Imagine the invisible

**Cougar-640**
LN2 cooled high resolution SWIR camera

**Designed to have the lowest noise and highest sensitivity for low-light-level measurements**

The Cougar-640 excels in performance for any R&D spectroscopy or semiconductor failure analysis task. These demanding applications, where very low light levels need to be measured, require cameras with low dark current, low noise and best response in the SWIR range. All of these features are now combined in one single camera.

The in-house developed InGaAs detector of the Cougar-640 is optimized for 77K operation, using Liquid Nitrogen (LN2) cooling and is based on a SFD (Source Follower per Detector) read-out topology for ultra-low noise levels ever seen (15 e-). Integration time of several hours is possible with the RWI (Read While Integrate) feature with non-destructive readout and very low dark current of less than 10e-/second.

The Cougar-640 features a high image resolution of 640 x 512 with a 20 µm pixel pitch and full 24 bit ADC. Camera interfacing is provided via standard CameraLink for ease of integration.

**Scientific Benefits & Features**
- Lowest noise
- High sensitivity
- Low dark current
- Windowing for enhanced focusing
- Measuring extreme low light signals
- Extreme long integration time with non-destructive readout

**Applications**
- Astronomy
- Raman spectroscopy
- Low light level SWIR imaging
- High resolution imaging spectroscopy
- Failure analysis via photon emission or electro-luminescence

**Designed for use in**
- Astronomy
- Lab spectroscopy
- Photon emission 10x zoom
- Photon emission 20x zoom
### Specifications

#### Camera specifications  
**Cougar-640**

<table>
<thead>
<tr>
<th>Lens (not included)</th>
<th>Optical interface</th>
<th>Imaging performance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Custom lens mount</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Frame rate (full frame)</th>
<th>Window of Interest</th>
<th>Exposure time range</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.42 Hz</td>
<td>Minimum size 2 x 4 pixels</td>
<td>Illuminated mode with ITR: 12.5 ms – 53.7 sec</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Emission mode with RWI: 0.7 sec – till saturation</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Full well</th>
<th>Gain (e-/ADU count)</th>
<th>Noise</th>
<th>Dark current</th>
<th>A to D conversion resolution</th>
</tr>
</thead>
<tbody>
<tr>
<td>400.000 e-</td>
<td>2.2 µV/e-</td>
<td>15 e- (T=77K, Tint=50 µs)</td>
<td>&lt; 10 e-/s (T=77K)</td>
<td>24 bit</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Interfaces</th>
</tr>
</thead>
<tbody>
<tr>
<td>Camera control</td>
</tr>
<tr>
<td>Image acquisition</td>
</tr>
<tr>
<td>Trigger</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>Power requirements</th>
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</thead>
<tbody>
<tr>
<td>Power consumption</td>
</tr>
<tr>
<td>Power supply</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Physical characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions electronics housing</td>
</tr>
<tr>
<td>Dimensions Dewar</td>
</tr>
<tr>
<td>Weight electronics module</td>
</tr>
<tr>
<td>Weight Dewar</td>
</tr>
</tbody>
</table>

#### Array specifications  
**XFPA-1.7-640-LN2**

<table>
<thead>
<tr>
<th>Array Type</th>
<th>Spectral band</th>
</tr>
</thead>
<tbody>
<tr>
<td>InGaAs</td>
<td>0.9 to 1.7 µm @ room temperature</td>
</tr>
<tr>
<td>0.9 to 1.55 µm @ 77K cooling</td>
<td></td>
</tr>
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</table>

<table>
<thead>
<tr>
<th># Pixels</th>
<th>Pixel Pitch</th>
</tr>
</thead>
<tbody>
<tr>
<td>640 x 512</td>
<td>20 µm x 20 µm</td>
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</table>

<table>
<thead>
<tr>
<th>Pixel Clock Frequency</th>
<th>Pixel Operability</th>
</tr>
</thead>
<tbody>
<tr>
<td>125 kHz</td>
<td>&gt; 98%</td>
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**Product selector guide**

<table>
<thead>
<tr>
<th>Part number</th>
<th>Cooling</th>
<th>Digital output interface</th>
<th>Frame rate (Hz)</th>
<th>ADC</th>
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</thead>
<tbody>
<tr>
<td>XEN-000076</td>
<td>LN2 (77K)</td>
<td>CameraLink</td>
<td>1.42</td>
<td>24 bit</td>
</tr>
</tbody>
</table>