pco.1200 s
digital high speed 10bit CMOS camera system

- 500 fps at full resolution (1068 fps at VGA resolution)
- extremely fast image recording - 820MB/s
- high resolution (1280 x 1024 pixel)
- exposure time range 1 µs - 1 s
- image memory in camera (camRAM up to 4 GB)
- standard interfaces (IEEE 1394, camera link)

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This high speed 10bit CMOS camera system comprises advanced CMOS and electronics technology. With the new approach to integrate the image memory (camRAM) into the camera itself, it enables unmatched fast image recording with 820MB/s. The system features an excellent resolution (1280 x 1024 pixel) and low noise. It consists of a compact camera with an external intelligent power supply. The image data are transferred via customer selectable standard data interfaces to a computer (IEEE 1394 ("firewire"), camera link). The available exposure times range from 1µs to 1s. This digital camera system is perfectly suited for high speed camera applications such as material testing, fast inspection, external crash tests or super slow motion image recordings for video clips and advertising.

technical data

	unit	setpoint	pco.1200 s
resolution (hor x ver)[1]	pixel		1280x1024
pixel size (hor x ver)	μm^2		12.0 x 12.0
sensor format/ diagonal	mm^2/ mm		15.36x12.29/ 19.67
peak quantum efficiency	%	@ 520nm typical	25
full well capacity	e^-		63 000
image sensor			MT9M413
dynamic range	dB	@ CMOS camera	59.6
dynamic range A/D[2]	bit		10
readout noise	e^- rms	@ 67.7 MHz	41
imaging frequency, frame rate	fps	@ full frame @ ROI VGA	501 1068
pixel scan rate	MHz		67.7
A/D conversion factor	e^-/count		115
spectral range	nm		290..1100
exposure time	s		1µs..1s
anti-blooming factor		typical	no blooming
smear	%		no smear
binning horizontal	pixel		1
binning vertical	pixel		1
dark current	e^-/pixel·s	@25 °C typical	5900
region of interest	pixel	horizontal vertical	steps of 10 steps of 1

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technical data

non linearity	%	full temperature range	<2
uniformity darkness DNSU[3]	e^- rms	@ 90% center zone	<700
uniformity brightness PRNU[4]	% rms	typical	0.6
trigger, auxiliary signals		internal/ external	software / TTL level
power consumption	W	typical/ maximum	25 / 40
power supply	VAC		90..260
mechanical dimensions camera (w x h x l)	mm^3		84 x 66 x 175
mechanical dimensions power supply (w x h x l)	mm^3		135 x 51 x 195
weight	kg		1.02
operating temperature range	°C		+5..+40
operating humidity range	%		10..90
storage temperature range	°C		-20..+70
optical input			Nikon f-mount, c-mount
data interface			IEEE1394, camera link
CE certified			yes

[1] horizontal versus vertical
[2] Analog-to-Digital-converter
[3] dark signal non-uniformity
[4] photo reponse non-uniformity

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software: Camware software for camera control, image acquisition and archiving of images in various file formats, WindowsXP and later, 32bit-dynamic link library (DLL) is available for user customisation and integration on PC platforms (software development kit - SDK), software is operational in either single mode or with built-in recorder functions, drivers for popular third party software packages are available (see website)

options: CMOS image sensor in color version
custom-made versions
camRAM available in: 1 GB, 2 GB and 4 GB

frame rate table [frames per second]

pixelclock exposure time	67.7MHz 1/fps / <1/fps
1280x1024 pixel (full frame)	501 / 499
1280x512 pixel	1002 / 994
1280x256 pixel	2003 / 1972
1280x128 pixel	4006 / 3883
1280x64 pixel	8011 / 7533
1280x32 pixel	16019 / 14216
1280x16 pixel	32023 / 25545

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areas of application

■ high speed inspection ■ short time physics ■ hyper velocity impact studies - automobile crash tests ■ material testing ■ tensile tests ■ airbag inflation ■ traffic control ■ spray analysis ■ hydrodynamics ■ fuel injection ■ super slow motion video clips ■ combustion process analysis ■ semiconductor quality control ■ fast events in nature and medicine ■ ballistics

Images of a sequence showing the popping of a corn recorded at 907 fps (resolution 680 x 512 pixel). Starting with the first image at t = 0s, the following images show the event at t = + 3ms, + 7.7 ms and + 32 ms.

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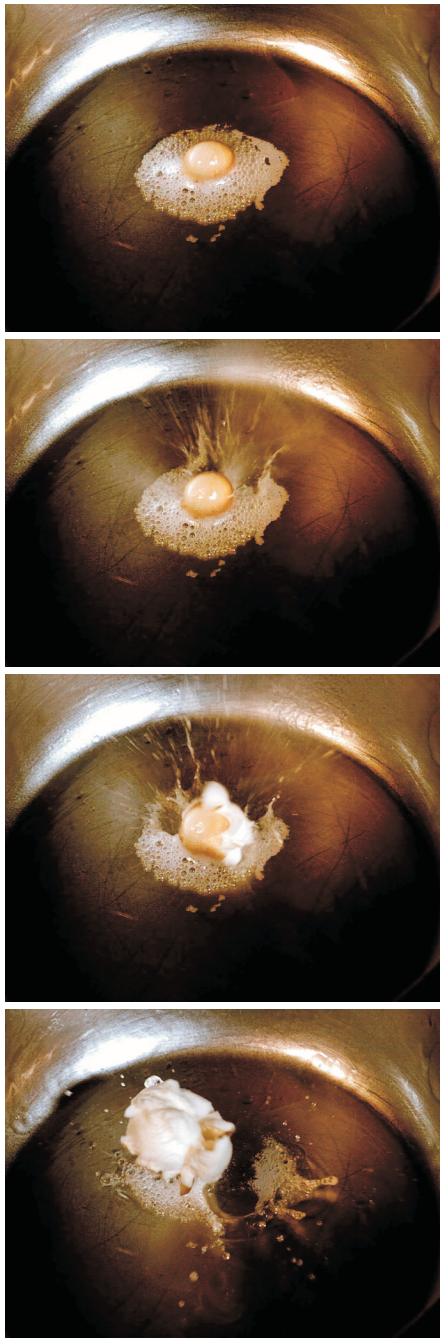

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