

EMVA 1288 Data Sheet m1355

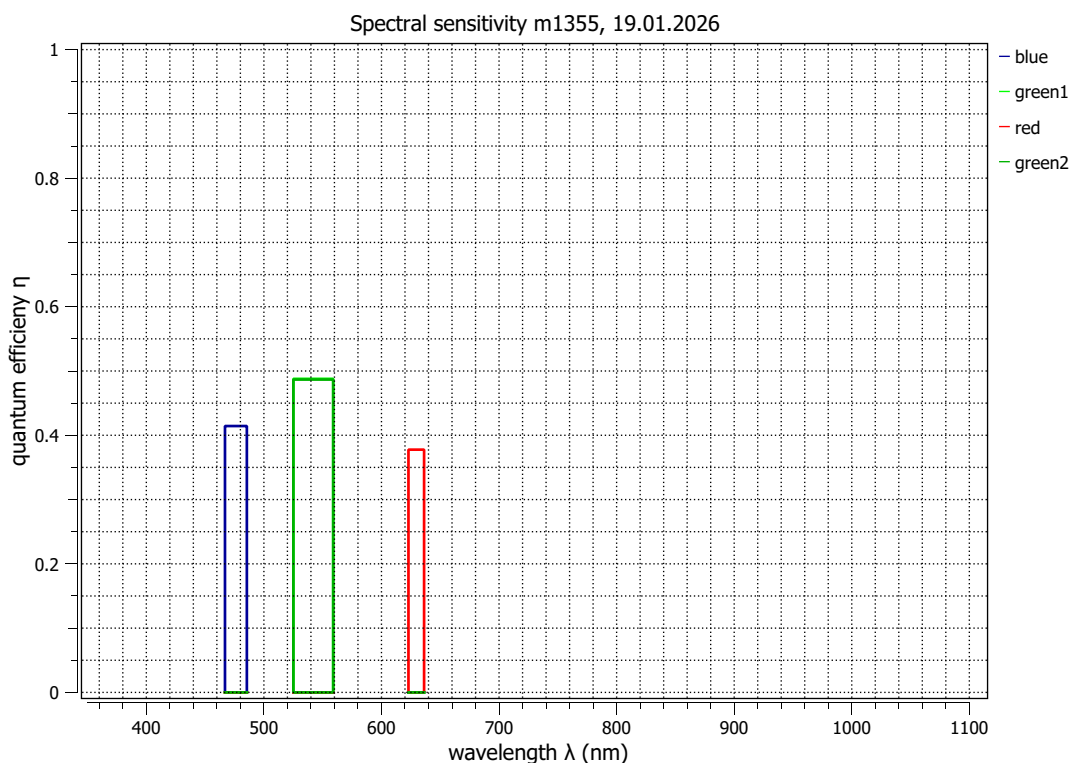
This data sheet describes the specification according to the standard 1288 Release 4.0 Linear issued on 21 June 2021 for "Characterization and Presentation of Specification Data for Image Sensors and Cameras" by the European Machine Vision Association (EMVA), published at <https://www.emva.org/standards-technology/emva-1288/> 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 3.3.

Measurements performed by Product Development Vision, Balluff GmbH

Type of data presented	Single
Vendor	Balluff GmbH
Model	BVS CA-GW1-0051BC
Serial number	GW000030
Sensor diagonal	8.81 mm
Lens category	C-Mount
Resolution	2464 × 2064, 12 bit
Offset/size channels	0 × 0/ 1232 × 1032
Pixel size (h×v)	2.74 μm × 2.74 μm
Sensor	IMX537
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

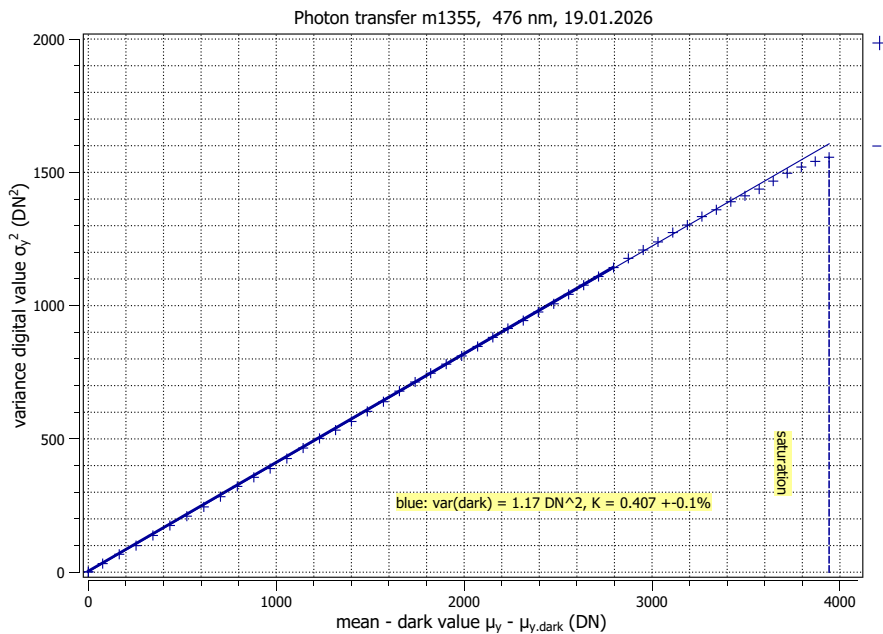
Optional data measured: None



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	21.5°C
Exposure time	2.000 ms	Camera body temperature	37.1°C
Frame rate	172.7 Hz	Internal temperature(s)	54.5°C, 45.0°C
Data transfer mode	BayerRG12p	Wavelength, centr., FWHM	476 nm, 18.6 nm

Photon Transfer



Signal-to-Noise Ratio

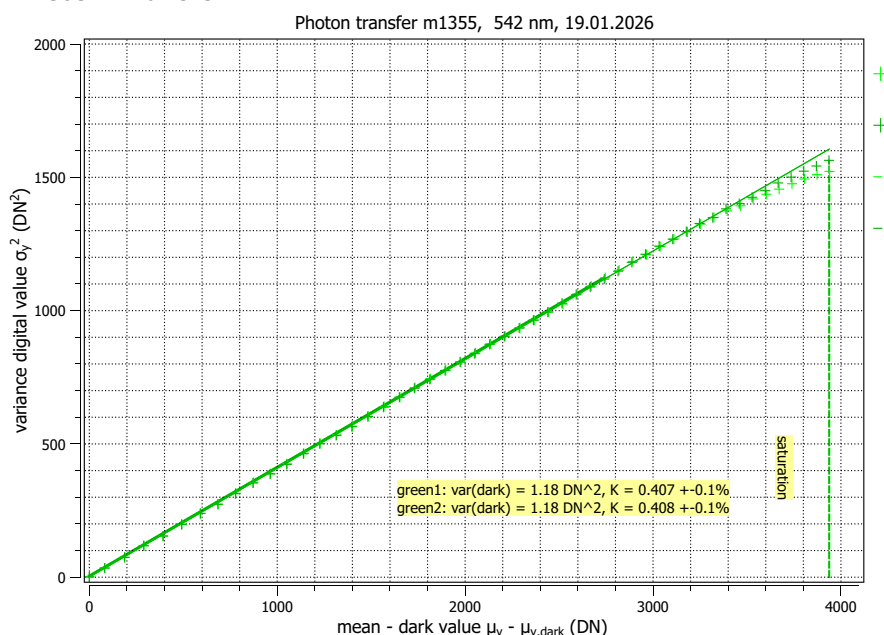


Quantum efficiency	
η	41.4%
Overall system gain	
K	0.4073 DN/e ⁻
$1/K$	2.455 e ⁻ /DN
Temporal dark noise	
σ_d	2.56 e ⁻
$\sigma_{y, \text{dark}}$	1.08 DN
Signal-to-noise ratio	
SNR _{max}	98.0
	39.8 dB
$1/\text{SNR}_{\text{max}}$	1.021 %
Absolute sensitivity threshold	
$\mu_{e, \text{min}}$	3.20 e ⁻
$\mu_{e, \text{min. area}}$	0.427 e ⁻ /μm ²
Saturation capacity	
$\mu_{e, \text{sat}}$	9602 e ⁻
$\mu_{e, \text{sat. area}}$	1279 e ⁻ /μm ²
Dynamic range	
DR	2998
	69.54 dB
Spatial nonuniformities	
DSNU ₁₂₈₈	0.264 e ⁻
DSNU _{1288.col}	0.052 e ⁻
DSNU _{1288.row}	0.009 e ⁻
DSNU _{1288.pix}	0.259 e ⁻
PRNU ₁₂₈₈	0.509 %
PRNU _{1288.col}	0.025 %
PRNU _{1288.row}	0.020 %
PRNU _{1288.pix}	0.508 %
Linearity error	
LE	0.46%
Dark current	
$\mu_{c, \text{mean}}$	2.68E+00 e ⁻ /s
$\mu_{c, \text{var}}$	4.35E+00 e ⁻ /s

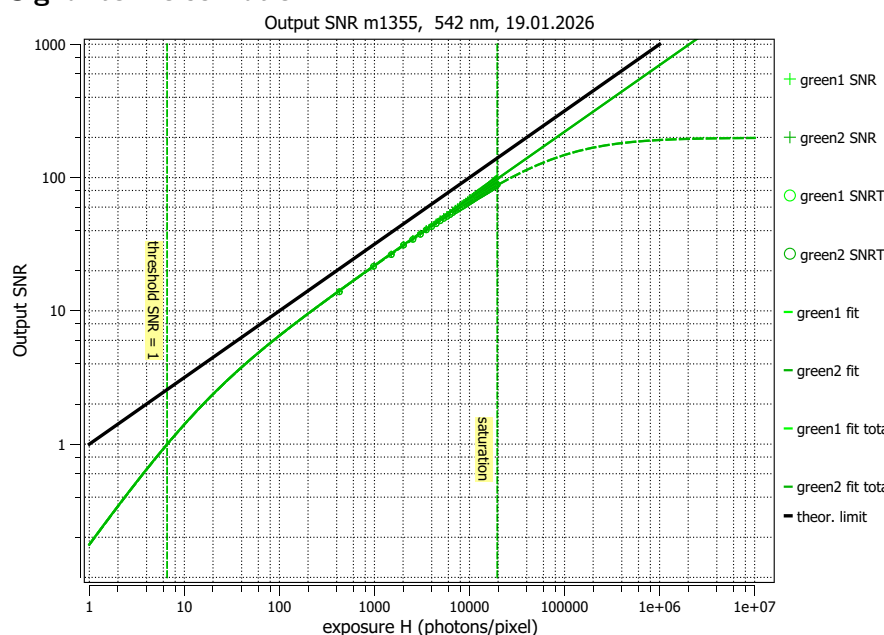
Summary Sheet for Operation Point 2 at a Wavelength of 542 nm

Type of data	Single	Gain, black-level	0.0dB, 0.1
Exposure control	By irradiance	Environmental temperature	21.4°C
Exposure time	3.000 ms	Camera body temperature	37.1°C
Frame rate	172.7 Hz	Internal temperature(s)	54.8°C, 45.0°C
Data transfer mode	BayerRG12p	Wavelength, centr., FWHM	542 nm, 33.9 nm

Photon Transfer



Signal-to-Noise Ratio



Quantum efficiency

η 48.8%

Overall system gain

K 0.4074 DN/e⁻

1/K 2.454 e⁻/DN

Temporal dark noise

σ_d 2.57 e⁻

$\sigma_{y, \text{dark}}$ 1.09 DN

Signal-to-noise ratio

SNR_{max} 97.8

39.8 dB

1/SNR_{max} 1.022 %

Absolute sensitivity threshold

$\mu_{e, \text{min}}$ 3.21 e⁻

$\mu_{e, \text{min, area}}$ 0.428 e⁻/μm²

Saturation capacity

$\mu_{e, \text{sat}}$ 9573 e⁻

$\mu_{e, \text{sat, area}}$ 1275 e⁻/μm²

Dynamic range

DR 2982

69.49 dB

Spatial nonuniformities

DSNU₁₂₈₈ 0.0000 e⁻

DSNU_{1288, col} 0.0000 e⁻

DSNU_{1288, row} 0.0000 e⁻

DSNU_{1288, pix} 0.0000 e⁻

PRNU₁₂₈₈ 0.0000 %

PRNU_{1288, col} 0.0000 %

PRNU_{1288, row} 0.0000 %

PRNU_{1288, pix} 0.0000 %

Linearity error

LE 0.50%

Dark current

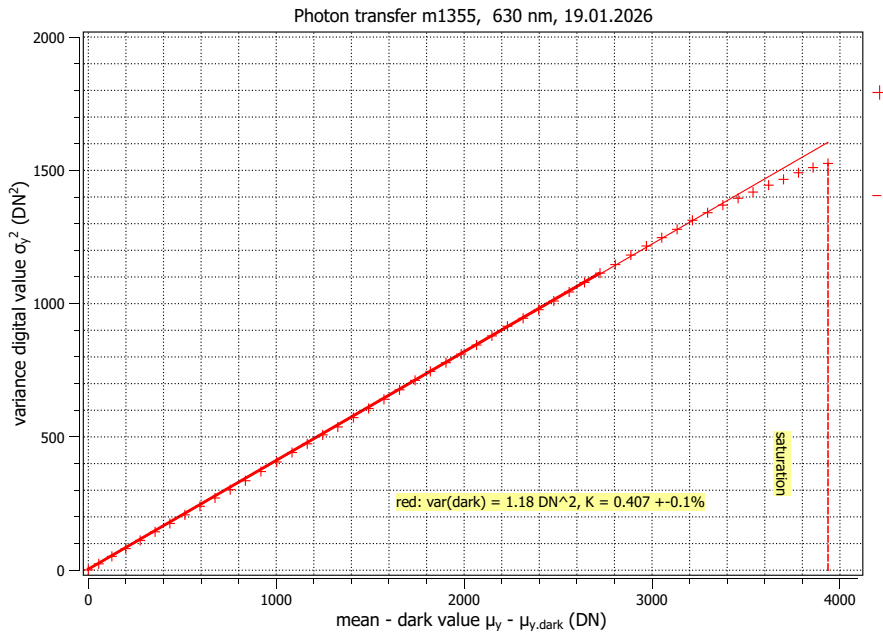
$\mu_{c, \text{mean}}$ 2.67E+00 e⁻/s

$\mu_{c, \text{var}}$ 5.54E+00 e⁻/s

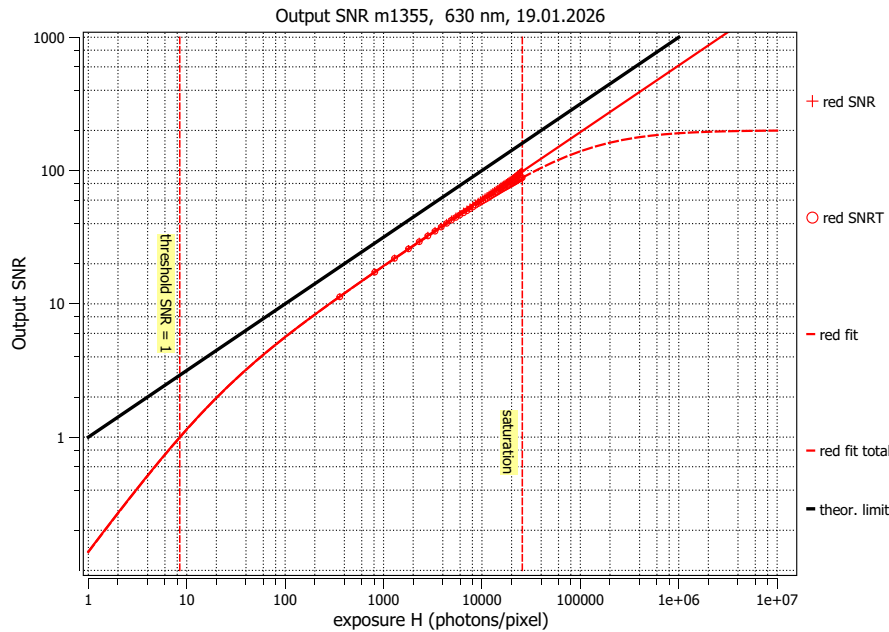
Summary Sheet for Operation Point 3 at a Wavelength of 630 nm

Type of data	Single	Gain, black-level	0.0dB, 0.1
Exposure control	By irradiance	Environmental temperature	21.4°C
Exposure time	2.000 ms	Camera body temperature	37.0°C
Frame rate	172.7 Hz	Internal temperature(s)	54.9°C, 45.0°C
Data transfer mode	BayerRG12p	Wavelength, centr., FWHM	630 nm, 13.3 nm

Photon Transfer



Signal-to-Noise Ratio



Quantum efficiency	
η	37.8%
Overall system gain	
K	0.4075 DN/e ⁻
$1/K$	2.454 e ⁻ /DN
Temporal dark noise	
σ_d	2.56 e ⁻
$\sigma_{y, \text{dark}}$	1.08 DN
Signal-to-noise ratio	
SNR _{max}	98.5
	39.9 dB
$1/\text{SNR}_{\text{max}}$	1.015 %
Absolute sensitivity threshold	
$\mu_{e, \text{min}}$	3.21 e ⁻
$\mu_{e, \text{min. area}}$	0.427 e ⁻ /μm ²
Saturation capacity	
$\mu_{e, \text{sat}}$	9711 e ⁻
$\mu_{e, \text{sat. area}}$	1294 e ⁻ /μm ²
Dynamic range	
DR	3028
	69.62 dB
Spatial nonuniformities	
DSNU ₁₂₈₈	0.305 e ⁻
DSNU _{1288.col}	0.040 e ⁻
DSNU _{1288.row}	0.010 e ⁻
DSNU _{1288.pix}	0.302 e ⁻
PRNU ₁₂₈₈	0.499 %
PRNU _{1288.col}	0.030 %
PRNU _{1288.row}	0.033 %
PRNU _{1288.pix}	0.497 %
Linearity error	
LE	0.10%
Dark current	
$\mu_{c, \text{mean}}$	2.51E+00 e ⁻ /s
$\mu_{c, \text{var}}$	3.73E+00 e ⁻ /s