◇ PHANTOM®

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

DATA SHEET

Phantom®
VEO4K-PL

4K at up to 1000 fps

Super 35mm sensor

72GB RAM standard

10Gb Ethernet connectivity

Key Features:

Support for CFast media

3G HD-SDI and HDMI video outputs

On-camera controls

Secondary 12V power input for battery

Wireless options for remote operation

Made in the USA

VEO4K-PL pictured with Cameo handle

The VEO4K can be considered a smaller, lightweight version of the Flex4K-GS. Some of the differences:

Flex4K-GS	VEO4K-PL
- Up to 128GB RAM	- Up to 72GB RAM
- CineMag Support @ 1GB/sec speed	- CFast Support @ 90MB/sec speed
- Max 2160p30 video output	- Max 1080p60 video output
- 14 lbs (6.3 kg)	- 6 lbs (2.6 kg)
- Gb Ethernet on camera	- 10Gb Ethernet on camera
- Integrated accessory outputs including Remote	- Similar outputs as Flex4K-GS with addition of VEObob

Introduction

The image and frame rate performance of the Flex4K-GS meets the convenient form factor of the Phantom VEO-S camera family. The VEO4K-PL will capture up to 1,000 fps at 4096 x 2160 pixel resolution. The VEO4K-PL includes all the available features for media production, with accessories available for customization.

Imaging Specifications:

The VEO4K-PL employs a 4K 12-bit CMOS sensor with 6.75 micron pixels, and supports both global shutter and rolling shutter modes. Optical low pass filter (OLPF) is included. The ISO and dynamic range changes based on the shutter mode:

	Global Shutter	Rolling Shutter
Base ISO*	640 (Color)	320 (Color)
Recommended Exposure Index Range**	EI 800-1000	EI 800-1000
Dynamic Range	54.8 dB, 9-stops	71.6 dB, 12-stops

  * ISO is measured according to ISO 12232:2006 method.

 ** Recommended Exposure Index (E.I.) range is specified. Set with On-camera controls or PCC software. Higher EI settings are possible with additional image processing.

AMETEK®
MATERIALS ANALYSIS DIVISION

Phantom VEO4K-PL

Inputs & Outputs

The VEO4K-PL incorporates same features and functions as VEO-S camera models

Front/Side	SDI: Din port for 3G HD-SDI HDMI: Standard HDMI output VFPWR: 4-pin Hirose for 12V power output rated for 12W
Ethernet	8-pin Fischer for Gb Ethernet and 10Gb Ethernet; auto-negotiating
Power Input	6-pin Fischer: 16-32 VDC 12-pin Capture port: Secondary 12V input for battery mount
Capture Port	Yes, 12-pin Fischer
Available Signals	Timecode-in, F-Sync/P, Strobe/P, Ready/P, Timecode-out/P, Range Data
Trigger BNC	Yes
Rear SDI BNC	Yes (3G)
Programmable I/O	4 BNC ports Available signals: Strobe, Event, Pre-trigger, Timecode- out, Ready, F-Sync, Aux Trigger, Auto-Trigger
Serial RS232	Via 6-pin Power
Range Data	Dedicated 6-pin Fischer
On-camera Controls	Yes, Encoder knob and buttons for access to menu and control
USB	Yes, for Wi-Fi dongle
Removable Media	CFast 2.0 cards, NTFS formatted

Example Frame Rates & Record Time		
Estimated, subject to change		
Resolution	**Frame Rate (fps)**	**Rec time @ max fps (72GB RAM)**
4096 x 2304	938	5.6 seconds
4096 x 2160	1000	5.6 seconds
4096 x 2160	120	46 seconds
4096 x 2160	24	3.9 minutes
4096 x 1152	1850	5.6 seconds
2048 x 2048	1050	11 seconds
2048 x 1152	1850	11 seconds
2048 x 1080	1970	11 seconds

Camera Control & File Formats

Software: Windows-based PCC is used for complete setup, control, image processing and download. Mac-based Séance software from Glue Tools is available for control, playback and file download on a Mac. Cameras are connected on a dedicated Ethernet network.

On-camera controls (OCC) are for use with a connected SDI or HDMI monitor or viewfinder. The OCC menu system allows for setup, capture, playback and saving to a CFast card.

File formats: The native file format is Cine RAW, which can be easily converted to other formats including h.264 mp4, Apple ProRes .mov and many more using PCC. Cine RAW files are also directly compatible with several major video editing and motion analysis programs.

CFast workflow

CFast 2.0 cards enable remote and untethered recording. Cine files are first recorded to RAM, and then can be played back immediately, trimmed and saved to the card. Once on the card the file is safely stored and you are free to take your next shot.

- Use standard CFast 2.0 cards, formatted with the NTFS file system.
- Transfer speed from RAM is 90 MB/second.
- Drag-and-drop saved files using standard CFast 2.0 card readers on Windows or Mac operating systems.

Featured Accessories

Lens mounts:

- PL mount default, field replaceable with Nikon F/G and Canon EF mount with electronic control of aperture and focus.

Custom CAMEO accessories from AbelCine

- Cine Essential kit includes handle, cheese plate, cine-style riser, rosette bar.
- VEObob (pictured) for added power outputs including remote port.

Battery solutions

- Side-mount V-Lock and Gold-mount
- XLR adapter cables for 12V and 24V batteries

VEO4K-PL pictured with CAMEO Cine Essential kit and VEObob

Additional Features

Video monitoring: Front 3G HD-SDI, HDMI & VF power available on all models. Additional rear 3G HD-SDI port on S models. Provides the following video signals: 720p 50, 59.97, 60; 1080i 25, 29.97, 30; 1080psf 23.976, 24, 25, 29.97, 30; 1080p 23.976, 24, 25, 29.97, 30, 50, 59.97, 60.

Connectivity: Gb Ethernet and optional 10Gb Ethernet on all VEO4K models, for control and download. Both protocols use same Ethernet port and auto-negotiate the connection based on network configuration.

Signals: Programmable I/O provides the ability to assign and define the parameters of various signals including: F-Sync, Strobe, Event, Pre-trigger, Memgate, Timecode-out, Ready, Aux and Auto-Trigger. Trigger and Timecode-in ports are fixed.

Timecode: IRIG in/out, SMPTE and MISP time system support.

Multi-Cine: Partition internal RAM, into up-to 63 segments and capture quick recordings back-to-back. Supports Seamless-Cine-Switching to ensure no frames are missed. RAM is available up-to 72GB.

Internal Mechanical Shutter: Activate to perform a black reference or protect the sensor while changing lenses. No physical access to the camera is needed.

At 1000 fps, a 72GB VEO4K-PL records 6 seconds, resulting in 3.5 minutes of playback at 30p. Use multi-cine to segment the memory for fast, uninterrupted capture of shorter events.

Download entire 72GB of data in as little as 2 minutes, with the 10Gb Ethernet option and an optimized system.

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Phantom® VEO4K-PL

VEO4K-PL (left) and VEO4K-990S (right)

Power Requirements:

Primary power: 16-32 VDC via 6-pin Fischer

Secondary power*: down to 12 VDC, via 12-pin capture port

Power draw at max load: 75 Watts (approx.)

* When both are connected, the power input with highest voltage gets used first.

Mechanical & Environmental Specifications

Size: 5" X 5.5" X 6" (12.7 x 14 x 15.2 cm)

Weight: 6.0 lbs (2.8 kg)

Operational Temperature: -10°C - + 50°C

Operational Shock: Rated 30G with shutter and 100G without shutter.

Rugged Design: Milled out of aluminum with electronics isolated from airflow.

About the VEO4K Camera Family

The Phantom VEO4K-PL is part of the VEO4K camera family, which includes several models. The PL version as described here is tailored for media production applications and is the only one with a black housing.

Other VEO4K cameras include S and L models at two performance levels in the traditional VEO white housing (as pictured above), as required for science and range applications.

Vision Research Global Support - for wherever you are

The Phantom VEO 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.phantomhighspeed.com/Service-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.

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