

# LWA 7000 Series

## Lightwave Component Analyzer

The LWA 7601-C Lightwave Component Analyzer is a fast and simple-to-use tool for testing passive optical components and modules. The LWA 7601-C measures and analyzes the Insertion Loss (IL) and Return Loss (RL) distribution, as well as length, scanning optical components in either reflection or transmission mode.

The LWA 7601-C instrument utilizes optical frequency domain reflectometry (OFDR) technology to measure backscattered or transmitted light as a function of distance/time (or wavelength). The extremely high sensitivity and sampling resolution (20  $\mu\text{m}$ ) make an ideal analyzer for photonic integrated circuits (PICs) and silicon photonics. When combined with the extended measurement range, up to 500 m measurement range is achieved, making the testing of fiber networks an easy task. The LWA 7601-C reduces the cost and complexity of test while increasing throughput by measuring RL, IL and length in reflection or transmission with a single instrument.

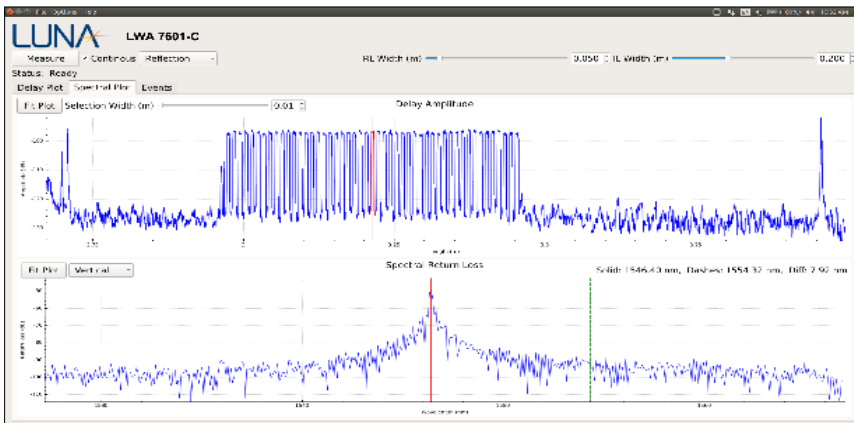
Model	Length measurement Modes (in Reflection)
LWA 7601-C	20 m, 50 m, 100 m Optional: 200 m, 500 m

### KEY FEATURES

- Return loss (RL) and insertion loss (IL) analysis
- Analyze components in reflection and transmission
- Trace distributed RL over length of optical path
- Spectral analysis of RL and IL
- Detect and precisely locate reflective events and measure path length (up to 500 m)
- Speed, resolution and accuracy for optimizing production test
- 20 $\mu\text{m}$  sampling resolution
- 12 Hz scan/acquisition rate
- Optional 19-inch rack-mount version

### APPLICATIONS

- Spatial RL testing
- Automated IL test and analysis
- Skew measurement with sub-picosecond resolution
- PIC waveguide devices, PLCs, AWGs, ROADMs, etc.
- Optical fiber networks, cable and subassemblies



Measuring in reflection mode, the Luna 6415 measures return loss versus length. The bottom plot shows the spectral content of the identified reflection event (filter).

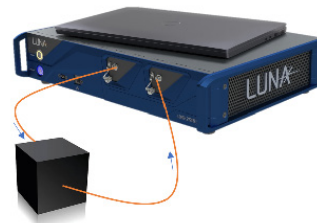
High-Speed and High-Resolution  
OFDR Measurements for  
Manufacturing Test

## Reflection Measurements



- Reflectivity, RL versus length
- Event loss measurement (RL, IL)
- RL spectral amplitude analysis
- Event length measurement

## Transmission Measurements



- Total Insertion Loss (IL)
- Spectral amplitude response
- Total path length

## PERFORMANCE

PARAMETER		SPECIFICATION		UNITS
Measurement				
		LWA 7601-C	LWA 7601-C <sup>2</sup>	
Maximum Measurement length	Reflection	100	500	m
	Transmission	200	1000	m
Sampling resolution (two-point) <sup>1</sup>		20	80	μm
Wavelength accuracy <sup>3</sup>		± 6		pm
Time-of-flight delay accuracy <sup>3</sup>		± 0.01		%
Center wavelength		1546.69		nm
Wavelength scan range		± 20	± 5	
Measurement time (in continuous mode)		0.08 (20m) 0.4 (100 m)	0.5	s
Maximum optical power		5		mW
Return Loss Characteristics (Reflection Mode)				
RL dynamic range <sup>4</sup>		70		dB
Total range <sup>5</sup>		0 to -130		dB
Sensitivity <sup>5</sup>		-135		dB
Resolution <sup>6</sup>		± 0.1		dB
Accuracy <sup>6</sup>		± 0.5		dB
Insertion Loss Characteristics (Reflection/Transmission)				
IL dynamic range, in transmission mode		70		dB
IL dynamic range, in reflection mode <sup>7</sup>		15		dB
Resolution <sup>8</sup>		± 0.1		dB
Accuracy <sup>8</sup>		± 0.2		dB
Physical				
Remote Interface		SCPI API over TCP/IP		–
Optical connector type		FC/APC		–
Dimensions		35 (L) x 47 (W) x 10 (H)		cm
Weight (controller not included)		15 (7)		lb (kg)

## ORDERING

Product #	Description	Includes
LWA 7601-C	Lightwave Component Analyzer	Instrument mainframe for C band with measurement length modes of up to 100 m in reflection mode (200 m in transmission), instrument controller (workstation-class laptop), application software and accessory kit.
LWA 7601-C-RM	Lightwave Component Analyzer Rack-mountable Mainframe	Instrument mainframe for C band with measurement length modes of up to 100 m in reflection mode (200 m in transmission), instrument controller (rack-mountable), application software and accessory kit.
OPT07650	Extended range option	Extends measurement length of the LWA 7601-C to 500 m (in reflection).

## NOTES

1. Distance between two sample points along the length axis in SMF-28.
2. With extended range option OPT07650.
3. Accuracy guaranteed via internal NIST-traceable HCN gas cell.
4. Range between strongest reflection greater than -60 dB and noise floor.
5. Noise floor return loss at half of maximum length.
6. Measured with 1 cm integration width.
7. Two way loss before backscatter reaches noise floor and IL measurements are no longer possible.
8. With 10 cm integration width for 20 m mode, and 40 cm for 500 m mode.



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+1.866.586.2682  
solutions@lunainc.com  
www.lunainc.com

\*Specifications subject to change without notice.