The ORCA-AG is a high resolution digital camera with a progressive scan interline CCD chip with no mechanical shutter. Features include 1.37 million pixels, wide dynamic range, 12 bit digital output. With very high quantum efficiency and low noise, this camera is designed for a wide range of applications including low light level imaging. Peltier cooling with hermetic vacuum sealing drastically reduces dark noise and minimizes thermal drift, which makes the camera an ideal choice for demanding scientific and industrial applications.

A high performance serial bus IEEE 1394 is used as a computer interface. Furthermore, a standard C-mount lens coupling makes it easy to connect to optics such as optical microscopes.

**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

**FEATURES**
- High sensitivity in VIS-NIR region
- Hermetic vacuum sealed head
- High resolution of 1.37 million pixels
- Exposure time up to 4200 sec
- Low dark noise with peltier cooling for a dynamic range of 3000 : 1
- Progressive scan interline CCD chip with no mechanical shutter
- Compatible with IIDC 1394-based digital camera specification
- Full remote control from PC via IEEE 1394 bus

**SYSTEM CONFIGURATION**

Hamamatsu is a member of 1394 Trade Association
## SPECIFICATIONS

<table>
<thead>
<tr>
<th>Type number</th>
<th>C4742-80-12AG</th>
</tr>
</thead>
<tbody>
<tr>
<td>Camera head type</td>
<td>Hermetic vacuum-sealed air-cooled head</td>
</tr>
<tr>
<td>Imaging device</td>
<td>ER-150 progressive scan interline CCD</td>
</tr>
<tr>
<td>Effective number of pixels</td>
<td>1344 (H) X 1024 (V)</td>
</tr>
<tr>
<td>Cell size</td>
<td>6.45 µm (H) X 6.45 µm (V)</td>
</tr>
<tr>
<td>Effective area</td>
<td>8.67 mm (H) X 6.60 mm (V)</td>
</tr>
<tr>
<td>Pixel clock rate</td>
<td>14.75 MHz/pixel</td>
</tr>
</tbody>
</table>

### Imaging device

- **ER-150** progressive scan interline CCD
- **Effective number of pixels**: 1344 (H) X 1024 (V)
- **Cell size**: 6.45 µm (H) X 6.45 µm (V)
- **Effective area**: 8.67 mm (H) X 6.60 mm (V)
- **Pixel clock rate**: 14.75 MHz/pixel

### Exposure time

**Typical Dynamic Range**: 3000 : 1

### Cooling method

- Forced air peltier cooling, with hermetic sealing

### Dark current

- 0.03 electrons/pixel/s

### Full well capacity

- 18000 electrons

### Cooling temperature

- -30 °C

### Interface / Output signal (digital output)

- IEEE1394-1995 / Non-compressed data (Mono 16)

### External control

- IIDC 1394-Based Digital Camera Specification Ver.1.30

### Power consumption

- approx. 90VA

### Ambient storage temperature

- -10 °C to +50 °C

### Ambient operating temperature

- 0 °C to +40 °C

### Ambient storage/operating humidity

- 70 % max. (no condensation)

### Lens mount

- C-mount

### Sub-array

- Analog gain (10 times max.) and offset function

### External trigger

- yes

### External control

- yes

### Line voltage

- AC 100 V / AC 117 V / AC 220 V / AC 240 V, 50/60 Hz

### Readout noise (r.m.s.) typ.

- 6 electrons

### Frame rate

- 8.8 frame/s
- 16 frame/s
- 27 frame/s
- 41 frame/s

<table>
<thead>
<tr>
<th>Frame rate</th>
<th>Binning</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>1 x 1</td>
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<td>8.8 frame/s</td>
</tr>
<tr>
<td>2 x 2</td>
<td></td>
<td>16 frame/s</td>
</tr>
<tr>
<td>4 x 4</td>
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<td>27 frame/s</td>
</tr>
<tr>
<td>8 x 8</td>
<td></td>
<td>41 frame/s</td>
</tr>
</tbody>
</table>

### Cooling method

- Forced air peltier cooling, with hermetic sealing

### Dynamic range

- Calculated from the ratio of the full well capacity and the readout noise

### DIMENSIONAL OUTLINES (Unit: mm)

- **Camera head (approx. 1.5 kg)**

  ![Camera head diagram](image)

- **Camera controller (approx. 6.2 kg)**

  ![Camera controller diagram](image)

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