The QImaging® Retiga-4000RV CCD digital camera has been specially engineered for low-light, high-dynamic-range applications. An 80,000e- full well capacity, combined with a three-stage Peltier device using an all-metal, hermetic-vacuum-sealed CCD chamber, provides extreme dynamic range for applications such as chemiluminescence, live-cell imaging, and fluorescence. The camera’s software-selectable regulated cooling enables precise control in single-degree increments down to -30˚C. The Retiga-4000RV features a 4-megapixel CCD, 12-bit digital output, and an IEEE 1394 interface for enhanced connectivity and noise-shielding performance. Additionally, the camera comes with iGlo™ technology, which features an organic light emitting diode (OLED) display that provides users with key information about camera settings in a convenient, ergonomic way.

### camera models
Includes: IEEE 1394 FireWire cable, IEEE 1394 PCI card, power supply, QCapture Suite software, and access to SDK

- **Monochrome Retiga-4000RV:**
  Model: RET-4000RV-F-M-12-C

### camera options
- Removable IR-Cutoff Filter
- RGB Color Filter for monochrome cameras (F-mount interface required), refer to data sheet for more details
- Extended Warranty

### features | benefits
--- | ---
**iGlo™** | OLED display for easy-to-verify key camera information in a simple, ergonomic design
Black-Out Mode | Turns all lights off for low-light imaging applications
High-Resolution, 4-Million-Pixel Sensor | Highly detailed, sharp images
Low-Noise Electronics | Quantitation & imaging of low light levels
Optional/Removable IR-Cutoff Filter | High-contrast, visible-range images with IR filter in place
| Removable for IR applications
Flexible Exposure Control from 10μs to 17.9min | Optimal integration over a wide range of light levels
External Sync & Trigger | Tight synchronization with flashlamps, automated filters, shutters, & microscope stages
Three-Stage Peltier Cooling w/ Vacuum Seal | Reduced thermal noise for low-light, long exposures
Binning | Increases sensitivity for quantitation & imaging of very low light levels
| Increases frame rate
IEEE 1394 FireWire Connection | Simple connectivity
| Better noise performance
| Excellent connectivity ability
| Ease of use & installation
| Portability with laptop computer
| Simultaneous use of multiple cameras through a single port
Extensive Application Software Support | Choose from a large selection of life science & industrial software for microscopy, machine vision, & video-streaming functions

**Note:** Lens shown for illustration only and is not included.
## RETIGA-4000RV Specifications

### ccd sensor
- **Light-Sensitive Pixels**: 4 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)
- **Pixel Size**: 7.4μm x 7.4μm
- **Linear Full Well**: 40,000e- (1x1); 80,000e- (2x2)
- **Read Noise**: 12e- (at 20MHz)
- **Dark Current**: 0.084e-/pix/s
- **Cooling Technology**: Three-stage Peltier cooling with all-metal, hermetic-vacuum-sealed chamber assembled in a Class 1,000 cleanroom
- **Cooling Type**: Down to -30˚C, regulated, with software control in 1˚C increments

### camera
- **Black-Out Mode**: Turns all camera lights off to reduce light reflection during low-light applications; software controlled
- **iGlo Display**: Provides key camera information to the user, allowing easy verification of camera settings
- **Computer Platforms/Operating Systems**: Windows®, Mac OS*, Linux® 2.6.7+ with raw 1394 support
- **Digital Interface**: IEEE 1394 FireWire
- **External Trigger**: TTL Input (optically coupled)
- **Trigger Types**: Internal, Software, External
- **External Sync**: TTL Output (optically coupled)
- **Gain Control**: 0.493 to 23.5 times
- **Offset Control**: -2048 to 2047
- **Optical Interface**: F-mount optical format; aspect ratio 1:1
- **Threadmount**: 1/4” – 20 mount
- **Power Requirements**: 30W; 12–24VDC
- **Weight**: 1.180kg
- **Warranty**: 2 years
- **Operating Environment**: 0 to 40˚C
- **Storage Temperature**: 0 to 50˚C
- **Humidity**: Less than 80% relative humidity

### spectral response

![spectral response graph]

### applications
- Quantitative Fluorescence Imaging
- Live-Cell Imaging
- Semiconductor Inspection
- Chemiluminescence
- Particle Tracking
- LCD Inspection

<ref>QImaging website for detailed listing of supported operating systems.</ref>

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