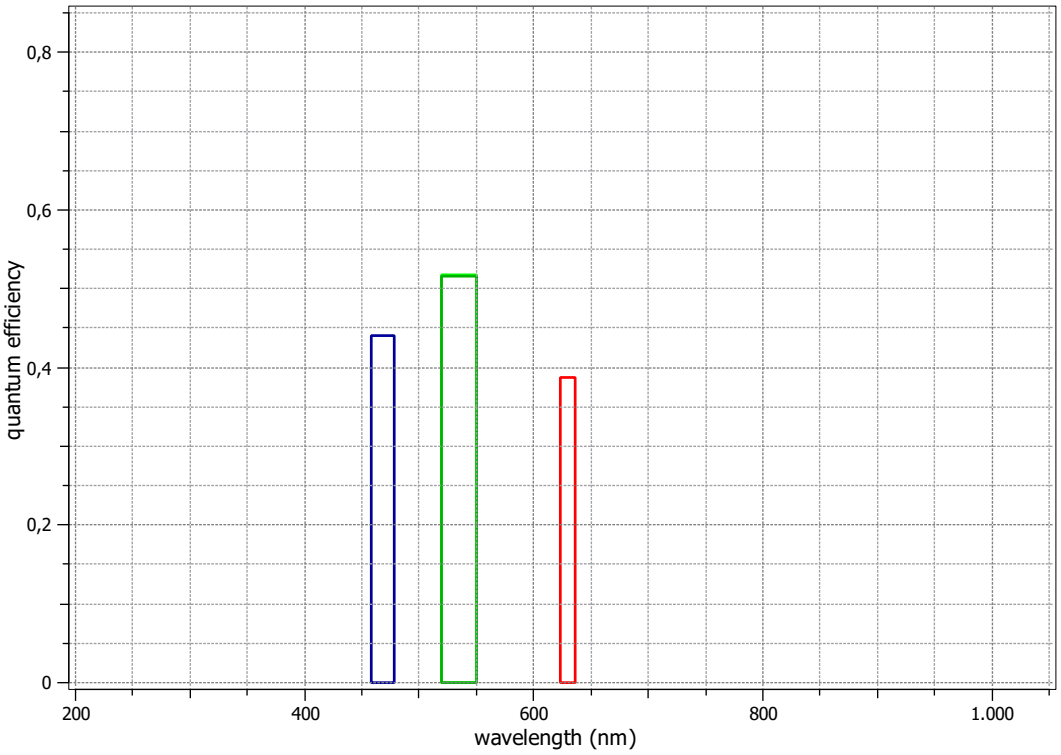
EMVA 1288 Data Sheet m0866

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-XD1025C
Serial number	GX217996
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	4.9 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	535.0 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	



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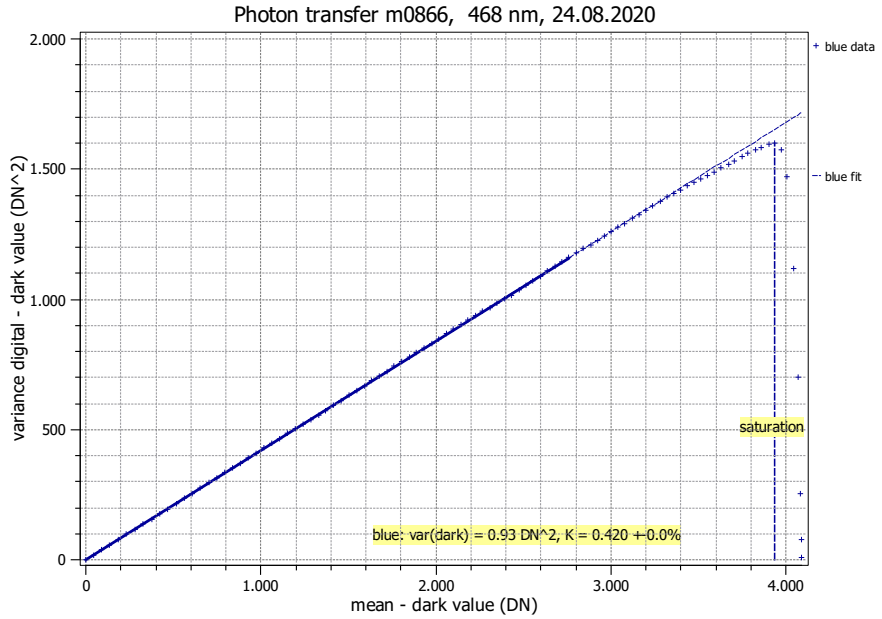
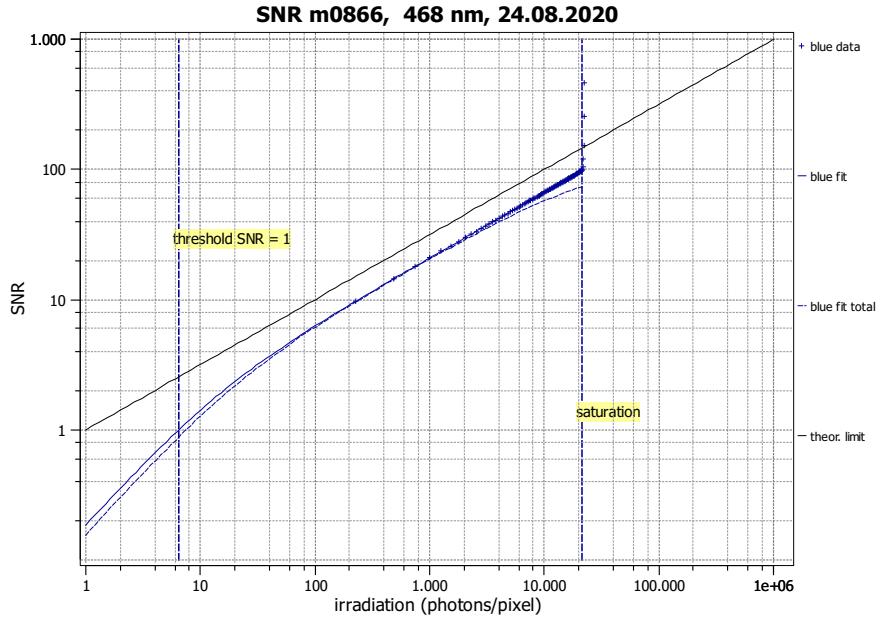
Summary Sheet for Operation Point 1 at a Wavelength of 468 nm

Type of data	Single	Gain, black-level	0dB, 0.1
Exposure control	By irradiance	Environmental temperature	23.1°C
Exposure time	22.00 ms	Camera body temperature	39.0°C
Frame rate	4.5 Hz	Internal temperature(s)	—
Data transfer mode	BayerRG12	Wavelength, centr., FWHM	468 nm, 20.0 nm

Photon Transfer



Signal-to-Noise Ratio



Quantum efficiency

η	44.0%

Overall system gain

K	0.420 DN/e$^-$
$1/K$	2.381 e$^-$/DN

Temporal dark noise

σ_d	2.19 e$^-$
$\sigma_{y.\mathrm{dark}}$	0.97 DN

Signal-to-noise ratio

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

Absolute sensitivity threshold

$\mu_{p.\mathrm{min}}$	6.48 p
$\mu_{p.\mathrm{min.area}}$	0.863 p/μm^2
$\mu_{e.\mathrm{min}}$	2.85 e$^-$
$\mu_{e.\mathrm{min.area}}$	0.380 e$^-$/μm^2

Saturation capacity

$\mu_{p.\mathrm{sat}}$	21314 p
$\mu_{p.\mathrm{sat.area}}$	2839 p/μm^2
$\mu_{e.\mathrm{sat}}$	9384 e$^-$
$\mu_{e.\mathrm{sat.area}}$	1250 e$^-$/μm^2

Dynamic range

DR	3289
	70.3 dB
	11.7 bit

Spatial nonuniformities

DSNU_{1288}	1.53 e$^-$
	0.64 DN
PRNU_{1288}	0.88 %

Linearity error

$\mathrm{LE}_{\min}$	-0.26%
$\mathrm{LE}_{\max}$	0.39%

Dark current

$\mu_{c.\mathrm{mean}}$	3.5 ± 0.0 e$^-$/s
	1.49 DN/s
$\mu_{c.\mathrm{var}}$	3.8 ± 0.0 e$^-$/s
T_d	— °C

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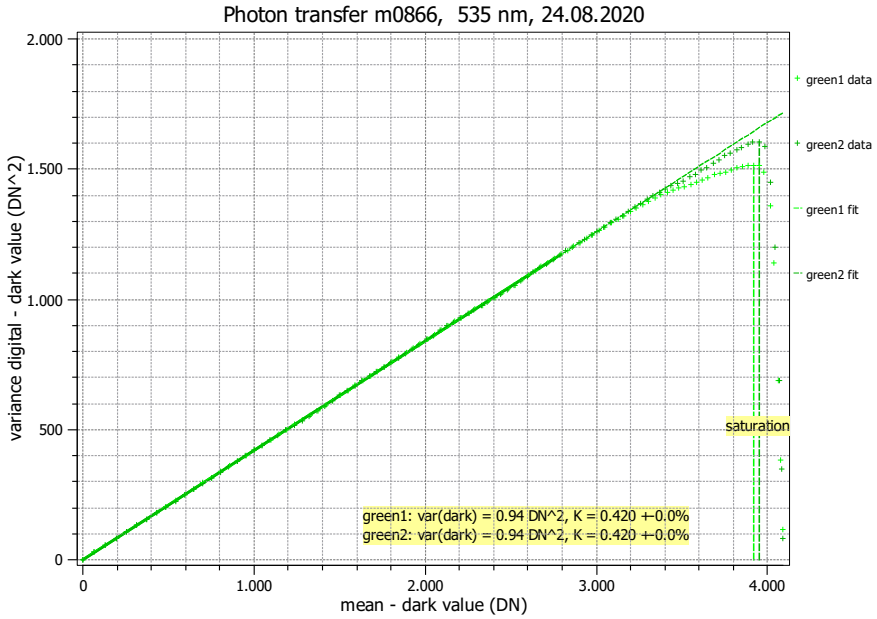
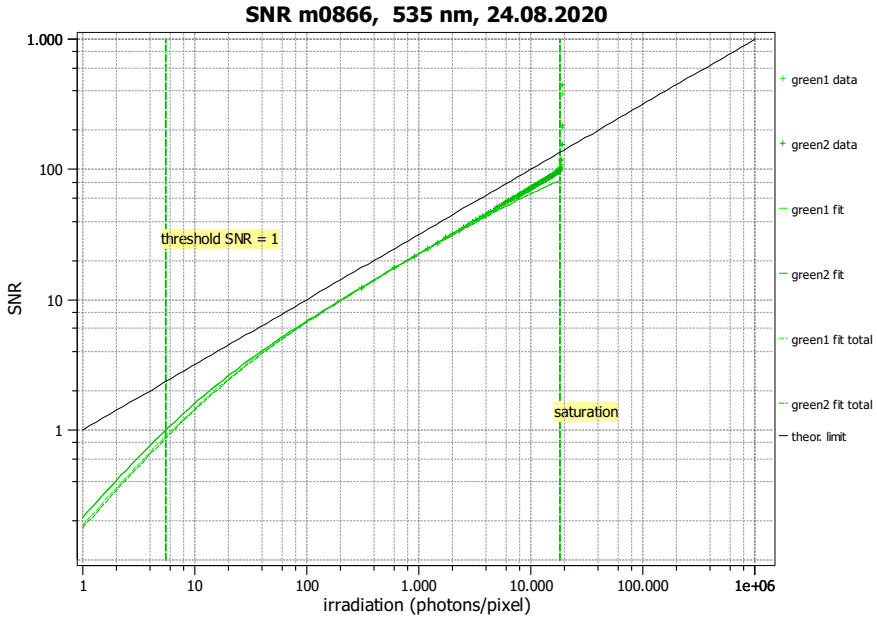
Summary Sheet for Operation Point 2 at a Wavelength of 535 nm

Type of data	Single	Gain, black-level	0dB, 0.1
Exposure control	By irradiance	Environmental temperature	23.1°C
Exposure time	22.00 ms	Camera body temperature	40.2°C
Frame rate	4.5 Hz	Internal temperature(s)	—
Data transfer mode	BayerRG12	Wavelength, centr., FWHM	535 nm, 31.0 nm

Photon Transfer



Signal-to-Noise Ratio



Quantum efficiency

η	51.7%

Overall system gain

K	0.420 DN/e$^-$
$1/K$	2.382 e$^-$/DN

Temporal dark noise

σ_d	2.21 e$^-$
$\sigma_{y.\mathrm{dark}}$	0.97 DN

Signal-to-noise ratio

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

Absolute sensitivity threshold

$\mu_{p.\mathrm{min}}$	5.54 p
$\mu_{p.\mathrm{min.area}}$	0.737 p/μm^2
$\mu_{e.\mathrm{min}}$	2.86 e$^-$
$\mu_{e.\mathrm{min.area}}$	0.381 e$^-$/μm^2

Saturation capacity

$\mu_{p.\mathrm{sat}}$	18047 p
$\mu_{p.\mathrm{sat.area}}$	2404 p/μm^2
$\mu_{e.\mathrm{sat}}$	9336 e$^-$
$\mu_{e.\mathrm{sat.area}}$	1244 e$^-$/μm^2

Dynamic range

DR	3260
	70.3 dB
	11.7 bit

Spatial nonuniformities

DSNU_{1288}	1.40 e$^-$
	0.59 DN
PRNU_{1288}	0.66 %

Linearity error

$\mathrm{LE}_{\min}$	-0.56%
$\mathrm{LE}_{\max}$	1.14%

Dark current

$\mu_{c.\mathrm{mean}}$	3.5 ± 0.0 e$^-$/s
	1.47 DN/s
$\mu_{c.\mathrm{var}}$	3.8 ± 0.0 e$^-$/s
T_d	— °C

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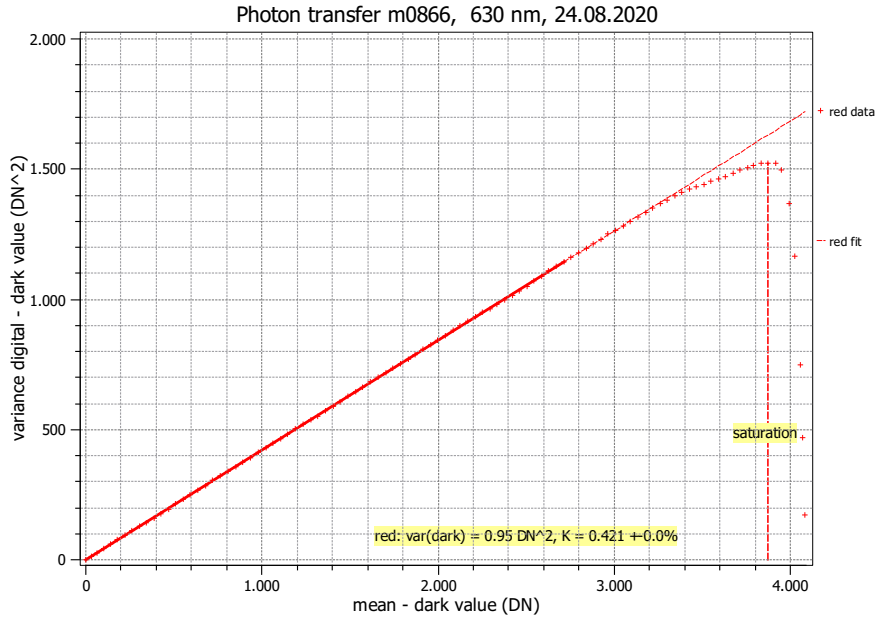
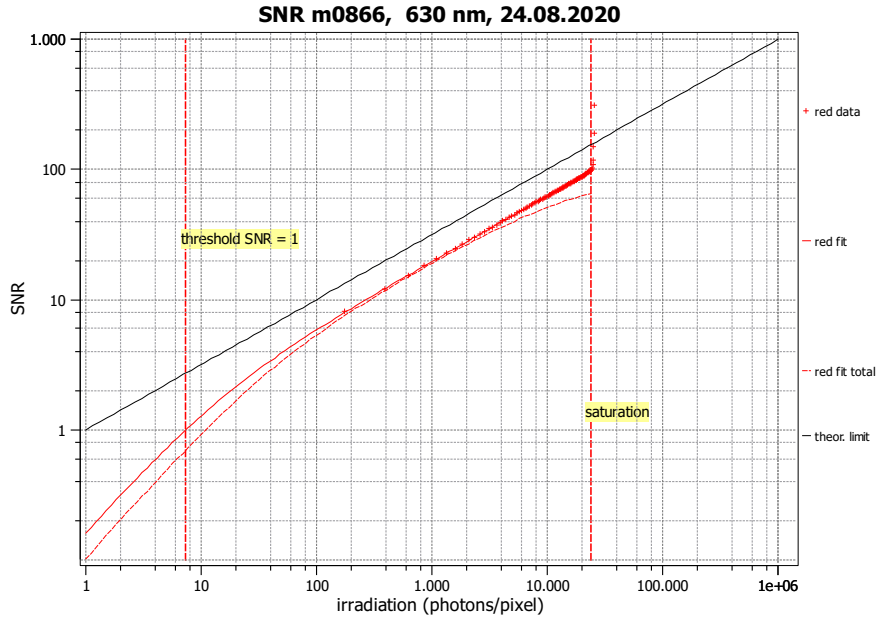
Summary Sheet for Operation Point 3 at a Wavelength of 630 nm

Type of data	Single	Gain, black-level	0dB, 0.1
Exposure control	By irradiance	Environmental temperature	23.1°C
Exposure time	22.00 ms	Camera body temperature	40.8°C
Frame rate	4.5 Hz	Internal temperature(s)	—
Data transfer mode	BayerRG12	Wavelength, centr., FWHM	630 nm, 13.0 nm

Photon Transfer



Signal-to-Noise Ratio



Quantum efficiency

η	38.8%

Overall system gain

K	0.421 DN/e$^-$
$1/K$	2.375 e$^-$/DN

Temporal dark noise

σ_d	2.21 e$^-$
$\sigma_{y.\mathrm{dark}}$	0.98 DN

Signal-to-noise ratio

$\mathrm{SNR}_{\max}$	96
	39.7 dB
	6.6 bit
$1/\mathrm{SNR}_{\max}$	1.04 %

Absolute sensitivity threshold

$\mu_{p.\mathrm{min}}$	7.39 p
$\mu_{p.\mathrm{min.area}}$	0.985 p/μm^2
$\mu_{e.\mathrm{min}}$	2.87 e$^-$
$\mu_{e.\mathrm{min.area}}$	0.382 e$^-$/μm^2

Saturation capacity

$\mu_{p.\mathrm{sat}}$	23941 p
$\mu_{p.\mathrm{sat.area}}$	3189 p/μm^2
$\mu_{e.\mathrm{sat}}$	9291 e$^-$
$\mu_{e.\mathrm{sat.area}}$	1237 e$^-$/μm^2

Dynamic range

DR	3238
	70.2 dB
	11.7 bit

Spatial nonuniformities

DSNU_{1288}	2.92 e$^-$
	1.23 DN
PRNU_{1288}	1.12 %

Linearity error

$\mathrm{LE}_{\min}$	-0.64%
$\mathrm{LE}_{\max}$	0.39%

Dark current

$\mu_{c.\mathrm{mean}}$	3.3 ± 0.0 e$^-$/s
	1.39 DN/s
$\mu_{c.\mathrm{var}}$	3.5 ± 0.0 e$^-$/s
T_d	— °C

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