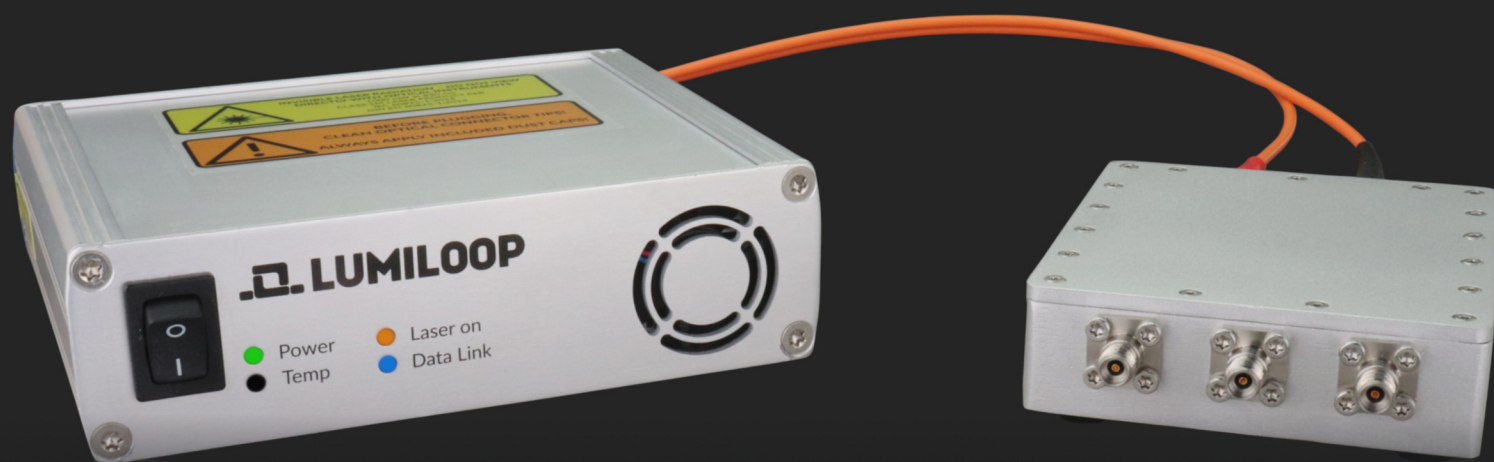




LASER-POWERED SENSOR SYSTEMS



Datasheet

—— LSPM 1.1 | LSPM 2.1 ——

9 kHz – 8.2 GHz | 9 kHz – 26.5 GHz

**LASER-POWERED**  
**RF Power Meters**



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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 8.2 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 electrical field strengths of 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 65 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+ Front Side View

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.

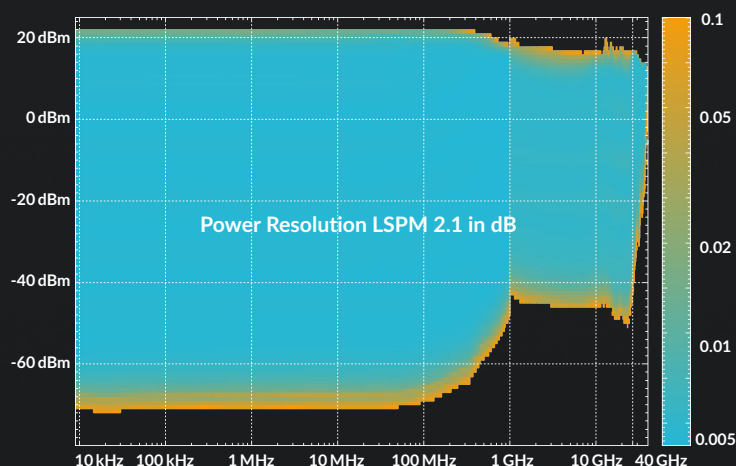
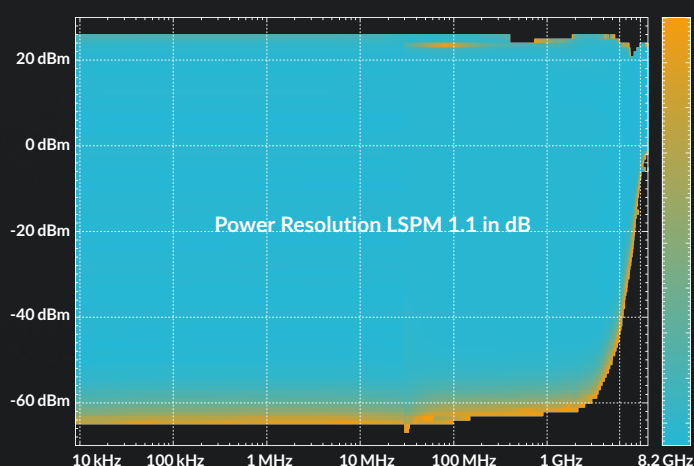
The LSPM 1.1/2.1 allows for galvanically isolated RF power measurements, automated test setups, ISO 11452-4 BCI tests, ISO 11452-9 portable transmitter tests. LSPM 2.1 is particularly well suited for ETSI EN 300 328 wide band transmission systems and ETSI EN 301 893 broad band radio measurements.

LUMILOOP offers an all-round carefree service of accredited calibration according to ISO 17025. This includes checking your measuring equipment and handling the accredited calibration for you.



| Specifications                                      | LSPM 1.1                                                                                                      | LSPM 2.1                                                               |
|-----------------------------------------------------|---------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|
| Frequency Range                                     |                                                                                                               |                                                                        |
| Low Band                                            | 9 kHz ... 400 MHz                                                                                             | 9 kHz ... 1GHz                                                         |
| High Band                                           | 30 MHz ... 8.2 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 $\mu$ s (VBW 500 kHz)                                                                                       | 1 $\mu$ 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                 |                                                                                                               |                                                                        |
| Low Band Modes                                      | 500 kSamples/s, 2 $\mu$ s                                                                                     | 500 kSamples/s, 2 $\mu$ s                                              |
| High Band Continuous Modes                          | 1 MSamples/s, 1 $\mu$ s                                                                                       | 1 MSamples/s, 1 $\mu$ s                                                |
| High Band Burst and Single Channel Continuous Modes | 2 MSamples/s, 500 ns                                                                                          | 2 MSamples/s, 500 ns                                                   |
| Measurement Range & Dynamic Range                   |                                                                                                               |                                                                        |
| Low Band                                            | <-55 dBm ... >24 dBm up to 400 MHz                                                                            | <-65 dBm ... >20 dBm up to 200 MHz<br><-45 dBm ... >20 dBm up to 1 GHz |
| High Band                                           | <-60 dBm ... >23 dBm 0.03 ... 3 GHz<br><-44 dBm ... >23 dBm 3 ... 6 GHz<br><-23 dBm ... >20 dBm 6 ... 8.2 GHz | <-40 dBm ... >15 dBm 0.7 ... 26.5 GHz                                  |
| Amplitude Accuracy*                                 | 0.04 ... 0.07 dB                                                                                              | 0.08 ... 0.20 dB                                                       |
| Linearity Error                                     | 0.15 dB                                                                                                       | <0.2 dB                                                                |
| Temperature Stability                               | <0.2 dB                                                                                                       | <0.2 dB                                                                |
| Power Resolution                                    | <0.1 dB<br>(see plot below)                                                                                   | <0.1 dB<br>(see plot below)                                            |
| Channel Isolation                                   | >48 dB up to 6 GHz                                                                                            | >50 dB up to 26.5 GHz                                                  |
| Damage Level                                        | >33 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 FC/ST extension                                                                            | 0.2 m fixed + 15 m FC/ST extension                                     |
| Max. Fiber Optic Cable Length                       | 1000 m                                                                                                        | 1000 m                                                                 |
| Ambient Temperature                                 | 10 ... 40 °C                                                                                                  | 10 ... 40 °C                                                           |
| Dimensions (W x D x H)                              | 77 x 122 x 26 mm <sup>3</sup>                                                                                 | 77 x 122 x 26 mm <sup>3</sup>                                          |

\*) At 0 dBm, CW, depending on calibration laboratory and frequency.



## Computer Interface

|                                      | CI-250                                       | CI-250 <sup>+</sup>                          |
|--------------------------------------|----------------------------------------------|----------------------------------------------|
| PC Interface                         | USB 2.0                                      | Gigabit Ethernet                             |
| Application Software                 | LUMILOOP TCP Server, LUMILOOP GUI            | LUMILOOP TCP Server, LUMILOOP GUI            |
| Trigger Voltage                      | 5 V                                          | 5 V                                          |
| Trigger Connector                    | BNC                                          | BNC                                          |
| Laser Wavelength                     | 830 nm                                       | 830 nm                                       |
| Laser, Max. Output Power             | 1,000 mW                                     | 1,000 mW                                     |
| Laser Class                          | 1M                                           | 1M                                           |
| Laser Shutdown Time                  | 6 ms                                         | 6 ms                                         |
| Fiber Optic Connectors               | FC/ST                                        | FC/ST                                        |
| Number of Fiber Optic Couplers       | >6                                           | >6                                           |
| Input Voltage                        | 5 V $\pm$ 5 %                                | 85-305 V, 50/60 Hz                           |
| Input Current                        | <3 A                                         |                                              |
| Output Voltage                       |                                              | 5 V DC ( max. 3 A)                           |
| Output Current                       |                                              | <3 V                                         |
| Ambient Temperature                  | 10 °C ... 40 °C                              | 10 °C ... 40 °C                              |
| Dimensions (W $\times$ D $\times$ H) | 135 $\times$ 120 $\times$ 38 mm <sup>3</sup> | 200 $\times$ 88 $\times$ 150 mm <sup>3</sup> |
| Certifications                       | CE, IEC 60825-1:2014                         | CE, IEC 60825-1:2014                         |

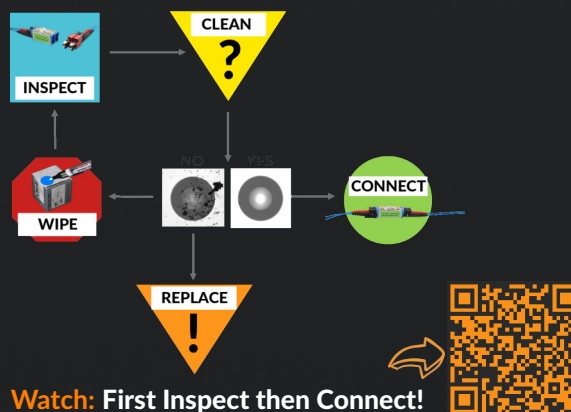


Computer Interface CI-250 Rear Side View



Computer Interface CI-250<sup>+</sup> Rear Side View

### First INSPECT then CONNECT



## 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

# LUMILOOP

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Made in Germany



Register your LUMILOOP device and get a free one year warranty extension!

[lumiloop.de/support/register](http://lumiloop.de/support/register)



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