data sheet
pco.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 noise
1.0 electrons

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

high speed
100 fps

high dynamic range
30,000 : 1

high resolution
2560 x 2160 pixel

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technical data

image sensor

sensor technology	scientific CMOS (sCMOS)
color type	monochrome or color
resolution (horizontal x vertical)	2560 pixel x 2160 pixel
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 type	rolling shutter (RS) with free selectable readout modes, global/snapshot shutter (GS) global reset - rolling readout (GR) double shutter (DS)
modulation transfer function (theoretical max.)	76.9 lp/mm
fullwell capacity	30,000 e^-
readout noise (typ.)[1]	1.0_{med} / 1.4_{rms} e^- @ RS/GR, slow scan 1.1_{med} / 1.5_{rms} e^- @ RS/GR, fast scan 2.2_{med} / 2.5_{rms} e^- @ GS/DS, fast scan
dynamic range (intra-scene)	30,000 : 1 (89.5 dB RS, slow scan)
peak quantum efficiency	60 % @ 600 nm
spectral range	370 nm - 1100 nm
dark current	< 0.6 e^-/pixel/s RS/GR@ +7 °C sensor temperature < 0.9 e^-/pixel/s GS @ +7 °C sensor temperature

frame rate table[2]

vertical resolution reduction

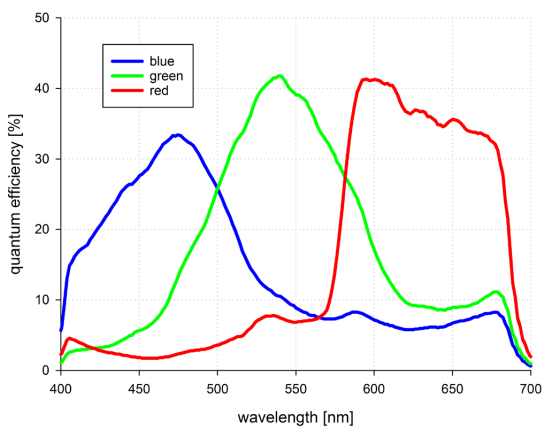
	fast scan			slow scan
	RS	GS	DS	RS
2560 x 2160	100 fps	50 fps	25 fps	33 fps
2560 x 1024	212 fps	105 fps	52 fps	70 fps
2560 x 512	422 fps	208 fps	104 fps	140 fps
2560 x 256	838 fps	409 fps	204 fps	279 fps
2560 x 128	1651 fps	789 fps	394 fps	550 fps

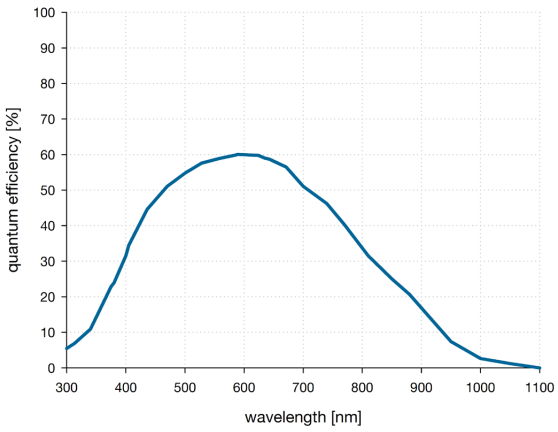
typical resolutions

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

camera	
max. frame rate @ full resolution	100 fps @ RS/GR 50 fps @ GS 25 fps @ DS
exposure time range	500 µs - 2 s (RS) 10 µs - 100 ms (GS/DS) 10 µs - 2 s (GR)
dynamic range A/D[3]	16 bit
conversion factor	0.46 e^-/count
pixel scan rate	286.0 MHz fast scan RS/GS/GR/DS 100.0 MHz slow scan RS/GR
pixel data rate	572.0 MPixel/s fast scan RS/GS/GR/DS 200.0 MPixel/s slow scan RS/GR
region of interest (ROI)	horizontal: steps of 16 pixels vertical: steps of 1 pixel
binning	horizontal: x2, x4 vertical: x2, x4
non-linearity	< 0.6 %
cooling method	+7 °C stabilized, selectable: peltier with forced air (fan), or water cooling (both up to 27 °C ambient)
dark signal non-uniformity (DSNU)	< 0.3 e^- rms RS/GR slow scan < 3.9 e^- rms GS/DS fast scan < 0.3 e^- rms RS/GR fast scan
photo response non-uniformity (PRNU)	< 0.34 %
anti blooming factor[4]	> 10,000
interframing time	100 ns
trigger input signals	programmable input - exposure trigger, acquire enable
trigger output signals	programmable output - status busy, status exposure
input / output signal interface	SMA connectors
time stamp	in image (1 µs resolution)
data interface	Camera Link HS FOL

quantum efficiency





general	
power supply	24 VDC (±10 %)
power consumption	32 W max. (typ. 19 W @ +20 °C)
weight	850 g (air-cooled variant) 1060 g (water-cooled variant)
dimensions (height x width x length)	79.5 mm x 70 mm x 122.5 mm
operating temperature range	+10 °C to +40 °C
operating humidity range (non-condensing)	10 % to 80 % (non-condensing)
storage temperature range	-10 °C to +60 °C
CE / FCC certified	yes

optical interface	
direct mounting	5.0 mm ±10 %
lens mounting	C-Mount
optional lens mounting	F-Mount, TFL-Mount
optional lens remote control[5]	EF-Mount, EF-S-Mount (Canon)

[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] Max. fps with centered ROI.

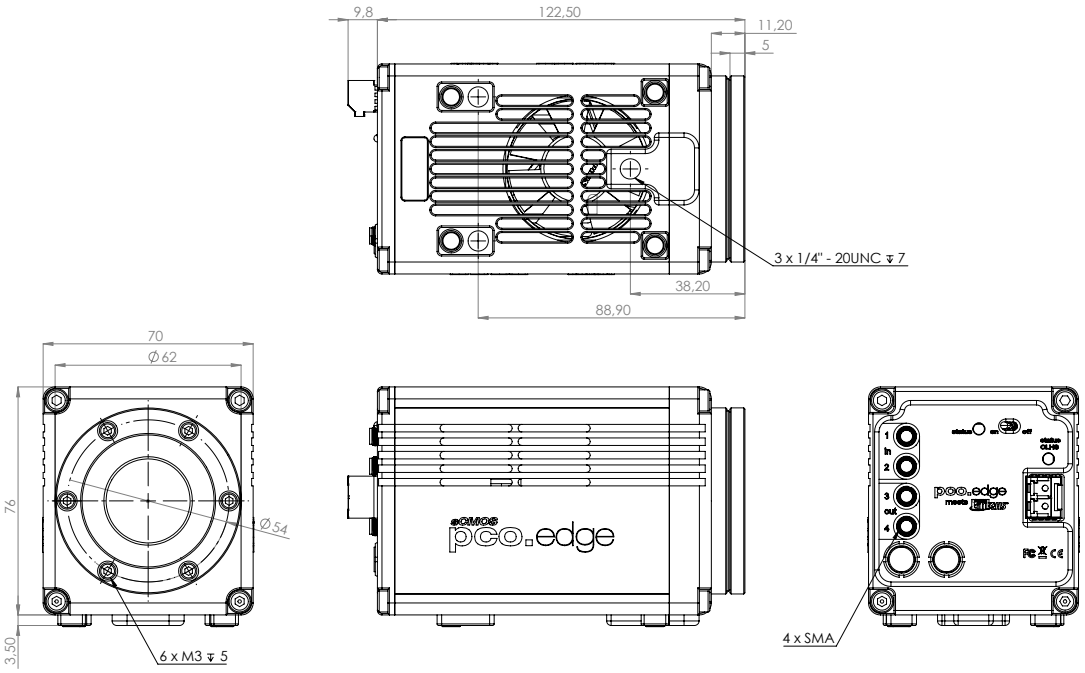
[3] The high dynamic signal is simultaneously converted at high and low gain by two 11 bit A/D converters and the two 11 bit values are sophistically merged into one 16 bit value.

[4] Based on image sensor data sheet.

[5] Available for air-cooled variants only.

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

dimensions



Outlines of pco.edge 5.5 DS CLHS (all dimensions given in mm).

software

Our main camera control software pco.camware is the first choice to get started with your camera. It enables full control of all camera settings and makes image acquisition and storage very easy. Using different layouts, styles and features you can customize it exactly to your needs.

You are using a different software:
PCO cameras are also integrated in a variety of software applications. Check our homepage to find a list of all applications that support PCO cameras.

You want to create your own application for the camera:
We offer a wide range of Software Development Kits (SDK) for different programming languages, both for windows and linux. Our pco.sdk, pco.recorder and high-level SDK are designed for C/C++ apps. With pco.python, pco.matlab, pco.labview and pco.java you can control the camera in your C#, python, matlab, labview and java applications, respectively.

Your use case is in the field of microscopy:
PCO cameras are also integrated in µManager.

double shutter applications

flow visualization | particle imaging velocimetry (PIV) | particle tracking velocimetry (PTV)

ordering information		
pco.edge 5.5 DS CLHS	85108072647	camera system, double shutter, monochrome, 2560x2160 pixel, air cooled, CLHS
pco.edge 5.5 DS CLHS	85108072649	camera system, double shutter, monochrome, 2560x2160 pixel, air and water cooled, CLHS
pco.edge 5.5 DS C CLHS	85108072648	camera system, double shutter, color, 2560x2160 pixel, air cooled, CLHS
pco.edge 5.5 DS C CLHS	85108072650	camera system, double shutter, color, 2560x2160 pixel, air and water cooled, CLHS

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