pco.1300 solar
cooled digital 12bit CCD camera system

- quantum efficiency of up to 11 % @ 900nm
- excellent resolution (1392 x 1040 pixel)
- cooled 12 bit dynamic range
- superior low noise of 7 e^- rms @ 10 MHz
- no glow functionality at long exposure times
- designed for electro luminescence (EL) applications
- hot pixel correction integrated
- optimal offset stability and control (≤ 1 count)
- exposure time range 5 µs - 1 h
- cooling to 5 °C
- standard IEEE1394a ("firewire") interface

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pco.1300 solar

This versatile high performance 12 bit CCD camera system is specifically designed for electro-luminescence (EL) applications in the range of 850nm to 1200nm. The pco.1300 solar has an extraordinary quantum efficiency of up to 11 % @ 900nm. 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. The pco.1300 solar's most unique feature is its increased sensitivity in the NIR range of the spectrum. ROI, binning, cooling, as well as other features of the camera can be selected and optimized to accommodate the user's application. Camera features excellent resolution (1392 x 1040 pixel), 12 bit dynamic range, exposure time 5 µs to 1 hour, internal frame buffer for continuous image capture (64 MB min), excellent low noise of 7 e^- rms @ 10 MHz, cooling to 5 °C, standard interface IEEE1394a, optimal offset stability and control (≤ 1 count).

technical data

	unit	setpoint	pco.1300 solar
resolution (hor x ver)[1]	pixel	@ extended mode @ normal mode	1424 x 1060 1392 x 1040
pixel size (hor x ver)	µm[2]		6.45 x 6.45
sensor format/ diagonal	inch/ mm		2/3" / 11.14
peak quantum efficiency	%	@ 880 nm typical	11.2
full well capacity,	e^-		18 000
dark current	e^-/pixel·s	@ 10 °C typical	0.05
image sensor			ICX285AL
maximum dynamic range	dB	CCD + camera @ 10 MHz	66
dynamic range A/D[2]	bit		12
readout noise	e^- rms	@ 10 / 20 MHz	7 / 10
imaging frequency, frame rate	fps	@ full frame @ 10 / 20 MHz	5.9 / 11.7
pixel scan rate	MHz	dual clock	10 / 20
A/D conversion factor	e^-/count		3.9
spectral range	nm nm	sensor camera	290 .. 1200 750 .. 1200
exposure time	s		5 µs .. 1 h
anti-blooming factor		@ stand. light mode / @ low light mode @ 100ms expos. time	> 400 / > 4
smear	%		< 0.002
optical input			c-mount
trigger, auxiliary signals		internal / external	software, TTL level
binning (hor x ver)			1x1, 1x2, 2x1 2x2

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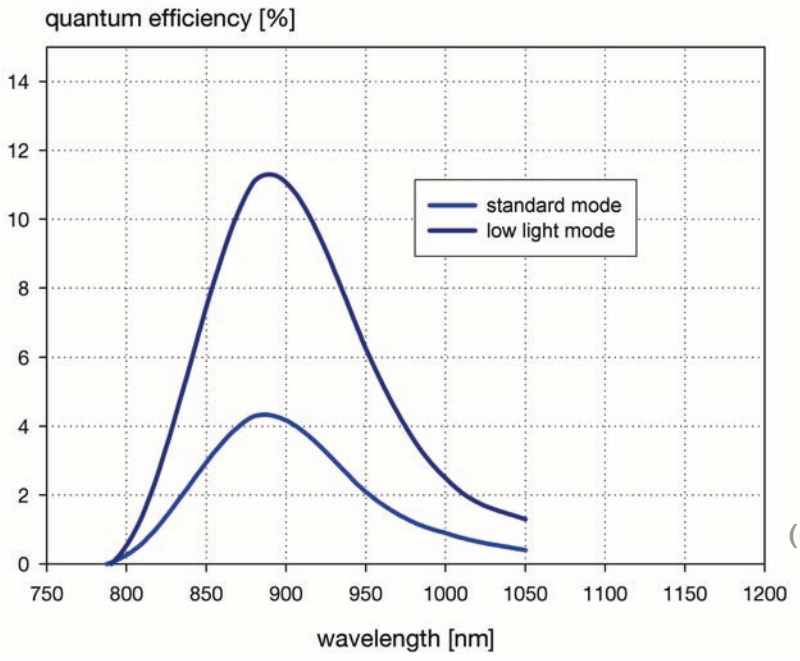
technical data

	unit	setpoint	pco.1300 oem
power supply	VDC	typical	18 .. 28 V 24 V
power consumption	W	max.	20
mechanical dimensions (w x h x l)	mm^3		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			IEEE1394a
CE certified			yes

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

quantum efficiency



(measured by pco)

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Electroluminescence images of a solar cell panel at different operating currents (upper: nominal short circuit current, lower: 0.1 x nominal short circuit current). The images clearly indicate areas or lines (dark or shadow vertical structures) where due to mechanical stress the silica is broken, such that these areas would not contribute to the generation of energy.

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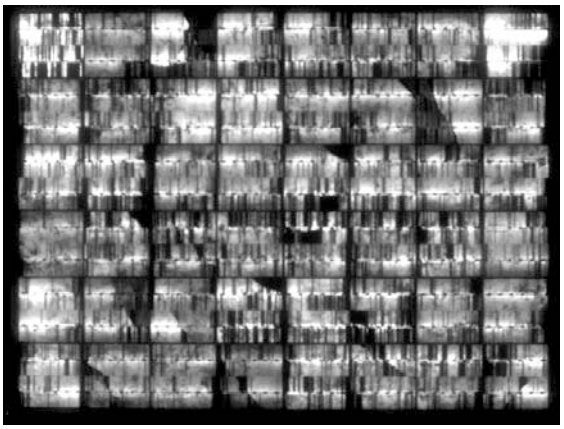
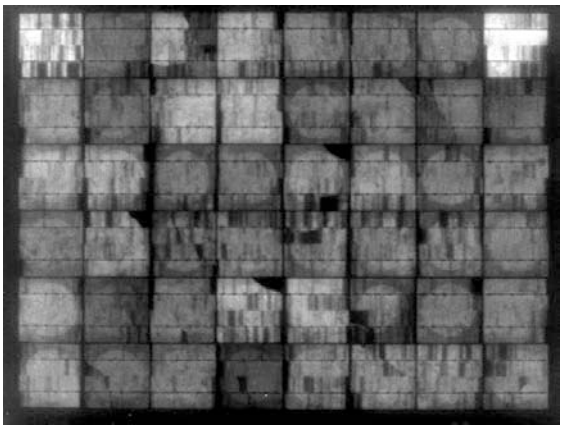
Hameln, Germany, www.ifsh.de





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