

Photometrics  
**CoolSNAP™ ES<sup>2</sup>**

1392 x 1040 imaging array  
6.45 x 6.45-μm pixels

The CoolSNAP ES2 Monochrome camera from Photometrics® delivers fast, high-resolution imaging for low-light life sciences applications. This cooled CCD camera provides 12-bit digitization at 20 MHz. The fine pitch of the pixels is ideally matched to the resolution of optical microscopes. Megapixel resolution and small pixels allow imaging of very fine detail, yet the pixels can be easily binned to utilize the full dynamic range and increase signal-to-noise performance. Advanced interline-transfer CCD technology provides high quantum efficiency, most notably in the near-infrared (NIR) portion of the spectrum.

#### Primary applications

**Fixed-cell imaging**

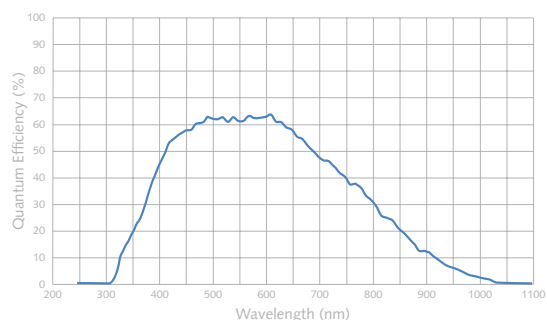
**Immunofluorescence**

**Quantitative FRET, FRAP, FISH**

**Ion concentration imaging**

**Near-infrared (NIR) DIC**

Features	Benefits
20-MHz readout	High-speed, high-sensitivity readout
1392 x 1040 imaging array 6.45 x 6.45-μm pixels	Resolves fine detail Ideally matched to optical microscope
Interline-transfer, progressive-scan CCD	Electronic shuttering eliminates camera vibration and facilitates fast triggering
Flexible binning and readout	Increases signal-to-noise performance while increasing the frame rate
IEEE-1394a interface	High-bandwidth, uninterrupted data transfer with no dropped frames
12-bit digitization	Quantifies bright and dim signals in the same image
Thermoelectric cooling	Low dark current allows longer integration times
Enhanced quantum efficiency	Provides higher sensitivity than typical interline cameras (especially in the NIR)
C-mount	Easily attaches to microscopes, standard lenses, or optical equipment
Subcompact design	Low profile allows easy integration
Acquisition software	Captures, analyzes, and saves high-resolution images
PVCam® Circular buffers Device sequencing IEEE-1394a compatibility	Supported by numerous third-party software packages Real-time focus Precise integration with shutters, filter wheels, etc. Windows® XP/Vista 32 and Mac OS X



		Region		
		1392 x 1040	512 x 512	256 x 256
Binning	1 x 1	10	20	36
	2 x 2	19	35	56
	3 x 3	27	46	69
	4 x 4	33	54	78
	8 x 8	50	74	97
(Frames per second)				

Note: Frame rates are measured at 20 MHz with 0-millisecond exposure times.

Specifications	
CCD image sensor	Sony® ICX285; interline-transfer, progressive-scan device with microlenses
CCD format	1392 x 1040 imaging array 6.45 x 6.45- $\mu$ m pixels 8.98 x 6.71-mm imaging area (optically centered)
Grade	Sony Grade 0
System gain	3 e-/ADU
Linear full well	13,500 e- (single pixel) 25,000 e- (2 x 2 binned pixel)
Read noise	$\leq 8$ e- rms @ 20 MHz
Nonlinearity	$< 1\%$
Digitizer type	12 bits @ 20 MHz
Frame readout	96 ms/frame
CCD temperature	0°C
Dark current	.01 e-/p/s
Operating environment	15 to 30°C ambient, 0 to 80% relative humidity noncondensing
Dimensions	4.5" x 5.0" x 2.5" (1.9 lbs)
I/O	TTL output while exposing (BNC connector)

Note: Specifications are typical and subject to change.

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