Photometrics Cascade :128+

128 x 128 imaging array
24 x 24-µm pixels

The Cascade 128+ camera from Photometrics® uses a high-QE, back-illuminated CCD with *EM gain* to provide extraordinary sensitivity for low-light-level, live-cell microscopy applications. Its thermoelectrically cooled detection array features square, 24-µm pixels in a 128 x 128, frame-transfer format. The state-of-the-art camera can collect more than 500 full frames of true 16-bit data per second — faster frame rates are achievable via subregion readout or binning. This unprecedented combination of speed and sensitivity makes the Cascade 128+ a perfect choice for neuroscience applications and single-molecule fluorescence (SMF) imaging.

Primary applications

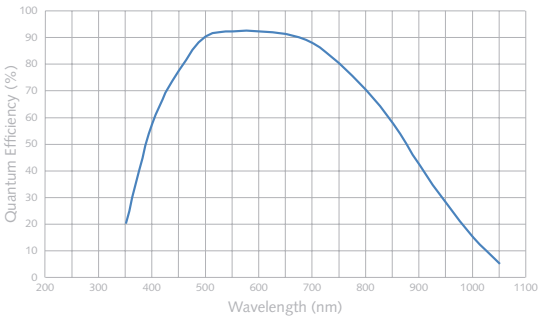
Neurosciences

Single-molecule fluorescence

Live-cell microscopy

Spinning-disc confocal microscopy

Features	Benefits
EM gain	Very high sensitivity Low-noise, impact-ionization process
Back-illuminated EMCCD	Highest available quantum efficiency (>90% peak QE)
128 x 128 imaging array 24 x 24-µm pixels	Small array facilitates fast readout Good resolution
12-MHz readout	Excellent for live-cell microscopy
16-bit digitization	Wide dynamic range allows detection of bright and dim signals in the same image
Frame-transfer EMCCD	100% duty cycle to collect continuous data No mechanical shutter required
Thermoelectric cooling	Detector cooled to reduce background for high sensitivity
C-mount	Easily attaches to microscopes, standard lenses, or optical equipment
Acquisition software	Captures, analyzes, and saves high-resolution images
PCI interface	High-bandwidth, uninterrupted data transfer
PVCam® Circular buffers Device sequencing	Supported by numerous third-party software packages Real-time focus Precise integration with shutters, filter wheels, etc. *Compatible with Windows® XP/Vista 32, Mac OS X, and Linux® (kernel versions 2.4 and 2.6.8)*



Region

Binning	128 x 128	64 x 64	32 x 32
1 x 1	510	926	1684
2 x 2	926	1610	2732
3 x 3	1272	2227	3676
4 x 4	1656	2703	4149

(Frames per second)

Note: Frame rates are measured at 12 MHz with 0-second exposure times.

	Specifications
EMCCD image sensor	e2v CCD60; back-illuminated, frame-transfer CCD with EM gain
EMCCD format	128 x 128 imaging pixels; 24 x 24-µm pixels; 3.072 x 3.072-mm imaging area (optically centered)
Linear full well single pixel* output node	 250 ke- 750 ke- (with EM gain enabled)
Digitizer type	16 bits @ 12 MHz
Read noise	<65 e- rms @ 12 MHz *Read noise effectively reduced to <1 e- rms with EM gain enabled*
EM gain	1 to 500x (guaranteed) 1 to 1,000x (typical) Software controlled in 4,096 steps
Parallel (vertical) shift rate	83 nsec/row
EMCCD temperature	-30˚C (regulated)
Dark current	≤1 e-/p/s @ -30˚C
Binning	Flexible binning capabilities in parallel direction; 1 through 4 binning in serial direction
Operating environment	0 to 30˚C ambient, 0 to 80% relative humidity noncondensing

Note: Specifications are typical and subject to change.

* Single-pixel full well up to 450 ke- can be achieved using custom mode of operation.

PHOTOMETRICS®

USA 520.889.9933
Asia Pacific +65.6841.2094
France +33.1.60.86.03.65
Germany +49.89.660.779.3
Japan +81.3.5639.2731
UK +44.1628.890858
www.photometrics.com
info@photometrics.com

