



Phantom S991  
Front View



Phantom S991  
Back View

# PHANTOM S991

4K High Speed  
Machine Vision

937 fps at 4096 x 2304 resolution  
CXP-over-Fiber for extreme high-speeds  
High image quality, with low noise



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## DESIGNED FOR EXTREME HIGH-SPEED MACHINE VISION

- The Phantom S991 uses renowned Phantom sensor technology to offer both high resolution imaging and high frame rates to achieve 9Gpx/sec (70 Gbps) throughput and over 900 fps at full resolution and 52,000 fps at smaller resolutions.
- The S991 employs CoaXPress-over-Fiber (CXPoF) with CXP-12, the latest in high-speed machine vision technology, to deliver high throughput with ease of use. Two simple cables reliably transfer data, with very low latency.
- CXP 2.0 protocol is an industry accepted standard and supports extreme high frame rates.

## PACKED WITH PHANTOM QUALITY

- 9 Mpx resolution with a 6.75µm pixel and 12-bit capabilities provides exceptional detail
- Phantom image quality offers very low noise and high dynamic range for the clearest images
- Flexible, with Rolling and Global shutter, 8-bit or 12-bit selection, and a full selection of signals.

FRAME RATES & EXPOSURE		
	12-bit	8-bit
Top FPS at Max Resolution	625	937
1 Megapixel FPS	2,645	2,645
Maximum FPS	52,080	52,080
Minimum FPS	30	
CAR Increments	128 x 4 (bank A); 128 x 8 (banks A & B)	
Minimum Exposure	5 $\mu$ s	
Electronic Shutter	Global Shutter / Rolling Shutter	

IMAGING	
Sensor Type	CMOS
Maximum Resolution	4096 x 2304
Bit Depth	12-bit, output in either 12-bit or 8-bit
Pixel Size	6.75 $\mu$ m
Sensor Size	27.6 x 15.5 mm; 31.72 mm diagonal
ISO Daylight (12232 STD)	GS: Color 400 RS: Color 250
ISO Tungsten (12232 STD)	GS: Color 400 RS: Color 250

RESOLUTION			FPS			
H	V	Bit Depth	2 Fiber Banks		1 Fiber Bank	
			Global Shutter	Rolling Shutter	Global Shutter	Rolling Shutter
4096	2304	8-bit	937	937	465	465
		12-bit	620	620	310	310
3072	2000	8-bit	1,075	1,075	715	715
		12-bit	955	955	475	475
2048	1600	8-bit	1,340	1,340	1,340	1,340
		12-bit	1,340	1,340	890	890
1280	800	8-bit	2,635	2,645	2,635	2,645
		12-bit	2,635	2,645	2,635	2,645
1024	512	8-bit	4,035	4,065	4,035	4,065
		12-bit	4,035	4,065	4,035	4,065
1024	128	8-bit	13,840	14,200	13,840	14,200
		12-bit	13,840	14,200	13,840	14,200
1920	64	8-bit	23,270	24,300	23,270	24,300
		12-bit	23,270	24,300	16,185	16,905
2560	32	8-bit	35,280	37,715	28,225	30,170
		12-bit	35,280	37,715	18,815	20,110
2304	32	8-bit	35,280	37,715	31,360	33,520
		12-bit	35,280	37,715	20,900	22,345
2304	16	8-bit	47,550	52,080	42,270	46,290
		12-bit	47,550	52,080	28,180	30,860
2048	16	8-bit	47,550	52,080	47,550	52,080
		12-bit	47,550	52,080	31,700	34,720
128	4	8-bit	N/A	N/A	47,550	52,080
		12-bit	N/A	N/A	47,550	52,080



### CONNECTIVITY & SIGNALS

QSFP+ Ports	Bank A Bank B	
Timecode	IRIG-B Modulated and Un-modulated	
Port Descriptions	Dedicated BNC	Timecode-in
	I/O BNC	3 Ports
	Power	6-pin Fischer
	Ethernet (for programming only)	RJ45
I/O Signals - available on GPIO 0, 1, 2	<b>Signal</b>	<b>I/O</b>
	Trigger In	Input
	Trigger Out	Output
	Software Trigger Out	Output
	Strobe	Output
	Event	Input
	Ready	Output
	Memgate	Input
	Timecode In	Input
	Timecode out	Output
	User out	Output
	User in	Input



Phantom S991 Connectors



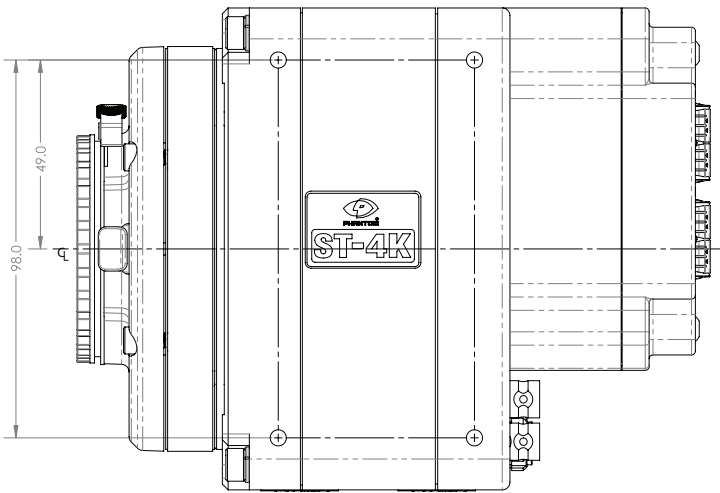
Phantom S991 with cables

### CONTROL

Operational Protocols	CXP-12, CoaXPress-over-Fiber (CXPoF), CXP 2.0 protocol compliant
Exposure Start	Programmed in GenICam and operates as FSYNC
Exposure Active	Frame state and exposure duration are controlled by an input signal, for synchronizing with systematic processes
Metadata Available	Meta data including Event ID, Event timestamp, Event payload can be streamed

## MECHANICAL

Size	5 x 5 x 6.3" (125 x 125 x 159.7 mm)
Weight	7.0 lbs (3.2 kg)
Lens Mounts	F Mount standard, EOS, C, M42 and PL Mounts optional
Mounting Points	6 x 1/4-20, 16 x M5-0.8 mounting points
Internal Shutter	Standard, for remote black references
Cooling	Active cooling. Fans can be disabled via Quiet mode.



## POWER

AC Power	80W 24V power supply included
Voltage Range	16-32 VDC

## ENVIRONMENTAL

Operating Temperature	0 to +50°C
Storage Temperature	-20 to +70°C
Operational Shock	Rated 30G, sawtooth wave, 11 ms, +/- 10 pulses all axes
Operational Vibration	MIL-STD-202H Method 214-I; Test Condition A. Rated 7.5 Grms, 15 min/axis
Regulatory	Made in the USA CE Emissions – CE Compliant EN 61326-1 CE Immunity – CE Compliant EN 61326-1 FCC – CFR 47, Part 15, Subpart B & ICES-0003, Class A Safety - IEC 60950-1

## GLOBAL SUPPORT NETWORK

The Phantom High-speed Machine Vision Cameras are supported by Vision Research's Global Service and Support network, offering Phantom Care Performance Services from multiple sites around the globe. Maximize the value of your Phantom camera with a selection of professional services from which to choose

Learn more about our service offering at [www.phantomhighspeed.com/Service-Support](http://www.phantomhighspeed.com/Service-Support)

## ABOUT VISION RESEARCH

Focused. Since 1950, Vision Research has been designing, and manufacturing high-speed cameras. Our single focus is to invent, build, and support the most advanced cameras possible.



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