

# MicroSpotMonitor MSM+



Fiber and disc laser



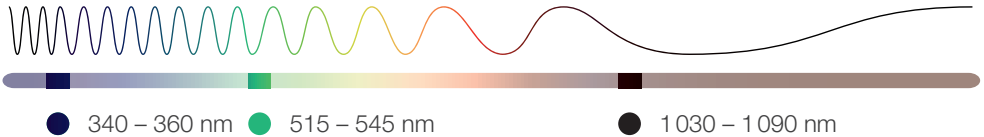
Diode laser



Ultrashort pulse laser



CO<sub>2</sub> laser



The most versatile and advanced camera based beam profiler for Micro to Macro, femto to cw and UV to NIR



Caustic



Raw beam



Power



Beam profile



Pointing stability



Vector



Focus shift

POWER RANGE	1 mW – 500 W
BEAM QUALITY M <sup>2</sup>	Single mode - multi mode
BEAM DIAMETER	10 μm – 1 000 μm
HIGHLIGHT	Magnification up to 15-fold, Autocaustic
INTERFACES	Ethernet

# Tech Corner

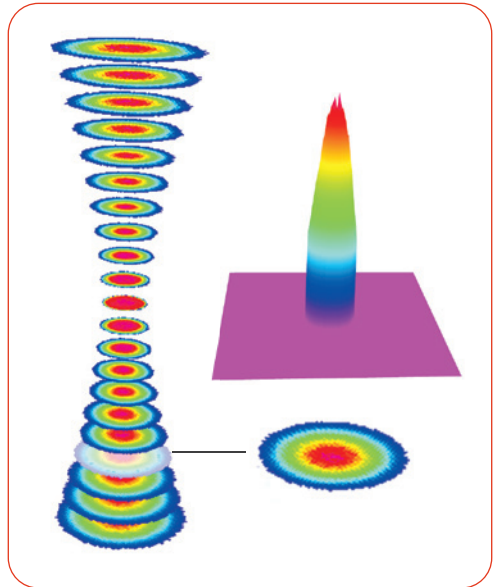
The MicroSpotMonitor MSM+ is the most sophisticated and versatile camera based measuring device for lasers ranging from the UV to NIR spectrum. With its unique design and its perfectly chosen components and optical elements the MSM+ is the ideal fit to attenuate and image a laser beam at up to 500 W average power or ultra-short pulsed lasers in the pico- or femtosecond regime.

The MSM+ generates a magnified image of the incoming beam on the CCD by means of the measuring objective. Additional attenuators as well as a filter wheel equipped with different OD filters attenuate the beam gradually.

Using the imaged two dimensional power density distribution, our LaserDiagnostics-Software LDS calculates information such as beam diameter and location. Repeating this measurement at different positions along the working range, all parameters necessary to fully describe the artificial caustic are determined. An integrated x- and y-axis is available for straightforward adjustment.

We offer 3 different measuring objectives (MOB), each of which is coated in the NIR and optionally for the 2nd and 3rd harmonic. The objectives differ essentially in the magnification achieved, the maximum allowed NA and the possible working distance. Two additional internal beam paths will extend the suitable magnification by 0.3 and 1.8.

An integrated safety circuit monitors the condition of the equipment and immediately shuts off the laser in the event of a fault.

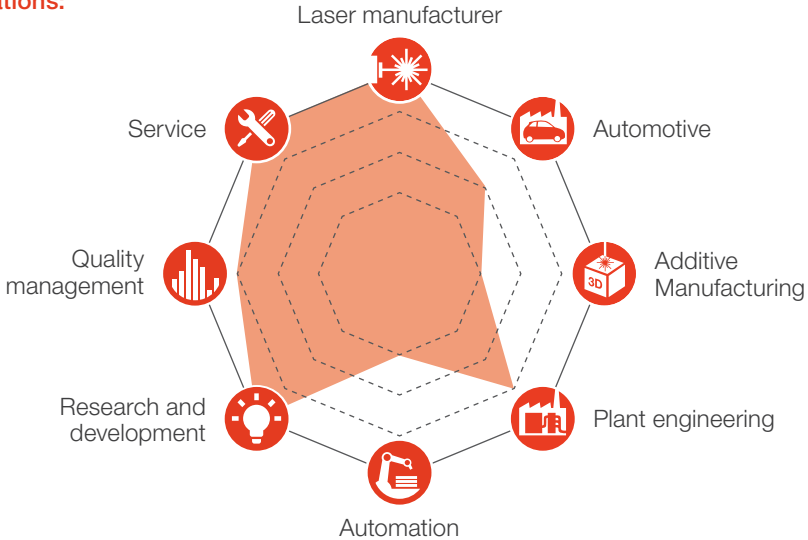


Display of a caustic measurement of a multi mode laser by the LaserDiagnosticsSoftware.

MEASUREMENT PARAMETERS	
Power range	1 mW – 200 W (optional 500 W with water cooling)
Wavelength range	340 – 360 nm, 515 – 545 nm and 1 030 – 1 090 nm
Beam diameter	10 µm – 1 000 µm
MEASUREMENT RESULTS	
Focus position x, y, z	yes
Focus radius x, y	yes
Beam quality factor M <sup>2</sup>	yes
Raw beam diameter at focussing element	yes
Beam parameter product BPP	yes
Divergence angle	yes
Power density distribution	2D, 3D
DEVICE PARAMETERS	
Travel range x-y-plane	2 x 2 mm
Travel range z-axis	35 mm or 120 mm (dep. on device type)
Integrated variable attenuation (option)	Filter wheel with 5 OD filters (OD 0 – 5)
SUPPLY DATA	
Power supply	24 V DC ± 5 %, max. 1.8 A
Compressed air for cyclone (cleaned, free of water and oil)	0.5 – 1 bar
Specification of compressed air for the cyclone according to ISO 8573-1: 2010	6:4:4
Cooling water pressure <sup>1)</sup>	2 bar primary pressure with an unpressurized outflow, max. 4 bar
Min. Cooling water flow rate <sup>1)</sup>	1.5 l/min
Cooling water temperature T <sub>in</sub> <sup>1)</sup>	Dew point temperatur < T <sub>in</sub> < 30 °C
COMMUNICATION	
Interfaces	Ethernet
DIMENSIONS AND WEIGHT	
Dimensions (L x W x H)	Length: 427 mm + 12 mm traversing range + connector Width: 202 mm Height: 181 mm + 35 mm / 120 mm traversing range + projection depending of the measuring objective used
Weight (approx.)	15 kg

<sup>1)</sup>The water cooling specifications only apply to the 500 W type of the MSM+ (on request).

## Applications:



**System description:** The MicroSpotMonitor MSM+ is designed to meet market requirements of ever increasing applications using USP and high brilliant laser sources at different wavelengths. The camera based system measures all relevant parameters of a focused laser, including the power density distribution with the highest resolution and accuracy.

**Your benefit:** Developing new laser sources, optimizing the optical path of focusing heads or verifying the performance of lasers in processing machines has never been that easy and reliable. The new “plus generation” of our established MicroSpotMonitor provides higher measuring rates, enhanced algorithms and new measuring modes. Fully automatic caustic measurements and new features within our LaserDiagnosticsSoftware LDS increase the usability for basic measurements, while providing detailed information for in-depth analyses of your beam profile.

## CONCLUSION

Laser systems equipped with pulsed- or cw-lasers at different wavelengths can be monitored in great detail. Power density distributions along the propagation of the focused or fiber guided laser will enable an easy root cause analysis. Distortions, aberrations or, more common, spatters and defects on optical surfaces are directly detectable. Appropriate countermeasures can be initiated in a targeted and immediate manner.



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