

pco.edge gold 5.5

deep cooled scientific CMOS camera

high resolution

2560 x 2160 pixel

low noise

0.8 electrons



**deep
cooled**

high dynamic range

37 000:1

cooling down to

-30° Celsius

high quantum efficiency

> 60 %

technical data

image sensor

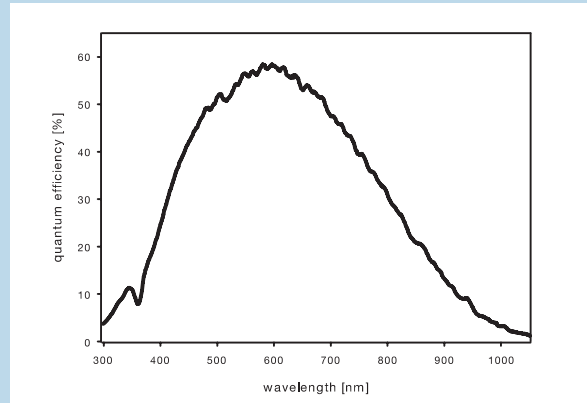
type of sensor	scientific CMOS (sCMOS)
image sensor	CIS2521
resolution (h x v)	2560 x 2160 pixel
pixel size (h x v)	6.5 μm x 6.5 μm
sensor format / diagonal	16.6 mm x 14.0 mm / 21.8 mm
shutter modes	rolling shutter (RS)
MTF	76.9 lp/mm (theoretical)
fullwell capacity	30 000 e ⁻
readout noise ¹	0.8 _{med} / 1.3 _{rms} e ⁻
dynamic range	37 000 : 1 (91.4 dB)
quantum efficiency	> 60 %
spectral range	370 nm .. 1100 nm
dark current ²	< 0.08 e ⁻ /pixel/s @ -30 °C
DSNU	< 0.3 e ⁻ rms
PRNU	< 0.2 %
anti blooming factor	1 : 10 000

camera

frame rate	32 fps @ 2560 x 2160 pixel
exposure / shutter time	500 μs .. 60 s
dynamic range A/D ³	16 bit
A/D conversion factor	0.46 e ⁻ /count
pixel scan rate	86.0 MHz
pixel data rate	172.0 Mpixel/s
binning horizontal	x1, x2, x4
binning vertical	x1, x2, x4
region of interest (ROI)	horizontal: steps of 4 pixels vertical: steps of 1 pixel
non linearity	< 0.6 %
cooling method	-30 °C water cooling, up to 25 °C ambient temperature -15 °C peltier with forced air (fan), up to 30 °C ambient temp.
trigger input signals	frame trigger, programmable input (SMA connectors)
trigger output signals	exposure, busy, line, programmable output (SMA connectors)
data interface	USB 3.0
time stamp	in image (1 μs resolution)

quantum efficiency

monochrome



general

power supply	24 VDC (+/- 10 %)
power consumption	36 W max.
weight	1800 g
operating temperature	+ 10 °C .. + 40 °C
operating humidity range	10 % .. 80 % (non-condensing)
storage temperature range	- 10 °C .. + 60 °C
optical interface	F-mount & C-mount
CE / FCC certified	yes

frame rate table

typical example

2560 x 2160

32 fps

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 Measurements with dark current compensation.
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 sophisticatedly merged into one 16 bit value.



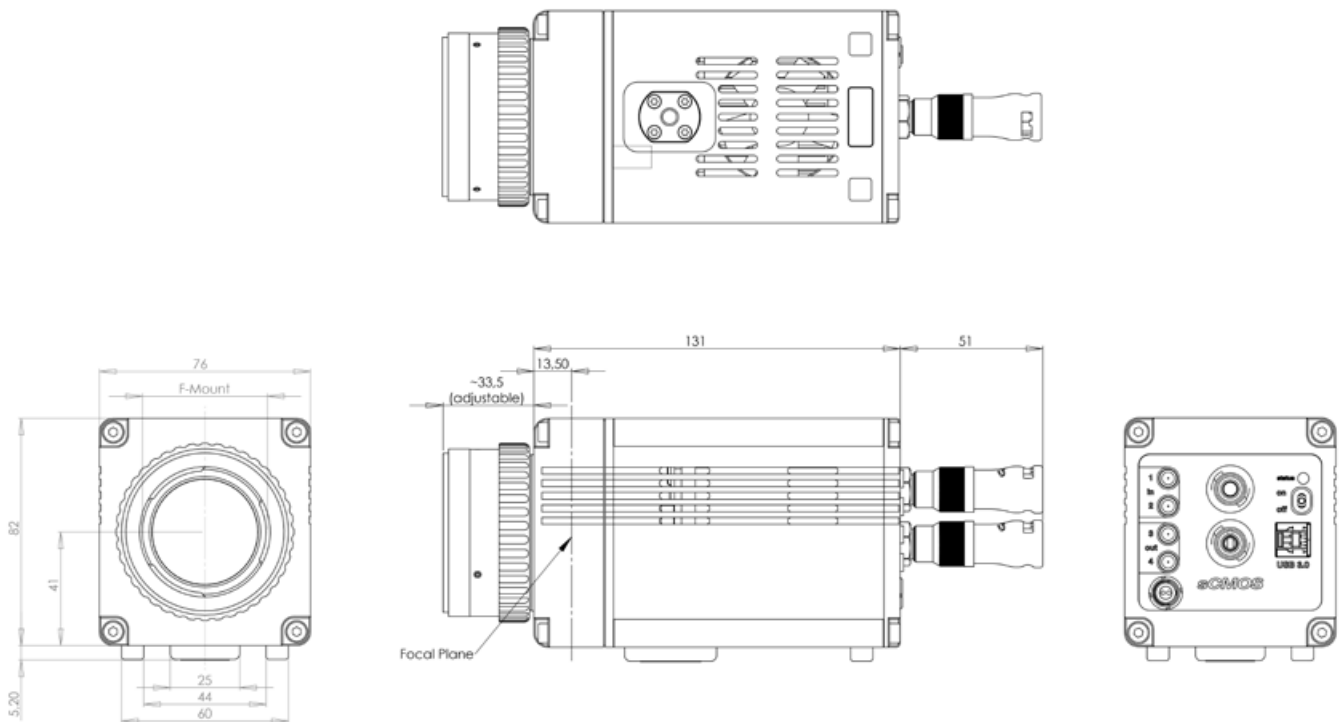
technical data

camera views



dimensions

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



technical data

software

Camware is provided for camera control, image acquisition and archiving of images in various file formats (WindowsXP, 7, 8 and later). A free software development kit (SDK) including a dynamic link library, for user customization, integration on PC platforms is available. Drivers for popular third party software packages are also available. (www.pco.de)

options

custom made versions, OEM solutions



Water cooling unit Aquamatic II for use with pco.edge cameras.



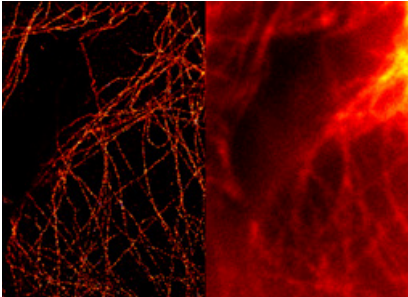
third party integrations

software drivers



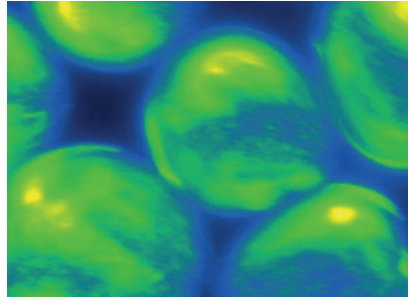
applications

life science



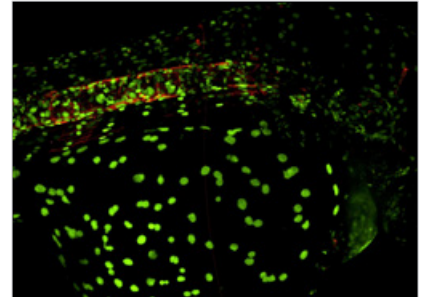
A widefield (right) and a GSDIM super-resolution (left) microscopy image of tubulin fibers obtained with a pco.edge, courtesy of Leica Microsystems, Germany

physical science



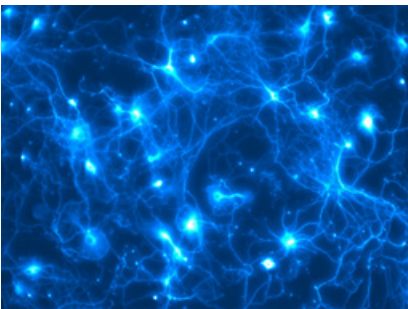
A single image of fluorescence labeled protein networks in water drops in an oil phase, which moved fast. One pixel corresponds to 0.1625 μm in reality, courtesy of Prof. Dr. Sarah Köster, Institute for X-Ray Physics, Göttingen, Germany

life science



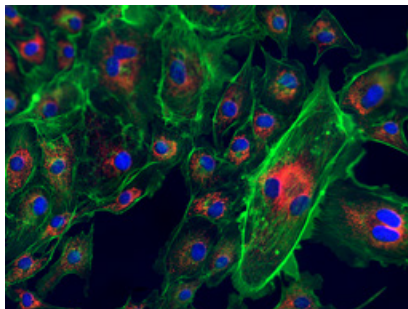
Zebrafish with two fluorescent labels, collected with a VisiScope Confocal based on the Yokogawa CSU-W1 wide head and a pco.edge camera, courtesy of Visitron Systems GmbH, Germany

life science



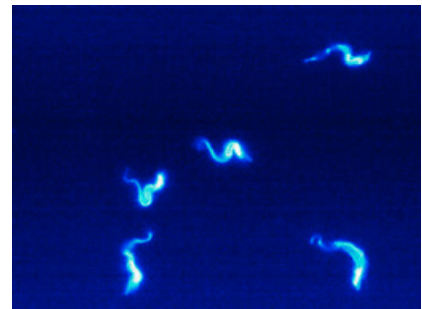
Neuronal network marked with a fluorophore (false color rendering) and recorded with a pco.edge.

life science



Extract of a fluorescent slide which was scanned by a pco.edge camera in a Panoramic 250 Flash scanner for digital pathology, courtesy of 3DHitech, Hungary

life science



An image of a sequence, which was recorded with a pco.edge at 400 frame/s. The maximum signal was about 100 photons, courtesy of Prof. Engstler, University of Würzburg, Germany

application areas

■ Widefield microscopy ■ Fluorescent microscopy ■ Digital pathology ■ PALM ■ STORM ■ GSDIM ■ dSTORM ■ Superresolution microscopy ■ Lightsheet microscopy ■ Selective plane imaging microscopy (SPIM) ■ Calcium imaging ■ FRET ■ FRAP ■ 3D structured illumination microscopy ■ High speed bright field ratio imaging ■ High throughput screening ■ High content screening ■ Biochip reading ■ TIRF ■ TIRF microscopy / waveguides ■ Spinning disk confocal microscopy ■ Live cell microscopy ■ 3D metrology ■ TV / broadcasting ■ Ophthalmology ■ Electro physiology ■ Lucky astronomy ■ Photovoltaic inspection

europa

PCO AG
Donaupark 11
93309 Kelheim, Germany

fon +49 (0)9441 2005 50
fax +49 (0)9441 2005 20
info@pco.de
www.pco.de

america

PCO-TECH Inc.
6930 Metroplex Drive
Romulus, Michigan 48174, USA

fon +1 (248) 276 8820
fax +1 (248) 276 8825
info@pco-tech.com
www.pco-tech.com

asia

PCO Imaging Asia Pte.
3 Temasek Ave
Centennial Tower, Level 34
Singapore, 039190

fon +65 6549 7054
fax +65 6549 7001
info@pco-imaging.com
www.pco-imaging.com