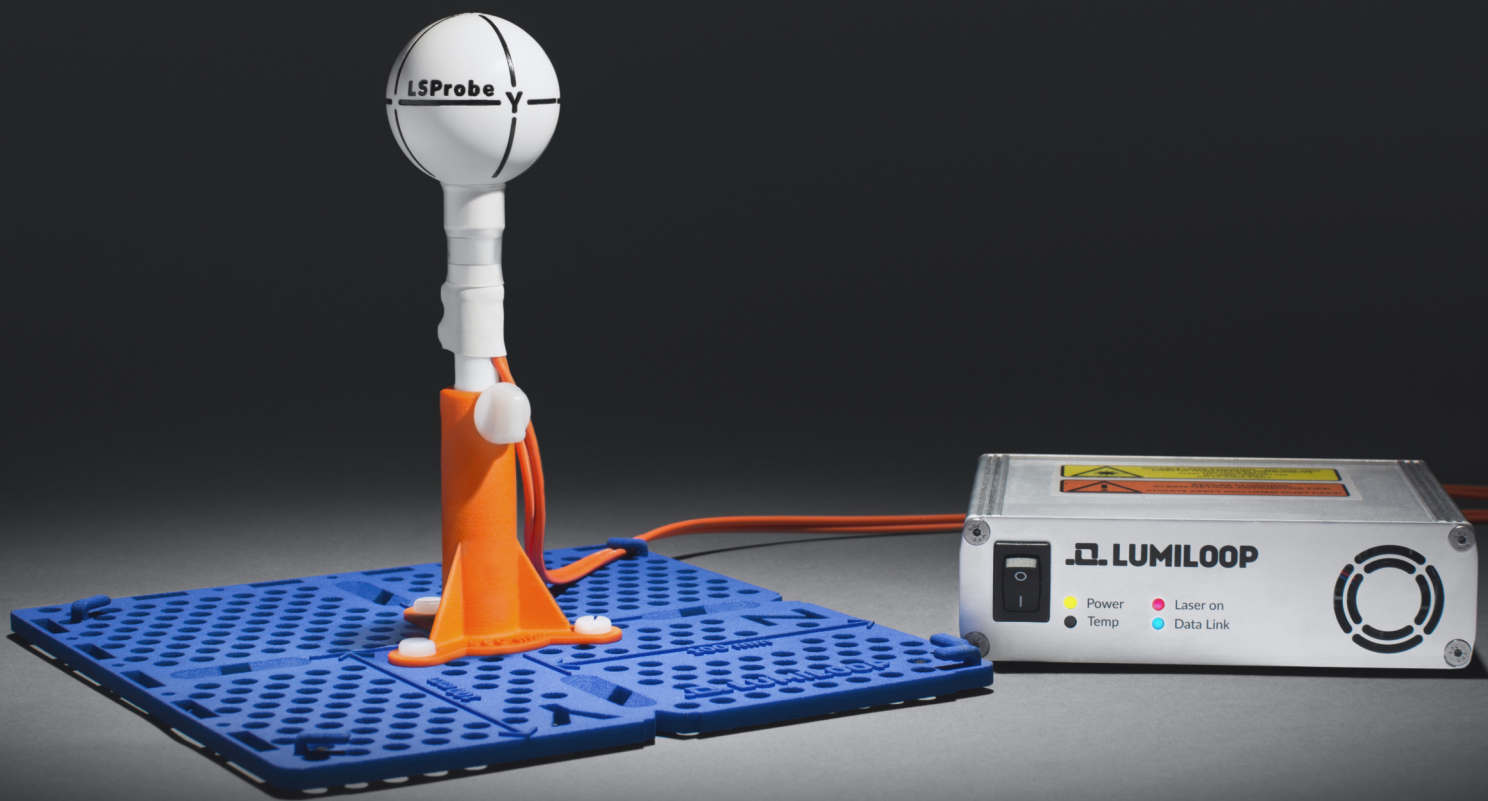


LUMILOOP

LASER-POWERED SENSOR SYSTEMS

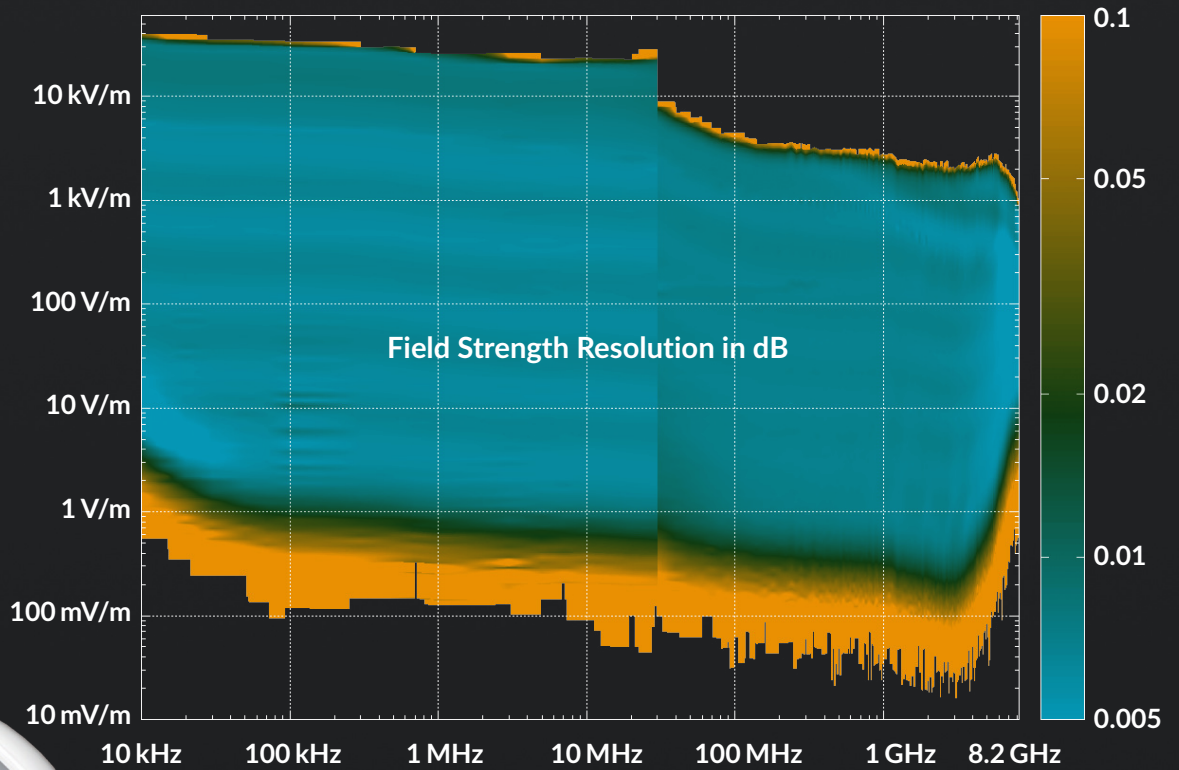


Datasheet

————— LSProbe 1.2 —————

**Electric-Field Probe
(10Hz) 10kHz - 8.2(12)GHz**

The LSProbe 1.2 Field Probe is a high speed, high accuracy and high dynamic range electric-field probe. Its standard frequency range of 10 kHz – 8.2 GHz can be extended to 10 Hz – 12 GHz. Best-in-class compensation of linearity, frequency and temperature guarantees accurate measurements from less than 0.1 to at least 1,000 V/m. A dynamic range of 100 dB is achieved for many frequencies, enabling field measurements at more than 10,000 V/m. Customized high field-strength "X"-variants, supporting up to 30,000 V/m and a damage level of 100,000 V/m, are available upon request. Please contact LUMILOOP support for detailed information.



A single axis, continuously sampling mode, operating at 2 MS/s, can be used for Equivalent Isotropically Radiated Power (EIRP) measurements of IoT products without antenna connectors in accordance with EN 300 328 and EN 301 893.

Laser-powered operation eliminates battery recharging and replacement. Extensive in-house calibration data are provided with each field probe and is handled automatically by the LSProbe Software (TCP Server and GUI). Third-party EMC-software support for R&S EMC32, R&S ELEKTRA, Emcware, BAT-EMC, Tepto, Tile, Win6000, Compliance5 and Radimation.

LSProbe 1.2 Variants

Variant	Low Band Frequency Ranges		High Band Frequency Ranges	
	10 Hz - 10 kHz	10 kHz - 200 MHz	30 MHz - 8.2 GHz	8.2 GHz - 12 GHz
A ... D	Legacy variants incl. LO, HI, HI+LO with in-house calibration up to 6 GHz.			
E	—	✓	✓	—
F	✓	✓	✓	—
G	—	✓	15 kV/m ✓	—
X	✓	✓	✓	✓

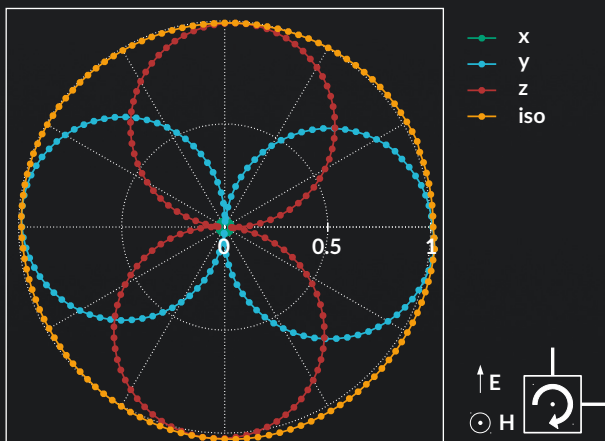
Customized for high frequency and electric-field strengths, e.g., 30 kV/m.



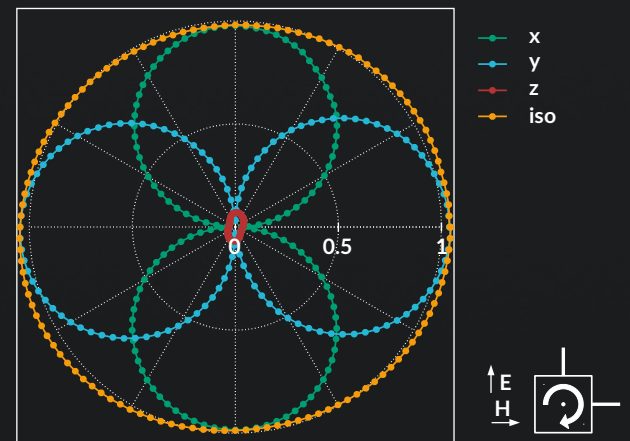
LSProbe 1.2 Field Sensor

Supported Frequency Ranges	Variant
10 kHz ... 8.2 GHz	E, F, G*
10 Hz ... 10 kHz	F
8.2 GHz ... 12 GHz	X
Detectors	
Low Band	(10 Hz) 10 kHz ... 200 MHz
High Band	30 MHz ... 8.2 GHz (12 GHz)
Field Strength Range, Dynamic Range	
10 Hz ... 30 MHz (F)	<3 V/m ... >10 kV/m, >70 dB
10 kHz ... 30 MHz (E, G)	<1 V/m ... >10 kV/m, >80 dB
30 MHz ... 6 GHz (E, F)	<0.1 V/m ... >1 kV/m, >80 dB
6 GHz ... 8.2 GHz (E, F)	<1 V/m ... >1 kV/m, >60 dB
8.2 GHz ... 12 GHz (X)	<100 V/m ... >1 kV/m, >20 dB
Damage Level	>25 kV/m
Sampling Rate, Minimum Pulse Width	
Burst Mode	2 MSamples/s, 500 ns
Continuous Mode	500 kSamples/s, 2 μ s
Single Axis Continuous Mode	2 MSamples/s, 500 ns
Analog Rise Time	
Low Band, low bandwidth	1.9 ms
Low Band, high bandwidth	770 ns
High Band	330 ns
Resolution	<0.01 dB
Typical Worst-Case Isotropy Error	
@ 1 GHz	± 1.0 dB
@ 3 GHz	± 1.7 dB
@ 6 GHz	Please see Application Note 8.
Amplitude Accuracy	Accredited Cal. at PTB, Germany
10 kHz ... 30 MHz	± 0.6 dB
30 MHz ... 1 GHz	± 1.0 dB
1 GHz ... 8.2 GHz	± 1.4 dB
Linearity Error	± 0.2 dB relating to 10 V/m
Temperature Stability	± 0.1 dB
Fiber Optic Connectors	ST/FC
Standard Fiber Optic Cables	5 m permanently attached, 15 m ST/FC extension, two E2000 Sacrificial Cable Kits
Max. Fiber Optic Cable Length	1,000 m
Fiber Optic Cable Bending Radius	>30 mm
Ambient Temperature	10 °C ... 40 °C
Dimensions (W x D x H)	46 x 46 x 114 mm ³

*) Variant G, reduced sensitivity to support 15 kV/m



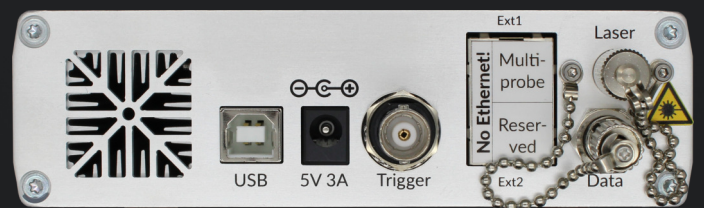
Isotropy @ 1 GHz, normalized E-field rotating around H-vector



Isotropy @ 1 GHz, normalized E-field rotating in E-H-plane

LSProbe 1.2 Computer Interface

PC Interface	USB 2.0
Application Software	LSProbe 1.2 TCP Server, LSProbe 1.2 GUI
Trigger Voltage	5 V
Trigger Connector	BNC
Laser Wavelength	830 nm
Laser, Max. Output Power	1,000 mW
Laser Class	1M
Laser Shutdown Time	1 ms
Fiber Optic Connectors	ST/FC
Number of Fiber Optic Couplers	>6
Input Voltage	5 V ± 5 %
Input Current	<3 A
Ambient Temperature	10 °C ... 40 °C
Dimensions (W x D x H)	135 x 120 x 38 mm ³
Certifications	CE, IEC 60825-1:2014



Computer Interface Rear Side View

Selected International Standards

ISO	11451-2, WD 11451-5, 11452-2, 11452-11
IEC	61000-4-3, 61000-4-21
EN	300 328, 301 893
Other	RTCA/DO-160

LSProbe 1.2 Documentation and Application Notes (AN)

- LSProbe 1.2 User's Manual
- AN 1: Measuring Radio Jammers
- AN 2: Measuring Pulsed Fields
- AN 3: Multi-Probe EUT-Monitoring using EMC32
- AN 4: Reliable Operation of LSProbe 1.2 Electric-Field Probes
- AN 5: Third Party EMC-Software Integration of LSProbe 1.2 Electric-Field Probes
- AN 6: Calibration of LSProbe 1.2 Electric-Field Probes
- AN 7: LSProbe 1.2 Variants

LSProbe 1.2 Accessories

E2000 Sacrificial Cable Kit



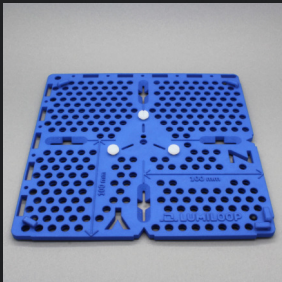
- prevents contamination of connectors
- quick and simple replacement in case of connector burn-in
- includes two 0.5 m E2000 to ST/FC cables
- includes E2000 and ST/FC couplers

Optic Fiber Cable Extension



- 5/10/15/20 m duplex fiber optic cable with ST/FC connectors
- includes ST/FC coupler
- arbitrary length of cable available on request

Tabletop Probe Stand Base



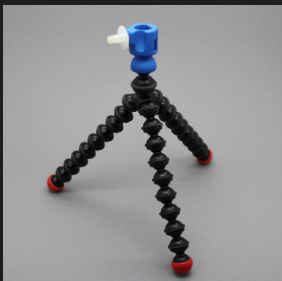
- quick positioning for table and ground-plane setups
- horizontal probe position 100 mm relative to all edges
- relative permittivity better than 2.7 @ 1 kHz

Tabletop Probe Stand Mounting Pole



- to position the field sensors center at 100 mm, 125 mm, 150 mm, 200 mm or 300 mm above surface
- well-defined field probe alignment with quick mount/release
- relative permittivity better than 2.7 @ 1 kHz

Flexible Probe Stand



- flexible tripod feet for versatile positioning
- vertical position approximately 150 to 250 mm above surface
- strong magnetic feet with rubber coating
- no metal parts
- quick mount/release

Fiber Connector Cleaning Kit



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



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