

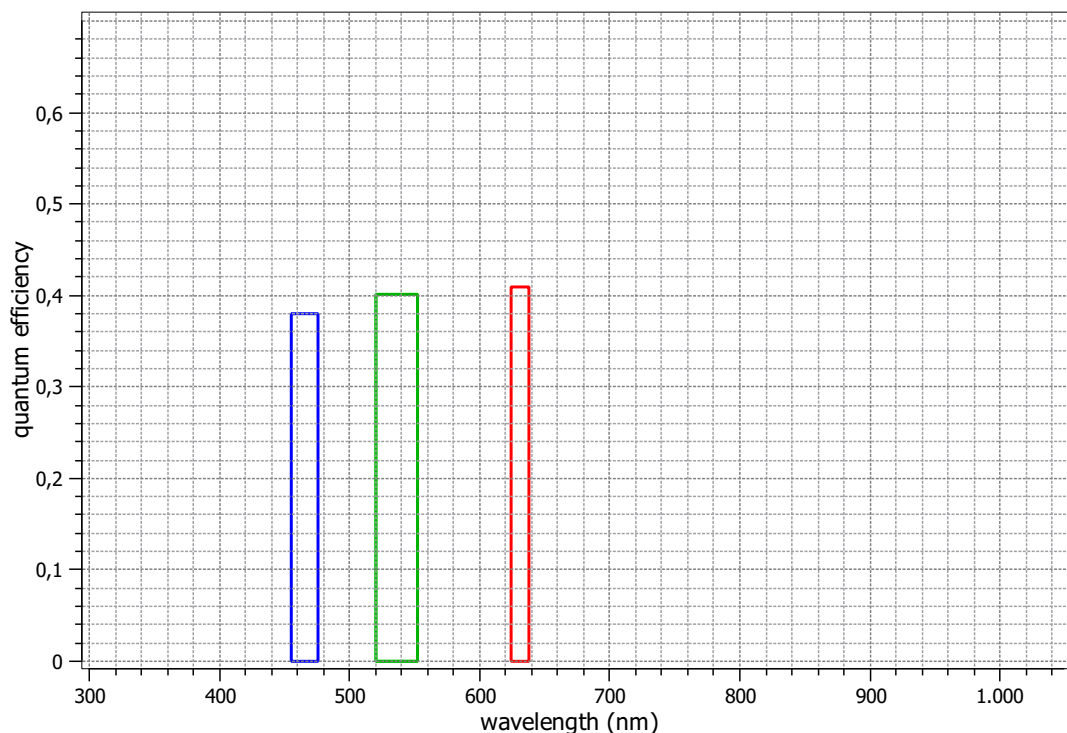
EMVA 1288 Summary Sheet

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 RGB Release 3, 15.08.2015, SN 0001(Baumer) . 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 Technical and Application Support Center, Baumer Optronik GmbH.

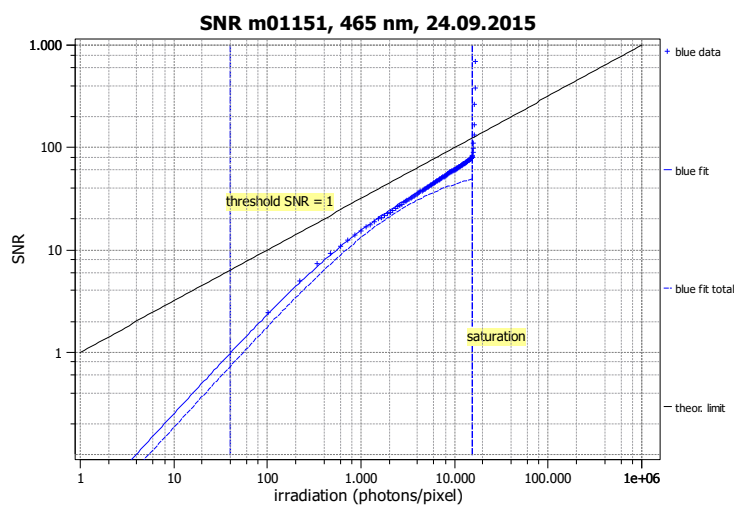
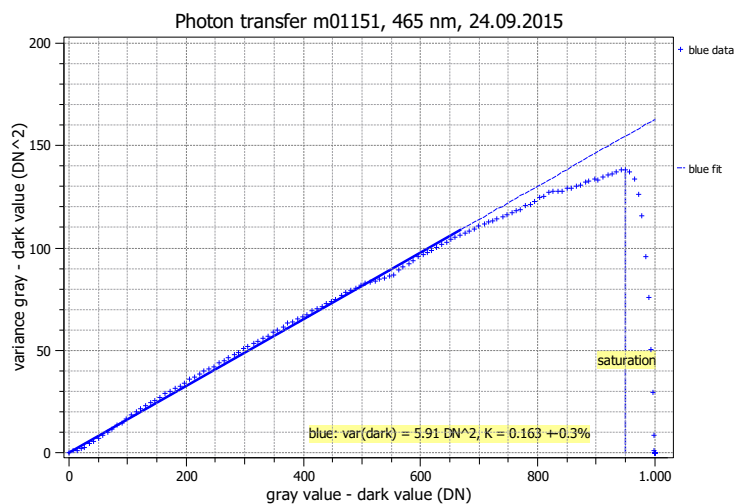
| | |
|----------------------|---------------------|
| Vendor | Baumer |
| Model | LXG-40C |
| Serial number | 0679823115 |
| Sensor diagonal | 15.93 mm |
| Lens category | C-Mount |
| Resolution | 2048 × 2048, 10 bit |
| Pixel size | 5.50 μm × 5.50 μm |
| Sensor | CMOSIS CMV4000 |
| Sensor type | CMOS |
| Shutter type | Global shutter |
| Overlap capabilities | Overlapped |
| Maximum frame rate | 0.0 Hz |
| Interface type | GEV |

| | |
|-------------------------------|-----------------|
| Type of data presented | Single |
| Operation point 1 | |
| Wavelength centroid | 465.3 nm |
| Wavelength FWHM | 20.7 nm |
| Gain, offset | BlackLevel = 14 |
| Operation point 2 | |
| Wavelength centroid | 535.8 nm |
| Wavelength FWHM | 32.0 nm |
| Gain, offset | BlackLevel = 14 |
| Operation point 3 | |
| Wavelength centroid | 631.0 nm |
| Wavelength FWHM | 13.4 nm |
| Gain, offset | BlackLevel = 14 |
| Optional data measured | |
| None | |



EMVA 1288 Summary Sheet for Operating Point 1

| | | | |
|--------------------|----------------|---------------------------|-----------------|
| Type of data | Single | Gain, offset | BlackLevel = 14 |
| Exposure time | 500.00 μ s | Environmental temperature | 25.9°C |
| Frame rate | 10.0 Hz | Camera body temperature | 36.4°C |
| Data transfer mode | BayerGB10 | Intern temperature(s) | — |
| | | Wavelength, centr., FWHM | 465 nm, 20.7 nm |



Results

Quantum efficiency η 38.0%

Overall system gain

K 0.163 DN/e⁻
 $1/K$ 6.143 e⁻/DN

Temporal dark noise & DSNU

$\sigma_{y,\text{dark}}$ 2.43 DN
 DSNU_{1288} 2.28 DN
 σ_d 14.83 e⁻
 DSNU_{1288} 14.03 e⁻

Signal-to-noise ratio & PRNU

SNR_{max} 76
 SNR_{max} 37.6 dB
 SNR_{max} 6.3 bit
 $1/\text{SNR}_{\text{max}}$ 1.31 %
 PRNU_{1288} 1.52 %

Nonlinearity

LE (%) 0.28

Sensitivity & saturation

$\mu_{p,\text{min}}$ 40.6 p
 $\mu_{p,\text{min}}$ 1.34 p/ μm^2
 $\mu_{p,\text{sat}}$ 15274 p
 $\mu_{p,\text{sat}}$ 505 p/ μm^2
 $\mu_{e,\text{min}}$ 15.4 e⁻
 $\mu_{e,\text{min}}$ 0.51 e⁻/ μm^2
 $\mu_{e,\text{sat}}$ 5806 e⁻
 $\mu_{e,\text{sat}}$ 192 e⁻/ μm^2

Dynamic range

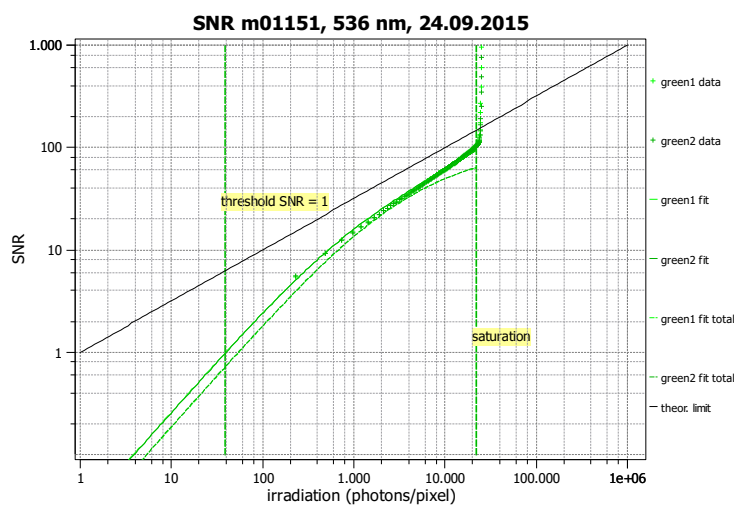
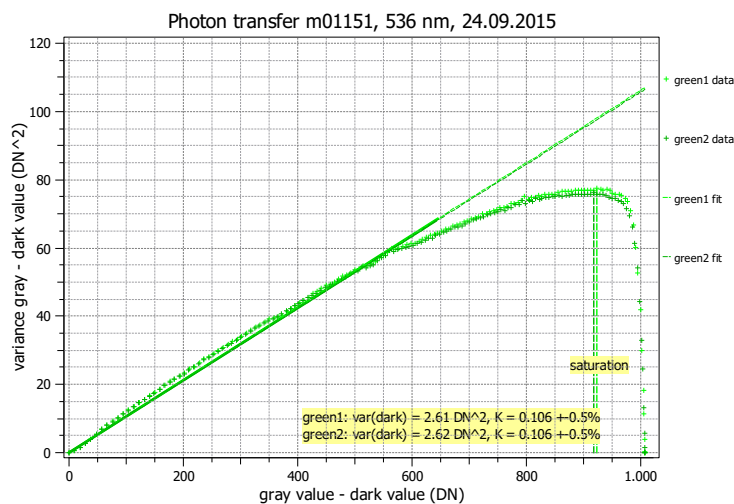
DR 376
 DR 51.5 dB
 DR 8.6 bit

Dark current

$\mu_{c,\text{mean}}$ 67.5 DN/s
 $\mu_{c,\text{mean}}$ 414.9 e⁻/s
 $\mu_{c,\text{var}}$ 218.6 e⁻/s

EMVA 1288 Summary Sheet for Operating Point 2

| | | | |
|--------------------|----------------|---------------------------|-----------------|
| Type of data | Single | Gain, offset | BlackLevel = 14 |
| Exposure time | 500.00 μ s | Environmental temperature | 25.9°C |
| Frame rate | 10.0 Hz | Camera body temperature | 36.4°C |
| Data transfer mode | BayerGB10 | Intern temperature(s) | — |
| | | Wavelength, centr., FWHM | 536 nm, 32.0 nm |



Results

Quantum efficiency η 40.2%

Overall system gain

K 0.106 DN/e⁻
 $1/K$ 9.413 e⁻/DN

Temporal dark noise & DSNU

$\sigma_{y,\text{dark}}$ 1.61 DN
 DSNU₁₂₈₈ 1.59 DN
 σ_d 14.95 e⁻
 DSNU₁₂₈₈ 15.00 e⁻

Signal-to-noise ratio & PRNU

SNR_{max} 94
 SNR_{max} 39.5 dB
 SNR_{max} 6.6 bit
 $1/\text{SNR}_{\text{max}}$ 1.06 %
 PRNU₁₂₈₈ 1.14 %

Nonlinearity

LE (%) 0.79

Sensitivity & saturation

$\mu_{p,\text{min}}$ 39.1 p
 $1.29 \text{ p}/\mu\text{m}^2$
 $\mu_{p,\text{sat}}$ 22070 p
 $730 \text{ p}/\mu\text{m}^2$
 $\mu_{e,\text{min}}$ 15.7 e⁻
 $0.52 \text{ e}^-/\mu\text{m}^2$
 $\mu_{e,\text{sat}}$ 8870 e⁻
 $293 \text{ e}^-/\mu\text{m}^2$

Dynamic range

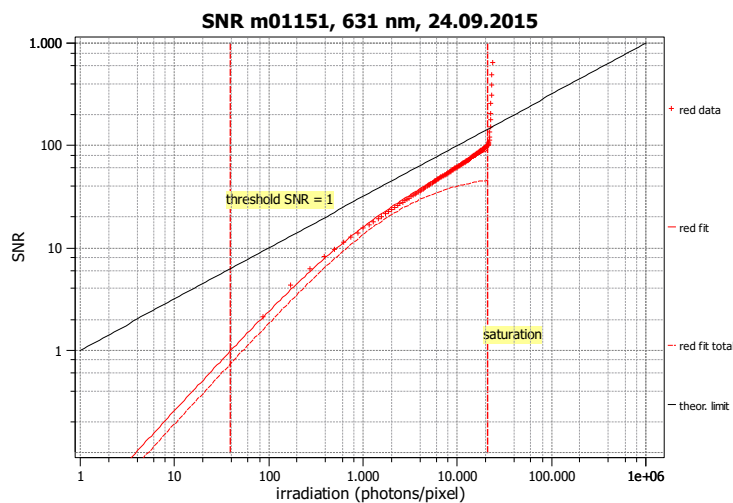
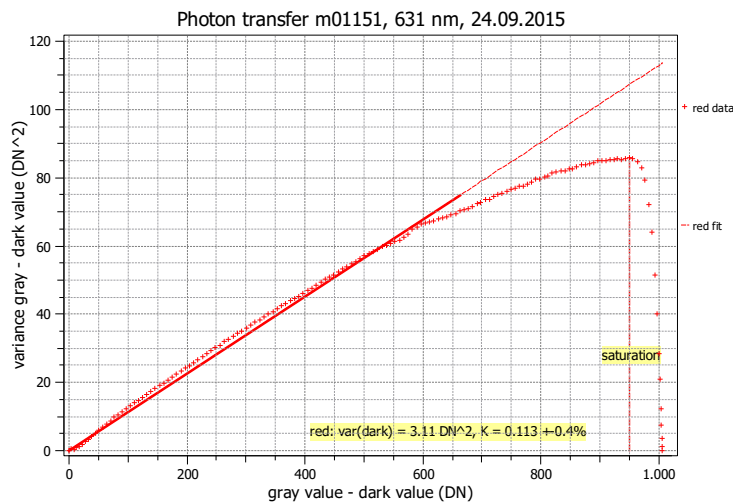
DR 565
 DR 55.0 dB
 DR 9.1 bit

Dark current

$\mu_{c,\text{mean}}$ 46.4 DN/s
 $\mu_{c,\text{mean}}$ 437.0 e⁻/s
 $\mu_{c,\text{var}}$ 238.4 e⁻/s

EMVA 1288 Summary Sheet for Operating Point 3

| | | | |
|--------------------|----------------|---------------------------|-----------------|
| Type of data | Single | Gain, offset | BlackLevel = 14 |
| Exposure time | 500.00 μ s | Environmental temperature | 25.9°C |
| Frame rate | 10.0 Hz | Camera body temperature | 36.4°C |
| Data transfer mode | BayerGB10 | Intern temperature(s) | — |
| | | Wavelength, centr., FWHM | 631 nm, 13.4 nm |



Results

Quantum efficiency η 40.9%

Overall system gain

K 0.113 DN/e⁻
 $1/K$ 8.857 e⁻/DN

Temporal dark noise & DSNU

$\sigma_{y,\text{dark}}$ 1.76 DN
 DSNU₁₂₈₈ 1.63 DN
 σ_d 15.40 e⁻
 DSNU₁₂₈₈ 14.44 e⁻

Signal-to-noise ratio & PRNU

SNR_{max} 93
 SNR_{max} 39.3 dB
 SNR_{max} 6.5 bit
 $1/\text{SNR}_{\text{max}}$ 1.08 %
 PRNU₁₂₈₈ 1.88 %

Nonlinearity

LE (%) 0.82

Sensitivity & saturation

$\mu_{p,\text{min}}$ 39.5 p
 1.30 p/ μm^2
 $\mu_{p,\text{sat}}$ 21067 p
 696 p/ μm^2
 $\mu_{e,\text{min}}$ 16.1 e⁻
 0.53 e⁻/ μm^2
 $\mu_{e,\text{sat}}$ 8608 e⁻
 285 e⁻/ μm^2

Dynamic range

DR 534
 DR 54.5 dB
 DR 9.1 bit

Dark current

$\mu_{c,\text{mean}}$ 46.2 DN/s
 $\mu_{c,\text{mean}}$ 409.5 e⁻/s
 $\mu_{c,\text{var}}$ 206.6 e⁻/s