4 HDMI sources to 4 HDMI displays

4x4 HDMI Matrix

Connect and access any four sources from up to four displays

4 Sources + 4 Displays = An Easily Integrated HDTV Matrix System

The 4x4 HDMI™ Matrix routes high definition video in multiple resolutions up to 1080p plus multichannel digital audio from any of the four HDMI™ sources to the displays. Four outputs gives you the choice of sending high definition audio and video signals up to four displays. Any four to any four matrix switching allows for maximum versatility for integrated systems. The 4x4 HDMI Switcher eliminates the need to disconnect and reconnect sources to a display equipped with one input. It works with HD-DVD players, TiVo systems, HT PCs, and satellite set top boxes that connect to an HDMI display. Every source is accessible at all times by any display by selecting it with an IR remote.

Fully HDCP Compliant

HDCP (high bandwidth digital content protection) is a standard encoded into the video signal to prevent it from being pirated. If a source device is HDCP coded and is connected to a display or projector without the proper decoding mechanism, the picture is relegated to "snow" or in some cases, very low (480P) resolutions of the images. In order to see high resolution digital video with HDCP compliance, both the source, the display and anything in between must be equipped with HDMI connections that can enable HDCP decoding, such as the 4x4 HDMI Matrix.

How It Works

You simply connect the sources to the Matrix's inputs. Then connect four displays to the Matrix's outputs. Once the sources, the matrix and the displays are powered and connected, you simply select which sources you want view on which displays using the IR remote.

Note: This HDMI product supports BOTH Audio and Video signals

DVI, HDCP & HDMI Defined

Features:

- Switch easily between any four HDMI™ sources
- Distributes any of the four inputs to any or any combination of the four HDMI™ output displays
- Maintains high resolution video - beautiful, sharp HDTV resolutions up to 1080p, 2k, and computer resolutions up to 1920 x 1200 are easily achieved
- Discrete IR remote (included)
- Serial RS-232 remote port
- Rack ears included
- HDMI™ compliant
- HDCP compliant

Specifications:

- Video Amplifier Bandwidth: 165 MHz
- Input Video Signal: 1.2 volts p-p
- Input DDC Signal: 5 volts p-p (TTL)
- Single Link Range: 1080p/1920 x 1200
- HDMI Connector: type A 19 pin female
- Remote Control Port: RS232 female, mini-stereo
- Power Supply: 24V DC
- Power Consumption: 60 watts (max)
- Dimensions: 17"W x 1.75"H x 5.875"D
- Shipping Weight: 10 lbs.

Package Includes:

- 4x4 HDMI Matrix
- RMT-16IR Remote Control
- Four 6 foot HDMI cables
- 24V DC Power Supply
- User's Manual
- Rack Ears

EXT-HDMI-444

4x4 HDMI Matrix

U S E R   M A N U A L

www.gefen.com

ASKING FOR ASSISTANCE

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Notice
Gefen Inc. reserves the right to make changes in the hardware, packaging and any accompanying documentation without prior written notice.

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TABLE OF CONTENTS

INTRODUCTION

Thank you for purchasing the 4x4 HDMI Matrix.

The 4x4 HDMI Matrix switches four HDTV sources to any four HDMI displays.

The 4x4 HDMI Matrix switcher has four HDMI inputs and four HDMI outputs. Matrix input #1 and the HDMI port of HDTV source #1 connects using a male to male HDMI cable. The HDMI port of HDTV source #2 connects to HDMI input #2. The HDMI port of HDTV source #3 connects to HDMI input #3. The HDMI port of HDTV source #4 connects to HDMI input #4. There are four (4) HDMI outputs connecting to four (4) different displays.

Note: The switching is done by using either the RMT-16-IR remote control or through the RS232 port. The 4x4 HDMI Matrix is rack mountable. Any HDTV with DVI inputs can be connected to the HDMI outputs of the matrix by using a DVI to HDMI adapter if the cable used is DVI.

OPERATION NOTES

READ THESE NOTES BEFORE INSTALLING
OR OPERATING THE 4X4 HDMI MATRIX

• You should connect all the cables and power supply prior to connecting power to the HDTV sources and 4x4 HDMI Matrix.

• When powering the sources, the display needs to point to the source input.

• The 4x4 HDMI Matrix is housed in a metal box for better RF shielding.

• The 4x4 HDMI Matrix works with all DVI and HDMI displays.

• The 4x4 HDMI Matrix supports both AUDIO and VIDEO signals.

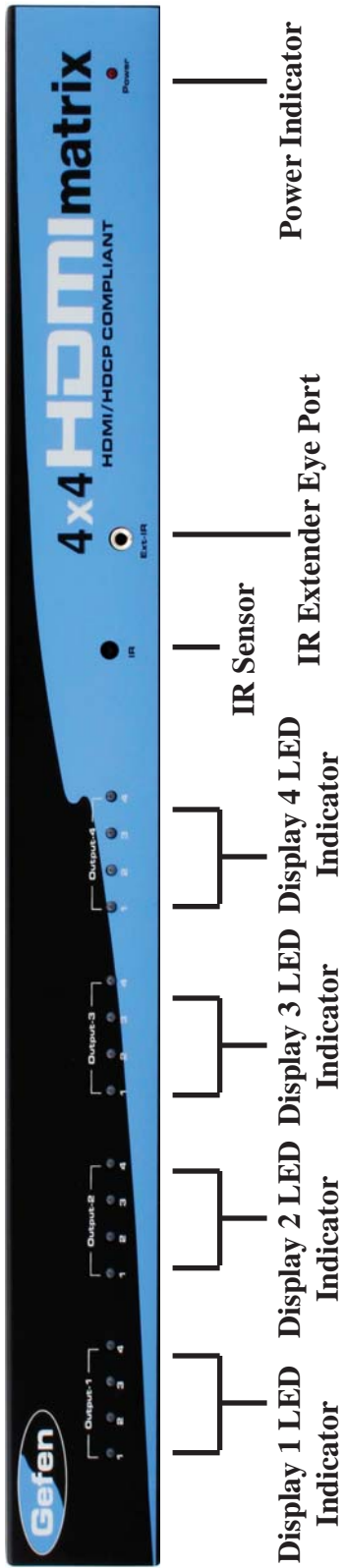• The 4x4 HDMI Matrix is fully HDCP compliant.

Features

- Allows any HDMI display to view any source at any time

- Allows any source to be displayed on multiple displays at the same time

- Maintains resolutions up to 1080p, 2K, and 1920x1200

- Maintains highest HDMI single link video resolution

- Maintains highest HDMI digital audio signal

- Supports HDCP compliant devices

- HDMI or DVI to HDMI cables are used to connect the inputs and the matrix output

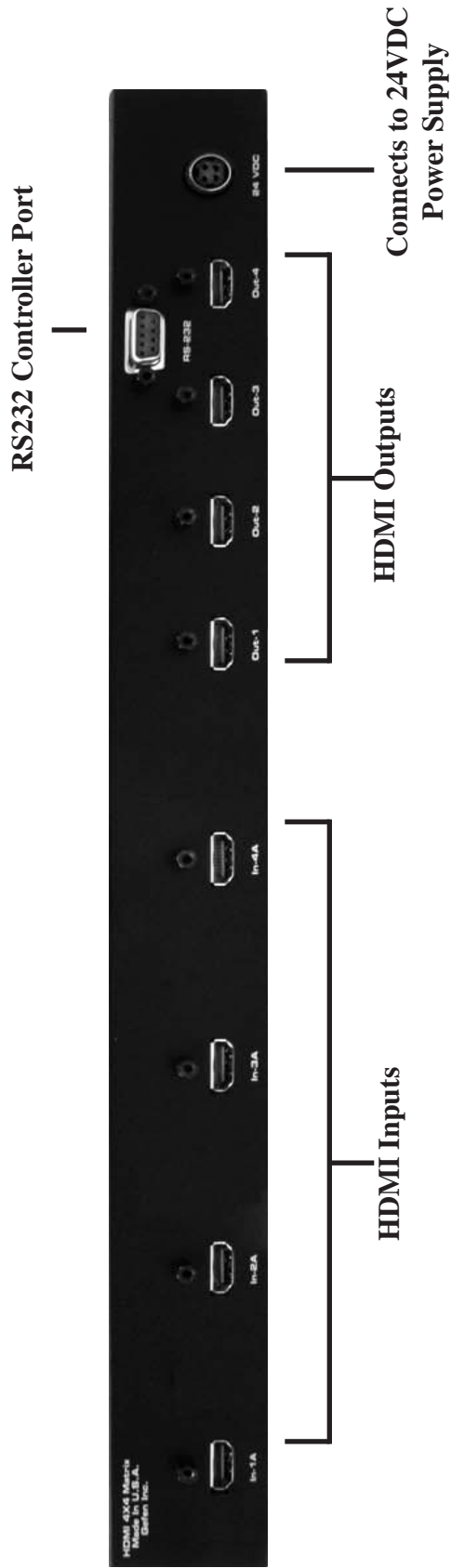- Each display's inputs can be switched with the IR remote control or through RS232

Includes:

(1) 4x4 HDMI Matrix
(4) HDMI 6 Cables (M-M)
(1) 24VDC Power Supply
(1) User Manual
(1) RMT-16IR Remote Control
(1) Rack Ears

Front Panel

Power Indicator

IR Extender Eye Port

IR Sensor

Display 4 LED Indicator

Display 3 LED Indicator

Display 2 LED Indicator

Display 1 LED Indicator

Back Panel

Connects to 24VDC Power Supply

RS232 Controller Port

HDMI Outputs

HDMI Inputs

1   Connect all the sources to the HDMI inputs on the 4x4 HDMI Matrix, using the supplied cables.

2   Connect the HDMI/DVI displays to the outputs on the 4x4 HDMI Matrix.

3   Connect the 24VDC power supply to the 4x4 HDMI Matrix

4   Controlling the 4x4 HDMI Matrix using the RMT16-IR:

| Pressing Buttons...	Switches...
1-4	Display 1 to view Source 1, 2, 3, or 4
5-8	Display 2 to view Source 1, 2, 3, or 4
9-12	Display 3 to view Source 1, 2, 3, or 4
13-16	Display 4 to view Source 1, 2, 3, or 4

1. Remove battery cover from the back of the RMT16-IR remote.

2. Verify that dip switches 1 & 2 are in the down (OFF) position.

3. Insert the battery, hold the battery so that you can see the positive side facing up. The side that is not marked must be facing down.

4. Test the RMT16-IR remote by pressing ONLY one button at a time. The indicator light on the remote will flash once each time you press a button. WARNING: Do not press multiple buttons simultaneously and do NOT press buttons rapidly. These actions will cause the remote to reset and steps 1-4 will have to be repeated.

Note: The RMT16-IR ships with two batteries. One battery is required for operation, the second battery is complimentary.
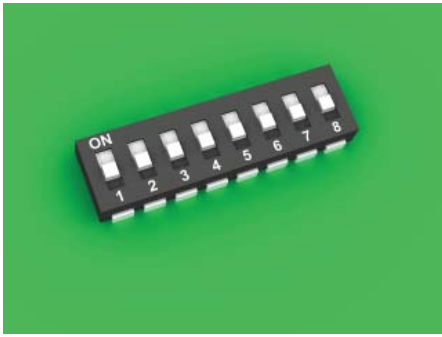
DIP SWITCH
EDID GUIDE

Extended display identification data (EDID) is a data structure provided by a display to describe its capabilities to any source that asks for it. The EDID includes manufacturer name, product type, timings supported by the display, display size, luminance data, (for digital displays only) pixel mapping data, supported audio channels and formats. This information is used by the source to cater its output to resolutions and audio formats that are supported by the display.

Additional EDID modes are available and configured using a combination of dip switches 1, 2, and 5. Please refer below for the different EDID modes.

To access the Dip Switches, remove all screws from the bottom and sides of the Gefen unit. Remove the hex screw heads from each side of the RS-232 port and above each HDMI connector. Carefully slide the unit apart. The 8 Bank of Dip Switches are located on the main PCB. Once adjustments are complete, slide the unit back together and replace all removed screws.

EDID Mode 0 (Switch 1=OFF Switch2=OFF Switch5=ON)
-EDID is copied from the first HDMI port

EDID Mode 1 (Switch 1=ON Switch2=OFF Switch5=ON)
-Same as Mode 0 and adds basic audio support

EDID Mode 2 (Switch 1=OFF Switch2=ON Switch5=ON)
-Same as Mode 0 and adds full audio support

EDID Mode 3 (Switch 1=ON Switch2=ON Switch5=OFF)
-EDID is generated based on the common video and audio features of all of the connected devices

EDID Mode 4 (Switch 1=OFF Switch2=ON Switch5=OFF)
-Same as Mode 3 and adds basic audio support

EDID Mode 5 (Switch 1=ON Switch2=OFF Switch5=OFF)
-Same as Mode 3 and adds full audio support

EDID Mode 6 (Switch 1=OFF Switch2=OFF Switch5=OFF) **DEFAULT**
-EDID is generated based on the common video features of all of the connected devices and the combined audio features of all of the connected devices

IR CODES

In the event of IR conflicts, please do the following:

1. Remove the battery cover from the back of the RMT16-IR remote.

2. Locate the Dip Switches above the batteries

3. Switch the Dip Switches on the RMT16-IR to any of the combinations pictured below.

4. Dip Switches 1 and 2 in the RMT16-IR correspond with Dip Switches 3 and 4 inside the 4x4 HDMI Matrix respectively. Switch the switches inside the 4x4 HDMI Matrix to match the same Remote Channel as the RMT16-IR. The 4x4 Matrix is now set to a new IR Code.

Remote Channel 0:

Remote Channel 1:

Remote Channel 2:

Remote Channel 3:
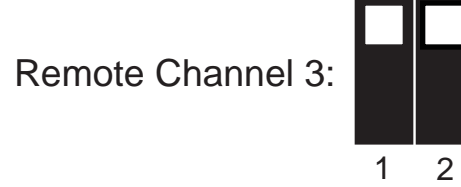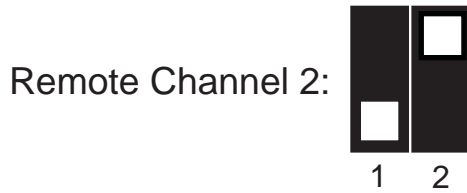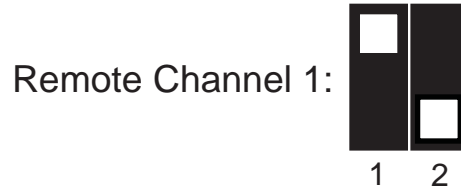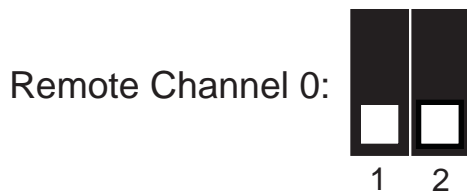
9 Pin Female   9 Pin Male
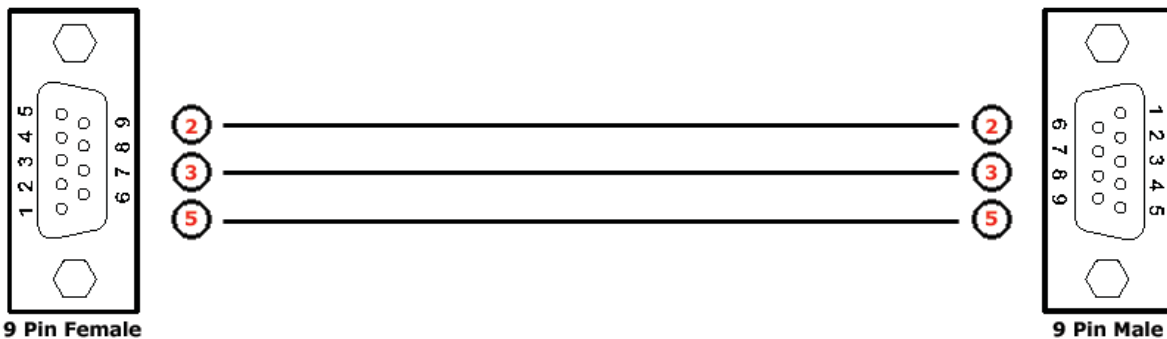
Binary Table

ASCII	Corresponding RMT16-IR Button	Binary	ASCII	Corresponding RMT16-IR Button	Binary
1	1	0011 0001	9	9	0011 1001
2	2	0011 0010	a	10	0110 0001
3	3	0011 0011	b	11	0110 0010
4	4	0011 0100	c	12	0110 0011
5	5	0011 0101	d	13	0110 0100
6	6	0011 0110	e	14	0110 0101
7	7	0011 0111	f	15	0110 0110
8	8	0011 1000	g	16	0110 0111

Additional control of the EDID modes and IR channel are possible using the RS-232 interface. For any of these modes to be successfully written to the EEPROM, all Dip Switches must be in the OFF position.

ASCII	EDID Mode
m0	0
m1	1
m2	2
m3	3
m4	4
m5	5
m6	6

ASCII	Remote Channel
r1	1
r2	2
r3	3
r4	4

OK is printed out on screen when a mode has successfully been changed.

RS232 Settings

Bits per second 19200

Data bits 8

Parity .... None

Stop bits 1

Flow Control .... None
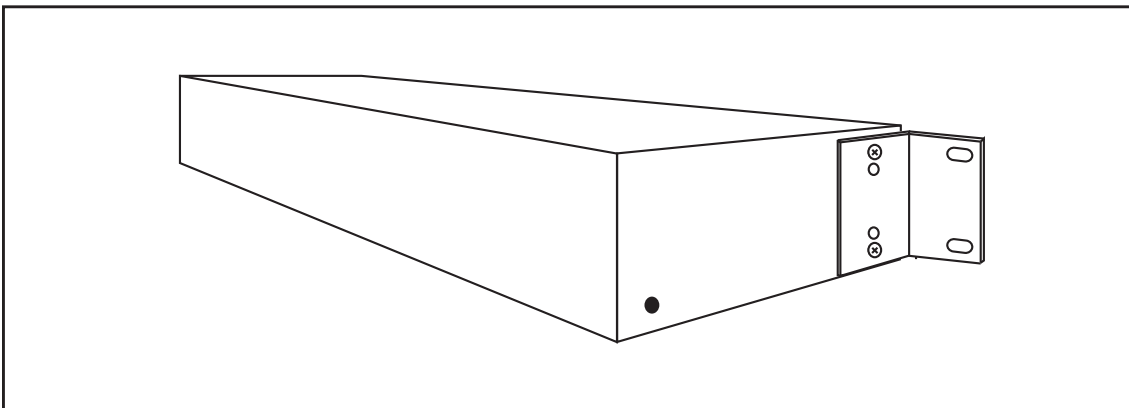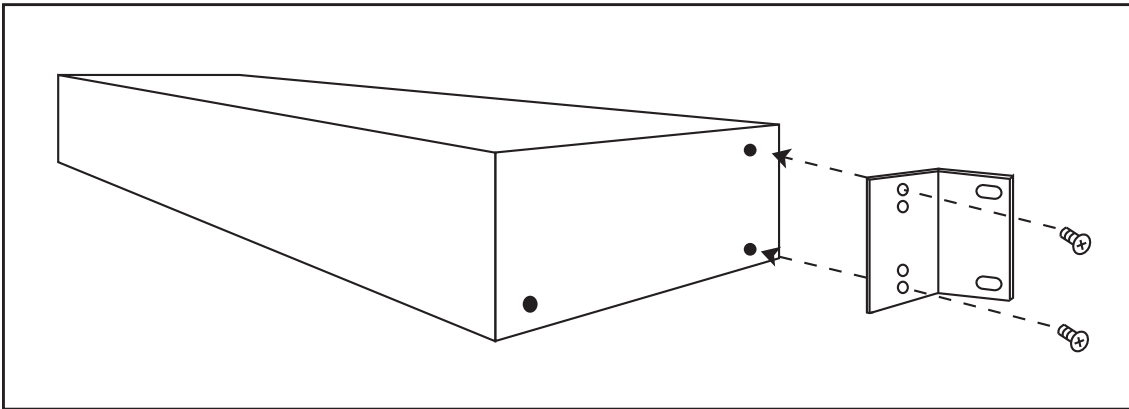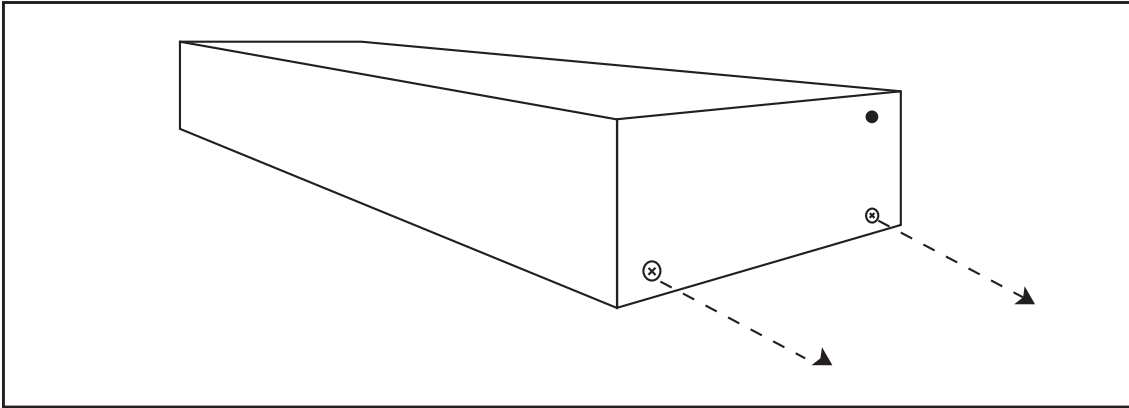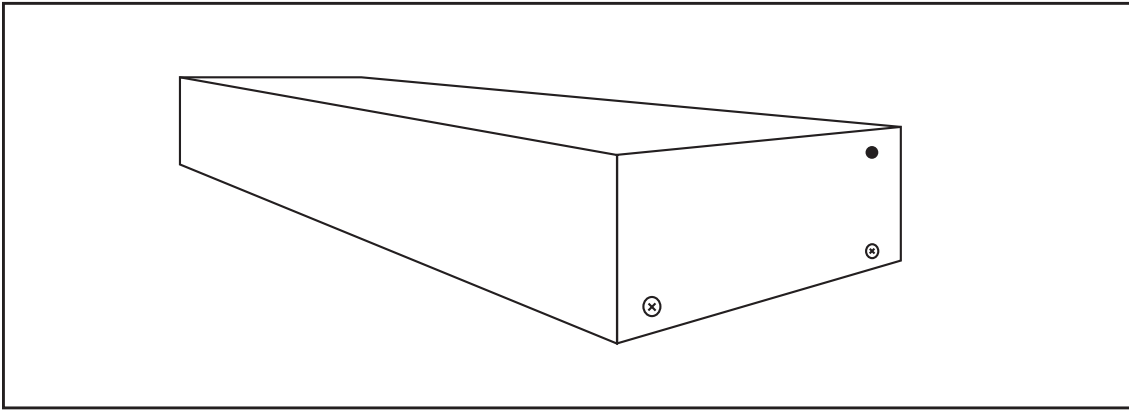
SPECIFICATIONS

Video Amplifier Bandwidth .... 1.65 Gbps

Input Video Signal .... 1.2 volts p-p

Input DDC Signal .... 5 volts p-p (TTL)

Single Link Range ....1080p / 1920 x 1200

HDMI Input/Output Connector .... Type A 19-pin Female

Remote Control Port .... RS-232 Female, Mini-Stereo

Power Consumption .... 60 watts (max)

Power Supply .... 24V DC

Dimensions .... 17" W x 1.75" H x 5.875" D

Shipping Weight .... 10 lbs.

DDC

Short form for Display Data Channel. It is a VESA standard for communication between a monitor and a video adapter. Using DDC, a monitor can inform the video card about its properties, such as maximum resolution and color depth. The video card can then use this information to ensure that the user is presented with valid options for configuring the display.

DDWG

Digital Display Working Group DDWG are the creators of the DVI specification.

DVI

Digital Visual Interface. Connection standard developed by Intel for connecting computers to digital monitors such as flat panels and DLP projectors. A consumer electronics version, not necessarily compatible with the PC version, is used as a connection standard for HDTV tuners and displays. Transmits an uncompressed digital signal to the display. The latter version uses HDCP copy protection to prevent unauthorized copying.

HDCP

High-Bandwidth Digital Content Protection. Created by Intel, HDCP is used with HDTV signals over DVI and HDMI connections and on D-Theater D-VHS recordings to prevent unauthorized duplication of copy written material.

HDMI

The High-Definition Multi-media Interface (HDMI) is an industry-supported, uncompressed, all-digital audio/video interface. HDMI provides an interface between any compatible digital audio/video source, such as a set-top box, DVD player, and A/V receiver and a compatible digital audio and/or video monitor, such as a digital television (DTV).

HDTV

High-Definition Television. The high-resolution subset of our DTV system. The ATSC defines HDTV as a 16:9 image with twice the horizontal and vertical resolution of our existing system, accompanied by 5.1 channels of Dolby Digital audio. The CEA defines HDTV as an image with 720 progressive or 1080 interlaced active (top to bottom) scan lines. 1280:720p and 1920:1080i are typically accepted as high-definition scan rates.

RS-232

Recommended Standard 232. This is the de facto standard for communication through PC serial ports. It can refer to cables and ports that support the RS232 standard.

VESA

Video Electronic Standards Association, a consortium of manufacturers formed to establish and maintain industry wide standards for video cards and monitors. VESA was instrumental in the introduction of the Super VGA and Extended VGA video graphics standards with a refresh rate of 70 Hz, minimizing flicker and helping to reduce user eyestrain and fatigue.