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-X105bC</td>
</tr>
<tr>
<td>Serial number</td>
<td>GX014826</td>
</tr>
<tr>
<td>Sensor diagonal</td>
<td>11.07 mm</td>
</tr>
<tr>
<td>Lens category</td>
<td>C-Mount</td>
</tr>
<tr>
<td>Resolution</td>
<td>2464 × 2056, 12 bit</td>
</tr>
<tr>
<td>Pixel size</td>
<td>3.45 µm × 3.45 µm</td>
</tr>
<tr>
<td>Sensor</td>
<td>IMX264</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>11.7 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 468.0 nm
- Wavelength FWHM 20.0 nm
- Gain, black-level 0 dB / 0.1

**Operation point 2, (page ??)**
- Wavelength centroid 536.0 nm
- Wavelength FWHM 31.0 nm
- Gain, black-level 0 dB / 0.1

**Operation point 3, (page ??)**
- Wavelength centroid 630.0 nm
- Wavelength FWHM 13.0 nm
- Gain, black-level 0 dB / 0.1

Optional data measured None
EMVA 1288 Summary Sheet for Operating Point 1

<table>
<thead>
<tr>
<th>Type of data</th>
<th>Single</th>
<th>Gain, black-level</th>
<th>0dB / 0.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exposure control</td>
<td>By irradiance</td>
<td>Environmental temperature</td>
<td>22.9°C</td>
</tr>
<tr>
<td>Exposure time</td>
<td>16.00 ms</td>
<td>Camera body temperature</td>
<td>38.3°C</td>
</tr>
<tr>
<td>Frame rate</td>
<td>11.7 Hz</td>
<td>Internal temperature(s)</td>
<td>—</td>
</tr>
<tr>
<td>Data transfer mode</td>
<td>BayerRG12</td>
<td>Wavelength, centr., FWHM</td>
<td>468 nm, 20.0 nm</td>
</tr>
</tbody>
</table>

### Quantum efficiency

\[ \eta = 45.9\% \]

### Overall system gain

\[ K = 0.373 \text{ DN/e}^{-} \]
\[ 1/K = 2.680 \text{ e}^{-}/\text{DN} \]

### Temporal dark noise & DSNU

\[ \sigma_{y,\text{dark}} = 0.89 \text{ DN} \]
\[ \text{DSNU}_{1288} = 0.48 \text{ DN} \]
\[ \sigma_{d} = 2.26 \text{ e}^{-} \]
\[ \text{DSNU}_{1288} = 1.29 \text{ e}^{-} \]

### Signal-to-noise ratio & PRNU

\[ \text{SNR}_{\text{max}} = 103 \]
\[ 1/\text{SNR}_{\text{max}} = 0.97\% \]
\[ \text{PRNU}_{1288} = 0.67\% \]

### Nonlinearity

\[ \text{LE} = 0.30\% \]
\[ \text{LE}_{\text{min}} = -0.42\% \]
\[ \text{LE}_{\text{max}} = 0.19\% \]

### Sensitivity & saturation

\[ \mu_{p,\text{min}} = 6.41 \text{ p} \]
\[ 0.538 \text{ p}/\mu\text{m}^{2} \]
\[ \mu_{p,\text{sat}} = 23083 \text{ p} \]
\[ 1939 \text{ p}/\mu\text{m}^{2} \]
\[ \mu_{e,\text{min}} = 2.94 \text{ e}^{-} \]
\[ 0.247 \text{ e}^{-}/\mu\text{m}^{2} \]
\[ \mu_{e,\text{sat}} = 10587 \text{ e}^{-} \]
\[ 889 \text{ e}^{-}/\mu\text{m}^{2} \]

### Dynamic range

\[ \text{DR} = 3602 \]
\[ 71.1 \text{ dB} \]
\[ 11.8 \text{ bit} \]

### Dark current

\[ \mu_{c,\text{mean}} = -0.1 \text{ DN/s} \]
\[ \mu_{c,\text{mean}} = -0.3 \text{ e}^{-}/\text{s} \]
\[ \mu_{c,\text{var}} = 4.8 \text{ e}^{-}/\text{s} \]
EMVA 1288 Summary Sheet for Operating Point 2

<table>
<thead>
<tr>
<th><strong>Type of data</strong></th>
<th>Single</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Exposure control</strong></td>
<td>By irradiance</td>
</tr>
<tr>
<td><strong>Exposure time</strong></td>
<td>16.00 ms</td>
</tr>
<tr>
<td><strong>Frame rate</strong></td>
<td>11.7 Hz</td>
</tr>
<tr>
<td><strong>Data transfer mode</strong></td>
<td>BayerRG12</td>
</tr>
<tr>
<td><strong>Gain, black-level</strong></td>
<td>0dB / 0.1</td>
</tr>
<tr>
<td><strong>Environmental temperature</strong></td>
<td>22.9°C</td>
</tr>
<tr>
<td><strong>Camera body temperature</strong></td>
<td>38.3°C</td>
</tr>
<tr>
<td><strong>Internal temperature(s)</strong></td>
<td>—</td>
</tr>
<tr>
<td><strong>Wavelength, centr., FWHM</strong></td>
<td>536 nm, 31.0 nm</td>
</tr>
</tbody>
</table>

**Photon transfer m0561, 536 nm, 20.09.2016**

- **green1 data**
- **green2 data**
- **green1 fit**
- **green2 fit**

- **variance gray - dark value (DN^2)**
  - 0
  - 200
  - 400
  - 600
  - 800
  - 1000
  - 1200
  - 1400
  - 1600

- **gray value - dark value (DN)**
  - 0
  - 1000
  - 2000
  - 3000
  - 4000

- **green1: var(dark) = 0.79 DN^2, K = 0.373 ±0.1%**
- **green2: var(dark) = 0.78 DN^2, K = 0.376 ±0.1%**

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

- **SNRmax**
  - 103
  - 40.2 dB
  - 6.7 bit

- **1/SNRmax**
  - 0.97%

- **PRNU1288**
  - 0.85%

**Nonlinearity**

- **LE**
  - 0.24%
- **LEmin**
  - -0.33%
- **LEmax**
  - 0.15%

**Sensitivity & saturation**

- **μp,min**
  - 5.07 p
- **μc,mean**
  - 4.26 p/μm²
- **μp,sat**
  - 18280 p
- **μc,mean**
  - 1536 p/μm²
- **μe,min**
  - 2.93 e⁻
- **μc,mean**
  - 0.246 e⁻/μm²
- **μe,sat**
  - 10580 e⁻
- **μc,mean**
  - 889 e⁻/μm²

**Dynamic range**

- **DR**
  - 3607
  - 71.1 dB
  - 11.8 bit

**Dark current**

- **μc,mean**
  - -0.1 DN/s
- **μc,mean**
  - -0.2 e⁻/s
- **μc,mean**
  - 4.8 e⁻/s
EMVA 1288 Summary Sheet for Operating Point 3

Type of data | Single | Gain, black-level | 0dB / 0.1
Exposure control | By irradiance | Environmental temperature | 22.9°C
Exposure time | 16.00 ms | Camera body temperature | 38.3°C
Frame rate | 11.7 Hz | Internal temperature(s) | —
Data transfer mode | BayerRG12 | Wavelength, centr., FWHM | 630 nm, 13.0 nm

Quantum efficiency

$$\eta = 52.3\%$$

Overall system gain

$$K = 0.375 \text{ DN/e}^{-}$$
$$1/K = 2.664 \text{ e}^{-}/\text{DN}$$

Temporal dark noise & DSNU

$$\sigma_{y,\text{dark}} = 0.89 \text{ DN}$$
$$\text{DSNU}_{1288} = 0.47 \text{ DN}$$
$$\sigma_{d} = 2.23 \text{ e}^{-}$$
$$\text{DSNU}_{1288} = 1.24 \text{ e}^{-}$$

Signal-to-noise ratio & PRNU

$$\text{SNR}_{\text{max}} = 102$$
$$40.2 \text{ dB}$$
$$6.7 \text{ bit}$$
$$1/\text{SNR}_{\text{max}} = 0.98\%$$
$$\text{PRNU}_{1288} = 0.75\%$$

Nonlinearity

$$\text{LE} = 0.31\%$$
$$\text{LE}_{\text{min}} = -0.41\%$$
$$\text{LE}_{\text{max}} = 0.20\%$$

Sensitivity & saturation

$$\mu_{p,\text{min}} = 5.57 \text{ p}/\mu \text{m}^{2}$$
$$0.468 \text{ p}/\mu \text{m}^{2}$$
$$19963 \text{ p}/\mu \text{m}^{2}$$
$$1677 \text{ p}/\mu \text{m}^{2}$$
$$2.91 \text{ e}^{-}$$
$$0.245 \text{ e}^{-}/\mu \text{m}^{2}$$
$$10445 \text{ e}^{-}$$
$$878 \text{ e}^{-}/\mu \text{m}^{2}$$

Dynamic range

$$\text{DR} = 3583$$
$$71.1 \text{ dB}$$
$$11.8 \text{ bit}$$

Dark current

$$\mu_{c,\text{mean}} = -0.2 \text{ DN/s}$$
$$\mu_{c,\text{mean}} = -0.6 \text{ e}^{-}/\text{s}$$
$$\mu_{c,\text{var}} = 4.6 \text{ e}^{-}/\text{s}$$