DIGITAL IMAGING MADE EASY

PRODUCT DATASHEET

RETIGA-4000R

High Sensitivity IEEE 1394 FireWire® Digital CCD Camera

FAST1394

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.

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

Note: Lens shown for illustration only and is not included.

features	benefits
High-Resolution, 4.19-Million-Pixel Sensor	▪ Highly detailed, sharp images
Large Pixels (7.4µm x 7.4µm)	▪ High sensitivity, high dynamic range, large well capacity
ROI (Region of Interest)	▪ Higher frame rates for precise analysis of rapidly changing specimens
Low-Noise Electronics	▪ Quantitation & imaging of low light levels
12-Bit Digitization/ 36-Bit Color Digitization (with Optional RGB Filter)	▪ 4096 grey levels for precise light-intensity discrimination ▪ 4096 levels per channel for superior color images
External Sync & Trigger	▪ Tight synchronization with flashlamps, automated filters, shutters, & microscope stages
Peltier Cooling	▪ Minimizes thermal noise during low-light, long-exposure imaging
Binning	▪ Increases sensitivity for quantitation & imaging of very low light levels ▪ Increases frame rate
IEEE 1394 FireWire Connection	▪ 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)
Extensive Application Software Support	▪ Choose from a large selection of life science & industrial software for microscopy, machine vision, & video-streaming functions

RETIGA-4000R FAST1394 Specifications

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	10µs to 17.9min in 1µs increments
Sensor Type	Kodak® KAI-4021 progressive-scan interline CCD (monochrome or color)
Pixel Size	7.4µm x 7.4µm
Linear Full Well	40,000e- (1x1); 80,000e- (2x2)
Read Noise	12e- @ 20MHz
Dark Current	1.64e-/pix/s
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	17W
Weight	845g
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)

camera models

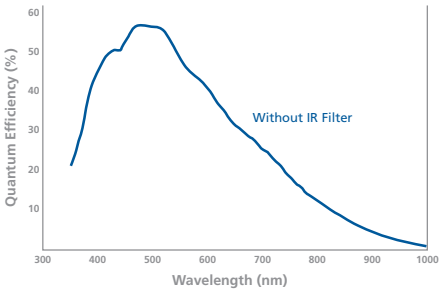
Includes: IEEE 1394 FireWire cable, IEEE 1394 PCI card, QCapture software, and access to SDK

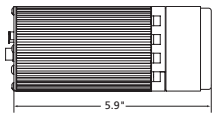
- **Monochrome Retiga 4000R:**
  Model: RET-4000R-F-M-12-C
- **Color Retiga 4000R:**
  Model: RET-4000R-F-CLR-12-C

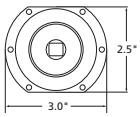
camera options

- RGB Color Filter for monochrome cameras (F-mount interface required), refer to data sheet for more details
- Extended Warranty

spectral response







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

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