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, 20.01.2104, 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.

### Vendor
MATRIX VISION

### Model
mvBlueCOUGAR-X104eC

### Serial number
GX007969

### Sensor diagonal
9.00 mm

### Lens category
C-Mount

### Resolution
1600 × 1200, 10 bit

### Pixel size
4.50 µm × 4.50 µm

### Sensor type
CMOS

### Shutter type
Global

### Overlap capabilities
Overlapping

### Maximum frame rate
20.7 Hz

### Interface type
GigE Vision

### Type of data presented
Single

#### Operation point 1, (page 5)
- **Wavelength centroid**: 467.3 nm
- **Wavelength FWHM**: 20.5 nm
- **Gain, offset**: Gain = 0dB, Offset = 21.0

#### Operation point 2, (page 17)
- **Wavelength centroid**: 534.2 nm
- **Wavelength FWHM**: 30.9 nm
- **Gain, offset**: Gain = 0dB, Offset = 21.0

#### Operation point 3, (page 29)
- **Wavelength centroid**: 629.5 nm
- **Wavelength FWHM**: 13.1 nm
- **Gain, offset**: Gain = 0dB, Offset = 21.0

### Optional data measured
None

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**Spectral sensitivity m0431, 17.07.2015**

<table>
<thead>
<tr>
<th>Wavelength (nm)</th>
<th>blue data</th>
<th>green1 data</th>
<th>red data</th>
<th>green2 data</th>
</tr>
</thead>
<tbody>
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</table>

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# EMVA 1288 Summary Sheet for Operating Point 1

<table>
<thead>
<tr>
<th>Type of data</th>
<th>Single</th>
<th>Gain, offset</th>
<th>Gain = 0dB, Offset = 21.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exposure time</td>
<td>12.0 ms</td>
<td>Environmental temperature</td>
<td>28.6°C</td>
</tr>
<tr>
<td>Frame rate</td>
<td>0.0 Hz</td>
<td>Camera temperature</td>
<td>38.2°C</td>
</tr>
<tr>
<td>Data transfer mode</td>
<td>BayerGR10</td>
<td>Wavelength, centr., FWHM</td>
<td>467 nm, 20.5 nm</td>
</tr>
</tbody>
</table>

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**Quantum efficiency**

\[ \eta = 0.309 \]

**Gain**

\[ K \text{ (DN/e)} = 0.131 \]
\[ 1/K \text{ (e/DN)} = 7.615 \]

**Dark noise & DSNU**

\[ \sigma_d \text{ (DN)} = 2.86 \]
\[ \sigma_0 \text{ (e)} = 21.6 \]
\[ \text{DSNU}_{1288} \text{ (DN)} = 2.86 \]
\[ \text{DSNU}_{1288} \text{ (e)} = 21.75 \]

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

\[ \text{SNR}_{\text{max}} = 83 \]
\[ \text{SNR}_{\text{max}} \text{ (dB)} = 38.3 \]
\[ \text{SNR}_{\text{max}} \text{ (bits)} = 6.4 \]
\[ 1/\text{SNR}_{\text{max}} \text{ (%)} = 1.21 \]
\[ \text{PRNU}_{1288} \text{ (%)} = 15.481 \]

**Nonlinearity**

\[ \text{LE (\%)} = 0.75 \]

**Sensitivity & saturation**

\[ \mu_{p,\text{min}} \text{ (p)} = 72.0 \]
\[ \mu_{e,\text{min}} \text{ (e)} = 22.3 \]
\[ \mu_{p,\text{sat}} \text{ (p)} = 22120 \]
\[ \mu_{e,\text{sat}} \text{ (e)} = 6835 \]

**Dynamic range**

\[ \text{DR} = 307 \]
\[ \text{DR (dB)} = 49.7 \]
\[ \text{DR (bit)} = 8.3 \]

**Dark current**

\[ \mu_{c,\text{mean}} \text{ (DN/s)} = 123.56 \]
\[ \mu_{c,\text{mean}} \text{ (e/s)} = 940.88 \]
\[ \mu_{c,\text{var}} \text{ (e/s)} = 5670.52 \]
### 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 = 0dB, Offset = 21.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exposure time</td>
<td>12.0 ms</td>
<td>Environmental temperature</td>
<td>28.6°C</td>
</tr>
<tr>
<td>Frame rate</td>
<td>0.0 Hz</td>
<td>Camera temperature</td>
<td>38.2°C</td>
</tr>
<tr>
<td>Data transfer mode</td>
<td>BayerGR10</td>
<td>Wavelength, centr., FWHM</td>
<td>534 nm, 30.9 nm</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Gain, Offset</strong></td>
<td></td>
</tr>
</tbody>
</table>

![Photon transfer](image1)

**Photon transfer m0431, 534nm, 17.07.2015**

- **Gain**
  - \( K (DN/e) = 0.130 \)
  - \( 1/K (e/DN) = 7.699 \)

- **Dark noise & DSNU**
  - \( \sigma_d (DN) = 2.86 \)
  - \( \sigma_0 (e) = 21.9 \)
  - \( DSNU_{1288} (DN) = 2.90 \)
  - \( DSNU_{1288} (e) = 22.31 \)

- **Signal-to-noise ratio & PRNU**
  - \( SNR_{\text{max}} = 84 \)
  - \( SNR_{\text{max}} (dB) = 38.5 \)
  - \( SNR_{\text{max}} (bits) = 6.4 \)
  - \( 1/SNR_{\text{max}} (%) = 1.19 \)
  - \( PRNU_{1288} (%) = 15.564 \)

- **Nonlinearity**
  - \( LE (%) = 0.77 \)

- **Sensitivity & saturation**
  - \( \mu_{p,\text{min}} (p) = 72.8 \)
  - \( \mu_{e,\text{min}} (e) = 22.5 \)
  - \( \mu_{p,\text{sat}} (p) = 22659 \)
  - \( \mu_{e,\text{sat}} (e) = 7014 \)

- **Dynamic range**
  - \( DR = 311 \)
  - \( DR (dB) = 49.9 \)
  - \( DR (bit) = 8.3 \)

- **Dark current**
  - \( \mu_{c,\text{mean}} (DN/s) = 122.83 \)
  - \( \mu_{c,\text{mean}} (e/s) = 945.71 \)
  - \( \mu_{c,\text{var}} (e/s) = 5823.15 \)
### 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 = 0dB, Offset = 21.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exposure time</td>
<td>12.0 ms</td>
<td>Environmental temperature</td>
<td>28.6°C</td>
</tr>
<tr>
<td>Frame rate</td>
<td>0.0 Hz</td>
<td>Camera temperature</td>
<td>38.2°C</td>
</tr>
<tr>
<td>Data transfer mode</td>
<td>BayerGR10</td>
<td>Wavelength, centr., FWHM</td>
<td>630 nm, 13.1 nm</td>
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</tbody>
</table>

#### Quantum efficiency

\[ \eta = 0.286 \]

#### Gain

\[ K (\text{DN/e}) = 0.129 \]

\[ 1/K (\text{e/DN}) = 7.756 \]

#### Dark noise & DSNU

\[ \sigma_d (\text{DN}) = 2.86 \]

\[ \sigma_0 (\text{e}) = 22.1 \]

\[ \text{DSNU}_{1288} (\text{DN}) = 2.85 \]

\[ \text{DSNU}_{1288} (\text{e}) = 22.07 \]

#### Signal-to-noise ratio & PRNU

\[ \text{SNR}_{\text{max}} = 84 \]

\[ \text{SNR}_{\text{max}} (\text{dB}) = 38.5 \]

\[ \text{SNR}_{\text{max}} (\text{bits}) = 6.4 \]

\[ 1/\text{SNR}_{\text{max}} (\%) = 1.19 \]

\[ \text{PRNU}_{1288} (\%) = 14.853 \]

#### Nonlinearity

\[ \text{LE (\%)} = 0.92 \]

#### Sensitivity & saturation

\[ \mu_{p,\text{min}} (\text{p}) = 79.3 \]

\[ \mu_{e,\text{min}} (\text{e}) = 22.7 \]

\[ \mu_{p,\text{sat}} (\text{p}) = 24612 \]

\[ \mu_{e,\text{sat}} (\text{e}) = 7044 \]

#### Dynamic range

\[ \text{DR} = 311 \]

\[ \text{DR (dB)} = 49.8 \]

\[ \text{DR (bit)} = 8.3 \]

#### Dark current

\[ \mu_{c,\text{mean}} (\text{DN/s}) = 123.28 \]

\[ \mu_{c,\text{mean}} (\text{e/s}) = 956.22 \]

\[ \mu_{c,\text{var}} (\text{e/s}) = 5935.06 \]