Leaders in digital camera solutions

X-RAY   EMCCD   CCD   SWIR
All specifications are typical and correct at time of print. More detailed specifications can be found in the datasheets for our cameras. All standard cameras are monochrome and use Camera Link digital output. For custom options please contact us directly.

### LG = Low Gain  HG = High Gain

<table>
<thead>
<tr>
<th>LG</th>
<th>HG</th>
</tr>
</thead>
<tbody>
<tr>
<td>63dB</td>
<td>71dB</td>
</tr>
</tbody>
</table>

#### Dynamic Range (Typical Value)

- Weight (g): 250 <1.5kg
- Dimensions (mm): 75 x 50 x 50 129 x 112 x 94
- TE Cooling: Active -80°C
- Typical Dark Current (e/p/s): <60,000 <100
- Peak Quantum Efficiency: 80% @ 1.5μm 80% @ 1.5μm
- Max. Full Resolution Frame Rate (Hz): 300 100
- LG = Low Gain  HG = High Gain HG: <30e- LG: <390e-

#### Digitization (bits)

- 14 16

#### Pixel Pitch (μm)

- 15 x 15 15 x 15

#### Array Size (pixels)

- 640 x 512 640 x 512

#### Sensor Size

- 0.32MP

#### Sensor Type

- InGaAs

#### Applications

- Instrumentation
- Non-destructive testing
- Medical imaging through tissues / rare earth nanoparticles
- Transportation
- Telecommunications

#### Features and Benefits

- Reduced read noise
- Superior SNR
- Improved edge contrast

#### SWIR Technology Overview

- InGaAs technology is ideal for long wave infrared imaging, where the sensitivity is higher than that of visible sensors.
- InGaAs detectors are capable of detecting the infrared spectrum from 1.5μm to 2.5μm.

#### VIS-SWIR Technology Overview

- VIS-SWIR cameras can be used for applications requiring the detection of light wavelengths shorter than 1.5μm, such as visible light, ultraviolet, and near-infrared imaging.
- InGaAs technology is particularly useful for applications requiring high sensitivity in the infrared spectrum.

#### Examples of Applications

- Instrumentation
- Non-destructive testing
- Medical imaging through tissues / rare earth nanoparticles
- Transportation
- Telecommunications

#### Features and Benefits

- Reduced read noise
- Superior SNR
- Improved edge contrast
### UV, VIS, NIR

<table>
<thead>
<tr>
<th></th>
<th>Falcon III</th>
<th>Kestrel</th>
<th>Hawk 252</th>
<th>Eagle 42-40</th>
<th>Eagle 47-10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensor</td>
<td>CCD-351</td>
<td>CCD-60</td>
<td>CCD-252</td>
<td>CCD42-40</td>
<td>CCD47-40</td>
</tr>
<tr>
<td>Sensor Type</td>
<td>½&quot; EMCCD</td>
<td>½&quot; EMCCD</td>
<td>½&quot; EMCCD</td>
<td>Front and Back illuminated</td>
<td></td>
</tr>
<tr>
<td>Sensor size</td>
<td>1MP</td>
<td>0.16MP</td>
<td>1.3MP</td>
<td>4MP</td>
<td>1MP</td>
</tr>
<tr>
<td>Array Size (pixels)</td>
<td>1024 x 1024</td>
<td>128 x 128</td>
<td>1280 x 1024</td>
<td>2048 x 2048</td>
<td>1024 x 1024</td>
</tr>
<tr>
<td>Pixel Pitch (μm)</td>
<td>10 x 10</td>
<td>24 x 24</td>
<td>8 x 8</td>
<td>13.5 x 13.5</td>
<td>13 x 13</td>
</tr>
<tr>
<td>Active Area (mm)</td>
<td>10.2 x 10.2</td>
<td>3.1 x 3.1</td>
<td>10.24 x 8.19</td>
<td>27.65 x 27.65</td>
<td>13.3 x 13.3</td>
</tr>
<tr>
<td>Full Well Capacity</td>
<td>35ke-</td>
<td>160ke-</td>
<td>20ke-</td>
<td>100ke-</td>
<td>100ke-</td>
</tr>
<tr>
<td>Shift Register Well Depth</td>
<td>200ke-</td>
<td>800ke-</td>
<td>120ke-</td>
<td>150ke-</td>
<td>150ke-</td>
</tr>
<tr>
<td>Digitization (bit)</td>
<td>16</td>
<td>16</td>
<td>12</td>
<td>16</td>
<td>16</td>
</tr>
<tr>
<td>Typical Readout Noise (RMS)</td>
<td>EM Gain ON: &lt;1e-</td>
<td>EM Gain ON: &lt;1e-</td>
<td>EM Gain ON: &lt;0.01e-</td>
<td>2.3e- @ 75kHz</td>
<td>2.3e- @ 75kHz</td>
</tr>
<tr>
<td>Max. Full Resolution Frame Rate (Hz)</td>
<td>31</td>
<td>500</td>
<td>25 / 30</td>
<td>0.42</td>
<td>1.45</td>
</tr>
<tr>
<td>Peak Quantum Efficiency</td>
<td>95% @ 575nm</td>
<td>95% @ 600nm</td>
<td>95% @ 600nm</td>
<td>&gt;90% @ 550nm</td>
<td>&gt;90% @ 550nm</td>
</tr>
<tr>
<td>Spectral Response (nm)</td>
<td>300 - 1100</td>
<td>300 - 1100</td>
<td>300 - 1100</td>
<td>300 - 1100</td>
<td></td>
</tr>
<tr>
<td>TE Cooling</td>
<td>-70°C</td>
<td>-20°C</td>
<td>15°C</td>
<td>-90°C</td>
<td>-90°C</td>
</tr>
<tr>
<td>Typical Dark Current (e/p/s)</td>
<td>0.001</td>
<td>0.001</td>
<td>TBC</td>
<td>&lt;0.0001</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Typical Dynamic Range (dB)</td>
<td>91</td>
<td>&gt;90</td>
<td>&gt;90</td>
<td>93</td>
<td>93</td>
</tr>
<tr>
<td>Lens Mount</td>
<td>C mount</td>
<td>C mount</td>
<td>C mount</td>
<td>F mount</td>
<td>F mount</td>
</tr>
<tr>
<td>Dimensions (mm)</td>
<td>121 x 140 x 113</td>
<td>129 x 112 x 94</td>
<td>73 x 62 x 62</td>
<td>155 x 141 x 110</td>
<td>155 x 141 x 110</td>
</tr>
<tr>
<td>Weight</td>
<td>&lt;1.5kg</td>
<td>&lt;1.5kg</td>
<td>350g</td>
<td>3.0kg</td>
<td>3.0kg</td>
</tr>
</tbody>
</table>

### UV-VIS-NIR Technology Overview

An EMCCD is an Electron Multiplying Charge Coupled Device. (Also referred to as an L3CCD or an Impactron CCD). In an ordinary CCD device light incident on the device is converted to electrons through photonic processes. EMCCDs employ a unique architecture that enables the device to greatly multiply (>1000 times) the number of resulting electrons produced by the incident light. This feature gives the EMCCD a far superior advantage over existing CCD technology in low light conditions.

### Features and Benefits

Raptor Photonics offers a range of cameras for the detection of photons and high energy particles. Using high performance CCD and EMCCD sensors, photon (or particle) energies from 1.2eV up to 20keV can be detected directly within the silicon. Higher energies are detected indirectly, by coupling a phosphor or scintillator screen onto the CCD sensor.

### Applications

- Adaptive Optics and Astronomy
- Calcium signaling
- Fluorescence imaging / spectroscopy
- Flow cytometry
- FRET / FRAP / TIRF
- Genome sequencing
- High content screening
- High resolution fluorescence imaging
- Hyperspectral imaging
- Live Cell Imaging
- Single molecule detection
- Solar Cell Inspection
- X-ray tomography

Please consult with our X-ray & High-Energy brochure to see our full range of open-front and in-vacuum cameras and detectors.
Applications

In-Vivo Fluorescence Imaging

Live Cell Imaging

Solar Cell Inspection

Chemiluminescence

Astronomy

Spectroscopy

Hyperspectral Imaging

X-Ray Diffraction

Earth Observation (CubeSat)

Software

Raptor designs and builds cameras, but we understand that we also need to deliver solutions that integrate with relevant software for the capture and analysis of images. We have developed drivers to enable users to control the camera for the following software platforms:

- **EPIX XCAP / XCLIB** – This is the software provided by Epix Inc., a US based manufacturer of CameraLink cards. http://www.epixinc.com/

- **MicroManager** – a complete image acquisition and microscope control package that runs as a plugin to ImageJ. It is an open-source platform (https://micro-manager.org/)

- **Labview / C++** - Raptor provides a range of .ICD files to enable customers to write their own software

For any questions on software of for any support issues, please contact sales@raptrophotonics.com
OEM Accreditations

Raptor’s core business is targeted at the OEM market. Since our inception in 2006 we have focused on building our credentials / capabilities to meet our OEM customer needs. These include:

- Operating a quality management system, the company fully complies with the requirements of BS EN ISO 9001:2015
- Accustomed to designing to MilSpec standards including MIL-STD-810F and MIL-STD-704F
- RMAs of less than 2% – we deliver quality products
- Workmanship to class IPCa610
- ESD Compliant
- RoHS Compliant

We have also introduced our Raptor Certified Supply Chain to ensure that our suppliers conform to best practice guidelines e.g. Counterfeit goods inspections.

OEM and Custom Options

Raptor offers a range of custom options for OEMs and customers with high-end projects. This includes optical, electronic, mechanical layout and interface. Contact us to discuss your requirements in more detail.

Customer Support

Understanding your instrumentation solutions, your product roadmap and your business model will enable us to offer you the best camera solution. We would be delighted to hear from you.

For further information, datasheets or to schedule a demo of any of our cameras please refer to our website, contact your local distributor or reach out to us directly:

Raptor Key Facts

- Established 2006.
- Made in the UK.
- Onshore US sales and technical support.
- Complete Turnkey manufacturing.
- Strong Financial Performance - Year on Year Growth.
- Operating in three key markets; Surveillance, Scientific and Aerospace.
- Compatible with XCAP software, Micromanager & Labview.