CMOSIS/ams CMV2000 CMOS sensor, NIR optimized, global shutter

Mako G-223B NIR is a GigE machine vision camera that incorporates the high quality Type 2/3 (12.7 mm diagonal) CMOSIS/ams CMV2000 CMOS NIR enhanced sensor. At full resolution, this camera runs 49.5 frames per second. With a smaller region of interest, higher frame rates are possible. Mako G cameras have the same ultra-compact form factor and the same mounting positions as many analog cameras. All models include Power over Ethernet (PoE), three opto-isolated outputs, and a 64 MB image buffer. The image quality profits from the precisely aligned sensor. By default NIR models ship with no optical filter.

Benefits and features:

- GigE Vision interface with Power over Ethernet
- Screw mount RJ45 Ethernet connector for secure operation in industrial environments
- Supports cable lengths up to 100 meters (CAT-5e or CAT-6)
- Comprehensive I/O functionality for simplified system integration
- Popular C-Mount lens mount
- Easy camera mounting via standard M3 threads on top and bottom of housing or optional tripod adapter
- Easy software integration with Allied Vision’s Vimba SDK and compatibility to the most popular third party image-processing libraries.
- Defect pixel masking feature with the Defect Mask Loader tool that allows you to manage a user defined defective pixel list to match your application and optimize the life cycle of the camera.
- Available with protection glass, IR cut filter, or IR pass filter

See the Modular Concept for lens mount and optical filter options. See the Customization and OEM Solutions webpage for additional options.
Specifications

**Mako G**

<table>
<thead>
<tr>
<th><strong>Interface</strong></th>
<th>IEEE 802.3 1000BASE-T, IEEE 802.3af (PoE)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Resolution</strong></td>
<td>2048 (H) × 1088 (V)</td>
</tr>
<tr>
<td><strong>Sensor</strong></td>
<td>CMOSIS/ams CMV2000 NIR</td>
</tr>
<tr>
<td><strong>Sensor type</strong></td>
<td>CMOS</td>
</tr>
<tr>
<td><strong>Shutter mode</strong></td>
<td>Global shutter</td>
</tr>
<tr>
<td><strong>Sensor size</strong></td>
<td>Type 2/3</td>
</tr>
<tr>
<td><strong>Pixel size</strong></td>
<td>5.5 µm × 5.5 µm</td>
</tr>
<tr>
<td><strong>Lens mounts (available)</strong></td>
<td>C-Mount, CS-Mount, M12-Mount</td>
</tr>
<tr>
<td><strong>Max. frame rate at full resolution</strong></td>
<td>49.5 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 NIR models measured at full resolution without optical filter. Contact Sales or AE for more information.

- Quantum efficiency at 529 nm: 78%
- Quantum efficiency at 850 nm: 42%
- Temporal dark noise: $12.9 \text{ e}^{-}$
- Saturation capacity: $9300 \text{ e}^{-}$
- Dynamic range: 56.8 dB
- Absolute sensitivity threshold: $13.4 \text{ e}^{-}$

**Output**

- Bit depth: 8/12 Bit
- Monochrome pixel formats: Mono8, Mono12, Mono12Packed

**General purpose inputs/outputs (GPIOs)**

- 1 input, 3 outputs

**Operating conditions/dimensions**

- Operating temperature: +5 °C to +45 °C housing temperature
- Power requirements (DC): 12 to 24 VDC AUX or 802.3at Type 1 PoE
- Power consumption: 2.4 W at 12 VDC; 2.8 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

Features

Image optimization features:

- Auto gain (manual gain control: 0 to 26 dB; 1 dB increments)
- Auto exposure (manual exposure control: 30 µs to 153 s; 1 µs increments)
- Defect pixel masking (user defined with Defect Mask Loader tool)
- Gamma correction
- One look-up table (LUT)
- Piecewise Linear HDR mode
- Region of interest (ROI), separate ROI for auto features

Camera control features:

- Event channel
- Image chunk data
- Storable user sets
• StreamBytesPerSecond (bandwidth control)
• Stream hold
• Sync out modes: Trigger ready, input, exposing, readout, imaging, strobe, GPO
• Temperature monitoring (main board only)
Applications

Mako G-223B NIR is ideal for a wide range of applications including:

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