

High Resolution Digital B/W CCD Camera ORCA II-ER

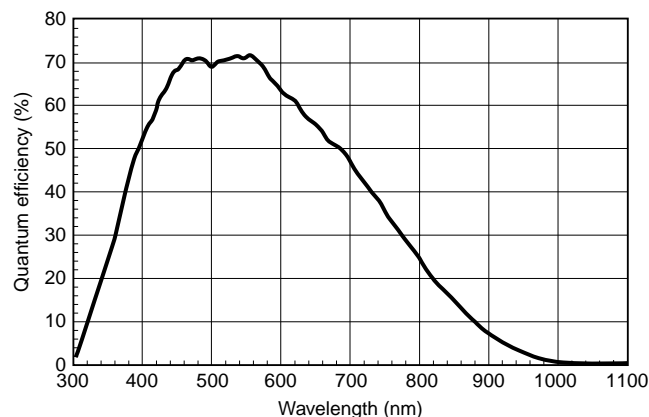


The ORCA II-ER camera features the unique ER-150 CCD chip packaged in a proprietary permanently sealed vacuum chamber evacuated to 10^{-7} Torr. This CCD offers very high quantum efficiency over the spectrum from 350 nm to 850 nm and very low noise. With selectable full well capacity, low read noise, cooling to -60°C to virtually eliminate dark current, this camera will produce rapid exposures and high dynamic range images. Dual mode digitization offers a software selectable choice of speed or very low noise readout methods with 12 and 14 bit precision. Special analog contrast enhancement circuits increase versatility for even the most difficult imaging conditions.

APPLICATIONS

- Routine Fluorescence Microscopy
- Green Fluorescent Protein applications
- DNA and Ploidy analysis
- Fluorescence In Situ Hybridization studies
- Red and Near Infrared Fluorescent applications
- Motility and Motion analysis
- Combined DIC/Phase and Fluorescence
- Histology, Pathology and Cytology
- Metallurgical Microscopy
- Failure analysis
- Semiconductor inspection
- X-ray Scintillator readout

SPECTRAL RESPONSE CHARACTERISTIC



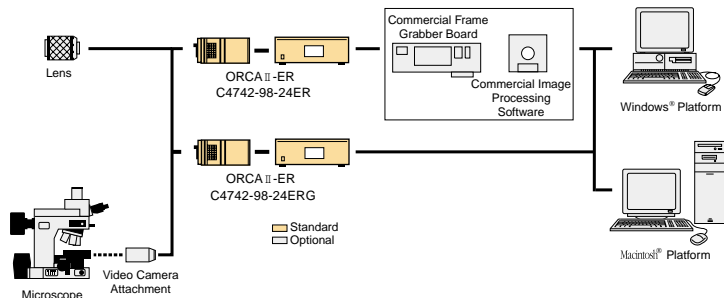
★ This is typical, not guaranteed

FEATURES

- Progressive scan interline readout with no mechanical shutter
- High resolution format (1344 × 1024 pixels)
- Software selectable quantum efficiency (High or Low light mode)
- Broad spectral range (300 nm to 950 nm)
- Software selectable full well capacity (18,500 or 40,500* electrons typ.)
- Low readout noise design (3 to 5 electrons (typ.) at 14 bit.)
- Software selectable dual digitizers (12 and 14 bit)
- Analog contrast enhancement

*2 x 2 binning mode offers 40,500 electron full well capacity

SYSTEM CONFIGURATION



TYPE NUMBER

- **C4742-98-24ERG**
A high performance serial bus IEEE 1394 is used as a computer interface.



Hamamatsu is a member of 1394 Trade Association

- **C4742-98-24ER**
RS422A digital output ensures compatibility with a large number of commercially available frame grabber boards.

SPECIFICATIONS

Type number	C4742-98-24ERG		C4742-98-24ER		
Camera head type	Hermetic vacuum sealed air-cooled head				
Circulating water cooler	-				
Mechanical shutter	-				
Imaging device	ER-150 interline CCD chip with micro-lens				
Effective no. of pixels	1344 (H) × 1024 (V)				
Cell size	6.45 (H) μm × 6.45 (V) μm				
Effective area	8.67 (H) mm × 6.60(V) mm / 2/3 inch format				
Pixel clock rate	High speed readout	10 MHz/pixel			
	High-precision readout	1.25 MHz/pixel			
Frame rate	High speed readout	1 × 1	5.6 Hz	6.0 Hz	
		2 × 2	9.8 Hz	10.7 Hz	
		4 × 4	15.6 Hz	18.0 Hz	
		8 × 8	22.2 Hz	27.3 Hz	
	High-precision readout	1 × 1	0.83 Hz	0.84 Hz	
		2 × 2	1.58 Hz	1.63 Hz	
		4 × 4	2.90 Hz	3.08 Hz	
		8 × 8	4.97 Hz	5.51 Hz	
Readout noise(r.m.s.)	High speed readout	7 to 8 electrons			
	High-precision readout	3 to 5 electrons			
Full well capacity	1 × 1	18,500 electrons			
	binning	40,500 electrons (High-precision readout only)			
Dynamic range*	High speed readout	2,466 : 1			
	High-precision readout	1 × 1	4,625 : 1		
		binning	10,125 : 1		
Cooling method	Peltier cooling / forced-air cooling + hermetic sealing				
Cooling temperature	- 60 °C				
Dark current	High light mode	0.0025 electrons/pixel/sec			
	Low light mode	0.0065 electrons/pixel/sec			
A/D converter	High speed readout	12 bit			
	High-precision readout	14 bit			
Output signal (digital output)	High speed readout	Non-compressed data (Mono16)	RS-422A 12 bit parallel output		
	High-precision readout		RS-422A 14 bit parallel output		
Exposure time	30 μs to 11 hours				
External control	1394-Based Digital Camera Specification V1.30		RS-232C		
Sub-array**	Yes				
External trigger	Yes				
Contrast enhancement	High speed readout	1 to 6 times			
	High-precision readout	1, 2, 10 times			
Lens mount	C-mount				
Line voltage	100 / 117 / 220 / 240 VAC, 50/60 Hz				
Power consumption	Approx. 220 VA				
Ambient storage temperature	-10 °C to +50 °C				
Ambient operating temperature	0 °C to +40 °C				
Ambient operating/storage humidity	70% max. (with no condensation)				

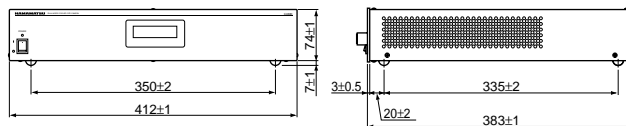
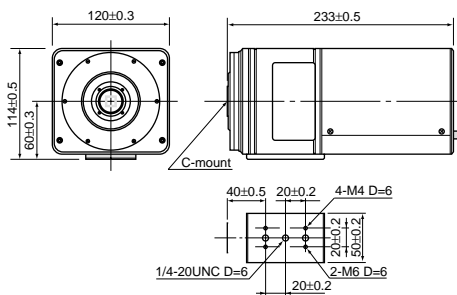
* Calculated from the ratio of the full well capacity and average readout noise.

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

DIMENSIONAL OUTLINES (Unit: mm)

● Camera head (approx. 2.5 kg)

● Camera controller (approx. 8.5 kg)



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