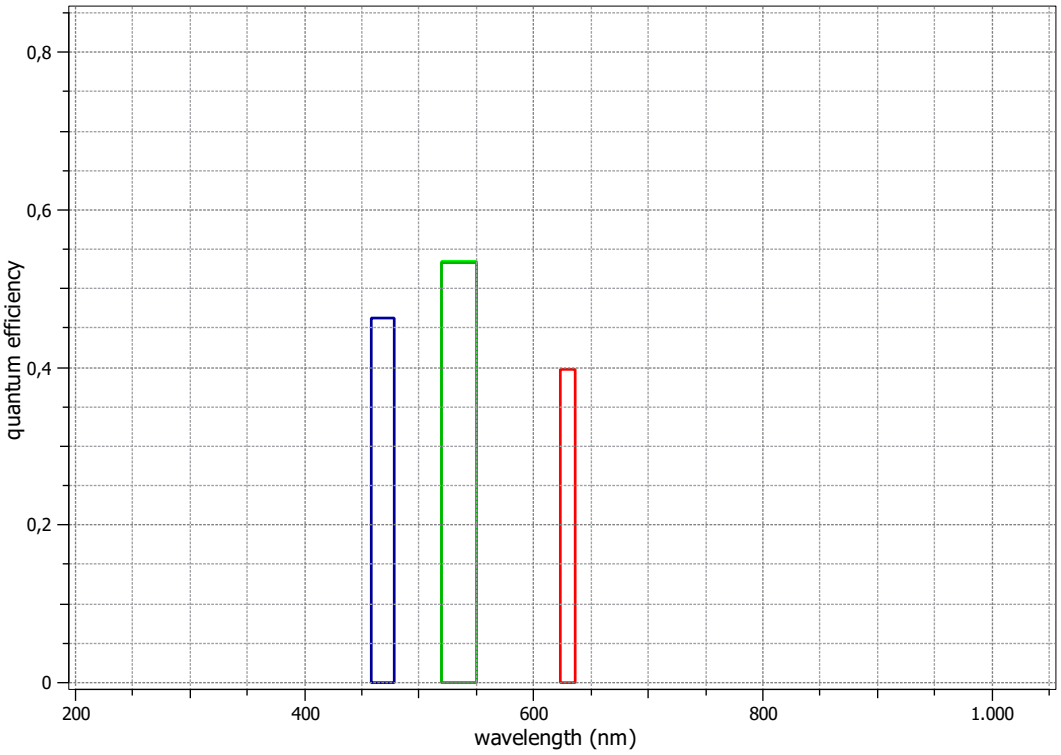
EMVA 1288 Data Sheet m0936

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	BVS_CA-BN2-0246AC
Serial number	BN000122
Sensor diagonal	19.30 mm
Lens category	C-Mount
Resolution	5328 × 4608, 12 bit
Pixel size (h×v)	2.74 μm × 2.74 μm
Sensor	IMX540
Sensor type	CMOS
Shutter type	Global
Overlap cap.	Overlapping
Max. frame rate	22.0 Hz
Interface type	GENiCAM

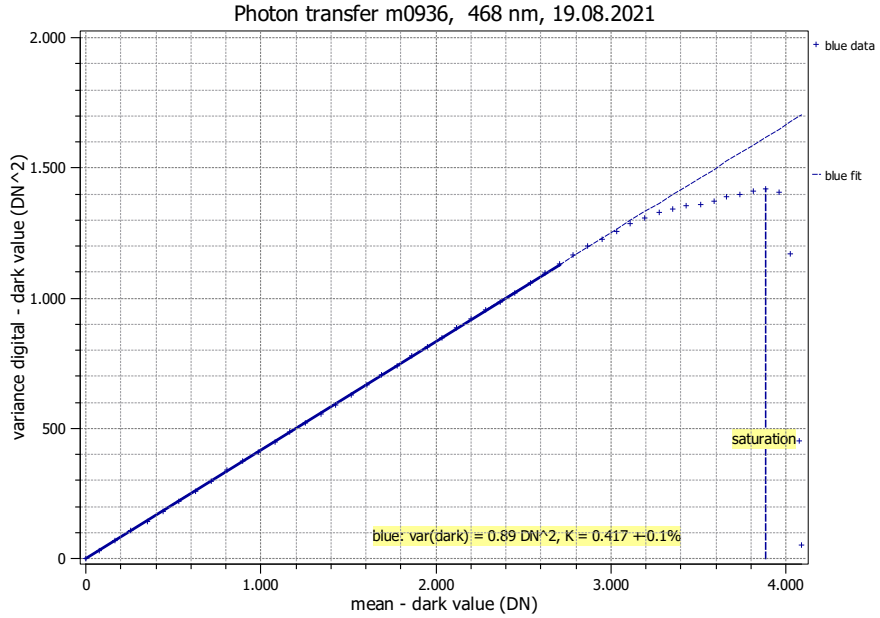
Type of data presented	Single
Operation point 1 (page 5)	
Wavelength centroid	468.0 nm
Wavelength FWHM	20.0 nm
Gain, black-level	0dB, 0.1
Operation point 2 (page 19)	
Wavelength centroid	535.0 nm
Wavelength FWHM	31.0 nm
Gain, black-level	0dB, 0.1
Operation point 3 (page 33)	
Wavelength centroid	630.0 nm
Wavelength FWHM	13.0 nm
Gain, black-level	0dB, 0.1
Optional data measured	
None	



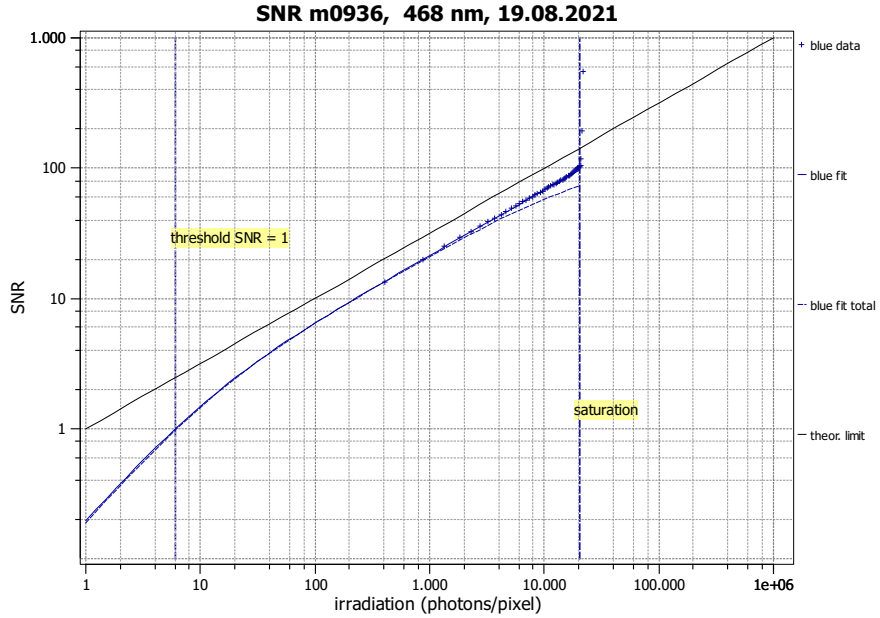
Summary Sheet for Operation Point 1 at a Wavelength of 468 nm

Type of data	Single	Gain, black-level	0dB, 0.1
Exposure control	By irradiance	Environmental temperature	22.3°C
Exposure time	1.50 ms	Camera body temperature	23.5°C
Frame rate	22.0 Hz	Internal temperature(s)	—
Data transfer mode	BayerRG12p	Wavelength, centr., FWHM	468 nm, 20.0 nm

Photon Transfer



Signal-to-Noise Ratio



Quantum efficiency

η	46.3%

Overall system gain

K	0.417 DN/e$^-$
$1/K$	2.400 e$^-$/DN

Temporal dark noise

σ_d	2.16 e$^-$
$\sigma_{y.\mathrm{dark}}$	0.94 DN

Signal-to-noise ratio

$\mathrm{SNR}_{\max}$	97
	39.7 dB
	6.6 bit
$1/\mathrm{SNR}_{\max}$	1.03 %

Absolute sensitivity threshold

$\mu_{p.\mathrm{min}}$	6.09 p
$\mu_{p.\mathrm{min.area}}$	0.811 p/μm^2
$\mu_{e.\mathrm{min}}$	2.82 e$^-$
$\mu_{e.\mathrm{min.area}}$	0.376 e$^-$/μm^2

Saturation capacity

$\mu_{p.\mathrm{sat}}$	20277 p
$\mu_{p.\mathrm{sat.area}}$	2701 p/μm^2
$\mu_{e.\mathrm{sat}}$	9395 e$^-$
$\mu_{e.\mathrm{sat.area}}$	1251 e$^-$/μm^2

Dynamic range

DR	3332
	70.5 dB
	11.7 bit

Spatial nonuniformities

DSNU_{1288}	0.60 e$^-$
	0.25 DN
PRNU_{1288}	0.91 %

Linearity error

$\mathrm{LE}_{\min}$	-0.43%
$\mathrm{LE}_{\max}$	0.37%

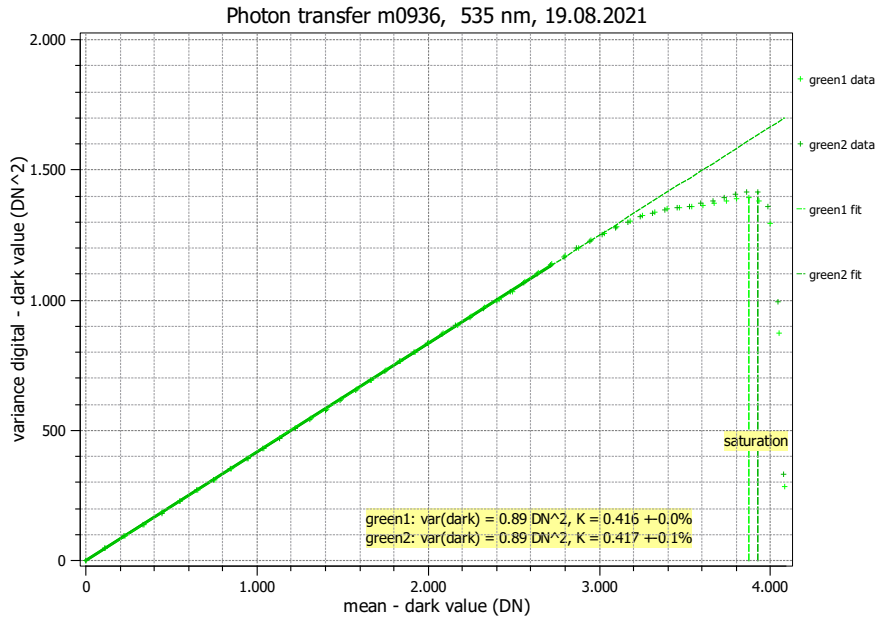
Dark current

$\mu_{c.\mathrm{mean}}$	1.7 ± 0.0 e$^-$/s
	0.71 DN/s
$\mu_{c.\mathrm{var}}$	1.8 ± 0.0 e$^-$/s
T_d	— °C

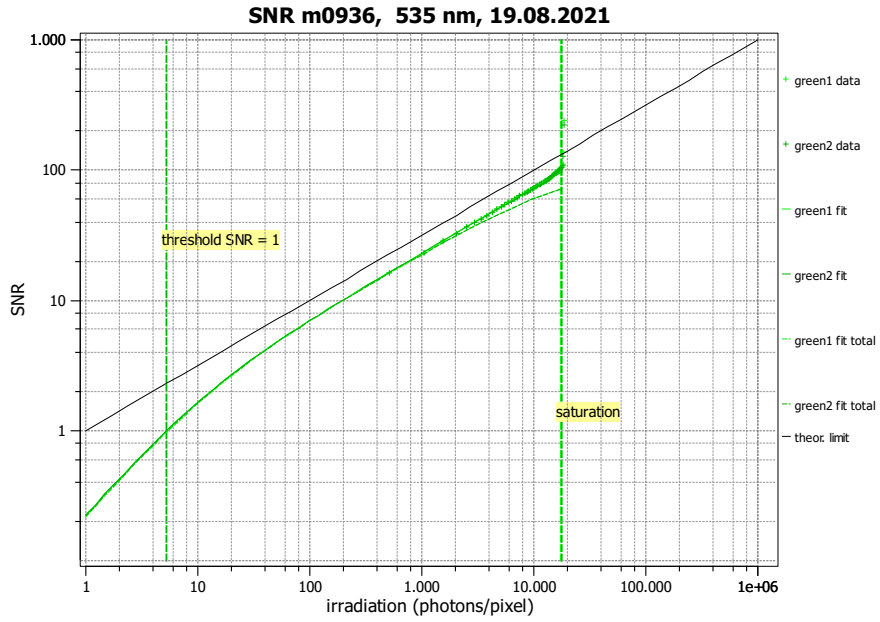
Summary Sheet for Operation Point 2 at a Wavelength of 535 nm

Type of data	Single	Gain, black-level	0dB, 0.1
Exposure control	By irradiance	Environmental temperature	22.3°C
Exposure time	1.50 ms	Camera body temperature	23.6°C
Frame rate	22.0 Hz	Internal temperature(s)	—
Data transfer mode	BayerRG12p	Wavelength, centr., FWHM	535 nm, 31.0 nm

Photon Transfer



Signal-to-Noise Ratio



Quantum efficiency

η	53.5%

Overall system gain

K	0.416 DN/e$^-$
$1/K$	2.401 e$^-$/DN

Temporal dark noise

σ_d	2.16 e$^-$
$\sigma_{y.\mathrm{dark}}$	0.94 DN

Signal-to-noise ratio

$\mathrm{SNR}_{\mathrm{max}}$	97
	39.7 dB
	6.6 bit
$1/\mathrm{SNR}_{\mathrm{max}}$	1.04 %

Absolute sensitivity threshold

$\mu_{p.\mathrm{min}}$	5.28 p
$\mu_{p.\mathrm{min.area}}$	0.703 p/μm^2
$\mu_{e.\mathrm{min}}$	2.82 e$^-$
$\mu_{e.\mathrm{min.area}}$	0.376 e$^-$/μm^2

Saturation capacity

$\mu_{p.\mathrm{sat}}$	17444 p
$\mu_{p.\mathrm{sat.area}}$	2324 p/μm^2
$\mu_{e.\mathrm{sat}}$	9328 e$^-$
$\mu_{e.\mathrm{sat.area}}$	1242 e$^-$/μm^2

Dynamic range

DR	3305
	70.4 dB
	11.7 bit

Spatial nonuniformities

DSNU_{1288}	0.66 e$^-$
	0.27 DN
PRNU_{1288}	0.94 %

Linearity error

$\mathrm{LE}_{\mathrm{min}}$	-0.47%
$\mathrm{LE}_{\mathrm{max}}$	0.79%

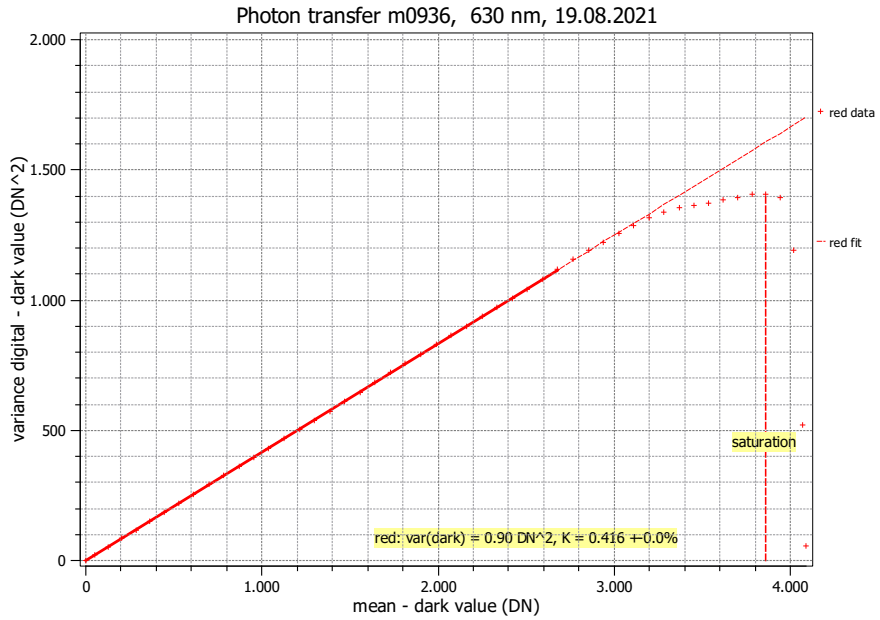
Dark current

$\mu_{c.\mathrm{mean}}$	1.7 ± 0.0 e$^-$/s
	0.72 DN/s
$\mu_{c.\mathrm{var}}$	1.8 ± 0.0 e$^-$/s
T_{d}	— °C

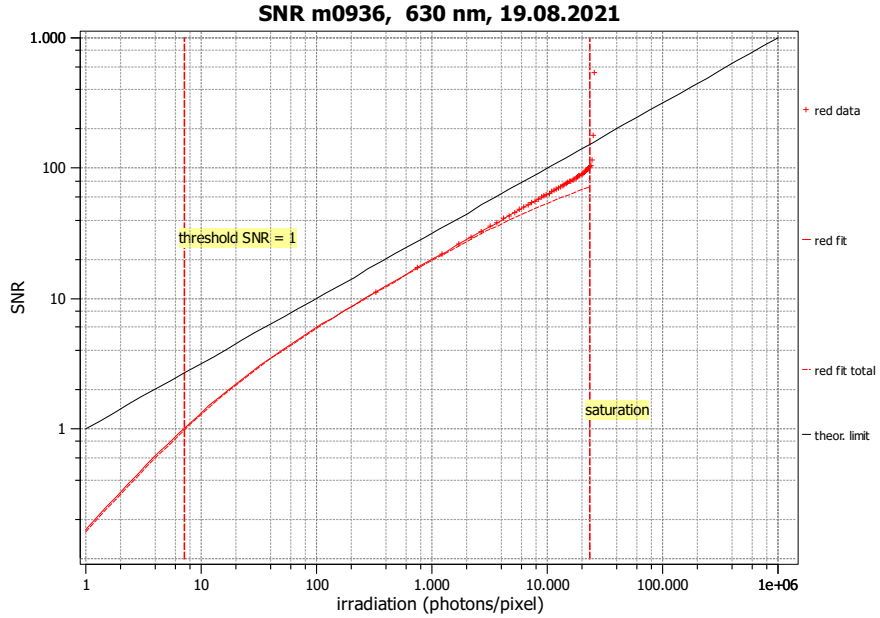
Summary Sheet for Operation Point 3 at a Wavelength of 630 nm

Type of data	Single	Gain, black-level	0dB, 0.1
Exposure control	By irradiance	Environmental temperature	22.4°C
Exposure time	1.50 ms	Camera body temperature	23.7°C
Frame rate	22.0 Hz	Internal temperature(s)	—
Data transfer mode	BayerRG12p	Wavelength, centr., FWHM	630 nm, 13.0 nm

Photon Transfer



Signal-to-Noise Ratio



Quantum efficiency

η	39.8%

Overall system gain

K	0.416 DN/e$^-$
$1/K$	2.401 e$^-$/DN

Temporal dark noise

σ_d	2.16 e$^-$
$\sigma_{y.\mathrm{dark}}$	0.95 DN

Signal-to-noise ratio

$\mathrm{SNR}_{\max}$	97
	39.7 dB
	6.6 bit
$1/\mathrm{SNR}_{\max}$	1.03 %

Absolute sensitivity threshold

$\mu_{p.\mathrm{min}}$	7.10 p
$\mu_{p.\mathrm{min.area}}$	0.945 p/μm^2
$\mu_{e.\mathrm{min}}$	2.83 e$^-$
$\mu_{e.\mathrm{min.area}}$	0.376 e$^-$/μm^2

Saturation capacity

$\mu_{p.\mathrm{sat}}$	23558 p
$\mu_{p.\mathrm{sat.area}}$	3138 p/μm^2
$\mu_{e.\mathrm{sat}}$	9384 e$^-$
$\mu_{e.\mathrm{sat.area}}$	1250 e$^-$/μm^2

Dynamic range

DR	3320
	70.4 dB
	11.7 bit

Spatial nonuniformities

DSNU_{1288}	0.70 e$^-$
	0.29 DN
PRNU_{1288}	0.95 %

Linearity error

$\mathrm{LE}_{\min}$	-0.61%
$\mathrm{LE}_{\max}$	0.46%

Dark current

$\mu_{c.\mathrm{mean}}$	1.6 ± 0.0 e$^-$/s
	0.67 DN/s
$\mu_{c.\mathrm{var}}$	1.7 ± 0.0 e$^-$/s
T_d	— °C