



LBS-400

User Notes

P/N SP90349, SP90351, SP90354



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Chapter 1 General Information

1.1 Overview

The LBS-400 beam sampler allows you to measure laser beams with diameters up to 1 inch (25.4mm) and powers ranging from 10mW to ~500W. The beam sampler is designed so that the preferential polarization selection effect of a single wedge is canceled 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 99% of the beam is transmitted through the beam sampler with 0.01% passed on to the camera. A set of adjustable filters are provided to make final intensity adjustments to the beam before it reaches the camera imager.

1.2 LBS-400 Components

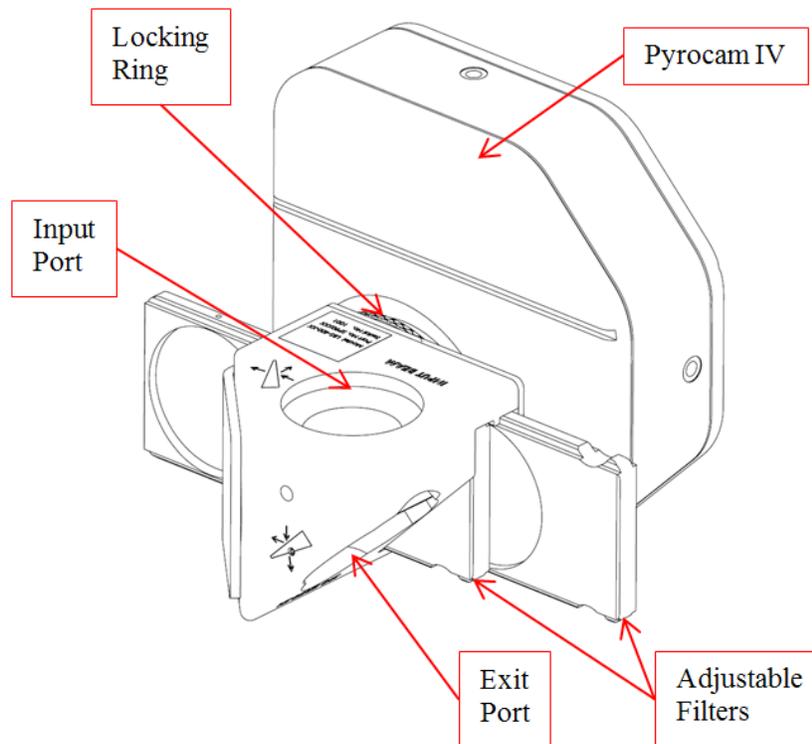


Figure 1

1.3 Installation and Setup

1. The LBS-400 is attached to the Pyrocam as shown in Figure 1 or to the L11059 (not shown). An adjustable locking ring is provided so that the beam sampler can be oriented in any required direction.

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 LBS-400 so that the laser beam will enter the center of the input port. The beam will exit the LBS-400 turned approximately 90 degrees in the direction shown in Figure 2. Provision must be made to safely contain the transmitted beam.

2. Adjust the position of the LBS-400 so that the beam exits the center of the camera port.

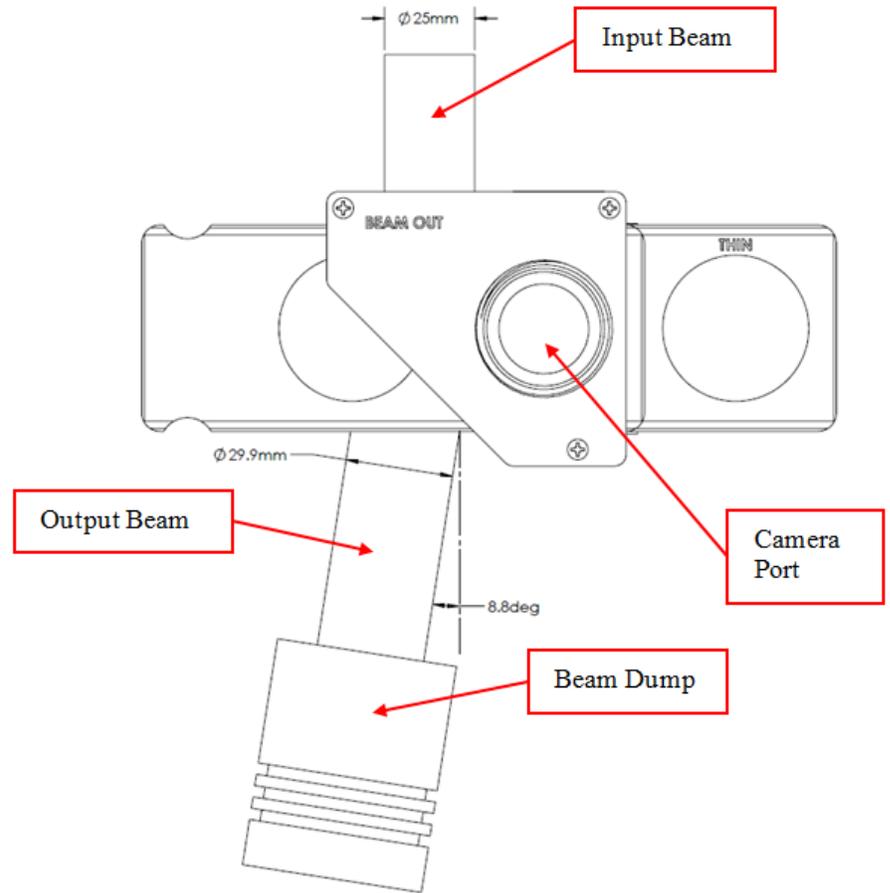


Figure 2

1.4 Operation

1. Start the beam profiler software and adjust the filter sliders for optimum image. See Appendix A for filter details. Interference effects may be eliminated by slight angling of the camera-sampler setup to the beam path.
2. If no picture is seen, check that the beam is aligned into the sampler. If the image is saturated when the maximum filters are in place, lower the camera signal below saturation by reducing the camera exposure setting¹.

CAUTION: The damage threshold for the filters is 5 Watts/cm². Make sure that the power density in the beam as it hits the 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.

¹ Do not use this method with pulsed lasers or 1064nm CW lasers.

1.5 Ordering Information

Laser Beam Sampling Systems for Large Sensor Cameras			
Model	LBS-400-IR	LBS-400-UV	LBS-400-NIR
Part No.	SP90349	SP90351	SP90354
Wavelength	10.6 μ m	193-355nm	1064nm
Wedge Material	ZnSe	UVFS	BK7
Wedge Coating	A/R \leq 1%	A/R \leq 1.5%	A/R \leq 1%
Clear aperture	1.25in (31.75mm)	1.25in (31.75mm)	1.25in (31.75mm)
Filter Material	CaF ₂	Inconel	Bulk ND
Filter OD Values, nominal	0.5, 1.0 (Yellow holders)	0.5, 1.0, 2.0, 3.0 (Blue holders)	0.5, 1.0, 2.0, 3.0 (Red holders)
Filter Slides	2	2	2
Filter Damage²	5 W/cm ² 300J/cm ² , 1ms pulse	100 W/cm ² CW 20mJ/cm ² , 10ns pulse	50 W/cm ² 1J/cm ² , 10ns pulse

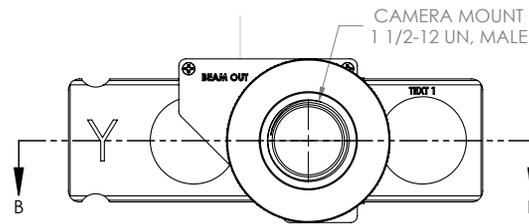
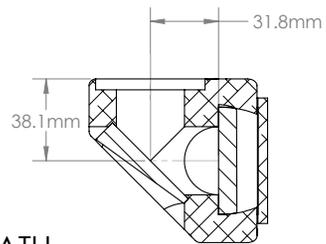
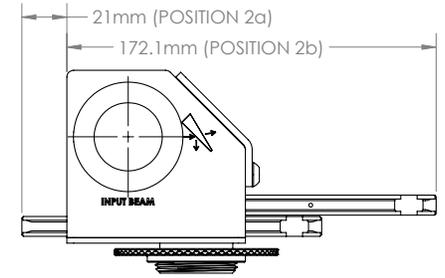
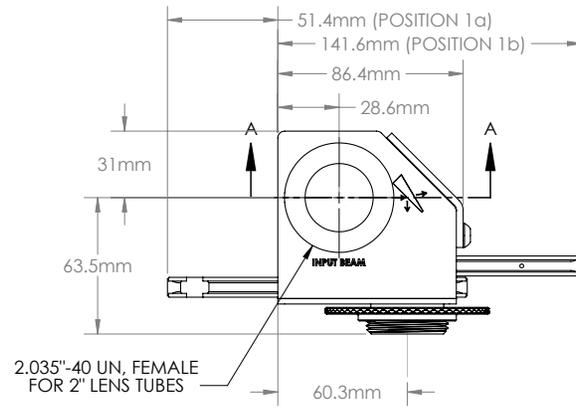
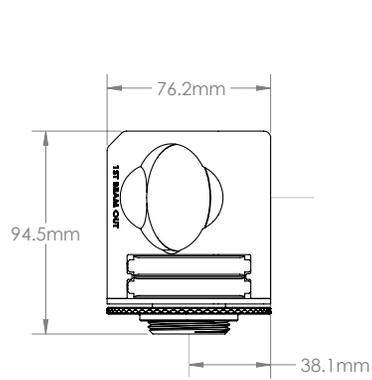
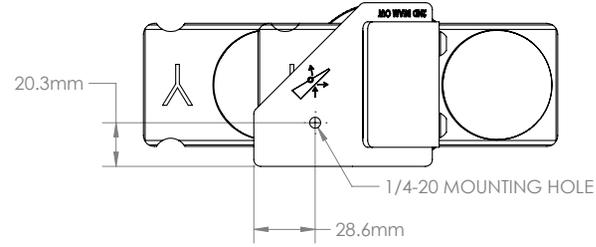
Accessories		
L11059 Adapter	SP90439	For use with L11059
Pyrocam IV Adapter	SP90510	For use with Pyrocam IV
C-Mount Adapter	SP90352	For use with Pyrocam IIIHR

1.6 Features

- 2.035-40 input thread compatible with most 2 inch lens tubes
- Lenses can be added for Focal Spot Analysis operation
- Wedges removable for replacement and cleaning
- Multiple mounting points
- Marked for easy use
- Power/Energy meter at 1st exit port can measure ~99% of input beam

² ND bulk absorbing filters damage threshold is 50W/cm² but should be used at <5W/cm² to avoid thermal lensing effects.

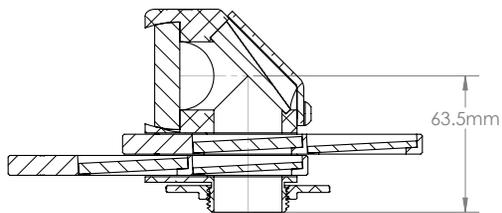
1.7 Dimensions



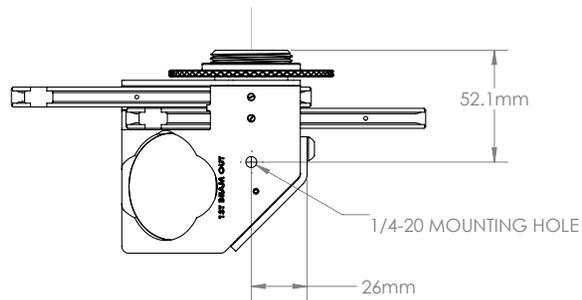
Part No.	Description
SP90351	LBS-400-UV
SP90354	LBS-400-NIR
SP90349	LBS-400-IR

BEAM PATH
TOTAL = 133.4mm

SECTION A-A



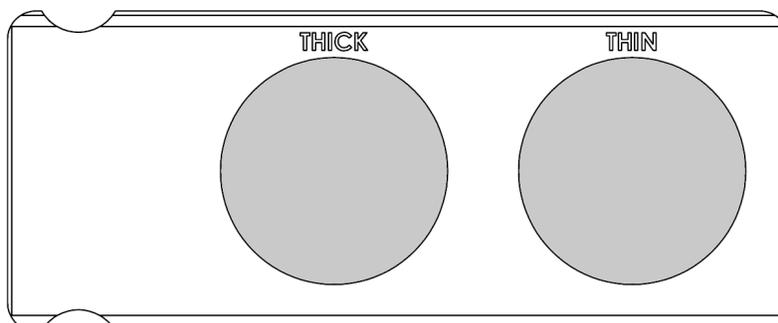
SECTION B-B



Appendix A Filters

Filter holders are provided with each LBS-400 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 LBS-400. A click is felt when the filter is properly aligned with the beam.

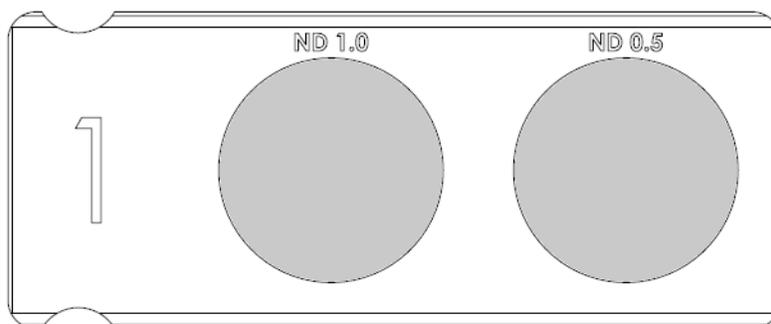
IR version only



Wavelength	Thick	Thin
10.6 μ m (Yellow Slides)	5mm (OD 1.0)	3mm (OD 0.5)

Two slides are provided, each with the same filters. The filter slides can be inserted to make nominal OD values of 0.5, 1.0, 1.5, and 2.0.

UV and NIR version only



Wavelength	Slide #1	Slide #2
193-355nm (Blue Slides)	ND 0.5 and 1.0	ND 2.0 and 3.0
1064nm (Red Slides)	ND 0.5 and 1.0	ND 2.0 and 3.0

Two slides are provided, each with different filters. The filter slides can be inserted to make nominal OD values of 0.5, 1.0, 2.0, 2.5, 3.0, 3.5, and 4.0.

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