

EMVA 1288 Data Sheet m1301

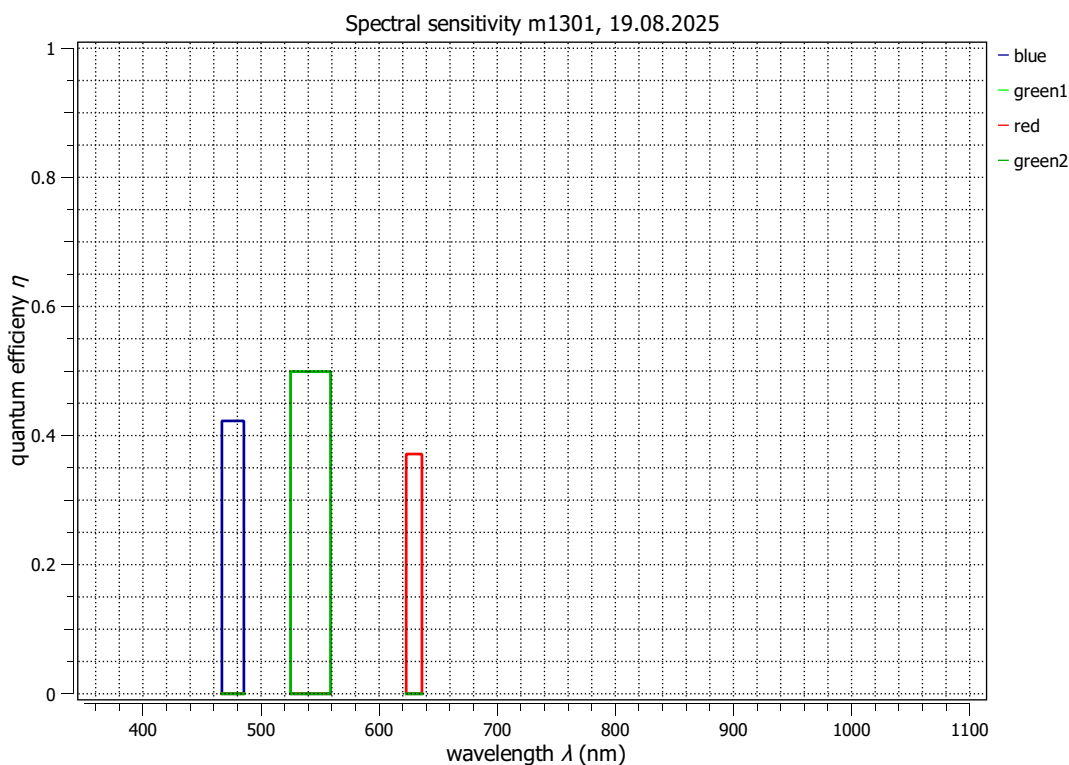
This data sheet describes the specification according to the standard 1288 Release 4.0 Linear issued on 21 June 2021 for "Characterization and Presentation of Specification Data for Image Sensors and Cameras" by the European Machine Vision Association (EMVA), published at <https://www.emva.org/standards-technology/emva-1288/> with proprietary extensions from AEON. The measurements were performed with the AEON ACC2b 14x1 color, Release 9, 13.11.2020, SN 0066(Balluff), software version 3.2.

Measurements performed by Product Development Vision, Balluff GmbH

Type of data presented	Single
Vendor	Balluff GmbH
Model	BVS CA-GV1-0051DC
Serial number	GV000096
Sensor diagonal	8.82 mm
Lens category	C-Mount
Resolution	2472 × 2064, 12 bit
Offset/size channels	0 × 0/ 1236 × 1032
Pixel size (h×v)	2.74 μm × 2.74 μm
Sensor	IMX547
Sensor type	CMOS
Shutter type	Global
Overlap cap.	Overlapping
Max. frame rate	0.0 Hz
Interface type	GigEVision

Nr.	Centroid/FWHM	Gain, blacklevel	t_{exp} (ms)
1	476.2/18.6 nm	0.0dB, 0.1	2.00
2	542.0/33.9 nm	0.0dB, 0.1	3.00
3	629.6/13.3 nm	0.0dB, 0.1	2.00

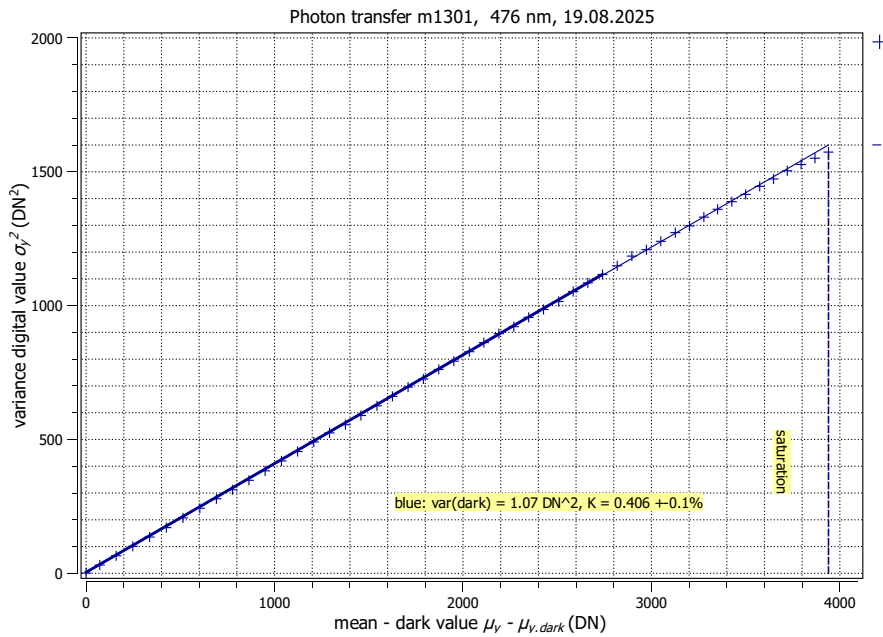
Optional data measured: None



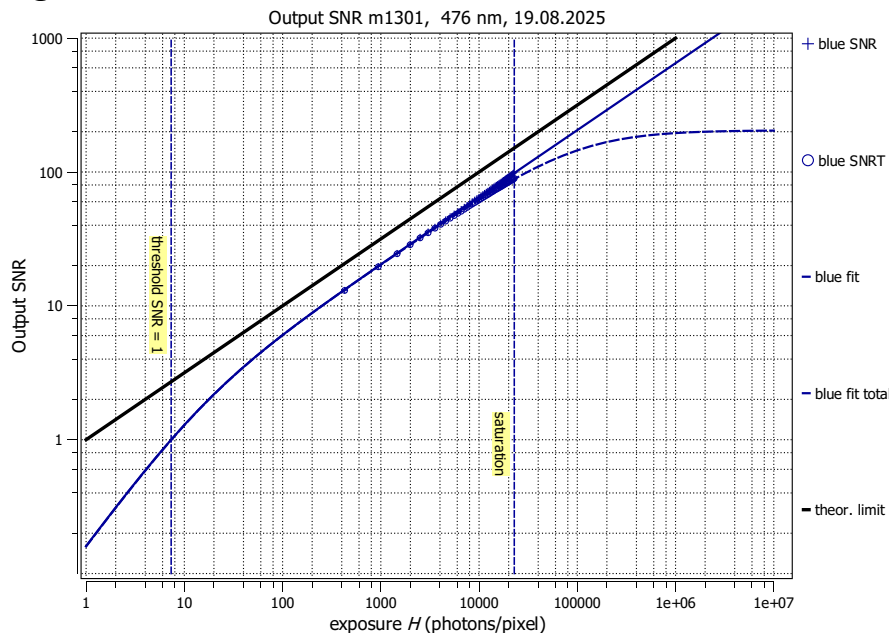
Summary Sheet for Operation Point 1 at a Wavelength of 476 nm

Type of data	Single	Gain, black-level	0.0dB, 0.1
Exposure control	By irradiance	Environmental temperature	25.8°C
Exposure time	2.000 ms	Camera body temperature	34.0°C
Frame rate	69.5 Hz	Internal temperature(s)	47.0°C, 36.0°C
Data transfer mode	BayerRG12p	Wavelength, centr., FWHM	476 nm, 18.6 nm

Photon Transfer



Signal-to-Noise Ratio



Quantum efficiency

η 42.3%

Overall system gain

K 0.4059 DN/e⁻

$1/K$ 2.464 e⁻/DN

Temporal dark noise

σ_d 2.45 e⁻

$\sigma_{y, \text{dark}}$ 1.04 DN

Signal-to-noise ratio

SNR_{max} 98.2

39.8 dB

$1/\text{SNR}_{\text{max}}$ 1.018 %

Absolute sensitivity threshold

$\mu_{e, \text{min}}$ 3.10 e⁻

$\mu_{e, \text{min. area}}$ 0.413 e⁻/μm²

Saturation capacity

$\mu_{e, \text{sat}}$ 9648 e⁻

$\mu_{e, \text{sat. area}}$ 1285 e⁻/μm²

Dynamic range

DR 3110

69.85 dB

Spatial nonuniformities

DSNU₁₂₈₈ 0.279 e⁻

DSNU_{1288.col} 0.025 e⁻

DSNU_{1288.row} 0.012 e⁻

DSNU_{1288.pix} 0.278 e⁻

PRNU₁₂₈₈ 0.488 %

PRNU_{1288.col} 0.021 %

PRNU_{1288.row} 0.018 %

PRNU_{1288.pix} 0.487 %

Linearity error

LE 0.33%

Dark current

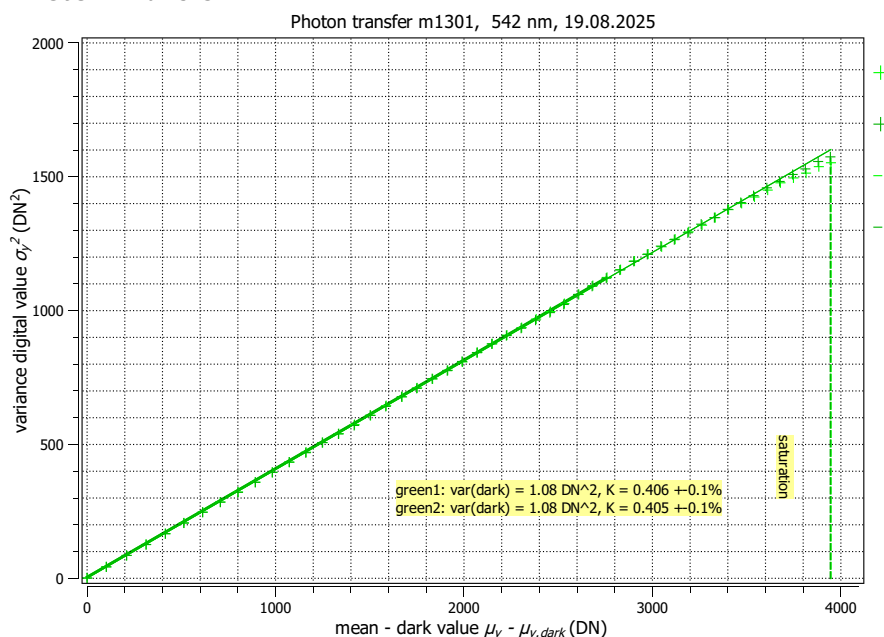
$\mu_{c, \text{mean}}$ 1.17E+00 e⁻/s

$\mu_{c, \text{var}}$ 1.22E+00 e⁻/s

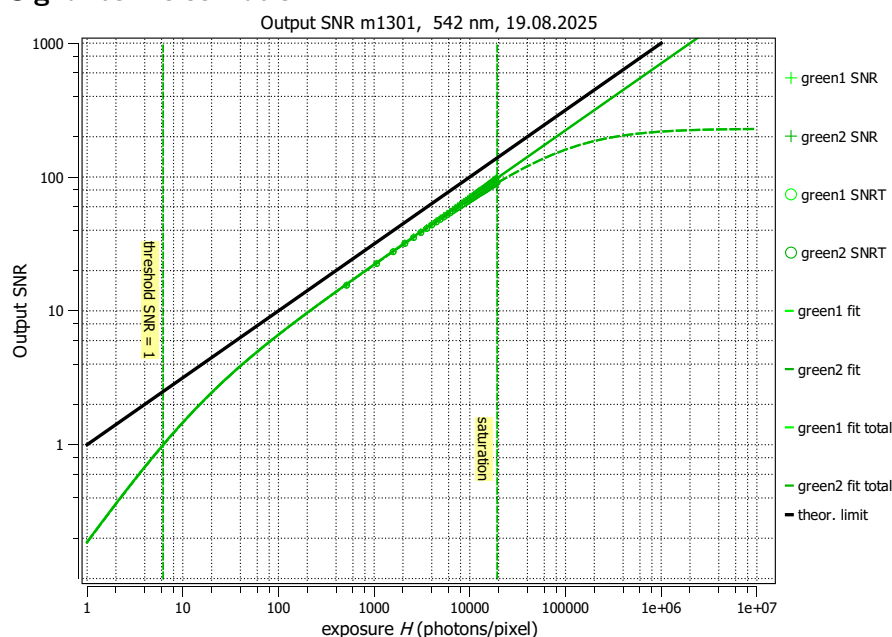
Summary Sheet for Operation Point 2 at a Wavelength of 542 nm

Type of data	Single	Gain, black-level	0.0dB, 0.1
Exposure control	By irradiance	Environmental temperature	25.8°C
Exposure time	3.000 ms	Camera body temperature	34.5°C
Frame rate	69.5 Hz	Internal temperature(s)	47.6°C, 36.3°C
Data transfer mode	BayerRG12p	Wavelength, centr., FWHM	542 nm, 33.9 nm

Photon Transfer



Signal-to-Noise Ratio



Quantum efficiency

η 49.9%

Overall system gain

K 0.4056 DN/e⁻

$1/K$ 2.465 e⁻/DN

Temporal dark noise

σ_d 2.46 e⁻

$\sigma_{y,dark}$ 1.04 DN

Signal-to-noise ratio

SNR_{max} 98.2

39.8 dB

$1/\text{SNR}_{max}$ 1.018 %

Absolute sensitivity threshold

$\mu_{e,min}$ 3.11 e⁻

$\mu_{e,min,area}$ 0.414 e⁻/μm²

Saturation capacity

$\mu_{e,sat}$ 9650 e⁻

$\mu_{e,sat,area}$ 1285 e⁻/μm²

Dynamic range

DR 3101

69.83 dB

Spatial nonuniformities

DSNU₁₂₈₈ 0.285 e⁻

DSNU_{1288,col} 0.024 e⁻

DSNU_{1288,row} 0.012 e⁻

DSNU_{1288,pix} 0.284 e⁻

PRNU₁₂₈₈ 0.436 %

PRNU_{1288,col} 0.024 %

PRNU_{1288,row} 0.021 %

PRNU_{1288,pix} 0.435 %

Linearity error

LE 0.39%

Dark current

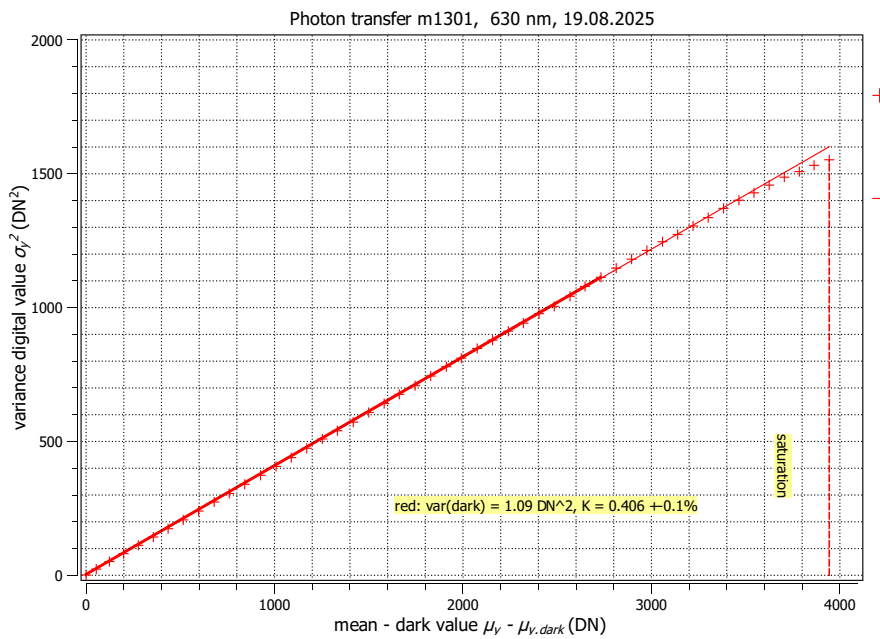
$\mu_{c,mean}$ 1.16E+00 e⁻/s

$\mu_{c,var}$ 1.20E+00 e⁻/s

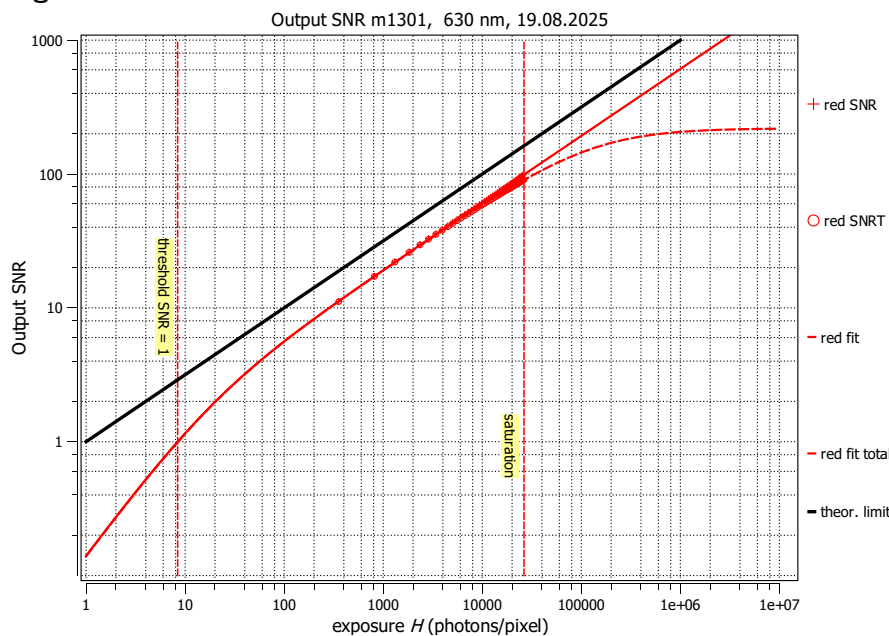
Summary Sheet for Operation Point 3 at a Wavelength of 630 nm

Type of data	Single	Gain, black-level	0.0dB, 0.1
Exposure control	By irradiance	Environmental temperature	25.8°C
Exposure time	2.000 ms	Camera body temperature	34.9°C
Frame rate	69.5 Hz	Internal temperature(s)	48.0°C, 37.0°C
Data transfer mode	BayerRG12p	Wavelength, centr., FWHM	630 nm, 13.3 nm

Photon Transfer



Signal-to-Noise Ratio



Quantum efficiency

η 37.1%

Overall system gain

K 0.4058 DN/e⁻

$1/K$ 2.465 e⁻/DN

Temporal dark noise

σ_d 2.47 e⁻

$\sigma_{y, \text{dark}}$ 1.04 DN

Signal-to-noise ratio

SNR_{max} 99.0

39.9 dB

$1/\text{SNR}_{\text{max}}$ 1.010 %

Absolute sensitivity threshold

$\mu_{e, \text{min}}$ 3.12 e⁻

$\mu_{e, \text{min. area}}$ 0.416 e⁻/μm²

Saturation capacity

$\mu_{e, \text{sat}}$ 9794 e⁻

$\mu_{e, \text{sat. area}}$ 1305 e⁻/μm²

Dynamic range

DR 3139

69.94 dB

Spatial nonuniformities

DSNU₁₂₈₈ 0.350 e⁻

DSNU_{1288.col} 0.041 e⁻

DSNU_{1288.row} 0.012 e⁻

DSNU_{1288.pix} 0.347 e⁻

PRNU₁₂₈₈ 0.456 %

PRNU_{1288.col} 0.030 %

PRNU_{1288.row} 0.033 %

PRNU_{1288.pix} 0.454 %

Linearity error

LE 0.22%

Dark current

$\mu_{c, \text{mean}}$ 1.14E+00 e⁻/s

$\mu_{c, \text{var}}$ 1.25E+00 e⁻/s