DisplayPort to HDMI conversion: Some Application Advice

Overview: DisplayPort is a digital display interface standard, similar in some ways to HDMI. It is a digital audio/video interconnect, intended to be used primarily between a computer and its display.

Unlike HDMI, DVI and LVDS standards, where 4 to 7 differential pairs are fixed to transmitting RGB pixels and a reference clock signal, the DisplayPort interface is based on micro data packets on a single pair—but can use variable number of data pairs. The reference-clock signal is embedded in each data-stream.

A DisplayPort signal can be used to transport audio-only content, video-only content, or both audio and video simultaneously. The video signal path supports 6 to 16 bits per color channel. The audio path supports up to 8 channels of 24 bit 192 kHz uncompressed PCM audio and can encapsulate compressed audio formats in the audio stream. A bi-directional half-duplex auxiliary channel carries device management and device control data for the Main Link, such as VESA EDID, MCCS, and DPMS standards.

Compatibility with HDMI/DVI: The DisplayPort standard specifies an “HDMI compatibility mode”, where the signal format reverts back to HDMI type interface. However, not all DisplayPort devices are required to support this feature. Only ports identified with the DisplayPort “DP++” logo will be able to provide legacy HDMI format video signals. Most (but not all) modern DisplayPort graphics cards and laptops support this mode. Always first check for the “DP++” logo.

To use a “DP++” video connector with HDMI displays, an external signal-level (and connector) adapter dongle must be inserted. This is essentially a “passive” device that is powered by the DisplayPort connector on the source device (laptop/PC). There are other DisplayPort adapter which provide Dual-link DVI and analog VGA outputs, but these are powered converter devices with active circuitry to perform the conversion. The adapter (passive or active) is usually detected automatically by the device and the output video format is changed accordingly.

The DisplayPort-to-HDMI adapters are readily available as retail products. The DisplayPort to DVI-DL (or VGA) should also be readily available if these are necessary.

DisplayPort version 1.0 to 1.1: DisplayPort v1.0 supports a maximum of 8.64 Gbit/s data rate over a 2 meter cable. DisplayPort v1.1 also supports devices which implement alternative link layers such as fiber optic, allowing a much longer reach between source and display without signal degradation. However, alternative implementations are not standardized. DP v1.1 also supports HDCP in addition to DisplayPort Content Protection (DPCP).

Magenta-Compatible DisplayPort to HDMI adapters: Magenta has performed cursory compatibility testing of the following DisplayPort to HDMI adapters:

- Accell B086-001B
- StarTech DP2HDMI2
- Link Depot MD-HDMI-0.2
- Bytecc MIDP-HM005
- GWC AY1200

While our cursory testing has shown these devices to basically work—it is essential that any configuration requiring such a device be thoroughly tested first, using the source device and display hardware actually being used in a particular installation. There may be subtle incompatibility issues that are beyond Magenta’s control.

Caveats: Although DisplayPort to HDMI adapters provide a means of converting the signals to an HDMI connector, keep in mind that it may not support embedded HDMI-audio. Also note that a source device will identify an attached “DisplayPort to HDMI adapter” as a DVI device, NOT an HDMI device.