

10 bit color video display in 14.5-question for developers.

Posted by David Rasberry - 14 Jun 2019 13:08

As I understand it, true 10 bit color display from Nvidia GTX series GPU's only works through DirectX-Directshow in Windows 10. I.E. it works mainly for games.

Premiere and Avid don't support this, hence require Quadro series GPU's and drivers for true 10 bit display from a GPU.

How does Lightworks handle 10 bit display rendering, or does it only support 8-bit?

My laptop has a GTX970 GPU that does support 10 bit display to an external monitor in primary mode with the laptop display off or in extended mode. I am seeing true 10 bit display on a recently purchased LG 32" 4K UHD monitor, The difference in color depth and refinement compared to my old monitor or the laptop is readily apparent.

It appears to me that I may be getting 10 bit display in Lightworks running in 32bit float mode, but it would be nice to confirm that. I could just be seeing 8-bit on a much superior monitor.

Thanks.

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Re: 10 bit color video display in 14.5-question for developers.

Posted by lghtwrks - 14 Jun 2019 16:20

I did a longer post some years ago,

afaik AMD supported more bits on gamer cards.

the post was how to enable more bits on standard

geforce cards without hacks.

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Re: 10 bit color video display in 14.5-question for developers.

Posted by David Rasberry - 14 Jun 2019 16:40

GTX970 definitely displays 10 bit color, no problem. It is strictly a matter of driver compatibility with different software apps.

Since Lightworks uses DirectX in Windows I suspect it might show 10 bit color. Avid and Premiere use Open GL not DirectX.

[nvidia.custhelp.com/app/answers/detail/a_id/3011/~10-bit-per-color-support-on-nvidia-geforce-gpus](https://www.nvidia.com/custhelp.com/app/answers/detail/a_id/3011/~10-bit-per-color-support-on-nvidia-geforce-gpus)

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Re: 10 bit color video display in 14.5-question for developers.

Posted by Craig Marshall - 14 Jun 2019 18:04

I have a dual 8bit/10bit test chart display you can use to test your vision pipeline. I'll post it here when I locate it in my Studio PC.

Using this chart, (plus an RGB test chart) I was able to prove a 10bit 4:4:4 display on our Grading monitor and 4K Client Sony TV. (via our Decklink SDI card)

EDIT here is the test chart. UHD Tiff

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Re: 10 bit color video display in 14.5-question for developers.

Posted by Craig Marshall - 14 Jun 2019 18:08

Dropbox link to 8/10bit test chart: www.dropbox.com/s/5figrsvp5d8qzrc/10vs8bit_darker-ramp.tif?dl=0

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Re: 10 bit color video display in 14.5-question for developers.

Posted by lghtwrks - 14 Jun 2019 18:09

it was some years ago (4)

www.lwks.com/index.php?option=com_kunena&func=view&catid=7&id=90993&limit=15&limitstart=15&Itemid=81#91259

Re: 10 bit color video display in 14.5-question for developers.

Posted by David Rasberry - 15 Jun 2019 09:37

Thanks for the chart Craig!

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Re: 10 bit color video display in 14.5-question for developers.

Posted by David Rasberry - 15 Jun 2019 10:13

Looks like 8-bit display in Lightworks and in Resolve. I exported the chart as an 8 bit 4:4:4 jpeg and it looks the same as the 16 bit tif. Some visible banding.

The chart also revealed a very slight shading error region on the left side of the monitor screen. This is not a high end grading monitor, but it uses the same panel and engine as the reference monitors with fewer features. \$350 vs \$1400 and \$2100 for the high end versions.

I expect they are using B grade panels that didn't pass muster for these. But it is not critical for what I do and has no significant impact on video image quality or grading judgements. Still a huge step up from my old 24" that died. Well worth the bucks.

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Re: 10 bit color video display in 14.5-question for developers.

Posted by Craig Marshall - 15 Jun 2019 18:01

Yes, Resolve is a complex beast as 10bit is only displayed in the Color page or the Edit page with Scopes 'off'. Bringing Scopes up in Edit reduces the display to 8bit, even with a Decklink card. GUI is 8bit.

I was surprised that our (old!) 2014 Sony X9005 4K TV, their first model to introduce HDMI 2.0, included a 10bit panel but certainly, 4K BluRay is 10bit and possible in RGB or YUV too with the Panasonic BD Player.

I'm still using BenQ's former flagship PG2401PT as a grading reference reference monitor as it can be calibrated for Rec.709 with good uniformity. It is a 10bit display (8bit + FRC) which is fine, but best performance is through Display Port so we use an SDI > DP converter. This monitor is only HD but our Decklink has 4K>HD onboard so in Lightworks, we can work in 4K on the big screen and have the " Benq referencing at the desk in HD.

This has proved to be a reliable setup for a few years now but look out for the howls of derision if you mention this or any BenQ monitor on the LiftGammaGain forum!

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Re: 10 bit color video display in 14.5-question for developers.

Posted by hugly - 15 Jun 2019 21:50

David Rasberry wrote:

Looks like 8-bit display in Lightworks

Could this have changed with V14.6?

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Re: 10 bit color video display in 14.5-question for developers.

Posted by Craig Marshall - 15 Jun 2019 22:51

To be honest, now that Lightworks supports the latest 12G Decklink I/O cards, the grading controls within Lightworks are more than adequate for 90% of the work we do.

Resolve is fast becoming an all-in-one-box Juggernaut as it is now over a 1GB download. Resolve though, still has performance advantages with Power Windows, Sharpening, Speed & Stabilisation control and of course a fully fledged, built in DAW and VFX capabilities since the integration of Fairlight & Fusion.

So long as you have an AJA or Decklink card installed in your PC, (or the TB equiv on Mac) Lightworks users can enjoy a clean, reliable 10bit SDI or HDMI true 'Video' output which bypasses any of the idiosyncrasies of your computer's Graphics chain. Therefore, Lightworks remains a very powerful Professional video finishing tool.

IMO any software purporting to be suitable for professional Video post production but does not accept AJA or Decklink cards, cannot be considered "Pro" Video at all.

EDIT: Unless of course you are a Youtube vlogger, earning a lot of money from your Channel! Then a simple Smart Phone is probably all you need...

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Re: 10 bit color video display in 14.5-question for developers.

Posted by hugly - 15 Jun 2019 23:25

The gamers are changing the world. 10-bit HDR 4K is what the high-end gamers are playing and recording at, currently, no SDI, no Decklink. Why shouldn't the editors participate?

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Re: 10 bit color video display in 14.5-question for developers.

Posted by Craig Marshall - 16 Jun 2019 00:34

Gamers don't make Television or Cinema where 'standards' still exist. Just look at the very short list of reference monitors demanded of Netflix producers.

Many in the Mac world are hoping Apple's latest high tech and expensive HDR display (the one made to compliment their new Mac Pro) will qualify but just as many suggest it will not.

Sony's "4K OLED HDR display, the BVM-X300, is one of the few reference monitors that does qualify and it costs about US\$30K. Like glass lenses, high quality reference monitors are expensive to make.

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Re: 10 bit color video display in 14.5-question for developers.

Posted by hugly - 16 Jun 2019 00:50

The cinema people seem to live on a different planet anyway, budget wise. For the casual TV producer (something like) the BenQ PD2700U in 27 inch, 10-bit, UHD might be considerable, if the software used can feed it with appropriate signals.

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Re: 10 bit color video display in 14.5-question for developers.

Posted by Craig Marshall - 16 Jun 2019 01:18

Generally, reference monitors need to be calibrated via a 3D LUT. Some, like my BenQ PG2401PT, (and their new 12G SDI capable PV271) offer 'hardware' calibration where the LUT can be stored internally (as with the latest LG OLED TVs) but most use an external LUT Box. BMD's Latest 4K SDI to Display Port converter will allow for external calibration and store the LUT.

The problem with cheap 'computer' monitors (ie: less than \$5K) is generally poor uniformity. Those that offer hardware Uniformity Compensation generally suffer a significant loss in Brightness. My PG2401PT drops from 330 nits to 100 nits with UC switched in but as we operate in virtually complete darkness, 100 nits is very bright.

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