

# QUANTEM: 512SC

512 x 512 imaging array  
16 x 16- $\mu\text{m}$  pixels

The Photometrics® QuantEM:512SC is the world's first and only electron-multiplying CCD (EMCCD) camera to offer on-chip signal amplification with true quantitative stability across 16 bits at readout rates of 10, 5, and 1.25 MHz. The high-speed, high-performance QuantEM® lets you conduct precision ratiometric analysis in time-course experiments, acquire reproducible data during long-term studies, and capture streaming data for multidimensional time-lapse investigations — all with single-molecule sensitivity. A patent-pending PAR™ feedback system provides exceptional stabilization of EM gain, while an intelligent FPGA design facilitates self-calibrating linearization of EM gain and prevents bias drift over time. Furthermore, patent-pending ACE™ technology enables superior timing resolution of the device's pixel clocks, allowing optimal signal-to-noise sampling and minimizing spurious charge.



### Primary applications

- Quantitative FRET
- Multiprobe experiments
- Ratiometric ion imaging
- Confocal microscopy
- Live-cell fluorescence imaging

Features	Benefits
EM gain	Very high sensitivity Low-noise, impact-ionization process
Back-illuminated EMCCD	Highest available quantum efficiency (>90% peak QE)
512 x 512 imaging array 16 x 16- $\mu\text{m}$ pixels	Good field of view and sensitivity Good resolution
Intelligent FPGA design	Precise linearization of EM gain Self-calibrating linearization ensures truly quantitative data all the time Prevents bias drift over time to guarantee a stable background
PAR* feedback system (Photometrics Active Regulation)	Delivers unsurpassed EM gain stability for outstanding signal fidelity across 16 bits
ACE* technology (Advanced Clocking Enhancement)	Pixel-clock timing resolution 12x better than competing EMCCD cameras Provides lowest noise floor and minimizes generation of spurious charge and background events
10-MHz readout	Excellent for high-speed image visualization
5- and 1.25-MHz readout	Perfect for high-precision photometry
Dual amplifiers	Select readout mode via software for optimized (1) high-speed / high-sensitivity performance or (2) wide-dynamic-range performance
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
C- mount	Easily attaches to microscopes, standard lenses, or optical equipment
Turbo-1394™ interface (IEEE-1394a)	High-bandwidth, uninterrupted data transfer with no dropped frames Windows® XP/Vista 32 and Mac OS X compatibility
PVCAM® Circular buffers Device sequencing	Supported by numerous third-party software packages Real-time focus Precise integration with shutters, filter wheels, etc.

\* Patent-pending Photometrics technology

