



LUMILOOP

LASER-POWERED SENSOR SYSTEMS



Datasheet

— LSPM 1.1 — | — LSPM 2.1 —
9 kHz - 6 GHz | 9 kHz - 26.5 GHz

LASER-POWERED
High-Speed RF Power Meters

LSPM 1.1/2.1 Triple High-Speed Power Meters are laser-powered, three channel, high speed, high accuracy and high dynamic range RF Power Meters. Single and dual channel versions are available as well. Their frequency range is 9 kHz to 6 GHz for LSPM 1.1 and 9 kHz to 26.5 GHz for LSPM 2.1. Operation at higher frequencies is supported with reduced performance.

LSPM 1.1/2.1 are galvanically isolated. The sensor heads are extremely robust and can withstand more than 1000 V/m. Measuring forward and reverse RF Power at a directional coupler inside EMC test chambers has never been easier! Fiber cable lengths of up to 1000 m allow for remote operation without worrying about ground loops.



LSPM 1.1/2.1 front view

Compensation of linearity, frequency and power sensor temperature guarantee accurate measurements. A dynamic range of 80 dB for LSPM 1.1 and 63 dB for LSPM 2.1 is achieved for many frequencies.

The LSPM Triple High-Speed Power Meters' high sampling rate allows for high resolution time-domain signal analysis. The Power Meters can be synchronized with signal generators in order to realize high resolution pulse analysis. All LSPMs can be synchronized with additional LSPM 1.0/1.1/2.0/2.1 Power Meters as well as LSProbe E-Field Probes.



LSPM 1.1/2.1 with CI-250+

LSPM 1.1/2.1 Laser-Powered RF Power Meters can also be combined with CI-250+ Computer Interfaces, which are equipped with a 4.3" Touchscreen and Ethernet Interface.

The CI-250+ displays RF power, field strength, laser status and more at a glance. Setup is a child's play. Third party EMC software integration is quick and easy - just enter the IP address, turn on the laser, and start your measurement.

A CI-250+ can enhance other LUMILOOP devices. It can control other LSPM Power Meters as well as LSProbe E-Field Probes via USB. All devices can be accessed using the same touchscreen and Ethernet connection.



LSPM 1.1/2.1 rear view

The LSPM 1.1/2.1 Power Meters support Multi-Device Systems. Multiple LSPMs can be combined to obtain additional channels.

Combining LSPM 1.1/2.1 Power Meters with LUMILOOP's LSProbe E-Field Probes can accelerate standard EMC measurements such as IEC 61000-4-3 and 61000-4-21 by a factor of more than 100 over traditional setups.

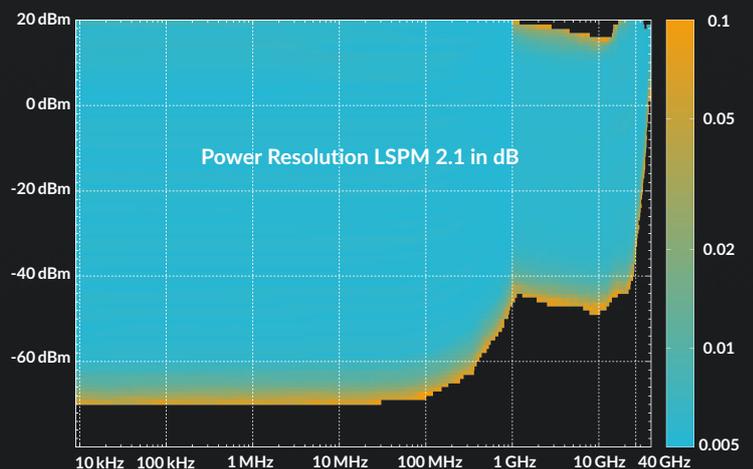
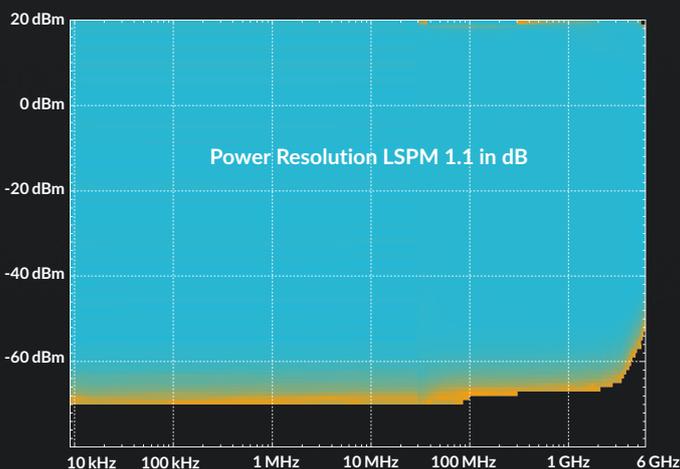
The LSPM 1.1/2.1 allows for galvanically isolated RF power measurements, automated test setups, ISO 11452-4 BCI tests, ISO 11452-9 portable transmitter tests. LSPM 2.1 is particularly is very well suited for ETSI EN 300 328 wide band transmission systems and ETSI EN 301 893 broad band radio measurements.

Specifications	LSPM 1.1	LSPM 2.1
Frequency Range		
Low Band	9 kHz ... 400 MHz	9 kHz ... 1GHz
High Band	30 MHz ... 6 GHz	700 MHz ... 26.5 GHz
Analog Rise Time & Video Bandwidth		
Low Band, low VBW	2.0 ms (VBW 210 Hz)	2.0 ms (VBW 210 Hz)
Low Band, high VBW	1 μ s (VBW 500 kHz)	1 μ s (VBW 500 kHz)
High Band	190 ns (VBW 2.0 MHz)	22 ns (VBW 40 MHz)
VSWR	<1.20:1	<1.22:1
Sampling Rate & Minimum Pulse Width		
Burst Mode	2 MSamples/s, 500 ns	2 MSamples/s, 500 ns
Continuous Mode	1 MSamples/s, 1 μ s	1 MSamples/s, 1 μ s
Single Channel Continuous Mode	2 MSamples/s, 500 ns	2 MSamples/s, 500 ns
Measurement Range & Dynamic Range		
Low Band	<-60 dBm ... >20 dBm up to 400 MHz	<-65 dBm ... >20 dBm up to 200 MHz <-45 dBm ... >20 dBm up to 1 GHz
High Band	<-65 dBm ... >20 dBm 0.03 ... 3 GHz <-50 dBm ... >20 dBm 3 ... 6 GHz	<-42 dBm ... >15 dBm 0.7 ... 20 GHz <-35 dBm ... >15 dBm 20 ... 26.5 GHz
Amplitude Accuracy*	0.15 dB	0.15 dB
Linearity Error	0.15 dB	<0.2 dB
Temperature Stability	<0.2 dB	<0.2 dB
Power Resolution	<0.1 dB (see plot below)	<0.1 dB (see plot below)
Channel Isolation	>56 dB up to 6 GHz	>50 dB up to 26.5 GHz
Damage Level	>30 dBm	>25 dBm
RF Connectors	2.92 mm	2.92 mm
Application Software	LUMILOOP TCP Server + GUI, Callimport	LUMILOOP TCP Server + GUI, Callimport
Standard Fiber Optic Cables	0.2 m fixed + 15 m ST/FC extension	0.2 m fixed + 15 m ST/FC extension
Max. Fiber Optic Cable Length	1000 m	1000 m

*) At 0 dBm, CW, accredited Calibration at esz AG calibration & metrology.

Computer Interface CI-250

PC Interface	USB 2.0
Trigger Voltage	5 V
Trigger Connector	BNC
Input Voltage	5 V \pm 5 %
Input Current	<3 A
Ambient Temperature	10 ... 40 °C
Dimensions (W x D x H)	77 x 117 x 27 mm ³
Certifications	CE



LSPM Documentation and Application Notes (AN)

- LSPM 1.0/1.1/2.0/2.1 User's Manual
- AN 04: Reliable Operation - Fiber Connector Cleaning Advice

LSPM Laser-Powered Power Meter Accessories

Fiber Connector Cleaning Kit



- optical fiber microscope
- lint-free cassette cleaner wipes
- unfilled isopropyl alcohol (IPA) pipette/bottle
- spare FC/ST dust caps and two E2000 locking caps

E2000 Sacrificial Cable Kit



- prevents contamination of connectors
- quick and simple replacement in case of connector burn-in
- includes two 0.5 m E2000 to ST/FC cables
- includes E2000 and ST/FC couplers

Optic Fiber Cable Extension



- fiber optic cable with ST/FC connectors
- includes ST/FC coupler
- arbitrary length of cable available on request



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