

Phantom Camera Comparison

Dated: 03, October 2006

	Phantom Camera Model									
	P65	PhantomHD	Phantom v10	Phantom v9.1	Phantom v7.3	Phantom v7.2	Phantom v6.2e (Multi Head)	Phantom v5.1	Phantom v4.3	Phantom v4.2
Standard Features										
Auto Exposure	■	■	■	■	■	■	■	■	■	■
Continuous Video Output	■	■	■	■	■	■	■	■	■	■
Continuous Data Streaming			■	■	■					
EDR Exposure	■	■	■	■	■	■	■	■	■	■
Ethernet Control Interface	■	■	■	■	■	■	■	■	■	■
Event Marker	■	■	■	■	■	■	■	■	■	■
HD-SDI Video Output	■	■	■	■	■					
HyGe Rated			■	■	■	■	■	■	■	■
Image Processing	■	■	■	■	■	■	■	■	■	■
Integral Image Memory	■	■	■	■	■	■	■	■	■	■
IRIG-B Timing Capture w/Phase Shift	■	■	■	■	■	■	■	■	■	■
Memory Gate			■	■	■	■				
Phantom Camera Control Software	■	■	■	■	■	■	■	■	■	■
Post Trigger Recording	■	■	■	■	■	■	■	■	■	■
Pre-Trigger Recording	■	■	■	■	■	■	■	■	■	■
Range Data Input				■	■	■		■		
Ready Signal	■	■	■	■	■	■	■	■	■	■
SDI Video Output						■	■	■	■	■

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Segmented Image Memory	■	■	■	■	■	■		■		
STMPE Time Code	■	■								
Strobe Sync	■	■	■	■	■	■	■	■	■	■
Sync Imaging	■	■	■	■	■	■	■	■	■	■
Trigger Input										
Variable Speed Playback	■	■	■	■	■	■	■	■	■	■
Framing and Resolution										
Maximum Resolution	4,096 x 2,240	1920 x 1080	2400 x 1800	1632 x 1200	800 x 600	800 x 600	512 x 512	1024 x 1024	800 x 600	512 x 512
Max Frame Rate (Full Resolution)	125fps	970fps	480fps	1,000fps	6,688fps	6,688fps	1,400fps	1,200fps	1,000fps	2,100fps
Max Frame Rate (Reduced Resolution)	33,057fps	144,175fps	153,848fps	144,175fps	190,476fps	190,476fps	115,385fps	95,000fps	90,000fps	90,000fps
F-sync Clock	Internal External IRIG IRIG w/Phase Shift	Internal External IRIG IRIG w/Phase Shift	Internal External IRIG IRIG w/Phase Shift	Internal External IRIG IRIG w/Phase Shift	Internal External IRIG IRIG w/Phase Shift	Internal External IRIG IRIG w/Phase Shift	Internal External IRIG IRIG w/Phase Shift	Internal External IRIG IRIG w/Phase Shift	Internal External IRIG IRIG w/Phase Shift	Internal External IRIG IRIG w/Phase Shift
Continuous Adjustable Resolution	Variable (16 x 8 pixels)	Variable (48 x 8 pixels)	Variable (96 x 8 pixels)	Variable (96 x 8 pixels)	Variable (32 x 8 pixels)	Variable (48 x 8 pixels)	Variable (16 x 8 pixels)	Variable (64 x 4 pixels)	Variable (16 x 8 pixels)	Variable (16 x 8 pixels)
Adjustable Frame Rates	1fps increments	1fps increments	1fps increments	1fps increments	1fps increments	1fps increments	1fps increments	1fps increments	1fps increments	1fps increments
Frame Profile Support	Up to 4 defined by: Image Number Time (sec) Image Percentage Time Percentage	Up to 4 defined by: Image Number Time (sec) Image Percentage Time Percentage	Up to 4 defined by: Image Number Time (sec) Image Percentage Time Percentage	Up to 4 defined by: Image Number Time (sec) Image Percentage Time Percentage	Up to 4 defined by: Image Number Time (sec) Image Percentage Time Percentage	Up to 4 defined by: Image Number Time (sec) Image Percentage Time Percentage	Up to 4 defined by: Image Number Time (sec) Image Percentage Time Percentage	Up to 4 defined by: Image Number Time (sec) Image Percentage Time Percentage	Up to 4 defined by: Image Number Time (sec) Image Percentage Time Percentage	Up to 4 defined by: Image Number Time (sec) Image Percentage Time Percentage

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Frame Formats										
70mm	2.21:1 (4096 x 1860) 1.85:1 (4096 x 2214)									
35mm	1.85:1 (1672 x 900) 1.85:1 (1920 x 1038) 1.37:1 (1672 x 1220) 1.37:1 (1920 x 1400)	1.85:1 (1920 x 1038)								
HD	1920 x 1080 1280 x 720	16:9 (1920 x 1080)								
UHD	3840 x 2160									

Sensor

Type	CMOS	CMOS	CMOS	CMOS	CMOS	CMOS	CMOS	CMOS	CMOS	CMOS
Size	51.2mm x 30.5mm	18.768mm x 13.8mm		18.768mm x 13.8mm	17.6mm x 13.2mm	17.6mm x 13.2mm	11.264mm x 11.264mm	16.384mm x 16.384mm		11.264mm x 11.264mm
Monochrome Sensitivity			2,400 ASA/ISO equivalent	2,400 ASA/ISO equivalent	4,800 ASA/ISO equivalent	4,800 ASA/ISO equivalent	4,800 ASA/ISO equivalent	2,400 ASA/ISO equivalent	4,800 ASA/ISO equivalent	4,800 ASA/ISO equivalent
Color Sensitivity			600 ASA/ISO equivalent	600 ASA/ISO equivalent	1,200 ASA/ISO equivalent	1,200 ASA/ISO equivalent	1,200 ASA/ISO equivalent	600 ASA/ISO equivalent	1,200 ASA/ISO equivalent	1,200 ASA/ISO equivalent
Pixel Size				11.5um		22um	22um	16um		
Bit Depth	8-bits (standard) 14-bits (optional)	8-bits (standard) 14-bits (optional)	8-bits (standard) 14-bits (optional)	8-bits (standard) 14-bits (optional)	8-bits (standard) 14-bits (optional)	10-bits	10-bits	10-bits	10-bits	10-bits

Exposure

Type	Variable shutter	Variable shutter	Global	Global	Global	Global	Global	Global	Global	Global
Minimum Exposure Rate	2us (Standard), 1us (Optional)	2us (Standard), 1us (Optional)	2us (Standard), 1us (Optional)	2us (Standard), 1us (Optional)	2us (Standard), 1us (Optional)	2us (Standard), 1us (Optional)	10us (Standard), 5us (Optional)	10us (Standard), 5us (Optional)	10us (Standard), 5us (Optional)	10us (Standard), 5us (Optional)
EDR Exposure	1 setting	1 setting	1 setting	1 setting	1 setting	1 setting	1 setting	1 setting	1 setting	1 setting
Auto Exposure Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

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Memory Options										
DRAM Support	2GB, 4GB, 8GB (internal)	4GB 8GB, 16GB (Internal)	1.5GB 3GB, 6GB, 12GB (Internal) Up to 320GB (Image3)	1.5GB 3GB, 6GB, 12GB (Internal) Up to 320GB (Image3)	2GB, 4GB, 8GB (internal)	1GB, 2GB, 8GB (Internal) Up to 320GB (Image3)	1GB, 2GB, 4GB	1GB, 2GB, 4GB, 8GB	256MB, 2GB	256MB, 2GB
NV Flash Memory Support	128GB w/docking station Hot swappable 128GB Flash magazine	128GB w/docking station Hot swappable 128GB Flash magazine	Up to 24GB	Up to 24GB	Up to 24GB	6GB	6GB	6GB	6GB	6GB
Compact Flash Support	No	No	No	No	No	No	No	No	No	No
Segmented Memory	Up to 16 segments	Up to 16 segments	Up to 16 segments	Up to 16 segments	Up to 16 segments	Up to 16 segments	N/A	Up to 16 segments	N/A	N/A
Continuous Data Streaming	N/A		Up to 275fps (8-bit images) Up to 175fps (12-bit images)	Up to 500fps (8-bit images) Up to 350fps (12-bit images)	Up to 2,000fps (8-bit images) Up to 1,300fps (12-bit images)	N/A	N/A	N/A	N/A	N/A
Maximum Recording Time at Full Resolution	2GB - 0.8 sec. (102 images) 4GB - 1.6 sec. (205 images) 8GB - 3.2 sec. (410 images)	4GB - 0.9 sec. (987 images) 8GB - 1.9 sec. (1,975 images) 16GB - 3.9 sec. (3,950 images)	1.5GB - 0.73 sec. 350 8-bit images 1.5GB - 0.38 sec. 175 14-bit images 3GB - 1.5 sec. 700 8-bit images 3GB - 0.73 sec. 350 14-bit images 6GB - 3.0 sec. 1,400 8-bit images 6GB - 1.5 sec. 750 14-bit images 12GB - 6.0 sec. 2,800 8-bit images 12GB - 3.0 sec. 1,400 14-bit images	1.5GB - 0.8 sec. 772 8-bit images 1.5GB - 0.38 sec. 386 14-bit images 3GB - 1.5 sec. 1,544 8-bit images 3GB - 0.8 sec. 772 14-bit images 6GB - 3.0 sec. 3,088 8-bit images 6GB - 1.5 sec. 1,544 14-bit images 12GB - 6.0 sec. 6,176 8-bit images 12GB - 3.0 sec. 3,088 14-bit images	2GB - 0.6 sec. 4,266 8-bit images 2GB - 0.3 sec. 2,133 14-bit images 4GB - 1.3 sec. 8,533 8-bit images 4GB - 0.6 sec. 4,267 14-bit images 8GB - 2.6 sec. 17,066 8-bit images 8GB - 1.3 sec. 8,533 14-bit images 16GB - 5.1 sec. 34,133 8-bit images 16GB - 2.6 sec. 17,066 14-bit images	1GB - 0.3 sec. 2,199 images 2GB - 0.7 sec. 4,421 images 8GB - 2.7 sec. 17,750 images	1GB - 0.8 sec. 1,000 images 2GB - 1.6 sec. 2,024 images 4GB - 3.1 sec. 4,072 images	1GB - 0.8 sec. 1,000 images 2GB - 1.7 sec. 2,024 images 4GB - 3.4 sec. 4,072 images 8GB - 6.8 sec. 8,168 images	256MB - 0.4 sec. 537 images 2GB - 3.7 sec. 4,449 images	256MB - 0.5 sec. 1,000 images 2GB - 3.7 sec. 8,168 images
Trigger Modes	Rising/Falling TTL Pulse Edge w/Filter Switch Closure Phantom Camera Control Software	Rising/Falling TTL Pulse Edge w/Filter Switch Closure Phantom Camera Control Software	Rising/Falling TTL Pulse Edge w/Filter Switch Closure Phantom Camera Control Software	Rising/Falling TTL Pulse Edge w/Filter Switch Closure Phantom Camera Control Software	Rising/Falling TTL Pulse Edge w/Filter Switch Closure Phantom Camera Control Software	Rising/Falling TTL Pulse Edge w/Filter Switch Closure Phantom Camera Control Software	Rising/Falling TTL Pulse Edge w/Filter Switch Closure Phantom Camera Control Software	Rising/Falling TTL Pulse Edge w/Filter Switch Closure Phantom Camera Control Software	Rising/Falling TTL Pulse Edge w/Filter Switch Closure Phantom Camera Control Software	Rising/Falling TTL Pulse Edge w/Filter Switch Closure Phantom Camera Control Software

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Lens Mounts	845 mount 667 mount PL mount F-mount (available)	PL mount plus a wide variety of lens mounts available	F-mount (standard) C-mount (available)	F-mount (standard) C-mount (available)	F-mount (standard) C-mount (available)	F-mount (standard) C-mount (available)	C-mount (standard) F-mount (available)	F-mount (standard) C-mount (available)	C-mount (standard) F-mount (available)	C-mount (standard) F-mount (available)	
Image Control/ Network Communication											
Transmission Method	Ethernet 10/100BASE-T 1000BASE-T RS232 HD-SDI, on camera control	Ethernet 10/100BASE-T 1000BASE-T RS232 HD-SDI, on camera control	Ethernet 1000BASE-T RS232 VSR192 Fiber	Ethernet 10/100BASE-T 1000BASE-T RS232 VSR192 Fiber	Ethernet 10/100BASE-T 1000BASE-T RS232	Ethernet 10/100BASE-T 1000BASE-T RS232	Ethernet 10/100BASE-T 1000BASE-T RS232	Ethernet 10/100BASE-T 1000BASE-T RS232	Ethernet 10/100BASE-T 1000BASE-T RS232	Ethernet 10/100BASE-T 1000BASE-T RS232	Ethernet 10/100BASE-T 1000BASE-T RS232
Maximum Distance	100 meters 75 feet 300 meters	100 meters 75 feet 300 meters	100 meters 75 feet 300 meters	100 meters 75 feet 300 meters	100 meters 75 feet 300 meters	100 meters 75 feet 300 meters	100 meters 75 feet 300 meters	100 meters 75 feet 300 meters	100 meters 75 feet 300 meters	100 meters 75 feet 300 meters	
Controller Unit/ Controller OS	Windows 2000 Windows XP Pro XP Tablet	Windows 2000 Windows XP Pro XP Tablet	Windows 2000 Windows XP Pro XP Tablet	Windows 2000 Windows XP Pro XP Tablet	Windows 2000 Windows XP Pro XP Tablet	Windows 2000 Windows XP Pro XP Tablet	Windows 2000 Windows XP Pro XP Tablet	Windows 2000 Windows XP Pro XP Tablet	Windows 2000 Windows XP Pro XP Tablet	Windows 2000 Windows XP Pro XP Tablet	Windows 2000 Windows XP Pro XP Tablet
Control Software	Phantom Camera Control	Phantom Camera Control	Phantom Camera Control	Phantom Camera Control	Phantom Camera Control	Phantom Camera Control	Phantom Camera Control	Phantom Camera Control	Phantom Camera Control	Phantom Camera Control	
SDK Availability		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	

Preview and Focusing

Preview and Focusing	ViewFinder w/ component video Computer monitor Continuous HD-SDI Video Out	SVGA Computer Monitor Continuous Video Out	SVGA Computer Monitor Continuous Video Out	SVGA Computer Monitor Continuous Video Out	SVGA Computer Monitor Continuous Video Out	SVGA Computer Monitor Continuous Video Out	SVGA Computer Monitor Continuous Video Out	SVGA Computer Monitor Continuous Video Out	SVGA Computer Monitor Continuous Video Out	SVGA Computer Monitor Continuous Video Out
Continuous Video Output Formats	NTSC PAL HD-SDI (720p, 1080p, 1080i at 24, 25, 59.9 and 60fps)	NTSC PAL HD-SDI (720p, 1080p, 1080i at 24, 25, 59.9 and 60fps)	NTSC PAL HD-SDI (720p, 1080p, 1080i at 24, 25, 59.9 and 60fps)	NTSC PAL HD-SDI (720p, 1080p, 1080i at 24, 25, 59.9 and 60fps)	NTSC PAL HD-SDI (720p, 1080p, 1080i at 24, 25, 59.9 and 60fps)	RS170 (NTSC, PAL) SDI	RS170 (NTSC, PAL) SDI	RS170 (NTSC, PAL) SDI	RS170 (NTSC, PAL) SDI	RS170 (NTSC, PAL) SDI

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Power										
Requirements	24VDC 1.5 Amps	24VDC 1.5 Amps	24VDC 1.5 Amps	24VDC 1.5 Amps	24VDC 1.5 Amps	24VDC 1.5 Amps	24VDC 1 Amp	24VDC 1.5 Amps	24VDC 1 Amp	24VDC 1 Amp
Battery Backup	N/A	External	External	External	External	External	External	External	External	External

Physical Dimensions

Camera Unit	5.5" x 4.9" x 11.6" 12lbs	5.5" x 4.9" x 11.6" 12lbs	4.3" x 4.0" x 9.5" 7lbs	4.3" x 4.0" x 9.5" 7lbs	4.3" x 4.0" x 9.5" 7lbs	4.3" x 4.0" x 9.5" 7lbs	5.75" x 8" x 4.5" 5lbs	4.3" x 4.0" x 9.5" 7lbs	4.25" x 3.37" x 8.25" 4.5lbs	4.25" x 3.37" x 8.25" 4.5lbs
Imaging Head	N/A	N/A	N/A	N/A	N/A	N/A	3" x 3" x 2" 1lb	N/A	N/A	N/A

Remote Imaging Head Systems

Max. Number of Remote Imaging Heads	N/A	N/A	N/A	N/A	N/A	N/A	4 Heads	N/A	N/A	N/A
Max. Number of Remote Micro Camera Heads	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Maximum Cable Lengths	N/A	N/A	N/A	N/A	N/A	N/A	5 meters	N/A	N/A	N/A

Standards

CE Approved	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
UL Recognized	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
HyGe Rated			100g up to 10ms 50g up to 100ms (all axis)	100g up to 10ms 50g up to 100ms (all axis)	100g up to 10ms 50g up to 100ms (all axis)	100g up to 10ms 50g up to 100ms (all axis))	100g up to 10ms 50g up to 100ms (all axis)	100g up to 10ms 50g up to 100ms (all axis)	100g up to 10ms 50g up to 100ms (all axis)	100g up to 10ms 50g up to 100ms (all axis)

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Supported Formats

File Formats Support (Movie)	Cine	Cine	Cine	Cine	Cine	Cine	Cine	Cine	Cine	Cine
	Cine Compressed	Cine Compressed	Cine Compressed	Cine Compressed	Cine Compressed	Cine Compressed	Cine Compressed	Cine Compressed	Cine Compressed	Cine Compressed
	Cine RAW	Cine RAW	Cine RAW	Cine RAW	Cine RAW	Cine RAW	Cine RAW	Cine RAW	Cine RAW	Cine RAW
	AVI	AVI	AVI	AVI	AVI	AVI	AVI	AVI	AVI	AVI
	MPEG	MPEG	MPEG	MPEG	MPEG	MPEG	MPEG	MPEG	MPEG	MPEG
	Multipage TIFF	Multipage TIFF	Multipage TIFF	Multipage TIFF	Multipage TIFF	Multipage TIFF	Multipage TIFF	Multipage TIFF	Multipage TIFF	Multipage TIFF
	MXF PAL	MXF PAL	MXF PAL	MXF PAL	MXF PAL	MXF PAL	MXF PAL	MXF PAL	MXF PAL	MXF PAL
	MXF NTSC	MXF NTSC	MXF NTSC	MXF NTSC	MXF NTSC	MXF NTSC	MXF NTSC	MXF NTSC	MXF NTSC	MXF NTSC
	Quick Time	Quick Time	Quick Time	Quick Time	Quick Time	Quick Time	Quick Time	Quick Time	Quick Time	Quick Time
File Formats Support (Image)	Windows BMP	Windows BMP	Windows BMP	Windows BMP	Windows BMP	Windows BMP	Windows BMP	Windows BMP	Windows BMP	Windows BMP
	OS/2 BMP	OS/2 BMP	OS/2 BMP	OS/2 BMP	OS/2 BMP	OS/2 BMP	OS/2 BMP	OS/2 BMP	OS/2 BMP	OS/2 BMP
	PCX	PCX	PCX	PCX	PCX	PCX	PCX	PCX	PCX	PCX
	TGA	TGA	TGA	TGA	TGA	TGA	TGA	TGA	TGA	TGA
	TIFF	TIFF	TIFF	TIFF	TIFF	TIFF	TIFF	TIFF	TIFF	TIFF
	LEAD	LEAD	LEAD	LEAD	LEAD	LEAD	LEAD	LEAD	LEAD	LEAD
	JPEG	JPEG	JPEG	JPEG	JPEG	JPEG	JPEG	JPEG	JPEG	JPEG
	JTIF	JTIF	JTIF	JTIF	JTIF	JTIF	JTIF	JTIF	JTIF	JTIF
	RAW	RAW	RAW	RAW	RAW	RAW	RAW	RAW	RAW	RAW