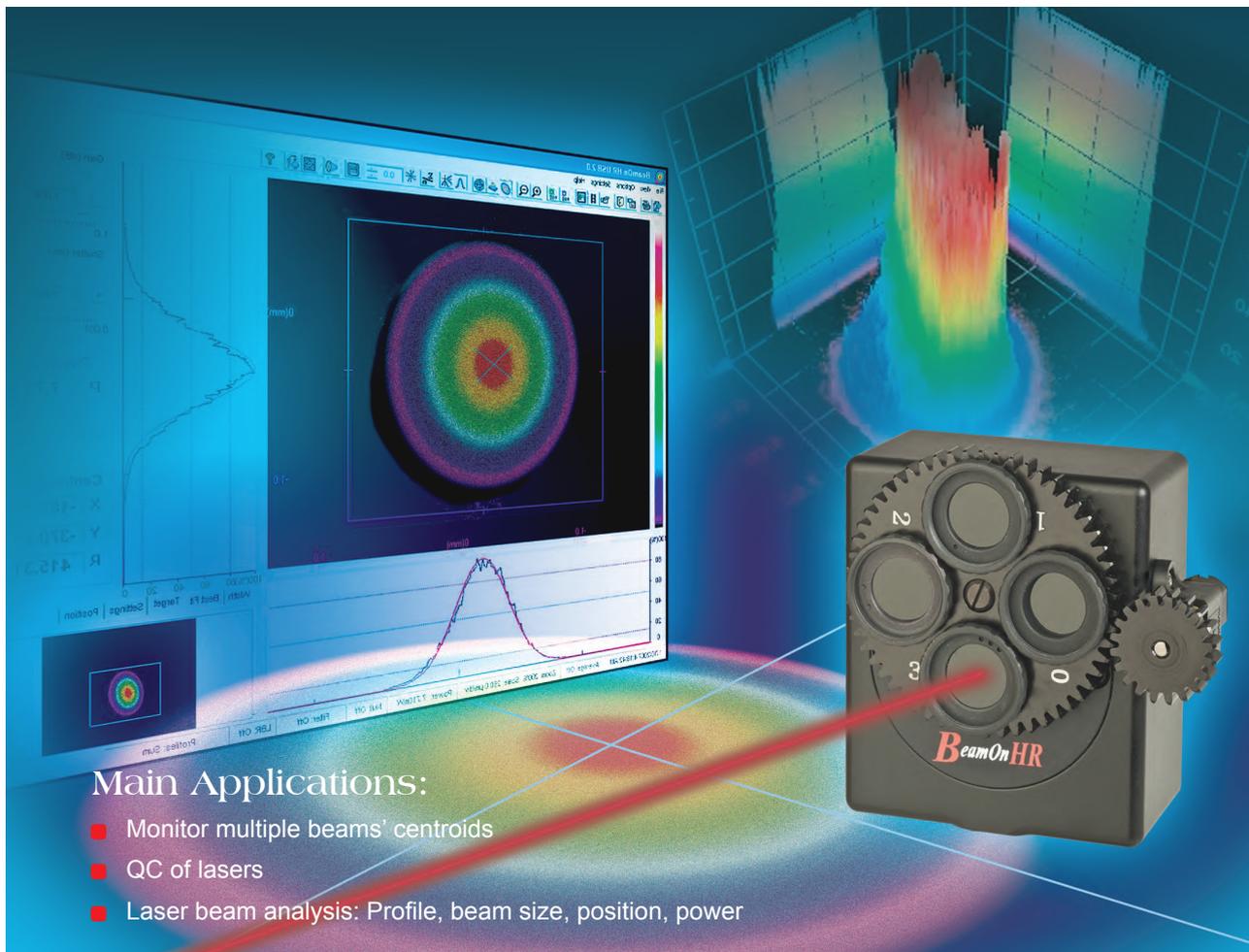


# BeamOn HR

1.4 Megapixel CCD Beam Profiler  
12 Bit resolution



## Main Applications:

- Monitor multiple beams' centroids
- QC of lasers
- Laser beam analysis: Profile, beam size, position, power

## Expanding your profiling capabilities

- Accurate: High resolution CCD having 12 bit true dynamic range
- Versatile: A complete test station measuring Profile, Power and Position, both for CW and pulsed beams
- Portable: Based on a USB 2.0 interface for notebooks (or desktops)
- Easy to use: user-friendly software, on-line help routine
- Accessories: Complete set for larger beams and high power attenuation

## Main Software Features

- Real time beam size and gaussian fit (or top hat)
- 2D/3D plots of beam in real time
- Beam centroid tracking and chart with time
- Software controlled electronic shutter & gain
- Video with playback, snapshot files
- Data exporting to another computer via RS232 or TCP/IP
- Data logging with detailed statistics
- ActiveX package to control software from your application
- Automatic Pass/Fail analysis report
- Motorized automatic filter wheel (AFW model) enables optimized setting of electronics parameters and enlarging the dynamic range



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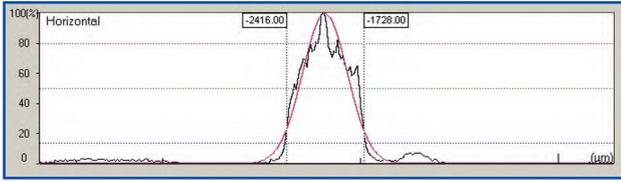
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November 2012



# Software Features

## Beam Profiles and Width



**Horizontal Profile with overlaid Gaussian Profile**

Two types of profile presentations are offered:  
Sum Profiles-Display the two orthogonal profiles, one along the vertical axis and one along the horizontal axis. Each profile is composed of a summation of rows and columns at a cross-section.  
Line Profiles-Display the beam contour along a line parallel to the vertical and horizontal axes. These two orthogonal lines are designated as a cross hair cursor on the image plane and can be moved along the working area. It is possible to rotate the line profiles by +/-50 degrees for analyzing the intensity profile along a certain line and angle of interest.

Best Fit (Gaussian)		
Horizontal Width (um)		Vertical Width (um)
590.17	80.0%	389.91
1104.13	50.0%	729.48
1883.30	13.0%	1244.27
83.34	Correlat (%)	90.69

**Best fit results**

Width		
Horizontal Width (um)		Vertical Width (um)
587.96	82.5%	314.81
1271.10	51.0%	786.85
1530.56	14.1%	1229.18

**Beam width results**

Beam widths are digitally displayed for any three user selected clip levels. Two vertical bars can be moved along the horizontal axis designating the distance (in mm) along this axis.

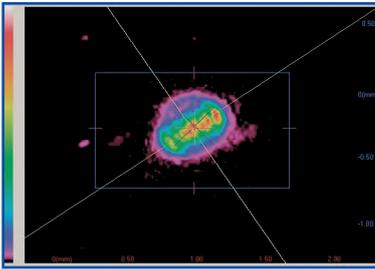
A Gaussian fit profile can be overlaid on the profiles in real time, while the correlation and fit values are displayed digitally. A Top Hat profile presentation and best fit is also available.

The software offers various algorithms for beam width calculation:

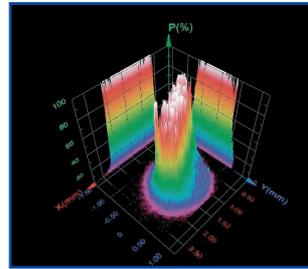
Percent of Peak

84/16 Knife Edge - 90/10 Knife Edge

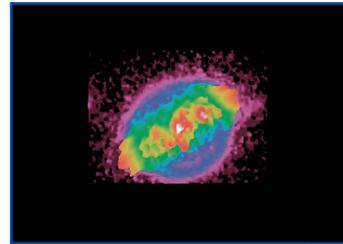
## 2D and 3D Intensity Plots



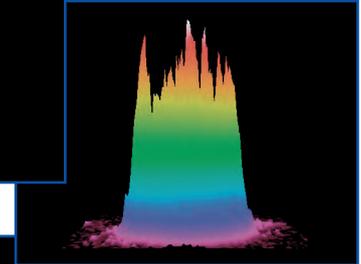
The Projection function provides either a 2D or a 3D plot of the beam intensity profile. A zooming feature enables magnification of the displayed image. For a weak beam image, even at max shutter and gain settings, optimize colors using the side color bar.



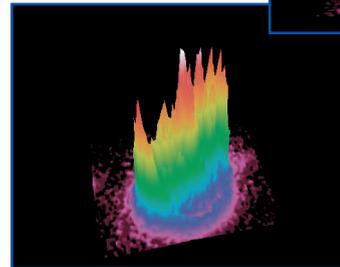
3D Projection enables viewing the 3D plot with projected images over the X and Y axes.



**3D Plot-top view**



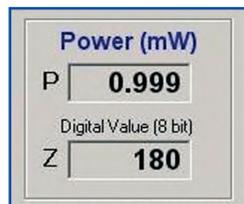
**3D Plot-side view**



**3D Plot**

The 2D/3D plots can be rotated along the beam optical axis, as well as be flipped. This feature enables the user to view the image from various angles around the beam.

## Power Measurement



The beam power is displayed as a digital readout at the status bar, as well as at the right-hand screen panel, where there is also a

display of the "Z" digital value in a specific cursor location (in 8 bits or 12 bits).

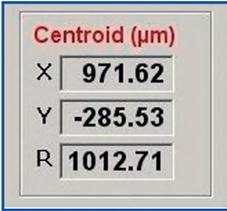
Alternatively, a needle-type display is available with additional features like: changing power measuring units, averaging, loading a pre-defined filter file, ambient light suppression.

A power calibration function allows the user enter a "base" power value. In subsequent captured images the summed intensity of all pixels will be proportional to this value.



# Software Features

## Beam Position & Chart



The beam centroid is continuously monitored relative to the center of the CCD head. Three Regions of Interest (ROI) can be defined by the user, thus enabling to monitor of up to 3 beams' centroids simultaneously. The display includes the values of X and Y (in mm) as well as R, which is the distance from the CCD center. Trace On/Off feature enables beam centroid tracking.

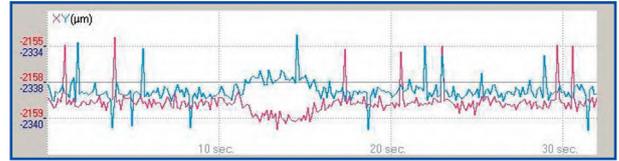
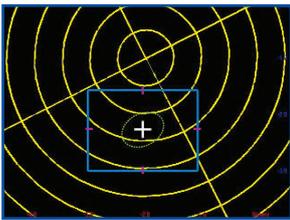
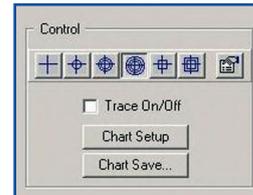


Chart Position function is used to display changes in the position (X and Y) with time, with autoscaling and saving capabilities.



Reticule type targets can be laid out on the position screen, for ease of positioning analysis. The following targets can be used: Cross, Circle, Square, multiple circles and multiple squares.

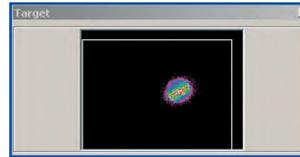


## Detailed Statistics

The information in Statistics screen is updated in real time and is useful for analyzing beam characteristics. It lists the information in a table format and shows the actual measurement values, as well as the minimal measurement, the maximal measurement, the averaged value, and the standard deviation of several parameters:

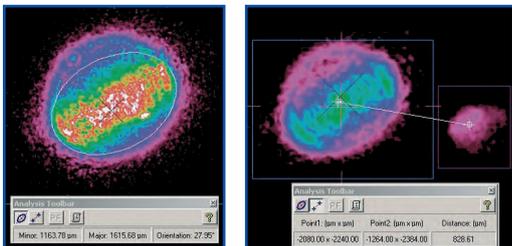
- Beam Centroid
- Beam Peak
- Beam width at 3 clip levels
- Correlation to Gaussian profile
- Power

## Beam finding Module – Target



A special feature, which facilitates finding your area of interest within the total CCD area. It is derived from the high-resolution CCD feature, where the resolution is much higher than the screen display capabilities. Your area of interest is clearly displayed as a small rectangular frame within a picture representing the CCD module. Move the small rectangle frame to explore other portions of the CCD area.

## Analysis, QA Testing & Report



**The ellipse** function calculated the best fit ellipsoid for the examined beam. The major and minor axes of the fit ellipse are calculated as well as the orientation of the major axes of the fit.

**The distance measurement** function calculates the distance between any two points on the beam image, the points are being selected by the user.

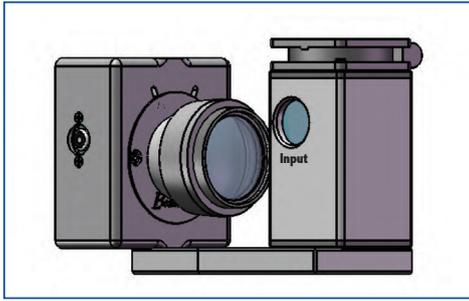
**The Test** routine allows the user to test a laser beam based on user-defined Pass/Fail criteria. The test results are calculated for any one of the beam selected parameters.

## A wealth of beam analysis features

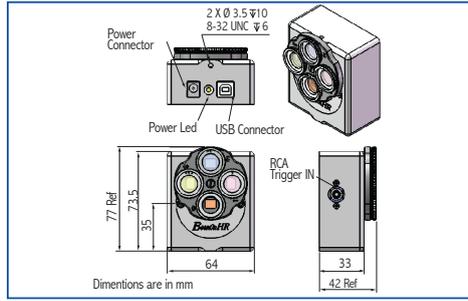
- Data logging to a Text file, or to an Excel file
- Averaging
- Zooming
- Printing of Text and pictures
- User set threshold levels
- Full on line Help routine
- Live Snapshot files replay for complete analysis of results
- Capture up to 12 still images and tile them in matrix format
- Sophisticated report in Excel format including mixed text & images
- Full session recordings for off-line analysis
- Customer set Pass/Fail criteria
- External trigger controle



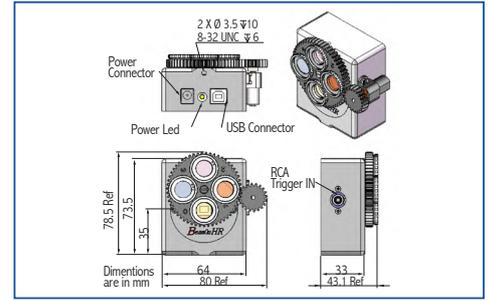
# Specifications



Accessories combination



BeamOn HR head



BeamOn HR AFW head

## CCD Head Specifications

<b>Camera Type:</b>	Monochrome interline transfer progressive scan, 1.4 Megapixel CCD 1/2" format
<b>Pixel size:</b>	4.65µmX4.65µm
<b>Sensor active area:</b>	6.47mmX4.83mm
<b>Weight:</b>	165 gr.
<b>Trigger in:</b>	RCA female jack, 4.5V square wave TTL
<b>Power consumption:</b>	6V, 4Watts
<b>Mounting threads:</b>	3/4" X 32 when filter wheel removed
<b>Accessories included:</b>	Filter wheel with 3X NG Scott colored filters (NG4, NG9, NG10) in housing. Adaptor ring for user filter. Mounting post.

## System performance with software

<b>Spectral response:</b>	350-1310nm
<b>Max frame rate:</b>	15fps at 1392x1040, 30 fps with binning (2X)
<b>Image resolution:</b>	1392X1040
<b>Shutter speed:</b>	0.6sec to 1µsec
<b>Gain control:</b>	X1 to X23
<b>Dynamic range:</b>	60DB not including filters
<b>Damage threshold:</b>	50W/cm <sup>2</sup> with filters
<b>Sensitivity:</b>	5nW/cm <sup>2</sup> @ 633nm, 60µW/mm <sup>2</sup> @ 1310nm
<b>Saturation:</b>	2mW/cm <sup>2</sup>
<b>Operation with pulsed lasers:</b>	Ability to capture and replay images from slowly pulsing lasers (1-100Hz) while filtering out frames with no laser pulse. Provision for displaying single shot pulses.
<b>Hardware triggering:</b>	in pulsed mode set threshold by slide bar to display frames with captured pulses
<b>Spectral response:</b>	1550nm±50nm
<b>Sensitivity:</b>	22µW/mm <sup>2</sup>
<b>Saturation:</b>	10mW/mm <sup>2</sup>

## Ordering Information

<b>BeamOnHR</b>	A camera for 350-1310nm, a standard USB2.0 cable, a post, a set of 3 X ND filters in housing on a built-in filter wheel (removable), software on CD disk, carrying case.
<b>BeamOnHR1550</b>	A camera for 1550nm±50nm
<b>BeamOnHR-AFW</b>	BeamOn HR with motorized filter wheel
<b>Accessories:</b>	
<b>SAM1</b>	Beam sampler (ratio 3X10 <sup>(-3)</sup> )
<b>SAM2</b>	Beam sampler (ratio 1X10 <sup>(-6)</sup> )
<b>SAM3-A</b>	Beam sampler polarization preserving (ratio 0.0016 Avg.)
<b>RDC</b>	Beam reducer (ratio 2X1)
<b>MountB</b>	Mounting base
<b>ND-FILT</b>	1/8 ND filter, M37X0.75
<b>NG-Filters</b>	1.6mm thick Schott colored filter in housing with adaptor, types: NG4 / NG9 / NG10
<b>Adapter</b>	C-Mount adapter ring

## General Specifications

<b>PC interface:</b>	High speed USB2.0 (480Mbps/sec)
<b>RS232:</b>	Data out
<b>Operating temp:</b>	0°C to 50°C
<b>Humidity:</b>	5% - 95% non-condensing
<b>CE compliance</b>	

## Host computer Requirements

Pentium IV 2GHz , 512MB RAM , 10MB Free HDD  
64MB 24 bit color VGA card, resolution (min) 1024x768,  
1 Free High Speed USB2.0 port, CD ROM any type,  
WinXP/Vista/7, 32 bit & 64 bit.



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