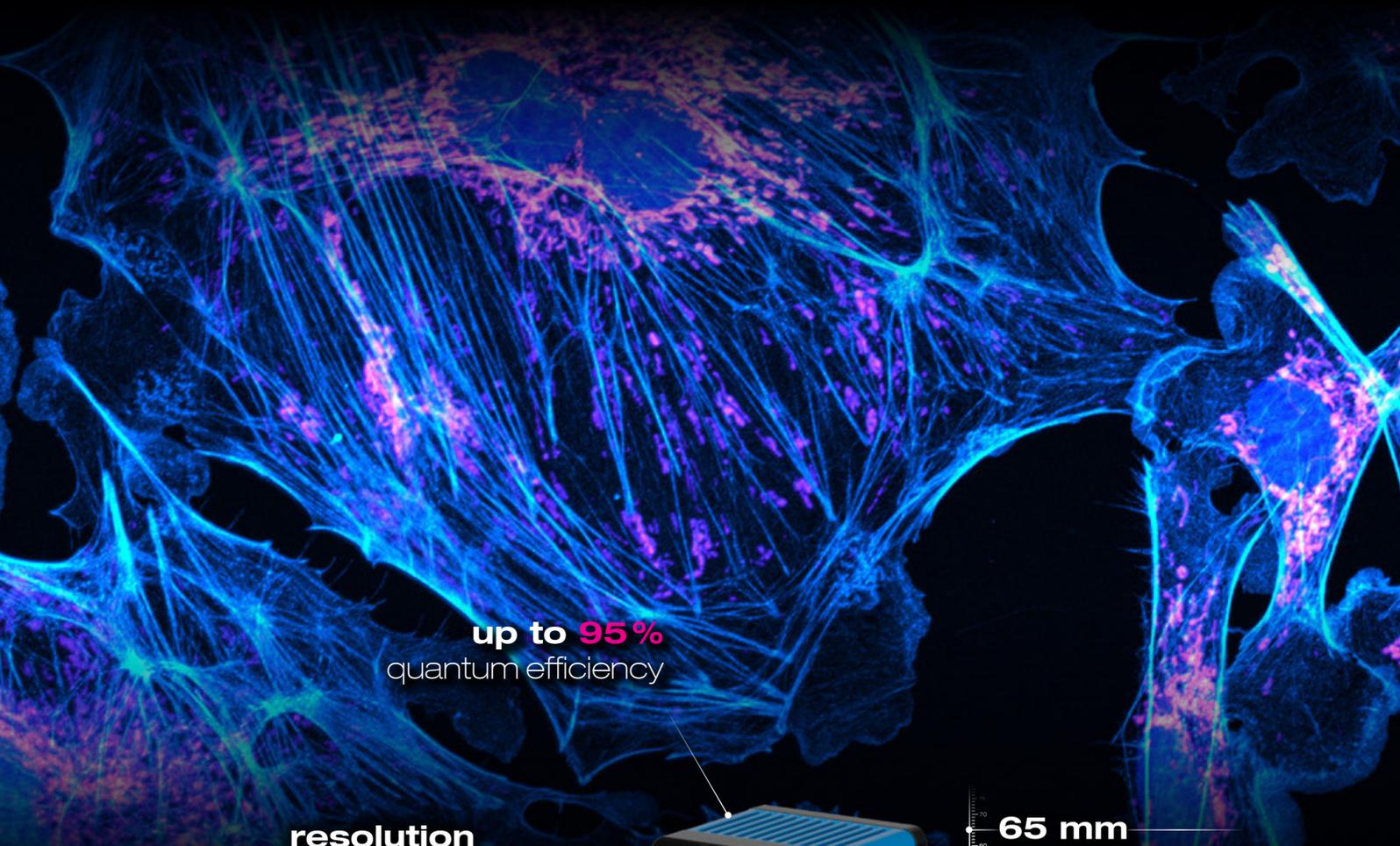


pco.panda family

ultra compact **sCMOS** cameras

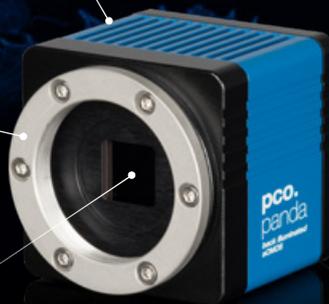
bi back illuminated



up to **95%**
quantum efficiency

resolution
2048 x 2048 pixel
with 6.5 μm pixel size

back illuminated
sCMOS sensor
available



65 mm

**ultra
compact
design**

1288 
EMVA Standard Compliant


Pyramid Imaging

» sCMOS image sensor

models	pc _o .panda 4.2	pc _o .panda 4.2 bi bi ^{back illuminated}
type of sensor	scientific CMOS (sCMOS) monochrome or color (bayer pattern)	backside illuminated scientific CMOS (bi sCMOS) monochrome
resolution (h x v)	2048 x 2048 active pixels	
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	45 000 e ⁻	48 000 e ⁻
readout noise (typ.) ¹	2.1 _{med} e ⁻ / 2.3 _{rms} e ⁻	1.8 _{med} e ⁻ / 1.9 _{rms} e ⁻
dynamic range (typ.)	21 400 : 1 up to 87 dB	26 667 : 1 up to 88.5 dB
quantum efficiency	up to 80 % (monochrome)	up to 95 %
dark current (typ.)	15 e ⁻ /pixel/s @ 21 °C ambient temperature	42 e ⁻ /pixel/s @ 21 °C ambient temperature
DSNU	0.5 _{rms} e ⁻	0.9 _{rms} e ⁻
PRNU	0.6 %	1.2 %

» camera system

models	pc _o .panda 4.2	pc _o .panda 4.2 bi bi ^{back illuminated}
frame rate @ full resolution	40 fps	
exposure / shutter time	10 µs .. 5 s	10 µs .. 500 ms
dynamic range A/D ²	16 bit	
A/D conversion factor	0.65 e ⁻ /count	0.73 e ⁻ /count
pixel scan rate	44.0 MHz	46.0 MHz
pixel data rate	176.0 Mpixel/s	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 pixel	
non-linearity	< 0.6 %	
cooling method	passive cooled	
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

models	pc _o .panda 4.2	pc _o .panda 4.2 bi bi ^{back illuminated}
power delivery	power over USB 3.1 Gen 1	
power consumption	typ. 4.5 W (max. 6.0 W)	
weight	420 g	
operating temperature	+ 10 °C ... + 40 °C	
operating humidity range	10 % ... 80 % (non-condensing)	
storage temperature range	- 10 °C ... + 60 °C	
optical interface	C-mount (optional: F-mount)	
CE / FCC certified	yes	



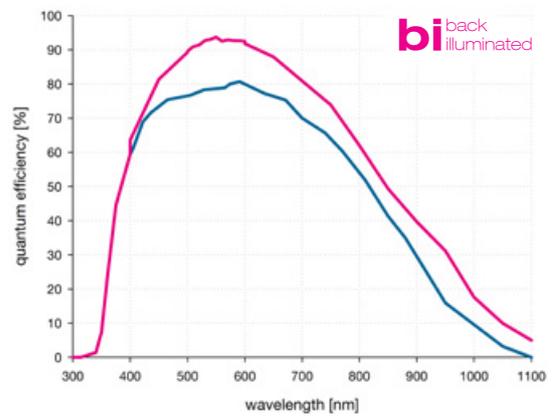
» frame rate table

models »	pco.panda 4.2	pco.panda 4.2 bi bi back illuminated
2048 x 2048	41 fps	40 fps
2048 x 1024	80 fps	80 fps
2048 x 512	160 fps	159 fps
2048 x 256	301 fps	300 fps
2048 x 128	521 fps	520 fps
1920 x 1080	76 fps	76 fps
1600 x 1200	68 fps	68 fps
1280 x 1024	80 fps	80 fps
640 x 480	170 fps	170 fps
320 x 240	318 fps	317 fps

» quantum efficiency

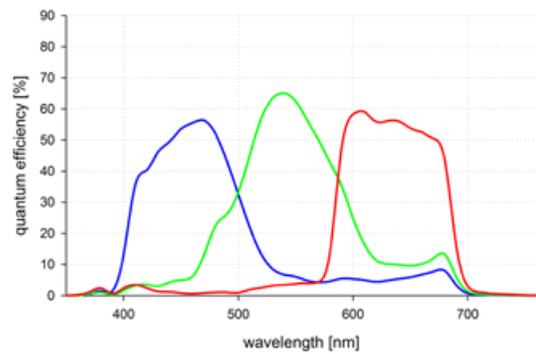
monochrome

pco.panda 4.2
pco.panda 4.2 bi



color

pco.panda 4.2

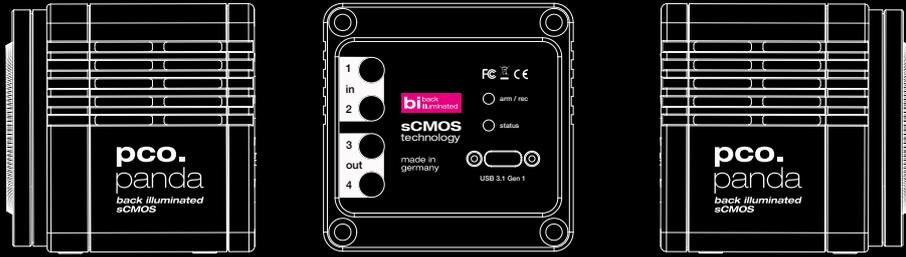


¹ The readout noise values are given as median (med) and root mean square (rms) values, due to the different noise models, which can be used for evaluation.

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.



» dimensions



F-mount and C-mount lens changeable adapter. All dimensions are given in millimeter.

» camera view



technical specifications

pco.panda family

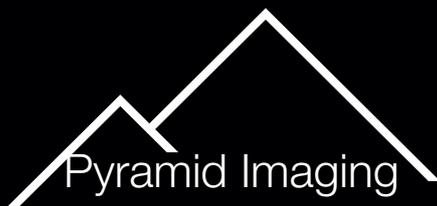
» **applications**

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 | industrial quality inspection

» **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.

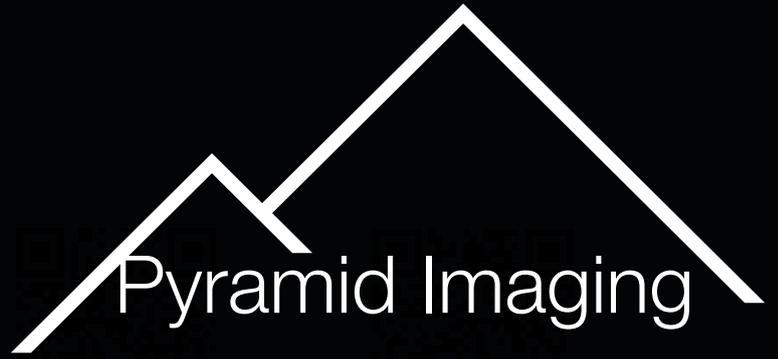
» **third party integrations**



find us

pyramid imaging

945 East 11th Avenue
Tampa, FL 33605
<https://pyramidimaging.com>
sales@pyramidimaging.com
+1 (813) 984 0125



ISO9001 : 2015



subject to changes without prior notice | lens is sold seperately
©PCO AG, Kelheim | pco.panda family data sheet | v1.04