The new pco.pixelfly usb is a high performance digital 14 bit CCD camera system specially designed for low light applications in the spectral range of visible light if a small form factor is required.

- **Low noise**: 6 electrons
- **Resolution**: 1.3 megapixel
- **Quantum efficiency**: up to 65%
- **Interframing time**: short

The new pco.pixelfly usb is a high performance digital 14 bit CCD camera system specially designed for low light applications in the spectral range of visible light if a small form factor is required.
technical data

image sensor
- type of sensor: CCD
- image sensor: ICX285AL
- resolution (h x v): 1392 x 1040 pixel (normal), 800 x 600 (center)
- pixel size (h x v): 6.45 µm x 6.45 µm
- sensor format / diagonal: 2/3" / 11.14 mm
- shutter mode: global (snapshot)
- MTF: 77.5 lp/mm (theoretical)
- fullwell capacity: 16 000 e- (full frame), 24 000 e- (binning)
- readout noise: 5 .. 7 e- rms @ 12 MHz (typ.), 6 .. 8 e- rms @ 24 MHz (typ.)
- dynamic range: 2 667 : 1 (68 dB, 12 MHz, full frame)
- quantum efficiency: 65 % @ peak
- spectral range: 290 nm .. 1100 nm
- dark current: 1 e- / pixel / s @ 23 °C
- DSNU\(^1\): 2 e- rms
- PRNU\(^2\): < 1 %

general
- power supply: 9 .. 28 VDC (12 VDC typ.)
- power consumption: < 4 W
- weight: 0.25 kg
- operating temperature: + 10 °C .. + 45 °C
- operating humidity range: 10 % .. 80 % (non-condensing)
- storage temperature range: - 20 °C .. + 70 °C
- optical interface: C-mount
- CE certified: yes

frame rate table\(^4\)

<table>
<thead>
<tr>
<th>pixelclock [MHz]</th>
<th>normal</th>
<th>center</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>7.3 fps</td>
<td>13.5 fps</td>
</tr>
<tr>
<td>25</td>
<td>11.7 fps</td>
<td>21.6 fps</td>
</tr>
<tr>
<td>v2 binning</td>
<td>14.7 fps</td>
<td>27 fps</td>
</tr>
<tr>
<td></td>
<td>21.8 fps</td>
<td>40.4 fps</td>
</tr>
</tbody>
</table>

camera
- max. frame rate: 7.3 / 13.5 fps (12 / 25 MHz, normal ), 11.7 / 21.6 fps (12 / 25 MHz, center)
- exposure/shutter time: 5 µs .. 60 s
- dynamic range A/D: 14 bit
- A/D conversion factor: 1.0 e-/count
- pixel scan rate: 12 MHz / 24 MHz
- pixel data rate: 19.5 Mpixel/s
- binning (hor x ver): 1 x 1 .. 2 x 2
- non linearity: < 1 %
- smear: < 0.002 %
- anti-blooming factor: > 400 (standard 100 ms exposure), > 4 (NIR enhanced 100 ms expos.)
- interframing time\(^3\): 1 µs
- trigger input signals: software / TTL level
- trigger output signals: 3.3 V LV TTL level

quantum efficiency

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\(^1\) dark signal non-uniformity measured in a 90% center zone of the image sensor
\(^2\) photo response non-uniformity
\(^3\) time between two consecutive images for particle image velocimetry (PIV) applications
technical data

software
Camware is provided for camera control, image acquisition and archiving of images in various file formats (WindowsXP and later). A free software development kit (SDK) including a 32 / 64 bit dynamic link library, for user customization, integration on PC platforms is available. Drivers for popular third party software packages are also available.

(Please visit www.pco.de for more information)

options
monochrome & color versions available; custom made versions

dimensions
C-mount lens adapter

All dimensions are given in millimeter.

camera views

Further information can be found on www.pco.de
applications

bio marker

The high sensitivity and image quality are extremely useful characteristics for fluorescent multi-probe marker applications in microscopy.

quality control

View of a row of an empty bottle inspection system, which uses pixelfly cameras for the improved resolution inspection (IRIS), courtesy of Krones AG, Neutraubling, Germany.

combustion analysis

An endoscopic view into the combustion chamber of a Diesel engine. The two images show the injection and combustion of Diesel fuel. They were recorded at different Crank angles with the AVL VisioScope system, courtesy of AVL List GmbH, Graz, Austria.

electron spectroscopy

Cu (111) state dispersion image by a pco. pixelfly, courtesy of Specs GmbH - Surface Analysis and Computer Technology, Berlin, Germany.

microscopy

Human cervical carcinoma epithelial cells (HeLa) stained with mCherry Fluorescent Protein Histone H2B, recorded with a pco. pixelfly, the Cooke corporation.

strain field

In the above experiment the motion of the different quartz sand layers was measured by a strainmaster system (incorporating pco.pixelfly cameras) and the strain field was computed, courtesy of LaVision, Göttingen, Germany.

application areas

- scientific imaging
- low light level imaging
- combustion imaging
- high resolution microscopy
- machine vision
- industrial applications
- particle image 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

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