

# HDMI™ 1.3 - New Capabilities

With the launch of version 1.3, HDMI continues to increase its overall capabilities to meet the needs of the High-Definition marketplace. HDMI 1.3 includes the following new features:

- **Higher Speed - 10.2 Gbps**

HDMI 1.3 increases its single-link bandwidth from 165 MHz (4.95 Gbps) to 340 MHz (10.2 Gbps) to support the demands of future high definition display devices:

- Deep Color - increasing the color depth from millions to billions of colors
- Higher resolutions - over 400% greater resolution than 720p HDTV
- High frame rates - higher refresh rates (up to 120 Hz) for smoother motion

- **New Lossless Audio Formats**

HDMI 1.3 adds additional support for new, lossless compressed digital audio formats Dolby® TrueHD and DTS-HD Master Audio™ for theater-like, professional sound quality.

- **Lip Sync**

HDMI 1.3 incorporates an automatic audio/video syncing capability that allows devices to perform this synchronization automatically with accuracy.

- **New Mini Connector**

With small portable devices such as HD camcorders and still cameras demanding seamless connectivity to HDTVs, HDMI 1.3 offers a new, smaller form factor connector option.

- **Deep Color**

HDMI 1.3 supports 30-bit, 36-bit and 48-bit (RGB or YCbCr) color depths, up from the 24-bit depths in previous versions of the HDMI specification.

- Lets HDTVs and other displays go from millions of colors to billions of colors
- Eliminates on-screen color banding, for smooth tonal transitions and subtle gradations between colors
- Enables increased contrast ratio
- Can represent many times more shades of gray between black and white. At 30-bit pixel depth, four times more shades of gray would be the minimum, and the typical improvement would be eight times or more

- **Broader Color Space:**

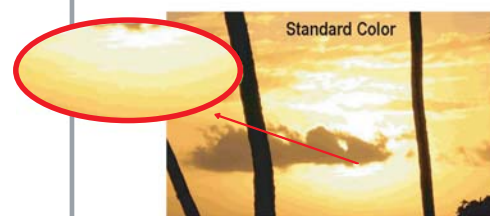
HDMI 1.3 removes virtually all limits on color selection. The human eye can see a broad range of color. Standard RGB color space allows the display of a portion of the colors that are viewable to the human eye (see triangle in Figure 2). The next generation "xvYCC" color space can display virtually the entire gamut of colors viewable by the human eye (Figure 3).

- Next-generation "xvYCC" color space supports 1.8 times as many colors as existing HDTV signals
- Lets HDTVs display colors more accurately
- Enables displays with more natural and vivid colors

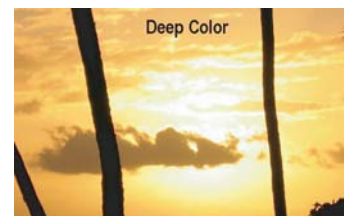
## 1.3 at a Glance

- Higher speed - 10.2 Gbps
- New lossless audio formats
- Lip sync correction
- New mini connector
- Deep Color support
- Broader color space

Figure 1: Deep Color



Color banding is perceptible to the human eye with standard color displays



Using billions of colors, Deep Color virtually eliminates color banding

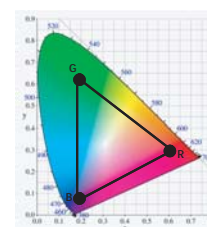


Figure 2: RGB

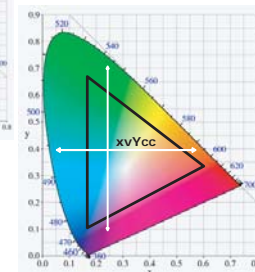


Figure 3: xvYCC

For more information about HDMI 1.3, visit [www.hdmi.org](http://www.hdmi.org)

**HDMI™**  
HIGH-DEFINITION MULTIMEDIA INTERFACE

One cable. One standard. The future-ready way to connect HD.

# Frequently Asked Questions

**Q: Is HDMI 1.3 backward compatible with prior releases of the HDMI spec and with DVI?**

A: Yes, HDMI is fully backward compatible with all prior releases of the HDMI spec, as well as DVI compliant devices.

**Q: What products or applications will take advantage of new HDMI 1.3 capabilities?**

A: According to announcements by manufacturers, new high-definition DVD formats (HD-DVD and Blu-Ray) and game machines (including the Sony PLAYSTATION® 3) will make use of capabilities added in HDMI 1.3. Digital televisions will be able to present images that are closer to real life than previously has been possible. These will include LCD TVs, plasma displays and rear projection microdisplays. The PS3 which is scheduled to ship in November 2006 will be the first source product to provide such high quality imagery to these displays. It is expected that hi-def DVD players will follow early in 2007 with HDMI 1.3 support. A/V Receivers that can decode DTS-HD Master Audio and Dolby TrueHD will start to show up early in 2007 as well. Please check with the manufacturers for details.

**Q: What is meant by the term “Deep Color” and why is it important?**

A: Deep Color lets HDTVs and other displays go from millions of colors to billions of colors allowing consumers to enjoy unprecedented vividness and accuracy of color on their displays. Deep Color eliminates on-screen color banding, for smooth tonal transitions and subtle gradations between colors. It enables increased contrast ratio, and can represent many times more shades of gray between black and white.

**Q: What is “xvYCC”?**

A: HDMI 1.3 adopts use of the IEC 61966-2-4 color standard, commonly called xvYCC (shorthand for Extended YCC Colorimetry for Video Applications). This new standard can support 1.8 times as many colors as existing HDTV signals. xvYCC lets HDTVs display colors more accurately, enabling displays with more natural, vivid colors.

**Q: What is the difference between “Deep Color” and “xvYCC?”**

A: Deep Color increases the number of available colors within the boundaries defined by the RGB or YCbCr color space, while xvYCC expands the available range (limits) to allow the display of colors that meet and exceed what human eyes can recognize.

**Q: Why is lip sync important?**

A: In a DTV, typically the video processing takes more time than the audio. As a result, lip sync can become an issue where it's noticeable to the viewer, creating an effect similar to that of a badly-dubbed movie. HDMI 1.3 provides a method whereby the audio processing times in devices can be automatically adjusted to remove lip sync.



For more information on HDMI 1.3, visit [www.hdmi.org](http://www.hdmi.org)

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One cable. One standard. The future-ready way to connect HD.