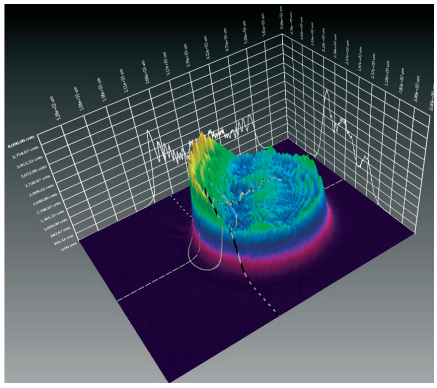
LBP2 Laser Beam Profiler

The LBP2 series laser beam profilers allow spatial beam profile measurements quickly with intuitive yet powerful application software.

- Windows 10 and USB3.0 compatible cameras are introduced
- Extensive set of ISO 11145, 11146-1/-3, and 13694 measurements
- Patented Ultracal™ algorithm for highest accuracy measurements
- Pass/fail testing available on most measured parameters
- Statistical Analysis of all measured parameters
- Industry standard data file formats, HDF5 and CSV

High Quality Cameras for Various Applications

The new LBP2 series laser beam profilers are available with a visible (190 - 1100 nm) CCD or a phosphor coated (1440 - 1605 nm) CCD camera. Both cameras are available in 1624 x 1224 array.



3D beam profile for an intuitive understanding of the intensity distribution

Product Features

- Designed for entry level or basic profiling needs
- Auto-setup and Auto-exposure capabilities
- Support for high and low resolution USB cameras
- Simultaneous 2D and 3D display
- Multi-instance, multi-camera use

Beam Samplers for Real Time Beam Monitoring for High Power Input

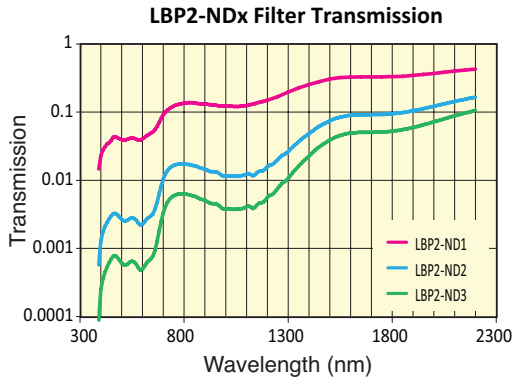
The LBP2-SAM Series beam sampler attachment allows you to measure laser beams with diameters up to 15mm and powers ranging from 10 mW to ~400 Watts. The beam sampler is designed so that the preferential polarization selection effect of a single wedge is cancelled out and the resulting beam image is polarization corrected to restore the polarization components of the original beam. The beam sampler operates by reflecting the incoming beam from the front surfaces of a pair of wedges through 90 degrees into the camera. Approximately

LBP2 Laser Beam Profiler

99% of the beam is transmitted through the beam sampler with 0.01% passed on to the camera. A set of adjustable ND filters are provided to make final intensity adjustments to the beam before it reaches the camera imager. Also, two samplers can be coupled in series providing up to a 10^{-8} attenuation.

Stackable Attenuators for High Power Input

Each laser beam profiler comes with stackable neutral density filters (one ND1 and two ND2 filters) with a 19 mm clear aperture, 1 inch-32UN (C-Mount). The damage threshold for these ND filters is 5 W/cm^2.



LBP2 series comes with one ND1 AND TWO ND2 stackable attenuators.

Extensive Software Features

The LBP2 software interface offers a broad range of functions and ISO approved quantitative results with an ease-of-use software user interface. The patented UltraCal algorithm, guarantees the data baseline or “zero-reference point” is accurate to 1/10 of a digital count on a pixel-by-pixel basis. ISO 11146 requires that a baseline correction algorithm be used to improve the accuracy of beam width measurements.

LBP2-SAM mounted on an LBP2 laser beam profiler

UV Beam Splitter

The new LBP2-UVBS is the UV beam splitter that can be mounted onto the input aperture of the LBP2-UVIMG, to allow imaging higher power/energy beams onto the CCD camera. While the saturation intensity of LBP2-UVIMG is ~ 15 mJ/cm2 and ~20 mJ/cm2 at 248 nm with the filters included in the LBP2 beam profilers, 20 times stronger beam can be imaged once the LBP2-UVBS is mounted on the imager.

Phosphor Coating Optimized for 1440 - 1605 nm

The Phosphor coating technology allows you to view NIR (1440 -1605 nm) lasers and light sources to measure with LBP2-IR and LBP2-HR-IR. The anti-Stokes phosphor coating produces visible photons at a rate roughly the square of the input signal. This non-linearity or Gamma is corrected in the software’s Gamma Correction function. Thus an accurate, linear image of the beam profile is obtained permitting standard, cost effective analysis of NIR beams. Note that the measured laser spot size will be slightly larger than the actual size, due to the use of phosphorescence.

Easy Software and Camera Installation

The LBP2 software and camera installation is simple and easy. See the video for step-by-step instructions. **https://youtu.be/NSmK6qxIV70**

LBP2 Laser Beam Profiler

UV Beam imager

The new LBP2-UVIMG is ideal for users who need to look at the profiles of 193 to 360 nm beams. There is a fluorescent plate that converts UV radiation that is poorly imaged by silicon camera into visible light. Then it is imaged onto the CCD. This converter has a high light output, wide linear dynamic range and high damage threshold. Resolution is 35 X 35 µm, and the dimensions are Ø31 X 120 mm.

Model	Description
LBP2-HR-IR3	LBP2 Beam Profiler: 1440-1605 nm, 1624 x 1224 CCD
LBP2-HR-VIS3	LBP2 Beam Profiler: 190-1100 nm, 1624 x 1224 CCD

Model	Description
LBP2-SAM-BB2	LBP2 Beam Sampling System, 190-1550 nm
LBP2-SAM-NIR2	LBP2 Beam Sampling System, 1064 nm
LBP2-SAM-UV2	LBP2 Beam Sampling System, 266-355 nm
LBP2-SAM-VIS2	LBP2 Beam Sampling System, 400-700 nm

Laser Beam Profiler Specifications

	LBP2-HR-VIS3	LBP2-HR-IR3
Minimum Spot Size (mm)	44	600
Sensor Size (mm)	7.1 x 5.3	7.1 x 5.3
Number of pixels	1624 x 1224	1624 x 1224
Pixel Size (µm)	4.4 x 4.4	4.4 x 4.4
Gain	24dB	24dB
Spectral Range (nm)	190-1100(2)	1440-1605
Beam Size Accuracy (%)	±2	±5
Computer Interface	USB3.0	USB3.0
Operating Mode	CW and Pulsed, Interline transfer CCD	CW and Pulsed, Interline transfer CCD
Minimum Power Density(1)	1.0 nW/cm^2	50 mW/cm^2
Saturation Intensity	32 µW/cm^2	7 mW/cm^2 @ 1550nm
Dimensions	29 x 29 x 29.5	29 x 29 x 29.5
Minimum Computer System Requirements	PC computer running Windows7,8,10 (32/64) or XP (32) Pro Laptop or Desktop GHz Pentium style processor, dual core recommended Minimum 2GB RAM Accelerated Graphics Processor Minimum 50 - 100 GB hard drive space	

Note:
(1) Camera set to full resolution at maximum frame rate and exposure times, running cw at 632.8 nm wavelength. Camera set to minimum useful gain for saturation test and maximum useful gain for lowest signal test.
(2) Below 350 nm, the camera sensitivity drops significantly and detector deterioration may occur. A UV image converter is recommended. Although our silicon cameras have shown responses out to 1320 nm, it can cause significant blooming which could lead to significant errors of beam width measurement.

Beam Sampler Specifications

	LBP2-SAM-UV2	LBP2-SAM-VIS2	LBP2-SAM-NIR2	LBP2-SAM-BB2
Spectral Range (nm)	266-355	400-700	1064	190-1550
Wedge Material	UVFS	BK7	BK7	UVFS
Antireflection Coating	<1%	<1%	<1%	<1%
Clear Aperture (mm)	17.5			
Optical Density Filters (included)	ND0.3, 0.7,1.0,2.0,3.0. 4.0			
Filter Slides	3	3	3	3
Maximum Allowable Input to Filter (W/cm2)	±2	±2	±2	±2
Max Energy Density (J/cm2)	100	50	50	50
Operating Mode	CW and Pulsed			
Max Energy Density (J/Cm^2)	1 on ND Filter	1 on ND Filter	1	1
Power Range (W)	10nW-400			

LBP2 Laser Beam Profiler

Software Features

Features Overview	Designed for entry level or basic profiling needs
	Supports our patented Ultracal algorithm plus
	Auto-setup and Auto-exposure capabilities
	Support for high and low resolution USB cameras
	Simultaneous 2D and 3D displays
	Multi-instance, multi-camera use
	Supports Satellite windows on multiple monitors
	Continuous zoom scaling in both 2D and 3D
	Camera ROI support
	Manual and Auto-aperturing to reduce background effects
	Pass/Fail on all results items, w/multiple alarm options
	Results logging capabilities in a reloadable
	Industry standard data file format
	Configurable Report Generator that allows cut and paste of results, images and settings.
	Supports English, German, Japanese and Chinese Windows OS in 64bit . Multilingual GUI in English, Japanese and Chinese.
Quantitative Calculations; Basic Results	(per ISO 11145, 11146-1/-3, and 13694)
Power/Energy Results	Total power or energy, Peak power/energy density, Min. Fluence
Spatial Results	Peak and Centroid locations
	Beam width (Second Moment (D4s), Knife Edge 90/10 or user selectable level, Percent of Peak (User selectable), Percent of Total Energy (User selectable), Encircled power smallest slit @ 95.4, Moving Slit (User Selectable))
	Beam diameter (Average diameter (based on x/y widths), Second Moment (D4s)
	Elliptical Results (Elliptical orientation, Ellipticity, Eccentricity
Statistical Analysis	Performed on all measurement functions with on-screen display
	• Choices of intervals
	• Manual start/stop
	• Time from 1 second to 1000 hours
	• Frames from 2 to 99,999
	• Measurements reported
	• Current frame data, Mean, Standard Deviation, Minimum, Maximum of each calculation performed
File types	Industry Standard HDF5 data and setup file format which are compatible in third party applications such as MatLab and Mathmatica
	Math program and Excel compatible ASCII-csv results files
	Graphics in jpg file format
	A user defined single file output that can contain settings, beam displays, beam profiles, results in either .pdf or .xps file formats
Printing	Images, reports, results, statistics and setup information
	Option to print many frames in a single operation
	WYSIWYG images
Pass/Fail	Set Maximum/Minimum limits on all calculations and statistics
	Red/Green font color indication on result items
	Multiple choices for indication of failed parameters, including TTL pulse for external alarm
	Master pass/fail which triggers alarm on any failure
	USB signal, beep, stop, and log alarm options
Logging	Results in ASCII-csv
	Continuous Logging
	Time Interval Logging
	Frame Count Logging
	Pass/Fail Sampling
Exporting	Convert frame buffer data to third party format
	Export a user specified number of frames from the buffer
	Export Image Data: ASCII-cvs
	Export Results: ASCII-csv
	Export Picture: jpg, gif, tiff, bmp, png file formats supported
	Export Image Data in Aperture

mks | Newport™

www.newport.com

DS-081601 LBP2 Serial Laser Beam Profiler Datasheet_05/21