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PHANTOM

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

DATA SHEET

For the most current version visit www.phantomhighspeed.com
Subject to change Rev January 2020


*VEO 1310 S & L*

# Phantom® VEO 1310

## High-speed Camera

1280 x 960 at 10,860 fps
1280 x 720 at 14,300 fps

Leading VEO Frame Rates and Light Sensitivity with advanced features in a compact & rugged design

The newest addition to the Phantom VEO family incorporates the latest in imaging technology to deliver premium performance in a compact, easy to use and reliable camera system.

### Highest VEO Frame Rates

Capture over 13 Gigapixels per second (Gpx/s) at full resolution. Binning mode is included for a 25% frame rate boost at 640 x 480 and below.

### Superior Light Sensitivity

The native ISO of 25,000 (mono) is more than double other VEO models allowing greater flexibility of optics and lighting when working with challenging subjects.

### Imaging Specifications

Custom 12-bit CMOS sensor, global shutter sensor, 18 µm pixels, global shutter with correlated double sampling (CDS).

| | Standard | Binning mode (mono output only) |
|---|---|---|
| **Max Pixel Resolution** | 1280 x 960 | 640 x 480 |
| **FPS at max res** | 10,860 fps | 40,300 fps |
| **Sensor Size** | 23 x 17.2 mm | 23 x 17.2 mm |
| **ISO (12232 STD)** | Mono: 25,000<br>Color: 6,400 | Mono: 50,000<br>Color: 8,000 |
| **Exposure Index** | Mono 25,000 - 125,000<br>Color: 6,400 - 32,000 | Mono: 50,000 - 250,000<br>Color: 8,000 – 40,000 |

*Recommended Exposure Index (E.I.) range is specified.

### Key Specifications:

Throughput: 13 Gpx/sec at full resolution

Memory: 18GB, 36GB or 72GB RAM
Multi-Cine: Partition RAM up to 63 segments

Gb Ethernet (standard) and 10Gb Ethernet (optional) for control and download. Both protocols use same port.

Minimum exposure is 1µs; 706 ns with FAST option (export controlled)

Available in two body styles: L and S

- L-models have standard connectors for software-based control.
- S-models include ruggedized connectors, CFast compatibility, on-camera controls, battery input and additional signals.

Rugged design: High-G Rated (nondestructive up to 30G standard, 100G without shutter). Milled aluminum housing with electronics isolated from airflow

Made in USA

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## Resolution/Speed Chart & Record Times

| | 1310 | 1310 Binned (mono output) |
|---|---|---|
| Resolution* | Max Frames per Second; (72GB rec time in seconds)** | |
| 1280 x 960 | 10,860 (3.7) | - |
| 1280 x 804 | 12,906 (3.7) | - |
| 1280 x 720 | 14,350 (4) | - |
| 960 x 960 | 13,330 (5) | - |
| 640 x 480 | 30,030 (7) | 40,300 (4) |
| 480 x 480 | 30,030 (10) | 40,300 (4) |
| 320 x 240 | 57,360 (10) | 105,260 (5.8) |
| 320 x 168 | 78,900 (10) | 140,430 (6.2) |
| 320 x 120 | 105,260 (11) | 180,680 (6.7) |
| 320 x 72 | 158,038 (12) | 253,270 (7) |
| 320 x 24 | 316,930 (15) | 423,350 (12) |

FAST option does not change the maximum frame rate, only the minimum exposure.

* More resolutions are available.

** Record times shown are to 72GB RAM. Divide by 2 for 36GB and 4 for 18GB RAM options.

| 'L' Model | Connectivity | 'S' Model |
|---|---|---|
|  | |  |
| RJ45 (Gb Ethernet Standard, 10Gb Optional) | Ethernet | 8-pin Fischer (Gb Ethernet Standard, 10Gb Optional |
| 6-pin Fischer 16-32VDC | Power Input | 6-pin Fischer 16-32VDC; Secondary 12V input for Battery via Capture Port |
| 2 BNC Ports | Programmable I/O | 4 BNC Ports |
| Yes | Trigger Input | Yes |
| Yes (IRIG-B) | Dedicated Timecode Input | Yes (IRIG-B) |
| No | Rear SDI Port | Yes (3G HD-SDI) |
| Via 6-pin Power | Serial RS232 | Via 6-pin Power |
| None | Range Data | Dedicated 6-pin Fischer |
| None | On-Cam Controls | Yes (buttons, encoder) |
| None | USB | Yes, for WiFi Dongle |
| None | Removable Media | CFast 2.0 Cards (NTFS) |

## Vision Research Global Support Network

The Phantom VEO 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 menu of professional support services. Learn more about our service and support options at www.phantomhighspeed.com/Service-Support

## Select Features

**Binning Mode:** For increased frame rates and sensitivity at 640 x 480 resolution and below. Binning is included on both color and mono cameras; however, the output is always mono with binning enabled.

**10Gb Ethernet Option:** Download entire 72GB of data in as little as 2 minutes.

**CFast Workflow (S-Model):** Use standard CFast 2.0 cards, formatted NTFS. Transfer Cine RAW files from RAM at ~90 MB/second. Drag-and-drop the files from card using standard readers on Windows or Mac operating systems.

**Image-based Auto Trigger (IBAT):** Trigger the camera (or even multiple connected cameras) from motion detected within the live image per the parameters set up in PCC.

## Camera Control & File Formats

**Phantom PCC software** for setup, control, download, image manipulation and motion analysis

**Native file format** is Phantom Cine Raw (.cine). Cines can be easily converted to other formats including h.264 mp4, Apple ProRes .mov, AVI, Tiff, JPEG, DPX, DNG and many more using PCC. Cine Raw files directly compatible with many major video editing and motion analysis program

**SDK** with both Labview and Matlab support is available

## Mechanical & Environmental

**Dimensions:** L-model: 5 x 5 x 5" (127mm³);
S-model: 5 x 5 x 5.5" (127 x 127 x 140 mm)

**Weight:** 6 lbs. (2.7Kg) L-model; 6.6 lbs (3Kg) S-model

**Lens Mount:** Choices include Nikon F with G-style lens support, C-mount, and Canon EF with electronic lens control

**Mounting Points:** 2X standard 1/4x20 on 3 sides, with additional points for custom mounting plates. VEO handle, Cheese Plates and other CAMEO VEO accessories are compatible.

**Cooling:** Actively cooled. Sealed system keeps electronics isolated from airflow. Quiet mode temporarily disables the fan.

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

**Storage Temperature:** -20°C - +70°C

**Operational Shock:** MIL-STD-202G Method 213-B. Rated 30G with shutter; 100G without; sawtooth wave, 11ms, +/- 10 pulses all axes

**Vibration Rating:** MIL-STD-202G Method 214-A. Rated 12Grms; Figure 2A-1, Test Condition D, 15 min per axis

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*Certain Phantom cameras are held to export licensing standards.*
*Please visit www.phantomhighspeed.com/export for more information.*