phantom® digital widescreen cinema™

creative control

The Sense of Time

one frame per second increments

11 Stops

extraordinary impact

phantom®

VISION

www.visionresearch.com

The Sense of Time

…time stays just where it is…
Zenji Dogen (early 13th century)

…speed is relative to the position of the observer…and so is time
Albert Einstein (early 20th century)

Every shot tells a story. If the Zenmaster Dogen is right and time stays just where it is, each story can return to the time of its origin. The director's work then is to move the story to the time it happens for the story will not, can not, come to us.

On the other hand, if Einstein is right and time depends on the position of the observer, each story has many origins. The director's craft is to move the story through time to the viewpoints of its pivotal characters.

However you see this duality, like a lens shift in focus, a shift in time is elemental in telling the story.

Now there is a camera that gives you complete creative control over time.
The Phantom. The Phantom allows you to select any frame rate in increments of one frame per second. Shift the frame rate a little and move the scene to a slightly future viewpoint. Or shift the frame rate a lot and move the scene to some long passing moment in time. With the Phantom camera, you have seamless control of the duration, speed and time of a story element.

The Phantom is a totally digital high resolution, high speed imaging system capable of recording thousands of high resolution images per second. The two main components of the system are the Phantom camera with advanced CMOS sensor technology, and the Phantom software.
Together they form a system that captures high speed, high resolution images in a digital cine format, with instant playback and output to multiple analog and HD display formats.

Call us when you're ready to develop **The Sense of Time.**

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VISION RESEARCH

phantom® digital widescreen cinema™

FREE**TIME**

- Focus
- Roll Camera
- Contrast Ratio
- Lighting Ratio
- Gamma
- Color Balance
- Color Correction
- SMPTE Time Code

HD

Digital Widescreen Cinema Cameras

www.visionresearch.com

Rev 03 May 2006

Free**Time**

At Vision Research, digital cinema isn't about just replacing film or video with some new technology. It's about creating a new way of seeing time. It's about telling the story from a viewpoint not limited by 24 frames per second. It's about exploring and creating a new sense of time.

Now there's a camera that gives you complete creative control over time. The Phantom.

With the totally digital high speed Phantom, you choose the speed of time for the overall cine, for each scene, for each character. How? The Phantom lets you set the frame rate in increments of one frame per second. Increase the frame rate slightly and subtly charge the character with tension. Or increase the frame rate until time stands menacingly still.

And with the Phantom you now have precise control over the amount of blur or clarity in each scene. Exposure time is no longer tethered to the camera's frame rate or limited to a few shutter openings. The Phantom lets you set the exposure time in increments of one microsecond. Experiment with shortened exposure times to achieve the look of a hard edge street video. Or lengthened exposure times until you've captured the indefinable, unmistakable feel of film.

Focus.

Whether you're creating a film in 35mm or the rare 70mm, a lens shift in focus is elemental in telling the story. Your digital mopic camera should give you creative focus control too. At the heart of each Phantom digital cinema camera is a full format 35mm or 70mm sensor. Add a cinematographer's lens, such as a PL-mount lens, and **experience the same feel and depth of focus as film**.

Roll camera.

Keep the camera rolling until the shot is perfect.
With the Phantom's circular camera roll, the camera is immediately **capturing images from the moment it's powered on.**
There's no film or tape to run out, so you can concentrate on capturing the best performance.
If you prefer, shoot in a more traditional style with the Phantom's linear roll. Direct the scene from start to end. With either the circular or linear roll, **the shot is immediately available for viewing** and critique. The scene can be quickly re-shot while the lighting, crew, and characters are still set and ready and the ideas are still flowing.

Contrast ratio.

Television displays a five stop range or a contrast ratio of 32:1. Negative film renders a seven stop range or a contrast ratio of 128:1. The Phantom camera has an **incredible 11 stop range for a contrast ratio of 2048:1**. Simply said, there are over two thousand shades of grey between black and white. So the more shades of gray, the more accurately the recorded scene captures the original scene. That said, the Phantom lets you select the contrast ratio you prefer to work with.

Lighting ratio.

Every story is better told when great care is given to visualizing and controlling lighting ratios. The Phantom set up screen lets you see instantly the effects of changes to lighting ratios. Moving the cursor to any point in the scene **immediately displays the reflectance** of that point.
Think of it as a built-in spot meter – for 10 million spots.

Gamma.

Think of gamma as a way to **break the law of reciprocity.** Compress or stretch the blacks. Squash or broaden mid-tones. Eliminate or intensify highlights. The Phantom lets you explore how changes in gamma immediately impact the story.

Color balance.

Shoot daylight or tungsten and put the color balance filters away. With the Phantom's built-in black reference and white balance, you can **shoot under any lighting conditions,** even with mixed sources.

Color correction.

You can use your favorite lenses, matte boxes and filters with complete compatibility with the Phantom. Or combine them with Phantom's built-in, user selected color corrections to create a look that's uniquely yours.

SMPTE time code.

When it's time for editing, Phantom quickly lets you randomly recall and display any frame in the cine. **Each Phantom cine frame is identified** with a unique identifying number and SMPTE time code. Experiment with different cuts; each frame, even if the clip is just one frame long, retains it number, time code, and settings.

VISION RESEARCH

phantom® digital widescreen cinema™

HD & 65 FEATURES & BENEFITS

2.0 and 10.0 Megapixel Definition

High Speed Framing Rates

Active Pixel SR-CMOS Sensors

HDTV 16:9, 35mm, 70mm formats

11 Stop Tonal Range

Flash Magazine

Real Time Output

HD & 65 FEATURES & BENEFITS

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Rev 03 May 2006

PRELIMINARY All specifications subject to change

phantom HD

- 2.0 Megapixel SR-CMOS sensor
- Full 16:9 aspect ratio
- 1920 x 1080 active pixels (24mm x 13.5mm)
- 35mm cinema compatible
- 1000 fps, full aspect ratio
- PL Mount lenses & others
- The Sense of Time™

PRELIMINARY All specifications subject to change

phantom 65

- 10.0 Megapixel SR-CMOS sensor
- Full 2.2:1 aspect ratio
- 4096 x 2440 active pixels (51.2mm x 23.25mm)
- 70mm cinema compatible
- 125 fps, full aspect ratio
- M645 lenses & others
- The Sense of Time™

phantom

Standard Features

- Selectable 11 stop tonal range (11:1) Contrast ratio 2048:1
- Accepts 128 Gigabyte solid-state memory magazine, hot-swap, non-volatile
- Compatible with multiple formats:
  24p, HD SDI, 720p, 1080p, 1080i, NTSC, PAL
- SMPTE Time Code (Society of Motion Picture and Television Engineers)
- Compatible with live broadcast, television, or cinema production
- Multiple camera synchronization
- Viewfinder port with HD SDI or composite video output
- Circular or linear image buffer
- On-chip shuttering, variable to 2 microseconds
- Variable frame rates in one frame per second increments

Memory

- Phantom HD: 4 Gigabyte DRAM internal memory
- Phantom 65: 8 Gigabyte DRAM internal memory

Memory Options:

- 8 Gigabyte DRAM internal memory
- 16 Gigabyte DRAM internal memory
- 128 Gigabyte Non-Volatile Flash memory magazine
  with docking station
- Dual fiber streaming output to Image³ intensive image storage system

Connectors:

- I/O: trigger, pre-trigger, SMPTE time code, sync
- Gigabit Ethernet Control
- Remote Control
- HD SDI Coax
- Power

phantom® digital widescreen cinema™

VISION RESEARCH

HD & 65 SPECIFICATIONS

- Sensors
- Frame Rates
- Memory Options
- Lens Mounts
- Inputs/Outputs
- Software
- Environmental

HD & 65 SPECIFICATIONS

Rev 03 May 2006

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PRELIMINARY All specifications subject to change

SPECIFICATIONS

MEMORY

Phantom HD

Standard: 4 Gigabytes integral image memory records 987 images for 0.9 sec of continuous recording at full format 1000fps.
Longer recording times for lower sample rates and allocated formats..

Optional: 8 Gigabytes integral image memory continuously records 1975 images/1.9 sec. at full format 1000fps.
16 Gigabytes will record 3950 images/3.9 sec at full format 1000fps.

Phantom 65

Standard: 8 Gigabytes integral image memory records 328 images for 13.6 sec. of continuous recording at full format 24fps.
Longer recording times for lower sample rates and allocated formats.

Optional: 16 Gigabytes integral image memory records 656 images for 27.3 sec. of continuous recording at full format 24fps.
Longer recording times for lower sample rates and allocated formats.

Flash Memory

Optional: Non-volatile flash magazine, hot-swap with docking station. Up to 128 Gigabytes.

FEATURES

"Hot-swap" Flash magazine
ViewFinder port with component video
SMPTE Time Code
On-camera control
Linear or circular image buffer
Pre-trigger recording
On chip shuttering
Strobe sync
Segmented image memory
Continuous color HD-SDI video output
IRIG-B timing capture with phase shift
10/100/Gigabit Ethernet

Sensor

Phantom HD: 2.0 Megapixel
1920 x 1080 active pixel SR-CMOS sensor (24mm x 13.5mm)
Phantom 65: 10 Megapixel
4096 x 2440 active pixel SR-CMOS sensor (51.2mm x 23.25mm)

Image Bit Depth: 11-bit

Pictures per Second (PPS)
Phantom HD: Full sensor; to 1,000fps
Phantom 65: Full sensor; to 120fps

Allocated Formats

Phantom HD: 35mm 1.85:1 1920 x 1038 HD 16:9 1920 x 1080
Phantom 65: 70mm 2.2:1 also 4K, 2K, HDTV

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 ViewFinder w/component video, computer monitor or continuous video out

Lens Mounts

Phantom HD: PL lens mount and others
Phantom 65: M645 lens mount and others

INPUTS/OUTPUTS:

via integrated quick release connectors:

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

Strobe Sync: TTL Pulse

RS232
Network: 10/100/Gigabit Ethernet
Video out: NTSC, PAL, and HD-SDI 4:2:2 (720p, 1080p, 1080i at 24, 25, 59.9, and 60 fps)
Power: 24VDC/1.5 Amp

Software

Phantom® operates in a Windows environment with familiar commands found in familiar places. Standard functions include:

Acquisition: Image capture, SMPTE or 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. Segmented Memory. 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. Full screen display or metadata screen display.

Supported mopic formats: Cine, Cine JPEG, Cine Raw, AVI, Multipage TIFF, MXF PAL, MXF, NTSC, and Quick Time MOV.

Supported image formats: Windows BMP, OS/2 BMP, PCX, TGA, TIFF, LEAD, JPEG, JTIF, and Raw

Measurements: Distance. Speed. RPMs. American and metric units.

Image processing: Built-in filters for smooth, sharpen, low and high pass, 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.

Cine Viewer

Share legal copies of free Cine Viewer shareware. Allows your original cine files to be easily viewed by anyone. Installs in minimum hard drive space or runs from CD-ROM drive.

Environmental

Ambient Temperature: -14˚F to +122˚F (-10˚C to + 50˚C)
Maximum humidity: 80%, non-condensing, at 5˚C

Dimensions

Size: 5.5 x 4.9 x 11.6 inch (HWD) (14.0 x 12.5 x 29.5 cm) (HWD)
Weight: 9 lbs (4.0kg)
Power: 20-36VDC input. 24VDC/1.5 Amp
Mounting: 3/8 - 16 inch main mounting hole and four 1/4 - 20 inch threaded mounting hole pattern in base
Mounting Axis: Any position
Material & Finish: Machined aluminum housing, plated finish
Country of Origin: The United States of America

Standard Accessories

Phantom® software, single user license*.
Phantom HD: 4 Gigabyte integral image memory.
Phantom 65: 8 Gigabyte integral image memory.
Ethernet and Capture cables with sync out, trigger, pre-trigger, video out, IRIG-B in. AC power adapter with power cord: 110/220VAC-24VDC

Questions?

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

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