This datasheet describes the specification according to the standard 1288 for “Characterization and Presentation of Specification Data for Image Sensors and Cameras of the European Machine Vision Association (EMVA)” (see www.standard1288.org or the Zenodo EMVA 1288 community) release 3.0 with proprietary extensions from AEON. The measurements were performed with the AEON ACC3 Release 6, 18.07.2016, SN 0005(MatrixVision). The performance parameters and estimated accuracy of the measurements are described in the technical report for the instrument, its calibration in the corresponding specification and calibration report.

Measurements performed by T.Renner, Matrix Vision GmbH

<table>
<thead>
<tr>
<th>Vendor</th>
<th>MATRIX VISION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>mvBlueCOUGAR-XD107G</td>
</tr>
<tr>
<td>Serial number</td>
<td>GX200376</td>
</tr>
<tr>
<td>Sensor diagonal</td>
<td>17.55 mm</td>
</tr>
<tr>
<td>Lens category</td>
<td>C-Mount</td>
</tr>
<tr>
<td>Resolution</td>
<td>3216 × 2208, 14 bit</td>
</tr>
<tr>
<td>Pixel size</td>
<td>4.50 µm × 4.50 µm</td>
</tr>
<tr>
<td>Sensor type</td>
<td>CMOS</td>
</tr>
<tr>
<td>Shutter type</td>
<td>Global</td>
</tr>
<tr>
<td>Overlap capabilities</td>
<td>Overlapping</td>
</tr>
<tr>
<td>Maximum frame rate</td>
<td>16.8 Hz</td>
</tr>
<tr>
<td>Interface type</td>
<td>GigE Vision</td>
</tr>
</tbody>
</table>

**Type of data presented**: Single

**Operation point 1, (page 3)**

- Wavelength centroid: 536.0 nm
- Wavelength FWHM: 31.0 nm
- Gain, black-level: LCG 12/0dB, 0.2

**Optional data measured**

- None

---

![Graph of quantum efficiency vs. wavelength](image-url)
EMVA 1288 Summary Sheet for Operating Point 1

<table>
<thead>
<tr>
<th>Type of data</th>
<th>Single</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exposure control</td>
<td>By irradiance</td>
</tr>
<tr>
<td>Exposure time</td>
<td>19.00 ms</td>
</tr>
<tr>
<td>Frame rate</td>
<td>3.5 Hz</td>
</tr>
<tr>
<td>Data transfer mode</td>
<td>Mono12</td>
</tr>
</tbody>
</table>

| Gain, black-level LCG | 12/0dB, 0.2                |
| Environmental temperature | 23.4°C          |
| Camera body temperature | 42.4°C          |
| Wavelength, centr., FWHM | 536 nm, 31.0 nm |

**Photon transfer m0651, 536 nm, 09.11.2017**

<table>
<thead>
<tr>
<th>Gray value - dark value (DN)</th>
<th>0</th>
<th>5.000</th>
<th>10.000</th>
<th>15.000</th>
</tr>
</thead>
<tbody>
<tr>
<td>mono fit</td>
<td>12.000</td>
<td>10.000</td>
<td>8.000</td>
<td>6.000</td>
</tr>
</tbody>
</table>

\[
\text{mono: } \text{var(dark)} = 7.70 \text{ DN}^2, K = 0.643 \pm 0.4\%
\]

**SNR m0651, 536 nm, 09.11.2017**

<table>
<thead>
<tr>
<th>Irradiation (photons/pixel)</th>
<th>1</th>
<th>10</th>
<th>100</th>
<th>1000</th>
<th>10,000</th>
<th>1e+06</th>
</tr>
</thead>
<tbody>
<tr>
<td>mono data</td>
<td>1.000</td>
<td>0.43</td>
<td>0.25</td>
<td>0.15</td>
<td>0.09</td>
<td>0.05</td>
</tr>
<tr>
<td>mono fit</td>
<td>1.000</td>
<td>0.43</td>
<td>0.25</td>
<td>0.15</td>
<td>0.09</td>
<td>0.05</td>
</tr>
</tbody>
</table>

\[
\text{SNR} \max = 157, 43.9 \text{ dB}, 7.3 \text{ bit}
\]

\[
\frac{1}{\text{SNR} \max} = 0.64 \%
\]

\[
\text{PRNU}_{1288} = 0.64 \%
\]

**Temporal dark noise & DSNU**

\[
\sigma_{y, \text{dark}} = 2.77 \text{ DN}, \text{DSNU}_{1288} = -\text{DN}
\]

\[
\sigma_d = 4.29 \text{ e}^-, \text{DSNU}_{1288} = -\text{e}^-
\]

**Signal-to-noise ratio & PRNU**

\[
\text{SNR}_{\text{max}} = 157, 43.9 \text{ dB}, 7.3 \text{ bit}
\]

\[
\frac{1}{\text{SNR}_{\text{max}}} = 0.64 \%
\]

\[
\text{PRNU}_{1288} = 0.64 \%
\]

**Nonlinearity**

\[
\text{LE} = 0.21 \%
\]

\[
\text{LE}_{\min} = -0.27 \%
\]

\[
\text{LE}_{\max} = 0.15 \%
\]

**Sensitivity & saturation**

\[
\mu_p,\text{min} = 6.75 \text{ p}, 0.333 \text{ p}/\mu m^2
\]

\[
\mu_p,\text{sat} = 34222 \text{ p}, 1690 \text{ p}/\mu m^2
\]

\[
\mu_e,\text{min} = 4.85 \text{ e}^-, 0.239 \text{ e}^-/\mu m^2
\]

\[
\mu_e,\text{sat} = 24581 \text{ e}^-, 1214 \text{ e}^-/\mu m^2
\]

**Dynamic range**

\[
\text{DR} = 5073, 74.1 \text{ dB}, 12.3 \text{ bit}
\]

**Dark current**

\[
\mu_c,\text{mean} = -\text{DN}/s
\]

\[
\mu_c,\text{mean} = -\text{e}^-/s
\]

\[
\mu_c,\text{var} = -\text{e}^-/s
\]

---

Quantum efficiency

\[
\eta = 71.8\%
\]

Overall system gain

\[
K = 0.643 \text{ DN/e}^-
1/K = 1.556 \text{ e}^-/\text{DN}
\]

--

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Measurements performed by T.Renner, Matrix Vision GmbH

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**Vendor** | MATRIX VISION  
**Model** | mvBlueCOUGAR-XD107G  
**Serial number** | GX205097  
**Sensor diagonal** | 17.55 mm  
**Lens category** | C-Mount  
**Resolution** | 3216 × 2208, 12 bit  
**Pixel size** | 4.50 µm × 4.50 µm  
**Sensor** | IMX420  
**Sensor type** | CMOS  
**Shutter type** | Global  
**Overlap capabilities** | Overlapping  
**Maximum frame rate** | 16.8 Hz  
**Interface type** | GigE Vision  

**Type of data presented** | Single  
**Operation point 1, (page 3)**  
Wavelength centroid | 536.0 nm  
Wavelength FWHM | 31.0 nm  
Gain, black-level | 0dB, 0.1  

**Optional data measured** | None  

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![Graph of quantum efficiency vs wavelength](image)
EMVA 1288 Summary Sheet for Operating Point 1

| Type of data | Single | Gain, black-level | 0dB, 0.1 |
| Exposure control | By irradiance | Environmental temperature | 22.7°C |
| Exposure time | 17.00 ms | Camera body temperature | 46.8°C |
| Frame rate | 8.0 Hz | Internal temperature(s) | — |
| Data transfer mode | Mono12 | Wavelength, centr., FWHM | 536 nm, 31.0 nm |

Quantum efficiency

\[ \eta = 68.6\% \]

Overall system gain

\[ K = 0.160 \text{ DN/e}^- \]
\[ 1/K = 6.236 \text{ e}^-/\text{DN} \]

Temporal dark noise & DSNU

\[ \sigma_{y,\text{dark}} = 0.96 \text{ DN} \]
\[ \text{DSNU}_{1288} = 0.34 \text{ DN} \]
\[ \sigma_d = 5.74 \text{ e}^- \]
\[ \text{DSNU}_{1288} = 2.11 \text{ e}^- \]

Signal-to-noise ratio & PRNU

\[ \text{SNR}_{\text{max}} = 158 \]
\[ 1/\text{SNR}_{\text{max}} = 44.0 \text{ dB} \]
\[ 1/\text{SNR}_{\text{max}} = 7.3 \text{ bit} \]
\[ \text{PRNU}_{1288} = 0.63\% \]
\[ \text{PRNU}_{1288} = 0.74\% \]

Nonlinearity

\[ \text{LE} = 0.17\% \]
\[ \text{LE}_{\text{min}} = -0.20\% \]
\[ \text{LE}_{\text{max}} = 0.14\% \]

Sensitivity & saturation

\[ \mu_{\text{p, min}} = 9.53 \text{ p}/\mu\text{m}^2 \]
\[ \mu_{\text{p, sat}} = 0.471 \text{ p}/\mu\text{m}^2 \]
\[ \mu_{\text{e, min}} = 36330 \text{ p} \]
\[ \mu_{\text{e, sat}} = 1794 \text{ p}/\mu\text{m}^2 \]
\[ \mu_{\text{e, min}} = 6.54 \text{ e}^- \]
\[ \mu_{\text{e, sat}} = 0.323 \text{ e}^-/\mu\text{m}^2 \]
\[ \mu_{\text{e, min}} = 24925 \text{ e}^- \]
\[ \mu_{\text{e, sat}} = 1231 \text{ e}^-/\mu\text{m}^2 \]

Dynamic range

\[ \text{DR} = 3813 \]
\[ \text{DR} = 71.6 \text{ dB} \]
\[ \text{DR} = 11.9 \text{ bit} \]

Dark current

\[ \mu_{\text{c, mean}} = -2.9 \text{ DN/s} \]
\[ \mu_{\text{c, mean}} = -18.2 \text{ e}^-/\text{s} \]
\[ \mu_{\text{c, var}} = 1.1 \text{ e}^-/\text{s} \]