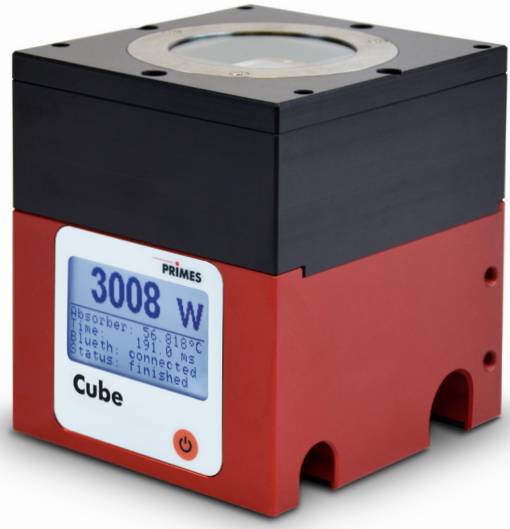
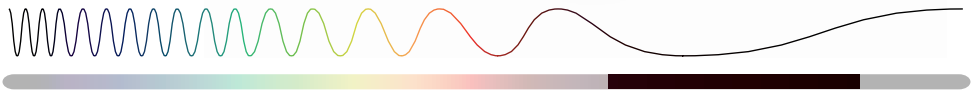
Cube L1

PRIMES

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





● 900 – 1 100 nm

Powerful design for fast measurements of multi-kilowatt lasers, enabled due to a maximum power density of up to 250 kW/cm².

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

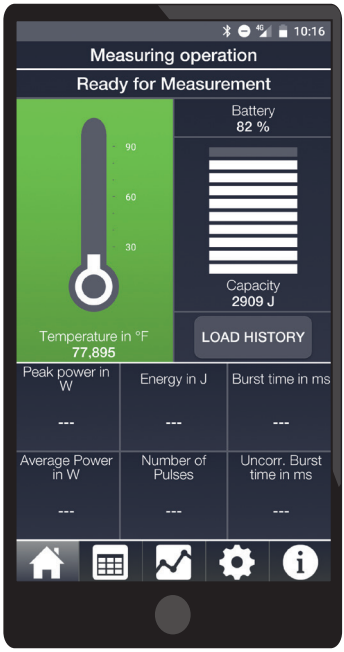
POWER RANGE	200 W – 16 000 W
BEAM QUALITY M^2	Up to single mode
BEAM DIAMETER[1)]	Focused 1 – 7 mm
SPECIAL FEATURE	Angle of incidence ±5° Power densitiy[1)] ≤ 250 kW/cm²
INTERFACES	Bluetooth, Micro-USB

[1)] on the protective window

Tech Corner

Identical to the other family members and related systems, the Cube L1 calculates the energy of a laser pulse by determining the temperature rise within its absorber. By measuring the length of the inserted laser pulse, the effective power is calculated. Due to this linear and accurate physical fact, this measurement method is particularly suitable for measuring laser power, even with the smallest amounts of energy.

What makes the Cube L1 unique is the optical front end, combined with its huge power range. Especially for service activities, this power meter is the universal tool for measuring a few hundred watts up to 16 kW. Based on the proven calorimetric measurement system, the specified accuracy and reproducibility always refers to the current measured value. At the same time, the optical front end enables power densities of up to 250 kW/cm². Ideal for demanding power measurements in confined spaces.



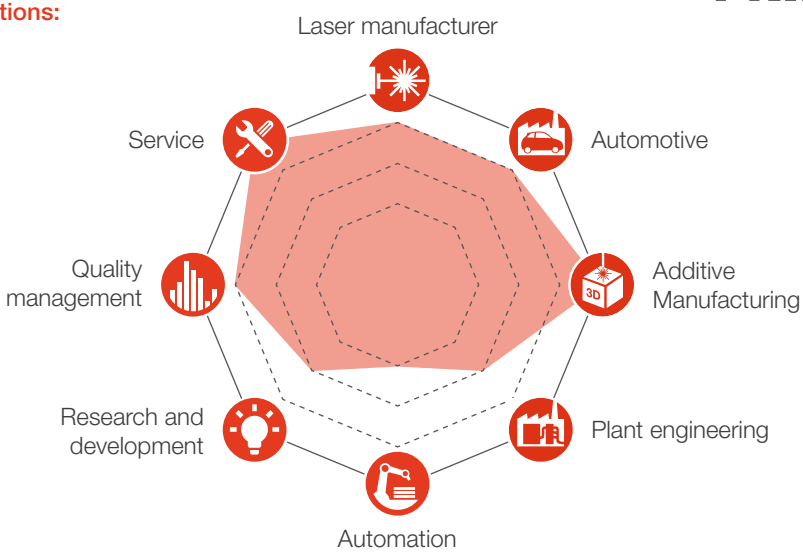
Using the PRIMES Cube App for mobile devices with Android™, you can operate and monitor all Cube models simply and conveniently on a tablet or smartphone via Bluetooth. Entire measuring series can be recorded during the measurement or uploaded from the internal storage (14 measurements) of the Cube. It will graphically display the measured values, such as average-, or peak power, energy per pulse and pulse duration.

The Cube App also supplements this information with the standard deviations. You can download the PRIMES Cube App for free from the Google Play Store. Alternatively, the micro-USB interface can be used to connect the Cube with a stationary computer and operate it with our new LaserDiagnosticsSoftware (LDS).This offers even more features to control the device or to analyze and back up measurement data.

MEASUREMENT PARAMETERS	CUBE L1
Power range	200 – 16 000 W [1)]
Wavelength range	900 – 1 100 nm
Beam diameter on the protective window	1 – 7 mm
Max. power density on the protective window	250 kW/cm²
Irradiation time (depending on laser power)	0.1 – 2.0 s [1)]
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	200 – 4 000 J
Recommended energy per measurement	500 – 2000 J
Total duration until measurement value output	< 15 s
Nominal measurement frequency	700 J: 1 cycle/min; 4 000 J: 1 cycle/15 min
DEVICE PARAMETERS	
Max. absorber temperature	120 °C
Max. angle of incidence perpendicular to inlet aperture	± 5°
Max. beam divergence (full angle) at angle of incidence of up to 5°	160 mrad
Max. centered tolerance	± 2.0 mm
Accuracy Angle of incidence up to 5°	± 3 %
Reproducibility	± 1 %
SUPPLY DATA	
Power supply	Built in lithium-ion battery, which can be charged via a Micro-USB port
Temperature range for charging the lithium-ion cell	0 – 45 °C
COMMUNICATION	
Interfaces	Bluetooth, Micro-USB
Software	LaserDiagnosticsSoftware (LDS) and Cube App
DIMENSIONS AND WEIGHT	
Dimensions (L x W x H; without connectors)	92 x 97 x 110 mm
Weight (approx.)	1 700 g

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

Applications:



System description: The Cube L1 is PRIMES' compact powerhouse for reliable power measurements in confined spaces. Especially in an industrial environment, things usually have to move fast. A challenging task in the field of high-power cutting or welding applications. We are easily talking about more than 10 kW of laser power. Typically the maximum power density for available power measurement tools is relatively low. However, the space in such machines is not sufficient to enlarge the beam for reliable measurements. **With its unique optical front end the Cube L1 enables fast measurements at power densities of up to 250 kW/cm², which means close to the focal plane.** Combined with the proven calorimetric measurement system, you get an all-rounder for servicing high-power lasers up to 16 kW.

Your benefit: The challenges of measuring high-power laser sources in an industrial environment are always defined by time and available space. With the PRIMES Cube L1 you get a service tool that easily passes these requirements. **The passively cooled measuring device measures up to 16 kW laser power close to the focal plane without the need for cooling water.** Therefore, the measurements are very fast and at the same time extremely accurate and simple.

CONCLUSION

The Cube L1 is a compact, robust and reliable solution for measurements at high-power density in high-power laser applications. Fast and easy measuring without cooling or cables make it the perfect tool for your quality assurance between machining operations in confined spaces.

For further information please visit www.primes.de/cubel1

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