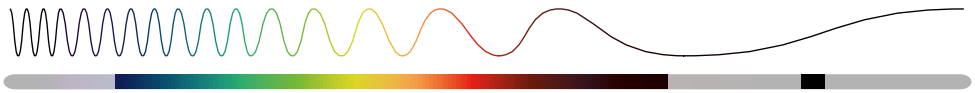
FocusMonitor FMW+

PRIMES

- Fiber and disc laser
- Diode laser
- Ultrashort pulse laser
- CO_2 laser



400 – 2100 nm

10 600 nm

The most versatile all-in-one solution for various laser based AM machines.

- Caustic
- Raw beam
- Power
- Beam profile
- Pointing stability
- Vector
- Focus shift

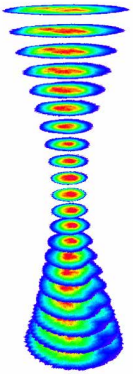
POWER RANGE	Up to 1000 W
BEAM QUALITY	Single mode – multi mode
BEAM DIAMETER	75 – 3000 µm
HIGHLIGHT	Integrated beam absorption
INTERFACES	Ethernet, OPC UA

Engineered for Precision

With its compact design and no need for water cooling or gas supply, the FMW+ is a beam profiler developed specifically for the requirements of additive manufacturing systems — whether in R&D, machine commissioning, or field service. It provides reliable, traceable measurements that give users full confidence in their laser systems.

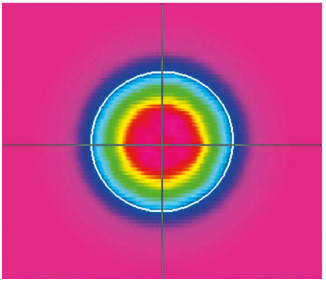
The FMW+ supports the qualification of innovative laser concepts and beam shapes such as ring beams, enabling faster validation, optimized process parameters, and consistent production results.

By delivering precise, comparable data across all use cases, the FMW+ helps shorten development cycles, streamline acceptance testing, and simplify service diagnostics — saving valuable time and resources while ensuring lasting process stability and quality.



Thanks to its OPC UA interface, the system can be used within automated, digital workflows, enabling a seamless integration into calibration and quality-assurance processes. This makes the FMW+ an ideal solution for connected, data-driven production environments.

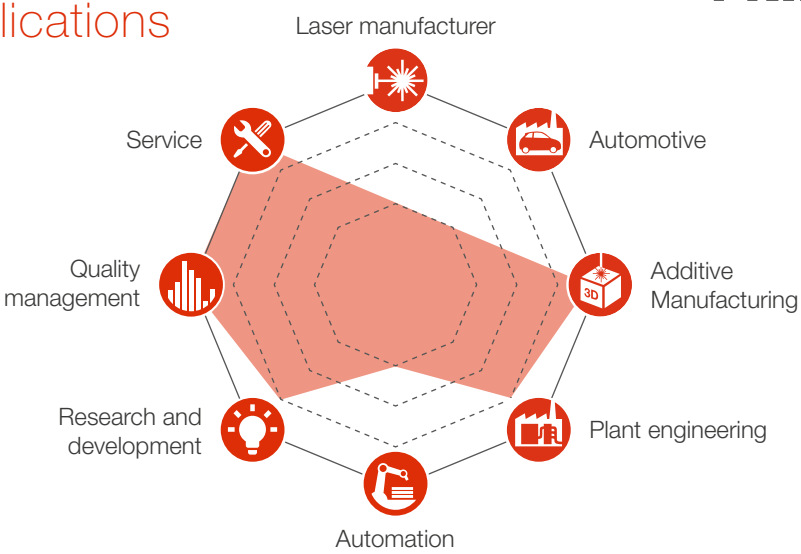
Behind this performance is a precisely engineered opto-mechanical design. The FMW+ uses a micro-aperture measuring tip to sample a fraction of the beam, which is directed to a wavelength-dependent detector. As the fast rotating tip moves transversely, it scans the planar beam power-density distribution with high spatial resolution. Using the machine's build platform motion, an entire caustic can be measured. Thanks to its wide dynamic range and advanced analog-digital conversion, the FMW+ captures both low and high intensities with equal precision — enabling fully compliant caustic measurements according to ISO 11146.



The special absorber design safely absorbs energies of up to 90 kJ, allowing a 400 W laser to be measured continuously for up to four minutes at full power. The system is also optionally available with a higher absorber capacity of up to 240 kJ.

MEASUREMENT PARAMETERS	FMW+	
Power range	up to 1 000 W	
Wavelength range	0,4 - 12 µm (depending on detector and measuring tip)	
Beam diameter	75 – 3 000 µm	
Max. energy per measurement	90 kJ (up to 240 kJ on request)	
Max. power density at different wavelengths	CO_2 laser (10 600 nm) Nd:YAG laser (1 000 – 1 100 nm) VIS laser (515 – 550 nm)	20 MW/cm² 5 MW/cm² 5 MW/cm²
Max. beam divergence (depending on measuring tip)	NIR high div CO_2 high power	200 mrad 240 mrad
DETERMINED PARAMETERS		
Focus position x, y, z	yes (with external z-axis possible)	
Focus radius x, y		
Beam quality factor M^2		
Raw beam diameter with focussing element		
Divergence angle		
Power density distribution	2D, 3D	
DEVICE PARAMETERS		
Measurement window sizes	0.1 x 0.1 up to 8 x 8 mm	
Resolution	up to 1 024 x 1 024 pixel	
Rotation speed	1 875, 3 750 min^{-1}	
SUPPLY DATA		
Power supply	24 V DC ± 5 %, max. 1.8 A	
COMMUNICATION		
Interfaces	Ethernet, OPC UA	
DIMENSIONS AND WEIGHT		
Dimensions (L x W x H) Height with the carrying handle folded down	185.5 x 153 x 237.5 mm 208,5 mm	
Weight (approx.)	8 kg	

Applications



Your benefit

Designed for maximum convenience, the FMW+ is the ultimate solution for comprehensive characterization of the laser beam in your additive manufacturing system, saving you valuable time, eliminating sources of error, and giving complete confidence in your laser process.

- High flexibility and installation in mere minutes, due to its compact design and no need for additional media
- Full integration into digital workflows via OPC UA
- Measure all key beam parameters – from beam geometry and power density distribution to beam parameter product and the full beam caustic of the focused laser
- Adaptable to all standard laser wavelengths used in Additive Manufacturing
- Combines a rugged, compact design with an integrated absorber for safe and reliable operation

Conclusion

The FMW+ is the ideal tool for additive manufacturing—delivering precise, traceable laser beam analysis in a compact, media-free design. Fully digital and OPC UA–ready, it accelerates development, validation, and service workflows, saving time while ensuring unmatched process stability, quality, and confidence in every laser application.

For further information please visit www.primes.de/fmw+

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