Phantom®
Flex4K

- 4K at up to 1000 fps
- Exceptional image performance
- Records 2K and 4K at ultra high-speed and standard frame rates
- Choose between RAW and Apple ProRes recording formats

Key Features:

Full resolution: 4096 x 2304 @ 938 fps

4096 x 2160 @ 1000 fps

2048 x 1080 @ 1975 fps

1° to 360° adjustable electronic shutter

3G HD-SDI video outputs

Dual-link 3G SDI for 4K video per SMPTE ST 425-3

Audio: AES/EBU and S/PDIF standards

Recording media:
CineMag IV and CineMag IV PRO; available with
  1TB and 2TB capacities

CineMag IV recording formats:
- Phantom Cine Raw
- Apple ProRes 422 HQ at 4K (4096 x 2304)
  and 2K (2048 x 1152) resolutions only

[ProRes]

The Industry's Most Flexible Digital Cinema Camera

The Phantom Flex4K is a full-featured digital cinema camera, capable of speeds that range from standard frame rates up to 1,000 frames-per-second (fps) at 4K and almost 2,000 fps at 2K resolution. Building upon the award winning technology of Phantom digital cinema products, the Flex4K combines features found in the latest cinema cameras with those otherwise found only in specialty cameras.

Recent innovations include the ability to choose between uncompressed Cine RAW and Apple ProRes 422 HQ recording formats to the camera's CineMag IV. The **CineMag IV PRO** is now available for a fast, seamless ProRes workflow, and is recommended particularly when RAW files are not required. Also available is an upgrade to the new **Flex4K-GS** model which adds the ability to switch from the camera's normal rolling shutter to global shutter for situations that require it.

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Features (continued):

Advanced on-camera control interface

Playback and save controls on both sides of the camera

Memory can be partitioned for multi-cine

Genlock for simplified 3D shooting and synchronizing video playback

Phantom RCU compatible

Optional Battery Back

Choose a battery back at the time of purchase - or later as an accessory. Three mounts are currently available:

• Hawk-Woods mount supports 26v Reel Power batteries

• Anton Bauer Gold mount supports 14.4v Hytron and Dionic-HC batteries

• V-Lock mount supports high-capacity 14.4v V-Lock batteries

Audio Recording

The camera accepts a stereo AES/EBU input compatible with both professional and consumer standards. It is intended for use as a reference or scratch track for sync-sound recording, and can be recorded at frame rates at or above 23.98 fps.

The signal is fed through the AES input on the Mini-BOB, via the camera's Sync port. It will accept 2 channels at variable rates which are normalized in camera to 48KHz with up to 24-bit full scale. The signal can be monitored via the AES output (recommended) or the headphone jack on top of the camera. On-camera meters are included to keep an eye on the audio levels during recording and playback. Files are saved from RAM or CineMag as separate tracks in the uncompressed .wav format, which can then be easily synchronized with the video.

Cinematic Design, 35mm Depth of Field, Exceptional Image Quality

Designed with the cinematographer in mind, the form factor of the Phantom Flex4K adapts to a variety of shooting environments. From the studio to extreme conditions, the Flex4K is built to perform.

At 4K resolution the Flex4K offers super 35mm depth of field. The custom 9.4 megapixel sensor captures intricate detail with impressive dynamic range and low noise. This means excellent image quality and low-light performance. The camera's streamlined design and thermal architecture makes the camera quick-to-shoot with an ultra-stable image.

Sensitivity & Exposure Index

The low noise performance of the Flex4K sensor allows for the effective ISO to be dialed in with the camera's Exposure Index function

Exposure Index (EI) range: from 250 to 1250 (color)

Convenient and Intuitive Camera Controls

Controlling the Phantom Flex4K is easier than ever with a full-featured on-camera control interface for both basic and advanced camera operation. Set up universal capture and recording parameters before the shoot, while retaining access to the more commonly adjusted parameters like frame rate and exposure settings at the push of a button.

Capture, trigger, playback and save controls can be found on both sides of the camera in order to provide a seamless workflow for different shooting environments. Remote control is also possible with a handheld Phantom RCU.

Expanded Recording Options for Different Production Styles

The Phantom Flex4K is available with 64 or 128 Gigabytes of internal RAM. More RAM allows longer recording times at high frame rates. Loop mode records into the RAM buffer at the camera's top speeds, and once the camera is triggered the files can be previewed immediately, then quickly offloaded to an installed Phantom CineMag IV.

For longer record times use run/stop (R/S) mode and record directly to the CineMag IV for several minutes. This is an excellent option when high-speed is not required. In fact, at 24 fps two hours of raw 4K footage can be recorded directly to a 2TB CineMag IV.

Phantom cameras have always generated .Cine raw files, and the Flex4K is no exception. These files include the maximum information for post processing. They are compatible with many of the industry's top color grading software packages, or they can be converted to common file formats using software provided with the camera.

Maximum Record Times *recording times vary based on memory size, frame rate and resolution			
Resolution	Frame Rate (fps)	128GB RAM (seconds)	2TB CineMag IV PRO Run/Stop Mode
4096 x 2304 (max res)	938 (max loop)	10	N/A
4096 x 2304	120	80	22 min. (raw) 55 min. (ProRes HQ)
4096 x 2160	1000 (max loop)	10	N/A
4096 x 2160	120	84	24 min. (raw)
4096 x 2160	24	7 min.	120 min. (raw)
2048 x 1152	1900 (max loop)	19.6	N/A
2048 x 1152	500	78	40 min. (raw) 100 min. (ProRes HQ)

Working with Apple ProRes

Set the camera to record ProRes 422 HQ and the files become 2.5X smaller compared to an equivalent Cine Raw. ProRes recording works at up to 938 fps in loop mode, and up to 136 fps in R/S mode to a CineMag IV PRO (the original CineMag IV is limited to 30 fps). A 2TB CineMag IV will hold more than 4 hours of footage at 30p.

PC & Mac Based Workflow Solutions

Download files from the CineMag IV with the Phantom CineStation® IV, a simple download device that saves files via Gb or 10Gb Ethernet using software on a PC or Mac. One license of the popular Glue Tools Cine Toolkit, and Séance download software for the Mac is included with camera purchase. This provides the ability to download Flex4K raw files in Mac OSX, and allows for direct compatibility with most Quicktime-based edit and color grading software.

The camera also ships standard with our updated (PC-only) Phantom PCC controller software, for downloading, file conversion and full camera control. Phantom PCC software includes both h.264 and Apple ProRes transcoding for Phantom Cine raw files.

Resolution / Maximum Frame Rates	
Resolution	Max fps Loop Mode
4096 x 2304 (max res)	938 fps
4096 x 2160 (4K standard)	1000 fps
3840 x 2160 (16 x 9)	1000 fps
1920 x 1080 (16 x 9)	1975 fps
1280 x 720 (16 x 9)	2930 fps

Inputs / Outputs	
Power input	1x 3-pin Fischer (+12 - 28V DC)
Battery mount (optional)	Selectable Hawk Woods RP mount, Anton Bauer Gold mount & V-Lock battery backs
12V Power aux outputs	1x 2-pin Lemo, 1x 4-pin Hirose for viewfinder
24V Power aux outputs	2x 3-pin Fischer with R/S (24V is unregulated)
Ethernet	8-pin Fischer for software operation & file download
Remote	5-pin Fischer for RS232 & 24V DC; works with BT-Dongle and Phantom RCU
HD-SDI	3x main 3G HD-SDI outputs, 1 additional SDI output at front for viewfinder. 1 SDI return (includes Genlock support)
Sync	12-pin Fischer for Mini-BOB. Provides access to F-Sync, AES/EBU Audio in & out, Timecode in & out, strobe, ready, trigger
Audio out	3.5mm headphone-jack (for monitoring only)
Viewfinder	1 Fischer (standard) or Hirose (optional) for component video, and 1x BNC for SDI-based viewfinders, including the Phantom OLED HD EVF

CineStation IV	
Power input	+12 - 28V DC
Gb Ethernet	RJ45 port
10Gb Ethernet	RJ45 port, for the fastest CineMag IV offload

DATA SHEET

Phantom Flex4K

Flex4K-GS Update

The Phantom Flex4K-GS is a new model that adds the unique ability to switch the 4K sensor from employing a rolling shutter (RS) to a global shutter (GS). The Flex4K's sensor has a very fast scan time of at least 1 millisecond and while it is rare to see the typical distortion associated with rolling shutters, it can still happen when recording subjects with very fast rotating motion. This distortion is eliminated in GS mode, which is also useful to eliminate horizontal bands and vertical scrolling issues when common LED lighting or strobes are present in the scene.

There are image differences between both modes. Most significantly, the dynamic range in RS mode is 12-13 stops, and in GS mode it is limited to 9 stops. The base ISO for color cameras increases to 640 in GS mode. Also, a black reference is required when changing settings in GS mode like other Phantom cameras. Switching modes is done on the camera body or in PCC software – and no reboot is required.

An upgrade to the GS model is available for existing Phantom Flex4K cameras.

Image Monitoring & Video Outputs

The multi-channel video system is customizable for monitoring with adjustable frame guides, and/or a clean output for use with field recorders. Supported video formats include: 720p and 1080p (up to 60 Hz); 1080psf, 1080i, and 2160p (up to 30 Hz).

The outputs can be switched between displaying Rec709 and a pre-set Log curve. The viewfinder and monitor feeds can also be set to always show a live feed, so the operator can follow the action while the last shot is still being saved or played from the other outputs.

Imaging Specifications:

Pixel size:	6.75 micron
Rolling shutter (<1 millisecond scan time); Flex4K-GS model includes a global shutter mode	
ISO Color:	250T (EI Range 250-1250)
ISO Mono:	2000T (EI Range 2000-10,000)
Sensor size:	27.7 x 15.5mm
Sensor @ 1080p:	13 x 7.3mm
Lens mount:	PL (standard), Nikon F/G & Canon EF

Additional Specifications:

Internal RAM:	64GB or 128GB
Recording media:	Phantom CineMag IV; CineMag IV PRO (up to 2TB)
Environmental:	-20˚ - +50˚ C temperature range
Camera size:	11.5 x 5.0 x 7.9 in (LxWxH); 29.2 x 14 x 20 cm
Camera weight:	14 lbs (6.3 kg) without lens, viewfinder or battery
CineStation IV size:	6.5 x 5.75 x 1.5 in (LxWxH); 16.5 x 14.6 x 3.8 cm
CineStation IV weight:	1 lb (0.45kg)

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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