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In Review: Convergent Design nanoFlash

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Quality Control: The nanoFlash offers exceptional portable video recording options.

By Ned Soltz

I've had dealings with many companies in my years in the biz, but I've never before encountered a company like Convergent Design. Its principals are available whenever you need them. Buy one of their products and you get the cell phone number of the support engineer and even the owner. You can call them 24/7 (really). They participate in online forum discussions. I sometimes wonder when they actually have time to develop and ship products! That pride of their device and concern for customers should alone recommend the nanoFlash.



The nanoFlash is a two-card version of CD's larger Flash XDR, and is both less costly as well as less bulky, representing an optimal-size unit for on-camera use.

The nanoFlash answers the basic question of "How can I get the maximum possible quality from my camera?" And not only does it address the issue of "maximum quality," but it seeks to resolve that need through codec efficiency.

Note that much of what I say here will also apply to Convergent Designs \$4,995 Flash XDR model. But the popularity of the nanoFlash means that firmware updates to add capabilities now appear first for it and then for the Flash XDR.

The nanoFlash weighs less than 0.5 lb. and fits in the palm of your hand. It's equipped with SDI and HDMI I/O as well as connectors for remote and power. It records to two CF cards. Thus far, Convergent Design has qualified 16GB and 32GB cards from SanDisk and 32GB and 64GB cards from PhotoFlash. Any camera which outputs SDI or HDMI may be used with the nanoFlash. Additionally, the SDI out allows a connection for monitoring what is being input to the device. It draws power either through a battery tap or any external power source that can provide at least 12 volts. Convergent Design sells optional battery packs as well as an optional wired remote start/stop/record device. The nanoFlash can also be used as a playback deck, playing out its contents via SDI or HDMI. Note, however, that for live playback to work, all clips on the card must be recorded in the same format. If the media is merely to be transferred to computer for editing, then you can record any combination of formats to the card.



The nanoFlash utilizes two internal processors to record MPEG2 8-bit 4:2:2 video in either Long GOP or iFrame at data rates up to 160Mb/s (Long GOP) or 280 Mb/s (iFrame). Just by comparison, the Sony XDCAM EX cameras output 35Mb/s Long GOP 4:2:0 data and the Sony PDW700 camera outputs 50Mb/s Long GOP with 4:2:2 bit depth.

An optional ASI interface is available for those who need to record MPEG streams directly for transmission from the unit. The nanoFlash can record a wide range of formats from .mov Quicktime files to MXF files to the XDCAM HD optical format. This ensures that files from the unit can be edited in a wide range of NLEs. Files can be used natively in Final Cut Pro and Avid. Premiere CS3/4 requires an optional codec from MainConcept (available at the discounted price of \$199 for nanoFlash users).

A note here about NLE support. Final Cut Pro has a preset for XDCAM HD at 50 Mb/s. It will accept nanoFlash files encoded at great rates with no problem and will identify them as such in item properties. However, when rendered, the timeline will render at a 50 Mb/s data rate. Avid MC currently will not accept Long GOP greater than 50 Mb/s but has no problems with iFrame.

nanoFlash can also directly record .mpg and .m2v formats, meaning it can encode directly for Blue-ray!

nanoFlash recording can be triggered either by pressing the record button on the unit or by embedded timecode from the camera via SDI. Note that HDMI does not carry timecode, so recording from HDMI cameras must be initiated manually. Pre-record functions can also be selected from the extensive menu options.

Recording is possible at a variety of data rates and it is here that both some data and explanations are necessary.

Long GOP by virtue of its very nature of compression is more efficient than iFrame recording. While Convergent Design does enable iFrame recording at data rates up to 280 Mb/s, the file sizes increase exponentially as do the speed requirements of the CF cards. Whether there is a substantial and visible difference between iFrame and Long GOP at higher data rates does represent an area of considerable discussion in the video world today. Likewise, 8-bit versus 10-bit recording also has merited some considerable discussion.

I tested the nanoFlash primarily at the data rate that Convergent Design claims is the "sweet spot" for MPEG2 Long GOP, 100 Mb/s.

According to Sony's hierarchy of codecs, this combination of data rate and compression produces quality greater than HDCAM, which by the way is actually 1440x1080 and 3:1:1 bit depth. At a data rate of 100 Mb/s, storage requirements were about 1GB per minute. Motion artifacting can virtually disappear at data rates of 100 Mbps. There are those who recommend that for the most precise keying work, the maximum 160 Mbps data rate should be used.

Convergent Design has issued two firmware updates since I obtained my test unit and in addition to the greater 280 Mbps iFrame data rate, it is now possible to record time-lapse as well as under and overcranking from cameras which support under/overcrank. For time-lapse, Convergent Design requires 220 Mb/s iFrame only.

Can one really see a visible difference between high data rate Long GOP and iFrame only footage? I suspect that depending upon the amount of motion within the frames, one might be able to make a case for iFrame only. If the ultimate destination of the footage is film for projection on big screen, again one might be able to make the case for 10-bit iFrame. And I'm not referring here just to engineering specs. I simply am trying to assess choices based upon the look of the actual finished product. I can agree with Convergent Design that for the vast majority of projects, high data rate Long GOP footage will provide both the efficiency and quality to do the job.

Likewise, can one see much of a difference between 8-bit and 10-bit footage.

I would content that material requiring significant graphics, grading, animation, etc., which will be encoded and decoded on sending/receiving ends could benefit from 10-bit footage. It is in these cases that the nanoFlash might not be optimal.

However, I refer to the EBU Technical Review, 2008 Q3, which concludes that 8-bit Long GOP at no less than 50 Mb/s "will not significantly degrade the HD picture quality at the consumer's premises." EBU recommendation is that Long GOP MPEG2 should encode at a bit rate of at least 50 Mb/s while iFrame (of any codec) should be encoded no less than 100 Mb/s.

Now the nanoFlash won't exactly magically transform your footage from a small prosumer HDMI camera into that of a 2/3" chip camera with high-quality lens. But the quality will certainly increase. In fact, the quality advantage gained by the nanoFlash has been recognized by networks, independent shooters, and a variety of technical observers.

Based upon the high quality of images it records, its versatility and its portability, I can offer my highest recommendation for the Convergent Design nanoFlash for anyone who needs footage whose bit rate, color depth and resolution must achieve the most rigid of broadcast standards. And it comes with the assurance of a company who stands behind the product and who seeks every opportunity to add functionality to the product through frequent free firmware updates.



Convergent Design nanoFlash

SCORE: 

PROS: High quality 4:2:2 MPEG2 Long GOP or iFrame recorded to CF cards. Portable. Excellent support and ongoing development.

CONS: 8-bit only. Price. Some NLE support issues.

BOTTOM LINE: I can offer my highest recommendation.

MSRP: \$2,995

CONTACT: www.convergent-design.com

DVSCORE — What Our Ratings Mean

 Excellent! A score of 4.5 or better earns our Award of Excellence.	 Very Good	 Solid Choice	 Almost	 Don't Bother
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