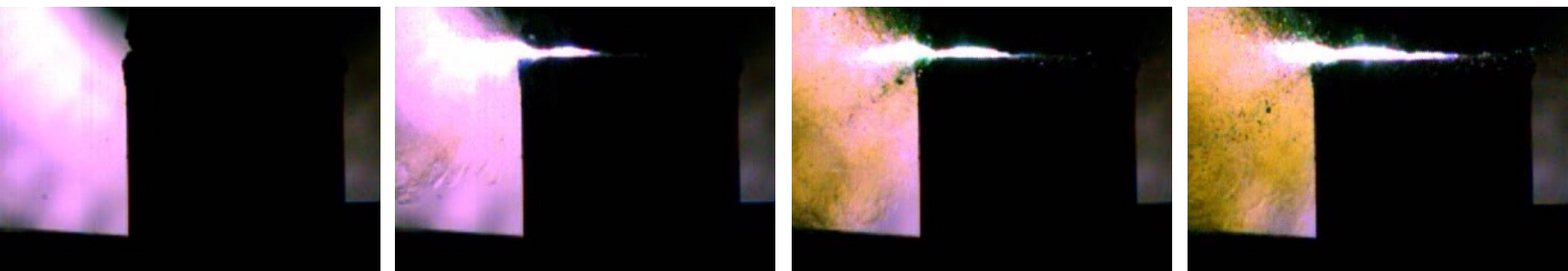


FASTCAM SA-Z

THE POWER AND THE SPEED TO UNDERSTAND MOTION



Speed Without Compromise

The Photron FASTCAM SA-Z offers scientists, researchers and engineers the ability to capture high resolution digital images at ultra-high speeds to see and understand previously invisible processes and events. Using Photron's proprietary CMOS image sensor technology, FASTCAM SA-Z combines high recording rates with outstanding light sensitivity and excellent image quality to provide the most versatile ultra-high speed digital camera available today.

The ultra-high speed SA-Z provides mega pixel resolution to a blistering 21,000 frames per second (fps) from its very light sensitive (ISO 25,000) 20µm square pixels, with 12-bit pixel depth (ADC) delivering incredible image quality. The SA-Z can operate at reduced resolution to over two million frames per second.

A global electronic shutter, 1µs standard, but capable of operating down as fast as 159 nanoseconds (export restrictions apply) ensures the 12-bit monochrome, 36-bit color images are crystal clear and blur free as you have come to expect from Photron high speed imaging products.

The square image format enables users to rotate their camera if needed, without having to sacrifice resolution as is so often needed with other aspect ratios, and with Photron's award winning PFV camera control/replay/editing software you can rotate the image back in real time.

APPLICATIONS

- Ballistics
- Plasma and arc studies
- Materials Science
- Fluidics
- Shock waves and detonics

Photron
High Speed Cameras

BENEFITS

- ISO 25,000 monochrome (10,000 color) measured using the recognized ISO 12232 Ssat method.
- Powerful performance with many usable resolution and speed combinations, including:
 - 1,024 pixels horizontal by 1,024 pixels vertical resolution to 20,000 frames per second (fps).
 - 1,024 x 512 up to 40,000 fps.
 - 640 x 280 to 100,000 fps.
 - 84 x 176 pixel operation to 200,000 fps.
- Reduced resolution operation to over 2M frames per second
- Global electronic shutter down to 159ns, freezing the fastest motion without blur.
- Two SD card slots and dual Gigabit Ethernet ports enable easy and very fast image off load.
- Available with four onboard memory options:
 - 8GB
 - 16GB
 - 32GB
 - 64GB



SPECIFICATIONS: Partial Resolution - Frame Rate - Record duration table

Frame Rate (fps)	Maximum Resolution		Record Duration (12-Bit)							
			Time (Sec.)				Frames			
	Horizontal	Vertical	8GB	16GB	32GB	64GB	8GB	16GB	32GB	64GB
480K Model										
500			10.91	21.83	43.68	87.37	5,455	10,916	21,839	43,684
1,000			5.46	10.92	21.84	43.68	5,455	10,916	21,839	43,684
2,000	1,024	1,024	2.73	5.46	10.92	21.84	5,455	10,916	21,839	43,684
10,000			0.55	1.09	2.18	4.37	5,455	10,916	21,839	43,684
20,000			0.27	0.55	1.09	2.18	5,455	10,916	21,839	43,684
21,000	1,024	1,000	0.27	0.53	1.07	2.13	5,586	11,178	22,363	44,733
40,000	1,024	512	0.27	0.55	1.09	2.18	10,912	21,835	43,680	87,371
60,000	640	480	0.31	0.62	1.24	2.49	18,600	37,200	74,400	149,100
67,200	512	512	0.33	0.65	1.31	2.62	24,508	49,036	98,092	196,204
100,000	640	280	0.32	0.64	1.28	2.56	31,931	63,887	127,801	255,627
120,000	512	256	0.36	0.73	1.46	2.91	43,656	87,347	174,728	349,491
180,000	256	256	0.49	0.97	1.94	3.88	87,315	174,696	349,459	698,984
360,000	128	128	0.97	1.94	3.88	7.77	349,267	698,792	1,397,843	2,795,944
480,000	512	56	0.42	0.83	1.66	3.33	199,580	399,309	798,766	1,597,681
2100K Model (Export License Restrictions Apply)										
525,000	384	64	0.44	0.89	1.78	3.55	232,844	465,861	931,894	1,863,962
700,000	256	56	0.57	1.14	2.28	4.57	399,162	798,620	1,597,535	3,195,365
900,000	128	64	0.78	1.55	3.11	6.21	698,536	1,397,587	2,795,688	5,591,891
1,200,000	128	32	1.16	2.33	4.66	9.32	1,397,075	2,795,176	5,591,379	11,183,784
2,100,000	128	8	2.66	5.32	10.65	21.3	5,588,307	11,180,712	22,365,523	44,735,144



FASTCAM SA-Z rear panel view

Sensor	20µm square pixel with 12-bit ADC	Triggering	Selectable positive or negative TTL 5Vp-p or switch closure
Shutter	Global electronic shutter from 1ms to 1µs independent of frame rate (159ns shutter option available subject to export control)	Trigger Delay	Programmable delay on selected input and output triggers, 100ns resolution
Lens Mount	Interchangeable Nikon F-mount (compatible with Nikon G type lenses) and C-mount using supplied adaptors. Optional Canon EF mount	Timing	Internal clock or external source
Extended Dynamic Range	Selectable in 20 steps (0 to 95%) to prevent individual pixel overexposure	Phase Lock	Enables cameras to synchronize precisely to a master camera or external signal source, such as IRIG/GPS time code
Memory	8GB (standard: 5,455 frames @ maximum resolution) 16GB (option: 10,916 frames @ maximum resolution) 32GB (option: 21,839 frames @ maximum resolution) 64GB (option: 43,684 frames @ maximum resolution)	Event Markers	Ten user specified event markers indicate specific events within an image sequence in real time. Immediately accessible through software
Recording bit-depth	Selectable 8-bit or 12-bit recording	Trigger Modes	Start, End, Center, Manual, Random, Random Reset, Random Center, Random Manual, Image Trigger
Video Output	Live & replay video through 2 x HD-SDI or 2 x RS170 outputs	Saved Image Formats	JPEG, AVI, TIFF, BMP, RAW, RAWW, MRAW PNG, MOV and FTIF. Images can be saved with, or without image or comment data
Non-volatile Data Storage	2 x SD card slots for direct image download	Data Display	Frame Rate, Shutter Speed, Trigger Mode, Date or Time, Status (Playback /Record), Real Time, Frame Count, Resolution and IRIG time stamp
Camera Control	Remote PC control via high-speed dual port Gigabit Ethernet or optional local control via handheld keypad with LCD monitor	Partitioning	Up to 64 memory segments for capturing multiple recordings. It is possible to download one recording while writing to another
User Preset Switches	Four user selectable camera function controls mounted on the camera's rear panel	Data Acquisition	Supports Photron and National Instruments™ DAQ options
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	Operating Temp.	0 - 45 degrees (32 - 113 degree F)
		Mounting	3 x 1/4 - 20 UNC, 3 x 3/8 - 16 UNC
		Dimensions	261mm (10.2")H×150mm (5.9")W×375mm (14.7")D
		Weight	10.5 kg (23.15 lbs)
		Power Requirements	100V-240V AC 50-60Hz. DC operation 20-36 VDC, 230VA

PHOTRON USA, Inc.
9520 Padgett Street, Suite 110
San Diego, California 92126
USA
Tel. +1 858-684-3555 1 800-585-2129
Email. image@photron.com
Web. www.photron.com

PHOTRON (EUROPE) LIMITED
The Barn, Bottom Road
West Wycombe, Bucks, HP14 4BS
United Kingdom
Tel. +44 (0) 1494 481011
Email. image@photron.com
Web. www.photron.com

PHOTRON LIMITED
Fujimi 1-1-8
Chiyoda-Ku, Tokyo 102-0071
Japan
Tel. +81 (0) 3 3238 2107
Email. image@photron.co.jp
Web. www.photron.co.jp

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