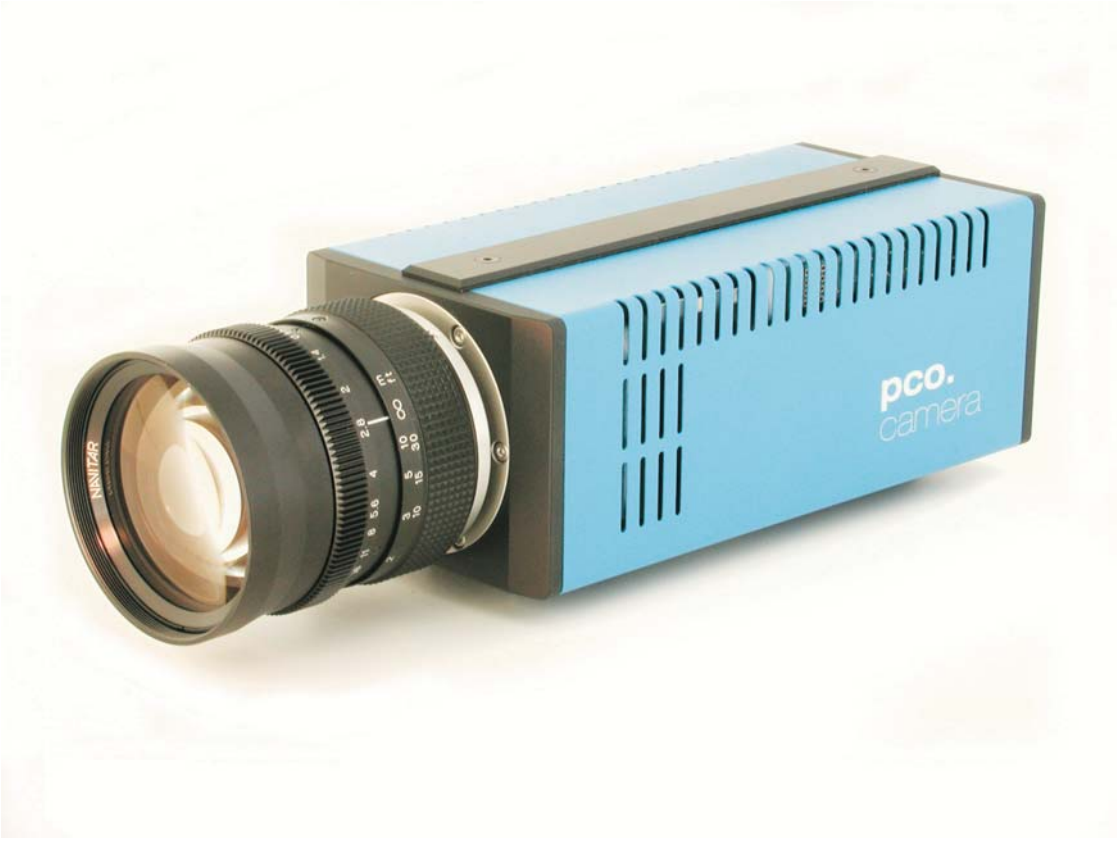
pco.1200 hs
digital high speed 10bit CMOS camera system

- 636 fps at full resolution (1.36kfps at VGA resolution)
- extremely fast image recording - 1GB/s
- high resolution (1280x1024pixel)
- exposure time range 50ns - 5s
- image memory in camera (camRAM up to 4GB)
- interframing time 75ns
- standard interfaces (IEEE1394, camera link, ethernet)



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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 1GB/s. The system features an excellent resolution (1280 x 1024pixel) 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, ethernet). The available exposure times range from 1µs (50ns optional) to 5s.

technical data

	unit	setpoint	pco.1200 hs
resolution (hor x ver)[1]	pixel		1280x1024
pixel size (hor x ver)	µm²		12.0 x 12.0
sensor format/ diagonal	mm²/ mm		15.36x12.29/ 19.67
peak quantum efficiency	%	@ 520nm typical	27
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	@ 66MHz	85
imaging frequency, frame rate	fps	@full frame/ @ROI VGA	636/ 1357
pixel scan rate	MHz	dual speed	66 / 86
A/D conversion factor	e⁻/count		115
spectral range	nm		290..1100
exposure time	s		1µs..5s (50ns..5s opt.)
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
interframing time	ns	full image	75

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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, ethernet
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

frame rate table [frames per second]

pixelclock exposure time	66MHz 1/fps / <1/fps	86MHz 1/fps / <1/fps
1280x1024 pixel (full frame)	488 / 486	636 / 634
1280x512 pixel	977 / 969	1272 / 1263
1280x256 pixel	1953 / 1923	2545 / 2506
1280x128 pixel	3906 / 3788	5090 / 4936
1280x64 pixel	7813 / 7353	10180 / 9581
1280x32 pixel	15625 / 13889	20360 / 18098
1280x16 pixel	31250 / 25000	40720 / 32576

areas of application

■ high speed partical image velocimetry (PIV) ■ short time physics ■ hyper velocity impact studies ■ automobile crash tests ■ material testing ■ tensile tests ■ airbag inflation ■ fast flow visualisation ■ spray analysis ■ hydrodynamics ■ fuel injection ■ sparks in electronical switches ■ combustion process analysis ■ semiconductor quality control ■ fast events in nature and medicine ■ ballistics

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