VISION RESEARCH

PHANTOM
when it's too fast to see, and too important not to.®

Phantom®
S990

The Highest throughput streaming camera available.

Inset: Back View with cables
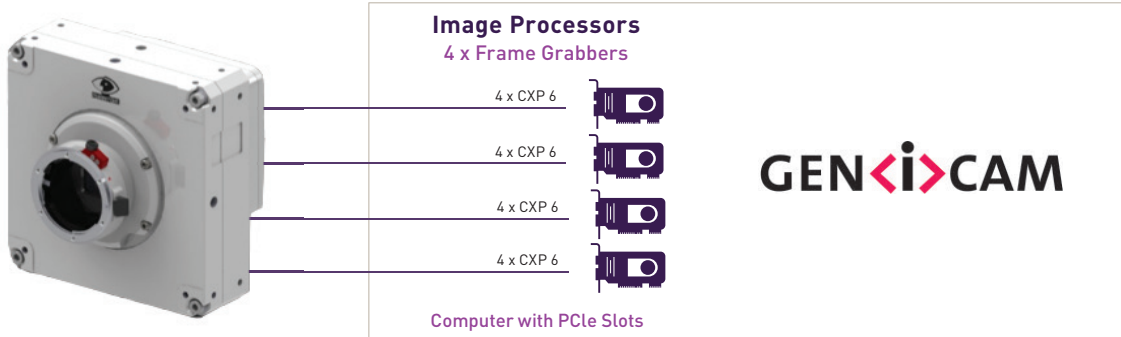
Phantom S990 Front View

Key Benefits:

The Phantom S990 brings together Phantom premium sensor image quality, world class high speed technology, and record breaking direct data transfer speed to provide 9Mpx at up to 938 fps and almost 9Gpx/sec. Using up to 16 standard CXP6 channels, the Phantom S990 streams directly into PCI Express frame grabbers, and is Gen-i-Cam compliant.

Designed for exacting machine vision applications and beyond, the Phantom S990 brings inherent benefits from high speed imaging technology.

- **World class high speed image quality:** The Phantom S990 uses the same Phantom-designed sensor found in the Phantom Flex 4K, with image quality high enough for media production.

- **Expertise in super-fast image capture and transfer:** The Phantom S990 leverages know-how from our traditional high-speed cameras, some with capture rates of up to 26Gpx/sec.

- **Signaling for any situation:** Standard machine vision signals, plus time code in and out, with a header for metadata

- **Highest level of detail:** Images are captured in 12-bit, but can be transferred in either 8 or 12-bit.

- **Crossover to Streaming:** CXP and Gen-i-Cam compliant, plus 4 Enhancements:

Key Features:

9 Gpx/sec of streaming capability

Scalable - Up to 4 banks of 4 CXP ports available

Phantom 4K sensor in color or monochrome

CXP protocol, Gen-i-Cam compliant

Sturdy, metal body construction

Made in USA

Designed for up to 4 frame grabbers, with image stitching	Metadata header including time code in each image
GPIO for flexible signaling and synchronization	Rolling / Global / Global Bright Field shutter selection

AMETEK®
MATERIALS ANALYSIS DIVISION

S990

SET-UP FOR HIGH THROUGHPUT STREAMING APPLICATIONS

Image Processors
4 x Frame Grabbers

4 x CXP 6

4 x CXP 6

4 x CXP 6

4 x CXP 6

GEN<i>CAM

Computer with PCIe Slots

1. Acquires images, processes signals:
• FSYNC (in/out)
• IRIG
• Strobe (out)
• Trigger (SW)

→

2. Streamer establishes CXP link with FG SW:
• Transmits raw images as 1 to 4 virtual cameras
• Time stamp added in header
• Images are captured 12-bit, transmitted in 8-bit or 12-bit

→

3. FG receives images:
• DMA's image data in to PC ram
• Images are stitched

→

4. Viewer/Integrator receives images via Gen-i-Cam:
• Camera control
• Manages resolution / speed
• Performs color interpolation
• Places time stamp in header

• Up to 8 Gpx/sec
• 9Mpx @ 1000 fps

Flexible Data Transfer

The S990 streams only the amount of data needed, and lower frame rates or resolutions can use fewer ports. User programming stiches either 2 or 4 virtual cameras to maximize throughput up to standard Phantom VEO-4K performance levels.

1 bank of 4 CXP ports = Max 2.2 Gpx/ sec

2 banks of 4 CXP ports = Max 4.4 Gpx/sec

4 banks of 4 CXP ports = Max 8.85 Gpx/sec

Standard protocols

- CoaXPress (CXP) 6
- Gene-i-Cam
- Jiia Certified

Phantom S990 - Back Panel

Specifications:

Resolution (H x V)	4096 x 2304	**Sensor**	Phantom 4K
Resolution Mpx	9.4 Mpx	**Sensor Tpe**	CMOS Color or Mono
Frame Rate	938 fps @ 8bit 625 fps @ 12bit	**Image Data Interface**	CXP6 (CoaXPress)
Sensor Size	27.6 x 15.5 mm	**Data I/O**	2 opto-isolated, 3 bi-directional, Timecode In/Out
Sensor Diagonal	31.72 mm	**Power Requirements**	40 Watt
Pixel Size	6.75µm	**Cooling**	Fan
Bits/Pixel	12, output in either 8 or 12	**Lens Mount**	F Standard
Electronic Shutter	Global / Rolling / Bright Field	**Weight**	1.62 Kg (3.6 Lb)
Dynamic Range	GS: 54.8 dB RS: 71.6 dB	**Dimensions WxHxD**	145 x 145 x 190 mm (5.7 x 5.7 x 7.5 in) Without lens mount
ISO	GS: 5,000(M), 640 (C) RS: 2,000 (M), 320 (C)	**Operating Temperature**	-10C to +55C
Minimum Exposure	5µm		

The S990 has 3 selectable shutter modes to customize to specific applications:
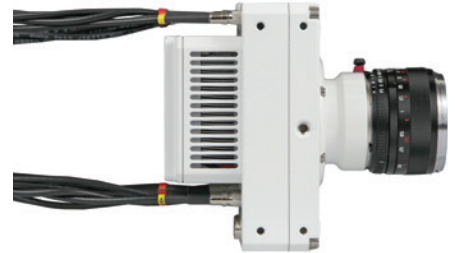
- Rolling Shutter: For images with the highest dynamic range and lowest noise
- Global shutter: For high-speed and precise applications
- Bright Field Mode: For the lowest noise in applications with bright backgrounds

Signalling: Hirose 12-pin Connector		
GPIO 0 - 3 - Bi-directional	Input: Event In Trigger In Memgate	Output: Strobe Trigger out Ready Time Code Out
GPIO 3 - Bi-directional	Time Code In	
GPIO 4	Isolated Input: Event In Trigger In Memgate Time Code In	
GPIO 5		Output: Strobe Trigger out Ready Time Code Out

Phantom® S990

Resolution			FPS		
H	V	Bit Depth	8Gpx/sec	4Gpx/sec	2Gpx/sec
4096	2304	8 bit	938	465	235
		12 bit	625	310	155
2048	2304	8 bit	938	938	465
		12 bit	938	625	310
1024	1600	8 bit	1,345	1,345	1,345
		12 bit	1,345	1,345	895
4096	960	8 bit	2,215	1,105	555
		12 bit	1,475	735	730
2048	960	8 bit	2,215	1,865	935
		12 bit	2,215	1,245	625
1024	960	8 bit	2,215	2,215	2,215
		12 bit	2,215	2,215	1,475
4096	512	8 bit	4,065	3,030	1,020
		12 bit	2,710	1,355	675
2048	512	8 bit	4,065	4,065	2,030
		12 bit	4,065	2,710	1,355
1024	512	8 bit	4,065	4,065	4,065
		12 bit	4,065	4,065	2,710
4096	128	8 bit	14,200	7,100	3,565
		12 bit	9,465	4,730	2,370
2048	128	8 bit	14,200	14,200	7,100
		12 bit	14,200	9,465	4,730
1024	128	8 bit	14,200	14,200	14,200
		12 bit	14,200	14,200	9,465

Phantom S990 - Side View with Cables

Vision Research Global Support – for wherever you are

Our ultrahigh-speed camera line is supported by Vision Research's Global Service and Support network offering AMECare Performance Services from multiple sites around the globe. Maximize the value of your Phantom camera with a full menu of professional support services.
Learn more about our service and support options at www.**phantom**highspeed.com/Support

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.

VISION
RESEARCH

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