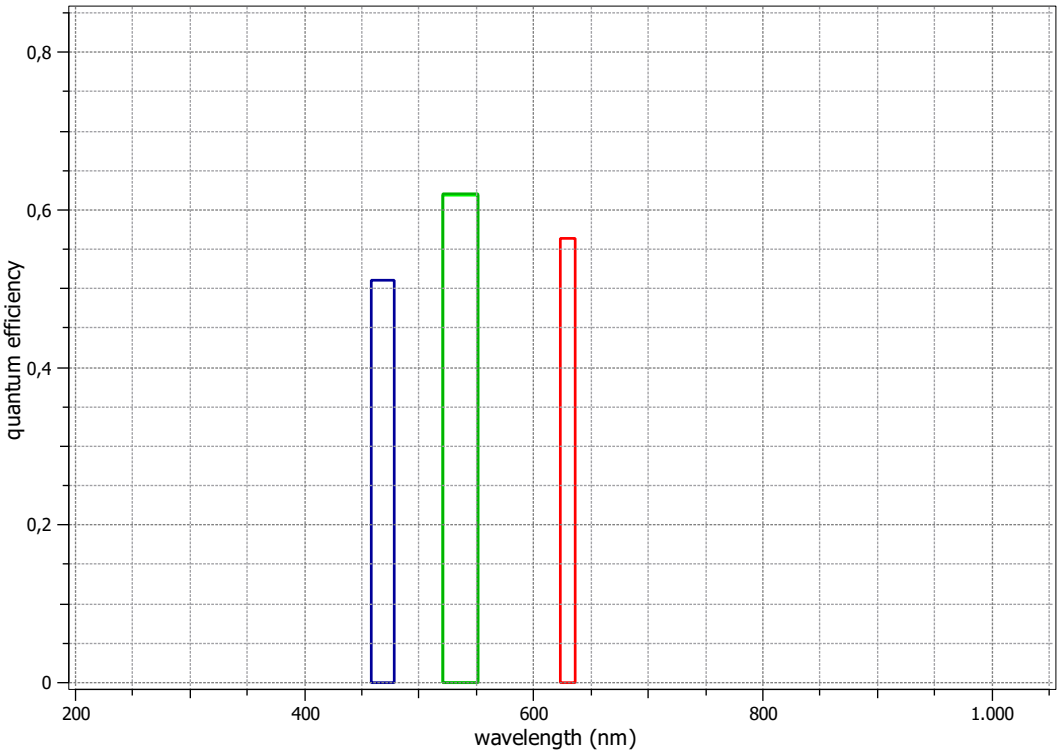
# EMVA 1288 Data Sheet m0783

This datasheet describes the specification according to the standard 1288 release 3.1 for "Characterization and Presentation of Specification Data for Image Sensors and Cameras" issued on December 30, 2016 by the European Machine Vision Association (EMVA), published at `www.standard1288.org` and the *zenodo EMVA 1288 community* with proprietary extensions from AEON. The measurements were performed with the AEON ACC3 Release 6, 26.11.2016, SN 0005(MatrixVision.

Measurements performed by T.Renner, Matrix Vision GmbH

| | |
|---|---|
| Vendor | MATRIX VISION |
| Model | mvBlueCOUGAR-X102mC |
| Serial number | GX027718 |
| Sensor diagonal | 17.50 mm |
| Lens category | C-Mount |
| Resolution | 1600 × 1104, 12 bit |
| Pixel size (h×v) | 9.00 $\mu$m × 9.00 $\mu$m |
| Sensor | IMX425 |
| Sensor type | CMOS |
| Shutter type | Global |
| Overlap cap. | Overlapping |
| Max. frame rate | 33.8 Hz |
| Interface type | GigE Vision |

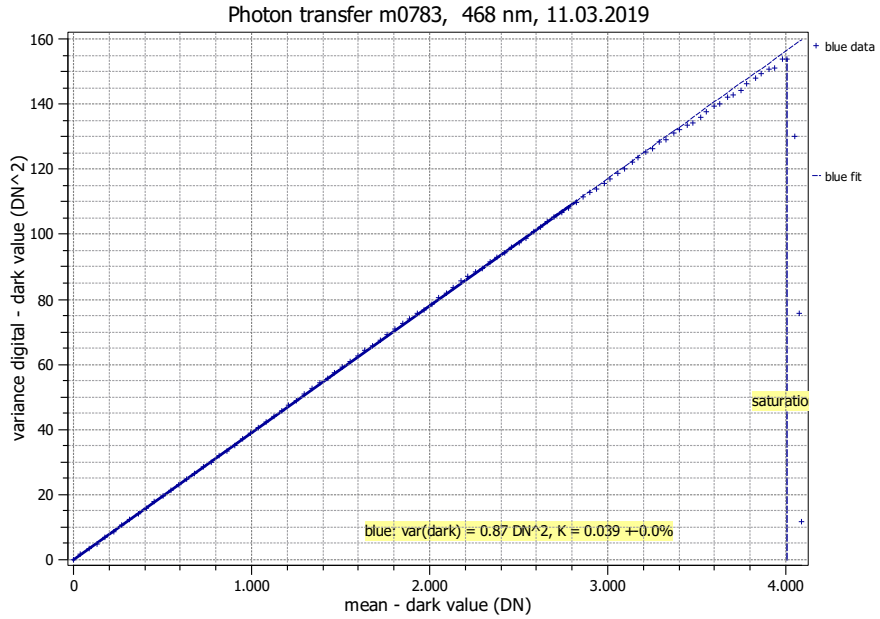
| | |
|---|---|
| Type of data presented | Single |
| **Operation point 1 (page 5)** | |
| Wavelength centroid | 468.0 nm |
| Wavelength FWHM | 20.0 nm |
| Gain, black-level | 0dB, 0.1 |
| **Operation point 2 (page 20)** | |
| Wavelength centroid | 536.0 nm |
| Wavelength FWHM | 31.0 nm |
| Gain, black-level | 0dB, 0.1 |
| **Operation point 3 (page 35)** | |
| Wavelength centroid | 630.0 nm |
| Wavelength FWHM | 13.0 nm |
| Gain, black-level | 0dB, 0.1 |
| **Optional data measured** | |
| None | |



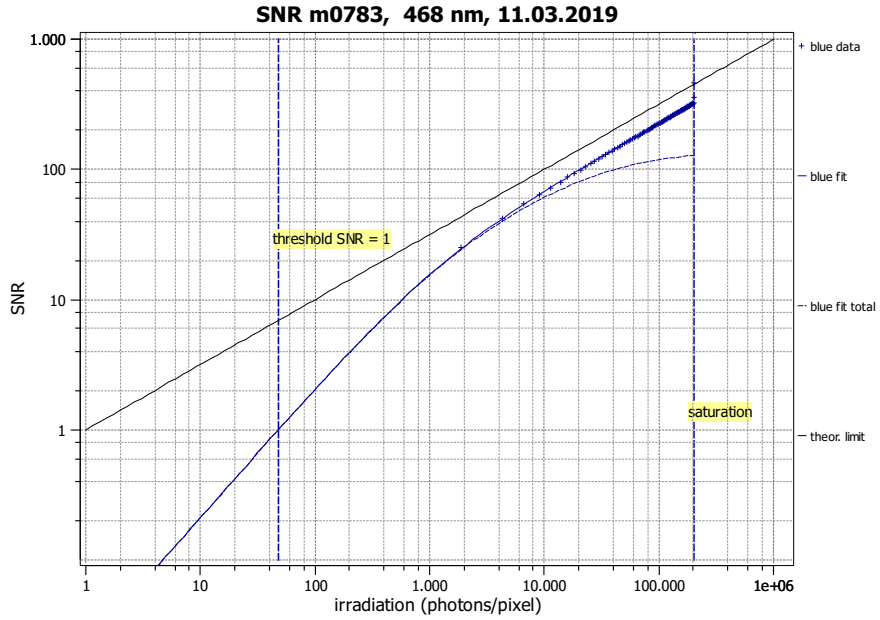
# Summary Sheet for Operation Point 1 at a Wavelength of 468 nm

| | | | |
|---|---|---|---|
| Type of data | Single | Gain, black-level | 0dB, 0.1 |
| Exposure control | By irradiance | Environmental temperature | 24.7°C |
| Exposure time | 18.00 ms | Camera body temperature | 35.4°C |
| Frame rate | 33.0 Hz | Internal temperature(s) | — |
| Data transfer mode | BayerRG12 | Wavelength, centr., FWHM | 468 nm, 20.0 nm |

## Photon Transfer




## Signal-to-Noise Ratio




### Quantum efficiency

| | |
|---|---|
| $\eta$ | 51.1% |

### Overall system gain

| | |
|---|---|
| $K$ | 0.039 DN/e$^-$ |
| $1/K$ | 25.604 e$^-$/DN |

### Temporal dark noise

| | |
|---|---|
| $\sigma_d$ | 22.78 e$^-$ |
| $\sigma_{y.\mathrm{dark}}$ | 0.94 DN |

### Signal-to-noise ratio

| | |
|---|---|
| $\mathrm{SNR}_{\max}$ | 320 |
| | 50.1 dB |
| | 8.3 bit |
| $1/\mathrm{SNR}_{\max}$ | 0.31 % |

### Absolute sensitivity threshold

| | |
|---|---|
| $\mu_{p.\mathrm{min}}$ | 47.9 p |
| $\mu_{p.\mathrm{min.area}}$ | 0.59 p/$\mu$m$^2$ |
| $\mu_{e.\mathrm{min}}$ | 24.5 e$^-$ |
| $\mu_{e.\mathrm{min.area}}$ | 0.30 e$^-$/$\mu$m$^2$ |

### Saturation capacity

| | |
|---|---|
| $\mu_{p.\mathrm{sat}}$ | 200621 p |
| $\mu_{p.\mathrm{sat.area}}$ | 2477 p/$\mu$m$^2$ |
| $\mu_{e.\mathrm{sat}}$ | 102474 e$^-$ |
| $\mu_{e.\mathrm{sat.area}}$ | 1265 e$^-$/$\mu$m$^2$ |

### Dynamic range

| | |
|---|---|
| DR | 4191 |
| | 72.4 dB |
| | 12.0 bit |

### Spatial nonuniformities

| | |
|---|---|
| $\mathrm{DSNU}_{1288}$ | 2.18 e$^-$ |
| | 0.09 DN |
| $\mathrm{PRNU}_{1288}$ | 0.72 % |

### Linearity error

| | |
|---|---|
| $\mathrm{LE}_{\min}$ | -0.46% |
| $\mathrm{LE}_{\max}$ | 1.03% |

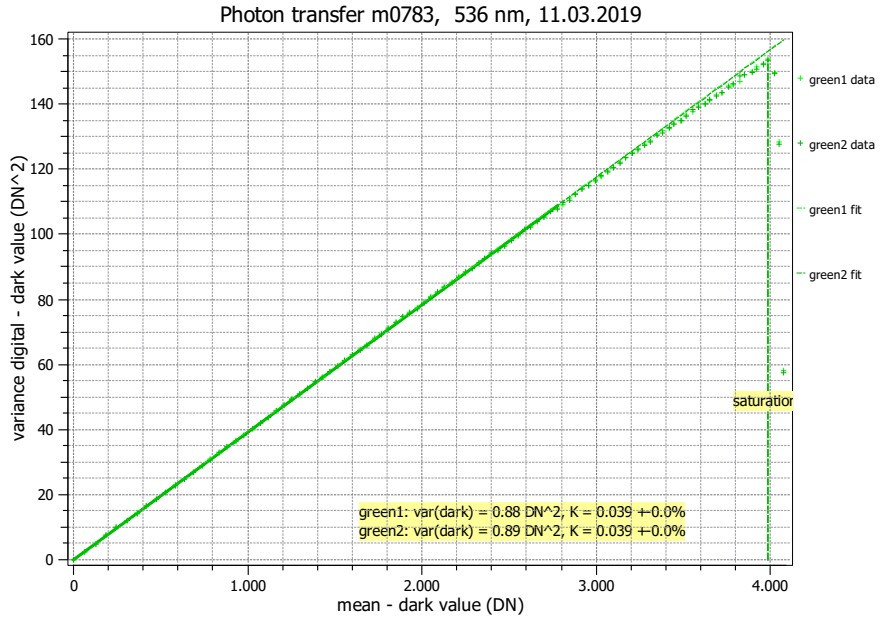
### Dark current

| | |
|---|---|
| $\mu_{c.\mathrm{mean}}$ | $-130 \pm 25$ e$^-$/s |
| | -5.1 DN/s |
| $\mu_{c.\mathrm{var}}$ | $-192 \pm 70$ e$^-$/s |
| $T_d$ | — °C |

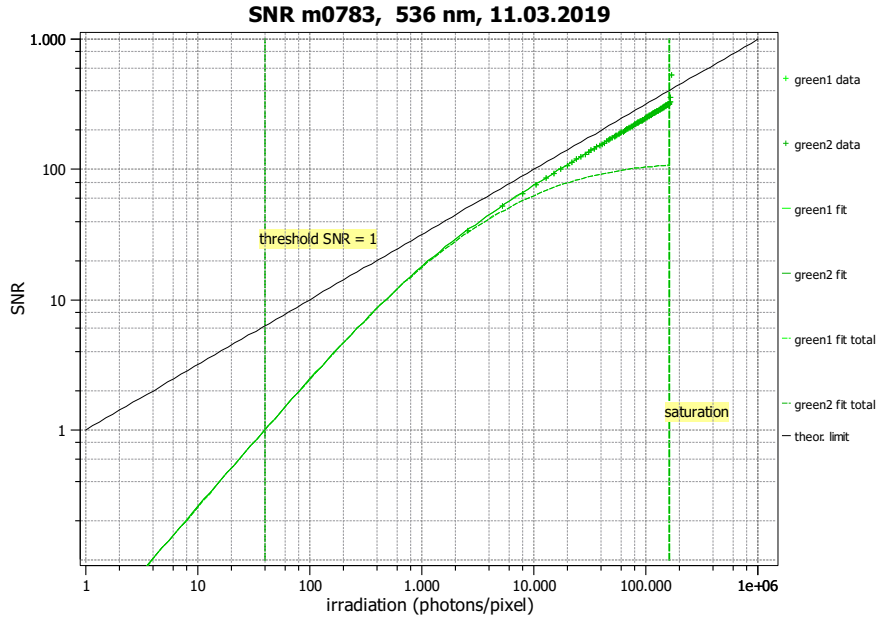
# Summary Sheet for Operation Point 2 at a Wavelength of 536 nm

| | | | |
|---|---|---|---|
| Type of data | Single | Gain, black-level | 0dB, 0.1 |
| Exposure control | By irradiance | Environmental temperature | 24.7°C |
| Exposure time | 18.00 ms | Camera body temperature | 39.1°C |
| Frame rate | 33.0 Hz | Internal temperature(s) | — |
| Data transfer mode | BayerRG12 | Wavelength, centr., FWHM | 536 nm, 31.0 nm |

## Photon Transfer




## Signal-to-Noise Ratio




### Quantum efficiency

| | |
|---|---|
| $\eta$ | 61.9% |

### Overall system gain

| | |
|---|---|
| $K$ | 0.039 DN/e$^-$ |
| $1/K$ | 25.508 e$^-$/DN |

### Temporal dark noise

| | |
|---|---|
| $\sigma_d$ | 22.82 e$^-$ |
| $\sigma_{y.\mathrm{dark}}$ | 0.94 DN |

### Signal-to-noise ratio

| | |
|---|---|
| $\mathrm{SNR}_{\mathrm{max}}$ | 318 |
| | 50.1 dB |
| | 8.3 bit |
| $1/\mathrm{SNR}_{\mathrm{max}}$ | 0.31 % |

### Absolute sensitivity threshold

| | |
|---|---|
| $\mu_{p.\mathrm{min}}$ | 39.5 p |
| $\mu_{p.\mathrm{min.area}}$ | 0.49 p/$\mu$m$^2$ |
| $\mu_{e.\mathrm{min}}$ | 24.5 e$^-$ |
| $\mu_{e.\mathrm{min.area}}$ | 0.30 e$^-$/$\mu$m$^2$ |

### Saturation capacity

| | |
|---|---|
| $\mu_{p.\mathrm{sat}}$ | 163709 p |
| $\mu_{p.\mathrm{sat.area}}$ | 2021 p/$\mu$m$^2$ |
| $\mu_{e.\mathrm{sat}}$ | 101377 e$^-$ |
| $\mu_{e.\mathrm{sat.area}}$ | 1252 e$^-$/$\mu$m$^2$ |

### Dynamic range

| | |
|---|---|
| DR | 4140 |
| | 72.3 dB |
| | 12.0 bit |

### Spatial nonuniformities

| | |
|---|---|
| $\mathrm{DSNU}_{1288}$ | 3.21 e$^-$ |
| | 0.13 DN |
| $\mathrm{PRNU}_{1288}$ | 0.87 % |

### Linearity error

| | |
|---|---|
| $\mathrm{LE}_{\mathrm{min}}$ | -0.42% |
| $\mathrm{LE}_{\mathrm{max}}$ | 1.00% |

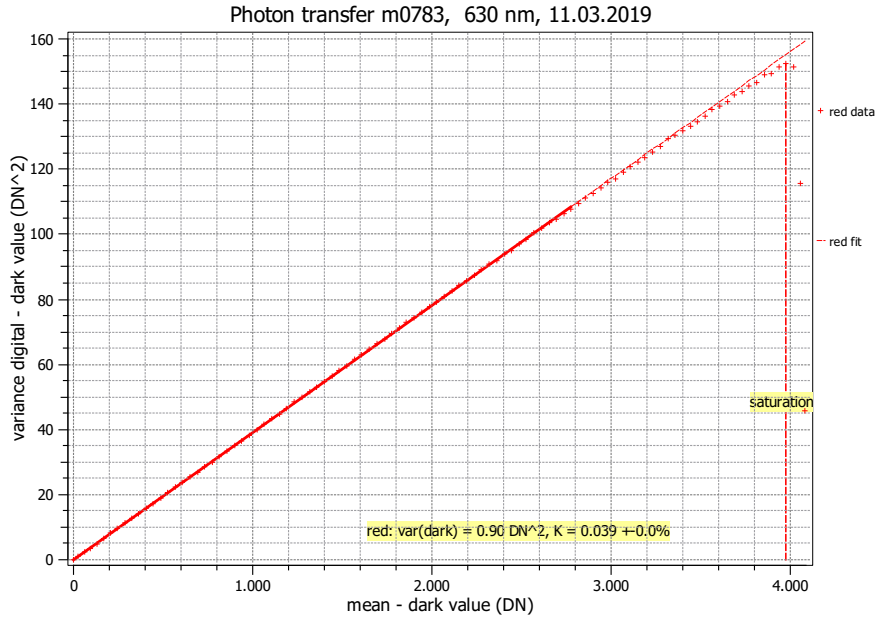
### Dark current

| | |
|---|---|
| $\mu_{c.\mathrm{mean}}$ | $-129 \pm 24$ e$^-$/s |
| | -5.1 DN/s |
| $\mu_{c.\mathrm{var}}$ | $-182 \pm 67$ e$^-$/s |
| $T_{\mathrm{d}}$ | — °C |

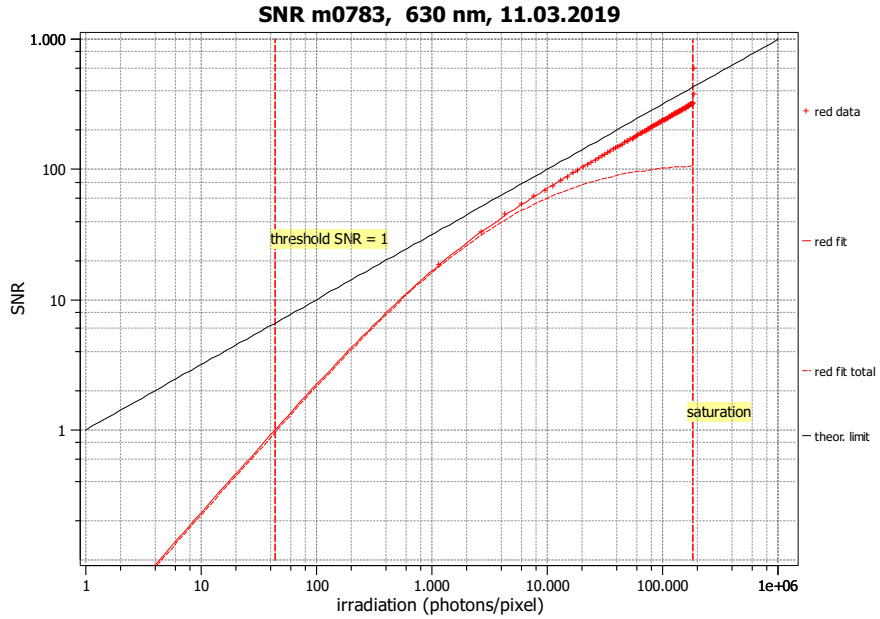
# Summary Sheet for Operation Point 3 at a Wavelength of 630 nm

| | | | |
|---|---|---|---|
| Type of data | Single | Gain, black-level | 0dB, 0.1 |
| Exposure control | By irradiance | Environmental temperature | 24.8°C |
| Exposure time | 18.00 ms | Camera body temperature | 41.7°C |
| Frame rate | 33.0 Hz | Internal temperature(s) | — |
| Data transfer mode | BayerRG12 | Wavelength, centr., FWHM | 630 nm, 13.0 nm |

## Photon Transfer




## Signal-to-Noise Ratio




### Quantum efficiency

| | |
|---|---|
| $\eta$ | 56.4% |

### Overall system gain

| | |
|---|---|
| $K$ | 0.039 DN/e$^-$ |
| $1/K$ | 25.626 e$^-$/DN |

### Temporal dark noise

| | |
|---|---|
| $\sigma_d$ | 23.13 e$^-$ |
| $\sigma_{y.\mathrm{dark}}$ | 0.95 DN |

### Signal-to-noise ratio

| | |
|---|---|
| $\mathrm{SNR}_{\max}$ | 320 |
| | 50.1 dB |
| | 8.3 bit |
| $1/\mathrm{SNR}_{\max}$ | 0.31 % |

### Absolute sensitivity threshold

| | |
|---|---|
| $\mu_{p.\mathrm{min}}$ | 44.0 p |
| $\mu_{p.\mathrm{min.area}}$ | 0.54 p/$\mu$m$^2$ |
| $\mu_{e.\mathrm{min}}$ | 24.8 e$^-$ |
| $\mu_{e.\mathrm{min.area}}$ | 0.31 e$^-$/$\mu$m$^2$ |

### Saturation capacity

| | |
|---|---|
| $\mu_{p.\mathrm{sat}}$ | 181227 p |
| $\mu_{p.\mathrm{sat.area}}$ | 2237 p/$\mu$m$^2$ |
| $\mu_{e.\mathrm{sat}}$ | 102195 e$^-$ |
| $\mu_{e.\mathrm{sat.area}}$ | 1262 e$^-$/$\mu$m$^2$ |

### Dynamic range

| | |
|---|---|
| DR | 4122 |
| | 72.3 dB |
| | 12.0 bit |

### Spatial nonuniformities

| | |
|---|---|
| $\mathrm{DSNU}_{1288}$ | 7.26 e$^-$ |
| | 0.28 DN |
| $\mathrm{PRNU}_{1288}$ | 0.89 % |

### Linearity error

| | |
|---|---|
| $\mathrm{LE}_{\min}$ | -0.19% |
| $\mathrm{LE}_{\max}$ | 0.21% |

### Dark current

| | |
|---|---|
| $\mu_{c.\mathrm{mean}}$ | $-129 \pm 25$ e$^-$/s |
| | -5.1 DN/s |
| $\mu_{c.\mathrm{var}}$ | $-193 \pm 69$ e$^-$/s |
| $T_d$ | — °C |