



# QUANTEM™

SEE HOW MUCH YOU GAIN



# QUANTEM™



## An Elite EMCCD Pedigree

Photometrics® is the foremost designer and manufacturer of high-performance CCD and electron-multiplying CCD (EMCCD) cameras for the life sciences. Our highly popular Cascade® series, the world's first line of EMCCD cameras engineered specifically for microscopists, has helped revolutionize the realm of advanced bio-imaging.

Today, the introduction of the Photometrics QuantEM™ marks the advent of another new era in EMCCD camera technology. The sophisticated QuantEM:512SC is the first and only camera to offer EM gain with true quantitative stability across 16 bits.

More life science papers have been published about research facilitated by Cascade cameras than on studies conducted with any other EMCCD camera line.

## The Quest To Quantify

The thermoelectrically cooled QuantEM:512SC utilizes a high-quantum-efficiency EMCCD to boost signal in an extended readout register via on-chip multiplication gain — a low-noise, impact-ionization process. The resultant improvement in signal-to-noise ratio yields exceptional sensitivity at very low light levels.

The new QuantEM:512SC employs patent-pending ACE™ (Advanced Clocking Enhancement) technology and an intelligent FPGA design to achieve voltage-clock timing resolution over 12x more precise than other EMCCD cameras, unsurpassed bias stability, extremely accurate 16-bit measurements, self-calibrating gain linearization to 1000x with a linear gain slider, and the lowest generation rate of dark background events.

A patent-pending PAR™ (Photometrics Active Regulation) feedback system, enabled by the camera's intelligent FPGA design, continually controls EM gain to an unprecedented level and ensures there is no deviation from the detection device's accurate, quantitative, factory-set parameters.

The QuantEM:512SC delivers superior quantitative EMCCD camera performance:

- **Unsurpassed bias and gain stability**
- **Superb image fidelity across 16 bits**
- **Lowest rate of spurious charge generation**
- **Self-calibrating gain linearization and linear gain slider**

## High Performance at High Speed

Photometrics has designed the QuantEM:512SC to maintain top-notch performance at the highest operation speeds.

QuantEM:512SC features include:

- 100% duty cycle to enable continuous data collection
- Supravideo frame rates, subregion readout, binning
- Small parallel shift time to preserve optimal image quality
- Real-time image updating during focus-mode operation
- No mechanical shutter needed (frame-transfer architecture)
- Industry-leading Turbo 1394™ (FireWire) connectivity

The QuantEM:512SC camera offers multiple speed settings, giving you the ability to tailor operation for either the fastest image visualization or the most precise photometry. Flexible binning options permit optimization of experiments both for desired spatial resolution and required detection efficiency.

# The First and Only EMCCD Camera with 16-Bit Quantitative Stability

## Optimized for Advanced Applications

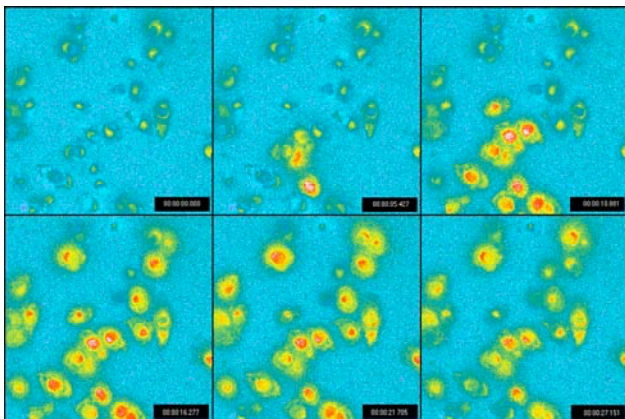
The QuantEM:512SC camera lets you conduct accurate ratiometric analysis in time-course experiments, acquire reproducible data during long-term studies, and capture streaming data for multidimensional time-lapse investigations — all with single-molecule sensitivity.

The new QuantEM:512SC features a back-illuminated, frame-transfer EMCCD for >90% peak quantum efficiency and high-speed operation. Owing to the camera's exceptional sensitivity, very short exposure times are possible, thereby permitting more rapid data acquisition and allowing greater temporal resolution in experiments.

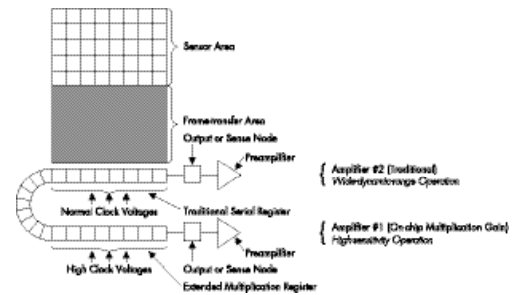
Applications such as intracellular calcium or pH ratio imaging, fluorescence recovery after photobleaching (FRAP), total internal reflection fluorescence (TIRF), fluorescence resonance energy transfer (FRET), and widefield confocal microscopy benefit greatly from the impressive set of capabilities offered by the new QuantEM:512SC.

For enhanced flexibility, the QuantEM:512SC utilizes dual readout amplifiers in order to deliver optimized performance not only for applications that demand tremendous low-light-level sensitivity but also for those requiring wide dynamic range.

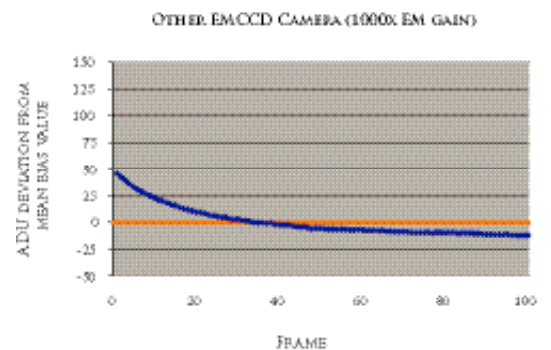
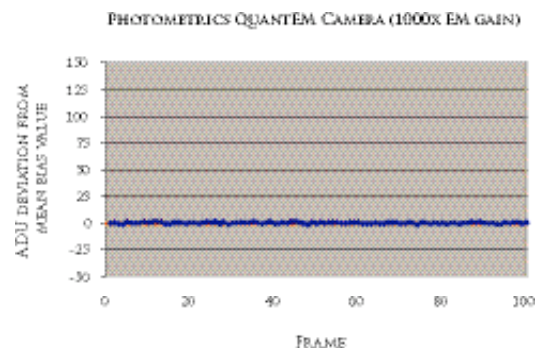
A standard C-mount configuration allows easy attachment to microscopes, standard lenses, or other optical equipment.



Time course of calcium ion measurements in Fura-loaded, living THP1 cells. Data acquired at the lab of Simon Watkins (University of Pittsburgh) with a QuantEM camera.



Electron-multiplying CCD (EMCCD) cameras move charge through the pixels of a special serial register with high clock voltages in order to amplify signal via an impact-ionization process.



Analog-to-digital unit (ADU) deviation from mean bias value over a 100-frame sequence for the new Photometrics QuantEM and another EMCCD camera. The QuantEM camera shows no bias drift.

## Unrivaled Software Compatibility

PVCAM®-enabled compatibility lets you instantly run your Photometrics camera under dozens of popular third-party imaging programs across all major operating systems. If you want to switch to a new software package, your QuantEM:512SC is ready and able.

Additionally, common DLLs and Photometrics' proprietary Imager Control Language (ICL) create a stable PVCAM development base for user customization and future upgrades.

## Support You Can Trust

Since 1978, superior customer service has been a Photometrics hallmark.

Our support staff comprises knowledgeable PhD application scientists and highly trained camera technicians. Whether rendering assistance via phone, email, or in person, all Photometrics personnel treat your issue with the utmost respect and urgency.

To help protect your valuable investment, Photometrics also offers an extensive selection of service contracts and product warranties. Utilization of powerful remote diagnostics often precludes the need for cameras to be shipped back for service.

### Photometrics® QuantEM™ Features

<b>Linearized and quantitative EM gain slider</b>	Provides a much more intuitive, easily quantifiable EMCCD camera
<b>Self-calibrating EM gain feature</b>	Ensures that the camera delivers the proper amounts of user-specified EM gain and that the camera remains quantitative over time
<b>Stabilized background (bias stability) enabled by intelligent FPGA design</b>	Allows a constant background with no "drift" during streaming, time lapse, etc.
<b>16-bit A/D conversion on the EM port and very low noise</b>	ACE™ technology and PAR™ feedback system yield high signal-to-noise ratio, which is especially important for low-light fluorescence imaging
<b>Turbo 1394™ connectivity</b>	Unique implementation of the IEEE 1394a (FireWire™) interface enables the camera to provide the fastest parameter-switching image acquisition available on the market

Please refer to our data sheets (online at [www.photomet.com](http://www.photomet.com)) for complete specifications.

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[www.photomet.com/quantem](http://www.photomet.com/quantem)

Contact your local Photometrics representative to discuss the exciting new QuantEM:512SC camera.

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