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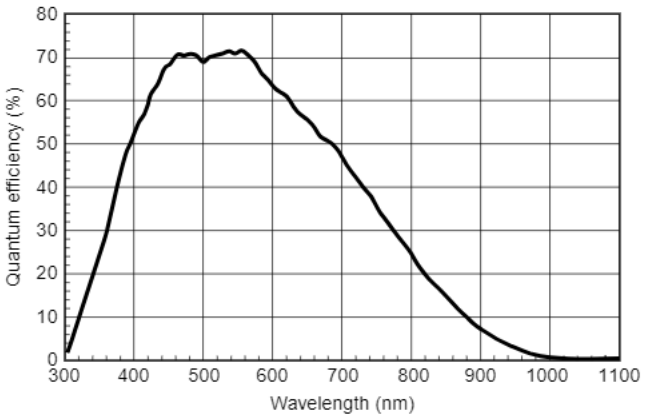
DATA SHEET

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



The ORCAⅡ-ERG and ORCAⅡ-ER 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 bit and 14 bit precision. Special analog contrast enhancement circuits increase versatility for even the most difficult imaging conditions.

## SPECTRAL RESPONSE CHARACTERISTIC




★ This is typical, not guaranteed
Low-light mode

## FEATURES

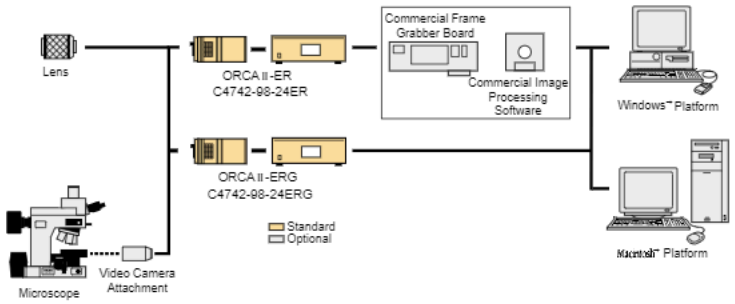
- **Progressive scan interline readout with no mechanical shutter**
- **High resolution format (1344 - 1024 pixels)**
- **Software selectable quantum efficiency (High or Low light mode)**
- **Broad spectral range (300 nm to 950 nm)**
- **Software selectable full well capacity (18500 or 40500* electrons typ.)**
- **Low readout noise design (4 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

## APPLICATIONS

- **Routine Fluorescence Microscopy**
- **Green Fluorescent Protein applications**
- **DNA and Ploidy analysis**
- **Red and Near infrared fluorescent applications**
- **Fluorescence In Situ Hybirdization studies**
- **Motility and Motion analysis**
- **Combined DIC/Phase and Fluorescence**
- **Histology, Pathology and Cytology**
- **Metallurgical microscopy**
- **Failure analysis**
- **Semiconductor inspection**
- **X-ray scintillator readout**

## SYSTEM CONFIGURATION




## TYPE NUMBER

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

Hamamatsu is a member of 1394 Trade Association

- **C4742-98-24ER (ORCAⅡ-ER)**
  RS-422A digital output ensures compatibility with a large number of commercially available frame grabber boards.

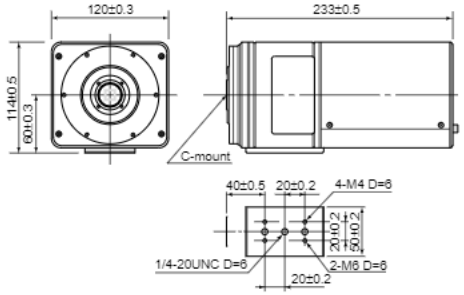
# SPECIFICATIONS

| Model name | | | | ORCA Ⅱ-ERG | ORCA Ⅱ-ER |
|---|---|---|---|---|---|
| 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 (square format) | | | | 6.45 ∝m (H) - 6.45 ∝m (V) | |
| Effective area | | | | 8.67 mm (H) - 6.60 mm (V) | |
| 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 frame/s | 6.0 frame/s |
| | | 2 - 2 | | 9.8 frame/s | 10.7 frame/s |
| | | 4 - 4 | | 15.6 frame/s | 18.0 frame/s |
| | | 8 - 8 | | 22.2 frame/s | 27.3 frame/s |
| | High-precision readout | 1 - 1 | | 0.83 frame/s | 0.84 frame/s |
| | | 2 - 2 | | 1.58 frame/s | 1.63 frame/s |
| | | 4 - 4 | | 2.90 frame/s | 3.08 frame/s |
| | | 8 - 8 | | 4.97 frame/s | 5.51 frame/s |
| Readout noise(r.m.s.) typ. | High-speed readout | | | 8 electrons | |
| | High-precision readout | | | 4 electrons | |
| Full well capacity typ. | 1 - 1 | | | 18 500 electrons | |
| | binning | | | 40 500 electrons (High-precision readout only) | |
| Dynamic range* typ. | High-speed readout | | | 2 312 : 1 | |
| | High-precision readout | 1 - 1 | | 4 625 : 1 | |
| | | binning | | 10 125 : 1 | |
| Cooling method | | | | Forced-air peltier cooling with hermetic sealing | |
| Cooling temperature | | | | - 60 °C | |
| Dark current | | | | 0.0045 electrons/pixel/s | |
| A/D converter | High-speed readout | | | 12 bit | |
| | High-precision readout | | | 14 bit | |
| Interface / Output signal (digital output) | High-speed readout | | | IEEE1394 / Non-compressed data (Mono16) | RS-422A 12 bit parallel output |
| | High-precision readout | | | | RS-422A 14 bit parallel output |
| Exposure time | | | | 30 ∝s to 7 200 s | |
| External control | | | | IIDC 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 | | | | AC 100 V / AC 117 V / AC 220 V / AC 240 V, 50/60 Hz | |
| Power consumption | | | | approx. 220 V·A | |
| 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) | |

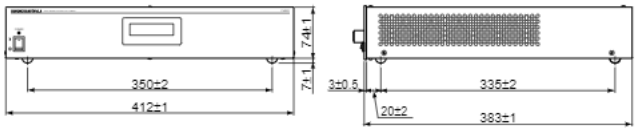
* Calculated from the ratio of the full well capacity and average readout noise.

# DIMENSIONAL OUTLINES (Unit: mm)

- **Camera head (approx. 2.5 kg)**




- **Camera controller (approx. 8.5 kg)**




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