



Phantom Comparison

Image				
Model	Phantom HD GOLD	Phantom FLEX	Phantom Miro LC320S	Phantom 65
Short Description	This camera is not just a high-speed camera, but an instrument that gives the cinematographer 35mm depth of field either at HD or 2K resolutions with stunning results. The Phantom HD GOLD combines the visual quality of high-definition imaging with the high frame rates of specialty cameras.	The Phantom Flex introduces new degrees of flexibility not available on any other digital cinema camera. And, it goes beyond HD and supports 4 megapixel imaging when the ultimate in image resolution is required.	This >2 megapixel camera with 3.2 Gpx/s throughput sets a new standard for price/performance and ease-of-use in the high-speed imaging industry. At 1920 x 1080 HD resolution, the camera can shoot over 1500 frames-per-second. And, the camera sports a number of advanced features such as: CineFlash storage, Canon EOS lens mount, internal capping shutter and an on-board battery, all in a small, rugged package.	The world's first and still only 65mm high-speed digital camera. The Phantom digital widescreen cinema cameras aren't just about replacing film or video with some new technology, they're about creating a new way of seeing time.
Throughput/Speed	<ul style="list-style-type: none"> • 2.3 Gpx/second • Max speed at full resolution of 2048 x 2048 is 555 fps • Max speed at reduced resolution of 256 x 256 is 4,400 fps • At 1920 x 1080, max speed is 1050 fps • Record direct to CineMag at up to 1 Gpx/second • Minimum frame rate of 10 fps 	<ul style="list-style-type: none"> • 6 Gpx/second • Max speed at full resolution of 2560 x 1600 is 1455 fps in Standard mode and 725 fps in HQ mode • At 1920 x 1080, max speed is 2,570 fps in Standard mode and 1275 fps in HQ mode • Record direct to CineMag at up to 800 Mpx/second 	<ul style="list-style-type: none"> • 3.2 Gpx/second • Max speed at full resolution of 1920 x 1200 is 1380 fps • At 1920 x 1080, you can achieve over 1500 fps and • at 1152 x 1152, over 2200 fps • Maximum speed at reduced resolution of 64 x 8 is 240,000 fps • Minimum frame rate of 24 fps • Shutter speeds down to 1 microsecond 	<ul style="list-style-type: none"> • 440 Mpx/second • Max speed at full resolution of 4096 x 2440 is 141 fps • Max speed at reduced resolution of 256 x 256 is 1,343 fps • At 1920 x 1080, max speed is 320 fps • Record direct to CineMag at up to 200 mps/second • Minimum frame rate of 10 fps
Sensor Specifications	<ul style="list-style-type: none"> • 2048 x 2048 pixels • 12.5 µm pixel size • 25.6 mm x 25.6 mm • 8-, 10-, 12-, 14-bit depth • ISO 250-320 • TE cooled • Dynamic range: 10,5 to 11 stops 	<ul style="list-style-type: none"> • 2560 x 1600 pixels • 10 µm pixel size • 25.6 mm x 16.0 mm • 12-bit depth • ISO 800 • TE cooled • Dynamic range: 10 stops 	<ul style="list-style-type: none"> • 1920 x 1200 pixels • 10 µm pixel size • 19.2 mm x 12.0 mm • 12-bit depth • ISO 1,100 T color (ISO 12232 SAT method) • TE cooled • Dynamic range: 55 dB 	<ul style="list-style-type: none"> • 4096 x 2440 pixels • 12.5 µm pixel size • 52.1 mm x 30.5 mm • 8-, 10-, 12-, 14-bit depth • ISO 250-320 • TE cooled • Dynamic range: 10,5 to 11 stops
Exposure	<ul style="list-style-type: none"> • 2 µs minimum exposure • Progressive electronic shutter 	<ul style="list-style-type: none"> • 1 µs minimum exposure in Standard mode • Exposure range in HQ mode is dependent upon frame rate • Global electronic shutter 	<ul style="list-style-type: none"> • 1 µs minimum exposure • Global electronic shutter • Extreme Dynamic Range (EDR) • Auto Exposure • Shutter Off mode for PIV applications 	<ul style="list-style-type: none"> • 2 µs minimum exposure • Progressive electronic shutter
Memory	<ul style="list-style-type: none"> • 8 GB, 16 GB, 32 GB high-speed internal RAM • CineMag for non-volatile storage (128 GB, 256 GB, 512 GB) 	<ul style="list-style-type: none"> • 8 GB, 16 GB, 32 GB high-speed internal RAM • CineMag for non-volatile storage (128 GB, 256 GB, 512 GB) 	<ul style="list-style-type: none"> • 3GB, 6GB, 12GB high-speed internal RAM • Slot for CineFlash support 	<ul style="list-style-type: none"> • 8 GB, 16 GB, 32 GB high-speed internal RAM • CineMag for non-volatile storage (128 GB, 256 GB, 512 GB)

Record Times	<ul style="list-style-type: none"> 8.45 seconds at 1,000 fps, 14-bit depth, 1920 x 1080 resolution and into 32 GB of internal memory 	<ul style="list-style-type: none"> 10.3 seconds at 1,000 fps, 12-bit depth, 1920 x 1080 resolution and into 32 GB of internal memory (Standard mode), 5.1 seconds in HQ mode 	<ul style="list-style-type: none"> 2.3 seconds at maximum frame rate, 12-bit depth, largest resolution and into maximum internal memory 	<ul style="list-style-type: none"> 14 seconds at 140 fps, 14-bit depth, 4096 x 2440 resolution and into 32 GB of internal memory
Special Features	<ul style="list-style-type: none"> Segment memory for up to 63 cines in multi-cine mode 	<ul style="list-style-type: none"> Dual shooting modes: <ul style="list-style-type: none"> Standard mode for highest frame rates HQ mode for ultimate image quality Segment memory for up to 63 cines in multi-cine mode SMPTE in/out Standard internal mechanical shutter for automatic/remote Current Session Reference (CSR) Mounting plates for optional gear on side and handle 	<ul style="list-style-type: none"> Segment memory for up to 16 cines in multi-cine mode Image-Based Auto-Trigger Continuous recording Memory gate Event marking Frame timestamp IRIG In (modulated or unmodulated) IRIG Out (unmodulated) Shutter off mode for PIV exposure 1.4µs straddle time (mono) Burst mode Standard internal mechanical shutter for automatic/remote Current Session Reference (CSR) Secondary IP address Field-based firmware upgrade capable Autoset feature 	<ul style="list-style-type: none"> Segment memory for up to 63 cines in multi-cine mode
Triggering	<ul style="list-style-type: none"> Programmable trigger location (pre/post trigger recording) Trigger from software Hardware trigger BNC 	<ul style="list-style-type: none"> Programmable trigger location (pre/post trigger recording) Trigger from software Hardware trigger BNC Trigger inputs also available on Aux ports 	<ul style="list-style-type: none"> Programmable trigger location (pre/post trigger recording) Image Based Auto Trigger standard Trigger from software Hardware trigger on capture cable 	<ul style="list-style-type: none"> Programmable trigger location (pre/post trigger recording) Trigger from software Hardware trigger BNC
Timing & Synchronization	<ul style="list-style-type: none"> Frame synchronization to internal or external clock (FSYNC) Strobe output 	<ul style="list-style-type: none"> 20 ns timing resolution Frame synchronization to internal or external clock (FSYNC) Strobe output 	<ul style="list-style-type: none"> 20ns timing accuracy Frame synchronization to internal or external clock (FSYNC) IRIG In (modulated or unmodulated) IRIG Out (unmodulated) 	<ul style="list-style-type: none"> Frame synchronization to internal or external clock (FSYNC) Strobe output
Signaling	<ul style="list-style-type: none"> Strobe, Ready, Video, IRIG on capture cable Viewfinder 	<ul style="list-style-type: none"> Dual-link HD-SDI Genlock BNC FSYNC BNC Trigger BNC Timecode In BNC Timecode Out BNC Remote (RCU) port Viewfinder port Two 12VDC (1.5A) Aux ports (with trigger signal available) 	<ul style="list-style-type: none"> Capture connector (Trigger, Ready, IRIG In, Video, IRIG Out, Aux) (Aux signal can be assigned to Event, Strobe or Memgate) Dedicated FSYNC and connection on camera body 	<ul style="list-style-type: none"> Strobe, Ready, Video, IRIG on capture cable Viewfinder
Ethernet Connection	<ul style="list-style-type: none"> Gb Ethernet for both control and data 	<ul style="list-style-type: none"> Gb Ethernet for both control and data 	<ul style="list-style-type: none"> Gb Ethernet for both control and data 	<ul style="list-style-type: none"> Gb Ethernet for both control and data
Camera Control	<ul style="list-style-type: none"> Phantom Camera Control (PCC) On-Camera Controls Remote Control Unit (RCU), connects direct to camera Phantom Application (legacy) SDK available 	<ul style="list-style-type: none"> Phantom Camera Control (PCC) On-Camera Controls Remote Control Unit (RCU), connects direct to camera Phantom Application (legacy) SDK available 	<ul style="list-style-type: none"> Phantom Camera Control software (PCC) Flip-out LCD Touchscreen on LC-Series Remote Control Unit (RCU) SDK available 	<ul style="list-style-type: none"> Phantom Camera Control (PCC) On-Camera Controls Remote Control Unit (RCU), connects direct to camera Phantom Application (legacy) SDK available

Video Out	<ul style="list-style-type: none"> • Analog video (NTSC or PAL) on capture cable • 4:2:2 HD-SDI • Component viewfinder port 	<ul style="list-style-type: none"> • Dual-link HD-SDI • Component viewfinder port 	<ul style="list-style-type: none"> • HD-SDI from BNC on rear of camera. Standard 720P, 1080i and 1080psf signals are supported. 	<ul style="list-style-type: none"> • Analog video (NTSC or PAL) on capture cable • 4:2:2 HD-SDI • Component viewfinder port
Lensing	<ul style="list-style-type: none"> • PL-mount standard • Nikon F-mount optional (lens not included) 	<ul style="list-style-type: none"> • PL-mount standard • Nikon F-mount optional • Canon EOS optional • B4 lens support through the use of an adapter 	<ul style="list-style-type: none"> • Canon EOS • Nikon F-mount • Nikon F mount adapter (allows the use of F-mount lenses on EOS mount) • 1" C-mount • PL-mount 	<ul style="list-style-type: none"> • PL-mount standard • Nikon F-mount optional • Mamiya 645 mount optional (lens not included)
Video Processing	<ul style="list-style-type: none"> • Brightness • Contrast • Gamma • Saturation • Hue • White Balance 	<ul style="list-style-type: none"> • Brightness • Contrast • Gamma • Saturation • Hue • White Balance 	<ul style="list-style-type: none"> • Brightness • Contrast • Gamma • Saturation • Hue • White Balance 	<ul style="list-style-type: none"> • Brightness • Contrast • Gamma • Saturation • Hue • White Balance
Power	<ul style="list-style-type: none"> • 100 - 240 VAC, 150 Watt power supply included • 20-36 VDC battery input 	<ul style="list-style-type: none"> • 100 - 240 VAC, 150 Watt power supply included • 20-36 VDC battery input • Two power connectors for hot-swapping battery power or having battery backup when on AC power 	<ul style="list-style-type: none"> • 12 - 28 VDC, 65 W • 100 - 240 VAC power supply included • Rechargeable battery (Sony BP-U30 or BP-U60) 	<ul style="list-style-type: none"> • 100 - 240 VAC, 150 Watt power supply included • 20-36 VDC battery input
Mechanical Specifications	<ul style="list-style-type: none"> • 5.47 x 7.62 x 12.13 in 13.97 x 19.4 x 30.8 cm (L, W, H) • Weight: 12.1 lbs, 5.5 kg 	<ul style="list-style-type: none"> • 11.5 x 5.5 x 5.0 inches 29.2 x 14 x 12.7 cm (L, W, H) • Weight: 11.75 lb; 5.33 kg 	<ul style="list-style-type: none"> • 7.5 x 4 x 4 inches, 19 x 10 x 10 cm (L x W x H without lens or battery) • Weight: 3.0 lbs, 1.4 kg (without CineFlash, lens or battery) 	<ul style="list-style-type: none"> • 5.47 x 7.62 x 12.13 in 13.97 x 19.4 x 30.8 cm (L, W, H) • Weight: 12.1 lbs, 5.5 kg
Environmental Specifications	<ul style="list-style-type: none"> • Temperature: 0°C - 40°C • Humidity: 80% non-condensing at 5°C 	<ul style="list-style-type: none"> • Temperature: 0°C - 40°C • Humidity: 80% non-condensing at 5°C 	<ul style="list-style-type: none"> • Temperature: 0°C - 40°C • Humidity: 8% to 80% RH • Storage Temperature: -20°C to +70°C 	<ul style="list-style-type: none"> • Temperature: 0°C - 40°C • Humidity: 80% non-condensing at 5°C
APIs	<ul style="list-style-type: none"> • Phantom SDK • LabView • MatLab 	<ul style="list-style-type: none"> • Phantom SDK 	<ul style="list-style-type: none"> • Phantom SDK • LabView • MatLab 	<ul style="list-style-type: none"> • Phantom SDK • LabView • MatLab
Ships Standard With	<ul style="list-style-type: none"> • Power supply • Ethernet cable • Phantom PCC software • Getting Started guide • Case 	<ul style="list-style-type: none"> • Power supply • Ethernet cable • Phantom PCC software • Getting Started guide • Spare CineMag interface pin array • Case 	<ul style="list-style-type: none"> • Power supply • Ethernet cable • Battery, battery charger • 60GB CineFlash and dock • Capture cable • PCC software <p>Options</p> <ul style="list-style-type: none"> • Upgrade bundled 60GB CineFlash to 120 or 240GB • Lens mount choice 	<ul style="list-style-type: none"> • Power supply • Ethernet cable • Phantom PCC software • Getting Started guide • Case
Popular Accessories	<ul style="list-style-type: none"> • CineMag • CineStation • RCU • Spare Cable Kit 	<ul style="list-style-type: none"> • CineMag • CineStation • RCU • Spare Cable Kit • Spare CineMag interface pin array • 645, PL, Super-PL and F-mount lens mounts 	<ul style="list-style-type: none"> • Remote Control Unit • Spare batteries, battery charger • Additional CineFlash modules • Battery belt 	<ul style="list-style-type: none"> • CineMag • CineStation • RCU • Spare Cable Kit • 645, PL, Super-PL and F-mount lens mounts

Resolution / FPS				Std.	HQ				
	2048 x 2048	555				1920 x 1200	1,380	4096 x 2440	141
	2048 x 1104 (2k 1.85)	1,029	2650 x 1600	1,455	725	1920 x 1080 (HDTV)	1,530	4096 x 2304 (4k 16:9)	150
	2048 x 872 (2k 2.35)	1,302	1920 x 1080	2,570	1,275	1152 x 1152	2,240	4096 x 1712 (65mm 2.40)	202
	1920 x 1080 (HDTV 16:9)	1,052	1280 x 720	5,350	2,640	1024 x 1024	2,770	3840 x 2160 (UHD)	160
	1632 x 1200	946	640 x 480	10,750	5,285	1280 x 800	2,940	2048 x 2048	169
	1280 x 800	1,419				1280 x 720	3,200	2048 x 1104 (2k 1.85)	313
	1280 x 720 (HDTV 16:9)	1,576				640 x 480	8,300	2048 x 872 (2k 2.35)	396
	1152 x 896	1,267				512 x 512	9,200	1920 x 1080 (HDTV 16:9)	320
	800 x 600	1,890				384 x 288	19,000	1632 x 1200	288
	640 x 480	2,316				256 x 256	26,400	1280 x 800	431
	512 x 512	2,213				128 x 128	62,000	1280 x 720 (HDTV 16:9)	479
						128 x 64	102,000	1152 x 896	385
						64 x 8	240,000	800 x 600	575
								640 x 480	718
								512 x 512	673
								256 x 256	1,342
								16 x 8	34,482



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[Camera Comparison Chart](#)