

datasheet

pc_o.edge 5.5 USB

cooled sCMOS camera

resolution

5.5 MPixel

pixel size

6.5 μm x 6.5 μm

interface

USB 3.0



low readout noise
1.0 e⁻ (med)

high speed
30 fps

high dynamic range
30 000 : 1

high resolution
2560 x 2160 pixels

shutter modes
rolling & global shutter,
global reset

technical data

image sensor

sensor technology	scientific CMOS (sCMOS)
color type	monochrome color (bayer pattern)
resolution (horizontal x vertical)	2560 px x 2160 px
pixel size (horizontal x vertical)	6.5 µm x 6.5 µm
sensor size (horizontal x vertical)	16.6 mm x 14.0 mm
sensor diagonal	21.8 mm
shutter mode	rolling shutter (RS) with selectable readout direction global reset (GR) global shutter (GS)
modulation transfer function (theoretical max.)	76.9 lp/mm
peak quantum efficiency	60 % @ 600 nm (monochrome)
spectral range	300 nm - 1100 nm (monochrome)
dark current (typ.)	0.5 e ⁻ /pixel/s @ +5 °C sensor temperature (RS/GR) 0.8 e ⁻ /pixel/s @ +5 °C sensor temperature (GS)
fullwell capacity	30 000 e ⁻
readout noise (typ.)¹	1.4 e ⁻ rms (RS/GR) 1.0 e ⁻ med (RS/GR) 2.6 e ⁻ rms (GS) 2.3 e ⁻ med (GS)
dynamic range (intra-scene)²	30 000 : 1 (90 dB) (RS/GR) 13 000 : 1 (82 dB) (GS)

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

	RS/GR	GS
2560 x 2160	30 fps	28 fps
2560 x 1024	63 fps	59 fps
2560 x 512	126 fps	117 fps
2560 x 256	248 fps	232 fps
2560 x 128	481 fps	455 fps

typical resolutions

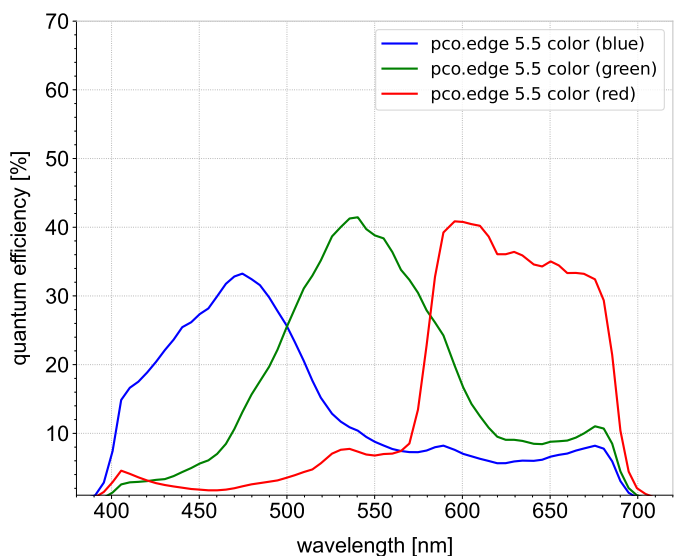
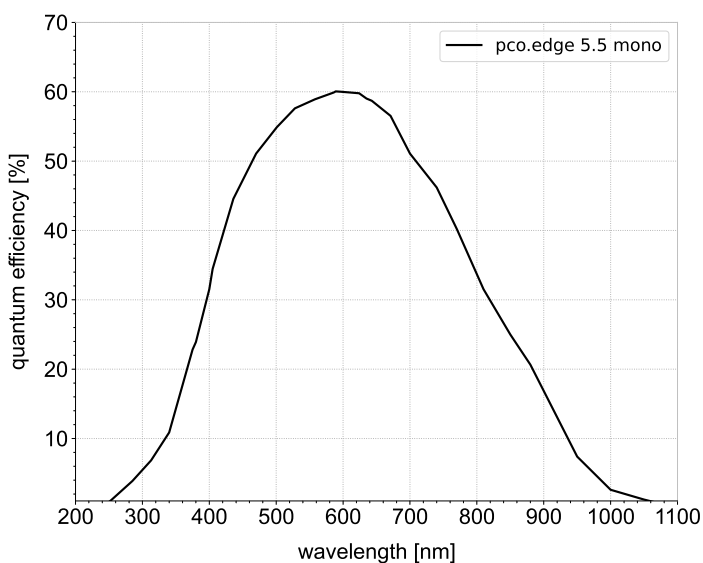
	RS/GR	GS
1920 x 1080	60 fps	56 fps
1600 x 1200	54 fps	50 fps
1280 x 1024	63 fps	59 fps
640 x 480	134 fps	125 fps
320 x 240	264 fps	247 fps

camera

max. frame rate @ full resolution	30 fps (RS/GR) 28 fps (GS)
exposure time range	500 μ s - 2 s (RS) 30 μ s - 2 s (GR) 20 μ s - 100 ms (GS)
dynamic range A/D¹	16 bit
conversion factor²	0.46 e ⁻ /DN
pixel rate	172 MPixel/s (RS/GR) 320 MPixel/s (GS)
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 (RS/GR) < 2.0 (GS)
photo response non-uniformity (PRNU)	< 0.2 %
cooling temperature image sensor	+5 °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

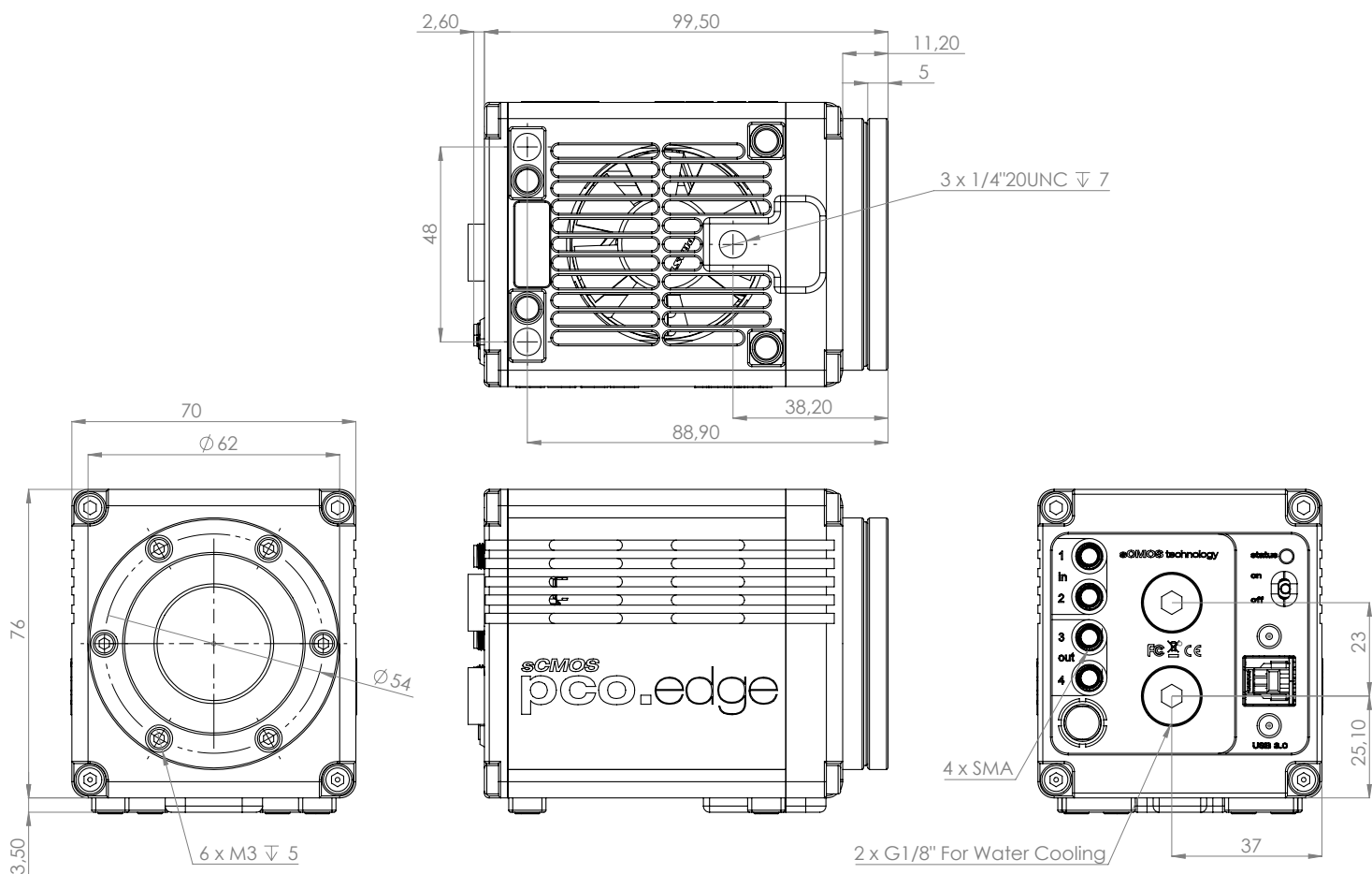
power supply	24 VDC ($\pm 10\%$)
power consumption	max. 21 W
weight	0.75 kg
dimensions (height x width x length)	76 mm x 70 mm x 99.5 mm
operating temperature range	+10 °C to +40 °C
storage temperature range	-10 °C to +60 °C
humidity range (non-condensing)	10 % to 80 % (recommended < 65 %)
certifications	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 5.5 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:

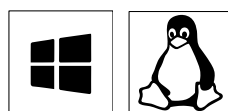
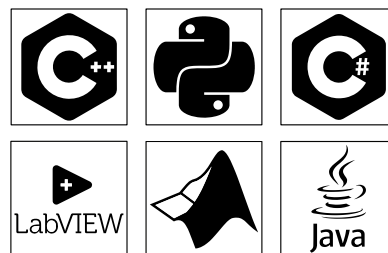
Our cameras integrate with a range of third-party software applications.

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 | flow cytometry | fluorescence microscopy | fluorescence recovery after photobleaching (FRAP) | Förster resonance energy transfer (FRET) | high-content screening | high-speed brightfield ratio imaging | high-throughput screening | hyperspectral imaging | image intensifier imaging | industrial quality inspection | lightsheet fluorescence microscopy (LSFM) | lucky astronomy | ophthalmology | particle tracking velocimetry (PTV) | 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 5.5 USB	85108072401	camera system, 2560 x 2160 pixel, monochrome, global and rolling shutter, USB 3.0 interface, air & liquid cooling
pco.edge 5.5 C USB	85108072409	camera system, 2560 x 2160 pixel, color, global and rolling shutter, USB 3.0 interface, air & liquid cooling
pco.edge 5.5 RS USB	85108072417	camera system, 2560 x 2160 pixel, monochrome, rolling shutter, USB 3.0 interface, air & liquid cooling
pco.edge 5.5 C RS USB	85108072425	camera system, 2560 x 2160 pixel, color, rolling shutter, USB 3.0 interface, air & liquid cooling

address:	Excelitas PCO GmbH Donaupark 11 93309 Kelheim, Germany
phone:	(+49) 9441-2005-0 (+1) 866-662-6653 (+86) 0512-6763-4643
mail:	pco@excelitas.com
web:	www.excelitas.com/pco

