

### 3.1.2.3 190-1320nm USB Silicon CCD Cameras

#### SP Series

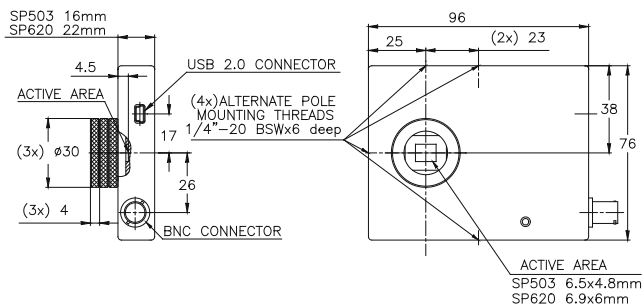
##### Features

- USB 2.0 compatible
- 64dB true system dynamic range - highest in the industry
- Programmable high speed electronic shutter
- Spectral range: 190 - 1320nm
- Gain adjustable to accommodate a wide range of input levels
- Built in optical trigger synchronizes with even the shortest laser pulses.
- Slim profile and multiple mounting options
- Available with BeamGage or BeamStar software



Built-in photodiode trigger

##### SP503U/SP620U



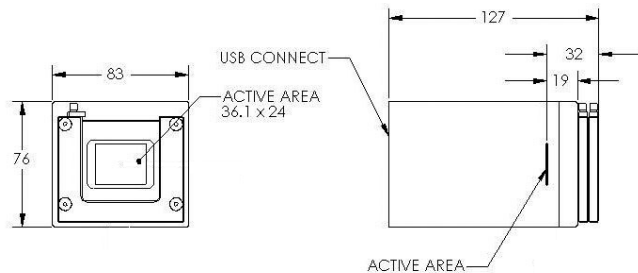
#### L-Series

##### Features

- 35mm format for large beams
- 59dB true system dynamic range
- Spectral range: 190 - 1100nm
- Available only with BeamGage software



##### USB L11058



## USB Cameras for use with Laptop or Desktop PC

Item	Specification		
Model	SP503U	SP620U	USB L11058
Application	½" format, slim profile, wide dynamic range, CW & pulsed lasers, adjustable ROI	1/1.8" format, high resolution, wide dynamic range, pulsed lasers, CW YAG, adjustable ROI	36mm x 24mm, 35mm format for large dia. beams, CW & pulsed lasers, ideal for CW YAG, Adjustable ROI
Spectral Response	190 - 1320nm <sup>(2)</sup>	190 - 1320nm <sup>(2)</sup>	190 - 1100nm <sup>(2)</sup>
Active Area	6.3mm W x 4.7mm H	7.1mm W x 5.4mm H	35mm x 24mm
Pixel spacing	9.9µm x 9.9µm	4.40µm x 4.40µm	9.0µm x 9.0µm
Number of effective pixels	640 x 480	1600 x 1200	4008 x 2672
Minimum system dynamic range	64 dB	62 dB	59dB
Linearity with Power	±1%	±1%	±1%
Accuracy of beam width	±2%		
Frame rates: In 12 bit mode	50 fps at full resolution 80 fps at 320x240	7.5 fps at full resolution 28 fps at 640x480 44 fps at 320x240	3.1 fps at full resolution higher rates with binning and smaller region of interest
Shutter duration	30µs to multiple frame times		10µs to multiple frame times
Gain control	43:1 automatic or manual control	29:1 automatic or manual control	14:1 manual control LBA only
Trigger	<ol style="list-style-type: none"> <li>1. BNC connector accepts positive or negative trigger. LED on camera indicates triggering. Will synchronize with laser repetition rates up to 1KHz. Built in pre-trigger allows synchronization to even sub-nanosecond pulses.</li> <li>2. Same connector can provide trigger out to synch laser. Supports programmable delay on Strobe Out</li> <li>3. Same connector accepts photodiode trigger (see below)</li> </ol>		Supports both Trigger In and Strobe Out.
Photodiode trigger	Optional photodiode trigger available: P/N SPZ17005		N/A
Saturation intensity <sup>(1)</sup>	1.3µW/cm <sup>2</sup> 2.2µW/cm <sup>2</sup>	2.2µW/cm <sup>2</sup>	0.15µW/cm <sup>2</sup>
Lowest measurable signal <sup>(1)</sup>	0.5nW/cm <sup>2</sup>	2.5nW/cm <sup>2</sup>	0.17nW/cm <sup>2</sup>
Damage threshold	50W/cm <sup>2</sup> / 0.1J/cm <sup>2</sup> with all filters installed for <100ns pulse width <sup>(3)</sup>		0.15mW/cm <sup>2</sup>
Dimensions and CCD recess	96mm x 76mm x 16mm CCD recess: 4.5mm below surface	96mm x 76mm x 23mm CCD recess: 4.5mm below surface	83mm x 76mm x 128mm CCD recess: 18.8mm below bezel, 31.75 from ND filter holder
Image quality at 1064nm	Pulsed with trigger synch - excellent Pulsed with video trigger - good CW - poor	Pulsed with trigger synch - excellent Pulsed with video trigger - good CW - good	Pulsed with trigger synch - excellent Pulsed with video trigger - good CW - good
Operation mode	Interline transfer progressive scan CCD		
Software supported	BeamGage or BeamStar		BeamGage
PC interface	USB 2.0		
Notes:	<p>(1) Camera set to full resolution at maximum frame rate and equivalent exposure times, running CW at 632.8nm wavelength. Camera set to minimum useful gain for saturation test and maximum useful gain for lowest signal test.</p> <p>(2) May be useable for wavelengths below 350nm but sensitivity is low and detector deterioration may occur. Therefore UV image converter is recommended. For operation at 1300nm sensitivity is low and short wavelength blocking filter SPZ08242 is recommended.</p> <p>(3) This is the damage threshold of the filter glass of the filters. Assuming all filters mounted with ND1 (red housing) filter in the front. Distortion of the beam may occur with average power densities as low as 5W/cm<sup>2</sup></p>		