



Phantom[®] v12

High-Definition, 1280x800, 1 million fps, sub- μ s shutter, Phantom CineMag[™] compatible

WHEN IT'S TOO FAST TO SEE, AND TOO IMPORTANT NOT TO[™]

One million is the new benchmark in high-speed imaging. Introducing the Phantom v12—a megapixel camera capable of taking 1,000,000 pictures-per-second.

With the Phantom v12 camera, Vision Research breaks the high-speed digital imaging speed barrier...again!

Take the wide view with our custom-designed high-definition 1280x800 megapixel CMOS sensor. The wide aspect ratio of the v12 allows you to see more of the event you are recording with a "widescreen" view.

Get 6,242 frames-per-second (fps) at full resolution. At lower resolutions, you will get even higher frame rates, up to 1,000,000 fps (optional).

With an active pixel size of 20 microns and improved quantum efficiency, the Phantom v12 camera has **sensitivity** superior to our acclaimed v7.3. So, even if you are using our sub-microsecond shuttering, you'll get the highest sensitivity possible with the lowest noise possible.

That's right. You can eliminate blur and see the most minute detail by using our optional **sub-microsecond shuttering**. Down to 300 nanoseconds, programmable in 18ns increments.

Each camera supports **8- and 12-bit pixel depth**. Smaller bit-depth gives you more recording time and smaller files. Greater bit-depth gives you more gray levels and finer detail. With the greater latitude of 12-bit, you can pull more detail out of the image.

The v12 has a **high-resolution timing system**. A highly stable internal clock yields a timing resolution of 20ns. Frame rate, sync and exposure accuracy are all improved over previous generations of high-speed cameras. This makes the camera perfect for **PIV applications** with a 500 nanosecond straddle time and no image lag.

Of course, the v12 offers our unique **Extreme Dynamic Range** (EDR) feature giving you the ability to get two different exposures within a single frame. And, with **auto**



exposure, the camera adjusts to changing lighting conditions automatically.

The v12 comes with 8GB of high-speed dynamic RAM standard, but you can order 16GB or 32GB versions. Our **segmented memory** allows you to divide this into up to 64 segments so you can take multiple shots back-to-back without the need to download data from the camera.

Or, record directly and repeatedly to our **Phantom CineMag[™]** non-volatile, hot-swappable memory magazines. They mount directly on the CineMag compatible version of the camera. Continuously record full resolution cines into non-volatile memory at up to 1000 fps. That's up to 256 seconds into the 256GB CineMag or 512 seconds into the 512GB CineMag. Or, record at higher speeds into camera RAM (up to 32GB), then manually or automatically move your cine to the CineMag. With CineMag storage you get maximum data protection and an ideal storage medium for secure environments.

Move the CineMag from the camera to a **CineStation[™]** dock connected to a PC and view, edit, and save your cines using the Phantom Software supplied with the camera. Keep them in their original cine raw format, or convert them to TIFF, QuickTime, AVI, or a number of other formats. Move the files from the CineStation to a disk or tape deck via Gb Ethernet, or dual HD-SDI, or Component Video outputs.

A video-out port on the camera allows you to connect to a component video monitor and **view your recordings immediately** in a variety of formats including NTSC, PAL,

SDI and high-definition 720p. And, there are **two HD-SDI ports**.

The v12 is controlled by the feature-rich Phantom Software. If you've used any Phantom camera before, you will know how to run the v12. And, we'll ship you a trial version of Image System's TEMA Starter for Phantom for motion analysis applications.

(The v12 comes in two base models, either with or without a CineMag interface. The base models operate at up to 680,000 fps and 1 μ s. An option is available to enable 1,000,000 fps and 300ns exposure. All models come in either color or monochrome configurations.)



SPECIFICATION	V12
RESOLUTION (PIXELS)	1280x800
CONTINUOUSLY ADJUSTABLE RESOLUTION (CAR)	Yes, 128 x 8
FRAMES-PER-SECOND AT FULL RESOLUTION	6,242 fps
MAXIMUM FRAME RATE	680,000 fps 1,000,000 fps optional
EXPOSURE TIME (SHUTTER SPEED)	1 μ s standard 300ns optional
BUILT-IN MEMORY	8GB, 16GB or 32GB
ISO (ISO-12232 STANDARD)	6400 Mono 1600 Color
NON-VOLATILE MEMORY	Phantom CineMag
MEMORY SEGMENTATION	Yes, up to 64 segments
PIXEL BIT-DEPTH	8 and 12 bits
CAMERA TRIGGER AND SIGNALS	Trigger, Aux (IRIG-out or Strobe), Ready, FSync, IRIG-in, Video
GB ETHERNET	Yes
ANALOG VIDEO OUT	PAL, NTSC & HD Component (720p)
HD-SDI	720p
LENSING	F-mount
SIZE	H = 5.0" (7.5" w/handle) W = 5.0" L = 11.5" (w/o lens)
WEIGHT	11.5 pounds without lens
POWER	60 Watts
OPERATING TEMPERATURE	10°C to 40°C

RESOLUTION/SPEED CHARTS*:

	128	256	512	768	1024	1280
8	1,000,000	980,392	763,941	632,511	534,759	463,177
16	852,514	683,994	490,196	381,970	312,891	264,970
32	560,224	423,190	284,171	214,684	172,503	143,472
64	330,469	240,096	155,207	114,220	90,637	74,934
96	236,239	168,067	106,371	77,911	61,402	50,709
128	183,250	128,998	81,024	59,059	46,464	38,296
256	96,749	66,997	41,483	30,042	23,548	19,362
512	49,724	34,140	20,978	15,156	11,854	9,735
768	33,479	22,906	14,042	10,134	7,921	6,501
800	32,161	22,006	13,485	9,730	7,605	6,242

H	V	FPS
1280	800	6,242
1280	720	6,933
1024	768	7,921
1024	512	11,854
800	600	11,364
720	576	13,485
640	480	18,769
512	512	20,978
512	384	27,865
512	256	41,483
512	128	81,024
512	64	155,207
512	32	284,171
320	240	54,516
256	256	66,997
256	128	128,998
256	64	240,096
256	32	423,190
256	16	683,994
256	8	980,392
128	128	183,250
128	96	236,239
128	64	330,469
128	32	560,224
128	16	852,514
128	8	1,000,000



* Assumes optional 1,000,000 fps, 300nsec upgrade is installed.



Preliminary data. All specifications are subject to change. (Mar 20, 2008)

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