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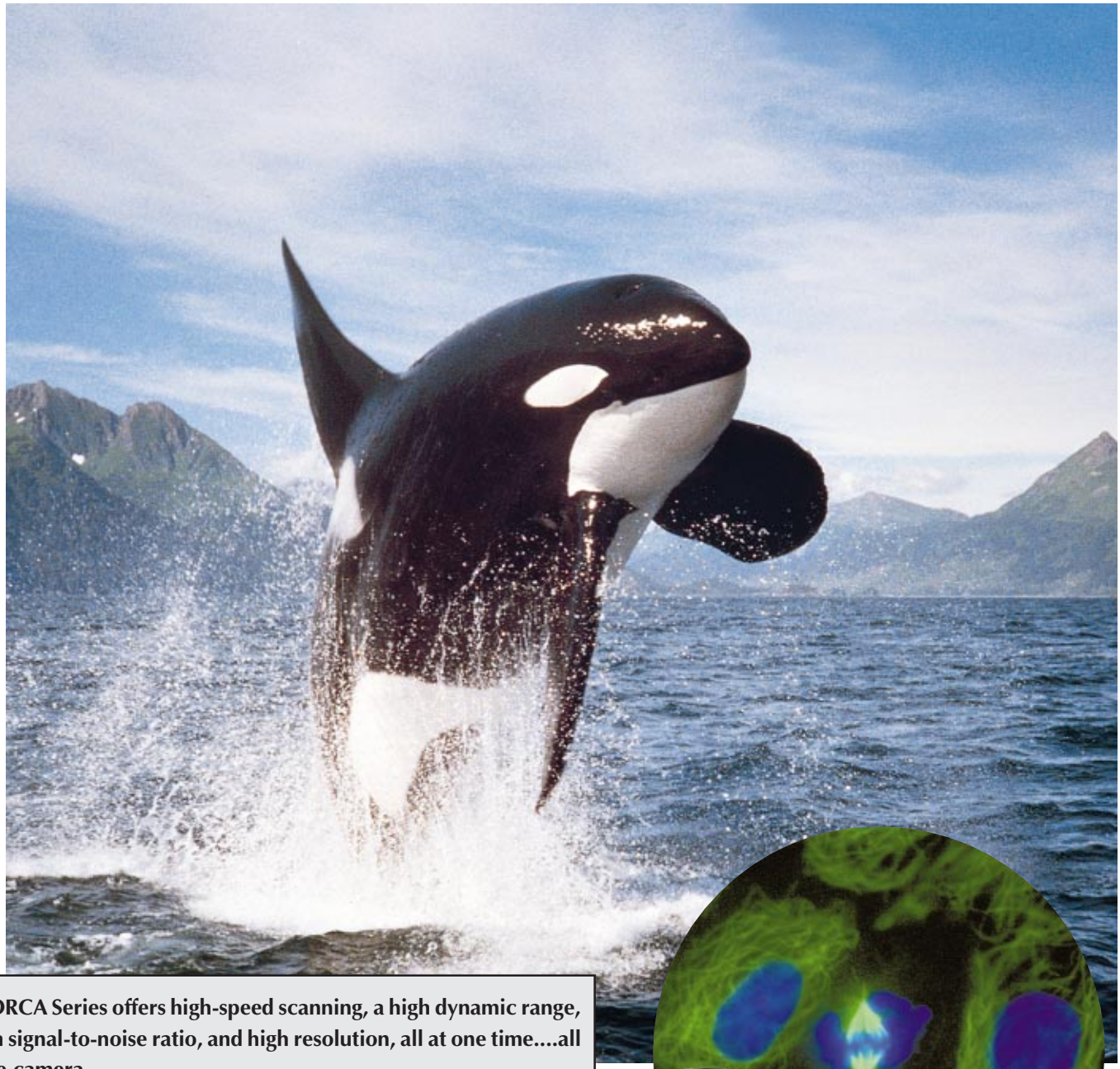
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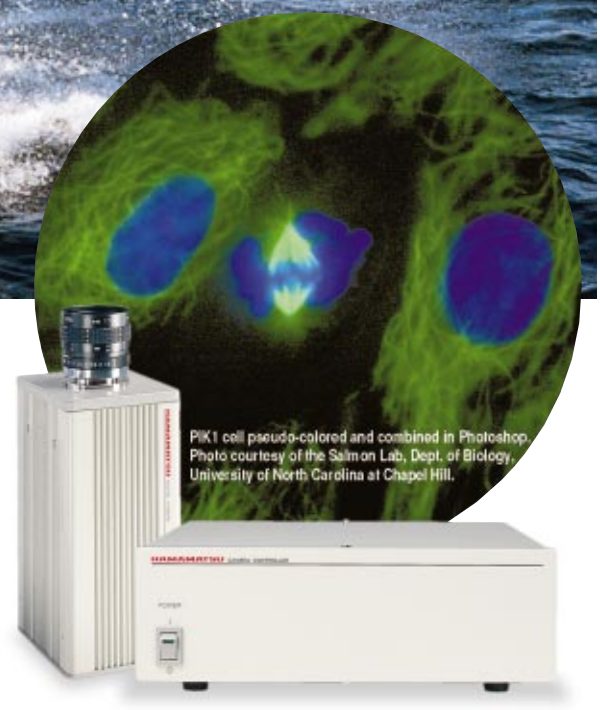
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ORCA Digital Cameras





The ORCA Series offers high-speed scanning, a high dynamic range, a high signal-to-noise ratio, and high resolution, all at one time....all in one camera.

As if that weren't enough, you can count on features like software and frame grabber compatibilities, no mechanical shutter, a progressive scan interline CCD, and application flexibility including GFP. Add it all up and you'll see....it's a whale of a deal.

Like everything in nature, species evolve.

So naturally, ORCA is now available in both 10- and 12-bit versions as well as B/W and Color configurations offering total flexibility to meet all your application needs.

Hamamatsu's ORCA Digital Cameras. They deliver all the features you're looking for....without swallowing up your budget.

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High Resolution Digital B/W CCD Cameras

ORCA — High Sensitivity

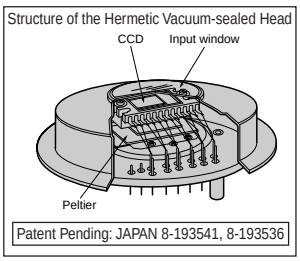


ORCA II — Ultra High Sensitivity



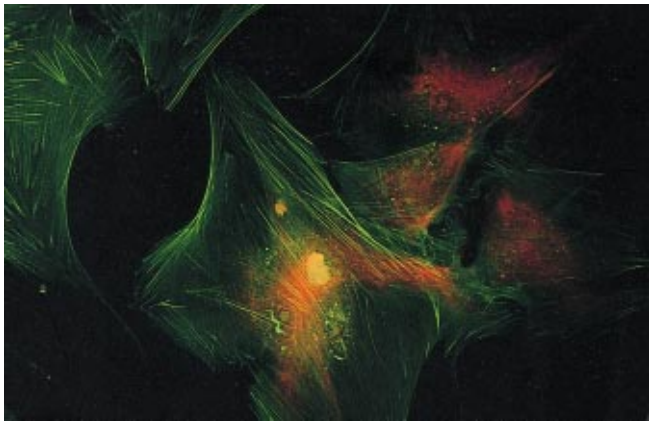
The ORCA and ORCA II are High Resolution Digital B/W CCD Cameras using a progressive scan interline CCD chip with no mechanical shutter. In addition to a high resolution of 1.3 million pixels, a wide dynamic range and a high sensitivity, these cameras serve a wide application range, down to low-light level imaging. Peltier cooling drastically reduces dark noise and minimizes thermal drift which makes this camera an ideal choice for demanding scientific and industrial applications. RS422A digital output ensures compatibility with a large number of commercially available frame grabber boards. In addition, a standard C-mount lens coupling makes it easy to connect to optical microscopes and lenses.

ORCA II employs a hermetic vacuum-sealed head which can be cooled to –50 °C and guarantees maintenance-free operation.



APPLICATIONS

- Observation of fluorescence-stained samples
- Fluorescent antibody technique
- DNA cytometry
- Observation of dark-field images (bacteria flagellum, etc.)
- Stationary sample observation
- FISH
- IC pattern analysis
- Observation of metallic surfaces
- Observation and inspection of semiconductors

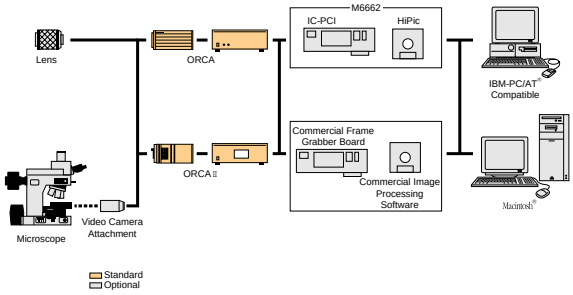


▲ Immuno fluorescence image of mouse fibroblasts (multi stained), fluorescence filters for FITC and Rhodamine emission. Pseudo color of multiple B/W images.

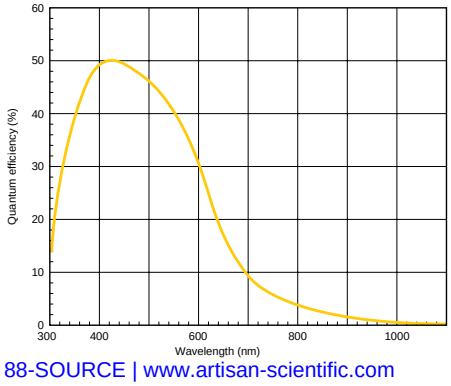
FEATURES

- High resolution of 1.3 million pixels
- Full remote control from PC
- Progressive scan interline CCD chip with no mechanical shutter
- Low readout noise
- Binning function for improved sensitivity
- Low dark noise with peltier cooling
- UV option (down to 193 nm)
- Hermetic vaccuum sealed Head (ORCA II)

SYSTEM CONFIGURATION



SPECTRAL RESPONSE CHARACTERISTICS



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SPECIFICATIONS

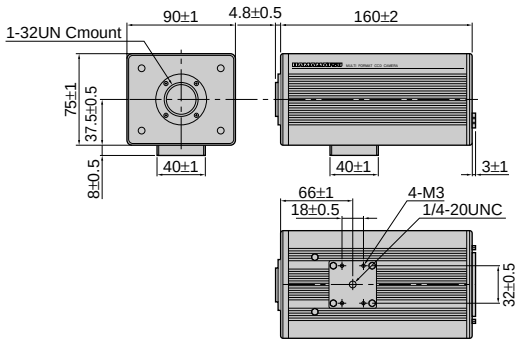
Model	ORCA	ORCA Ⅱ	
		High-speed readout	High-precision readout
Imaging device	Progressive scan interline CCD		
Effective no. of pixels	1280 (H) × 1024 (V) or 1024 (H) × 1024 (V)	1280 (H) × 1024 (V)	
Cell size	6.7 µm × 6.7 µm (square format)		
Effective area	8.58 mm × 6.86 mm / 2/3-inch format		
Pixel clock rate	14.75M Hz/pixel	10.00M Hz/pixel	1.25M Hz/pixel
Frame rate	9 Hz	5.3 Hz	0.8 Hz
2 × 2 binning	18 Hz	10.1 Hz	1.6 Hz
4 × 4 binning	32 Hz	17.8 Hz	3.0 Hz
8 × 8 binning	53 Hz (option)	28.8 Hz	5.2 Hz
Readout noise (r.m.s.)	8 to 12 electrons	10 electrons	3 to 5 electrons
Full well capacity	13000 electrons	16000 electrons	
binning		40000 electrons	
Dynamic range*	1300:1	1800:1	6000:1
binning			10000:1
Cooling method	Peltier cooling, air radiation system		
Cooling temperature	+5 °C	-40 °C to -50 °C	
Dark current	1 electron/pixel/sec	0.001 electron/pixel/sec	
A/D converter	10 bit or 12 bit	12 bit	12 bit or 14 bit
Output signal (digital output)	RS-422A 10/12-bit parallel output	RS-422A 12 bit parallel output	RS-422A 12/14-bit parallel output
Exposure time	130 µsec to 10 sec	20 msec to 1 hour	
External control	RS-232C (full remote for all camera functions)		
ROI	—	yes	
External trigger	yes	yes	
Contrast enhancement	1 to 10 times	1 to 6 times	1, 3, 6 times
Power consumption	70 VA	Approx. 220 VA	
Ambient storage temperature	-10 to +50 °C		
Ambient operating temperature	0 to +40 °C		
Ambient operating/storage humidity	70% max. (no condensation)		

* Calculated from the ratio of the maximum saturation charge and average readout noise.

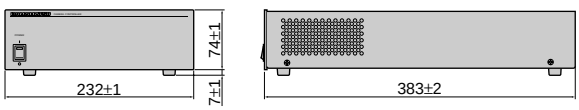
DIMENSIONAL OUTLINES (Unit: mm)

ORCA

- Camera head (approx. 1.3 kg)

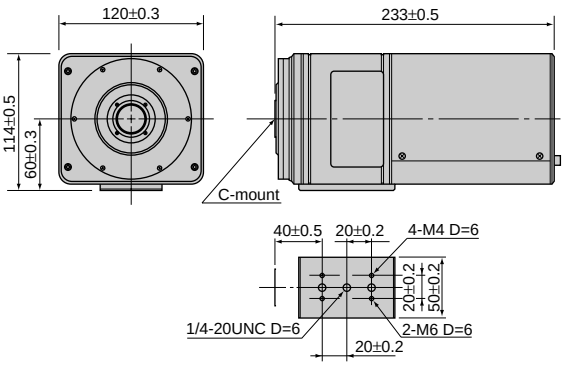


- Camera controller (approx. 6.3 kg)

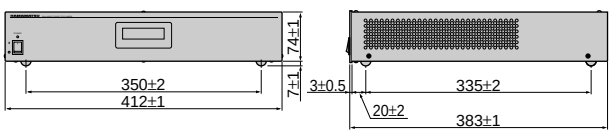


ORCA Ⅱ

- Camera head (approx. 2.5 kg)



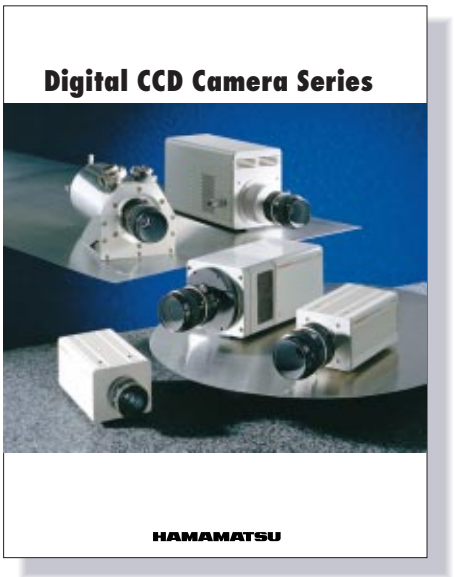
- Camera controller (approx. 8.5 kg)



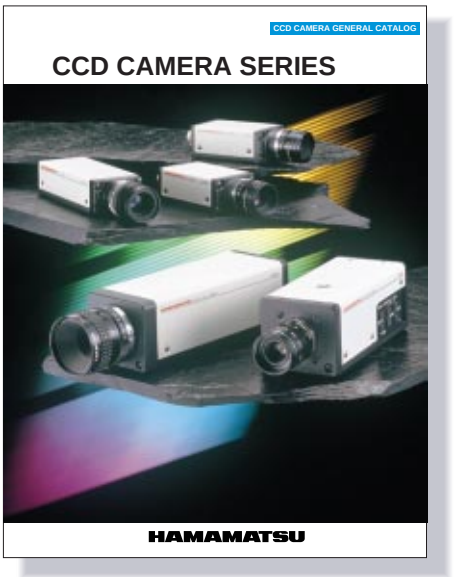
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OTHER CAMERAS AVAILABLE FROM HAMAMATSU

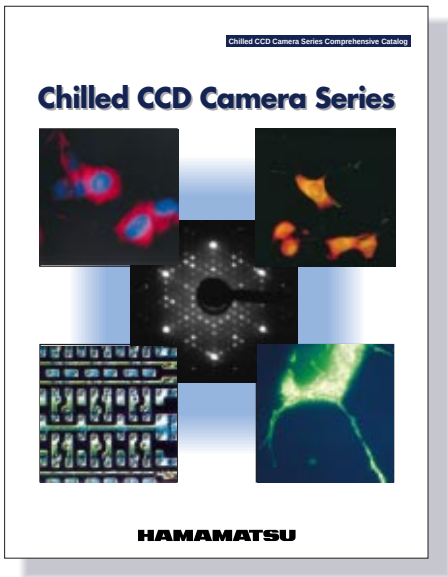
Digital CCD Camera Series



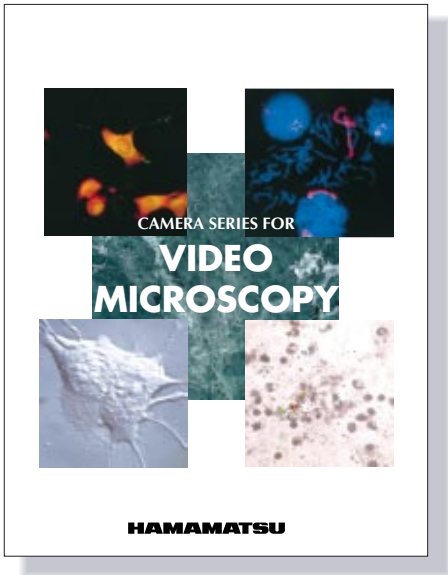
CCD Camera Series



Chilled CCD Camera Series



Camera Series for Videomicroscopy



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