Hamamatsu’s brilliantly designed ORCA-Flash4.0 is truly a game changer in the world of scientific imaging. Built on a revolutionary new Gen II sCMOS detector, the ORCA-Flash4.0 is the first sCMOS camera that challenges the performance of all CCD, EM-CCD, and Gen I sCMOS cameras. With its combination of low noise and high quantum efficiency, the ORCA-Flash4.0 delivers unprecedented sensitivity as well as high dynamic range, blazing fast speeds, large field of view, and excellent resolution—all at once.

Furthermore, the camera’s high NIR sensitivity (over 20% Q.E. at 900 nm) is perfectly suitable for many NIR applications such as solar cell quality control, semiconductor inspection, IR reflectography, etc.

The new standard for sensitivity, speed, and resolution is here. We think you will enjoy the results.

### Applications

- Electroluminescence imaging for photovoltaic cell inspection
- NIR semiconductor inspection
  - Internal inspection (TSV, MEMS, etc.)
  - Wafer inspection (appearance, defects, characteristics)
  - Bonded wafer inspection (Si/GaAs)
- TEM readout
- X-ray L.L., X-ray scintillator readout
- IR reflectography (art inspection)
Sample images

Comparison under the same field of view as C8800-21CU (NIR CCD Camera)

ORCA-Flash4.0 enables much finer details to be resolved because of its higher resolution than C8800-21CU.

Specifications

<table>
<thead>
<tr>
<th>Type number</th>
<th>C1440-20C (ORCA-Flash4.0)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Imaging device</td>
<td>Scientific CMOS sensor FL-400</td>
</tr>
<tr>
<td>Effective number of pixels</td>
<td>2048 (H) × 2048 (V)</td>
</tr>
<tr>
<td>Cell size</td>
<td>6.5 μm × 6.5 μm</td>
</tr>
<tr>
<td>Effective area</td>
<td>13.312 mm × 13.312 mm</td>
</tr>
<tr>
<td>Full well capacity (typ.)</td>
<td>30 000 electrons</td>
</tr>
<tr>
<td>Readout noise (at 100 frames/s, typ.)</td>
<td>1.3 electrons</td>
</tr>
<tr>
<td>Dynamic range (typ.)</td>
<td>23 000:1</td>
</tr>
<tr>
<td>Quantum efficiency</td>
<td>Higher than 70 % at 600 nm and 50 % at 750 nm</td>
</tr>
</tbody>
</table>

Readout speed

- Full resolution: 100 frames/s
- 1024 lines at center position: 200 frames/s
- 8 lines at center position: 25 656 frames/s

A/D conversion

- 16 bit output

Readout modes

- Digital binning 2 × 2 / 4 × 4
- Sub-array readout mode

Exposure time

- Max. 10 s

Digital interface

- CameraLink full configuration Deca mode

Lens mount

- C-mount

Power requirement

- AC 100 V to AC 240 V, 50 Hz/60 Hz

Power consumption

- Approx. 90 VA

Trigger in

- External trigger mode: Edge, Level, Synchronous readout and Start trigger
- External trigger signal routing: SMA connector or CameraLink I/F
- External trigger delay function: 0 to 10 s in 10 μs steps

Trigger out

- External signal output: 3 programmable timing outputs
- Global exposure timing and Trigger ready output
- External signal output routing: SMA connector

Software

- Software interface: PC-based acquisition package included
- DCAM-SDK, commercially available software
- *HCImage software provides standard image measurement functions. Upgrades to more feature-rich versions are available.

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