DVI Demystified

What is DVI?

For years, VGA has been a standard way of connecting analog monitors to computers. With the introduction of digital flat panel LCD monitors, however, a new standard had to be developed. Several early standards were proposed, such as P∓D (or "Plug and Display") and DFP (an early digital-only interface that suffers from resolution limits). Eventually, DVI emerged as the new interface for Digital flat panel LCD monitors and video cards.

DVI Connectors / Specifications

One of the most confusing aspects of DVI is that there are actually three different styles of cables and connectors. They are:

DVI-D (Digital Only Signal)

DVI-D: This is the most common style. Almost all DVI-capable devices on the market use a DVI-D interface.

DVI-A (Analog Only Signal)

DVI-A: In a digital-only world, "DVI Analog" would make no sense. However, as with all new technologies, there needs to be way to connect to older equipment. DVI-A uses a DVI style connector on a cable that sends an analog-only signal, which can be understood by analog VGA monitors.

DVI-I (Integrated Analog & Digital)

DVI-I: In practice, DVI Analog-only cables are rare, and DVI Analog devices are non-existent. The DVI Integrated cables and connectors offer the best of both worlds: a single cable and connector that can transmit both a digital and an analog signal. Since a DVI-I connector offers the most flexibility, video cards such as the ATI Radeon 8500 use this connector so that either a DVI digital screen or VGA monitor can be connected.

Important: In DVI like anything else, an Analog signal will only talk to analog devices, and a Digital signal will only talk to digital devices. Trying to convert a DFP or DVI-D (Digital Only) signal to a VGA (Analog) signal will not work.

Single Link vs. Dual Link:

As if three flavors of DVI are not confusing enough, it turns out that DVI-D and DVI-I also come in either Single Link or Dual Link. The basic difference is that dual link can support higher resolutions. Single link cables can be identified as having 8 pins missing, while dual link cables use all 24 pins.

Single Link: Can support resolutions up to 1920 x 1080 at 60 Hz. Each link has three data channels for RGB information with a maximum bandwidth of 165 MHz, which is equal to 165 million pixels a second. Uses 12 of 24 pins. This is more than adequate for most plasma TVs. A typical DVI digital single link cable can be seen here: DVI digital single link cable

Dual Link: Can support resolutions up to 2048 x 1536 at 60 Hz. Each link has three data channels for RGB information with a maximum bandwidth of 165 MHz, which is equal to 165 million pixels a second. Uses all 24 pins. Here is a picture of a DVI digital dual link cable: DVI digital dual link cable

While most DVI digital devices have connectors that can accept dual link cables, there are a few plasma TVs that can only accept a single link cable. Therefore, it's always good to check with your device retailer about the appropriate cable to choose.

Cable Length: The maximum length of a typical DVI Digital cable made out of copper wires is approximately 5 meters. Longer DVI cables, made out of fiber optic cables, are available for lengths up to 100 meters, although they tend to be very expensive.

We hope you enjoyed this tour through the world of DVI cables. Tune in next month for "USB Uncovered" where we sort out the various problems enountered in dealing with USB devices.
