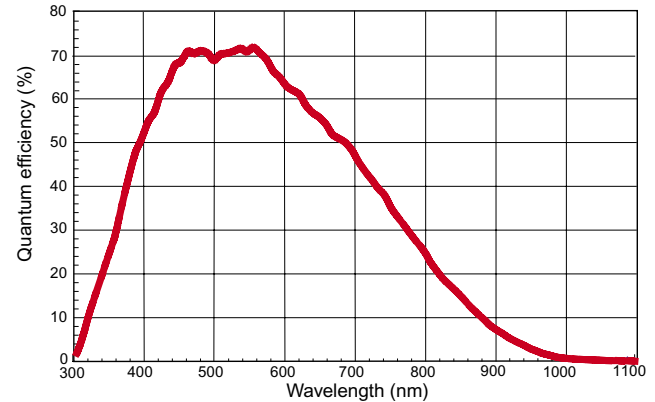


## SPECTRAL RESPONSE CHARACTERISTICS



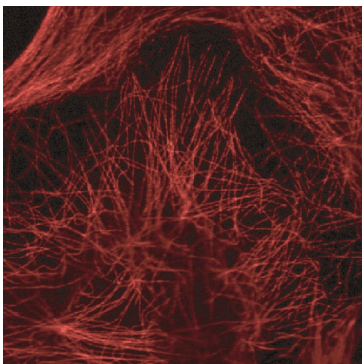
\* This is typical, not guaranteed.

The ORCA-ER is a next-generation B/W CCD digital camera using an advanced progressive scan interline CCD chip with high sensitivity in VIS-NIR region offering substantially better noise characteristics at high frame rates. The Peltier cooled hermetic vacuum-sealed head can be cooled to  $-20^{\circ}\text{C}$ , reducing dark noise and minimizing 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. Fast electronic shuttering, fast readout and low noise integration all combine to make this camera a great choice for both high and low level imaging applications.

## APPLICATIONS

- Routine Fluorescence Microscopy
- Green Fluorescent Protein applications
- DNA and Ploidy analysis
- Fluorescence In Situ Hybridization studies
- Red and Near Infrared Fluorescent applications



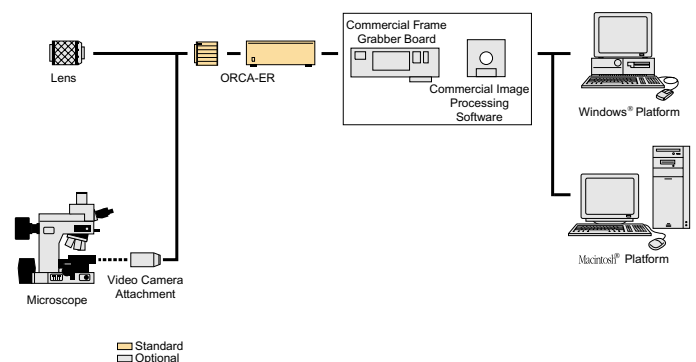
▲ Newt lung epithelial cells labelled with 1.5 mg/ml x-rhodamine tubulin. (Image taken with a 1.2 second exposure and a 60x Plan ADO, NAB 1.4 lens.) \*\* 1 to 5 fluorophores per speckle.

- Motility and Motion analysis
- Combined DIC/Phase and Fluorescence
- Histology, Pathology and Cytology
- Metallurgical Microscopy
- Failure analysis
- Semiconductor inspection
- X-ray Scintillator readout

## FEATURES

- High sensitivity in VIS-NIR region
- Hermetic vacuum sealed head
- Low dark noise with peltier cooling
- High resolution of 1.37 million pixels
- Progressive scan interline CCD chip with no mechanical shutter
- Low readout noise
- Binning function for improved sensitivity
- Full remote control from PC

## SYSTEM CONFIGURATION



## SPECIFICATIONS

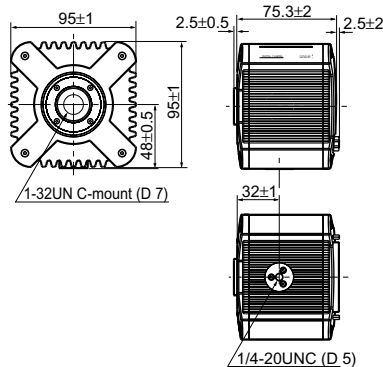
Imaging device	Progressive scan interline CCD with micro-lens
Effective no. of pixels	1344 (H) × 1024 (V)
Cell size	6.45 μm × 6.45 μm (square format)
Effective area	8.67mm × 6.60 mm (2/3-inch format)
Pixel clock rate	14.75MHz/pixel
Frame rate	8.3 Hz
2 × 2 binning	16.4 Hz
4 × 4 binning	29.0 Hz
8 × 8 binning	45.3 Hz
Readout noise (r.m.s.)	8 electrons
Full well capacity	18,000 electrons
Dynamic range*	2250 :1
Cooling method	Peltier cooling with hermetic vacuum sealing
Cooling temperature	- 20 °C at 20 °C ambient temperature
Dark current	0.1 electron/pixel/sec
A/D converter	12 bit
Output signal (digital output)	RS-422A 12-bit parallel output
External control	RS-232C (full remote for all camera functions)
Sub array**	yes
External trigger	yes
Contrast enhancement	Analog Gain (10 times max.) and Offset functions
Power consumption	70 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 full well capacity and average readout noise.

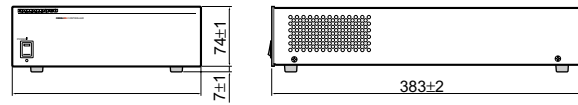
\*\* Note: Includes 1280 × 1024 image size software compatibility with ORCA and ORCA II series.

## DIMENSIONAL OUTLINES (Unit: mm)

### • Camera head (approx. 1.3 kg)



### • Camera controller (approx. 6.3 kg)



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• Information furnished by HAMAMATSU is believed to be reliable. However, no responsibility is assumed for possible inaccuracies or omissions.

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