



# Phantom v10

Provides 14-bit image depth, and 480 frames per second at a full resolution of 2400 x 1800 pixels

## INSTRUMENTATION OR CINEMATOGRAPHY? IT'S YOUR CHOICE

The Phantom v10's CMOS sensor, offers 480 frames per second at its full resolution of 2,400 x 1,800 active pixels. At the HD resolution of 1920 x 1080 the v10 records 1,000 fps (standard mode), or 500 fps (enhanced mode).

While continuing the feature rich tradition, sensitivity and "ease-of-use" offered in previous Phantom camera models, the Phantom v10 offers new features such as an HD-SDI interface, Gigabit Ethernet, 14-bit depth, and larger DRAM image memory optioning to record more images over a longer record time.



- ***Full frame 4:3 aspect ratio CMOS sensor composed of 2,400 x 1,800 pixels***
- ***14-bit image depth (standard)***
- ***480 frames per second full resolution, up to 153,846 fps maximum***
- ***"CAR" (Continuously Adjustable Resolution) in 96 x 8 pixel increments***
- ***2400 ISO/ASA monochrome, 600 ISO/ASA color sensitivity equivalency***
- ***Global (snap-shot) on-chip shuttering to 2 microseconds***
- ***"EDR" Extreme Dynamic Range™ exposure control***
- ***Auto Exposure control***
- ***Up to 24 Gigabytes DRAM, 24 Gigabytes Flash memory (optional)***
- ***IRIG-B timing capture, modulated or unmodulated, IRIG lock w/phase shift***
- ***Continuous video output; NTSC, PAL, multiple HD-SDI output formats available***
- ***Optional continuous data streaming up to 275 fps (8-bits) 175 fps (12-bits)***
- ***Automated multiple session recording for remote unmanned operation***
- ***Gigabit Ethernet or RS232 control***



## V10 Specifications

### FEATURES

*Auto Exposure*

*"EDR" Extreme Dynamic Range™*

*Continuous data streaming (optional)*

*Continuous recording*

*Pre-trigger recording*

*On chip global shuttering*

*Strobe sync*

*Segmented image memory*

*Continuous color HD-SDI video output*

*IRIG-B timing capture with phase shift*

*10/100/Gigabit Ethernet*

**Sensor:** 2400 x 1800 pixel CMOS sensor.

**Image Bit Depth:** 14-bit (standard)

**Sensitivity:** 2400 ISO/ASA mono-chrome, 600 ISO/ASA color

**Frames per second (FPS):** Full sensor; to 480 fps maximum; 1,000 fps (standard mode), or 500 fps (enhanced mode)

**Exposure Time:** Variable, independent of sample rate (fps), to 2 microseconds

**Trigger:** Continuously variable pre/post

**Imager Control:** 10/100/Gigabit Ethernet, or RS232 serial interface

**Preview and Focusing:** Via computer monitor or continuous video out

**Lens Mounts:** Nikon mount standard. Many other lens mounts available, including C-mount

**INPUTS/OUTPUTS:** via integrated quick-release connector:

**Trigger:** Rising/falling TTL pulse w/filter, or switch closure

**Sync Image:** TTL pulse

**Event Marker:** TTL pulse or switch closure

**Ready Signal:** TTL pulse

**IRIG-B Timing:** IRIG-B code, modulated or unmodulated input, with IRIG-B output, lock, and variable phase shift

**Continuous Data Streaming:** Up to 275 fps (8-bits), 175 fps (12-bits)

**Strobe Sync:** TTL Pulse

**RS232**

**Network:** 10/100/Gigabit Ethernet

**Video out:** NTSC, PAL, and HD-SDI (720p, 1080p, 1080i, or 1080pfs at 24, 25, 59.9, and 60 fps)

**Power:** 24VDC/1.5 Amp

### MEMORY

**Standard:** 6 Gigabytes integral image memory records 1,422 images for 2.96 sec of continuous recording at 480 fps, full format (8-bits) or 813 images for 1.69 sec of continuous recording at 480 fps, full format (14-bits). Longer recording times for lower sample rates and allocated formats.

**Optional:** 12 Gigabytes integral image memory continuously records 2,890 images for 6.0 sec. (8-bits) or 1,651 images for 3.43 sec (14-bits) at 480 fps full frame, and 24 Gigabytes will record 5,825 images for 12.1 sec (8-bits) or 3,329 images for 6.92 sec (14-bits) at 480 fps full frame.

**Optional:** Non-Volatile Flash Memory, up to 24Gigabytes.

### ENVIRONMENTAL

**Ambient Temperature**  
32°F and 104°F (0°C and 40°C)

**Maximum humidity:** 80%, non-condensing, at 5°C

### SOFTWARE

Phantom® operates in Windows XP Pro or Vista environments with familiar commands found in familiar places. Standard functions include:

**Acquisition:** Image capture, IRIG-B timing capture & standard time annotation. Field of view & focus. Sample rate & aspect ratio selection. Shutter speed. Histogram. Brightness, contrast, & gamma adjust. Trigger modes. Continuous record. Save & recall setups.

**Analytical playback:** Immediate playback of cine. Variable playback speed in forward or reverse, including freeze frame & endless loop. Random Go-to-Image. View single images at random from any cine. Tile/cascade multiple images on one screen. Timing data displayed with each image. Cine editor. Multi Cine Viewer.

**Measurements:** Linear or angular measurements. English and metric units. Generate Velocity, RPM, or 100 data points per measurement reports. Report files & images are compatible with Phantom, TEMA Starter Software or any spread-

sheet software, and image analysis software such as TrackEye®, Image Express®, or Falcon®.

**Image processing:** Smooth, sharpen, psuedocolor, negative image, and edge detection. Brightness, contrast & gamma adjust. 3x3 and 5x5 filter matrix for custom image processing.

**File management:** Organize, save, compress and export cines, or single images. File formats are compatible with most word processing, desktop, publishing, and presentation software.

### DIMENSIONS

**Size:** 4.3 x 4.0 x 9.5 inch (HWD)  
(10.9 x 10.16 x 24.13 cm) (HWD)

**Weight:** 7 lbs (3.18kg)

**Power:** 24VDC/1.5 Amp

**Mounting:** 1/4-20 inch and four 10-32 threaded hole pattern in base and top

**Mounting Axis:** Any position

**Country of Origin:** The United States of America

### STANDARD ACCESSORIES

Phantom® software, Single user license\*

6 Gigabyte integral image memory

Ethernet, Sync output pulse, trigger, pretrigger, video out, and IRIG-B

110/220VAC -24VDC International Power Adapter, 12 foot (3.7 m) power cord

One year service contract included

### QUESTIONS?

For technical assistance, systems integration, custom options, or information on imaging techniques or training please call us toll free:

1.800.RESOLUTION

(US & Canada 1.800.737.6588)

For the most up-to-date information, specifications and options, please visit our website:

[www.visionresearch.com](http://www.visionresearch.com)

VISION RESEARCH

All specifications are subject to change. (Oct-07)

## Phantom v10 Maximum Recording Speed vs. Image Size

The Phantom v10 camera system can record up to 480 frames per second using the full 2400 x 1800 pixel CMOS imaging sensor array. The operator may also specify other aspect ratios to increase speeds or extend recording times.

The chart below details the Phantom v10 aspect ratio choices available in the setup screen pull down menu. Using the CAR (Continuous Adjustable Resolution) feature, speeds between these values are continuously adjustable in 96 x 8 pixel increments.

STANDARD MODE	
RESOLUTION	RATE
2400 x 1800	480
1920 x 1200	880
1920 x 1080	978
1440 x 1440	943
1440 x 720	1,878
1248 x 720	2,118
768 x 768	2,921
768 x 576	3,875
576 x 576	4,761
576 x 288	9,302
480 x 480	6,420
96 x 96	51,948
96 x 32	100,000
96 x 16	129,032
96 x 8	153,846



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