LaVision

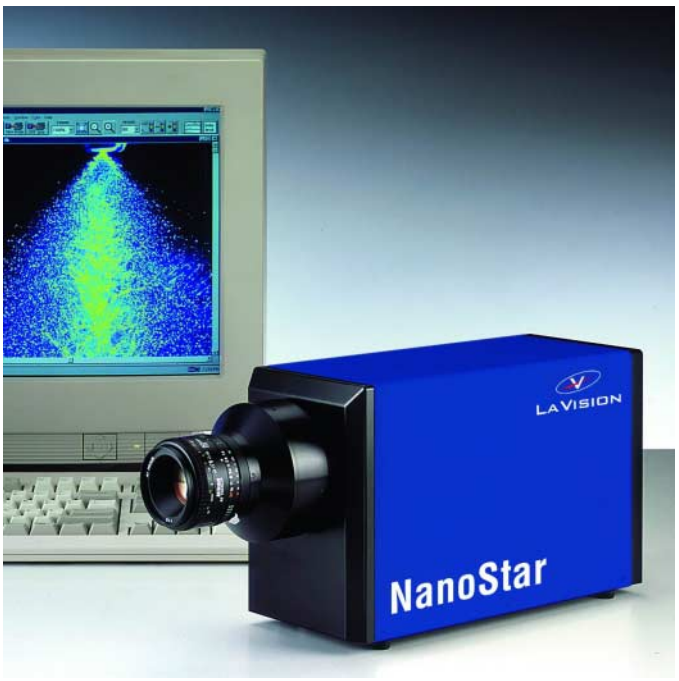
We count on Photons

NanoStar

family of intensified 12 bit camera systems for imaging and spectroscopy.

NanoStar incorporates a high resolution fast-scan CCD, very fast readout, and low noise.

- Image Intensifier: gate width to 5 ns, repetition rate to 2 MHz, UV – NIR with single photon sensitivity
- CCD: 12 bit, 12.5 MHz readout, 1280 x 1024 pixels or 1340 x 1024 pixels, horizontal and vertical binning
- Interface: PCI board connected with fiber optic cable (10-1500 m)
- DaVis software: image acquisition and analysis, camera control, synchronization and control of external devices, programming of all features in 'C' syntax
- **NEW** Double frame mode: 2 full frames with interframing time down to 500 ns



SPECIAL

Fast electronic CCD-shutter on-chip (superior to MCP bracket-pulsing or MCP gating)

Applications

- Combustion Research
- Spray Diagnostics
- Fluorescence Imaging and Spectroscopy
- Engine Diagnostics
- Flow Analysis
- Raman Imaging
- Plasma Diagnostics
- Laser Ablation

- Ultrafast Readout: 8 frames /s (1280 x 1024 pixels)
  High System Dynamic: > 2000 : 1 @ single shot
- Compact Design: all controllers built in camera head
- Test Certificate: detection efficiency (counts / photoelectron),
- gain curve, single or double shot linearity, dark noise
  Options: spectrograph, stepping motor, chiller, lenses,
- stereoscope, filters, additional analogue input, software packages for device control (spectrographs, lasers, stepping motors)

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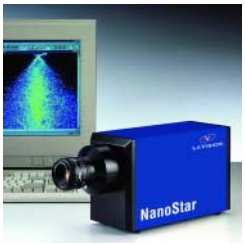
NanoStar



NanoStar is a turn-key system. It consists of camera head including control units (for CCD and image intensifier), PC, PCI interface and TTL-I/O board. The DaVis software integrates these devices into a single system. This allows immediate implementation and synchronization to the application.

The image intensifier is proximity focused with single stage MCP. Different photo cathodes are available with 18 or 25 mm diameter.

The DaVis software controls all camera functions (gate width, delay, gain, binning, windowing) and performs accurate timing. By use, the user can quickly acquire a data series. Measurement and evaluation series can also be user programmed with 'C' syntax Command Language.

Note:
Above data is for NanoStar camera family. For the specific models see corresponding technical data sheets.

A. General System Specifications

Image intensifier gate	down to 5 ns
System dynamic	> 2000:1 @ single shot
Sensitivity	typical: > 80 counts / photoelectron
Spectral range	190 – 900 nm
Double frame	2 full frames with interframing time down to 500 ns
On-chip CCD shutter	down to 100 ns electronic CCD shutter

B. CCD Chip and Control Unit

Sensor	SuperVGA
Number of pixels	1280 x 1024 pixels
Pixel size	6.7 x 6.7µm
Full-well capacity	25,000 electrons
Frame rate	8 frames/s
Readout rate	12.5 MHz
Readout noise	< 2 counts RMS @ 12.5 MHz
A/D converter	12 bit @ 12.5 MHz
Binning	horizontal 1-8, vertical 1-32
Cooling type	2-stage Peltier, forced air (optional liquid)

C. Image Intensifier and Control Unit

Design	proximity focused, single stage MCP
Photocathode	18 mm or 25 mm, S20, S25, GaAs or GaAsP
Gate width	5 ns – 1000 s
Delay	0 ns - 1000 s, with minimum 45 ns intrinsic delay
Jitter	< 0.5 ns (< 5 ns for gates ≥ 100 ns)
Repetition rate	to 2 MHz (3 kHz for gates < 20 ns)
Phosphor	P43 or P46 (decay to 10% in 1 ms or 0.3 µs)
Coupling to CCD	lens optics

D. Personal Computer, PCI Interface and TTL-I/O Board

state-of-the-art PC, monitor, TTL-I/O interface, PCI interface with fiber optic cable.

E. DaVis software

Operating System	Windows XP
Data acquisition	Camera, timing, user programmable
Data processing	buffer, column, row or pixel addressing
Command Language	'C' syntax for system and user functions
Communication	RS 232 (GPIB optional), TTL-I/O board

F. Options

Spectrograph	various types with adapter to camera head
Device control	spectrograph, stepping motor, laser
Optics	lenses (e.g. UV-Nikkor), telescopes, filters, long distance microscopes (Questar), macro lenses
Upgrades	LIF, Rayleigh, Raman, Spray, ...
Analogue input	simultaneous recording (e.g. single shot control)

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