\text{C}$
 - ▶ Sub-millimeter spatial resolution
 - ▶ Maximum sensing lengths of 50 meters

The Luna ODiSI saves time and cost while adding a new dimension to sensing measurements with its unprecedented spatial resolution. Utilizing swept-wavelength interferometry, the ODiSI interrogates thousands of sensing locations on a single optical fiber simultaneously. Reduce cost and acquire more data by instrumenting many sensing locations with a single, inexpensive optical fiber. With 50 meters maximum sensing length and sub-millimeter spatial resolution, the ODiSI is the paramount tool for a variety of applications.

APPLICATIONS

- Load, fatigue, and mechanical testing
- Composite manufacturing and engineering
- Embedded sensing
- Temperature profile characterization
- Structural Health Monitoring
- Model and simulation validation



Demonstration of the ODiSI recording distributed strain of an optical fiber bonded to the top and bottom surfaces of a cantilevered aluminum beam. Shown above with sensor spacing of 5 mm, each sensor with a 1-cm gage length.

www.lunatechnologies.com

3157 State Street | Blacksburg, VA 24060

+1.540.961.5190 | Fax: 1.540.961.5191

solutions@lunatechnologies.com

Support phone: +1.866.586.2682

ODiSI A-Series

PARAMETER	SPECIFICATION		UNITS
Performance			
Model	A10	A50	
Maximum Sensing Length	10	50	meters
Acquisition Rate ¹	5	2.5	Hz
Minimum Sensor Spacing	0.4		mm
Minimum Gage Length ²	1		mm
Wavelength Accuracy ^{3,4}	1.5		pm
Strain:			
Range	± 13,000	± 15,000	µStrain
Single-scan repeatability ^{1,5}	± 2		µStrain
Temperature:			
Range ⁶	-50 to 300		°C
Single-scan repeatability ^{1,5}	± 0.2		°C
Physical			
Dimensions	14 x 12.5 x 6.75	(36 x 32 x 17)	in (cm)
Weight	17.5	(8)	lb (kg)
Power Consumption	50		W

- 1 For the default measurement range of ±1,250 µStrain or ±200 °C; see Page 3 for detailed timing information
- 2 Minimum gage length is achievable using the largest measurement range, having a single-scan repeatability of ±17.0 µStrain or ±2.0 °C
- 3 Accuracy maintained by an internal NIST-traceable HCN gas cell.
- 4 Temperature and strain measurements are calculated from the spectral shift of scattered laser light. Using the default conversion coefficients of 1 GHz = 0.8 °C = 6.58 µStrain, the accuracy of temperature and strain are 0.15 °C and 1.25 µStrain. [Othonos and K Kalli, Fiber Bragg Gratings (Artech House, Boston, 1999)].
- 5 For the default gage length of 1 cm
- 6 Based on material properties of the standard sensor: polyimide-coated, low-bend-loss optical fiber. Temperature sensing up to 800 °C has been demonstrated using gold-coated optical fiber.

CLASS 1 LASER PRODUCT

ODiSI A-Series

Measurement Timing Information

Acquisition time per scan versus measurement range for recording strain and temperature with the ODiSI A10 and A50. One acquisition acquires all the data necessary to calculate strain, or temperature, anywhere along the fiber sensor.

