

datasheet

pc_o.edge 4.2 USB

cooled sCMOS camera

resolution
4.2 MPixel

pixel size
6.5 μm x 6.5 μm

interface
USB 3.0



low readout noise
0.8 e⁻ (med)

high resolution
2048 x 2048 pixels

high speed
40 fps

high dynamic range
37 500 : 1

high quantum efficiency
up to 80 %

technical data

image sensor

sensor technology	scientific CMOS (sCMOS)
color type	monochrome
resolution (horizontal x vertical)	2048 px x 2048 px
pixel size (horizontal x vertical)	6.5 μm x 6.5 μm
sensor size (horizontal x vertical)	13.3 mm x 13.3 mm
sensor diagonal	18.8 mm
shutter mode	rolling shutter (RS) with selectable readout direction global reset (GR)
modulation transfer function (theoretical max.)	76.9 lp/mm
peak quantum efficiency	80 % @ 580 nm
spectral range	300 nm - 1100 nm
dark current (typ.)	0.3 e^- /pixel/s @ 0 °C sensor temperature
fullwell capacity	30 000 e^-
readout noise (typ.) ¹	1.5 e^- rms 0.8 e^- med
dynamic range (intra-scene) ²	37 500 : 1 (91 dB)

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. All values are raw data without any filtering.

² The dynamic range value is calculated with the median value of the readout noise and rounded.

frame rate table

vertical resolution reduction

2048 x 2048	40 fps
2048 x 1024	80 fps
2048 x 512	160 fps
2048 x 256	315 fps
2048 x 128	610 fps

typical resolutions

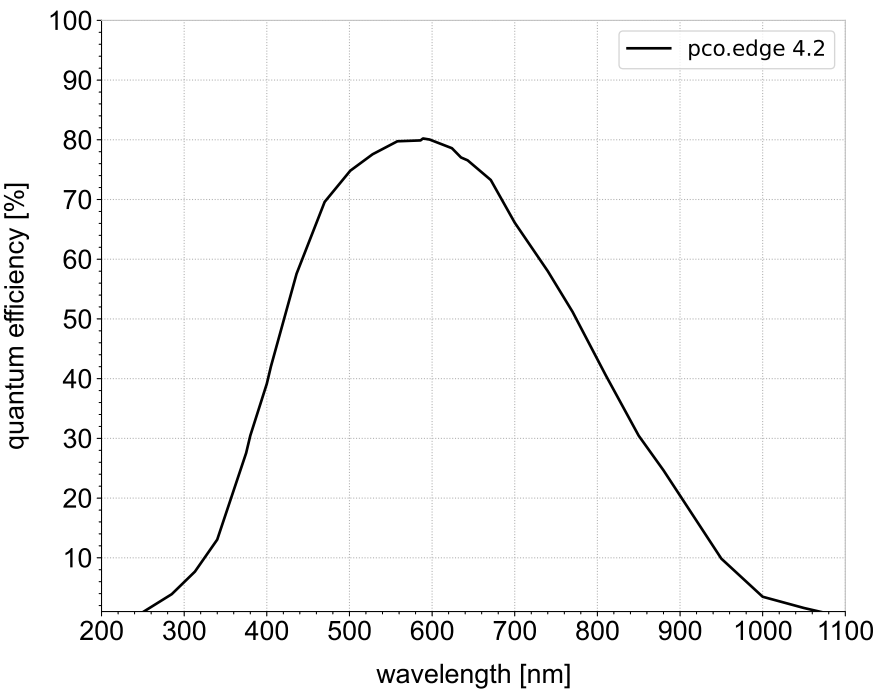
1920 x 1080	76 fps
1600 x 1200	69 fps
1280 x 1024	80 fps
640 x 480	170 fps
320 x 240	335 fps

camera	
max. frame rate @ full resolution	40 fps
exposure time range	100 μ s - 20 s (RS) 30 μ s - 2 s (GR)
dynamic range A/D ¹	16 bit
conversion factor ²	0.46 e ⁻ /DN
pixel rate	220 MPixel/s
region of interest (ROI)	horizontal: steps of 4 columns (min. 64) vertical: steps of 1 row (min. 16)
binning	horizontal: x2, x4 (sum) vertical: x2, x4 (sum)
non-linearity	< 0.6 %
dark signal non-uniformity (DSNU)	< 0.3 e ⁻ rms
photo response non-uniformity (PRNU)	< 0.2 %
cooling temperature image sensor	0 °C stabilized (up to +27 °C ambient temperature)
cooling method	forced air & liquid cooling
trigger input signals	external exposure start, external exposure control, sequence trigger, acquire enable
status output signals	exposure, busy, line
input / output signal connectors	SMA
time stamp	in image (1 μ s resolution)
data interface	USB 3.0

¹ The high dynamic signal is simultaneously converted at high and low gain by two 11 bit A/D converters and the two 11 bit values are sophistically merged into one 16 bit value.

² According to EMVA1288, the conversion factor equals the inverse of the system gain and can be operational mode dependent.

quantum efficiency



general

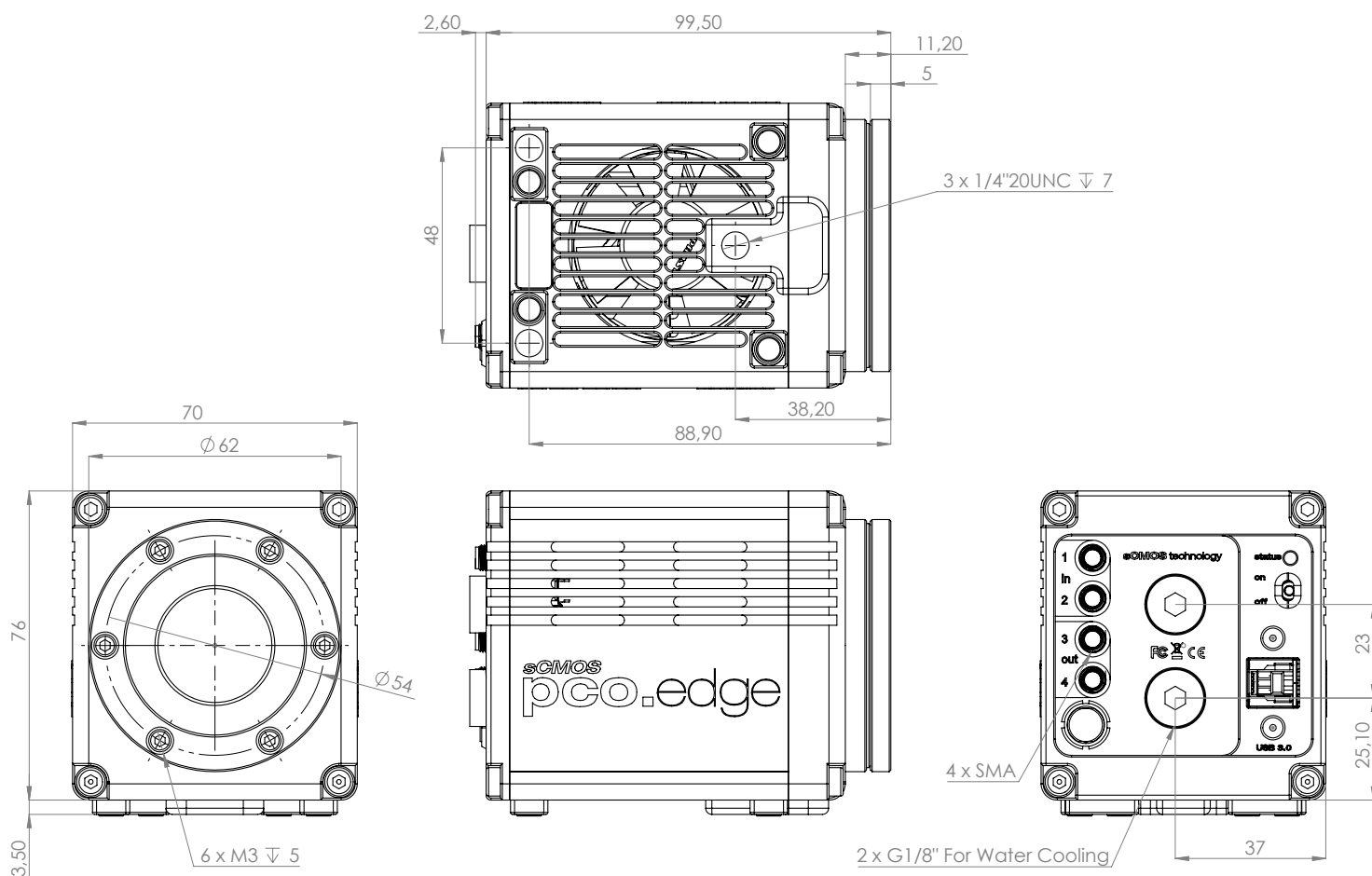
power supply	24 VDC ($\pm 10\%$)
power consumption	max. 21 W
weight	0.75 kg
dimensions (height x width x length)	76 mm x 70 mm x 99.5 mm
operating temperature range	+10 °C to +40 °C
storage temperature range	-10 °C to +60 °C
humidity range (non-condensing)	10 % to 80 % (recommended < 65 %)
certifications	CE, FCC, UKCA, KC

optical interface

direct mounting distance	11.1 mm ($\pm 10\%$)
lens mounting	C-mount, F-mount
optional lens mounting	TFL-mount

Configure your optical setup with our **MachVis Lens Selector** online tool.

dimensions



outlines of pco.edge 4.2 USB (all dimensions given in mm)

software

Your first choice is pco.camware:

Our main camera control software enables control of most camera settings and facilitates image acquisition and storage.

You can customize it exactly to your needs using different layouts, styles and features.

You prefer to use a different software:

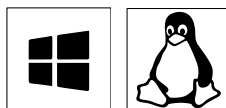
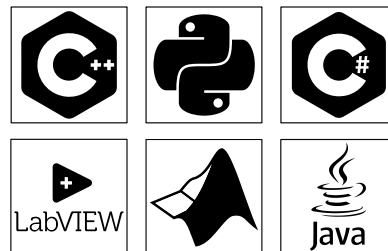
Our cameras integrate with a range of third-party software applications.

In microscopy we offer dedicated support for µManager, while ensuring compatibility with other software maintained by their providers.

You want to create your own application:

We feature a wide range of software development kits (SDK) for various programming languages, such as C++, Python, C#, LabVIEW, Matlab, and Java.

If you are looking for more general SDKs, we present pco.sdk and pco.recorder, our low-level SDKs with C interface.



Our software is available for Windows and Linux platforms.

Visit our **website** for detailed information, installation guidance, and Github projects.

areas of application

3D metrology | biochip reading | brightfield microscopy | calcium imaging | digital pathology | fluorescence microscopy | fluorescence recovery after photobleaching (FRAP) | Förster resonance energy transfer (FRET) | high-content screening | high-speed brightfield ratio imaging | high-throughput screening | image intensifier imaging | industrial quality inspection | lightsheet fluorescence microscopy (LSFM) | lucky astronomy | ophthalmology | photovoltaic inspection | single molecule localization microscopy (SMLM) – PALM, STORM, dSTORM, GSDIM | spinning disk confocal microscopy | structured illumination microscopy (SIM) | super-resolution microscopy | total internal reflection fluorescence microscopy (TIRF) | wafer inspection

ordering information

pco.edge 4.2 USB

85108072513

camera system, 2048 x 2048 pixel, monochrome,
rolling shutter, USB 3.0 interface, air & liquid cooling

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