



DISTRIBUTED SENSING SYSTEM
(Model DSS™ 4300)

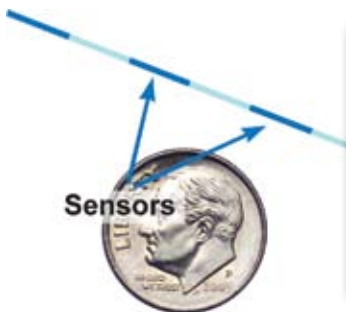
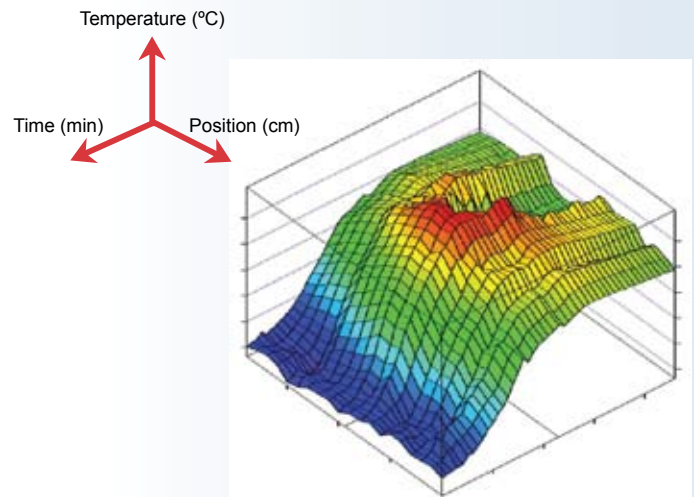
MEASUREMENT PERFORMANCE HIGHLIGHTS

- $\pm 1 \mu\text{Strain}$ resolution
- $\pm 0.1 \text{ C}$ resolution
- 1 cm spatial resolution up to 70 meters
- Measure thousands of sensors in a single fiber

APPLICATIONS

- Structural health monitoring for naval, aerospace and civil structures
- Conformal deformation and shape sensing
- Composite damage assessment
- Temperature profile characterization
- Industrial chemical process monitoring
- Condition-based maintenance

Luna Technologies' **Distributed Sensing System (DSS™) 4300** is a fiber-optic sensing tool for making distributed measurements of temperature and strain. The DSS™ uses swept-wavelength interferometry to simultaneously interrogate thousands of sensors on a single fiber. These sensors consist of discrete Fiber Bragg Grating (FBG) point sensors which can each reflect the same nominal wavelength. As such, the sensors can be fabricated on the draw tower, eliminating the need for individual grating fabrication.



Luna's revolutionary Fiber Bragg Grating (FBG) manufacturing process allows users a first-of-its-kind benefit of measuring with cost effective sensors.

The Luna DSS™ 4300 provides highly distributed fiber sensing for temperature and strain while maintaining the strength and structural integrity of the fiber.

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DISTRIBUTED SENSING SYSTEM (Model DSS™ 4300)

PARAMETER	SPECIFICATION	UNITS
Maximum Sensing Length:	70	meters
Sensor Spatial Resolution¹:	1.0	cm
Strain:		
Resolution ² :	± 1	µStrain
Range ³ :	± 7,000 ⁴	µStrain
Temperature:		
Resolution ⁴ :	± 0.1	C
Range ⁵ :	-50 to 300	C
Wavelength range⁶:	1525 - 1605	nm
Wavelength:		
Resolution	0.02	pm
Accuracy ⁷ :	± 1.5	pm
Measurement Rate⁸:	0.3	Hz

- 1 Typical parameter for sensing fiber fabrication
- 2 Temperature and strain accuracies are calculated from spectral shift of FBGs using $1 \text{ GHz} \approx 0.8 \text{ C} \approx 7 \text{ } \mu\text{strain}$ [see A. Othonos and K. Kalli, Fiber Bragg Gratings (Actech House, Boston, 1999)].
- 3 Based on available wavelength scan range and calibration coefficients for SMF-28 type fiber
- 4 With FBG wavelength in center of laser range
- 5 Based on material properties of polyamide-coated SMF-28 type fiber.
- 6 Range is nominal.
- 7 Accuracy maintained by an internal NIST-traceable HCN gas cell
- 8 For 1.25 nm scan range