

## **Why EDID Management In HDMI Is So Important**

A large number of issues seen in HDMI networks are related to EDID (Extended Display Identification Data) management and when you understand how this function works you quickly realize why this can go wrong. Firstly lets explain what happens.

When a source such as a DVD player or Satellite set top box is switched on and it has something connected to the HDMI port the source will request information about the display. The display will then respond with a manufacturer identifier such as Sharp or Sony etc. and capability information. This capability information defines what the screen can do. For example, one screen might only be able to handle a maximum resolution of 720p but another screen can handle a resolution of 1080p. Since HDMI contains audio as well as video there also needs to be capability information about what sort of audio signals the screen can handle. For example a typical TV might only be able to handle two channel audio as it only has 2 speakers whereas a surround sound system will be able to handle full 5.1 or 7.1 digital audio. Once the source has received the manufacturer and capability information it will then set the video and audio signal up accordingly. The manufacturer and capability information is know as the EDID.

This all seems straight forward and will normally work fine when you have a single source connected to a single display. The complication comes when you try to build more complicated HDMI networks with multiple displays. Take the situation where you may want to send your DVD signal to two locations. In this example you would use a HDMI splitter to allow such connection. This is where things start to become interesting as you now have two lots of manufacturer and capability information going back to the source and they may be different. Which set of information should the source use to set up its signal? You may well have a 1080p capable screen in the main lounge but only a 720p capable screen in the second location. If the main lounge capability information is used by the source then the source will send a 1080p resolution signal but the second location display will not be able to handle this and will show a messaging saying "Out of Range" or something similar.

Another example may be where you want to send your HD signal to multiple locations and one location is a surround sound zone with a 5.1 surround sound amplifier and the other zones are TV's that can only handle 2 channel stereo. If the source sets up the audio format based on the EDID from the surround sound zone then the 2 channel TV

displays will typically have a picture but a nasty buzzing noise for the audio as they cannot handle the digital 5.1 channel audio signal.

These two examples show how you easily get into trouble when trying to build HDMI networks. I stress the point about building HDMI networks as when operating point to point between source and screen you will probably never hit any issues. It is only when you start to build HDMI networks that some of these issues come to play. This is not a limitation of the splitter or the HDMI protocol, this is an example of what happens when ever you try to build a network. No matter what technology you use, when you start building networks of devices the complexity always increases compared to a simple point to point system. As specialists in our field we need to understand how the protocols work so that we are aware of the behavior and can engineer the system accordingly.

So how do we do that? Now that we know what is going on it is simply a matter of taking control of the EDID information that is being fed to the source device so it configures itself in a manner that meets our requirements. Clearly in the first example above I need the source to set the video output at a resolution which is the lowest common denominator of the two screens, i.e. 720p in our example and we will want 2 channel audio. If we can ensure this happens then we will get video and audio on both our displays. Sometime this can be achieved by making sure the the screen with the lowest capability is plugged into output port 1 of the splitter as some splitters use the EDID from the display plugged into output port 1 when the source requests the EDID. Some splitters may have an "Internal/External" switch on them. When switched to "Internal" the splitter will use a generic EDID that has been designed by the manufacturer rather than actually going out to the screen to get the screen EDID. This is typically a generic EDID that has a capability information stating it can do everything. Other splitters may have physical switches on them allowing you to set the EDID up manually by selecting the right switch locations. More advanced HDMI networking equipment have an HTML user interface where you can log into the device and inspect the EDID coming back from the display and override it with something different and even create your own EDIDs.

All the above techniques are valid and may well allow you to engineer your HDMI solution successfully. However, only the last option above gives you total control of the situation. An example of HDMI networking equipment that has full EDID management built in and configured via an HTML user interface is the Lightware range of

products. However, these products are commercial grade equipment and may well be outside your project budget.

An alternative solution for EDID management that puts you in full control and is a great deal more affordable is the use of an external hardware device that is connected to the HDMI output of the source such as the DVD player and has an HDMI output which carries on into the HDMI network. It is therefore usually used as the first item in the HDMI chain after the source. This device responds to the EDID request from the source and replies with what ever you want it to provide in terms of manufacturer and capability information. Therefore the EDID request never actually makes it beyond this device and the screen is never actually interrogated. This puts you back in control of the EDID and allows you to make sure the source sets up the video and audio format in a manner that meets your requirements. To program this magic box it is first put in learning mode and then you plug it into a screen of your choice which provides the EDID you want to use. The device then stores this EDID in non-volatile memory. The device is then located on the back of the source as described above and the source will then always be given this EDID no matter what screen or screens(s) are being used to display the source output. Alternatively there are some factory preset EDIDs that can be selected by dip switches to alleviate the need to learn the EDID from a real screen. An example of such a device is the Gefen HDMI Detective.

The intent of this article is to explain how this EDID information flows and impact it can have so that the reader can make an informed decision about what equipment or technique to use to ensure a successful outcome. I hope this has been useful to you. I welcome any comments and feedback.