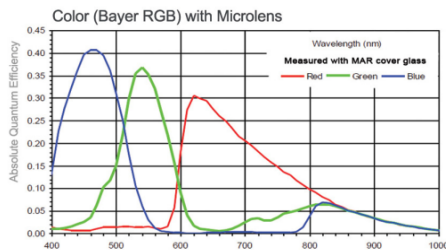


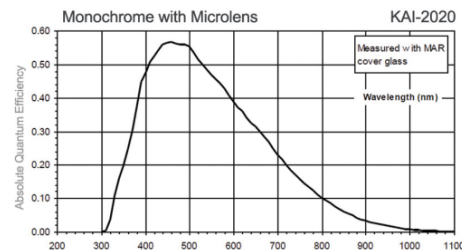
Pressure Sensitive Paint Camera

(Product ID: PSP-CCD-C, PSP-CCD-M)

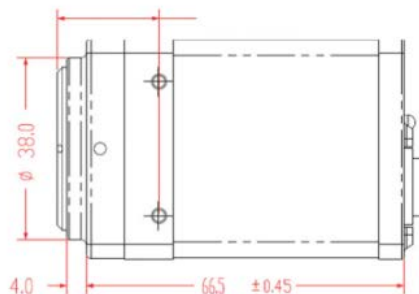
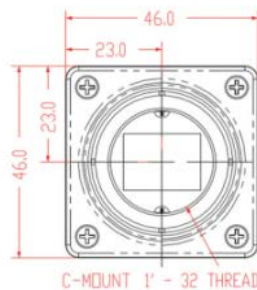
The PSP-CCD is a 2-megapixel CCD camera designed to operate within a PSP system. The camera is small and lightweight, allowing for an array of cameras to be mounted in a tight place for larger scale models and applications. The camera comes in two styles, one with a color chip and one with a monochrome chip. The color camera is used in Binary PSP and particle shadow velocimetry applications whereas the monochrome version is used in monochrome PSP or S3F applications. One approach that allows binary pressure sensitive paint data to be acquired using a single camera involves the use of a color camera (PSP-CCD-C). Rather than use optical filters in front of the camera lens, the filtering is applied on the chip using a standard Bayer filter. In the case of Binary FIB, the signal channel is acquired on the red pixels and the reference channel is acquired on the green pixels. All images are acquired through a single camera and lens and this process minimizes image alignment errors. This single chip system also accomplishes a second goal, all data is acquired simultaneously, and thus the stability of the illumination source is a less significant issue. The major drawback of this approach is the loss of spatial resolution. In a color chip, only 1/4 of the pixels are sensitive to the signal channel (red pixels) on the standard Bayer filter. Despite the loss of spatial resolution, the color camera approach produces excellent results at low speeds. The normal frame rate is 35 fps but can operate at 44 fps in overclock mode. The camera features a software trigger and external TTL trigger over BNC. The camera is compatible with Windows 7, Vista and XP both 32- and 64-bit. The PSP-CCD is packaged with ProAcquire data acquisition software.



Quantum Efficiency of Color Sensor



Quantum Efficiency of Monochrome Sensor



SPECIFICATIONS

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Sensor	
Resolution	1600 x 1200 (active)
Type	KAI-2020 CCD
Format	11.89 mm (H) x 8.94 mm (V), 14.8 mm diagonal (1" optical format)
Pixel Size	7.4 μm
Frame Rate	35 fps (40 MHz) Standard clock 44 fps (50 MHz) Overclocked
Electron Full Well Capacity	20,000 e^-
Readout Noise	20 electrons
Dynamic Range	60dB
Output Format(s)	8, 12, 14-bit (single AD only)
Binning H/L	1x, 2x, 3x, 4x, 8x
Interframe Transfer Time	200 ns
Maximum Exposure	16 seconds

Trigger	
Inputs	External (TTL via IN1/IN2), software, computer
Options	Level, edge, pulse width, internal exposure
Modes	Free-run, standard, double, frame accumulation
Strobe Output	Programmable position and duration

Communication	
Interface	GigE
On Board Memory	None
Software Interface	ProAcquire
Lens Control	Available in ProAcquire (LC-2 integration)

Environmental	
Vibration/Shock	100g
Operating Temperature Range	-40°C to 85°C
Humidity	10% to 90% non-condensing

Size & Weight	
Size	46 mm (L) x 46 mm (H), 68.6 mm (L)
Operating Temperature Range	-40°C to 85°C
Humidity	10% to 90% non-condensing
Weigth	219 grams
Lens Mount	c-mount

Power Requirements	
External Power Input	12V $\overline{\text{---}}$ 2A
Power Consumption	4.8 W

Export	
ECCN	EAR99

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