pco.1300
cooled digital 12bit CCD camera system

- resolution 1392 x 1040 pixel
- excellent quantum efficiency up to 65 %
- thermoelectrically cooled –25 °C vs. ambient
- 12 bit dynamic range
- superior low noise of typ. 6 e^- rms @ 10 MHz
- “now glow” functionality at long exposure times
- exposure times range from 5 µs – 1 h
- hot pixel correction integrated
- optimal offset stability and control (< 1 count/h)
- standard IEEE 1394a (“FireWire”) interface
- software selectable NIR sensitivity enhancement
- free software camware and software development kit included

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a.e.s adept electronic

adept electronic solutions

The Machine Vision and Imaging Speciaists

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pco.1300

This high performance digital 12 bit CCD camera system is perfectly suited for life science and machine vision applications, where an excellent image quality and high offset stability is required. The pco.1300 has an remarkable quantum efficiency of up to 65%. At the heart of the camera is an FPGA processor allowing for sophisticated control and accurate timing of the CCD and associated electronics. In addition a proprietary offset control algorithm has been developed which provides very high offset stability, regardless of ambient temperature or signal changes ensuring accurate and repeatable quantitative data over long periods of time. Binning, cooling, as well as other features of the camera can be selected and optimized to accomodate the user's application. The camera features excellent resolution (1392 x 1040 pixel), 12 bit dynamic range, exposure times from 5 µs – 1 hour, internal frame buffer for continuous image capture (64 MB min.), excellent low noise of 6 e^- rms @ 10 MHz, cooling of –25 °C versus ambient temperature, standard interface IEEE 1394a („FireWire"), optimal offset stability and control (< 1 count/h).

technical data

	unit	setpoint	pco.1300
resolution (hor x ver) [1]	pixel	@ normal mode @ extended mode	1392 x 1040 1424 x 1060
pixel size (hor x ver)	µm²		6.45 x 6.45
sensor format / diagonal	inch / mm		2/3" / 11.14
quantum efficiency	%	@ 500nm typical	62
full well capacity	e^-		16 000
dark current	e^-/pixel·s	@ 10 °C typical	0.05
image sensor			ICX285AL
maximum dynamic range	dB	CCD + camera @ 10 MHz	68.5
dynamic range A/D[2]	bit		12
readout noise	e^- rms	@ 10 / 20 MHz	6 / 10
imaging frequency, frame rate	fps	@ full frame @ 10 / 20 MHz	5.9 / 10.5
pixel scan rate	MHz		10 / 20
A/D conversion factor	e^- / count		3.9
spectral range	nm		290 .. 1100
exposure time	s		5 µs .. 1 h

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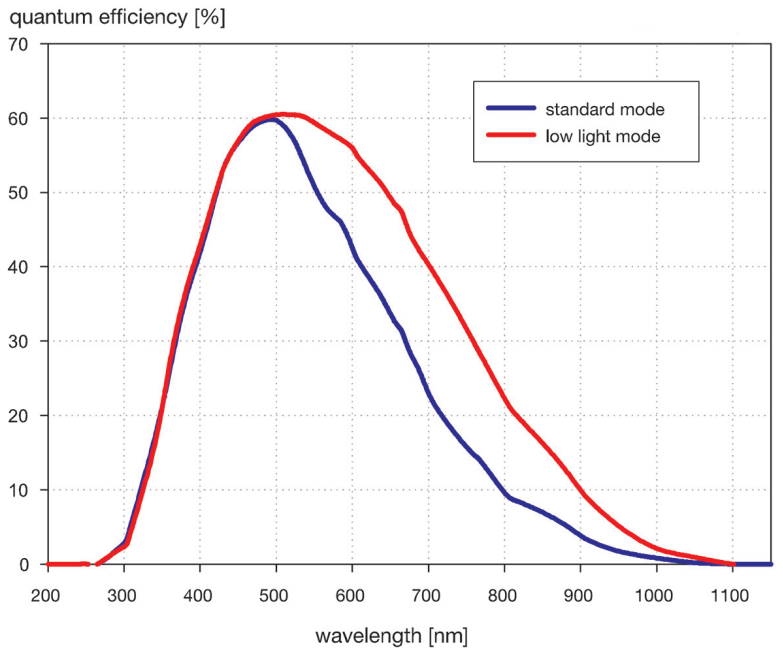
technical data

	unit	setpoint	pco.1300
anti-blooming factor		@ stand.light mode / @ low light mode @ 100ms expos. time	> 400 / > 4
smear	%		< 0.002
binning (hor x ver)	pixel		1x1, 1x2, 2x1, 2x2
optical input			c-mount
trigger, auxiliary signals		internal / external	software, TTL level
power supply	VDC	typical	18..28 V 24 V
power consumption	W	max.	20
mechanical dimensions (w x h x l)	mm³		113 x 104 x 110
weight	kg		1.1
ambient temperature	°C	range	+10 .. +40
operating humidity	%	range	10 .. 80
storage temperature	°C	range	-20 .. +70
data interface			IEEE 1394a
CE certified			yes

[1] horizontal versus vertical
[2] Analog-to-Digital-converter

quantum efficiency



(measured by pco).

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areas of application

- scientific imaging
- low light level imaging
- high resolution microscopy
- machine vision and industrial applications
- bioluminescence / chemoluminescence
- luminescence spectroscopy
- Red and NIR fluorescence applications
- spectroscopy
- imaging of bio markers (e.g. green fluorescent protein, GFP)
- quality control

example of application

Human Lung Diploid Fibroblast Cell (WI–38) stained with Alexa Fluor 568 – Tubulin (Ms), Alexa Fluor 647 – GPP 130 (Rb, Yel–low) and DAPI.

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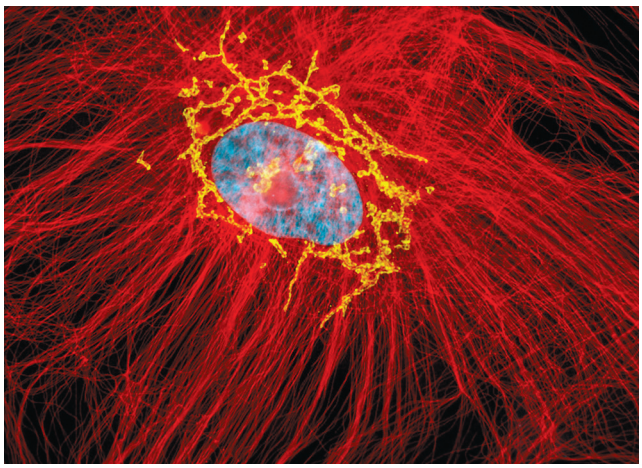

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