

EMVA 1288 Data Sheet m1352

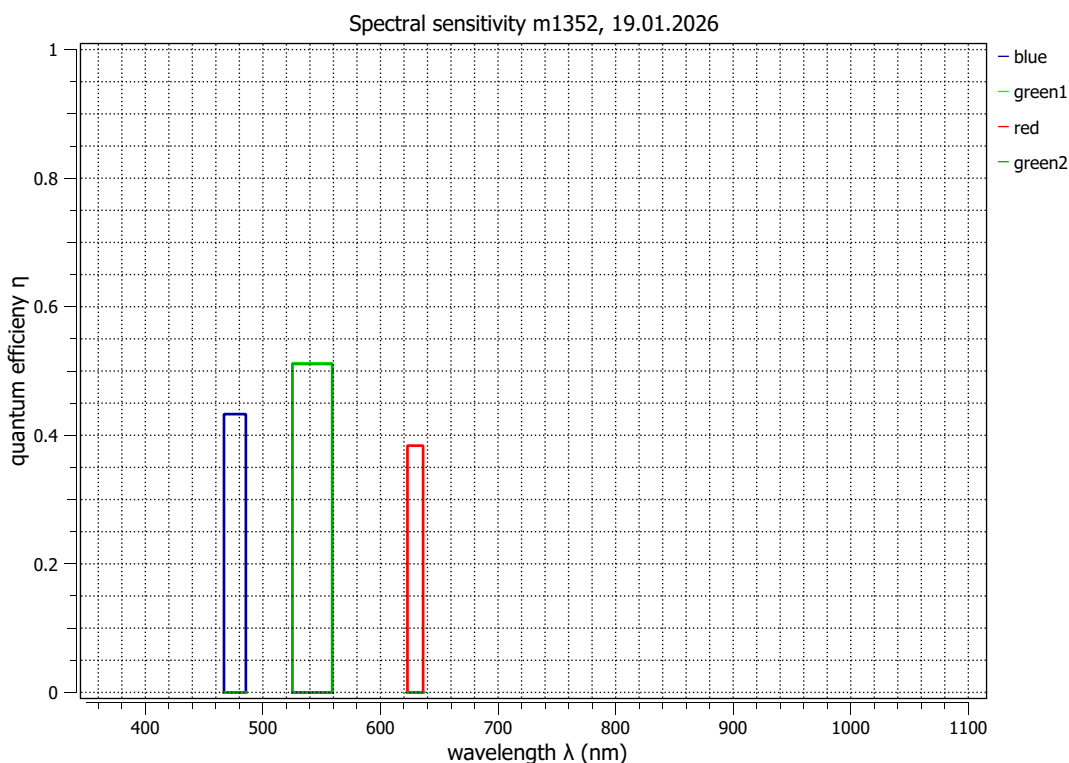
This data sheet describes the specification according to the standard 1288 Release 4.0 Linear issued on 21 June 2021 for "Characterization and Presentation of Specification Data for Image Sensors and Cameras" by the European Machine Vision Association (EMVA), published at <https://www.emva.org/standards-technology/emva-1288/> 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-GW1-0246ZC
Serial number	GW000033
Sensor diagonal	19.27 mm
Lens category	C-Mount
Resolution	5312 × 4608, 12 bit
Offset/size channels	0 × 0/ 2656 × 2304
Pixel size (h×v)	2.74 μm × 2.74 μm
Sensor	IMX530
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

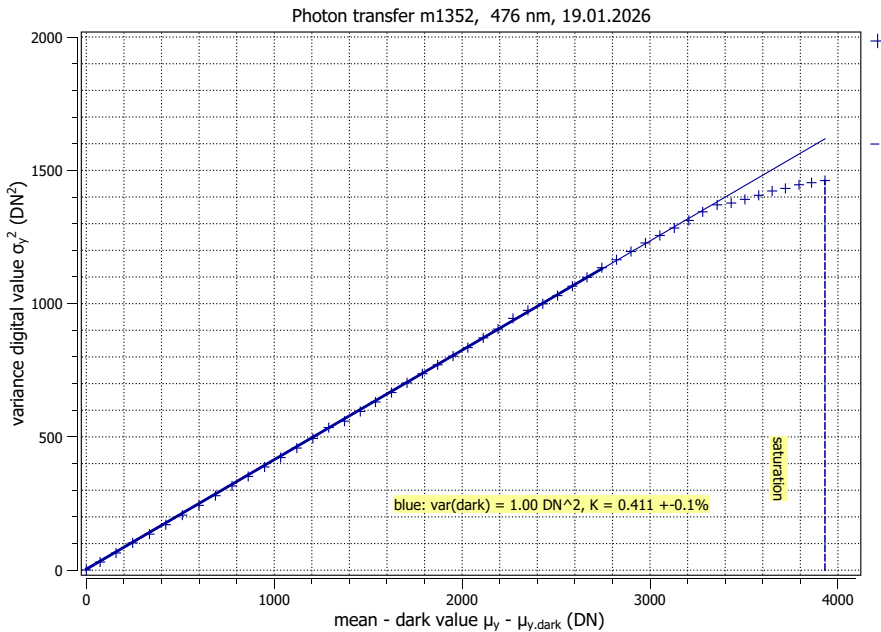
Optional data measured: None



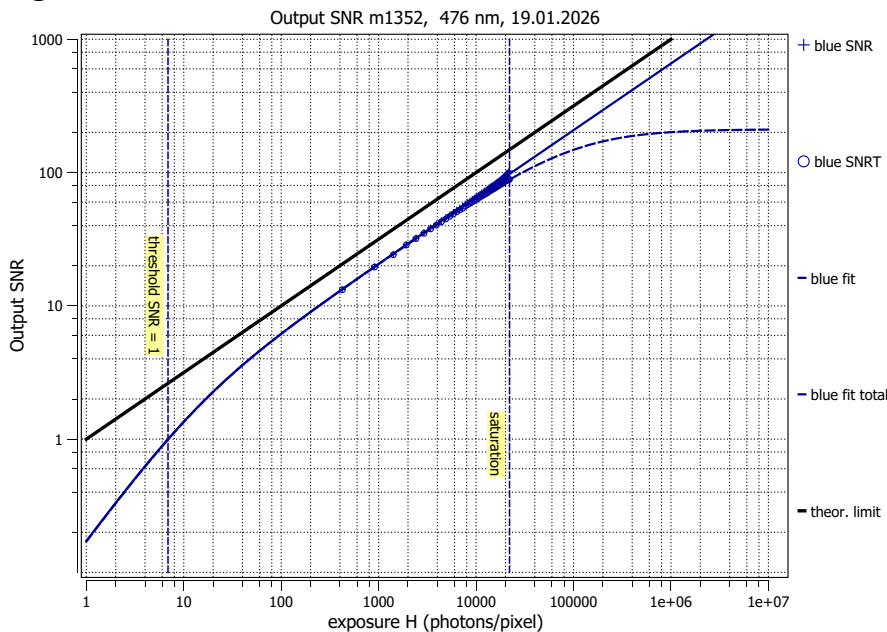
Summary Sheet for Operation Point 1 at a Wavelength of 476 nm

Type of data	Single	Gain, black-level	0.0dB, 0.1
Exposure control	By irradiance	Environmental temperature	20.5°C
Exposure time	2.000 ms	Camera body temperature	37.1°C
Frame rate	75.2 Hz	Internal temperature(s)	51.3°C, 41.0°C
Data transfer mode	BayerRG12p	Wavelength, centr., FWHM	476 nm, 18.6 nm

Photon Transfer



Signal-to-Noise Ratio

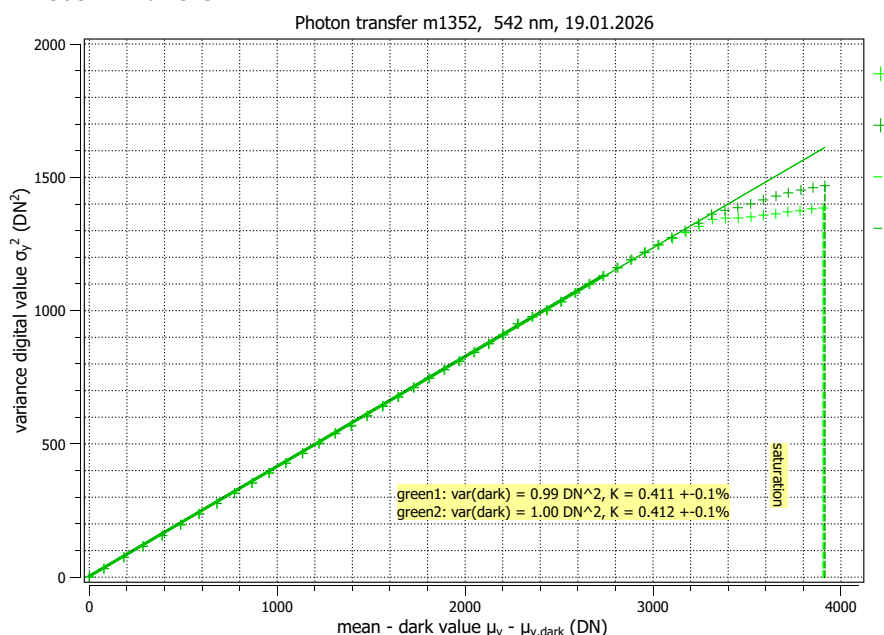


Quantum efficiency	
η	43.3%
Overall system gain	
K	0.4114 DN/e ⁻
$1/K$	2.431 e ⁻ /DN
Temporal dark noise	
σ_d	2.33 e ⁻
$\sigma_{y, \text{dark}}$	1.00 DN
Signal-to-noise ratio	
SNR _{max}	97.7
	39.8 dB
$1/\text{SNR}_{\text{max}}$	1.024 %
Absolute sensitivity threshold	
$\mu_{e, \text{min}}$	2.98 e ⁻
$\mu_{e, \text{min. area}}$	0.397 e ⁻ /μm ²
Saturation capacity	
$\mu_{e, \text{sat}}$	9538 e ⁻
$\mu_{e, \text{sat. area}}$	1270 e ⁻ /μm ²
Dynamic range	
DR	3199
	70.10 dB
Spatial nonuniformities	
DSNU ₁₂₈₈	0.321 e ⁻
DSNU _{1288.col}	0.021 e ⁻
DSNU _{1288.row}	0.016 e ⁻
DSNU _{1288.pix}	0.320 e ⁻
PRNU ₁₂₈₈	0.474 %
PRNU _{1288.col}	0.038 %
PRNU _{1288.row}	0.010 %
PRNU _{1288.pix}	0.472 %
Linearity error	
LE	0.34%
Dark current	
$\mu_{c, \text{mean}}$	1.91E+00 e ⁻ /s
$\mu_{c, \text{var}}$	2.78E+00 e ⁻ /s

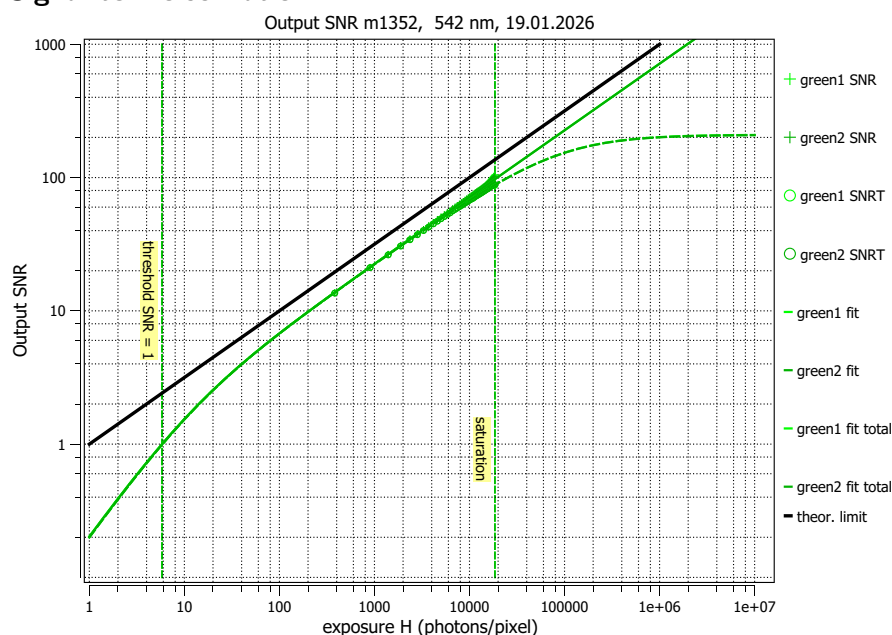
Summary Sheet for Operation Point 2 at a Wavelength of 542 nm

Type of data	Single	Gain, black-level	0.0dB, 0.1
Exposure control	By irradiance	Environmental temperature	20.4°C
Exposure time	3.000 ms	Camera body temperature	37.7°C
Frame rate	75.2 Hz	Internal temperature(s)	52.0°C, 42.0°C
Data transfer mode	BayerRG12p	Wavelength, centr., FWHM	542 nm, 33.9 nm

Photon Transfer



Signal-to-Noise Ratio



Quantum efficiency

η 51.2%

Overall system gain

K 0.4114 DN/e⁻

1/ K 2.430 e⁻/DN

Temporal dark noise

σ_d 2.31 e⁻

$\sigma_{y, \text{dark}}$ 0.994 DN

Signal-to-noise ratio

SNR_{max} 97.4

39.8 dB

1/SNR_{max} 1.027 %

Absolute sensitivity threshold

$\mu_{e, \text{min}}$ 2.97 e⁻

$\mu_{e, \text{min, area}}$ 0.395 e⁻/μm²

Saturation capacity

$\mu_{e, \text{sat}}$ 9483 e⁻

$\mu_{e, \text{sat, area}}$ 1263 e⁻/μm²

Dynamic range

DR 3196

70.09 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 0.40%

Dark current

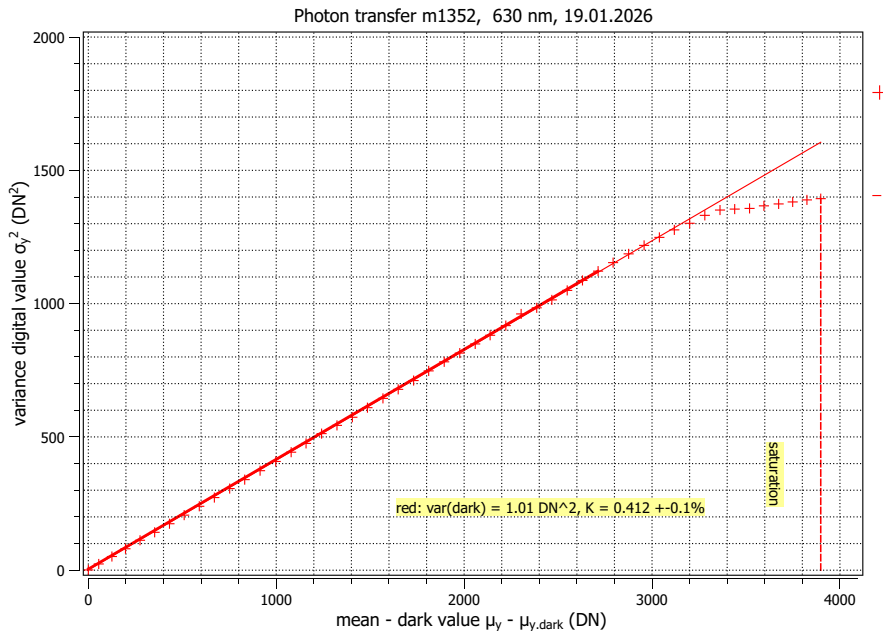
$\mu_{c, \text{mean}}$ 1.81E+00 e⁻/s

$\mu_{c, \text{var}}$ 3.51E+00 e⁻/s

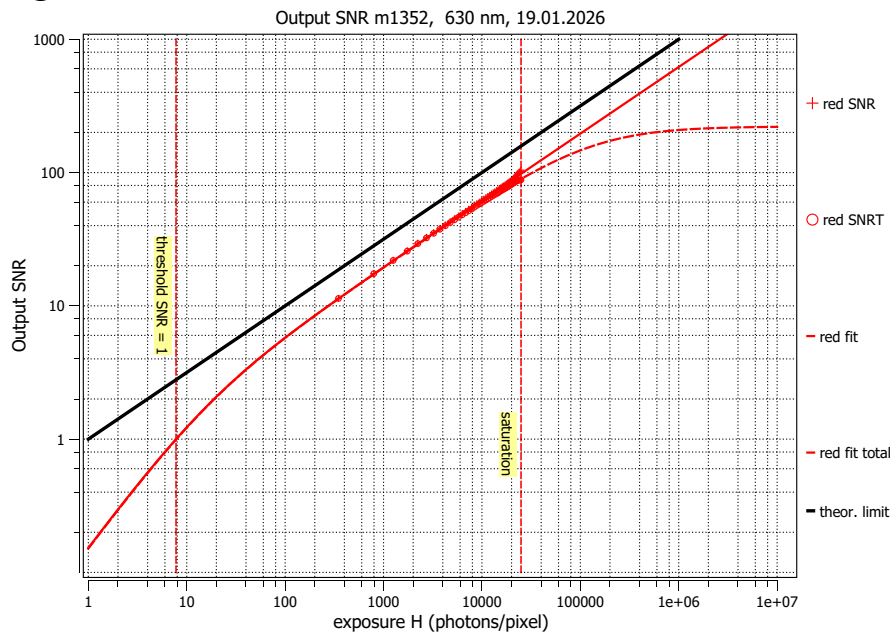
Summary Sheet for Operation Point 3 at a Wavelength of 630 nm

Type of data	Single	Gain, black-level	0.0dB, 0.1
Exposure control	By irradiance	Environmental temperature	20.5°C
Exposure time	2.000 ms	Camera body temperature	38.1°C
Frame rate	75.2 Hz	Internal temperature(s)	52.9°C, 42.0°C
Data transfer mode	BayerRG12p	Wavelength, centr., FWHM	630 nm, 13.3 nm

Photon Transfer



Signal-to-Noise Ratio



Quantum efficiency

η 38.4%

Overall system gain

K 0.4116 DN/e⁻

1/ K 2.429 e⁻/DN

Temporal dark noise

σ_d 2.33 e⁻

$\sigma_{y, \text{dark}}$ 1.00 DN

Signal-to-noise ratio

SNR_{max} 97.9

39.8 dB

1/SNR_{max} 1.022 %

Absolute sensitivity threshold

$\mu_{e, \text{min}}$ 2.99 e⁻

$\mu_{e, \text{min. area}}$ 0.398 e⁻/μm²

Saturation capacity

$\mu_{e, \text{sat}}$ 9582 e⁻

$\mu_{e, \text{sat. area}}$ 1276 e⁻/μm²

Dynamic range

DR 3209

70.13 dB

Spatial nonuniformities

DSNU₁₂₈₈ 0.363 e⁻

DSNU_{1288.col} 0.021 e⁻

DSNU_{1288.row} 0.016 e⁻

DSNU_{1288.pix} 0.362 e⁻

PRNU₁₂₈₈ 0.451 %

PRNU_{1288.col} 0.076 %

PRNU_{1288.row} 0.012 %

PRNU_{1288.pix} 0.445 %

Linearity error

LE 0.13%

Dark current

$\mu_{c, \text{mean}}$ 1.70E+00 e⁻/s

$\mu_{c, \text{var}}$ 3.21E+00 e⁻/s