



HIGH PERFORMANCE DIGITAL IMAGING  
**made easy**

# RETIGA 4000R *FAST1394*

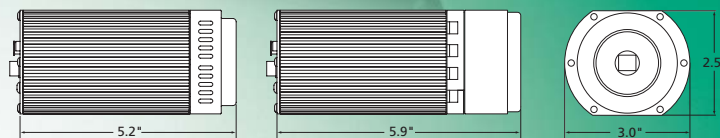
High-Sensitivity IEEE 1394 FireWire™ Digital CCD Camera – Monochrome or Color

The QImaging Retiga 4000R digital camera features enhanced well capacity and resolution resulting in high sensitivity that is perfect for brightfield, LCD inspection, and automated imaging applications. A progressive-scan interline CCD sensor gives a resolution of 4.19 million pixels with an aspect ratio of 1:1 in a 12-bit digital output — making it ideally suited for the 22mm light column provided by many microscope camera mounts. High-speed, low-noise electronics provide linear digital data for rapid image capture. The IEEE 1394 FireWire™ digital interface allows ease of use and installation with a single wire. No framegrabber or external power supply is required. The Retiga 4000R includes QCapture software (Windows® and Mac OS) for real-time image preview and capture. A **Software Development Kit (SDK)** is available upon request for interfacing with custom software.



Retiga 4000R (non-cooled)

Retiga 4000R cooled



(non-cooled)

cooled

Note: Lenses are shown for illustration only and are not included.

## CAMERA MODELS

Includes: IEEE 1394 FireWire™ cable, IEEE 1394 PCI card, QCapture software, & access to SDK

- **Monochrome Retiga 4000R Cooled** Model: RET-4000R-F-M-12-C
- **Monochrome Retiga 4000R Non-Cooled** Model: RET-4000R-F-M-12
- **Color Retiga 4000R Cooled** Model: RET-4000R-F-CLR-12-C
- **Color Retiga 4000R Non-Cooled** Model: RET-4000R-F-CLR-12

## CAMERA OPTIONS

- **RGB Color Filter** for monochrome cameras (F-mount interface required), refer to spec sheet for more details



- **Extended Warranty**

## FEATURES

- High-Resolution, 4.19-Million-Pixel Sensor
- Large Pixels (7.4µm x 7.4µm)
- ROI (Region of Interest)
- Low-Noise Electronics
- 12-Bit Digitization/  
36-Bit Color Digitization (with Optional RGB Filter)
- External Sync & Trigger
- Peltier Cooling
- Binning
- IEEE 1394 FireWire™  
QImaging Fast 1394 Technology
- Extensive Application Software Support

## BENEFITS

- Highly detailed, sharp images
- High sensitivity, high dynamic range, large well capacity
- Higher frame rates for precise analysis of rapidly changing specimens
- Quantitation & imaging of low light levels
- 4096 grey levels for precise light-intensity discrimination
- 4096 levels per channel for superior color images
- Tight synchronization with flashlamps, automated filters, shutters, & microscope stages
- Minimizes thermal noise during low-light, long-exposure imaging
- Increases sensitivity for quantitation & imaging of very low light levels
- Increases frame rate
- Simple connectivity
- Ease of use & installation
- Portability with laptop computer
- Simultaneous use of multiple cameras through a single port
- Single-cable operation (no external power supply or control unit)
- Choose from a large selection of life science & industrial software for microscopy, machine vision, & video-streaming functions

# RETIGA 4000R FAST 1394 SPECIFICATIONS

## APPLICATIONS

- Brightfield, Phase-Contrast, & Darkfield Microscopy
- Fluorescence Imaging
- Pathology, Histology, & Cytology
- DNA Analysis
- Metallurgical Microscopy
- LCD Inspection
- Manufacturing Quality Control
- Failure Analysis
- Forensic Analysis
- Automated Imaging

## CCD SENSOR

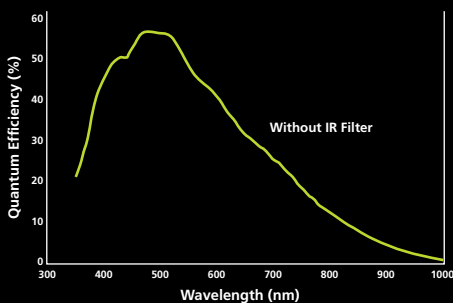
Light-Sensitive Pixels	4.19 million; 2048 x 2048
Binning Modes	2x2, 4x4, 8x8
ROI (Region of Interest)	From 1x1 pixels up to full resolution, continuously variable in single-pixel increments
Exposure/Integration Control	10 $\mu$ s to 17.9min in 1 $\mu$ s increments
Sensor Type	Kodak® KAI-4021 progressive-scan interline CCD (monochrome or color)
Pixel Size	7.4 $\mu$ m x 7.4 $\mu$ m
Linear Full Well	40,000e <sup>-</sup> (1x1)
Read Noise	12e <sup>-</sup> @ 20MHz
Dark Current	1.64e <sup>-</sup> /pix/s (cooled)
Cooling Available	Yes (optional)
Cooling Type	Peltier thermoelectric cooling to 25°C below ambient
Digital Output	12 bits
Readout Frequency	20, 10, 5MHz
Frame Rate	4fps full resolution @ 12 bits (125fps maximum with binning and ROI functions)

## CAMERA

Computer Platforms/Operating Systems	Windows® & Mac OS*
Digital Interface	IEEE 1394 FireWire™
Sustained Image Data Rate	40MB/s
Shutter Control	Electronic shutter, no moving parts
External Trigger	TTL Input
Trigger Types	Internal, Software, External
External Sync	TTL Output
Gain Control	0.549 to 26.2x
Offset Control	-2048 to 2047
Optical Interface	F-mount optical format; aspect ratio 1:1
Threadmount	1/4" — 20 mount
Power Requirements	11W (non-cooled); 17W (cooled)
Weight	585g (non-cooled); 845g (cooled)
Warranty	2 years
Operating Environment	0 to 50°C (32 to 122°F)
Storage Temperature	-10 to 60°C
Humidity	Less than 80% non-condensing at 35°C (95°F)

\*Refer to QImaging website for detailed listing of supported operating systems.  
Note: Specifications are nominal and subject to change.

## SPECTRAL RESPONSE



04-0018A-C



Tel 604.708.5061  
Fax 604.708.5081  
INFO@QIMAGING.COM  
WWW.QIMAGING.COM

FireWire and Mac OS are trademarks of Apple Computer, Inc., registered in the U.S. and other countries. Kodak is a registered trademark of Eastman Kodak Company. Windows is a registered trademark of Microsoft Corporation in the United States and other countries. Other brand and product names are the trademarks or registered trademarks of their respective owners and manufacturers.