

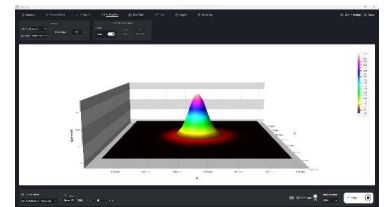
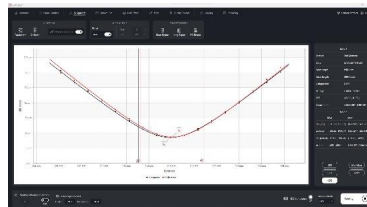
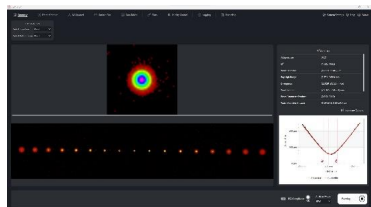
BWA-CAM®

BWA-CAM

The patented[†] BWA-CAM Beam Waist Analyzer CAMera system and software enables "real-time" laser beam measurement, analysis and monitoring of CW and pulsed lasers. The BWA-CAM® is the only system on the market that can provide the M2 of a laser in a single pulse! The system design is based on the international standards ISO 11146 and ISO 13694 which relate to lasers and laser related equipment and laser beam spatial metrics.

In every laser application, the laser beam profile provides valuable information for the most efficient use of the laser. By monitoring the laser beams spatial profile, circularity, centroid, astigmatism and M² values, the system provides early warning of any problems with the laser and entire beam delivery optical system. This relates to increased quality, process reliability, and reduced scrap.

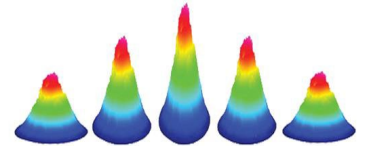
The BWA-CAM system is modular in design and can be configured for most applications and laser wavelengths.



The BWA-CAM can accommodate tens of watts of direct power from a focused laser beam; dependent upon wavelength. Additional attenuation can be used to measure higher level powers up to 30 kW. The beam waist can be seen in the primary region of interest (ROI). The smallest spot is located about midway in the series of spots (see image to the left). Once the multiple spots, each one a spatial cross-section along the beam caustic, are nearly horizontal, the software automatically tracks and sizes the ROIs for accurate M² measurement.

BWA-MON configurations available for powers up to 30 kilowatts and fiber core sizes from single mode to 1 mm.

[†]Covered by one or more of the following US patents: 8237922; 8427633; 8619247; 8711343; 8848177; 8848178; 8848179; 10708537; 10942275



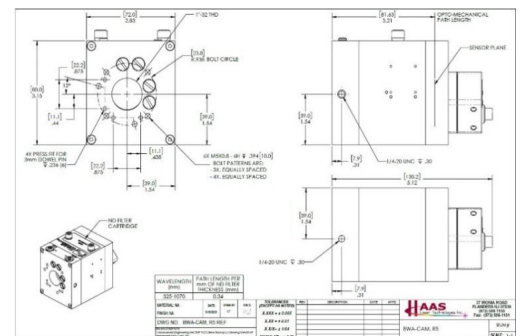
Features

Optical	
M² Measurement	Real-Time with No Moving Optics or Hardware
Rayleigh Range	1 mm to 48 mm
Single or Dual Camera	Measurement with Single or Dual Cameras
Auto Tracking of ROI	Software Auto Sizes and Tracks Region of Interest (ROI)
QC Measurement	All Beam Quality Metrics Monitored and Flagged for External Interlocking Control
Extended Report Generations	ISO Report Generator of all Beam Quality Metrics
Logging & Recording Capability	All Beam Quality Metrics and Record Live Camera Measurements for Offline Playback
Attenuation	-5 to -8 OD Attenuation Built-in
Optional High-Power Attenuator	For Power Levels to 30 kilowatts and above
Alignment	Easy Setup, Alignment and Calibration
Minimum Spot Size	28 microns

Specifications

Parameter	Description	Units
Sensor	CMOS, 1/1.1" (4:3)	
Pixel Area	4128 x 3008 Monochrome	
Pixel Size	2.74 x 2.74	µm
Active Sensor Area	11.311 x 8.242	mm
Scanning System	Progressive (Global Shutter)	
Gray Level	12	bits
Frame Rate (in 8-bit mode)	10	fps
Trigger	Auto or External (DIN 8)	
†Power Consumption	1.9 – 4.0	W
Interface	POE 1 GigE	
Dimensions (L x W x H)	~ 130.2 x 80.0 x 72.0	mm
Weight	~1.1	kg
Temperature Range	0 - 55	°C
Relative Humidity (non-condensing)	20 - 80	%
Wavelengths	350 - 1200	nm
Built-in Attenuation	-5.0 to -8.0	OD

†Power Over Ethernet (POE) Injector or switch, 48V 15.4W Power Over Ethernet, IEEE 802.3af Compliant, 10/100/1000Mbps and Category 5e, 6, or 6a cables only are not included with system.



Specifications subject to change without notice. Consult a Haas Laser Technologies engineer (973) 598-1150 for the latest specification changes or any additional assistance. Technical drawings of our products are available at www.haaslti.com. Contact sale@haaslti.com for ordering information.