FASTCAM SA4
HIGH-SPEED IMAGING SYSTEM

High performance CMOS sensor technology providing 3,600 fps operation at 1,024 x 1,024 pixel resolution and frame rates up to 500,000 fps at reduced resolution

To complement the existing range of Photron high-performance high-speed imaging products, the FASTCAM SA4 delivers a fully featured system including mega-pixel resolution, high light sensitivity, high dynamic range and low noise at an attractive price level.

For demanding applications that do not require the highest frame rates but where all other aspects of system specification are important the FASTCAM SA4 is the correct choice. Applications include fluid dynamics, biomechanics, material test, airbag development and test, microscopy and automotive safety testing.

The FASTCAM SA4 is 100% compatible with the existing range of Photron products and shares features such as remote keypad with built in view finder for remote operation and support of Photron data acquisition devices.

For applications where ingress of dust would be hazardous or external fans are undesirable a sealed case option (FASTCAM SA4 RV) is available.

Target applications include:

- Materials research
- Combustion
- Ballistics
- Cavitation
- Aerospace
- Fluid dynamics
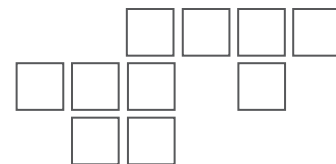- PIV

Benefits

- Performance examples:
  - 1,024 x 1,024 pixels @ 3,600 fps
  - 512 x 512 pixels @ 13,500 fps
  - 256 x 256 pixels @ 45,000 fps
  - 128 x 128 pixels @ 125,000 fps
  - 128 x 16 pixels @ 500,000 fps

- Variable Region of Interest (ROI)

- 1 µs global shutter

- Capture 12-bit uncompressed data

- 20 µm pixels ensure best light sensitivity for demanding high-speed or low light applications

- Equivalent ISO light sensitivity 10,000 (monochrome), 4,000 (color) measured to ISO12232 S sat

- Phase lock to IRIG/GPS

- Composite and SDI video output for real time monitoring during set up, recording and playback

- Optional remote keypad control with integrated viewfinder

- 8GB, 16GB, 32GB or 64GB memory options

- Gigabit Ethernet interface

Photron

www.photron.com

FASTCAM SA4
HIGH-SPEED IMAGING SYSTEM

Specifications: Partial Frame Rate / Recording Duration Table

FRAME RATE (fps)	RESOLUTION Horizontal	RESOLUTION Vertical	MAXIMUM SHUTTER SPEED	TIME (Sec.) 8GB	TIME (Sec.) 16GB	TIME (Sec.) 32GB	TIME (Sec.) 64GB	FRAMES 8GB	FRAMES 16GB	FRAMES 32GB	FRAMES 64GB
1,000	1,024	1,024		5.45	10.91	21.84	43.68	5,457	10,918	21,841	43,686
2,000	1,024	1,024		2.72	5.45	10.92	21.84	5,457	10,918	21,841	43,686
3,000	1,024	1,024		1.81	3.63	7.28	14.56	5,457	10,918	21,841	43,686
3,600	1,024	1,024		1.51	3.03	6.06	12.13	5,457	10,918	21,841	43,686
5,000	1,024	768		1.45	2.91	5.82	11.64	7,276	14,558	29,121	58,248
6,750	1,024	576		1.43	2.87	5.75	11.5	9,701	19,410	38,829	77,665
6,750	768	768		1.43	2.87	5.75	11.5	9,701	19,410	38,829	77,665
7,500	1,024	512	1 µs	1.45	2.91	5.82	11.64	10,914	21,837	43,682	87,372
10,000	768	512	1/1,000,000 sec	1.45	2.91	5.82	11.64	14,552	29,116	58,243	116,497
12,500	640	480		1.49	2.98	5.96	11.92	18,627	37,269	74,551	149,114
13,500	512	512		1.61	3.23	6.47	12.94	21,829	43,674	87,365	174,746
27,000	512	256		1.61	3.23	6.47	12.94	43,658	87,349	174,730	349,485
36,000	384	240		1.72	3.45	6.90	13.8	62,092	124,230	248,505	497,045
45,000	256	256		1.94	3.88	7.76	15.53	87,317	174,698	349,461	698,970
50,000	320	192		1.86	3.72	7.45	14.91	93,138	186,345	372,758	745,585
86,400	256	128		2.02	4.04	8.08	16.18	174,634	349,397	698,922	1,397,973
125,000	128	128		2.79	5.59	11.18	22.36	349,269	698,794	1,397,845	2,795,878
225,000	128	64		3.10	6.21	12.42	24.85	698,538	1,397,589	2,795,690	5,591,893
360,000	128	32		3.88	7.76	15.53	31.06	1,397,077	2,795,178	5,591,381	11,183,786
500,000	128	16		5.58	11.18	22.36	44.73	2,794,154	5,590,357	11,182,762	22,367,573

RECORD DURATION (12-BIT)

Sensor — 12-bit ADC (Bayer system color, single sensor) with 20 µm pixel

Shutter — Global electronic shutter from 16.7ms to 1 µs independent of frame rate

Lens Mount — Interchangeable F-mount and C-mount using supplied adapters

Extended Dynamic Range — Selectable in twenty steps (0 to 95% in 5% increments) to prevent pixel over-exposure

Memory — 8GB (standard: 5,457 frames @ maximum resolution)
16GB (option: 10,918 frames @ maximum resolution)
32GB (option: 21,841 frames @ maximum resolution)
64GB (option: 43,686 frames @ maximum resolution)

Video Output 1 — NTSC/PAL composite VBS (BNC). Ability to zoom, pan and tilt within image via keypad. Live video during recording

Video Output 2 — HD-SDI: HD-SDI 2 channel (BNC) digital output

Camera Control — Through optional keypad with integrated viewfinder and Gigabit Ethernet or RS-422

User Preset Switches — Four user selectable camera function controls mounted on the camera's rear panel

Low Light Mode — Low light mode drops the frame rate and shutter time to their maximum values, while maintaining other set parameters, to enable users to position and focus the camera

Triggering — Selectable positive or negative TTL 5Vp-p or switch closure

Trigger Delay — Programmable delay on selected input and output triggers, 100ns resolution

Timing — Internal clock or external source

Phase Lock — Enables cameras to be synchronized precisely together to a master camera or external source, such as IRIG/GPS time codes

Event Markers — Ten user entered event markers mark specific events within the image sequence in real time. Immediately accessible through software

Dual Speed Recording — Enables the recording speed to be changed up or down by a factor of 2, 4 or 8 during a recording

Trigger Modes — Start, End, Center, Manual, Random, Random Reset, Random Center, Random Manual and Duals Speed Recording

Saved Image Formats — JPEG, AVI, TIFF, BMP, RAW, PNG, MOV and FTIF. Images can be saved with or without image or comment data

Data Display — Frame Rate, Shutter Speed, Trigger Mode, Date or Time, Status (Playback/Record), Real Time, Frame Count and Resolution

Partitioning — Up to 64 memory segments for multiple recording in memory

Data Acquisition — Supports Photron MCDL and DAQ

Cooling — Actively cooled

Operating Temperature — 0 - 40 degrees C (32 - 104 degree F)
Range Version increases upper limit to 45 deg. C (113 deg. F)

Mounting — 1 x 1/4 - 20 UNC, 1 x 3/8 - 16 UNC, 6 x M6

Dimensions — 160mm (6.30")H×153mm (6.02")W×242.5mm (9.55")D *excluding protrusions

Weight — 5.9 kg (13 lbs)

Power Requirements — 100V-240V AC ~ 1.5A, 50-60Hz
DC operation 20-36 V DC, 100VA

Specifications subject to change without notice

Photron
SLOW MOTION IMAGING SOLUTIONS