



Phantom v9.1

Provides 14-bit image depth, and 1,000 frames per second at a full resolution of 1,632 x 1,200 pixels

HIGH RESOLUTION, HIGH SPEED, HIGH SENSITIVITY

With its CMOS sensor, the Phantom v9.1 offers 1,000, 14-bit, frames per second at a full resolution of 1,632 x 1,200 active pixels.

Like its predecessor, the Phantom v9.0, the v9.1 preserves such feature as Gigabit Ethernet for camera control and file transfer, and the ability to segment a significantly larger DRAM image memory for multiple cine recording. In addition to these features, the v9.1 has added an HD-SDI interface, and the ability to continuously data stream 8-bit or 12-bit images.



- *Full frame 4:3 aspect ratio CMOS sensor composed of 1,632 x 1,200 pixels*
- *14-bit image depth (standard)*
- *1,000 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 on-chip shuttering to 2 microseconds*
- *“EDR” Extreme Dynamic Range™ exposure control*
- *Auto Exposure control*
- *Up to 24 Gigabytes DRAM, 24 Gigabytes non-volatile flash memory (optional)*
- *IRIG-B timing capture, modulated or unmodulated, IRIG lock w/phase shift*
- *Continuous video output (NTSC, PAL, HD/SDI 720p, 1080p, 1080i, 1080psf)*
- *Optional continuous data streaming up to 500 fps (8-bits), 350 fps (12-bits)*
- *Automated multiple session recording for remote unmanned operation*
- *Gigabit Ethernet or RS232 control*



V9.1 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: 1,632 x 1,200 pixel SR-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 1,000 fps

Allocated formats: to 153,846 fps with “CAR” (Continuous Adjustable Resolution) feature

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 500 fps (8-bits), 350 fps (12-bits)

Strobe Sync: TTL Pulse

RS232

Network: 10/100/Gigabit Ethernet

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

Power: 24VDC/1.5 Amp

MEMORY

Standard: 6 Gigabytes integral image memory records 3,192 images for 3.19 sec of continuous recording at 1,000 fps, full format (8-bits) or 1,824 images for 1.82 sec of continuous recording at 1,000 fps, full format (14-bits). Longer recording times for lower sample rates and allocated formats.

Optional: 12 Gigabytes integral image memory continuously records 6,427 images for 6.43 sec. (8-bits) or 3,762 images for 3.67 sec (14-bits) at 1,000 fps full frame, and 24 Gigabytes will record 12,899 images for 12.9 sec (8-bits) or 7,370 images for 7.37 sec (14-bits) at 1,000 fps full frame.

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

ENVIRONMENTAL

Ambient Temperature

-14°F to +122°F (-10°C to + 50°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 spreadsheet 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 -28VDC 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

VISION RESEARCH

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

Phantom v9.1 Maximum Recording Speed vs. Image Size

The Phantom v9.1 camera system records up to 1,016 frames per second using the full 1632 x 1200 pixel CMOS imaging sensor array. The operator may specify other aspect ratios to increase recording speeds or extend recording times.

The chart below details some of the Phantom v9.1 aspect ratio choices available from a resolution and sample rates pull down menu. Using the CAR (Continuous Adjustable Resolution) feature, resolution/speed settings between these values are continuously adjustable in 96 x 8 pixel increments.

RESOLUTION	RATE
1632 x 1200	1,016
1632 x 960	1,268
1632 x 480	2,520
1632 x 240	4,975
960 x 960	1,972
960 x 480	3,906
960 x 240	7,648
480 x 480	6,420
480 x 240	12,422
480 x 120	23,391
480 x 64	36,603
96 x 96	51,948
96 x 48	81,632
96 x 32	100,000
96 x 16	129,032
96 x 8	153.846



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