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). The measurements were performed with an AEON ACC3 RGB Release 3, 20.01.2014, SN 0005(). The performance parameters and estimated accuracy of the measurements are described in the technical report for the instrument, its calibration in the corresponding calibration report.

<table>
<thead>
<tr>
<th>Vendor</th>
<th>MATRIX VISION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>mvBlueCOUGAR-X123C</td>
</tr>
<tr>
<td>Serial number</td>
<td>GX008913</td>
</tr>
<tr>
<td>Sensor diagonal</td>
<td>7.92 mm</td>
</tr>
<tr>
<td>Lens category</td>
<td>C-Mount</td>
</tr>
<tr>
<td>Resolution</td>
<td>1360 × 1024, 12 bit</td>
</tr>
<tr>
<td>Pixel size</td>
<td>4.65 µm × 4.65 µm</td>
</tr>
<tr>
<td>Sensor type</td>
<td>CCD</td>
</tr>
<tr>
<td>Readout type</td>
<td>Progressive</td>
</tr>
<tr>
<td>Transfer type</td>
<td>Interline</td>
</tr>
<tr>
<td>Maximum frame rate</td>
<td>15.2 Hz</td>
</tr>
<tr>
<td>Interface type</td>
<td>GigE Vision</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Type of data presented</th>
<th>Single</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Operation point 1, (page 5)</strong></td>
<td></td>
</tr>
<tr>
<td>Wavelength centroid</td>
<td>467.3 nm</td>
</tr>
<tr>
<td>Wavelength FWHM</td>
<td>20.5 nm</td>
</tr>
<tr>
<td>Gain, offset</td>
<td>Gain = -3dB, Offset = 0.3</td>
</tr>
<tr>
<td><strong>Operation point 2, (page 15)</strong></td>
<td></td>
</tr>
<tr>
<td>Wavelength centroid</td>
<td>534.2 nm</td>
</tr>
<tr>
<td>Wavelength FWHM</td>
<td>30.9 nm</td>
</tr>
<tr>
<td>Gain, offset</td>
<td>Gain = -3dB, Offset = 0.3</td>
</tr>
<tr>
<td><strong>Operation point 3, (page 25)</strong></td>
<td></td>
</tr>
<tr>
<td>Wavelength centroid</td>
<td>629.5 nm</td>
</tr>
<tr>
<td>Wavelength FWHM</td>
<td>13.1 nm</td>
</tr>
<tr>
<td>Gain, offset</td>
<td>Gain = -3dB, Offset = 0.3</td>
</tr>
<tr>
<td><strong>Optional data measured</strong></td>
<td>None</td>
</tr>
</tbody>
</table>

Spectral sensitivity m0248, 24.02.2015

![Spectral sensitivity graph](image)
EMVA 1288 Summary Sheet for Operating Point 1

- **Type of data**: Single
- **Exposure time**: 1.0 ms
- **Frame rate**: 0.0 Hz
- **Data transfer mode**: BayerRG12
- **Gain, offset**: Gain = -3dB, Offset = 0.3
- **Environmental temperature**: 24.6°C
- **Camera temperature**: 39.5°C
- **Wavelength, centr., FWHM**: 467 nm, 20.5 nm

**Photon transfer**

\[ \eta = 0.316 \]

\[ K = 0.330 \pm 0.1\% \]

**Dark noise & DSNU**

\[ \sigma_d = 4.04 \]

\[ \sigma_0 = 12.2 \]

\[ \text{DSNU}_{1288} = 0.47 \]

\[ \text{DSNU}_{1288} = 1.44 \]

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

\[ \text{SNR}_{\text{max}} = 110 \]

\[ \text{SNR}_{\text{max}} (\text{dB}) = 40.8 \]

\[ \text{SNR}_{\text{max}} (\text{bits}) = 6.8 \]

\[ 1/\text{SNR}_{\text{max}} (\%) = 0.91 \]

\[ \text{PRNU}_{1288} (\%) = 0.766 \]

**Nonlinearity**

\[ \text{LE} (\%) = 0.20 \]

**Sensitivity & saturation**

\[ \mu_{p,\text{min}} (\text{p}) = 40.4 \]

\[ \mu_{e,\text{min}} (\text{e}) = 12.8 \]

\[ \mu_{p,\text{sat}} (\text{p}) = 38168 \]

\[ \mu_{e,\text{sat}} (\text{e}) = 12056 \]

**Dynamic range**

\[ \text{DR} = 945 \]

\[ \text{DR (dB)} = 59.5 \]

\[ \text{DR (bit)} = 9.9 \]

**Dark current**

\[ \mu_{c,\text{mean}} (\text{DN/s}) = — \]

\[ \mu_{c,\text{mean}} (\text{e/s}) = — \]

\[ \mu_{c,\text{var}} (\text{e/s}) = — \]
**EMVA 1288 Summary Sheet for Operating Point 2**

<table>
<thead>
<tr>
<th>Type of data</th>
<th>Single</th>
<th>Gain, offset</th>
<th>Gain = -3dB, Offset = 0.3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exposure time</td>
<td>1.0 ms</td>
<td>Environmental temperature</td>
<td>24.6°C</td>
</tr>
<tr>
<td>Frame rate</td>
<td>0.0 Hz</td>
<td>Camera temperature</td>
<td>39.5°C</td>
</tr>
<tr>
<td>Data transfer mode</td>
<td>BayerRG12</td>
<td>Wavelength, centr., FWHM</td>
<td>534 nm, 30.9 nm</td>
</tr>
</tbody>
</table>

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**Quantum efficiency**

\[ \eta = 0.313 \]

**Gain**

\[ K (\text{DN/e}) = 0.323 \]
\[ 1/K (e/\text{DN}) = 3.094 \]

**Dark noise & DSNU**

\[ \sigma_d (\text{DN}) = 4.00 \]
\[ \sigma_0 (e) = 12.3 \]
\[ \text{DSNU}_{1288} (\text{DN}) = 0.37 \]
\[ \text{DSNU}_{1288} (e) = 1.13 \]

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

\[ \text{SNR}_{\text{max}} = 112 \]
\[ \text{SNR}_{\text{max}} (\text{dB}) = 41.0 \]
\[ \text{SNR}_{\text{max}} (\text{bits}) = 6.8 \]
\[ 1/\text{SNR}_{\text{max}} (%) = 0.90 \]
\[ \text{PRNU}_{1288} (%) = 1.159 \]

**Nonlinearity**

\[ \text{LE} (%) = 0.50 \]

**Sensitivity & saturation**

\[ \mu_{p,\text{min}} (\text{p}) = 41.1 \]
\[ \mu_{e,\text{min}} (e) = 12.9 \]
\[ \mu_{p,\text{sat}} (\text{p}) = 39779 \]
\[ \mu_{e,\text{sat}} (e) = 12464 \]

**Dynamic range**

\[ \text{DR} = 968 \]
\[ \text{DR (dB)} = 59.7 \]
\[ \text{DR (bit)} = 9.9 \]

**Dark current**

\[ \mu_{c,\text{mean}} (\text{DN/s}) = - \]
\[ \mu_{c,\text{mean}} (\text{e/s}) = - \]
\[ \mu_{c,\text{var}} (\text{e/s}) = - \]
# EMVA 1288 Summary Sheet for Operating Point 3

<table>
<thead>
<tr>
<th>Type of data</th>
<th>Single</th>
<th>Gain, offset</th>
<th>Gain = -3dB, Offset = 0.3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exposure time</td>
<td>1.0 ms</td>
<td>Environmental temperature</td>
<td>24.6°C</td>
</tr>
<tr>
<td>Frame rate</td>
<td>0.0 Hz</td>
<td>Camera temperature</td>
<td>39.5°C</td>
</tr>
<tr>
<td>Data transfer mode</td>
<td>BayerRG12</td>
<td>Wavelength, centr., FWHM</td>
<td>630 nm, 13.1 nm</td>
</tr>
</tbody>
</table>

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### Photon transfer

**Photon transfer m0248, 630nm, 24.02.2015**

- **Red data**
- **Red fit**
- **Variance gray - dark value (DN²)**
  - 0
  - 200
  - 400
  - 600
  - 800
  - 1000
  - 1200
  - 1400

### SNR

**SNR m0248, 630nm, 24.02.2015**

- **Red data**
- **Red fit**
- **Red fit total**
- **Theor. limit**

### Quantum efficiency

\[ \eta = 0.242 \]

### Gain

\[ K \text{ (DN/e)} = 0.317 \]

\[ 1/K \text{ (e/DN)} = 3.153 \]

### Dark noise & DSNU

- **\( \sigma_d \text{ (DN)} \)**: 3.99
- **\( \sigma_0 \text{ (e)} \)**: 12.6
- **DSNU\(_{1288} \text{ (DN)} \)**: 0.38
- **DSNU\(_{1288} \text{ (e)} \)**: 1.18

### Signal-to-noise ratio & PRNU

- **\( \text{SNR}_{\text{max}} \)**: 113
- **\( \text{SNR}_{\text{max}} \text{ (dB)} \)**: 41.0
- **\( \text{SNR}_{\text{max}} \text{ (bits)} \)**: 6.8
- **1/\( \text{SNR}_{\text{max}} \text{ (%)} \)**: 0.89
- **PRNU\(_{1288} \text{ (%)} \)**: 0.952

### Nonlinearity

**LE (%)**: 0.64

### Sensitivity & saturation

- **\( \mu_{p, \text{min}} \text{ (p)} \)**: 54.2
- **\( \mu_{e, \text{min}} \text{ (e)} \)**: 13.1
- **\( \mu_{p, \text{sat}} \text{ (p)} \)**: 52603
- **\( \mu_{e, \text{sat}} \text{ (e)} \)**: 12712

### Dynamic range

- **DR**: 971
- **DR (dB)**: 59.7
- **DR (bit)**: 9.9

### Dark current

- **\( \mu_{c, \text{mean}} \text{ (DN/s)} \)**: —
- **\( \mu_{c, \text{mean}} \text{ (e/s)} \)**: —
- **\( \mu_{c, \text{var}} \text{ (e/s)} \)**: —