

Cube+ M



Fiber and
disc laser



Ultrashort
pulse laser



Diode laser



CO₂ laser

**Power densities of
up to 250 kW/cm²**

Measure in confined spaces,
even in the corners of your
AM machine.

1 030 – 1 090 nm



- **Power Range**
25 W – 2 kW

- **Accuracy**
± 3 %

- **Power Density**
Up to 250 kW/cm²



- Large data storage
- No water cooling
- Bluetooth, USB-C, API and Interlock
- Up to 20° incidence angle

Precise Laser Power Measurement – Right at the Machine

Designed for simplicity, speed, and reliability, the PRIMES Cube+ M makes power measurement in your AM machine easier, faster and smarter. Ideal for validating your machine's power output and identifying fluctuations, helping you to maintain performance, perform adjustments, and ensure consistent part quality. A must-have for every machine operator and field service professional!

User independent yet highly accurate measurements: The laser power is measured based on the temperature rise of the absorber and the determined pulse length. This calorimetric measurement principle delivers the most reliable results, as it is independent from beam position, spot diameter and other factors.

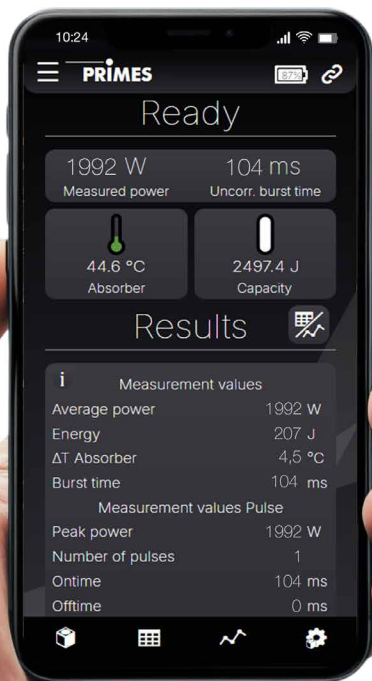
What makes the Cube+ M unique is the optical front end, which not only allows power densities of up to 250 kW/cm^2 , but also angles of incidence of up to 20° . This enables laser power measurements in scanner based processes on the entire working area.

New SpotLight App

Our new SpotLight App brings powerful measurement visualization and analysis to your fingertips, now available for Android™ and iOS. Connect via Bluetooth® and monitor your data in real time on your smartphone or tablet.

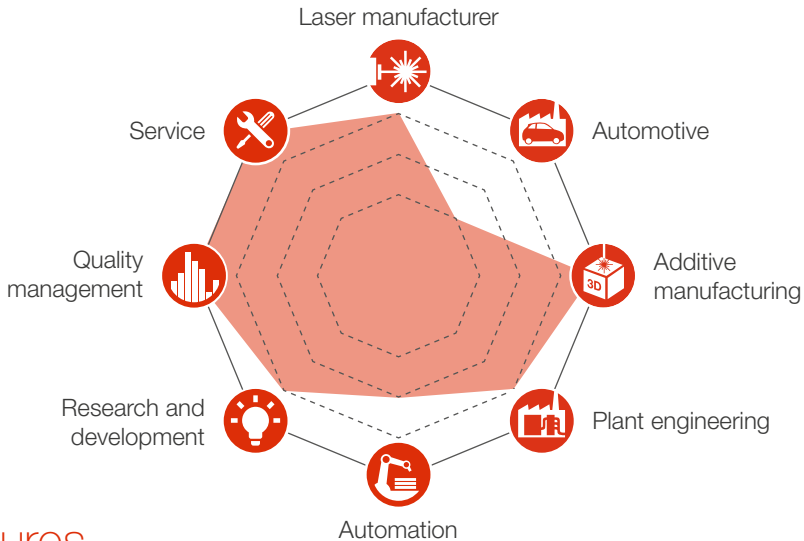
Key parameters such as laser power, pulse duration, and energy per pulse are displayed in clear, dynamic graphs. Each measurement is automatically recorded with precise timestamps, ensuring full traceability and easy data review.

Generate measurement reports on your phone or transfer data to a computer for in-depth analysis using PRIMES LDS. Integrated statistical tools, including standard deviation analysis, provide instant insights.



MEASUREMENT PARAMETERS		CUBE+ M
Power range		25 – 2 000 W ¹⁾
Wavelength range		1 030 – 1 090 nm
Beam diameter on the protective window		1 – 4 mm
Max. power density on the protective window		250 kW/cm ²
Irradiation time		0.1 – 2.0 s ¹⁾ (depending on laser power)
Min. on/off times (duty cycle) for pulsed lasers		50 µs (e.g. max. 10 kHz at 50 % duty cycle)
Max. laser rise time		< 1 % of irradiation time
Energy per measurement		50 – 3 000 J
Recommended energy per measurement		300 – 500 J
Total duration until measurement value output		< 10 s
Nominal measurement frequency		300 J: 1 cycle/min; 3 000 J: 1 cycle/15 min
DEVICE PARAMETERS		
Max. absorber temperature		120 °C
Max. angle of incidence perpendicular to inlet aperture		± 20°
Max. centered tolerance		± 2.0 mm
Max. beam divergence (full angle) at an angle of incidence of 0°/20°		300 mrad/30 mrad
Accuracy		
Angle of incidence up to 10°		± 3 %
Angle of incidence from 10° to 20°		± 5 %
Reproducibility		± 1 %
SUPPLY DATA		
Power supply		Built in lithium-ion battery
Temperature range for charging the lithium-ion battery		0 – 45 °C
COMMUNICATION		
Interfaces		USB-C/Bluetooth
Software		SpotLight App and LaserDiagnosticsSoftware LDS
DIMENSIONS AND WEIGHT		
Dimensions (L x W x H; without connectors)		60 x 65 x 80 mm
Weight (approx.)		675 g

¹⁾The stated limit values are to be understood in correlation with the permitted maximum energy ($E = P \cdot t$).



Features

Powerful Systems for Modern Laser Diagnostics

The Cube+ M is a portable laser power meter designed to measure at laser power densities of up to 250 kW/cm^2 and at an angle of incidence of $\pm 20^\circ$. With no need for water cooling or external cables, the Cube+ M is ideal for the use in confined spaces such as additive manufacturing machines. The high angle of incidence enables measurements in the overlap regions of multi-laser machines without time consuming repositioning across the scanner area.

- Unrivalled measuring accuracy and reproducibility
- The best solution for power measurement in additive manufacturing
- Completely wireless – no cables, no water cooling
- Extremely high power density up to 250 kW/cm^2
- High angle of incidence of $\pm 20^\circ$ allows measurement of multiple lasers from one position
- Integrated display and internal memory for measurement series

Other PRIMES Cube Models

- **Cube+:** standard power meter up to 12 kW
- **Cube+ L1:** operating close to focus at up to 16 kW
- **Cube+ L:** bigger spots, laser power up to 20 kW
- **Cube XT:** ultra high power up to 150 kW

Why choose Cube+ M?

The Cube+ M is a compact, robust and reliable solution for measuring at high power densities of up to 250 kW/cm^2 . Due to fast and easy measurements without cooling or cables, it's the perfect tool for your quality assurance between each build job.

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

