FASTCAM SA-Z

HIGH PERFORMANCE HIGH-SPEED CAMERA SYSTEM \square



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 FASTCAM SA-Z provides mega pixel resolution to a blistering 21,000 frames per second (fps) from it's very light sensitive (ISO 50,000) 20 µm square pixels, with 12-bit pixel depth (ADC) delivering incredible image quality. The FASTCAM SA-Z can operate at reduced resolution beyond 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 is ideal for any application requiring recording through a round or square viewing ports, such as combustion research, and has the added benefit of enabling users to rotate their camera if required without having to sacrifice horizontal resolution as is required when a camera with a rectangular aspect ratio is mounted on its side. Tools within Photron's PFV camera control / replay / editing software allow the displayed image to be rotated to reflect the true view.

Target applications include:

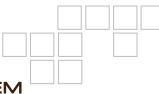
- Materials Science
- Defense and aerospace research
- Combustion Research
- Plasma and arc studies
 Shock Waves and Detonation
- Fluid dynamics (PIV)
- Ballistic Imaging
- Photron.com

Benefits

- Powerful performance with many usable resolution and speed combinations, including:
 - 20,000 fps at 1,024 x 1,024 pixels resolution
 - 40,000 fps at 1,024 x 512 pixel resolution
 - 100,000 fps at 640 x 280 pixel resolution
 - 200,000 fps at 384 x 176 pixel resolution
- Reduced resolution operation to over 2M frames per second
- Market leading light sensitivity (ISO Ssat 12232 standard)
 ISO 50,000 monochrome
 - ISO 20,000 color
- Global electronic shutter as fast as 159ns (independent of frame rate or resolution selected), 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
- Available with FAST Drive, an optional high-speed solid state drive (SSD) for local non-volatile retention of images



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Specifications: Partial Frame Rate / Recording Duration Table

	MAXIMUM RESOLUTION		RECORD DURATION (12-BIT)								
FRAME RATE (fps)	MAXIMUM RE Horizontal	Vertical				FRAMES					
			8GB	16GB	32GB	64GB	8GB	16GB	32GB	64GB	
				Mod	el 480K						
50	1,024	1,024	109.10	218.32	436.78	873.68	5,455	10,916	21,839	43,684	
1,000	1,024	1,024	5.46	10.92	21.84	43.68	5,455	10,916	21,839	43,684	
5,000	1,024	1,024	1.09	2.18	4.37	8.74	5,455	10,916	21,839	43,684	
20,000	1,024	1,024	0.27	0.55	1.09	2.18	5,455	10,916	21,839	43,684	
25,000	1,024	840	0.27	0.53	1.07	2.13	6,650	13,308	26,623	53,254	
40,000	1,024	512	0.27	0.55	1.09	2.18	10,912	21,835	43,680	87,37	
60,000	640	488	0.31	0.61	1.22	2.45	18,320	36,656	73,327	146,67	
75,000	512	456	0.33	0.65	1.31	2.62	24,508	49,036	98,092	196,20	
100,000	640	280	0.32	0.64	1.28	2.56	31,931	63,887	127,801	255,62	
120,000	512	264	0.35	0.70	1.41	2.82	42,333	84,700	169,433	338,90	
200,000	384	176	0.42	0.85	1.69	3.39	84,669	169,402	338,869	677,80	
				Mod	el 2100K						
525,000	384	64	0.44	0.89	1.78	3.55	232,844	465,861	931,894	1,863,9	
700,000		56		1.14	2.28	4.57	399,162	798,620	1,597,535	3,195,3	
900,000	128	56	0.89	1.77	3.55	7.10	798,327	1,597,242	3,195,073	6,390,73	
1,008,000	256	24	0.92	1.84	3.69	7.39	931,382	1,863,450	3,727,585	7,455,8	
1,200,000	128	32	1.16	2.33	4.66	9.32	1,397,075	2,795,176	5,591,379	11,183,7	

Model 2100K subject to export license control restrictions where applicable

	Sensor	$20\mu m$ pixel size, 12-bit ADC (Bayer system color, single sensor)	Triggering	Selectable positive or negative TTL or switch closure		
	Shutter	Global electronic shutter from 1 ms to 159ns independent of frame rate (sub-microsecond shutter available subject to export license control)	Trigger Delay	Programmable delay on selected input and output trig		
Lens Mount		Interchangeable Nikon F-mount (compatible with Nikon G type lenses),	Timing	Internal clock or external source		
		C-mount using supplied adapters. Optional Canon EF remote control mount	Phase Lock	Enables cameras to synchronize precisely to a master		
Extended Dynamic		Selectable in twenty steps (0 to 99% in 5% increments) to prevent pixel		signal source		
Range Memory		over-exposure	Event Markers	Ten user specified event markers indicate specific ever sequence in real time. Immediately accessible through		
		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)	Trigger Modes	Start, End, Center, Manual, Random, Random Reset, Random Manual		
	Recording bit depth	Selectable 8-bit or 12-bit recording	Saved Image Formats	JPEG, AVI, TIFF, BMP, RAW, RAWW, MRAW PNG, MOV can be saved with or without image or comment data		
	Video Output	Live and playback video through Two HD-SDI or Dual RS-170 (NTSC/PAL) outputs	Data Display	Frame Rate, Shutter Speed, Trigger Mode, Date or Tin (Playback /Record), Real Time, Frame Count and Reso		
	Standard Nonvolatile Data Storage	2x SD/SDHC/SDXC memory Card drives provided. Compatible with UHS-I (SDR104)	Partitioning	Up to 64 memory segments for capturing multiple rec camera memory		
	Optional Nonvolatile Data Storage	1TB high-speed solid state drive	Data Acquisition	, Supports Photron and National Instruments DAQ optic		
	Camera Control	Remote computer control via high-speed dual port Gigabit Ethernet or optional local control via handheld keypad with LCD monitor	Operating Temperature	0 - 45 degrees		
User Preset Switches		Four user schedulable camera function controls mounted on the camera's	Mounting	3 x 1/4-20 UNC, 3 x 3/8-16 UNC		
	User Treser Switches	rear panel	Dimensions	261mm (10.2")H×150mm (5.9")W×375mm (14		
Low Light Mode		Low light mode drops the frame rate and shutter time to their maximum	Weight	10.4 kg (22.93 lbs) ^{*excluding}		
		values, while maintaining other set parameters, to enable users to position and focus the camera	Power Requirements	100V-240V AC 50-60Hz DC operation 20-36 VDC 230VA		

lelay on selected input and output triggers, 100ns resolution external source s to synchronize precisely to a master camera or external d event markers indicate specific events within an image time. Immediately accessible through software er, Manual, Random, Random Reset, Random Center, BMP, RAW, RAWW, MRAW PNG, MOV and FTIF. Images th or without image or comment data Itter Speed, Trigger Mode, Date or Time, Status rd), Real Time, Frame Count and Resolution ry segments for capturing multiple recordings into n and National Instruments DAQ options , 3 x 3/8-16 UNC $H \times 150 \text{mm}$ (5.9") $W \times 375 \text{mm}$ (14.7") $D^{\text{*excluding}}_{\text{protrusions}}$ lbs) *excluding protrusions 50-60Hz

DC operation 20-36 VDC, 230VA

February 9, 2016 - Specifications subject to change without notice

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