

## 3.3.4.1 190-1100nm Cameras

### 3.3.4.1.1 USB Silicon CMOS Camera

#### SP932U high resolution

##### Features

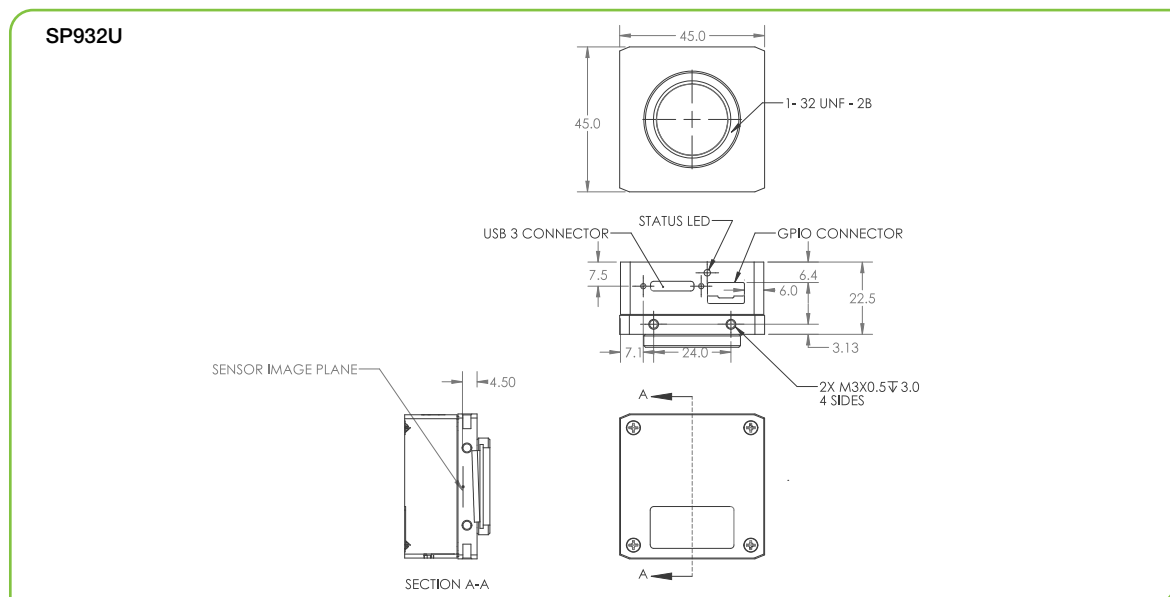
- Specially optimized for NIR and Nd:YAG regions via “Blooming Correction” algorithm
- 1/1.8” format CMOS global shutter imager
- Interface: USB3
- High Resolution 3.45µm pixel size
- 72dB true dynamic resolution, high bitrate
- No Smearing



| Model  | SP932U   |                               |
|--|--|-------------------------------|
| Format                                       | 1/1.8"   |                               |
| Wavelengths <sup>(1)</sup>                   | 190-1100nm   |                               |
| Active area                                  | 7.06mm x 5.3mm   |                               |
| Beam sizes                                   | 34.5µm - 5.3mm   |                               |
| Pixel spacing                                | 3.45µm x 3.45µm  |                               |
| Number of effective pixels                   | 2048 x 1536  |                               |
| Dynamic range                                | 72 dB  |                               |
| Linearity with power                         | <1%  |                               |
| Accuracy of beam width                       | ±2%  |                               |
| Frame rates in 12 bit mode <sup>(2)</sup>    | 24 fps at full resolution  |                               |
| Exposure                                     | 25µs to 2000ms   |                               |
| Gain control                                 | 1.46 dB to 256 dB  |                               |
| Trigger                                      | Hardware/Software Trigger & Strobe Out   |                               |
| Photodiode trigger (Optional) <sup>(3)</sup> | Si response: SP90408   |                               |
| Saturation intensity <sup>(4)</sup>          | 32µW/cm <sup>2</sup> at 633nm, 500µW/cm <sup>2</sup> at 1064nm                             |                               |
| Lowest measurable signal <sup>(4)</sup>      | 0.2nW/cm <sup>2</sup>  |                               |
| Damage threshold <sup>(5)</sup>              | 50W/cm <sup>2</sup> / 1J/cm <sup>2</sup> for < 100ns pulse width                           |                               |
| Dimensions                                   | 45 mm x 45 mm x 22.5 mm  |                               |
| Imager recess                                | 4.5±0.11mm   |                               |
| Image quality at 1064nm                      | Pulsed with trigger sync - excellent<br>Pulsed with video trigger - good<br>CW - excellent |                               |
| Operation mode                               | CMOS, Global shutter   |                               |
| PC interface                                 | USB 3.0  |                               |
| OS supported                                 | Windows 10 (64), BeamGage 6.17 required  |                               |
| Compliance                                   | CE, UKCA, China RoHS   |                               |
| <b>Ordering Information</b>                  |  |                               |
| Supported software                           | Item   | P/N                           |
| BeamGage Professional                        | BGP-USB3-SP932U  | <b>SP90607</b> <sup>(6)</sup> |
| BeamGage Standard                            | BGS-USB3-SP932U  | <b>SP90606</b> <sup>(6)</sup> |

Notes:

- (1) The camera's natural response is from 300nm through 1100nm. At wavelengths above 1000 nm and BeamGage “Blooming correction” function needs to be activated. To measure effectively below 300nm, please make use of Ophir UV converter, otherwise the sensitivity is too low and the measurement accuracy may degrade.
- (2) Dependent on PC processor and graphics card performance. Frame rate is reduced when the Blooming Correction algorithm is active and can be increased using smaller aperture or the binning option.
- (3) For more information please see “Optical Camera Trigger” catalog page
- (4) Camera set to full resolution at maximum frame rate at 633nm and 1064nm wavelength. Camera set to minimum gain and 1ms exposure time for saturation test and 35ms exposure time for the lowest signal test.
- (5) This is the damage threshold of the filter glass. Assuming all filters are mounted with ND1 (red housing) filter in the front. Distortion of the beam may occur with average power densities of 5W/cm<sup>2</sup> for beam size 5mm, 10W/cm<sup>2</sup> for 2mm beam, and >30W/cm<sup>2</sup> for 1mm beam.
- (6) Comes with USB 3.0 cable, Trigger cable and 3 ND filters.



### 3.3.4.1.2 USB Silicon CCD Cameras

#### SP920s high resolution

##### Features

- 1/1.8" imager format
- USB Interface
- Small camera size
- >60dB true dynamic resolution



| Model  | SP920s  |                               |
|--|---|-------------------------------|
| Format                                       | 1/1.8"  |                               |
| Wavelengths <sup>(1)</sup>                   | 190 - 1100nm  |                               |
| Active area                                  | 7.1mm x 5.3mm   |                               |
| Beam sizes                                   | 44µm - 5.3mm  |                               |
| Pixel spacing                                | 4.4µm   |                               |
| Number of effective pixels                   | 1624 x 1224   |                               |
| Dynamic range                                | 60 dB   |                               |
| Linearity with power                         | ±1%   |                               |
| Accuracy of beam width                       | ±2%   |                               |
| Frame rates in 12 bit mode <sup>(2)</sup>    | 15 fps at full resolution   |                               |
| Shutter duration                             | 70µs to multiple frames   |                               |
| Gain control                                 | 0 dB to 24 dB   |                               |
| Trigger                                      | Hardware/Software trigger & strobe out  |                               |
| Photodiode trigger (Optional) <sup>(3)</sup> | Si response: SP90408  |                               |
| Saturation intensity <sup>(4)</sup>          | 32µW/cm <sup>2</sup>  |                               |
| Lowest measurable signal <sup>(4)</sup>      | 1nW/cm <sup>2</sup>   |                               |
| Damage threshold <sup>(5)</sup>              | 50W/cm <sup>2</sup> / 1J/cm <sup>2</sup> with all filters installed for < 100ns pulse width |                               |
| Dimensions                                   | 29 mm x 29 mm x 29.5 mm   |                               |
| CCD recess                                   | 4.5 mm  |                               |
| Image quality at 1064nm                      | Pulsed with trigger sync - excellent<br>Pulsed with video trigger - good<br>CW - good       |                               |
| Operation mode                               | Interline transfer C  |                               |
| PC interface                                 | USB 3.0   |                               |
| OS supported                                 | Windows 7 (64) and Windows 10   |                               |
| Compliance                                   | CE, UKCA, China RoHS  |                               |
| <b>Ordering Information</b>                  |   |                               |
| Supported software                           | Item  | P/N                           |
| BeamGage Professional                        | BGP-USB3-SP920s   | <b>SP90550</b> <sup>(6)</sup> |
| BeamGage Standard                            | BGS-USB3-SP920s   | <b>SP90549</b> <sup>(6)</sup> |

Notes:

(1) The camera's natural response is from 340nm through 1100nm. To measure effectively below 340nm, please make use of one of our UV converters. Otherwise the sensitivity is too low and the measurement accuracy may degrade.

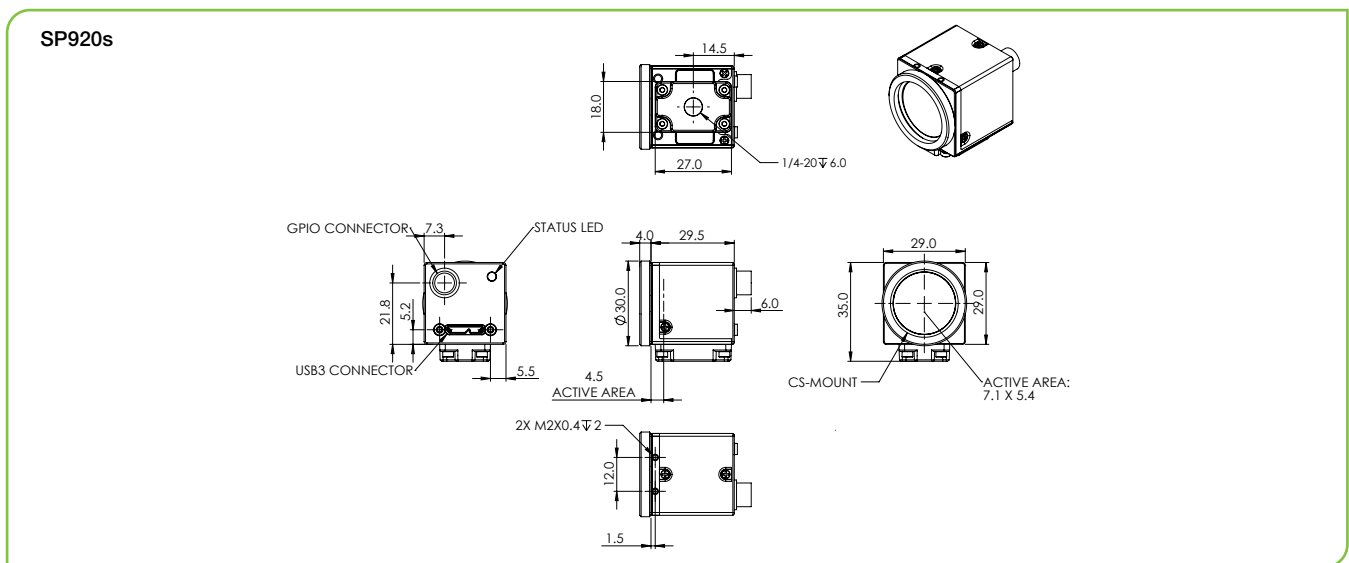
(2) Highly dependent on PC processor and graphics adapter performance.

(3) For more information please see "Optical Camera Trigger" catalog page

(4) Camera set to full resolution at maximum frame rate at 633nm CW wavelength. Camera set to minimum useful gain and 1ms exposure time for saturation test and maximum useful gain and 35ms exposure time for lowest signal test.

(5) 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 of 5W/cm<sup>2</sup> for beam size 5mm, 10W/cm<sup>2</sup> for 2mm beam and >30W/cm<sup>2</sup> for 1mm beam.

(6) Comes with USB 3.0 cable, Trigger cable and 3 ND filters.



### 3.3.4.1.3 Large Format USB Silicon CCD Cameras

#### LT665

##### Features

- Large 1" imager format
- High resolution
- High speed
- 54dB true dynamic resolution



#### L11059

##### Features

- 35mm x 24mm imager format
- Highest resolution
- Programmable high speed electronic shutter
- 59dB true dynamic resolution



Comes with 3 ND filters: (ND1, ND2, ND3)  
ND3 mounted in camera

| Model  | LT665   | L11059  |                |                               |
|--|---|---|----------------|-------------------------------|
| Format                                       | 1"  | 35mm  |                |                               |
| Wavelengths <sup>(1)</sup>                   | 190 - 1100nm  | 190 - 1100nm  |                |                               |
| Active area                                  | 12.5mm x 10mm   | 35mm x 24mm   |                |                               |
| Beam sizes                                   | 46µm - 9.9mm  | 90µm - 24mm   |                |                               |
| Pixel spacing                                | 4.54µm x 4.54µm   | 9.0µm x 9.0µm   |                |                               |
| Number of effective pixels                   | 2752 x 2192   | 4008 x 2672 <sup>(2)</sup>  |                |                               |
| Dynamic range                                | 54 dB   | 59 dB   |                |                               |
| Linearity with power                         | ±1%   | ±1%   |                |                               |
| Accuracy of beam width                       | ±2%   | ±2%   |                |                               |
| Frame rates in 12 bit mode <sup>(3)</sup>    | 27 fps at full resolution   | 3.1 fps at full resolution  |                |                               |
| Shutter duration                             | 31µs to multiple frames   | 10µs to multiple frame  |                |                               |
| Gain control                                 | 0.8 dB to 56 dB   | 0.8 dB to 56 dB   |                |                               |
| Trigger                                      | Hardware/Software trigger & strobe out  | Supports both trigger & strobe out  |                |                               |
| Photodiode trigger (Optional) <sup>(4)</sup> | Si response: SP90408  | Si response: SP90408  |                |                               |
| Saturation intensity <sup>(5)</sup>          | 14µW/cm <sup>2</sup>  | 160µW/cm <sup>2</sup>   |                |                               |
| Lowest measurable signal <sup>(5)</sup>      | 0.3nW/cm <sup>2</sup>   | 0.17nW/cm <sup>2</sup>  |                |                               |
| Damage threshold <sup>(6)</sup>              | 50W/cm <sup>2</sup> / 1J/cm <sup>2</sup> with all filters installed for < 100ns pulse width | 0.15mW/cm <sup>2</sup>  |                |                               |
| Dimensions                                   | 43mm x 43mm x 65mm  | 83 mm x 76mm x 128mm  |                |                               |
| CCD recess                                   | 17.5mm  | 17.3mm  |                |                               |
| Image quality at 1064nm                      | Pulsed with trigger sync - excellent<br>Pulsed with video trigger - good<br>CW - good       | Pulsed with trigger sync - excellent<br>Pulsed with video trigger - good<br>CW - good |                |                               |
| Operation mode                               | Quad Tap interline transfer CCD   |   |                |                               |
| PC interface                                 | USB 3.0   | USB 2.0   |                |                               |
| OS supported                                 | Windows 7 (64) and Windows 10   |   |                |                               |
| Compliance                                   | CE, UKCA, China RoHS  |   |                |                               |
| <b>Ordering Information</b>                  |   |   |                |                               |
| Supported software                           | Item  | P/N   | Item           | P/N                           |
| BeamGage Professional                        | BGP-USB3-LT665  | <b>SP90378</b> <sup>(7)</sup>   | BGP-USB-L11059 | <b>SP90320</b> <sup>(8)</sup> |
| BeamGage Standard                            | BGS-USB3-LT665  | <b>SP90377</b> <sup>(7)</sup>   | N/A            | N/A                           |

##### Accessories

LBS-300 to L11059 Adapter

**SP90571**

LBS-400 to L11059 Adapter

**SP90439**

##### Notes:

- (1) The camera's natural response is from 340nm through 1100nm. To measure effectively below 340nm, please make use of one of our UV converters. Otherwise the sensitivity is too low and the measurement accuracy may degrade.
- (2) Actual active aperture is 3968 x 2624.
- (3) Highly dependent on PC processor and graphics adapter performance.
- (4) For more information please see "Optical Camera Trigger" catalog page.
- (5) Camera set to full resolution at maximum frame rate at 633nm CW wavelength. Camera set to minimum useful gain and 1ms exposure time for saturation test and maximum useful gain and 35ms exposure time for lowest signal test.
- (6) 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 of 5W/cm<sup>2</sup> for beam size 5mm, 10W/cm<sup>2</sup> for 2mm beam and >30W/cm<sup>2</sup> for 1mm beam.
- (7) Comes with USB 3.0 cable, Power with Trigger cable and 3 ND filters.
- (8) Comes with USB A-B cable, Trigger cable and 3 ND filters.

