



ScanFieldMonitor



the laser beam over this structure and uses this information for fast laser beam characterization. Not only will it tell you the width of the beam on the measuring plane, but it will also allow you to reconstruct the path, position, and length of the beam and determine its speed of movement.

Complex relations such as pincushion distortion, the merging of overlapping scanning fields, and delays in laser activation and deactivation can be analyzed using special measuring schemes. This can be used to synchronize the laser with its scan unit. Using the 3D machine construction platform to move along the z-axis makes it possible to measure the caustic and determine the evenness of the plane. In summary, you will find all of this in the cube-shaped ScanFieldMonitor being small enough to be placed just about anywhere over the working area: a new measuring instrument unique to the market.

Lightyears Ahead: Our All-In-One Turbo

Find out everything worth knowing about your production parameters in less than 3 seconds from the ScanField-Monitor (SFM). You'll soon find that it is as innovative and creative as the 3D production industry itself. A revolutionary patented¹⁾ measuring process from PRIMES for additive manufacturing processes characterized by a small glass structure, a compact design, and our innovative measuring principle make the ScanFieldMonitor a multifaceted, nimble handheld turbo for laser beam diagnostics and process optimization.

A piece of glass with a specific measuring structure is what distinguishes the innovation of the ScanFieldMonitor (SFM). A photo diode captures the scattered light while scanning



¹⁾ PRIMES is the owner of US patent 10,184,828 which protects a method for determining properties of a laser beam. The SFM is a sophisticated tool that makes it easier for you to implement this method.



All-in-One: All Measuring Tasks in One Device

The greatest advantage of the SFM is that it combines multiple measuring tasks in a single device. This saves the user time and money, regardless of whether you're a mechanical engineer commissioning and maintaining AM machines or a user managing processes and quality.

The compact measuring unit with wireless communication enables you to identify properties at arbitrary positions in the working area under actual process conditions.

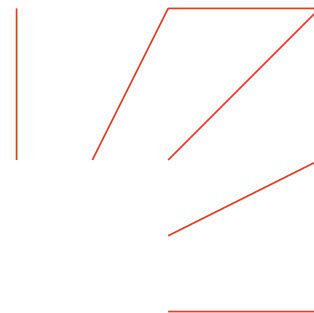
The Key Benefits

- ① Access to relevant process parameters outside the range of conventional beam diagnostics devices, such as marking speed or beam analysis in various positions on the structural panel.
- ② Combining separate applications for various calibration tasks into a single device cuts down on investments, complexity, and work time.
- ③ Measurements can be taken under actual operating conditions for laser sintering: laser power and inert gas atmosphere.
- ④ A compact, powerful service tool suitable for comprehensive on-site scanner analysis.

On a Practical Level

The ScanFieldMonitor meets the demands of scanner-specific measuring tasks, including aspects such as surface evenness, pincushion distortion, focal point shift, or precision of the position and marking speed. The device operates by detecting the scattered laser light on a structured glass plate and is therefore independent of the optical power. This makes it possible to reconstruct the travel path taken by the light and calculate the beam width at multiple positions across the working area.

All of the variables mentioned above can be measured with high resolution and reproducibility.



The measuring structure of the ScanFieldMonitor





Technical Data

MEASUREMENT PARAMETERS	
Power range	10 – 1 500 W
Wavelength range	1 000 – 1 100 nm
Beam diameter	50 – 500 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	5 mm x 5 mm
SUPPLY DATA	
Power supply	24 V DC; 20 400 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
DIMENSIONS AND WEIGHT	
Dimensions (L x W x H)	80 x 80 x 100 mm ScanFieldMonitor 326 x 160 x 91 mm Processing Unit
Weight (approx.)	1.15 kg ScanFieldMonitor 0.8 kg Device holder 2.9 kg Processing Unit
ENVIRONMENTAL CONDITIONS	
Operating temperature range	10 – 45 °C ScanFieldMonitor 10 – 45 °C Processing Unit
Storage temperature range	5 – 50 °C ScanFieldMonitor 0 – 45 °C Processing Unit
Reference temperature	22 °C
Permissible relative humidity (non-condensing)	10 – 80 %

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More info about the ScanFieldMonitor

can be found in our whitepaper on our website under
www.primes.de/en/company/latest-news/press.html