The ORCA-3CCD cooled digital color camera incorporates three cooled CCD chips, providing the rapid readout, high-resolution and superior S/N ratio of the Hamamatsu ORCA digital camera series. The three color CCDs employ an RGB prism to achieve extremely high quality color representation without color blur, performance difficult to achieve with a single-CCD camera. The CCDs used are the same as those used in the ORCA ER, providing proven high quantum efficiency and high resolution, cooled to 0°C for high sensitivity detection. It is suitable for a wide range of applications, from brightfield (i.e. stained pathological specimens) to fluorescent specimens using GFP and fluorescent antibodies.

FEATURES
- Total 4.13 million pixels
- Total 36 bit color resolution
- Cooling temperature of 0 ºC
- Individual R,G,and B exposure settings
- 8 × 8 binning capability
- 9.1 Hz full speed display
- Low readout noise design (13 electrons r.m.s. typ.)

APPLICATIONS
- Color digital time-lapse recording
- Fluorescence Resonance Energy Transfer (FRET) studies
- Fluorescence In Situ Hybridization (FISH) studies
- Histology, Pathology and Cytology
High performance R,G,and B separation

The ORCA-3CCD incorporates three color CCDs with a RGB prism to achieve color separation superior to that available with a conventional single CCD with mosaic filter for microscope use. Trichrome stained DAPI (blue), BODIPY FL (green), and MitoTracker (red) specimens were observed simultaneously using a D-F-T triple band mirror cassette. Separation of the color image into B, G, and R revealed admixture of BODIPY FL (green) fluorescence in the B (blue) and R (red) channels when using the single CCD with mosaic filter, however when the ORCA-3CCD was used, skillful matching of the fluorescent dyes with the wavelength separation prism achieved excellent color separation.

Total 4.13 million pixels

The use of three color CCDs in the ORCA-3CCD eliminates the deterioration in B (blue) and R (red) resolution which tends to occur with single color CCDs. The high spatial resolution of approximately 1,300,000 pixels for each of the R, G, and B channels allows acquisition of highly detailed fluorescing images.

Cooling temperature of 0 °C

The ORCA-3CCD employs Hamamatsu’s own cooling technology* to lower the temperature of the CCDs to 0 °C. This significantly reduces the noise characteristics often associated with long exposures, thus allowing observation of faint levels of fluorescence.

Specifications

- Type number: C7780
- Sensor structure: 3 chip CCD with RGB prism
- Imaging device: Progressive scan interline CCD
- Effective no. of pixels: 1344 (H) × 1024 (V)
- Cell size: 6.45 μm × 6.45 μm (square format)
- Effective area: 8.67 mm × 6.60 mm (2/3-inch format)
- Pixel clock rate: 16 MHz/pixel
- Frame rate: 9.1 Hz
- 2 × 2 binning: 17.9 Hz
- 4 × 4 binning: 31.5 Hz
- 8 × 8 binning: 49.2 Hz
- Readout noise (r.m.s.): 13 electrons
- Full well capacity: 18,000 electrons
- Dynamic range**: 1,384 : 1
- Cooling method: Peltier cooling with air radiation
- Cooling temperature: 0 °C at 20 °C ambient temperature
- Dark current: 0.5 electron/pixel/sec
- A/D converter: 12 bit
- Output signal (digital output): 12 bit, 10 bit and 8 bit × 3 channels parallel output
- External control: RS-232C (full remote for all camera functions)
- Sub array: yes
- External trigger: yes
- Lens mount: 2/3-inch bayonet mount (flare back 48mm)
- Line voltage: 100 / 117 / 220 / 240 V, 50/60 Hz
- Power consumption: 77 VA
- Ambient temperature: -10 to + 50 °C
- Ambient operating temperature: 0 to + 40 °C
- Ambient operating/storage humidity: 70% max. (no condensation)

OPTIONAL

- PC-DIG
- Phoenix 66M version
- AquaCosmos
- Photoshop plug-in
- Image Pro Plus plug-in
- Sample software

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