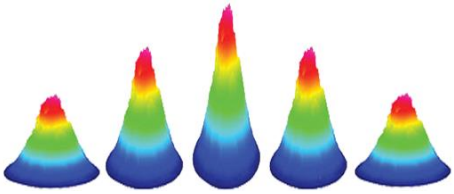
HAAS Laser Technologies Inc.

Your Single Source Solution for Laser Beam Delivery Systems



CO_2 BWA-CAM®

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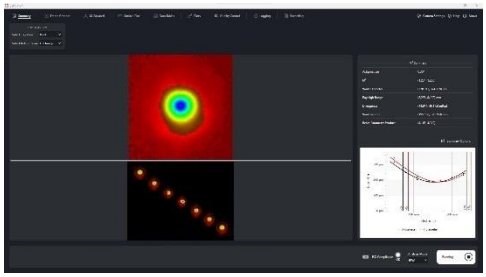
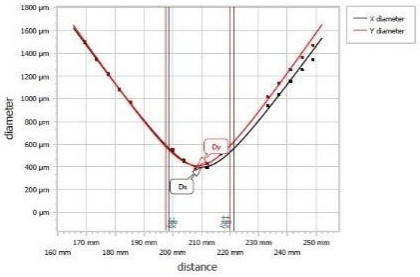
The patented† BWA-CAM **B**eam **W**aist **A**nalyzer **CAM**era system and software enables "real-time" laser beam measurement, analysis and monitoring of CW and pulsed lasers. The BWA-CAM® is the only system on the market that can provide the M^2 of a laser in a single pulse! The system design is based 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 M^2 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.

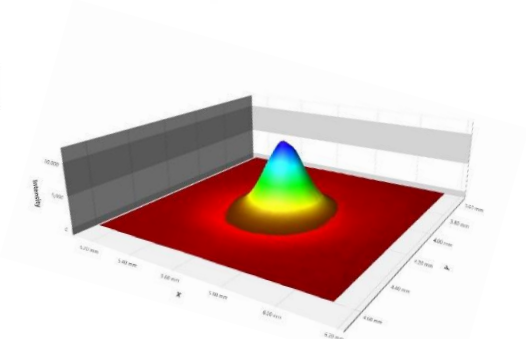
The BWA-CAM system is modular in design and can be configured for most applications and laser wavelengths.



Summary Screen



Full Scan Mode ISO Measurement



3-D Profile of Beam Waist

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 crossection along the beam caustic, are nearly horizontal, the software automatically tracks and sizes the ROIs for accurate M^2 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

Visit our website at www.HAASLTI.com for additional information and product videos

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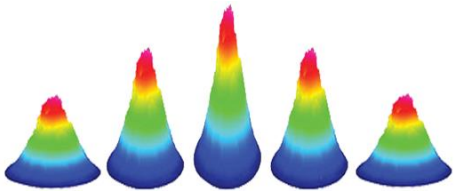
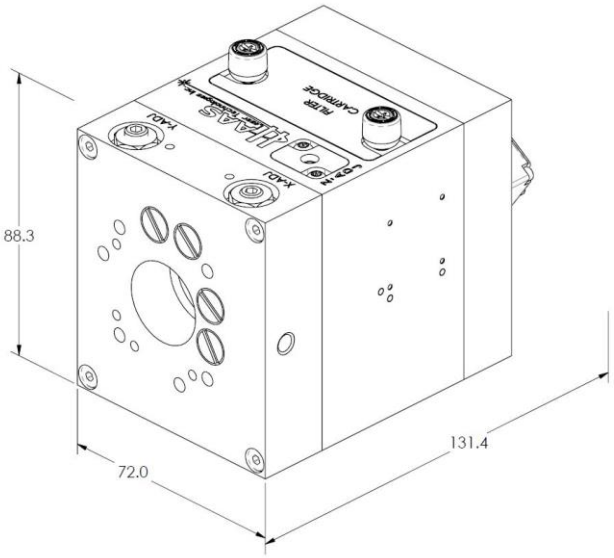


Features

Optical	
M^2 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	-4 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	170 microns

Specifications

Parameter	Description	Units
Sensor	Microbolometer	
Pixel Area	640 x 480	
Pixel Size	17 x 17	µm
Active Sensor Area	10.88 x 8.16	mm
Scanning System	Progressive with shutter	
Gray Level	16	bits
Frame Rate (in 16-bit mode)	30	fps
Trigger	Auto/Ext. Samtec 10-pin	
†Power Consumption	2.7 – 4.2	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	-20 - 60	°C
Relative Humidity (non-condensing)	20 - 80	%
Wavelengths	9.3 – 10.6	µm
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@haaslit.com for ordering information.