

pco.edge 4.2 bi

cooled sCMOS camera.

bi back illuminated

up to **95%**
quantum efficiency
with 6.5 μm pixel size

deep cooled
down to $-25\text{ }^{\circ}\text{C}$



resolution
2048 x 2048 pixel

compact
design

1288 
EMVA Standard Compliant

pco.

» sCMOS image sensor

type of sensor	backside illuminated scientific CMOS (bi sCMOS) monochrome
resolution (h x v)	2048 x 2048 active pixel
pixel size (h x v)	6.5 µm x 6.5 µm
sensor format / diagonal	13.3 mm x 13.3 mm / 18.8 mm
shutter mode	rolling shutter (RS)
MTF	76.9 lp/mm (theoretical)
fullwell capacity	54 000 e ⁻
readout noise (typ.)¹	1.8 _{med} e ⁻ / 1.9 _{rms} e ⁻
dynamic range (typ.)	30 000 : 1 up to 90 dB
quantum efficiency	up to 95 %
spectral range	370 nm ... 1100 nm
dark current (typ.)	0.2 e ⁻ /pixel/s @ -25 °C sensor temperature
DSNU	0.9 _{rms} e ⁻
PRNU	1.2 %

» camera system

frame rate	40 fps @ full resolution
exposure / shutter time	10 µs .. 20 s
dynamic range A/D²	16 bit
A/D conversion factor	0.8 e ⁻ /count
pixel scan rate	46.0 MHz
pixel data rate	184.0 Mpixel/s
binning horizontal	x1, x2, x4
binning vertical	x1, x2, x4
region of interest (ROI)	horizontal: steps of 32 pixels vertical: steps of 8 pixels
non linearity	< 0.6 %
cooling method	adjustable: from -25 °C to +20 °C peltier with forced air (fan) and water cooling calibration setpoint: -10 °C
trigger input signals	frame trigger, acquire (SMA connectors)
trigger output signals	exposure, busy (SMA connectors)
data interface	USB 3.1 Gen 1
time stamp	in image (1 µs resolution)

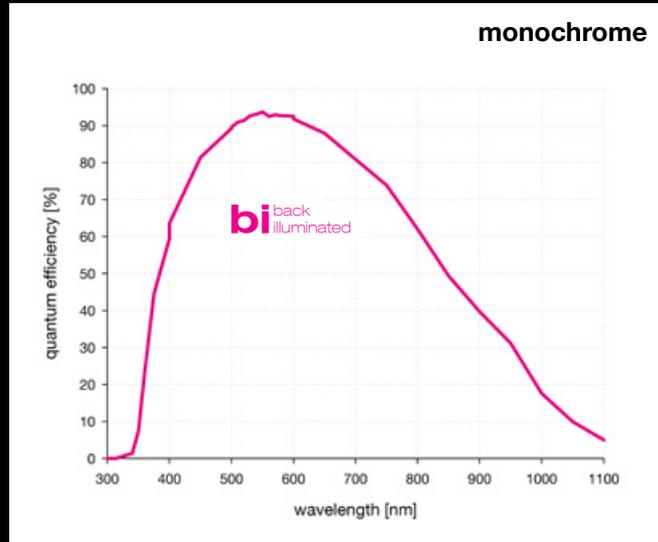
» general

power delivery	power over USB 3.1 Gen 1 and power connector (24 VDC +/- 10 %)
power consumption	typ. 4.5 W over USB 3.1 Gen 1 and typ. 10.0 W (max. 22.0 W) over power connector
weight	920 g
operating temperature	+10 °C ... +40 °C
operating humidity range	10 % ... 80 % (non-condensing)
storage temperature range	-10 °C ... +60 °C
optical interface	F-mount (optional: C-mount)
CE / FCC certified	yes

¹ The readout noise values are given as median (med) and root mean square (rms) values, due to the different noise models, which can be used for evaluation.

² The high dynamic signal is simultaneously converted at high and low gain by two 12 bit A/D converters and the two 12 bit values are sophisticatedly merged into one 16 bit value.

» quantum efficiency



» frame rate table³

2048 x 2048	40 fps
2048 x 1024	80 fps
2048 x 512	159 fps
2048 x 256	300 fps
2048 x 128	520 fps
1920 x 1080	76 fps
1600 x 1200	68 fps
1280 x 1024	80 fps
640 x 480	170 fps
320 x 240	317 fps

³ Max. fps with centered ROI.

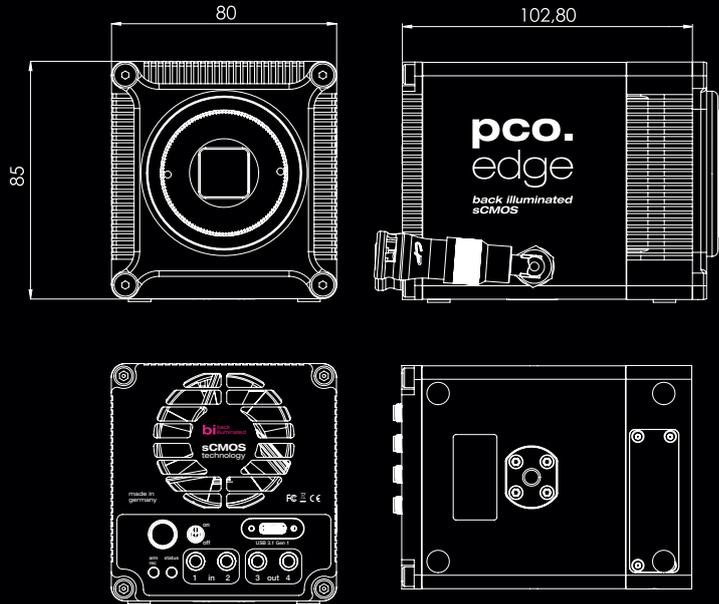
bi back illuminated

- 95 % peak quantum efficiency and more than 80 % quantum efficiency for the visible wavelength range
- No micro lenses eliminates sensitivity to angular limitation and provides a 100% photosensitive area
- 6.5 µm pixel size is ideal for spatial sampling in microscopy applications



» dimensions

F-mount and C-mount lens changeable adapter.



All dimensions are given in millimeter.

» camera view



» software

Camware is the application software for camera control, image acquisition and archiving of images in various file formats (Microsoft Windows®). A camera SDK (software development kit) including a 32 / 64 bit dynamic link library for user customization and integration on Microsoft Windows and Linux platforms is available for free. Please visit our [website](#) to get the latest camera interface drivers and software.

» applications

brightfield microscopy | fluorescence microscopy | digital pathology | single molecule localization microscopy | lightsheet fluorescence microscopy (LSFM) | calcium imaging | FRET | FRAP | structured illumination microscopy (SIM) | high-speed bright field ratio imaging | high throughput screening | high content screening | biochip reading | TIRF microscopy | spinning disk confocal microscopy | 3D metrology | ophthalmology | photovoltaic inspection | industrial quality inspection | lucky astronomy | bio luminescence | chemo luminescence

» third party integrations



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