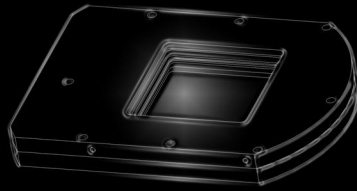
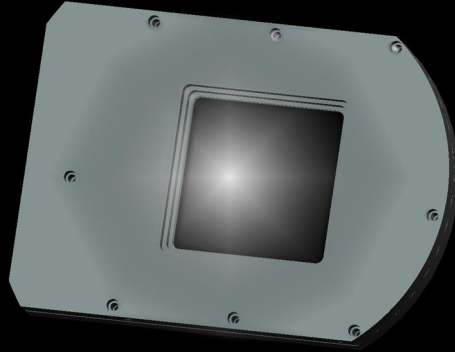


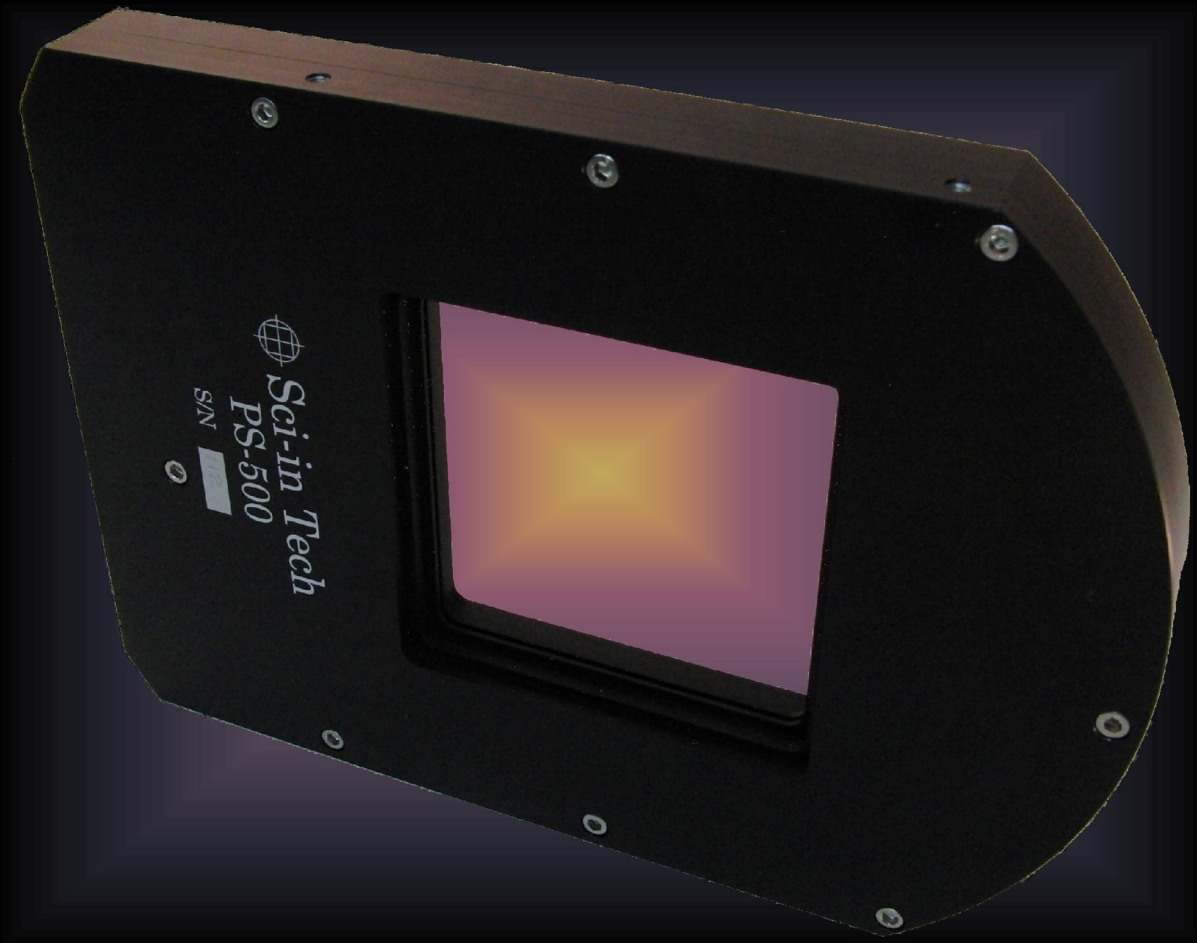
IDEA



MODEL



HARDWARE



Large Aperture  
Photometric Shutters

**What are they?**

Sci-in Tech PS-XXX photometric shutters are RS-232 controlled, or contact-closure assuring compatibility with your imaging software. Precision control provides uniform exposure over the entire aperture with accuracy > 99.9%. Engineered for astronomy robustly constructed with large aperture and small footprint. Standard aperture sizes start at 2.50" square, increasing in increments of 2.50" steps up to 12.50" (2.50", 5.00", 7.50", 10.00", and 12.50"). Custom sizes available upon request.

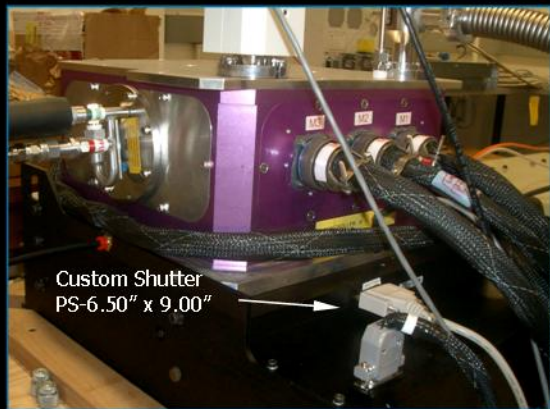
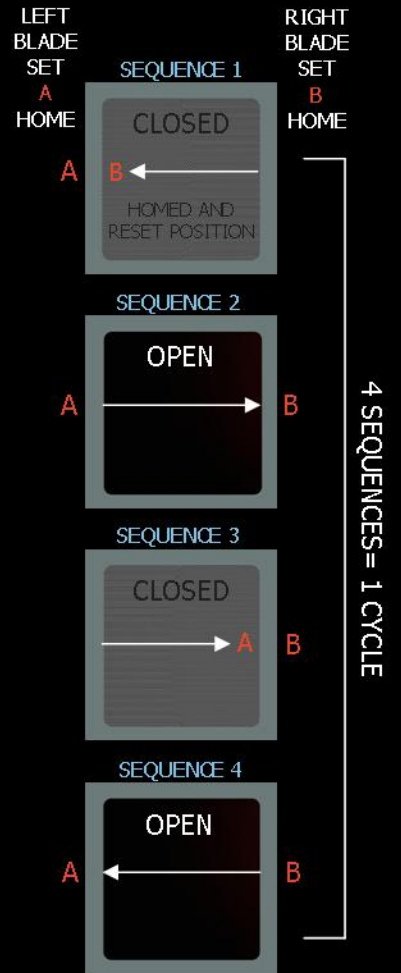
Astronomical imaging can take advantage of using precision shutters to enhance the ability of measuring flux in laboratories or on the sky providing sound repetitive and quantitative measurements. Carbon fiber shutter blades offer a strong safety membrane to protect the camera behind it when closed.

**How do they work?**

These are smart shutters with onboard electronics to apply power only when needed and remove noise for use with astronomical grade CCDs. Two blade sets, one on each side (L & R) of the aperture, move in four sequence steps to complete one cycle. See graphic illustration (right). If power is lost a reset homes the blades to start a new cycle.

The PS-XXX shutters are not snap action. Stepper motors drive blades to ramp up and ramp down to eliminate jarring. Blade traverse is 5 inches (127 mm) per second. PS-250 takes .50 seconds for blades to move across the aperture. PS-500 requires 1.00 second and PS-750 requires 1.50 seconds. The shortest exposure is 30msec, accomplished with a traveling slit. See the video at [www.sciin.com](http://www.sciin.com)

**BLADE MOVEMENT**

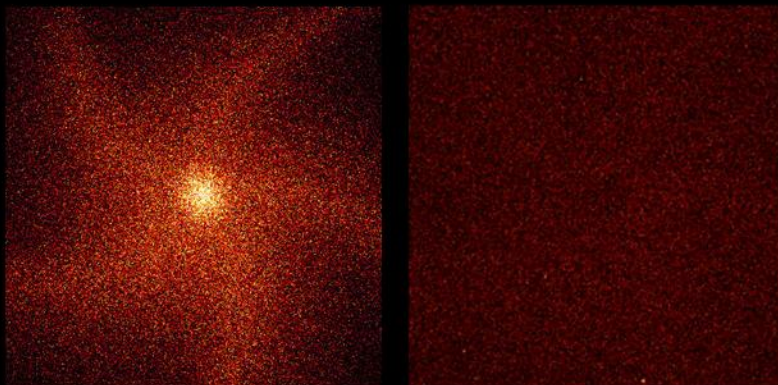


**Shutter Blade Strength**  
Impact test of the PS-250 blade was performed with a 6 foot free-fall drop of a 7/8" wrench (10 oz.) with blades closed. Blade damage occurred but stopped the wrench. The blade was replaced with no other damage to the shutter proving robust quality and cost effectiveness. See the video at [www.sciin.com](http://www.sciin.com)

- Custom options:**
- ◆ Aperture Size
  - ◆ Housing shape and size
  - ◆ Connectors and cabling
  - ◆ Blade speed
  - ◆ Other Control options

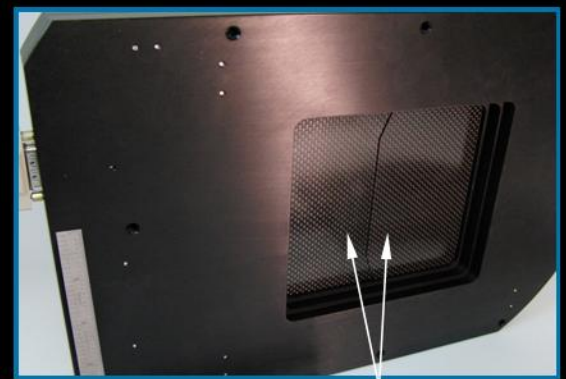
Palomar Transient Factory 12Kx8K Mosaic CCD Camera. Installation is on the 48-inch Samuel Oschin telescope at Palomar Observatory

**FLAT FIELD COMPARISON**

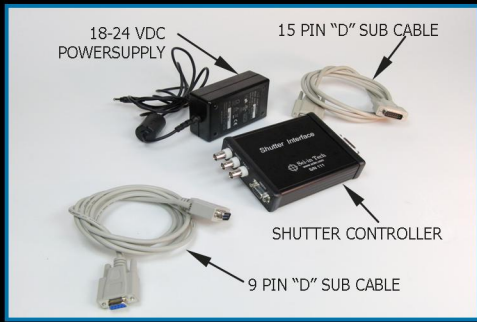


Flat field of iris type shutter

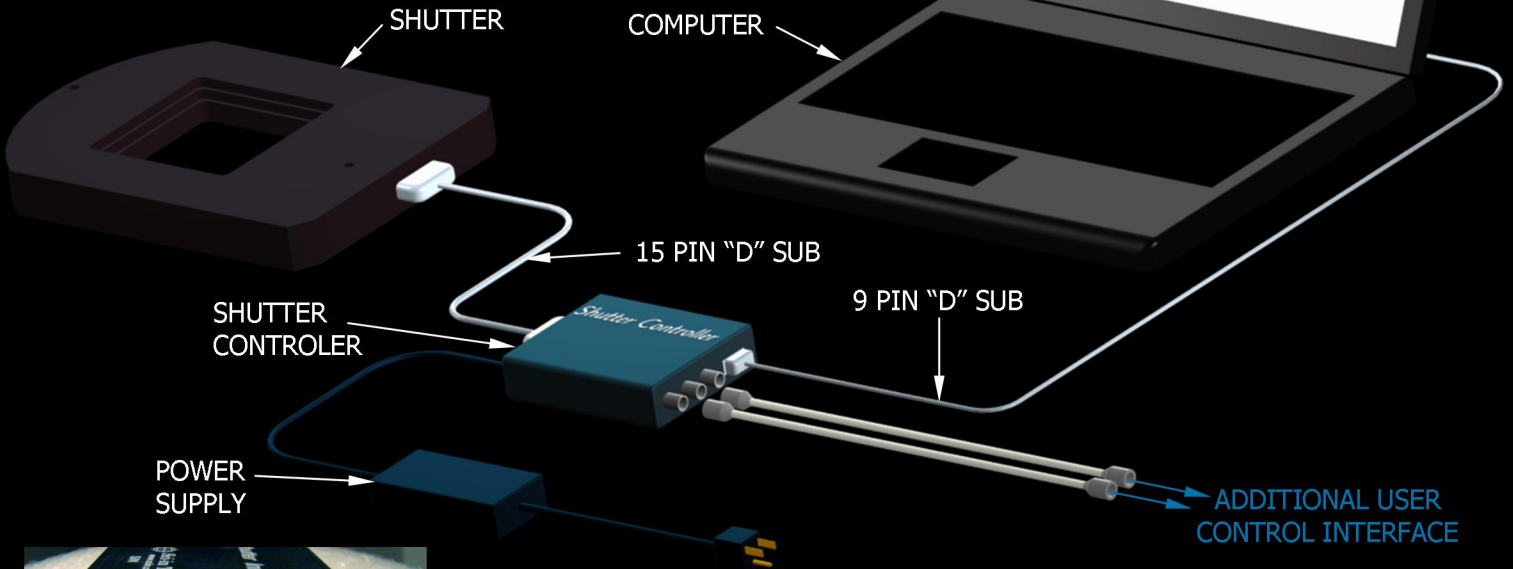
Flat field of PS-250 shutter



PS-500 Carbon-fiber blades

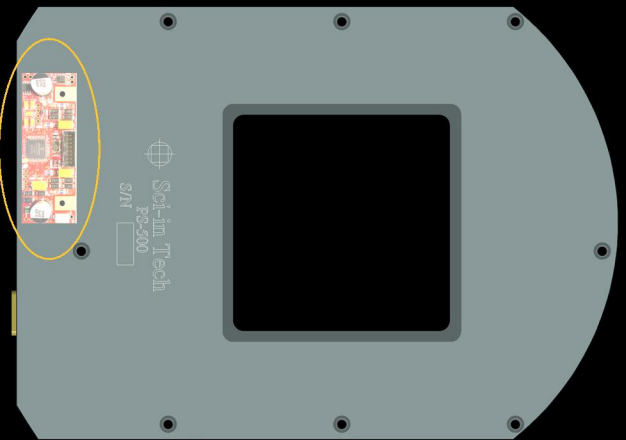


Electronics and hardware supplied with each shutter



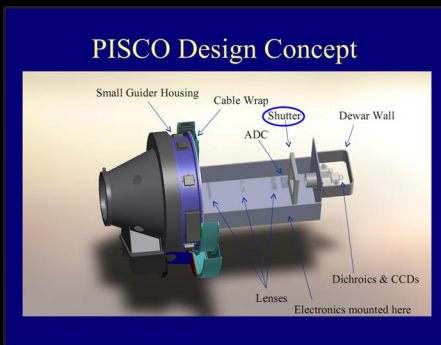
Shutter controller allows choice of operation. RS-232, contact-closure, USB with Opto-Isolator option.

A microprocessor embedded into each shutter provides precision timing for polling and motor control. Electronics engineered for low power and noise for use with astronomical grade CCDs.



All our components are 100% made in the USA.

Power Consumption		
	Single Blade Motion	Double Blade Motion
PS-250	170mA	340mA
All Other PS-XXX	250mA	500mA
Power is consumed only when blades are in motion		



PS-750 mounted on the 6.5 M Baade and Clay Telescope at Las Campanas Obs in Chile.



4Kx4K CCD camera for the 1.1-m Hall Telescope at Lowell Observatory

6.500" x 9.000" APERTURE SIZE

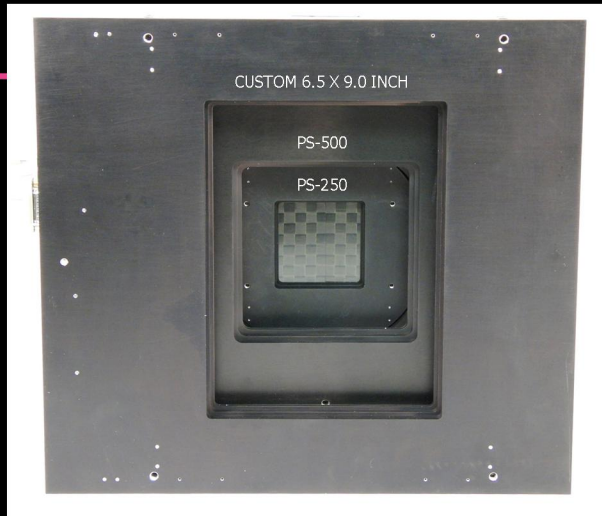
5.000" x 5.000" APERTURE SIZE

2.500" x 2.500" APERTURE SIZE



### PS-XXX SHUTTERS

STRONG AND LIGHTWEIGHT  
 EXCELLENT SAFETY BARRIERS FOR VACUUM WINDOWS  
 SQUARE CORNERS DO NOT VIGNETTE CCD  
 SMALL FOOTPRINT WITH LARGE APERTURE  
 ELECTRONIC NOISE FREE FOR CCD CAMERAS  
 COMPUTER CONTROLLED OR SIMPLE CONTACT-CLOSURE  
 LOW POWER CONSUMPTION  
 EASILY CONFIGURABLE  
 PRECISION MECHANISMS  
 GOOD ENGINEERING SUPPORT PROVIDED  
 GUARANTEED TO PERFORM  
 REFURBISH TO LIKE NEW CONDITION  
 LONG LIVED WITH >2.5 MILLION CYCLES PER REBUILD  
 STRUCTURALLY SOUND



Stacked together aperture size comparison



Visit [www.sciin.com](http://www.sciin.com)

D-U-N-S® Number: 80-805-5201  
 CAGE #5S8G2  
 NAICS #541990  
 SIC 5049  
 PSC 6650  
 FSC 6650

All parts are made  
 in the USA.



All components are  
 purchased in the USA.