

# 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.

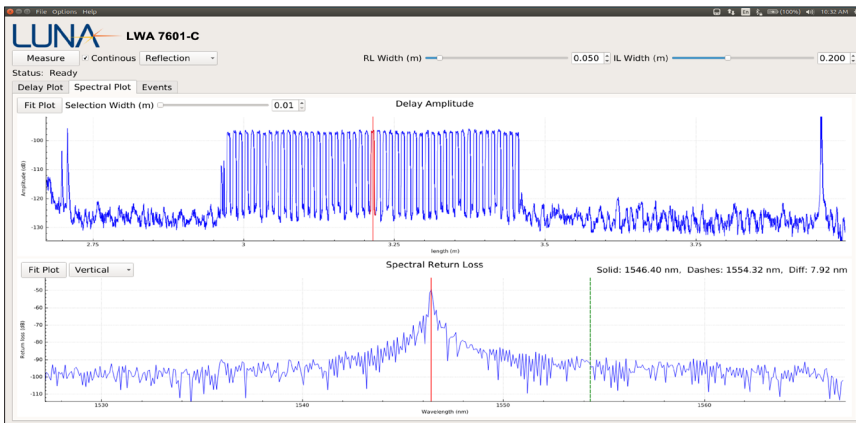
Model	Length measurement Modes (in Reflection)
LWA 7601-C	20 m, 50 m, 100 m Optional: 200 m, 500 m

### 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
- 12.5 Hz scan/acquisition rate (in 20 m mode)

### APPLICATIONS

- Spatial RL testing
- Automated IL test and analysis
- Skew measurement with sub-picosecond resolution
- PLCs, waveguide devices, AWGs, ROADMs, etc.
- Filters, couplers, switches, beam splitters, FBGs, specialty fibers



Measuring in reflection mode, the LWA 7601-C 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**



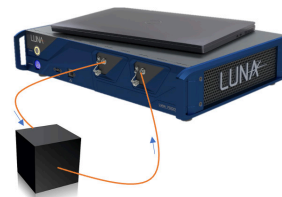
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## Reflection Measurements



- 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
<b>Measurement</b>				
		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>		± 2		pm
Time-of-flight delay accuracy <sup>3</sup>		± 0.001	± 0.005	%
Center wavelength		1546.69		nm
Frequency Scan Range (Wavelength)		± 2500 (~ ± 20 nm)	± 625 (~ ± 5 nm)	GHz
Measurement time (in continuous mode)		~0.08 (20m) ~0.4 (100 m)	~0.5	s
Maximum optical power		5		mW
<b>Return Loss Characteristics (Reflection Mode)</b>				
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
<b>Insertion Loss Characteristics (Reflection/Transmission)</b>				
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
<b>Physical</b>				
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.
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. +/- 0.001% is guaranteed over 200 m measurement range (in reflection mode)
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.

LWA7601C REV.5 11.06.23

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