**RETIGA 2000R**

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

The QImaging Retiga 2000R digital camera features enhanced visible-range quantum efficiency resulting in high sensitivity that is ideal for brightfield, machine vision, metrology, and metallurgical imaging applications. A progressive-scan interline CCD sensor gives a resolution of 1.92 million pixels in a 12-bit digital output. 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 2000R 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.

### CAMERAS MODELS

<table>
<thead>
<tr>
<th>Includes:</th>
<th>FEATUREs</th>
<th>BENEFITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>IEEE 1394 FireWire™ cable,</td>
<td>High-Resolution, 1.92-Million-Pixel</td>
<td>High detailed, sharp images</td>
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<tr>
<td>IEEE 1394 PCI card, QCapture software, QCapture Pro software, IEEE 1394 power supply (cooled version only), &amp; access to SDK</td>
<td>Large Pixels (7.4μm x 7.4μm)</td>
<td>High sensitivity, high dynamic range, large well capacity</td>
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<tr>
<td><strong>Monochrome Retiga 2000R Cooled</strong> Model: RET-2000R-F-M-12-C</td>
<td>High-Speed Readout</td>
<td>Previewing &amp; focusing in real time</td>
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<tr>
<td><strong>Monochrome Retiga 2000R Non-Cooled</strong> Model: RET-2000R-F-M-12</td>
<td>Low-Noise Electronics</td>
<td>Quantitation &amp; imaging of low light levels</td>
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<tr>
<td><strong>Color Retiga 2000R Cooled</strong> Model: RET-2000R-F-CLR-12-C</td>
<td>12-Bit Digitization/36-Bit Color Digitization (with Optional RGB Filter)</td>
<td>4096 grey levels for precise light-intensity discrimination</td>
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<tr>
<td><strong>Color Retiga 2000R Non-Cooled</strong> Model: RET-2000R-F-CLR-12</td>
<td>External Sync &amp; Trigger</td>
<td>Tight synchronization with flashlamps, automated filters, shutters, &amp; microscope stages</td>
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<tr>
<td><strong>Peltier Cooling</strong></td>
<td>Increases sensitivity for quantitation &amp; imaging of very low light levels</td>
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<tr>
<td>Binning</td>
<td>Increases frame rate</td>
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<tr>
<td><strong>IEEE 1394 FireWire™ QImaging Fast 1394 Technology</strong></td>
<td>Simple connectivity</td>
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<tr>
<td><strong>Extensive Application Software Support</strong></td>
<td>Choose from a large selection of life science &amp; industrial software for microscopy, machine vision, &amp; video-streaming functions</td>
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### RGB COLOR OPTIONS

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

Note: Lenses are shown for illustration only and are not included.
## APPLICATIONS
- Brightfield, Phase-Contrast, & Darkfield Microscopy
- Live-Cell Imaging
- Pathology, Histology, & Cytology
- FISH
- Ca++ Ratio Analysis
- Motility & Motion Analysis
- DNA Analysis
- Metallurgical Microscopy
- Semiconductor Inspection
- Manufacturing Quality Control
- Failure Analysis
- Forensic Analysis

## SPECTRAL RESPONSE

<table>
<thead>
<tr>
<th>Wavelength (nm)</th>
<th>Quantum Efficiency (%)</th>
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<tbody>
<tr>
<td>400</td>
<td>60</td>
</tr>
<tr>
<td>500</td>
<td>50</td>
</tr>
<tr>
<td>600</td>
<td>40</td>
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<tr>
<td>700</td>
<td>30</td>
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<tr>
<td>800</td>
<td>20</td>
</tr>
<tr>
<td>900</td>
<td>10</td>
</tr>
<tr>
<td>1000</td>
<td>0</td>
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</table>

*Without IR Filter*

## RETIGA 2000R SPECIFICATIONS

### CCD SENSOR
- **Light-Sensitive Pixels:** 1.92 million; 1600 x 1200
- **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-2020 progressive-scan interline CCD (monochrome or color)
- **Pixel Size:** 7.4μm x 7.4μm
- **Linear Full Well:** 40,000e- (1x1)
- **Read Noise:** 16e-
- **Dark Current:** 0.5e-/pix/s (non-cooled)
- **Cooling Available:** Yes (optional)
- **Cooling Type:** Peltier thermoelectric cooling to 25˚C below ambient
- **Digital Output:** 12 bits
- **Readout Frequency:** 20, 10, 5, 2.5MHz
- **Frame Rate:** 10fps full resolution @ 12 bits (190fps 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:** 0.451 to 21.5x
- **Offset Control:** -2048 to 2047
- **Optical Interface:** 1”, C-mount optical format
- **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.

ISO 9001:2000

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