# data sheet
# pco. edge 4.2 LT

scientific CMOS camera

resolution
**4.2 MPixel**

pixel size
**6.5 µm x 6.5 µm**

interface
**USB 3.0**


low noise
0.8 electrons

high quantum efficiency
up to 82 %

high dynamic range
37 500 : 1

high speed
40 fps

high resolution
2048 x 2048 pixel

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# technical data

| image sensor | |
|---|---|
| **sensor technology** | scientific CMOS (sCMOS) |
| **color type** | monochrome |
| **resolution (horizontal x vertical)** | 2048 pixel x 2048 pixel |
| **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 type** | rolling shutter (RS)<br>with free selectable readout modes,<br>global reset - rolling readout (GR) |
| **modulation transfer function (theoretical max.)** | 76.9 lp/mm |
| **fullwell capacity** | 30.000 $e^-$ |
| **readout noise (typ.)[1]** | $0.8_{med}$ / $1.3_{rms}$ $e^-$ |
| **dynamic range (intra-scene)** | 37 500 : 1 (91.5 dB) |
| **peak quantum efficiency** | up to 82 % @ peak |
| **spectral range** | 370 nm - 1100 nm |
| **dark current** | < 0.8 $e^-$ /pixel/s @ +10 °C sensor temperature |

| frame rate table[2] | |
|---|---|
| **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 |

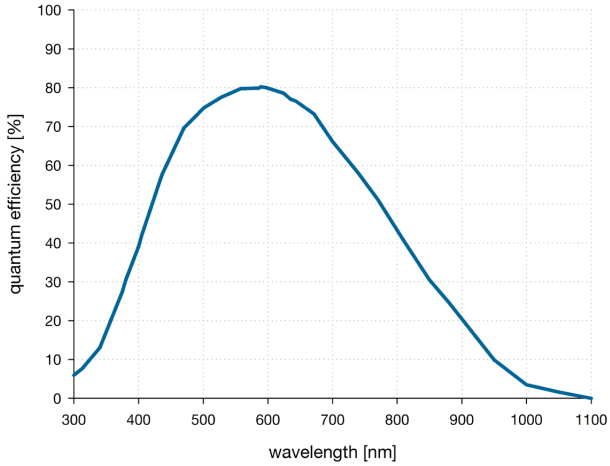
[1] the readout noises values are gives as median (med) and root mean square (rms) values, due to the different noise models, which can be used for evaluation. All values are raw data without any filtering.

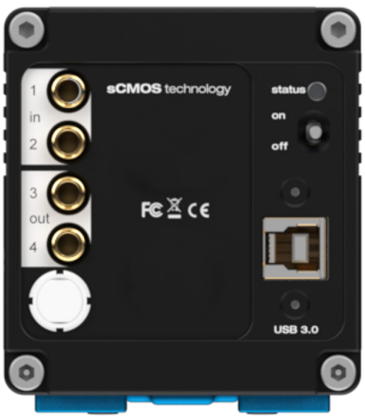
[2] Max. fps with centered ROI.

| camera | |
|---|---|
| **max. frame rate @ full resolution** | 40 fps @ 2048 x 2048 pixel |
| **exposure time range** | 100 µs - 10 s (RS)<br>30 µs - 2 s (GR) |
| **dynamic range A/D[3]** | 16 bit |
| **conversion factor** | 0.46 $e^-$/count |
| **pixel scan rate** | 110.0 MHz |
| **pixel data rate** | 220.0 MPixel/s |
| **binning** | x2, x4 |
| **non-linearity** | < 0.6 % |
| **cooling method** | +10 °C stabilized,<br>peltier with forced air (fan),<br>(up to 27 °C ambient) |
| **dark signal non-uniformity (DSNU)** | < 0.3 $e^-$ rms |
| **photo response non-uniformity (PRNU)** | < 0.2 % |
| **anto blooming factor** | > 10.000 |
| **trigger input signals** | frame trigger, programmable input |
| **trigger output signals** | exposure, busy, line, programmable output |
| **input / output signal interface** | SMA connectors |
| **time stamp** | in image (1 µs resolution) |
| **data interface** | USB 3.0 |

[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.

## quantum efficiency



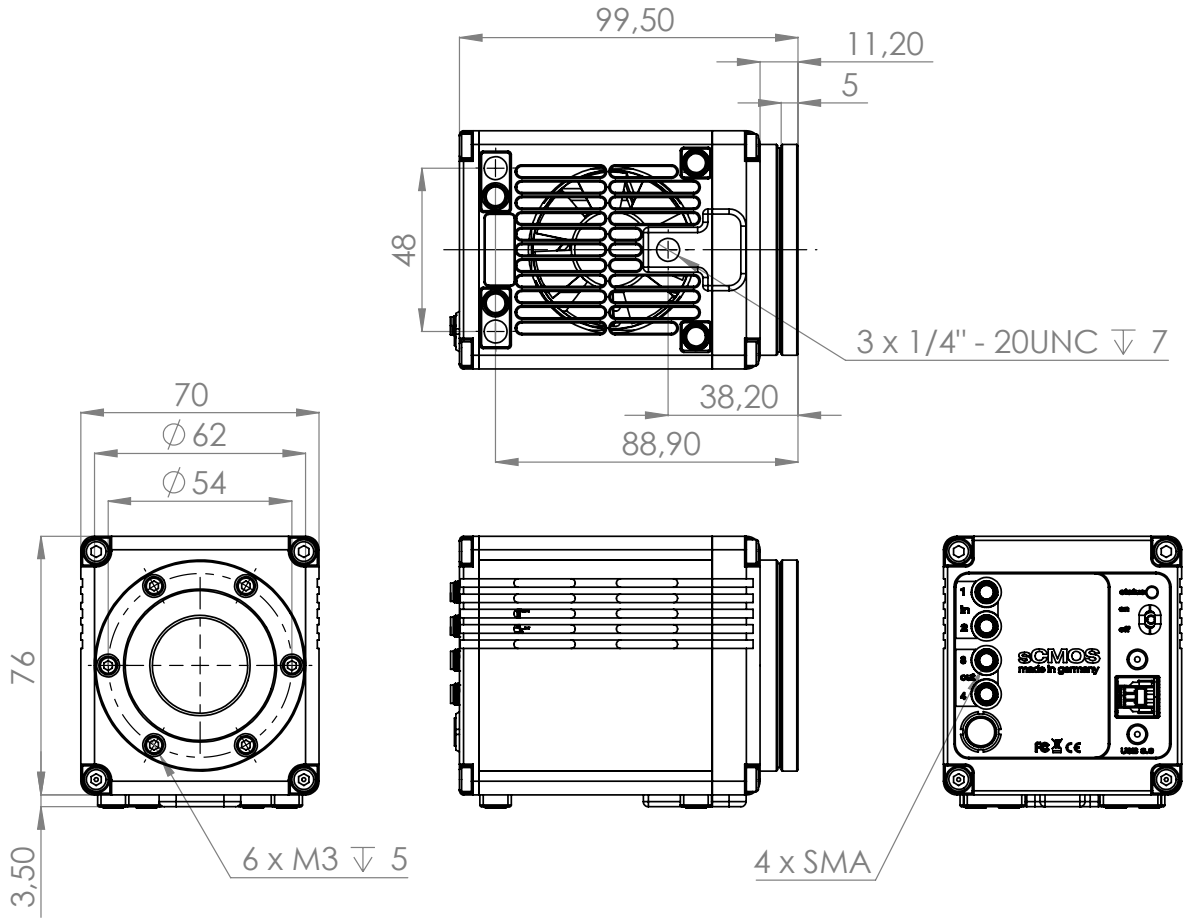



| general | |
|---|---|
| **power supply** | 12 - 24 VDC (+ / - 10 %) |
| **power consumption** | 21 W max. (typ. 12 W @ + 20 °C) |
| **weight** | 900 g |
| **dimensions (height x width x length)** | 79.5 mm x 70 mm x 103 mm |
| **operating temperature range** | +10 °C to +40 °C |
| **operating humidity range (non-condensing)** | 10 % to 80 % (non-condensing) |
| **storage temperature range** | -10 °C to +60 °C |
| **CE / FCC certified** | yes |

| optical interface | |
|---|---|
| **direct mounting** | 11.1 mm ±10 % |
| **lens mounting** | C-Mount |
| **optional lens mounting** | F-Mount, TFL-Mount |

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

## dimensions




Outlines of pco.edge 4.2 LT (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.

## areas of application

scientific imaging | low light level imaging | combustion imaging | high resolution microscopy | machine vision | industrial applications | particle imaging velocimetry (PIV) | spectroscopy | flow visualization (hydrodynamics) | industrial oem applications | fuel injection | material testing | luminescence spectroscopy | RED and NIR fluorescence applications | imaging of bio-markers (e.g. green fluorescent protein) | scintillation recording

## ordering information

| | | |
|---|---|---|
| **pco.edge 4.2 LT USB** | 85108072509 | camera system, monochrome, 2048x2048 pixel, air cooled, USB3 |

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