

### 3.5.5 Beam Reducers

#### 4X Reimaging Beam Reducer

The 4X Beam Reducer is an imaging system that images the plane 30cm in front of the reducer onto the camera CCD sensor while reducing the size 4 times and inverting it. The beam reducer uses the 3 screw on attenuators provided with the camera. Since the intensity of a beam after reduction will be increased by  $4 \times 4 = 16$  times, it is advisable to attenuate the beam more than you would without beam reduction. This can be done with additional external beam splitters and attenuators which are available (see ordering information). Note that the custom designed beam reducer gives better image quality than tapered fibers since it does not introduce graininess or uneven pixel response. Also the image distortion of  $\sim 1\%$  is considerably lower than with most tapered fibers. The beam reducer is not compatible with CS mount cameras.

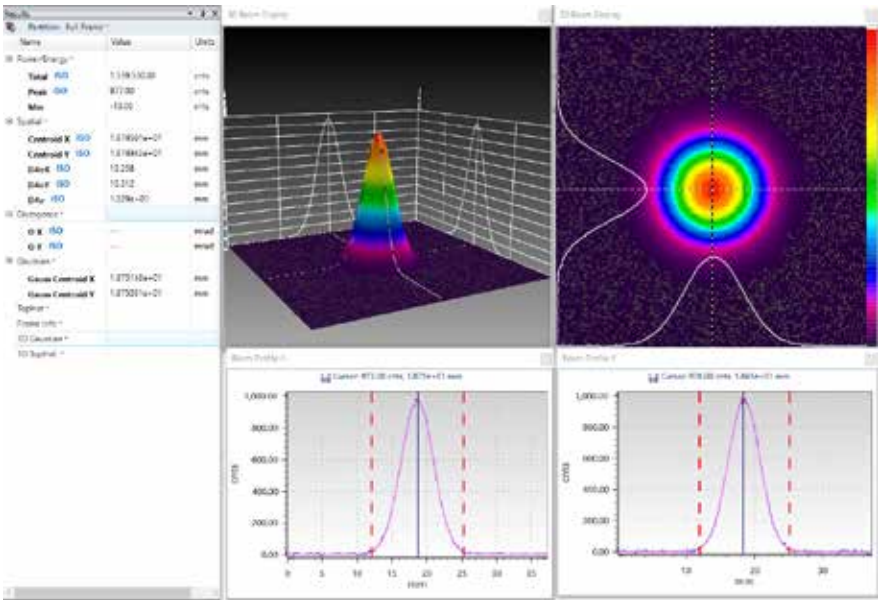
4X beam reducer



#### Specifications

Model	4X beam reducer	
Wavelengths	360-1100nm	
Antireflection Coating	Antireflection coating optimized for 1064nm and 532nm	
Beam reduction Accuracy	± 3%	
Size	Ø60 mm dia x 94mm length	
Aperture	50mm	
Maximum Beam Size	SP932U,SP920s: 28x21.2mm	
Distortion of Beam	Less than 1% over 80% of diameter	
Damage Threshold	30mJ per pulse for nanosecond pulses	
Part number	SPZ17017	
Accessories		
LBS-100 to 4X beam reducer adapter	This adapter enables mounting of the LBS-100 beam splitter / attenuator assembly in front of the 4X beam reducer. The combined assembly can image large high power beams in one unit	SPZ17029
Beam splitter large wedge	Wedge, UVFS, 44X32 mm, uncoated wedge housing mounts to 1/4" thread, 1/2" diameter laboratory rod (not included)	SPZ17018

The 4X beam reducer can be combined with the LBS-100/ LBS- 300s/ LBS- 400 beam splitter/attenuator system to attenuate higher power beams before reducing them in size



Shown is an image of a laser with beam diameter of 13mm. As can be seen, it is easily seen with the SP920s, SP932U camera with the 4X beam reducer.



Optional large wedge beam splitter (SPZ17018)



LBS-100 (SPZ17029) + LBS-100 combined with 4X beam reducer (SP90061+SPZ17017)