



OPTICAL BACKSCATTER REFLECTOMETER™ (Model OBR 4600)

KEY FEATURES AND PRODUCT HIGHLIGHTS

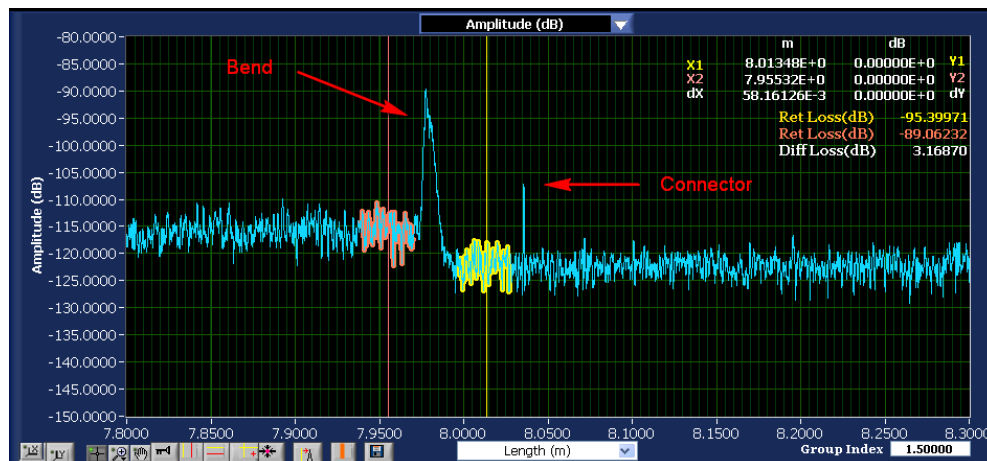
- Easily locate, identify and troubleshoot macro-bends, splices, connectors and breaks
- Locate Insertion Loss points at every point in the network or assembly – eliminate cut-back
- Look inside components to evaluate each interface for RL and IL
- Measure 30 m with 10 μm resolution in less than 7 seconds
- Continuously measure a 1 m segment at up to 3 Hz
- Test and troubleshoot short-run networks (<2 km)
- Automate pass/fail verification of fiber assemblies
- Monitor distributed temperature and strain profiles along network or inside a component or module

The **OBR 4600** is the latest model of Luna Technologies' award winning Optical Backscatter Reflectometer™ product line. Designed for component and short-run network testing and troubleshooting, the OBR 4600 enables ultra-high resolution reflectometry with backscatter-level sensitivity. With spatial resolution as fine as 10 microns, zero dead-zone, options for integrated temperature and strain sensing and extended device length mode, the OBR 4600 offers the ultimate in fiber diagnostics.

MEASUREMENT PERFORMANCE HIGHLIGHTS

- -130 dB sensitivity
- 70 dB dynamic range
- 2 kilometer length range with no dead-zone
- Micrometer resolution up to 70 meters
- < 0.05 dB insertion loss resolution

The OBR 4600 offers unbeatable testing and troubleshooting capabilities now at unprecedented measurement speeds.



OBR 4600

PARAMETER		SPECIFICATION		UNITS
Maximum Device Length:				
Standard Mode		30 or 70		meters
Long Range Mode ¹⁰		2000		meters
Spatial Resolution (two-point)¹:				
		10 µm over 30 meters		
		20 µm over 70 meters		
		1 mm over 2 km		
Dead Zone:				
		Equals 2-pt spatial resolution		
Wavelength Range²:				
		1265-1335 or 1525-1610		nm
Wavelength:				
Resolution (max)		0.02		pm
Accuracy ³		±1.5		pm
Integrated Return Loss Characteristics:				
Dynamic range ⁴		70		dB
Total range		0 to -125		dB
Sensitivity		-130		dB
Resolution		±0.05		dB
Accuracy		±0.10		dB
Integrated Insertion Loss Characteristics:				
Dynamic range ⁵		18		dB
Resolution		±0.05		dB
Accuracy		±0.10		dB
Group Delay:				
Accuracy		1.0		ps
Distributed Sensing^{6,10,11}:				
Spatial Resolution		±1.0		cm
Temperature Resolution		±0.1		C
Temperature Accuracy ⁷		±0.2		C
Strain Accuracy ⁷		±1.0		µstrain
Measurement Timing⁸		Standard	Fast⁹	Spot Scan⁹
5 nm scan time		3	1.6	0.3
Time vs. wavelength range		2.1 s+0.14 s/nm	1.3 s+0.06 s/nm	0.15 s+0.02 s /nm
Long Range (2 km) Scan Time		20		s

Specifications are for single-mode operation.

For multimode operation, specifications are nominal.

1 Over entire length range.

2 Ranges are nominal.

3 Accuracy maintained by an internal NIST-traceable HCN gas cell.

4 For the 2000 m option, return loss dynamic range is 60 dB.

5 The insertion loss dynamic range is the one-way loss that can be suffered before the scatter level of standard SMF (~ -100 dB/mm) is lower than the noise floor (~ -118 dB/mm).

6 Distributed sensing uses Rayleigh spectral shift method and is relative to reference scan.

7 Temperature and strain accuracies are calculated from spectral shift of Rayleigh scatter using 1 GHz = 0.8 C. [Othonos and K. Kalli, Fiber Bragg Gratings (Artech House, Boston, 1999)]. Spatial resolutions listed are ideal to get the Temperature and Strain Accuracies listed; they are not minimums or maximums.

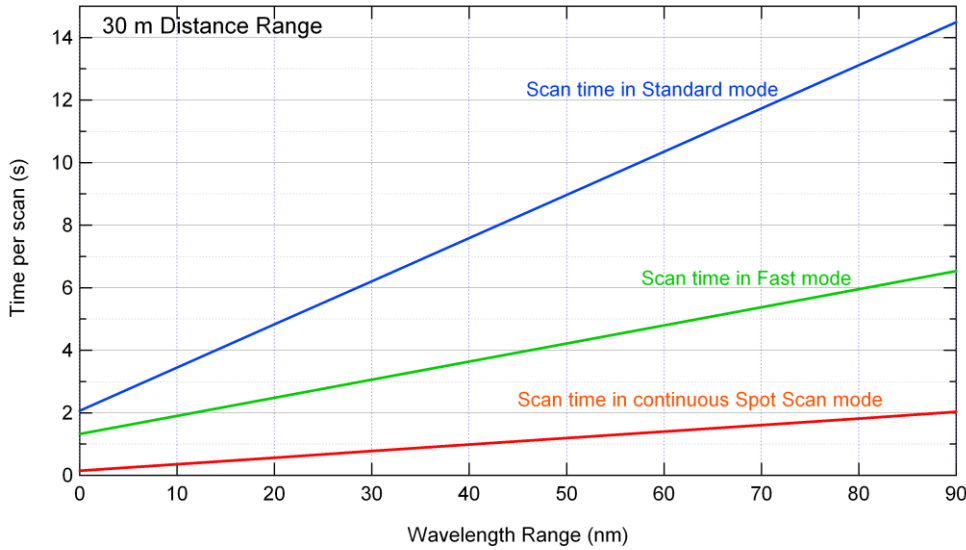
8 Combined scan and analysis time in high-resolution mode. Times are for 30 m scan mode.

9 Times are with laser tuning speed set at 100 nm/s.

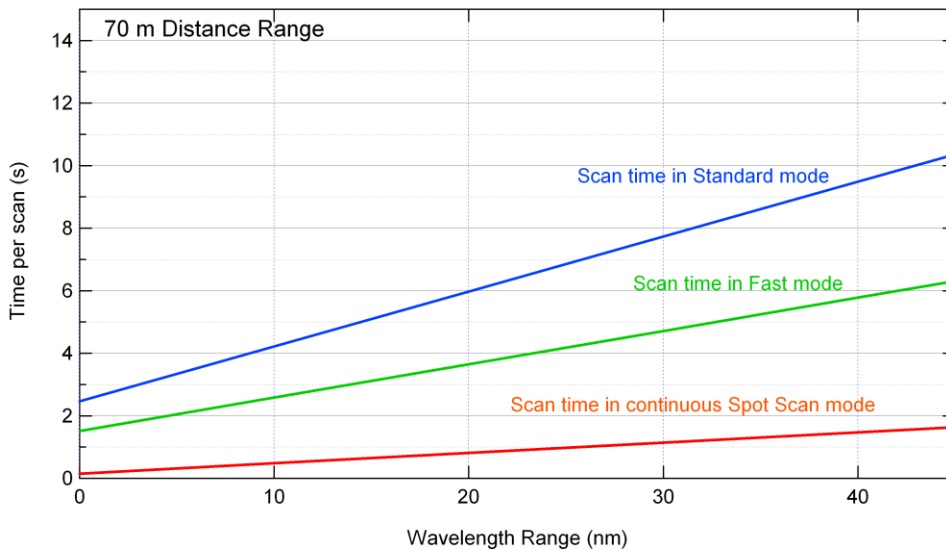
10 Extended range mode and distributed sensing are upgrade options.

11 Maximum sensing length is 70m.

Measurement Timing Information



Time per scan vs. scan wavelength range for 30 m scans in standard operating, fast scanning and continuous spot scanning modes.



Time per scan vs. scan wavelength range for 70 m scans in standard operating, fast scanning and continuous spot scanning modes.

Wavelength Range (nm)	Spot Scan Rate (Hz) 30 m mode	Spot Scan Rate (Hz) 70 m mode
5	3.7	2.9
10	2.7	2.0
20	1.8	1.2
40	0.9	0.6
80	0.5	-

Scan repetition rates at various scan wavelength ranges for continuous spot scanning in 30 m and 70 m modes of operation. Rates are for laser tuning speed set to 100 nm/s.