PHANTOM
VEO-SERIES

PHANTOM
VEO 710

7,500 fps at 1280 x 800
HIGH-SPEED CAMERA

Rugged, Compact Housing
L & S Body Styles
Up-to 72GB RAM
Optional 10Gb Ethernet

FEATURES & BENEFITS

PHANTOM VEO PRODUCT FAMILY

Designed to perform in a wide array of scientific and industrial applications, Phantom VEO high-speed cameras provide valuable insight into events that are otherwise too fast to be seen.

The VEO 710 captures images at 7Gpx/sec for frame rates reaching 7,500 frames per second (fps) at 1280 x 800 and up-to 700,000 fps at a reduced 64 x 8 resolution, or 1M fps with FAST Option.

EXTREME CONFIGURABILITY

VEO cameras are available in color or monochrome, up to 72GB RAM, with a variety of lens mounts and two body styles to allow users to **choose the best configuration** in terms of features and budget:

- **L-model** is for basic, software based imaging in a lab or office environment
- **S-model** provides additional signals, on-camera controls for untethered and remote recording, ruggedized connectors and compatibility with removable CFast 2.0 storage media.

ViSiON
RESEARCH

AMETEK
MATERIALS ANALYSIS DIVISION

FRAME RATES & EXPOSURE

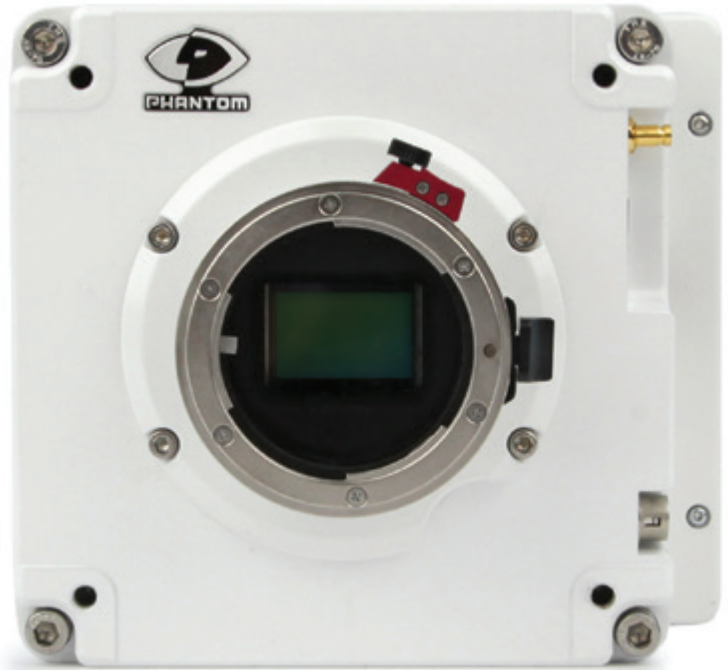|	
Top FPS at Max Resolution	7,500
Maximum FPS	690,000 fps at 64 x 8 standard; 1M fps with Fast Option*
Minimum FPS	24
CAR Increments	64 x 8
Minimum Exposure	1 µs Standard; 300 ns with Fast Option*
Electronic Shutter	Global
PIV Features	Shutter-off mode with straddle time of 395 ns, Supports Burst Mode
Exposure Features	Extreme Dynamic Range (EDR), Auto-Exposure, Overexposure indication over video and in PCC

IMAGING

Sensor Type	CMOS
Maximum Resolution	1280 x 800
Bit Depth	12-bit
Pixel Size	20 µm
Sensor Size	25.6 x 16; 30.2 mm diagonal
ISO Daylight (12232 STD)	Mono 6,400; Color 2,000
ISO Tungsten (12232 STD)	Mono 16,000; Color 2,000
Exposure Index	Mono 6,400 – 32,000; Color 2,000 – 8,000

FRAME RATE CHART

Table provides examples of common resolutions and frame rates. The record times shown are for 72GB RAM at the frame rate shown. Duration will be 1/2 the time for 36GB and 1/4 the time for 18GB RAM.

| Maximum Frame Rate - FPS; (72GB Record Time - Sec)	
Resolution (H x V)	**VEO 710**
1280 x 800	7,500 (6.5)
1280 x 720	8,300 (6.7)
1024 x 720	10,100 (6.8)
768 x 480	19,200 (7)
640 x 480	22,300 (7.5)
512 x 512	24,800 (7.9)
512 x 320	39,400 (7.9)
256 x 256	77,600 (9)
256 x 160	120,500 (10)
128 x 128	204,000 (15)
128 x 64	360,000 (17)
128 x 32	580,000 (21)
64 x 8	690,000 (140)
64 x 8*	1,000,000 (100)

*Certain Phantom cameras are held to export licensing standards. Details available at: www.phantomhighspeed.com/export

Specs Subject to Change | Rev 2 | September 2021

CONNECTIVITY & SIGNALS

Ethernet	Gigabit Standard, 10Gb Optional		
Timecode	IRIG-B Modulated and Un-modulated		
Port Descriptions		**S-model**	**L-model**
	Ethernet	Fischer 8-pin	RJ45
	Power	Fischer 6-pin	Fischer 6-pin
	Range Data	Fischer 8-pin	N/A
	USB	Yes for WiFi dongle	N/A
	Video output	3G-SDI (2 ports), HDMI	3G-SDI (1 port), HDMI
	Dedicated BNC	Trigger, Timecode-in, 3G-SDI	Trigger, Timecode-in
	Programmable I/O BNC	4 ports	2 ports
I/O Signals	Programmable I/O for Fsync, Strobe, Ready, Timecode-out, Event, Memgate, Pretrigger. Assign and define signals in PCC		
Hardware Trigger	Dedicated BNC		
Software Trigger	Trigger button (S-model); via Ethernet; via Image-based auto trigger (IBAT)		
Synchronization	External Sync via FSync or IRIG Timecode		
Recording Features	Burst mode; Image-based auto trigger, Continuous recording & AutoSave to CFAST (S-model)		
Video Output	3G-SDI via BNC (rear S-model only); Din and Micro HDMI type D (front). Cameras prior to 2021 had HDMI type A port.		
Accessory Power	4-pin Hirose (front) for 12V monitors up to 1 Amp		
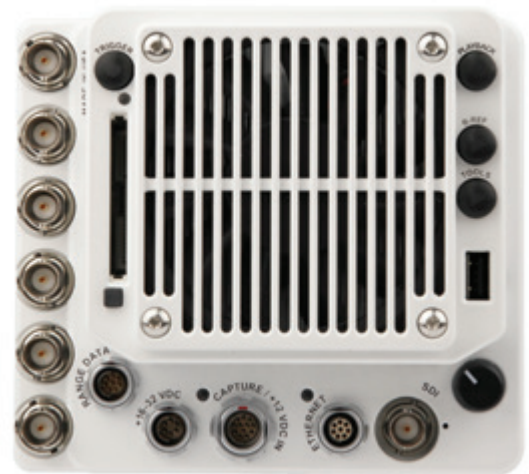
VEO S-model (Top),
L-model (Bottom)

CONTROL

Software & OS	Phantom PCC (Windows); SDK also available with MatLab and LabView drivers
On-camera Controls	S-models only. Access menu system with encoder, viewed on video monitor. Buttons for trigger, play and save – Color indicates current camera state
Primary File Format	Phantom Cine RAW (.cine)
Alternative File Formats	Easily convert to formats including .mp4, Apple ProRes .mov, .avi, Tiff, JPG, DNG and many more using PCC. Cine files are directly compatible with many major video editing and motion analysis programs
Software Feature Highlights	Continuous Recording for automated workflows, Integrated Data Acquisition (NI-DAQ), support for DIC Calibration with Sync-Snapshot menu, advanced Image Tools including Crop & Resample, Tone Curves, Filters and more

PHANTOM ®

MEMORY & STORAGE

RAM Buffer	18GB, 36GB, 72GB RAM options
Multi-Cine	Up-to 64 Partitions
Non-Volatile Media	VEO S-model supports CFAST 2.0 (NTFS format) 80 MB/s Cine Raw file transfer rate from RAM

POWER

AC Power	100-240 VAC, 80W power supply included
Voltage Range	16-32VDC Primary; Secondary Power down to 12VDC via 12-pin capture port (S-models only)
Power Consumption	65W typical
Battery Options	S-model includes 12V input for compatibility with common 14.4V batteries. V-Lock and Gold-mount VEO side-mounts are available for VEO-S cameras

MECHANICAL

Housing Variants	L-model and S-model variants
Size	L-model: 5 x 5 x 5" (12.7 x 12.7 x 12.7 cm); S-model: 5 x 5.5 x 5" (12.7 x 14 x 12.7 cm)
Weight	L-model: 5.0 lbs (2.3 kg); S-model: 5.6 lbs (2.5 kg)
Lens Mounts	Choose lens mount at time of purchase: F-mount (with aperture support for Nikon G-style lenses), Canon EF mount (with electronic focus and iris control), PL, C-mount
Mounting Points	Standard 1/4 x 20" mounting points on bottom. Top, bottom and side are compatible with Cameo cheese plate for added mounting points, riser, and custom handle
Internal Shutter	Standard, for remote black references
Cooling	Active cooling. Quiet mode disables fans during capture

ENVIRONMENTAL

Operating Temperature	-10 to +50°C
Storage Temperature	-20 to +70°C
Operational Shock	MIL-STD-202G Method 213-B. Rated 30G with shutter; 100G without; sawtooth wave, 11ms, +/- 10 pulses all axes
Operational Vibration	MIL-STD-202G Method 214-A. Rated 12Grms; Figure 2A-1, Test Condition D, 15 min per axis
Regulatory	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 KC Emissions – KC Compliant KN32 KC Immunity – KC Compliant KN35 Safety – IEC 60950-1

GLOBAL SUPPORT NETWORK

The Phantom VEO product line is supported by Vision Research's Global Service and Support network, offering PhantomCare 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.
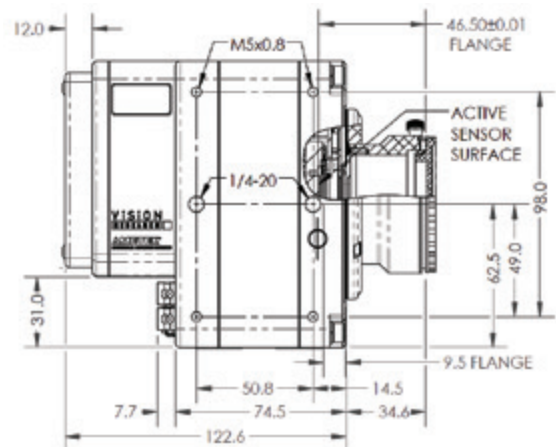
Learn more about our service offering at
www.phantomhighspeed.com/Service-Support

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.

ViSiON RESEARCH

AMETEK ®
MATERIALS ANALYSIS DIVISION

100 Dey Road
Wayne, NJ 07470 USA
+1.973.696.4500