Dedo Weigert Film GmbH • Karl-Weinmair-Str. 10 • D-80807 München

Phantom HD FAQ

What is the resolution of the camera?

The sensor is native 2K, 2048x2048 (a big square). The record resolution is selectable for the given application, which also gives expanded options on record time and frame rates. The camera uses a single CMOS sensor, and it uses a 35mm film format PL lens mount. Common resolution choices are 1920x1080 (aka 1080p, same as the Sony F900) and 1280x720 (720p, same as the Panasonic VariCam). Other resolutions are also available for Digital Cinema use, for example 2048x1112 (1.85 aspect ratio).

How fast can it shoot?

Frame rates are dependent on the choice of resolution. Only the vertical pixel count effects the maximum frame rate, so 2048x720 and 1280x720 will have the same frame rate options. Exposing the entire chip, the Phantom HD is capable of 527fps. At the more common 1080p, top speed is just over 1000fps. At 720p, top speed is about 1500fps. The camera can shoot at slower speeds as well, down to one frame per second.

How light sensitive is the camera?

The Phantom HD is rated at approximately 500 ISO with a dynamic range of exposure in excess of ten stops. No other high-speed Digital Cinema camera can offer similar performance.

How long can it shoot?

Currently, the most common versions of the Phantom HD are equipped with 16G of internal RAM. Runtime is determined by resolution, as a given resolution will yield a given number of frames that will fill this memory. So, in 1080p the memory can hold 4438 frames, which translates to 4.44 seconds when shooting at 1000fps. Played back at 30p (common for NTSC video use) this translates to 148 seconds of material. At 24p, this would be 185 seconds of material. At 720p, the memory can hold 6658 frames. At 30p playback, this runs for 222 seconds; at 24p, this runs for 277 seconds. 32G internal RAM is also available on option. If the Phantom HD you are using is a 32G model, the frame and time length capabilities described above would be doubled.

A convenient calculator for this is located on the Vision Research website at

http://www.visionresearch.com/index.cfm?sector=tools&page=timecalc

If you are looking for the highest image quality, be sure to select 16G of memory (or 32G, on 32G equipped cameras) and 14 bits of bit-depth. (In some cases, when longer run times are desired and more important than ultimate image quality, 12 bits can be selected at the expense of very slight image degradation.)

Currently the Phantom is limited by its internal RAM recording capabilities, but it will soon be able to record to 256G and 512G capacity CineMags, which are interchangeable flash-based memory magazines that clip to the top of the camera and can record up to 80 minutes of Uncompressed RAW (in 1080p). There will also be a separate CineStation for downloading the files from a CineMag while continuing to shoot with the camera.

What do I do with the material once it is captured on the camera?

Captured material can leave the camera in two ways. The camera has an HD-SDI port (single wire, 4:2:2), which can be used to feed directly to an HD deck in a variety of formats. Using the laptop computer controller some basic color correction can be performed on the image output over the HD-SDI. Downloading in this manner is in realtime, so a full file of 1080p material (4428 frames) played at 30p would take 148 seconds.

The second way to output material is by data transfer. The camera captures in Uncompressed RAW, which is considerably more information than any video format can handle. This is excellent for complicated post-grading and effect work and offers the richest material for Digital Cinema production. To copy this material, the files are downloaded from the camera's internal RAM through the laptop computer controller to a hard drive. Downloading Uncompressed RAW is not a realtime operation, and it can take 15-20 minutes to transfer the entire memory buffer from the camera. However, there are ways to make this process more efficient (see below).

How can I shorten download time during my shoot?

There are a few procedural ways to keep the downtime on set as minimal as possible. First and foremast is to realize that the entire length of a shot does not need to be transferred. Most extreme slow motion shots are used to capture events of a limited duration, such as a water drop or ball bounce. For these events, 1000fps footage would have perhaps 30 seconds of useful material. Using the laptop controller, IN and OUT points can be selected (they can also be selected for the HD-SDI output). The camera's memory can also be partitioned into multiple CINE files, so that a number of takes can be captured before selecting IN & OUT points on each and downloading. Often it is the nature of this type of shooting that the required reset time on set, due to the nature of the subject, is longer than the download time of the Phantom system.