



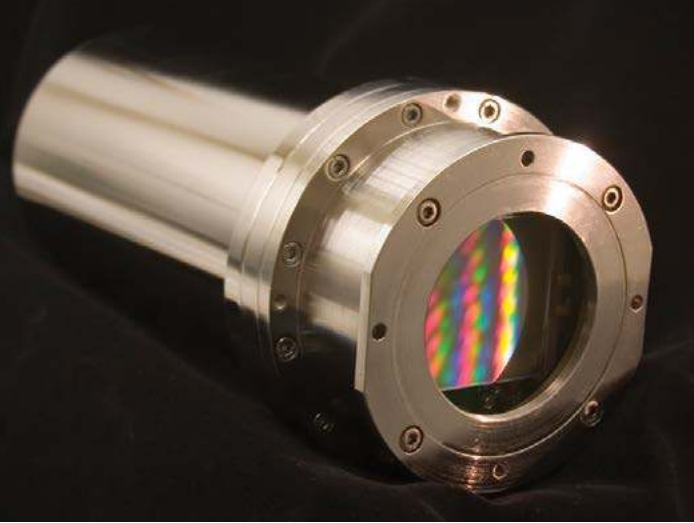
# 800S CCD Camera



SI's 800S camera is designed for uncompromising camera performance in a TEC camera unit. Cooling to  $-60^{\circ}\text{C}$  in the versatile 800S camera body is available with some CCDs. Large CCDs (4k x 4k) with fiber optic tapers can be installed as well, with cooling to  $-20^{\circ}\text{C}$ . Back illuminated CCDs along with industry-leading low read noise creates the perfect camera for low-light level applications such as astronomy, bioluminescence and plate reading for drug discovery.

## Features

- **Available CCD operating temperatures of  $-20$  to  $-60^{\circ}\text{C}$ ,** depends on the variety of CCDs, and fiber optics this camera can accommodate. Water and air cooled models are available.
- **Multiple read speeds available;** from low noise speeds of 100kHz up to four MHz pixel rates.
- **High dynamic range;** low noise performance with 16-bit digitization and high full well provide large dynamic range imaging.
- **Many sensors available;** large sized 4k x 4k, down to 1k x 1k full frame and frame transfer devices available; front or backside illuminated.
- **Binning and region of interest imaging;** high performance with binning, and ROI imaging for small area high speed available.
- **Multi-port readout;** one to four port readout.
- **Power supply options;** both our standard 'desktop' power supply (see next page) and a DC-DC option are available for the 800S camera line.
- **Shutter available;** shutters can be mounted on the camera and driven by the camera itself and configured by software.
- **Fiber optic communication;** standard communication to computer by fiber optic cable to proprietary PCI or PCIe card.
- **Software included with every camera;** SI Image software suite for camera control, data manipulation and archiving. Native file format is FITS. C++ and LabView SDK available upon request.



Shown at left is the custom designed 800S 'vacuum camera', which can be completely encased in a vacuum environment.

### Typical Camera performance 42-40 CCD

Read noise 100kHz	3.6e-
Read noise 200kHz	4.2e-
Read noise 500kHz	5.4e-
Read noise 800kHz	11.7e-
Dark current -35°C	0.05e-/pixel/s
Full well	90ke-
Linearity	<1%, 200e- to 100ke-
CCD size	27.4mm x 27.4mm
CCD pixel size	13.5µm
CCD pixel dimension	2048x2048
Backside AR coatings available	Midband, Broadband, none, Enhanced UV

### Camera Details

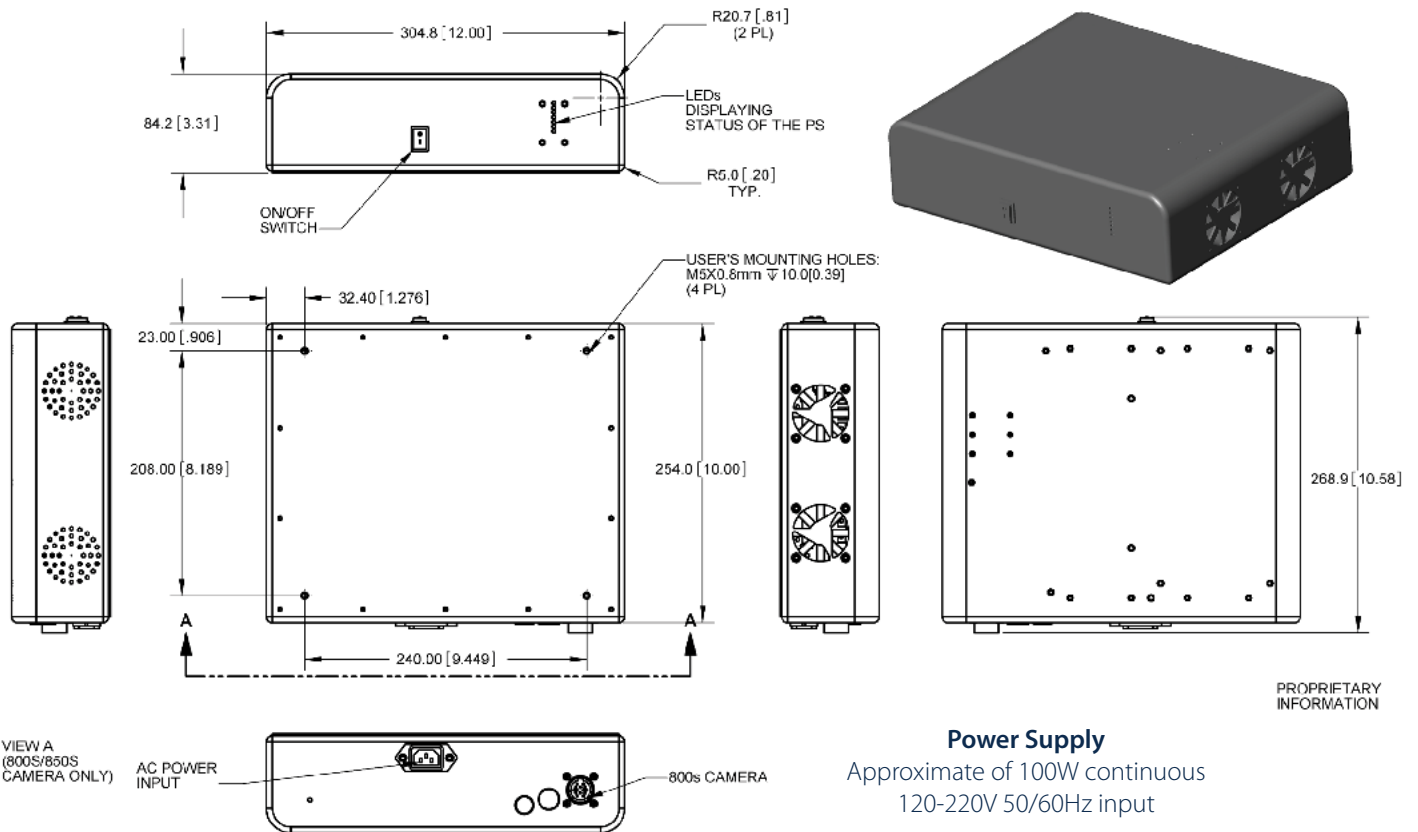
Water cooling required	1 lpm @ 20°C
Window details	Many AR coatings available with custom order. Typical Broadband specs: <1% Reflectivity per surface, 450-800nm
Window heater	Generally unnecessary, but available
CCD to mounting surface	~20mm, depends on CCD and options
Read speeds	Software selectable, customizable
Camera weight	About 6lbs, depending on options

### Typical Camera performance 47-10 CCD

Read noise @ 100kHz	2.8e-
Read noise @ 200kHz	3.3e-
Read noise @ 400kHz	4.5e-
Read noise @ 800kHz	11.0e-
Dark current -35°C	<0.1e-/pixel/s
Full well	100ke-
Linearity	<1%, 200e- to 100ke-
CCD size	13.3mm x 13.3mm
CCD pixel size	13.0µm
CCD pixel dimension	1024x1024
Backside AR coatings available	Midband, Broadband, none, and Enhanced UV

### Typical Camera performance 47-20 CCD

Read noise @ 3MHz, 14-bit	14e-
Dark current -60°C	0.005e-/pixel/s
Full well	90ke-
Linearity	<1%, 200e- to 90ke-
CCD size	13.3x13.3mm (imaging area)
CCD pixel size	13µm
CCD pixel dimension	1024x1024 imaging 1024x1024 frame transfer
Backside AR coatings available	Midband, Broadband, none and Enhanced UV

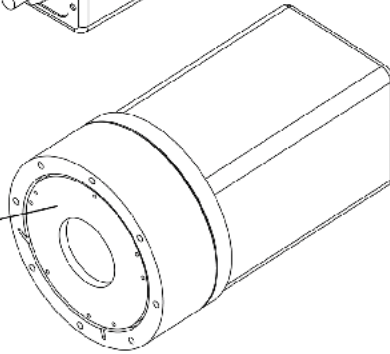
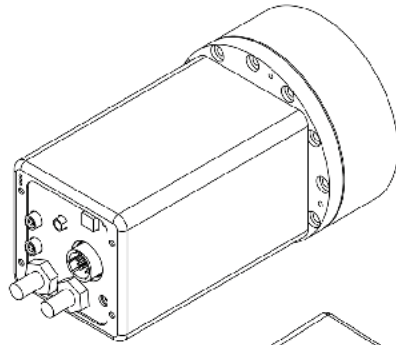
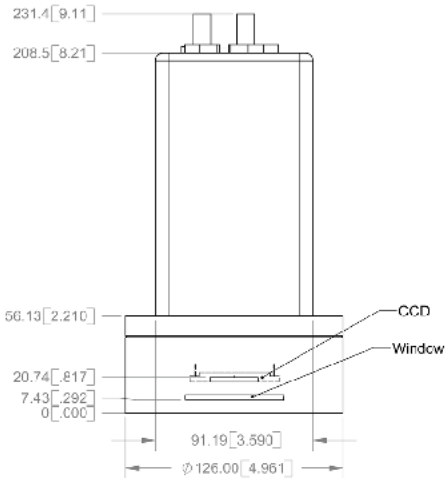


PROPRIETARY INFORMATION

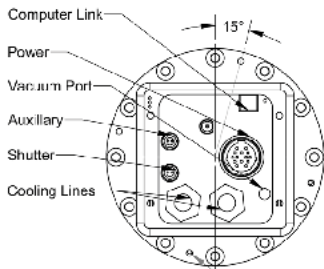
### Power Supply

Approximate of 100W continuous  
120-220V 50/60Hz input

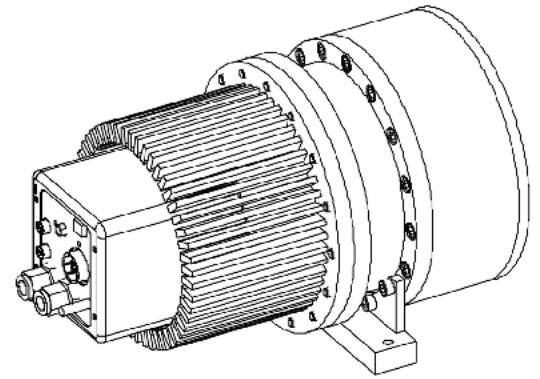
# 800S CCD Camera



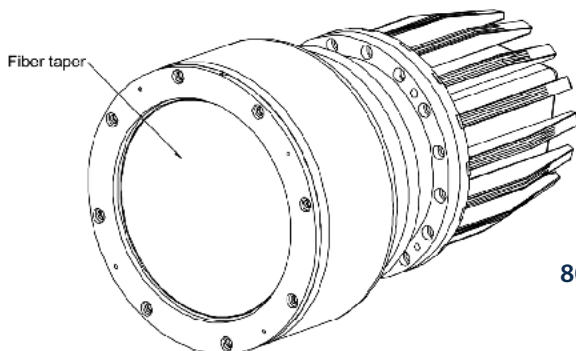
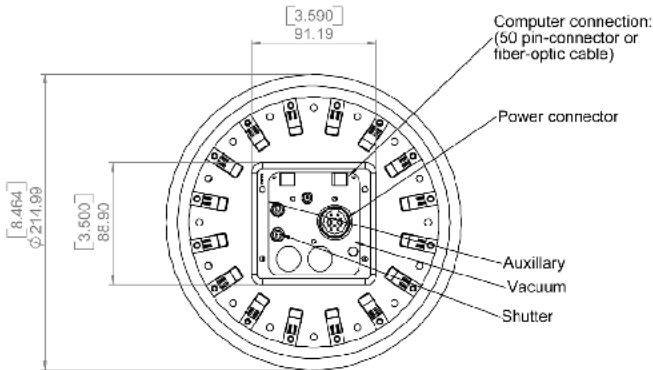
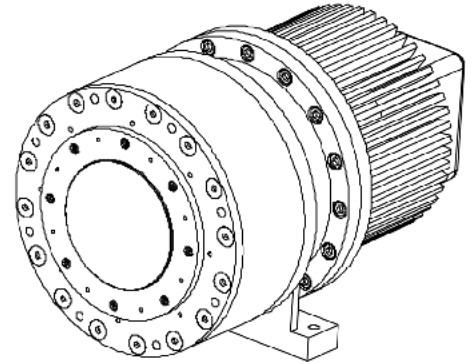
**800S with a 2k x 2k CCD  
with a window and shutter**



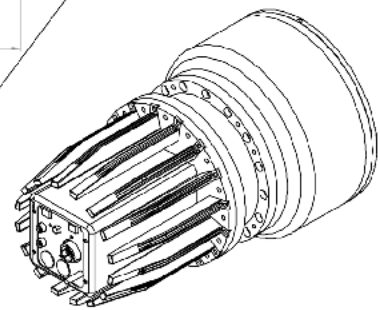
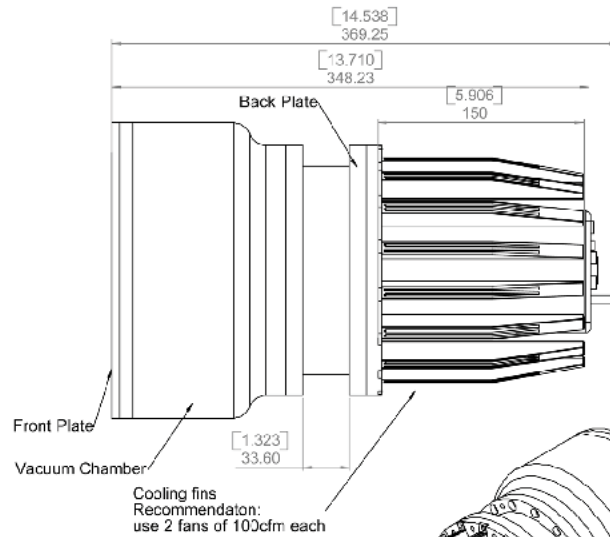
Customer Mounting Holes:  
M5x0.8 - 6H  $\nabla$  10.00 [0.394]  
4 PL EQ SP ON  $\phi$  115.00 [4.528] BC



**800S air cooled back-plate  
with a 4k x 4k CCD and a 1:1  
fiber faceplate**



**800S camera with a 4k x 4k CCD  
bonded to a 2.1:1 fiber optic  
taper, air cooled backplate**



**800 Series cameras** have been extensively used for diagnostics on many large laser systems. The OMEGA laser facility at the University of Rochester's Laboratory for Laser Energetics conducts high energy laser experiments for the inertial confinement fusion community. The versatile 800S camera line has the capability of incorporating many different sensors, fiber optic inputs or windows. This, included with the options for power supply inputs, has given the camera product line wide adoption at the LLE facility.

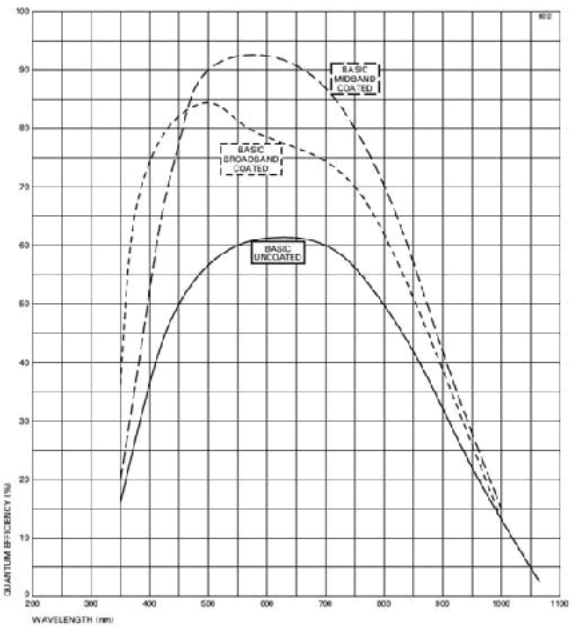


Above: Inertial confinement fusion experiments at the OMEGA laser at LLE.

Credit: Lawrence Livermore National Laboratory

Typical QE performance from e2v sensors shown below. Refer to e2v and other CCD manufacturers for up to date QE and blemish specifications.

**e2v QE Chart**



The **800S** is incorporated in other companies' products for x-ray or faint signal imaging such as that needed for 3D tomography or DNA sequencing. Spectral Instruments specializes in the development and manufacture of custom cameras for OEM and unique applications that can't be purchased off the shelf. Contact SI directly to discuss your imaging needs and define a camera solution for your application.

**Grade 1 CCD Cosmetics (42-40)**

Column Defects	3
Dark pixels	150
Bright pixels	150
Traps	20

CCD cosmetics subject to change  
 Contact SI if other requirements must be met  
 See [www.e2v.com](http://www.e2v.com) for the latest specifications

