Small and powerful

Ultra-compact GigE Vision cameras

Mako G-158 with Sony IMX273 runs 75.0 frames per second at 1.6 MP resolution.

Mako is an attractively priced GigE Vision-compliant camera in a compact rugged industrial housing. Many models include advanced functionalities such as Precision Time Protocol (PTP), Trigger over Ethernet (ToE) Action Commands, and Power over Ethernet (PoE). Screw mount RJ45 connector and multiple I/Os facilitate your straightforward system integration. Mako cameras are also available as Near Infrared (NIR) and polarizer variants.

Easy software integration with Allied Vision’s Vimba Suite and compatibility to the most popular third party image-processing libraries.

See the Modular Concept for lens mount, housing variants, optical filters, case design, and other modular options. See the Customization and OEM Solutions webpage for additional options.
## Specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Interface</strong></td>
<td>IEEE 802.3 1000BASE-T, IEEE 802.3af (PoE)</td>
</tr>
<tr>
<td><strong>Resolution</strong></td>
<td>1456 (H) × 1088 (V)</td>
</tr>
<tr>
<td><strong>Sensor</strong></td>
<td>Sony IMX273</td>
</tr>
<tr>
<td><strong>Sensor type</strong></td>
<td>CMOS</td>
</tr>
<tr>
<td><strong>Shutter mode</strong></td>
<td>GS (Global shutter)</td>
</tr>
<tr>
<td><strong>Sensor size</strong></td>
<td>Type 1/2.9</td>
</tr>
<tr>
<td><strong>Pixel size</strong></td>
<td>3.45 µm × 3.45 µm</td>
</tr>
<tr>
<td><strong>Lens mounts (available)</strong></td>
<td>C-Mount, CS-Mount</td>
</tr>
<tr>
<td><strong>Max. frame rate at full resolution</strong></td>
<td>75 fps</td>
</tr>
<tr>
<td><strong>ADC</strong></td>
<td>12 Bit</td>
</tr>
<tr>
<td><strong>Image buffer (RAM)</strong></td>
<td>64 MByte</td>
</tr>
</tbody>
</table>

### Imaging performance

Imaging performance data is based on the evaluation methods in the EMVA 1288 Release 3.1 standard for characterization of image sensors and cameras. Measurements are typical values for monochrome models measured at full resolution without optical filter. Contact Sales or AE for more information.

- **Quantum efficiency at 529 nm**: 64 %
- **Temporal dark noise**: $2.2 \times 10^{-5}$
- **Saturation capacity**: $10500 \times 10^{-5}$
- **Dynamic range**: 71.5 dB
- **Absolute sensitivity threshold**: $2.8 \times 10^{-5}$

### Output

<table>
<thead>
<tr>
<th>Feature</th>
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</tr>
</thead>
<tbody>
<tr>
<td><strong>Bit depth</strong></td>
<td>12 Bit</td>
</tr>
<tr>
<td><strong>Monochrome pixel formats</strong></td>
<td>Mono8, Mono12, Mono12Packed</td>
</tr>
<tr>
<td><strong>YUV color pixel formats</strong></td>
<td>YUV411Packed, YUV422Packed, YUV444Packed</td>
</tr>
<tr>
<td><strong>RGB color pixel formats</strong></td>
<td>RGB8Packed, BGR8Packed</td>
</tr>
<tr>
<td><strong>Raw pixel formats</strong></td>
<td>BayerRG8, BayerRG12, BayerRG12Packed</td>
</tr>
</tbody>
</table>
General purpose inputs/outputs (GPIOs)

- Opto-isolated I/Os: 1 input, 3 outputs

Operating conditions/dimensions

- Operating temperature: +5 °C to +45 °C housing temperature
- Power requirements (DC): 10.8 to 26.4 VDC AUX or 802.3at Type 1 PoE
- Power consumption: 2.43 W at 12 VDC; 2.68 W PoE
- Mass: 80 g (with C-Mount)
- Body dimensions (L × W × H in mm): 60.5 × 29.2 × 29.2 (including connectors)

Quantum efficiency

![Quantum Efficiency Graph](graph.png)
### Features

#### Image control: Auto
- Auto exposure
- Auto gain
- Auto white balance (color models)

#### Image control: Other
- Binning
- Black level
- Color transformation (incl. hue, saturation; color models)
- Decimation
- Gamma
- LUT (look-up table)
- Reverse X/Y
- ROI (region of interest)

#### Camera control
- Acquisition frame rate
- Action commands, incl. ToE (trigger over Ethernet)
- Bandwidth control
- Event channel
- Firmware update in the field
- I/O and trigger control
- Image chunk data
- PTP (IEEE 1588 Precision Time Protocol)
- Stream hold
- Temperature monitoring
- User sets
Applications

Mako G is suitable for all typical applications in machine vision:

- Robotics
- Quality control
- Inspection, surveillance
- Industrial imaging
- Machine vision
- Logistics