

sensicam uv

uv sensitive digital 12 bit CCD camera system

- excellent quantum efficiency in UV (QE ~ 10 % @ 193 nm)
- electron multiplication gain from 1 to 500
- high resolution of 1004 x 1002 pixel
- extremely low noise < 1 e⁻ @ gain > 50
- 12 bit dynamic range @ gain = 1
- shutter / exposure times from 75 μs to 1h
- thermoelectrical cooling down to - 12 °C



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This UV sensitive cooled digital 12 bit CCD camera system comprises advanced CCD and electronics technology. With its on-chip multiplication of the light signal the readout noise of the camera can be neglected ($< 1 e^-$ rms @ gain > 50). With its excellent resolution of 1004 x 1002 pixel this high performance cooled digital 12 bit CCD camera system is best suited for extreme low light applications. The system features thermoelectrical cooling of the image sensor (down to $-12\text{ }^\circ\text{C}$) and an outstanding direct (no light converting coating) quantum efficiency in the UV range of the spectrum (QE $\approx 15\%$ @ 254 nm and QE $\approx 10\%$ @ 193 nm). Exposure time modes (software selectable) range from 75 μs (1 row) – 1 h. A high speed serial data link connects the system to the PC (fiber optics link available). This low light camera system is perfectly suited for many sensitive and low noise imaging applications, like fluorescence imaging, semiconductor mask quality control, nano particle size measurements etc..

technical data

	unit	setpoint	sensicam uv
resolution (hor x ver) ¹	pixel		1004 x 1002
pixel size (hor x ver)	μm^2		8.0 x 8.0
sensor format / diagonal	inch / mm		8.03 x 8.03 / 11.35
quantum efficiency	%	@ 610 nm typical @ 254 nm typical @ 193 nm appr.	65 15 10
full well capacity	e^-		40 000
image sensor			TC285SPD
dynamic range	dB	@ CCD + camera	65
dynamic range A/D ²	bit		12
readout noise	e^- rms	@ em gain = 1 @ em gain > 50	18 < 1
imaging frequency, frame rate	fps	@ full frame	13
pixel scan rate	MHz		16
A/D conversion factor	e^- / count	@ em gain = 1	9.8
spectral range	nm		190 .. 1100
exposure time	s		75 μs .. 1 h
anti-blooming factor		typical	1000
smear	%		0.6
binning horizontal	pixel		1, 2, 4, 8
binning vertical	pixel	full resolution for 992 pixel vertical	1, 2 1, 2, 4, 8, 16, 32
dark current	e^- /pixel·s	@ $-12\text{ }^\circ\text{C}$ typical	0.9

technical data

	unit	setpoint	sensicam uv
region of interest	pixel	for 992 pixel vertical	down to 32
charge multiplication		9 steps	1, 2, 5, 10, 20, 50, 100, 200, 500
non linearity	%	full temperature range @ gain = 1	< 1
uniformity darkness DSNU ³	count	@ 90% center zone @ gain = 1	2
uniformity brightness PRNU ⁴	% rms	typical @ 610 nm	0.6
trigger, auxiliary signals		internal / external	software / TTL level
power consumption	W		36
power supply	VAC		90 .. 260
mechanical dimensions camera (w x h x l)	mm ³		93 x 78 x 210
mechanical dimensions power supply (w x h x l)	mm ³		84 x 50 x 155
weight	kg	camera	1.6
operating temperature range	°C		+5 .. +40
operating humidity range	%	non condensing	10..90
storage temperature range	°C		-20..+70
optical input			c-mount, Nikon f-mount
optical input window			fused silica
data interface			PCI local bus, Rev. 2.1, burst rate 132 MByte/s
CE certified			yes
cooled CCD temperature	°C		-12
cooling method			2 stage Peltier cooler with forced air cooling

[1] horizontal versus vertical

[2] Analog-to-Digital-converter

[3] dark signal non-uniformity

[4] photo response non-uniformity

data transfer to PC

standard: twin coaxial cable (5 m)
optional: fiber optic link (10 m – 1500 m)

software

camware software for camera control, display, storage and printing of image data under WindowsXP, WindowsNT, Windows2000; software development kit (SDK) with demo software for the above mentioned operating systems; TWAIN drivers; drivers or plug-ins for popular third party image processing products

options

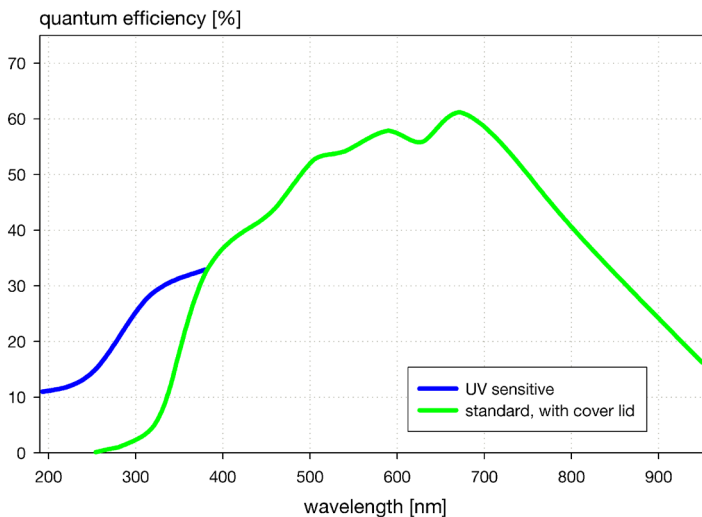
custom made versions

frame rate table [frames per second]

The given resolutions are selected for the frame rate calculations in the tables only, they are not mandatory. For ROIs see „technical data“ table on page 2.

vertical resolution [pixel]	vertical binning	frame rate [fps]
1002	1	12.9
501	2	25.0
248	4	47.3
124	8	84.9
62	16	84.9
31	32	105.8

quantum efficiency



(measured by pco)

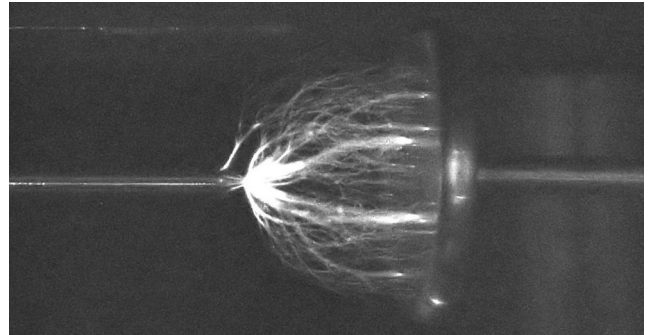
areas of application

- laser induced fluorescence
- fluorescence microscopy
- metrology
- fluorescence spectroscopy (down to UV)
- bioluminescence / chemoluminescence
- low light level imaging
- semiconductor quality control
- nano particle size determination

example of application

High voltage discharge
between gas insulated (SF6
gas) conduits.

...with friendly permission of:
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