LBP2-SAM Series

Beam Sampler for C-mount Cameras

P/N LBP2-SAM-UV, LBP2-SAM-VIS, LBP2-SAM-IR and LBP2-SAM-BB

User Notes

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Notice

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User Notes

LBP2-SAM and camera

The LBP2-SAM beam sampler attachment for C-mount, CS-mount, or Ophir mount cameras allow you to measure laser beams with diameters up to 15mm and powers ranging from 10mW to ~400W[1]. 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 oncoming beam from the front surfaces of a pair of wedges through 90 degrees into the camera. Approximately 99% of the beam is transmitted through the beam sampler with .01% passed on to the camera[2]. A set of adjustable ND filters are provided to make final intensity adjustments to the beam before it reaches the camera imager.

If additional attenuation is needed, an external wedge (P/N SPZ17015 or SP90273) may be mounted at the input port; however this 3rd wedge will cause polarization selectivity when the beam is significantly polarized different in the S and P planes.

[1] 0.5mW to ~400W for LBP2-SAM-BB
[2] The LBP2-SAM-BB passes 0.25% to the camera.

Alternatively, two LBP2-SAMs can be coupled in series providing up to 10^{-8} attenuation[3].

Note: If operating with pulsed lasers you should trigger the camera externally and set the exposure time long enough to collect one laser pulse.

If operating with CW YAG lasers at 1064nm, you must use the cameras set to 7.5Hz fps and maximum exposure timing. You cannot use the exposure control to reduce beam amplitude without causing image blooming.

LBP2-SAM components

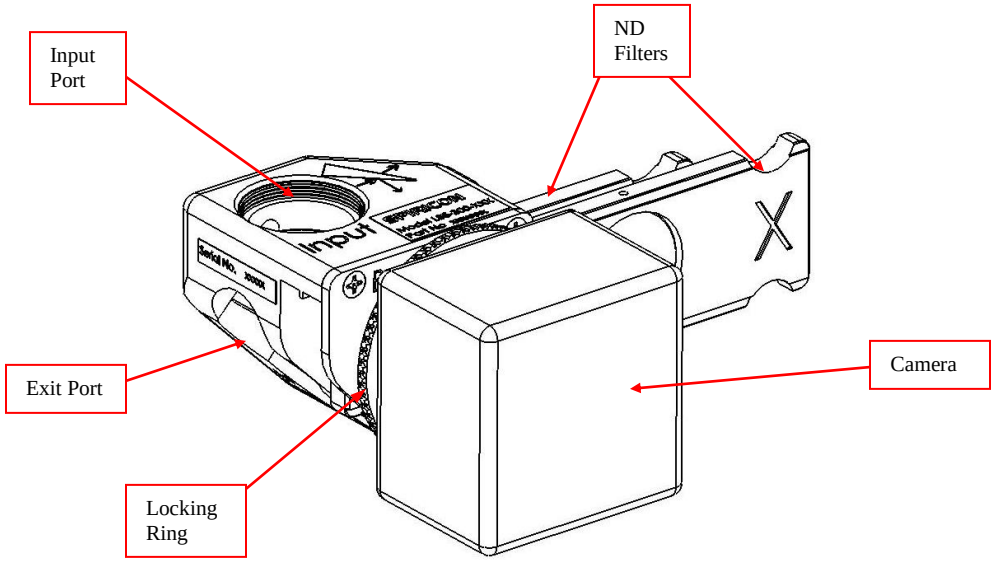


Figure 1

Installation and Setup:

1. The LBP2-SAM is attached to the camera as shown in Figure 1. An adjustable locking ring is provided so that the beam sampler can be oriented with the input port to the right, left, up, or down as required.

   WARNING: You must provide a beam stop for the laser beam that passes through the beam sampler. The beam stop must be able to withstand the continuous power/energy of the input beam.

   Position the LBP2-SAM so that the laser beam will enter the center of the input port. The beam will exit the LBP2-SAM turned approximately 5 degrees in the direction shown in Figure 2. Provision must be made to safely contain the transmitted beam. An optional beam dump is available to contain the beam if required.

[3] $6x10^{-6}$ attenuation for the LBP2-SAM-BB

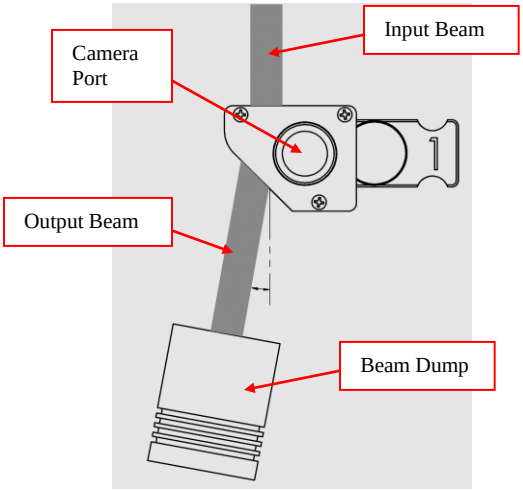


Figure 2

2. Adjust the position of the LBP2-SAM so that the beam will exit the center of the camera port. An alignment fixture consisting of a ground glass plate is provided to assist in aligning visible beams to the camera imager. This plate allows you to directly view a visible or UV beam (UV by secondary emissions). In the NIR, you would need to use an NIR viewer or a visible alignment beam. To use the alignment fixture, screw the fixture onto the camera port and center the image of the beam in the plate. See Figure 3. When the LBP2-SAM is aligned, remove the alignment fixture and attach the camera.

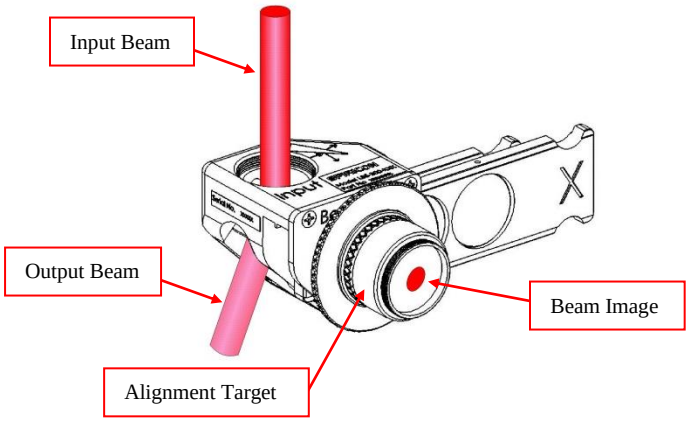


Figure 3

Operation

1. Start the beam profiler software and adjust the ND filter holders for optimum image. See Appendix A for ND filter details. If there are interference effects seen, slight angling of the camera-sampler setup to the beam path may eliminate this.
2. If no picture is seen, check again that the beam is aligned into sampler. If the image is saturated when the maximum ND filters are in place, lower the camera signal below

saturation by reducing the camera exposure setting[4] or removing the camera, adding one or more of the C-mount ND filters provided with the camera, and remounting the camera.

CAUTION: The damage threshold for the ND filters is 50 Watts/cm². Make sure that the power density in the beam as it hits the ND filters does not exceed this amount. If the beam is converging (focusing) rather than collimated, be sure to take this effect into consideration as well.

At power levels >5 W/cm^2 the ND filters may start to thermal lens and deform the observed beam profile.

Ordering Information:

Compact Laser Beam Sampling Systems for C-mount Cameras				
Part No.	**LBP2-SAM -UV**	**LBP2-SAM -VIS**	**LBP2-SAM -NIR**	**LBP2-SAM -BB**
Wavelength	266-355nm	400-700nm	1064nm	190-1550nm
Wedge Material	UVFS	BK7	BK7	UVFS
Wedge Coating	A/R ≤1%	AR ≤1%	AR ≤1%	None
Clear aperture	17.5mm	17.5mm	17.5mm	17.5mm
Wedge ND value, each	ND ≥2	ND ≥2	ND ≥2	ND ~1.3
ND Filters	Inconel	Bulk ND	Bulk ND	One each of the UV, VIS, & NIR sets
ND Values, nominal	.3, .7, 1.0, 2.0, 3.0, 4.0 (Blue holders)	.3, .7, 1.0, 2.0, 3.0, 4.0 (Green holders)	.3, .7, 1.0, 2.0, 3.0, 4.0 (Red holders)	See UV, VIS, and NIR descriptions
Filter Slides	3	3	3	9
Filter Damage[5]	100W/cm² CW 20mJ/cm², 10ns pulse	50W/cm² 1J/cm², 10ns pulse	50W/cm² 1J/cm², 10ns pulse	See UV, VIS, and NIR specifications
Accessories*				
Additional Wedge Splitters	**SPZ17015**	15mm clear aperture		
	SP90273	30mm clear aperture		

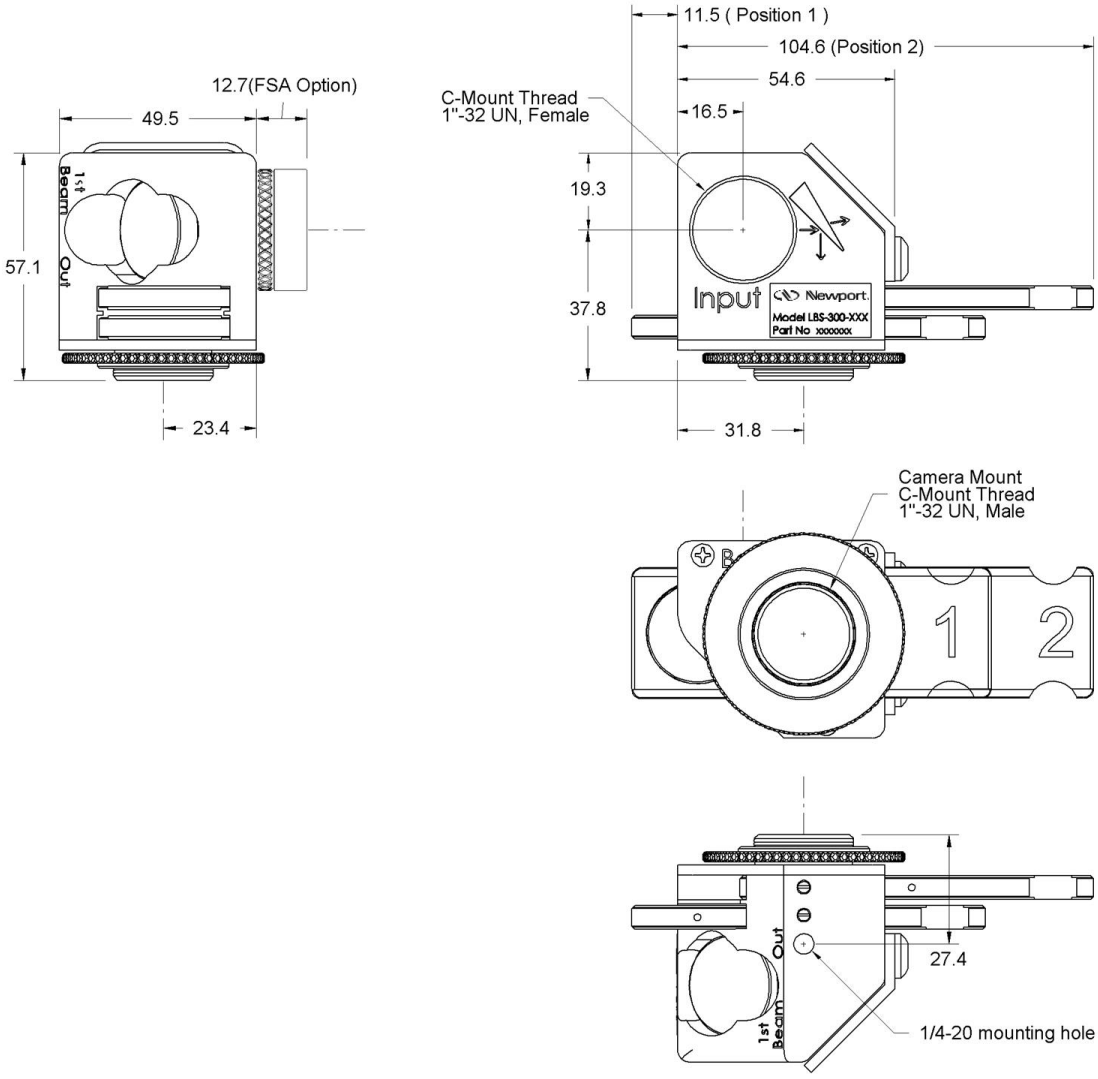
* Available as special order. Consult your Newport or Ophir-Spiricon representative.

[4] Do not use this method with pulsed lasers or 1064nm CW lasers.
[5] ND bulk absorbing filters damage threshold is 50W/cm² but should be used at <5W/cm² to avoid thermal lensing effects.

Features:

- C-mount stackable design compatible with most other C-mountable accessories
- Wedges removable for replacement and cleaning
- Multiple mounting points
- Marked for easy use
- Lenses can be added for Focal Spot Analysis operation
- Power/Energy meter at 1st exit port can measure ~99% (~95%-BB) of input beam
- ND filters are interchangeable with Optional Wedged Variable filters (Wedged filters are provided in pairs and must be used as a set.)

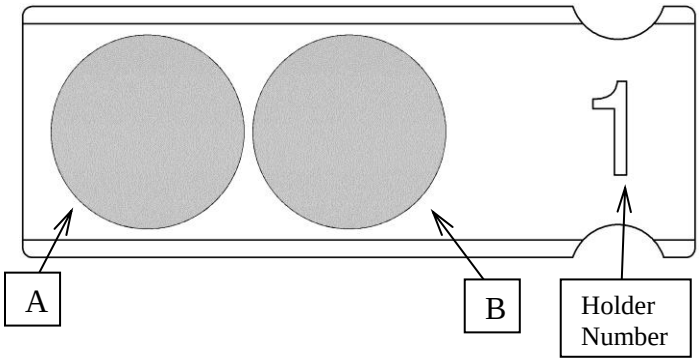
Dimensions



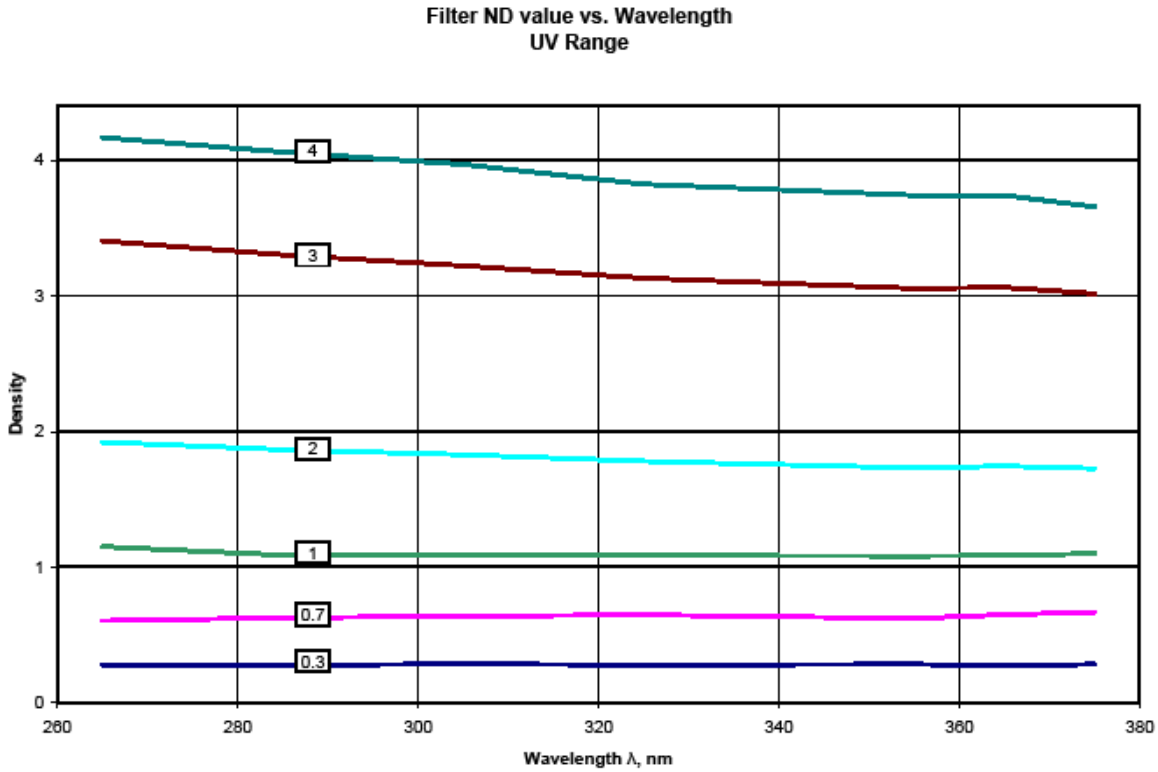
Appendix A
ND Filters

ND filter holders are provided with each LBP2-SAM to allow for final attenuation of the laser beam. Each filter in the holder provides for a different value of attenuation. To use, slide the desired holder into the slot in the LBP2-SAM. A click is felt when the filter is properly aligned with the beam. The holders provided will allow for attenuation of up to ND 6.

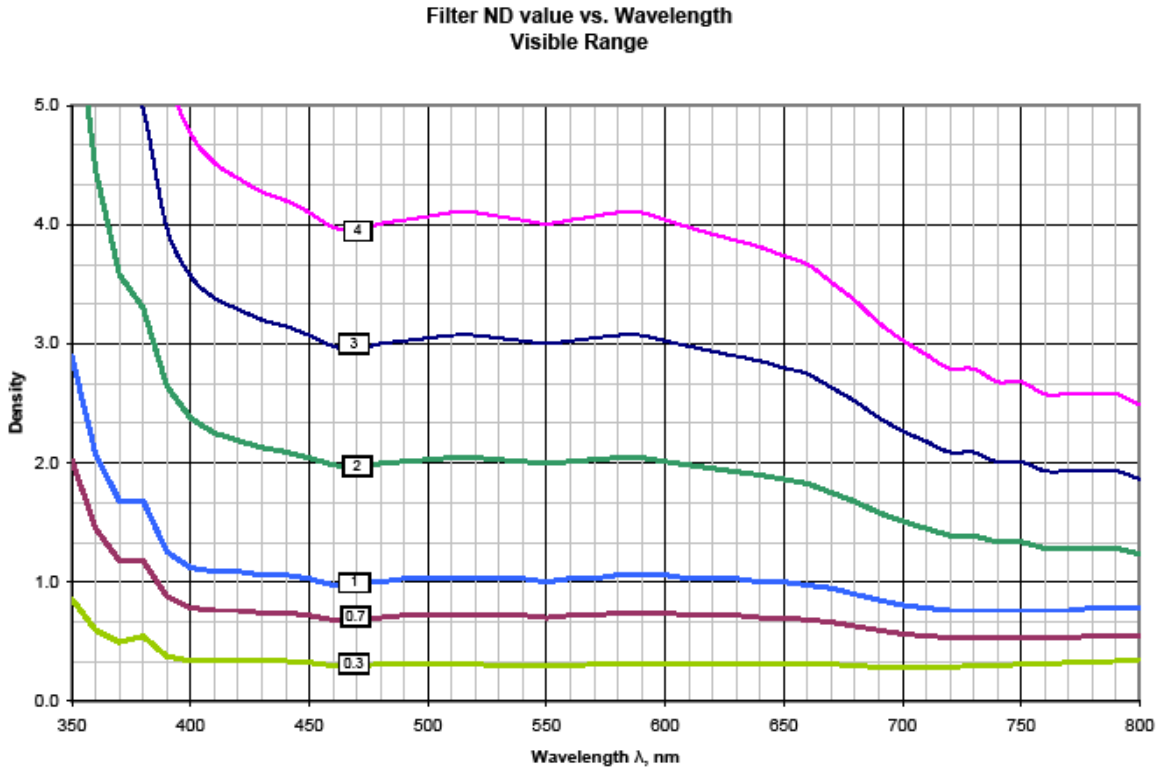
Holder Number	Filter A	Filter B
1	0.3	0.7
2	1	2
3	3	4



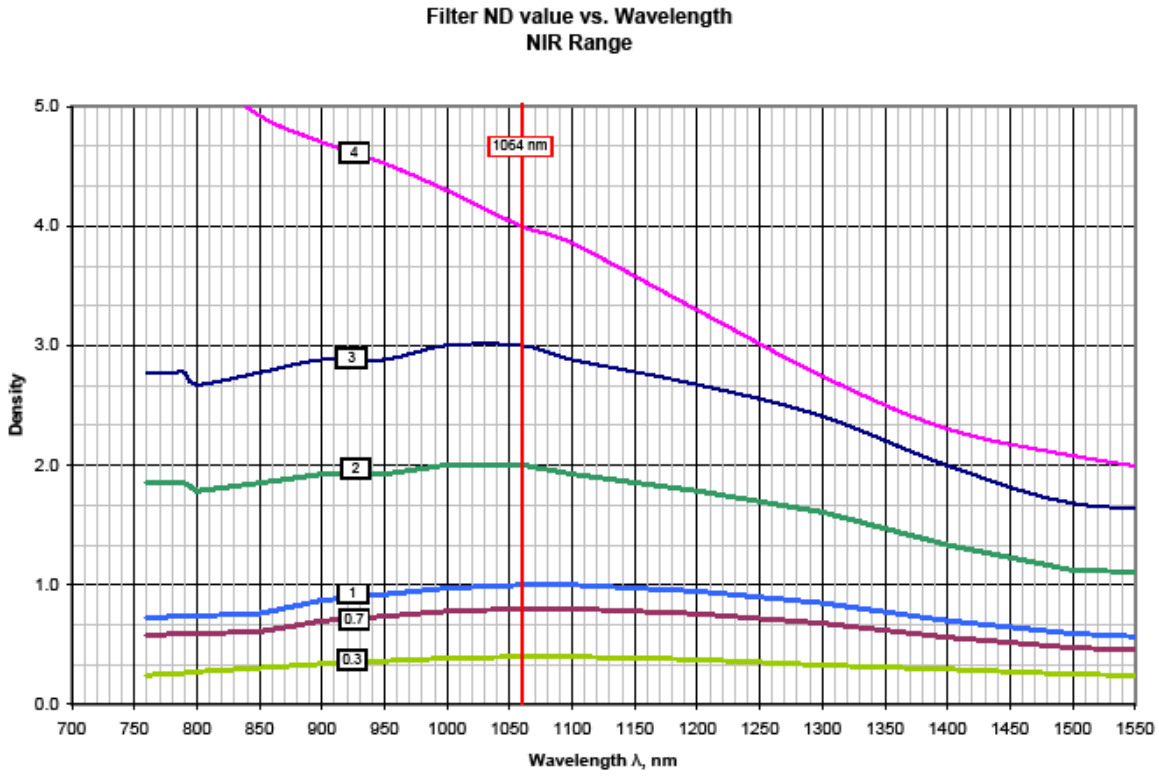
The attenuations at specified wavelengths are available in the charts below.



UV filter set (Blue Holders)



VIS filter set (Green Holders)



NIR filter set (Red Holders)