

datasheet

pc_o.edge 5.5 DS CLHS

cooled sCMOS camera with double shutter feature

DS double
shutter

resolution
5.5 MPixel

pixel size
6.5 μm x 6.5 μm

interface
CLHS FOL



low readout noise
1.0 e⁻ (med)

high speed
100 fps

high dynamic range
30 000 : 1

high resolution
2560 x 2160 pixels

shutter modes
rolling & global shutter,
global reset, double shutter

technical data

image sensor

	slow scan	fast scan
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)
	/	double shutter (DS)
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.)	0.6 e ⁻ /pixel/s @ +7 °C sensor temperature (RS/GR) 0.9 e ⁻ /pixel/s @ +7 °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) / /	1.5 e ⁻ rms (RS/GR) 1.1 e ⁻ med (RS/GR) 2.5 e ⁻ rms (GS/DS) 2.2 e ⁻ med (GS/DS)
dynamic range (intra-scene)²	30 000 : 1 (90 dB) (RS/GR) /	27 000 : 1 (89 dB) (RS/GR) 13 500 : 1 (83 dB) (GS/DS)

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 in fps

@ scan rate	slow scan	fast scan		
@ shutter mode	RS/GR	RS/GR	GS	DS
2560 x 2160	33	100	50	25
2560 x 1024	70	212	105	52
2560 x 512	140	422	208	104
2560 x 256	279	838	409	204
2560 x 128	550	1651	789	394

typical resolutions in fps

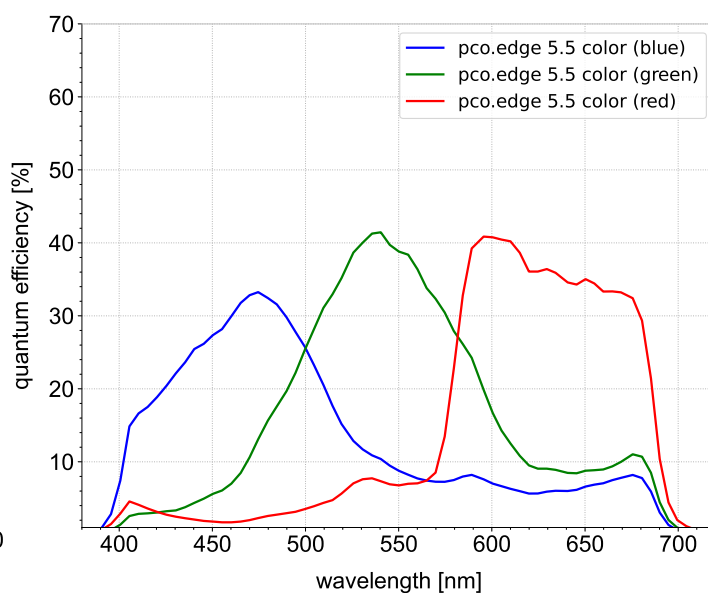
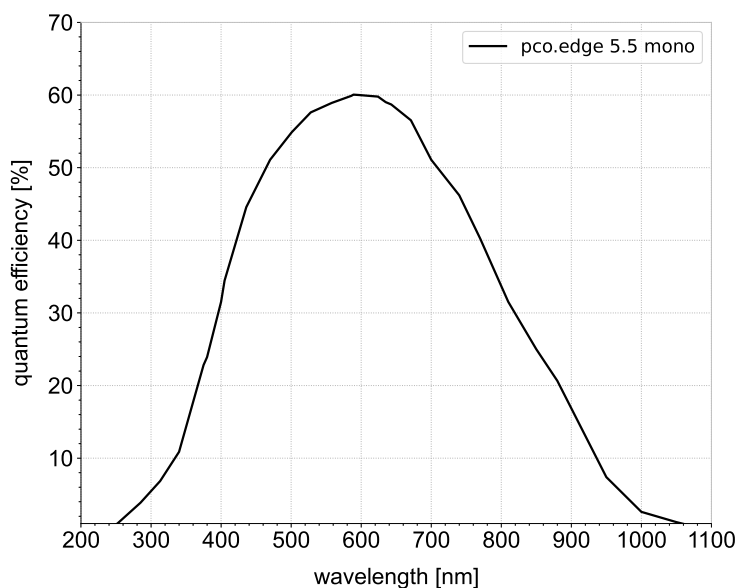
@ scan rate	slow scan	fast scan		
@ shutter mode	RS/GR	RS/GR	GS	DS
1920 x 1080	67	201	100	50
1600 x 1200	60	181	90	45
1280 x 1024	70	212	105	52
640 x 480	150	450	222	111
320 x 240	297	893	436	218

camera

	slow scan	fast scan
max. frame rate @ full resolution	33 fps (RS/GR) / /	100 fps (RS/GR) 50 fps (GS) 25 fps (DS)
double shutter interframing time	/	100 ns
exposure time range	500 μ s - 2 s (RS) 10 μ s - 2 s (GR) / 10 μ s - 100 ms (GS/DS)	
dynamic range A/D¹	16 bit	
conversion factor²	0.46 e ⁻ /DN	
pixel rate	200 MPixel/s (RS/GR)	572 MPixel/s (RS/GR/GS/DS)
region of interest (ROI)	horizontal: steps of 16 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 (RS/GR) /	< 0.3 e ⁻ rms (RS/GR) < 3.9 e ⁻ rms (GS/DS)
photo response non-uniformity (PRNU)	< 0.34 %	
cooling temperature image sensor	+7 °C stabilized (up to +27 °C ambient temperature)	
cooling method	forced air optional: 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	Camera Link HS FOL	

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

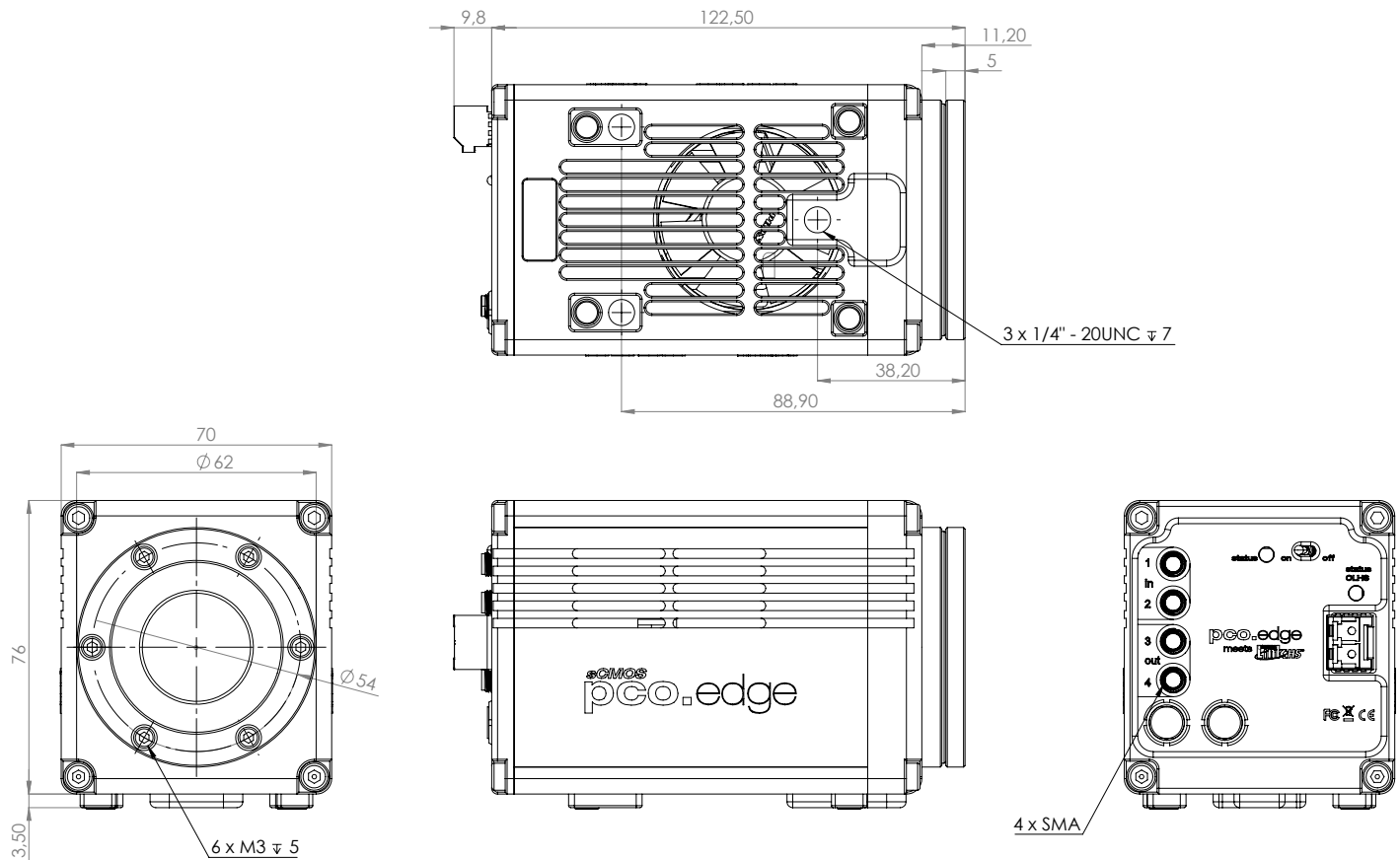
general

power supply	24 VDC ($\pm 10\%$)
power consumption	max. 32 W
weight	0.8 kg air-cooled 1.05 kg liquid-cooled
dimensions (height x width x length)	76 mm x 70 mm x 122.5 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

optical interface

direct mounting distance	11.1 mm ($\pm 10\%$)
lens mounting	C-mount, F-mount
optional lens mounting	TFL-mount
optional lens remote control (only air-cooled variant)	EF-mount, EF-S-mount

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

dimensions

outlines of pco.edge 5.5 DS CLHS air-cooled (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:

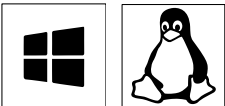
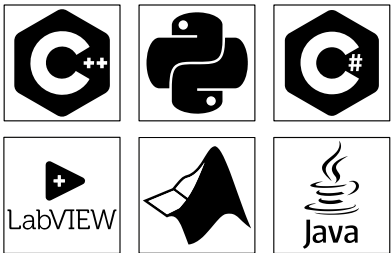
Our cameras integrate with a range of third-party software applications.

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

ballistics | combustion analysis | flow visualization | fluid dynamics | fuel injection research | particle image velocimetry (PIV) | particle tracking velocimetry (PTV) | spray analysis | wind tunnel studies

ordering information		
pco.edge 5.5 DS CLHS	85108072647	camera system, 2560 x 2160 pixel, monochrome, global shutter, double shutter feature and interframing time < 200 ns, CLHS interface, air cooling
pco.edge 5.5 DS WAT CLHS	85108072649	camera system, 2560 x 2160 pixel, monochrome, global shutter, double shutter feature and interframing time < 200 ns, CLHS interface, liquid cooling
pco.edge 5.5 C DS CLHS	85108072648	camera system, 2560 x 2160 pixel, color, global shutter, double shutter feature and interframing time < 200 ns, CLHS interface, air cooling
pco.edge 5.5 C DS WAT CLHS	85108072650	camera system, 2560 x 2160 pixel, color, global shutter, double shutter feature and interframing time < 200 ns, CLHS interface, liquid cooling

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