EMVA 1288 Data Sheet m0587

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 5, 06.06.2016, 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-X1012bG</td>
</tr>
<tr>
<td>Serial number</td>
<td>GX015764</td>
</tr>
<tr>
<td>Sensor diagonal</td>
<td>17.58 mm</td>
</tr>
<tr>
<td>Lens category</td>
<td>C-Mount</td>
</tr>
<tr>
<td>Resolution</td>
<td>4112 × 3008, 12 bit</td>
</tr>
<tr>
<td>Pixel size</td>
<td>3.45 μm × 3.45 μm</td>
</tr>
<tr>
<td>Sensor</td>
<td>IMX304</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>4.8 Hz</td>
</tr>
<tr>
<td>Interface type</td>
<td>GigE Vision</td>
</tr>
</tbody>
</table>

Type of data presented: Single

Operation point 1, (page ??)

Wavelength centroid: 536.0 nm
Wavelength FWHM: 31.0 nm
Gain, black-level: 0dB, 0.1

Optional data measured: None

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**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>15.00 ms</td>
</tr>
<tr>
<td>Frame rate</td>
<td>4.8 Hz</td>
</tr>
<tr>
<td>Data transfer mode</td>
<td>Mono12</td>
</tr>
</tbody>
</table>

**Gain, black-level**

0dB, 0.1

**Environmental temperature**

24.1°C

**Camera body temperature**

36.4°C

**Internal temperature(s)**

—

**Wavelength, centr., FWHM**

536 nm, 31.0 nm

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**Photon transfer m0587, 536 nm, 05.12.2016**

mono data

mono fit

variance gray - dark value (DN^2)

0 200 400 600 800 1,000 1.200 1.400 1.600

gray value - dark value (DN)

0 1,000 2,000 3,000 4,000

mono: var(dark) = 0.87 DN^2, K = 0.379 +-0.1%

**Saturation**

---

**SNR m0587, 536 nm, 05.12.2016**

mono data

mono fit

theor. limit

SNR

1 10 100 1.000 10.000 100.000 1e+06 1e+06

irradiation (photons/pixel)

1 10 100 1.000 10.000 100.000 1e+06 1e+06

saturation

threshold SNR = 1

---

**Quantum efficiency**

η = 62.7%

**Overall system gain**

\[ K = 0.379 \text{ DN/e} \]

\[ 1/K = 2.640 \text{ e^-/DN} \]

**Temporal dark noise & DSNU**

\[ \sigma_{y,dark} = 0.94 \text{ DN} \]

\[ \text{DSNU}_{1288} = 0.88 \text{ DN} \]

\[ \sigma_d = 2.35 \text{ e^-} \]

\[ \text{DSNU}_{1288} = 2.32 \text{ e^-} \]

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

\[ \text{SNR}_{\text{max}} = 102 \]

40.2 dB

6.7 bit

\[ 1/\text{SNR}_{\text{max}} = 0.98\% \]

\[ \text{PRNU}_{1288} = 0.88\% \]

**Nonlinearity**

LE = 0.19%

LE_{\text{min}} = -0.26%

LE_{\text{max}} = 0.12%

**Sensitivity & saturation**

\[ \mu_{p,\text{min}} = 4.81 \text{ p} \]

0.405 p/\mu m^2

\[ \mu_{p,\text{sat}} = 16630 \text{ p} \]

1397 p/\mu m^2

\[ \mu_{e,\text{min}} = 3.02 \text{ e^-} \]

0.254 e^-/\mu m^2

\[ \mu_{e,\text{sat}} = 10427 \text{ e^-} \]

876 e^-/\mu m^2

**Dynamic range**

DR = 3454

70.8 dB

11.8 bit

**Dark current**

\[ \mu_{c,\text{mean}} = -4.3 \text{ DN/s} \]

\[ \mu_{c,\text{mean}} = -11.5 \text{ e^-/s} \]

\[ \mu_{c,\text{var}} = 6.7 \text{ e^-/s} \]