

For Video Geeks: The Tech Behind HDMI Testing

There are many aspects influencing the performance of any given HDMI cable or accessory, such as an HDMI switch or distribution device. Put your geek glasses on! The following represents just a few of the measured elements that comprise the Digital Performance Level (DPL) ranking system:

■ **Bandwidth** — The ability to move all of the data bits through an HDMI Version 1.3a Category 2 cable requires 10.2 Gigabits per second. Low bandwidth decreases the available resolution and or the color depth.

■ **Capacitance/Dielectric loss** — High capacitance and dielectric loss causes video frequency response issues and corrupted data on the data communication channels (DDC).

■ **Current for the supply line** — The current required to pass the hot plug and EDID information between the source and the display. A weak current causes this handshaking to fail.

■ **Display Data Channel Corruption** — EDID and HDCP data are passed as part of the constant handshaking process between the source and the display. DDC data corruption is the largest cause of the connection having problems or not working at all.

■ **DDC-I2C (Inter-Integrated Circuit)** — The electrical communications channel for EDID and HDCP. The clock signals used for the data transfers must match the timing of the data precisely.

■ **Delay** — The timing of the serialized signals varies for the individual conductors within an HDMI cable. If these individual delays fall outside of the "wobble room" for the specification, the clock timing fails to operate correctly and failures occur.

■ **Eye Pattern** — The "Eye" pattern visually depicts the electrical characteristics of the entire data transmission: output voltage, fre-

quency response, jitter, noise, timing and even the probability of its working well. It is a good indicator of the overall quality of a cable and how well it will actually work.

■ **Impedance** — Produces a perfect non-reflective transmission line. Load impedance must match the HDMI impedance of 100 ohms.

■ **Intra Pair Skew** — The precision of the twists of the individual wires within the cable. Bit errors occur if one wire ends up being the slightest bit longer than another.

■ **Inter Pair Skew** — The timing between each of the balanced pairs of wires within the cable. Again, if the signal of one pair arrives even the tiniest bit later than another, it could destroy the signal.

■ **Jitter** — Changes in the timing of the signals over time. This is measured in picoseconds and has a very low tolerance.