

DATA SHEET

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Subject to change Rev August 2017



VEO4K-990S

Phantom® VEO4K

Models: 990S, 990L, 590S,
590L, 4K-PL

4K at up to 1000 fps

9.4 Mpx resolution

Super 35mm sensor

10Gb Ethernet option for optimized
workflow

Key Features:

Two Performance Levels

4K-590 at 5 Gpx/sec

4K-990 at 9 Gpx/sec

Two Memory Configurations

36GB & 72GB

Three Body Styles

4K-L model for software-based control

4K-S model for added I/O ports, on-camera controls,
power input and CFast 2.0

4K-PL model for cinema-style black housing, OLPF
and PL mount

All VEO cameras are rugged, milled out of solid aluminum
with electronics completely isolated from airflow.

Made in the USA

Introducing the Phantom VEO4K

The VEO4K camera family combines two platforms, the popular VEO and Flex4K, for high-speed imaging with the ultimate in image quality and pixel resolution. Examples of applications that can take advantage of this resolution include those that need high magnification, those where movement is travelling across a large space, and those that require fine detail precision such as particle tracking analysis.

Imaging Specifications

The VEO4K employs a custom 9.4 megapixel, 12-bit CMOS sensor with 6.75 micron pixels. Support for both global shutter and rolling shutter modes is included. Advantages of rolling shutter mode include increased dynamic range and the lack of need to perform a black reference after changing parameters.


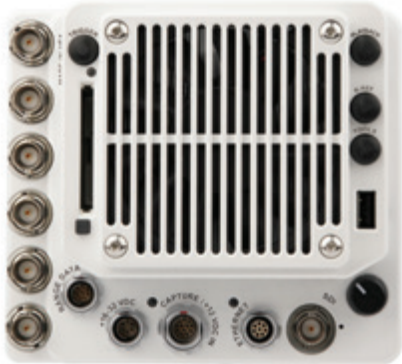
| Global Shutter Mode | Rolling Shutter Mode |
|---|---|
| Base ISO*: 640-T, 640-D Color; 5000-T, 2500-D Monochrome | Base ISO: 320-T, 320-D Color; 2000-T, 1000-D Monochrome |
| Recommended Exposure Index Range**: EI 800-1000 Color; 10,000-20,000 Monochrome | Recommended Exposure Index Range: EI 800-1000 Color; 4,000-8,000 Monochrome |

*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 using image processing.

Phantom VE04K Family

Inputs & Outputs

| | 4K-L models | 4K-S and 4K-PL 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 | SDI: Din port for 3G HD-SDI HDMI: Standard HDMI output VFPWR: 4-pin Hirose for 12V power output, rated for 12W |
| Ethernet | RJ45 for Gb Ethernet and 10Gb Ethernet; auto-negotiating | 8-pin Fischer for Gb Ethernet and 10Gb Ethernet; auto-negotiating |
| Power Input | 6-pin Fischer: 16-32 VDC | 6-pin Fischer: 16-32 VDC 12-pin Capture port: Secondary 12V input for battery mount |
| Capture Port | None | Yes, 12-pin Fischer |
| Available Signals | Timecode-in, 2 Programmable I/O | Timecode-in, F-Sync/P, Strobe/P, Ready/P, Timecode-out/P, Range Data |
| Trigger BNC | Yes | Yes |
| Rear SDI BNC | None | Yes (3G) |
| Programmable I/O | 2 BNC ports Available signals: Strobe, Event, Pre-trigger, Timecode-out, Ready, F-Sync, Aux Trigger, Auto-Trigger | 4 BNC ports Available signals: Strobe, Event, Pre-trigger, Timecode-out, Ready, F-Sync, Aux Trigger, Auto-Trigger |
| Serial RS232 | Via 6-pin Power | Via 6-pin Power |
| Range Data | None | Dedicated 6-pin Fischer |
| On-camera Controls | None | Yes, Encoder knob and buttons for access to menu and control |
| USB | None | Yes, for Wi-Fi dongle |
| Removable Media | None | CFast 2.0 cards, NTFS formatted |

Example Frame Rates & Record Times

Estimated, subject to change

| Phantom VE04K-990 & 4K-PL | | | Phantom VE04K-590 | | |
|---------------------------|--------------------|-------------------------------|-------------------|--------------------|-------------------------------|
| Resolution | Maximum Frame Rate | Rec time @ max fps (72GB RAM) | Resolution | Maximum Frame Rate | Rec time @ max fps (72GB RAM) |
| 4096 x 2304 | 938 | 5.6 seconds | 4096 x 2304 | 500 | 10 seconds |
| 4096 x 2160 | 1000 | 5.6 seconds | 4096 x 2160 | 550 | 10 seconds |
| 4096 x 1152 | 1850 | 5.6 seconds | 4096 x 1152 | 900 | 11 seconds |
| 2048 x 2048 | 1050 | 11 seconds | 2048 x 2048 | 550 | 20 seconds |
| 2048 x 1152 | 1850 | 11 seconds | 2048 x 1152 | 900 | 22 seconds |
| 2048 x 1080 | 1970 | 11 seconds | 2048 x 1080 | 950 | 22 seconds |

Record durations shown are for cameras with 72G of RAM at the max frame rate. Cameras with 36G RAM will record for ½ this value. Lower frame rates provide longer record times.

Specifications and Features:

Video monitoring: Front 3G HD-SDI, HDMI & VF power available on all models. Additional rear 3G HD-SDI port on S models. Provides standard 720 and 1080 video standards up to 1080 p60.

Connectivity: Gb Ethernet standard, 10Gb Ethernet optional on all VE04K 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.

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

Quiet Fans: Turn the fan off temporarily to eliminate noise and vibration.

Lens Mounts: Interchangeable. Supports Nikon F/G, Canon EF with electronic control of aperture and focus, 35mm PL and C-mount.

Accessories: Custom camera handle, cheese plate, battery mounts, case and more are available. Camera is pictured (right) with V-Lock battery mount and handle.



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Models: 990S, 990L, 590S, 590L, 4K-PL

Power Requirements:

Primary power: 16-32 VDC via 6-pin Fischer
 Secondary power*: down to 12 VDC, via 12-pin capture port (S-models only)

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 in. (12.7 x 14 x 15 cm) L x W x H

Weight: 6 lbs (2.5 kg)

Operational Shock: 30G with shutter, 100G without shutter

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

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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Camera Control & File Formats

Software: Phantom Camera Control software (PCC) is used for complete setup, control, image processing and download, and includes tracking and motion analysis tools. An SDK including Matlab and Labview drivers are also available.

On-camera controls (OCC) for setup, capture, playback and saving to a CFast card are standard on VEO4K-S model cameras and are used with a connected SDI or HDMI monitor or viewfinder.

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

CFast workflow: VEO4K-S and 4K-PL camera models feature compatibility with CFast 2.0 cards, which enable remote and untethered recording. Cine files are first recorded to RAM, and once captured the video can be played back immediately, trimmed and then saved to the CFast 2.0 card. Once on the card the Cine file is safely stored in non-volatile memory 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.

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.

AMETEK Vision Research's digital high-speed cameras are subject to the export licensing jurisdiction of the Export Administration Regulations. As a result, the export, transfer, or re-export of these cameras to a country embargoed by the United States is strictly prohibited. Likewise, it is prohibited under the Export Administration Regulations to export, transfer, or re-export AMETEK Vision Research's digital high-speed cameras to certain buyers and/or end users.

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