

SensiCam

High Speed CCD Imaging System



Image Capture
Every 100 Nanoseconds

the
cooke
corporation

HIGH SPEED CCD IMAGING SYSTEM

Capture an image every 100 nanoseconds

The SensiCam features exposure/delay times from 100 nanoseconds (special system option @ 50 ns) to over 10 msec over a spectral range from 280 nm to 1000 nm. Exposure and delay times are independently selectable by the user in steps of 100 nanoseconds. Recording rates up to 10,000,000 exposures per second are possible.

12-bit dynamic range

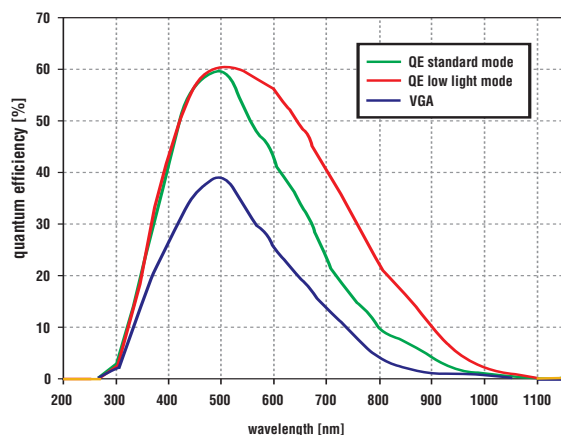
Combining the latest technologies — 12-bit dynamic range and low noise, the SensiCam produces high contrast images for accurate analysis.

Asynchronous single or multiple exposures

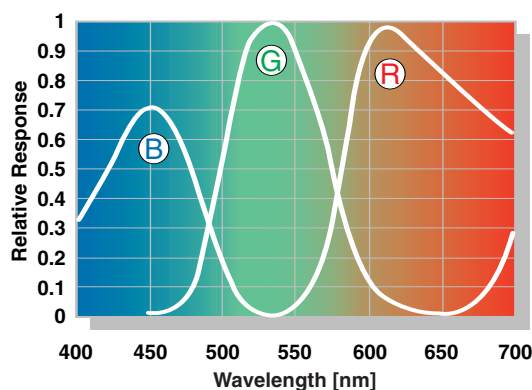
Trigger the SensiCam at any time for single or multiple exposures. Capture multiple exposure images on the same frame, each with its own exposure/delay setting with recording rates up to 10,000,000 exposures per second.

Spectral Response

Monochrome



RGB Color (Mosaic Filter)



SensiCam system shown with lenses, trigger system, flash source, mounting hardware, computer and image processing/analysis software.

Complete system solutions

The SensiCam system comes complete with a PCI-Interface Board and CamWare software to provide camera control, image viewing and saving options. Complete system solutions are available with the integration of lenses, triggering, high intensity light sources, and computer with image processing/analysis software.

Other features

- Up to 16 MHz readout rate with low electronic noise
- High quantum efficiency of 65 % @ 500 nm, and >20% @ 800 nm
- 2-stage peltier cooler to -15°C
- Quantum efficiency $\geq 65\%$
- UV quartz input window
- CamWare software compatible with Windows 98/2000/ME/NT/XP
- Software Developers Kit for driver development

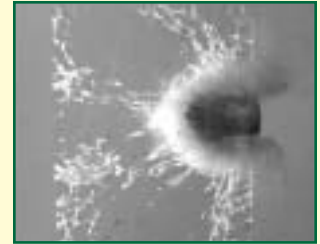
Options

- Double Shot Sequence, capturing of two frames with 200 ns interframe time (minimum)
- Optical Data Transmission up to 1500 m via Fiber Optic Link (FOL)
- LabView driver
- Drivers for popular third party software packages also available
- Hardened against high magnetic fields
- Ballistic software with velocity measurement capability.

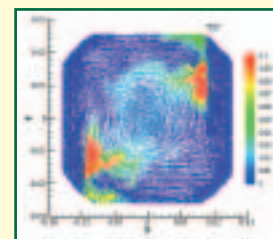
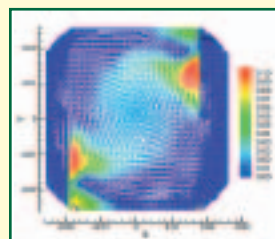
Applications

- Ballistics/Detonics
- Spray & Particle Analysis
- Laser Induced Fluorescence
- Fuel Injection Studies
- Digital Particle Image Velocimetry (DPIV)
- Discharge Studies
- Ink Jet Sprays
- Industrial Inspection
- High Speed Spectroscopy

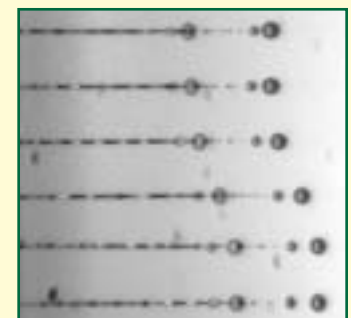
Ballistics



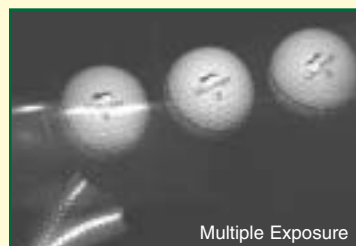
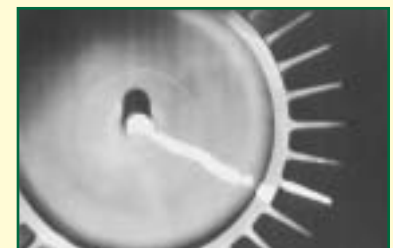
Spray and Particle



FUEL JETS
Instantaneous/
average velocity
vector
measurements (PIV)
are superimposed.
Courtesy Of NRC/IAR
Spray Lab.



General High Speed



Specifications

GENERAL SYSTEM PERFORMANCE			
Sensor Type	CCD-Interline Progressive Scan with "lens-on-chip"		
	VGA	QE	
Number of Pixels	640(H) x 480(V)	1376 (H) x 1040 (V)	
Pixel Size	9.9 μm x 9.9 μm	6.45 μm x 6.45 μm	
Sensor Format	1/2"	2/3"	
Scan Area	6.3 mm x 4.8 mm	8.9 mm x 6.7 mm	
Readout Time Full Frame	30 fps	10 fps	
A/D Conversion Factor	7.5 electrons/count	Standard & Low Light Mode High Gain: 2 electrons/count	Standard Mode Low Gain: 4 electrons/count
Readout Noise	13-14 electrons	Standard & Low Light Mode High Gain: 4 - 5 electrons @ 16 MHz	Standard Mode Low Gain: 5-6 electrons @ 16 MHz
Max. Quantum Efficiency	$\geq 40\%$ @ 500 nm	65% @ 500 nm	
Spectral Response (monochrome)	280 to 1000 nm	280 to 1000 nm	
Dynamic Range	12-bit at 12.5 MHz	12-bit at 16 MHz	
SNR (dB)	68 dB	70 dB	
Exposure/Delay Time Setting	100 ns to 1 ms, multiple exposure (user programmable)	500 ns to 10 ms	
Anti-Blooming	>1000	>1000 (Standard Mode), >4 (Low Light Mode)	
Dark Current	<0.1 electron/pixel/sec.		
Extinction Ratio	1 to 2000		
CCD Quality	Grade 0		
Non-Linearity	<1%		
Binning Horizontal	1 to 8		
Binning Vertical	1 to 32		
Cooling Type	2 stage peltier cooler with forced air regulated to -15°C (VGA), -12°C (SVGA), -12°C (QE)		
Lens Mount	C-Mount with adjustable focus		
Power Supply	110/220 VAC, 50/60 Hz external power supply		
Dimension	Head: 93(W) x 78(H) x 210(L)mm		
Weight	1.6 kg		
Operating Temperature	0 to 40°C		
Storage Temperature	-20 to +70°C		
Humidity	10 to 90% non-condensing		
Optional	Double shot with 200 nsec minimum interval between 2 frames	Double shot with 500 nsec minimum interval between 2 frames	
HIGH SPEED SERIAL LINK			
Standard	5 m coax cable	10 m fiber optic link	
Optional	Fiber optic link up to 1000 m		
PCI INTERFACE BOARD			
Board	PCI Local bus compatible, revision 2.1		
Buffer RAM	16 MByte		
Trigger Input	TTL level (rising/falling edge): BNC connector		
ACCESSORIES			
Available accessories include lenses, trigger systems, flash sources, mounting hardware, computers and image processing/analysis software.			
ORDERING INFORMATION			
The SensiCam High Speed Digital CCD Camera Imaging System comes complete with PCI interface board, coax or FOL cable, software, power supply and manual.			
To order, specify sensor type	VGA	QE	
	Monochrome or Color	Monochrome or Color	