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HDMI How What Where and Why



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Introduction

This document explains what the HDMI consumer needs to know.

As additional reading, there are numerous on line resources which have been used as reference material. The resource list has been added for your convenience.

Extracts have been used from some of these resources to compile this document

HDMI Organisaton	http://www.hdmi.org
Wikipedia	http://en.wikipedia.org/wiki/High-bandwidth_Digital_Content_Protection

Glossary

HDMI High Definition Multimedia Interface
HDCP High-bandwidth Digital Copy Protection

For detailed technical information and assistance on potential problems when using HDMI, I have found the following on line resources helpful

HDMI Organisaton	http://www.hdmi.org
Wikipedia	http://en.wikipedia.org/wiki/High-bandwidth_Digital_Content_Protection
Industry Resource	http://www.videsignline.com/howto/198900437
iLED	http://www.iled.co.za

What can iLED do

iLED provides HDMI extenders over CAT5e as well as HDMI switchers, HDMI splitters and HDMI matrix switchers. We have demonstration facilities at our Johannesburg office as well as technical expertise to assist you with solving your HDMI problems using our equipment.

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HDMI Overview

HDMI Basics

HDMI (refer to the glossary for the meaning of HDMI) is a High speed Digital connection between Multimedia Devices. If we simplify that further, HDMI connects HD PVR's DVD players etc to Surround Sound Amplifiers (processors), LCD's and Plasmas using a single cable for Audio and Video.

Traditional connection of video and audio has used analog signals to transfer the information required between devices. An example of this is the composite video connection between a DVD player and Plasma. Analog interfaces have served us very well but have limitations as we demand better quality – as quality is increased, so the amount of information transferred between devices is increased. Digital interfaces provide the ability to handle this increase in information without any quality loss. Another benefit if HDMI is that most new devices have digital insides - this means that the conversion between digital to analog then back to digital is not required.

Table1 – Digital – Analog – Digital conversion – The OLD way

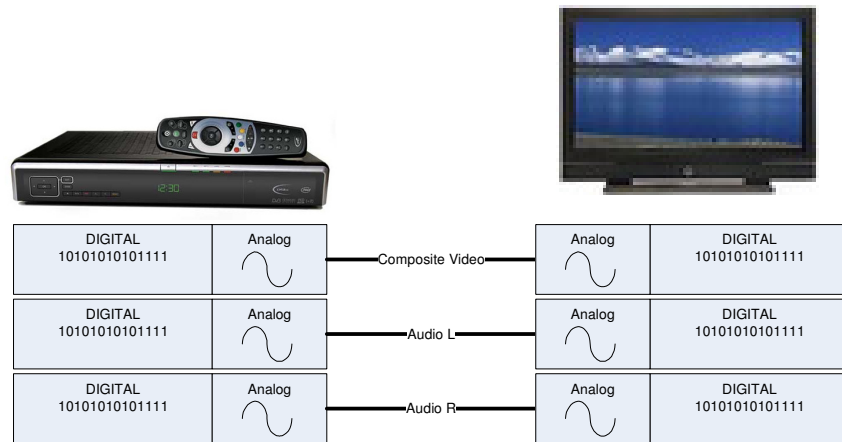
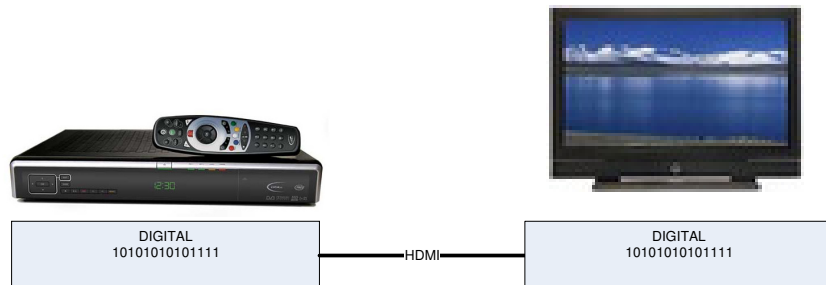


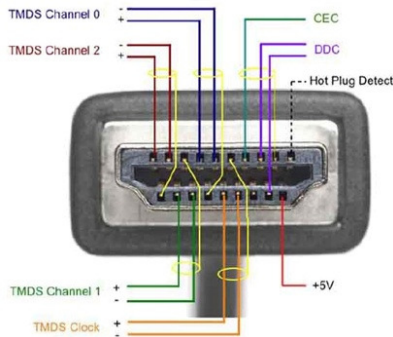
Table2 – Digital all the way – The HDMI way



HDMI Connection

The HDMI interface carries both Audio and Video between devices. The cable and connection are not designed to be custom made (you do not purchase cable, connectors and soldering iron and make your own length) because the amount of data carried over the HDMI cable imposes very strict quality rules. The cable lengths and connection information are given below

Table3 – HDMI Pin Outs



An HDMI cable must be purchased as a complete unit. The quality, type and length of the cable are the only factors you can select.

HDMI Cable Selection

As mentioned above, there are 3 factors to be taken into consideration when selecting an HDMI cable

1. Cable Quality

The HDMI specification does not limit cables to any particular length, but instead sets performance criteria based on maintaining adequate signal strength. Therefore, cable length is not determined by the HDMI specification, but by the design and manufacturing quality of the cable. Always purchase good quality cables from a reputable supplier

2. Cable Type

- a. **Standard** — Recommended for 1080i or 720p data loads
- b. **High Speed** — Best for heavier 1080p data loads such as Blu-ray Disc movies or the output from a PS3 gaming console and Deep Colour.

3. Cable Length (Rule of Thumb)

Up to 15 meters no amplifiers or interfaces required. This is dependant on Cable Quality.

Why use HDMI

The following is quoted from hdmi.org:

“HDMI is the global standard for connecting high-definition Consumer Electronics and PC products. It’s the uncompressed, all-digital interface that delivers both dazzling quality and unmatched ease of use. HDMI technology provides the highest possible signal to meet the needs of today’s – and tomorrow’s – HD entertainment systems. With a single cable, it transmits:

- a. digital video
- b. multi-channel surround sound
- c. advanced control data

More than 800 manufacturers have adopted the HDMI standard, including some of the world’s most trusted brands. 229 million HDMI-enabled devices shipped in 2008. 300 million are more projected in 2009.

Market research from In-Stat projects over a billion HDMI devices in the market by 2010, when every new digital TV will feature at least one HDMI port

HDMI connectivity is already standard on a wide range of products:

- a. HDTVs
- b. HD PVR’s
- c. Blu-ray Disc players
- d. multimedia PCs
- e. gaming systems
- f. digital camcorders, and more.

With HDMI connectivity, you get it all. The convenience of a one-cable solution, plus the power and performance of a high-speed digital link. Now and in the future, it’s the best way to connect HD.”

Enough said.

HDMI and HDCP

HDMI defines the interface between devices – HDCP is a copy protection method used to prevent content being copied. This is great for the suppliers of equipment but can lead to “HDCP handshake problems”.

Extending HDMI cables

The 15m rule of thumb for HDMI cables sometimes presents problems when the source and display devices are in different rooms or where the source devices are in a rack. HDMI active cables (electronics is used to boost and clean the signal) will allow cable runs of up to 30m. For longer runs, HDMI can be run over CAT5e/CAT6 using converters. Equipment is also available to run HDMI over Coax or Fiber.

Connecting Multiple HDMI devices

Multiple HDMI devices can be connected to a single display device as follows

- a. Display device has two or more HDMI inputs.
- b. Audio Visual receiver provides HDMI switching
- c. External HDMI switcher.

HDMI Version

HDMI has been through various improvements from the original HDMI 1.0 to the current HDMI 1.3b. The versions are backward compatible and include enhanced features. A complete description of the versions is available at <http://en.wikipedia.org/wiki/HDMI#Versions>