



# PHANTOM v2512/ v2012

ONE-MEGAPIXEL  
ULTRAHIGH-SPEED  
CAMERAS

1280 x 800 at over 25,000 fps (v2512)  
and 22,600 fps (v2012)

Superb sensitivity

Fast download with standard 10Gb Ethernet

## FEATURES & BENEFITS

### DESIGNED FOR ULTRAHIGH-SPEED APPLICATIONS

- From 25,700 fps at full 1280 x 800 resolution up to 1 Million fps\* at reduced resolutions, for applications that truly need very high frame rates and low exposure times.
- Flexible resolution combinations to reach required frame rates - wide Field of View for wide area applications, long and narrow Field of View for directional applications.
- Very high native light sensitivity and user-controlled Exposure Index reduces need for supplemental lighting at ultrahigh frame rates.

### FOCUS ON DATA MANAGEMENT

- Record multiple experiments with up to 288GB of memory that can be partitioned up to 63 times.
- 10Gb Ethernet is standard for the fastest data download directly from the camera's RAM buffer.
- Compatible with the Phantom CineMag IV and V, for up to 8TB of nonvolatile memory and even faster image transfer.

*\*with export controlled FAST option*

FRAME RATES & EXPOSURE		
Top FPS at Max Resolution	v2512: 25,700	v2012: 22,600
Maximum FPS	v2512: 663,280 at 128 x 16 1,000,000 at 256 x 32 with FAST option *	v2012: 651,150 at 128 x 16 1,000,000 at 128 x 32 with FAST option *
Minimum FPS	100	
CAR Increments	640 x 8	
Minimum Exposure	1 $\mu$ s Standard	With FAST Option: v2512 - 265ns v2012 - 290ns
Electronic Shutter	Global	
PIV Features	PIV-mode straddle time = v2512 - 375ns v2012 - 400ns	
Exposure Features	Auto-Exposure	

IMAGING		
Sensor Type	CMOS	
Maximum Resolution	1280 x 800	
Bit Depth	12-bit	
Pixel Size	28 $\mu$ m	
Sensor Size	35.8 x 22.4; 42.2mm diagonal	
ISO Daylight (12232 STD)	Mono 32,000D	Color 6,400D
ISO Tungsten (12232 STD)	Mono 100,000T	Color 10,000T
Exposure Index	Mono 32,000 – 160,000	Color 6,400 – 32,000
Dynamic Range	57.2 dB	
Readout Noise	27.0 e- typical	

## FRAME RATE CHART

Table provides select resolutions and frame rates. Many more resolution combinations exist. The record times shown are for 144GB RAM at the frame rate shown. Duration will be ½ for 72GB and double for 288GB RAM.

Maximum Frame Rate - FPS; (144GB Record time - Sec)		
Resolution (H x V)	v2512	v2012
1280 x 800	25,700 (3.8)	22,600 (4.4)
1280 x 720	28,500 (3.8)	25,100 (4.4)
1024 x 800	30,500 (4.0)	26,900 (4.6)
640 x 480	70,100 (4.6)	62,500 (5.2)
512 x 512	75,600 (5.1)	67,800 (5.6)
512 x 384	99,800 (5.1)	89,550 (5.7)
256 x 256	206,300 (7.3)	188,500 (8.0)
256 x 128	380,100 (7.6)	347,800 (8.3)
128 x 64	663,250 (16.4)	651,150 (16.7)
128 x 16	663,250 (46.7)	651,150 (47.5)

With the Fast Option (export controlled)	v2512	v2012
128 x 64	783,100 (13.9)	727,200 (15.0)
256 x 32	1,000,000 (9.6)	949,400 (10.1)
768 x 16	1,000,000 (5.1)	965,500 (5.3)
384 x 16	1,000,000 (10.3)	1,000,000 (10.3)
128 x 32	1,000,000 (31.0)	1,000,000 (31.0)



## CONNECTIVITY & SIGNALS

Ethernet	Gigabit and 10Gb standard
Timecode	IRIG-B Modulated and un-modulated
Port Descriptions	Fischer 8-pin Ethernet; Copper RJ45 for 10G Ethernet; Fischer 3-pin for Primary & backup power; Fischer 5-pin for Remote; Fischer 8-pin Range Data; Fischer 5-pin GPS; 4 Dedicated BNCs: Trigger, Timecode-in, 2 for SDI Video; 4 BNCs for Programmable I/O; Amphenol Capture connector
I/O Signals	Programmable I/O (4 ports) for Fsync, Strobe, Ready, Timecode-out, Event, Pretrigger. Assign and define signals in PCC.
Hardware Trigger	Dedicated BNC
Software Trigger	Trigger button; via Ethernet; via Remote port; via Image-based auto trigger (IBAT)
Synchronization	External Sync via FSync or IRIG Timecode
Recording Features	Burst Mode; Image-based Auto Trigger, Auto-save to CineMag
Video Output	1.5G-SDI via BNC
Accessory Power	6-pin Fischer (side) for 12V monitors up to 1.5 amp



## CONTROL

Software & OS	Phantom PCC (Windows); SDK also available in C++ and also with MatLab and LabView drivers
On-camera Controls	Standard Feature. Access menu system with encoder, viewed on video monitor. Buttons for trigger, play and save
Primary File Format	Phantom Cine RAW (.cine)
Alternative File Formats	Easily convert to formats including .mp4, Apple ProRes .mov, .avi, Tiff, JPG, DNG and many more using PCC. Cine files are directly compatible with many major video editing and motion analysis programs
Highlighted Software Features	Integrated Data Acquisition (NI-DAQ), DIC Calibration Support with Sync-Snapshot menu, DHCP capability, Programmable I/O, "Sync to trigger" capability, Continuous recording, Image Processing

## MEMORY & STORAGE

RAM Buffer	72GB, 144GB, 288GB RAM options
Multi-Cine	Up-to 63 Partitions
Non-Volatile Media	Phantom CineMag IV and V optional. Supports auto-save, direct record and video playback.
Media Transfer Rate	2TB CineMag V = 900 Mpx/sec 8TB CineMag V = 1.4 Gpx/sec

## POWER

AC Power	100-240 VAC, 280W power supply included
Voltage Range	20-28V
Power Consumption	255W max with CineMag, 230W max without CineMag
Battery Options	Works with 24V battery sources only, input through dedicated backup power port

## MECHANICAL

Housing Variants	CineMag and non-CineMag compatible variants
Size	9.7 x 7.5 x 10.8" (245.8 x 190 x 273 cm) (H x W x L, including handle and lens mount)
Weight	17 lbs 8 oz (8.1 kg)
Lens Mounts	F-Mount standard (aperture support for Nikon G-style lenses). Also available: Canon EF (with electronic focus and iris control), C-mount
Mounting Points	Standard 1/4 x 20 and 3/8" mounting points on bottom (2 each). 3 each of standard 1/4 x 20 and 3/8" mounting points on top-mounted handle
Internal Shutter	Standard, for remote black references
Cooling	Active cooling. Quiet mode disables fans during capture.

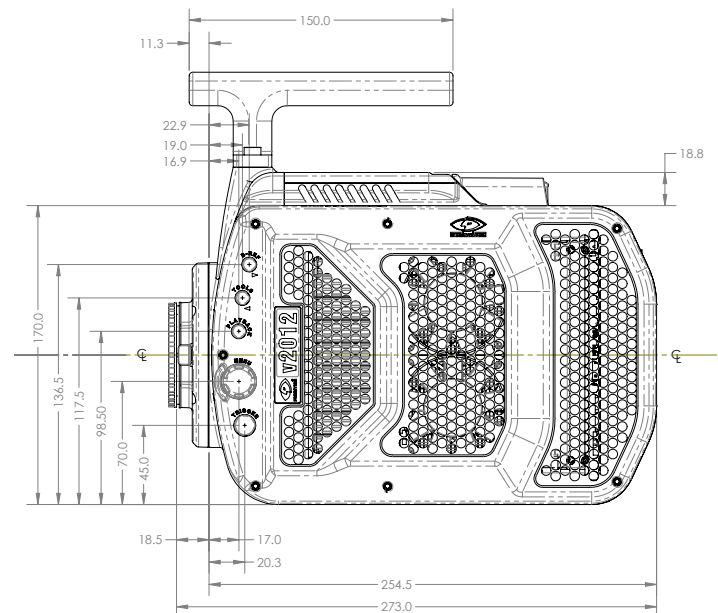
## ENVIRONMENTAL

Operating Temperature	-10 – 50C, 19Gb Ethernet operating: +5 - 50C
Storage Temperature	-20 – 70C
Humidity	95% non-condensing
Operational Shock	5.5G, 11mSec sawtooth, 3 axes, 60 pulses total
Operational Vibration	7.5 Grms, 3 axes, IAW MIL-STD-202G
Regulatory	CE Emissions - CE Compliant EN 61326-1 CE Immunity - CE compliant EN 61326-1 FCC - CFR 47, Part 15, Subpart B Safety - IEC 60950-1

## GLOBAL SUPPORT NETWORK

The Phantom UHS-Series 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 offering at  
[www.phantomhighspeed.com/Service-Support](http://www.phantomhighspeed.com/Service-Support)



## ABOUT VISION RESEARCH

Focused. Since 1950, Vision Research has been designing, and manufacturing high-speed cameras. Our single focus is to invent, build, and support the most advanced cameras possible.

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