



Fiber and disc laser



Diode laser



Ultrashort pulse laser



CO₂ laser



The perfect tool for easy laser and scanner characterization in confined spaces.



Caustic



Raw beam



Power



Beam profile



Pointing stability



Vector



Focus shift

POWER RANGE	10 W – 1.5 kW
BEAM SHAPE	Gaussian, Top Hat, Ring ¹⁾
BEAM DIAMETER	Focused 50 – 300 µm
HIGHLIGHT	Marking speed 0.1 – 10 m/s
INTERFACES	WLAN, Ethernet

¹⁾Cf. application note on www.primes.de/sfm

Tech Corner

The novel measuring principle enlightens your laser scanner application with highest accuracy. Guiding the laser over an engraved measuring structure enables precise measurements of the laser beam position and spot size all over your scanning field. Key to success are those characteristic peaks within the measurement signal. In combination with a detailed knowledge about the measuring structure, the SFM measures the exact beam path inside the measurement window.

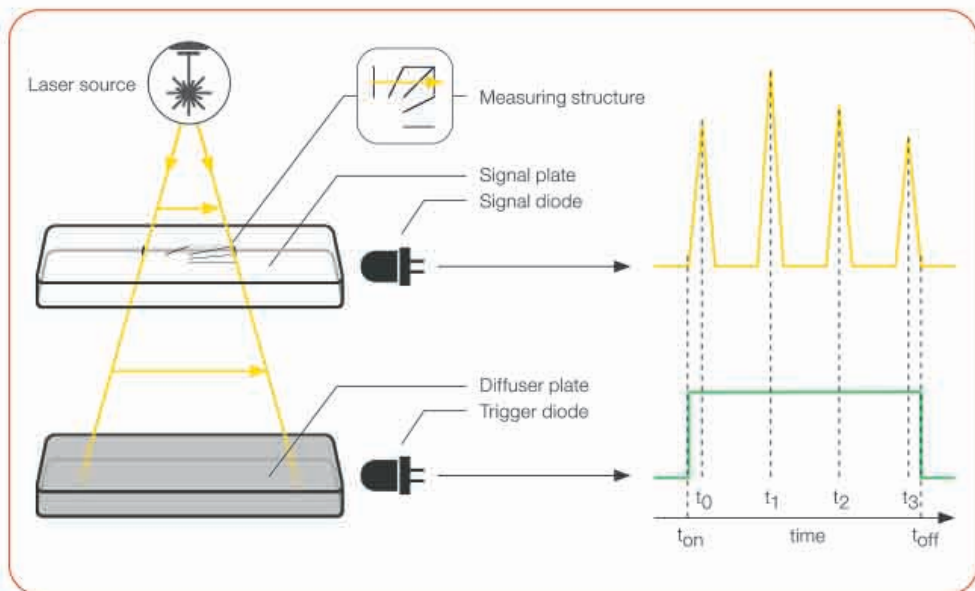


Figure: Measuring principle of the ScanFieldMonitor

But we are just getting started. Every measurement automatically contains the start and end point of your vector, the marking speed and, of course, the vector length. The structure size is in the range of 7.5 mm. With a vector of 10 mm in length and scanning speed from 0.1 m/s up to 10 m/s, every single measurement will just take a fraction of a second. The SFM thus enables several hundred measurements in a few seconds. So the time effort to measure focus shift, delay time, reproducibility and stitching of several sources is reduced to a minimum.

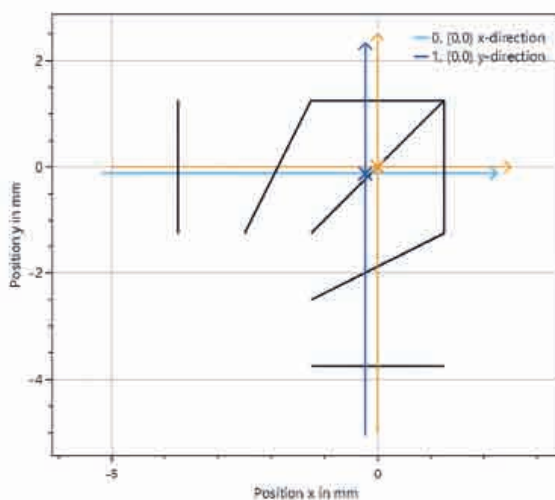
For an easy and intuitive handling the SFM comes with the powerful LaserDiagnosticsSoftware LDS by PRIMES. Even with a low level access to your Additive Manufacturing machine the LDS allows a high degree of automation. This simplifies complex measurement tasks such as a caustic measurement. It reduces the individual influence of the user and enables better comparability of measurements made on laser-scanner-systems at your locations around the world.

By the way: Did you know about measuring ring beams using PRIMES SFM?
Find more information on our website: www.primes.de/sfm
(A Boost for Additive Manufacturing: Application note)

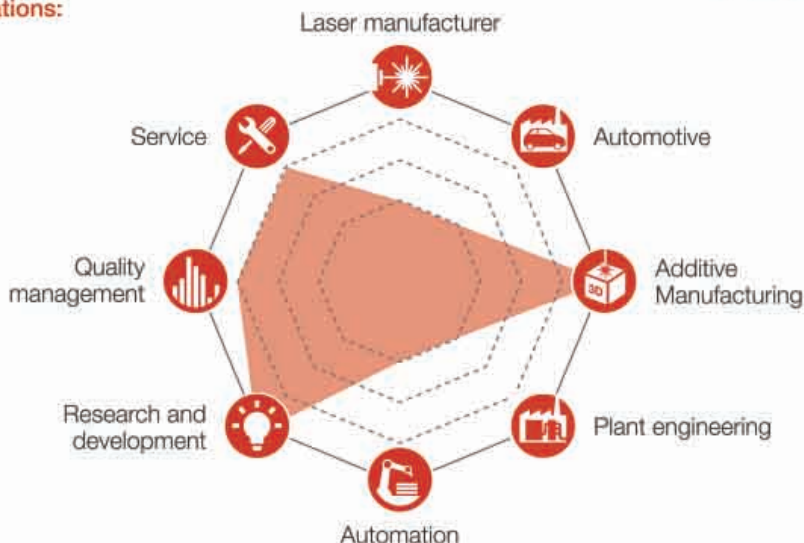
MEASUREMENT PARAMETERS	SFM
Power range	10 – 1 500 W
Wavelength range	1 000 – 1 100 nm
Beam diameter	50 – 300 μm
Max. power density (1 000 – 1 100 nm)	100 MW/cm ²
DEVICE PARAMETERS	
Max. angle of incidence perpendicular to inlet aperture	0 – 20°
Marking speed	0.1 – 10 m/s
Dimension of the scattering pattern	7.5 mm x 7.5 mm
SUPPLY DATA	
Power supply	12 V DC; 20 100 mAh Integrated lithium-ion cell in the processing unit, which can be charged via a USB port on the PC with 5 V charging voltage
COMMUNICATION	
Interfaces	WLAN, Ethernet
DIMENSIONS AND WEIGHT	
Dimensions (L x W x H)	80 x 80 x 100 mm ScanFieldMonitor 275 x 160 x 100 mm Processing Unit
Weight (approx.)	1.2 kg ScanFieldMonitor 0.8 kg Device holder 3.2 kg Processing Unit

Results Fit First peak

	0	1
theta in mrad	0.25	1570.31
theta in °	0.015	89.972
v in m/s	0.099	0.099
w _x in μm	79.66	---
w _y in μm	---	77.53
x ₀ in mm	-0.236	-0.230
y ₀ in mm	-0.118	-0.130
x _{max} in mm	-5.193	-0.232
y _{max} in mm	-0.120	-5.057
x _{end} in mm	2.243	-0.229
y _{end} in mm	-0.118	2.333
L in mm	7.436	7.391



Applications:



System Description: The ScanFieldMonitor (SFM) was developed specifically to meet the current requirements of Additive Manufacturing machines (SLM or LPBF). The device operates by detecting the scattered laser light on a structured glass plate and is therefore independent of the optical power. **No need for an external wiring, nor for a water supply to cool the absorber and even more important, capable of process-oriented measurements all across the build plate.**

Your Benefit: Due to its **compact design, wireless connection** and a **novel measurement principle**, the SFM addresses all **laser-scanner-specific** measurement tasks in **just one device** and enables laser beam characterization on the entire scanfield. The modern, intuitive Laser-DiagnosticsSoftware (LDS) ensures an **easy handling** and a **fast measurement procedure**.

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CONCLUSION

The SFM analyses various process parameters of scanner systems under actual operating conditions. Combining separate applications for various measurement tasks into a single device cuts down on investments, complexity, and work time.

For further information please visit www.primes.de/sfm

