GefenPRO

1080P PROGRESSIVE

Extender for HDMI ELR with PoL 2 over CAT5

GEF-HDCAT5-ELRPOL2

User Manual

www.gefenpro.com

ASKING FOR ASSISTANCE

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Notice

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INTRODUCTION

Congratulations on your purchase of the Extender for HDMI ELR PoL 2 over CAT5. Your complete satisfaction is very important to us.

GefenPRO

In the realm of video distribution, certain features are invaluable in a commercial or broadcast environment. Accommodations such as a build-in power supply and flat black rack-mount enclosures set GefenPRO apart from our traditional products. Complex distribution units allow for professional DVI, 3G-SDI, and HDMI signals to be routed and converted easily and seamlessly, while being backed up by a renowned and dependable technical support team. Gefen invites you to explore the GefenPRO product line and hopes that you find the solution that fits your needs.

The GefenPRO Extender for HDMI ELR with PoL 2 over CAT5

The GefenPRO Extender for HDMI ELR PoL 2 over CAT5 does everything that the GefenPRO Extender for HDMI ELR with PoL 2 over CAT5 does, but adds active source switching, with an additional Hi-Def input on the Receiver Unit. This provides the capability to switch between the Hi-Def source connected to the Sender Unit and a local source connected to the Receiver Unit. The GefenPRO Extender for HDMI ELR PoL 2 over CAT5 extends a Hi-Def source with multichannel digital audio at resolutions of up to 1080p Full HD to 330 feet (100 meters), using one CAT-5 cable. In addition, Gefen's PoL* technology gives it the capability to power an additional 5V DC device, up to 2 Amps, at the Receiver unit over the CAT-5 cable.

The Extender for HDMI ELR PoL 2 over CAT5 extends Ethernet and provides an IR back channel to control A/V sources using the same CAT-5 cable extension. With the built-in IR Blaster, simply point the IR remote(s) at the display to control the Hi-Def sources as if they were located in the same room as the display.

How It Works

The GefenPRO Extender for HDMI ELR PoL 2 over CAT5 Sender unit is located next to a set-top box or DVD player source. Use the supplied HMDI cable to connect an HDMI source to the Sender unit. The GefenPRO Extender for HDMI ELR PoL 2 over CAT5 Receiver unit is located up to 330 feet away, near the display. Connect the HDTV display and another Hi-Def source to the Receiver Unit.

One CAT-5 cable connects the Sender and Receiver units to each other. The Ethernet ports on both the Sender and Receiver units are connected to standard network devices, such as 100Base-T routers and hubs. Multichannel digital audio is embedded in the HDMI signal (Dolby® TrueHD / DTS-HD Master Audio™).

To use the switching capability, simply power on the Hi-Def source connected to the Receiver Unit. The Extender will automatically switch to source connected to the Receiver Unit. To revert to the source connected to the Sender Unit, simply power down the source connected to the Receiver Unit.

OPERATION NOTES

READ THESE NOTES BEFORE INSTALLING OR OPERATING THE EXTENDER FOR HDMI ELR WITH POL 2 OVER CAT5

- The Extender for HDMI ELR with PoL 2 over CAT5 units are housed in a metal box for better RF shielding.
- CAT-5 cables should not exceed 330 feet.
- Shielded CAT-6 with metal RJ-45 connectors are recommended to safeguard against random video flashes caused by electromagnetic interference (EMI).
- The Extender for HDMI ELR with PoL 2 over CAT5 features the ability to generate compatible EDID and Hot Plug signals for troubleshooting purposes when dealing with difficult interfacing issues between Source devices and Displays. Refer to page 13 for details.
- HDCP content is not supported when the unit is in DVI mode. See page 13 for details.
- Ethernet works as a Full Duplex system.

FEATURES

HDMI Features

- 225 MHz (up to 12-bit YUV 444 @ 1080p)
- Deep Color
- x.v.Color
- Dolby® TrueHD and DTS-HD Master Audio™
- Lip-Sync

Features

- Extends HDMI at 1080p Full HD and 1920x1200 up to 330 feet
- Extends RS-232 up to 330 feet over a single CAT5
- Supports high bit-rate audio formats (Dolby® TrueHD and DTS-HD Master Audio™)
- Supports 3DTV
- Locking HDMI input port on Receiver Unit allows the connection of a secondary Hi-Def source.
- Source-switching between Sender Unit source and Receiver Unit source.
- Fully HDMI and HDCP compliant
- EDID management for rapid integration of source and display devices
- Built-in IR Blaster allows IR remote control of source devices from remote viewing location
- Internal 110 / 220 V AC Power Supply
- 5V DC, 2 A Locking Power Supply output connector on Receiver unit
- Rack-mountable (with optional Gefen EXT-RACK-1U Rack Shelf)

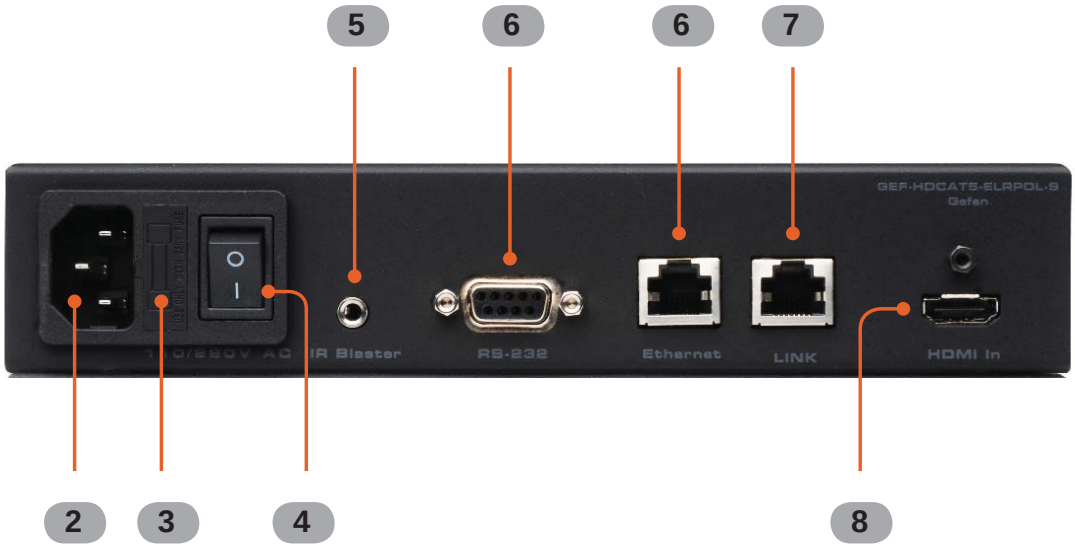
Package Includes

(1) Extender for HDMI ELR with PoL 2 over CAT5 - Sender Unit
(1) Extender for HDMI ELR with PoL 2 over CAT5 - Receiver Unit
(1) 6 ft. HDMI locking cable (M-M)
(2) AC power cord
(1) User Manual

SENDER UNIT LAYOUT

Front

Back



SENDER UNIT DESCRIPTIONS

1 Power

This LED indicator will glow bright red once power has been applied to the unit.

2 110 / 220 V AC

Connect the included AC power cord to this power receptacle.

3 ***Fuse Drawer***

Each power receptacle houses a fuse drawer. Within each fuse drawer are two (2) 250 V fuses. One fuse is active and the other is a spare.

4 Power Switch

Turn the power ON or OFF using this switch.

5 IR Blaster

Connect an IR Blaster cable (Gefen part no. EXT-2IREMIT) from this port to the Hi-Def source to control the source from the viewing location.

6 RS-232

This RS-232 serial port is used to update the Receiver Unit firmware.

7 Ethernet

Connects the Sender Unit to the network using Ethernet cabling.

8 Link

Connects the Sender Unit to the Receiver Unit using CAT-5 cabling.

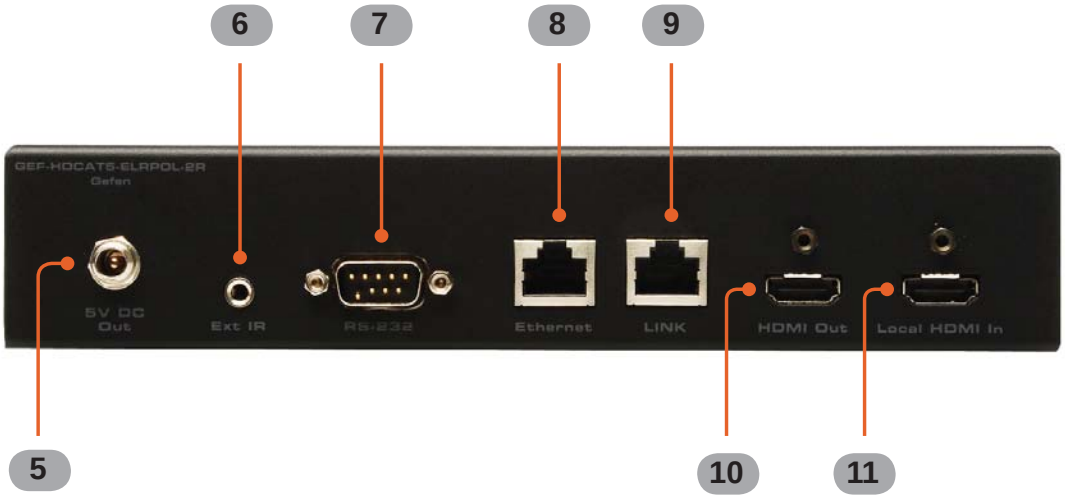
9 HDMI In

Connect a Hi-Def source to this locking HDMI port, using the included HDMI cable.

RECEIVER UNIT LAYOUT

Front

Back



RECEIVER UNIT DESCRIPTIONS

1 Local
This LED indicator will glow bright green when the Receiver Unit is switched to use the Local HDMI input.

2 Select
Switches between the HDMI input on the Sender Unit and the Local HDMI In port on the Receiver Unit.

3 IR
This IR window receives signals from the Hi-Def source IR remote control. The IR signals are sent back to the source device, when using an IR Blaster on the Sender.

4 Power
This LED indicator will glow bright red once power has been applied to the unit.

5 5V DC Out
Connect an optional locking (Gefen part no. CAB-PWR-06LL) or non-locking (Gefen Part no. CAB-PWR-06NL) power cord to this the included 5 V DC locking power supply connector to power additional devices.

6 Ext IR
Connect an IR Extender (Gefen part no. EXT-RMT-EXTIR) cable from this port to the Hi-Def source to extend the IR control.

7 RS-232
This RS-232 serial port is used to update the Receiver Unit firmware.

8 Ethernet
Connects the Receiver Unit to the network device.

9 Link
Connects the Receiver Unit to the Sender Unit using CAT-5 cabling.

10 HDMI Out
Connect an HDTV display or other output device to this locking HDMI port.

11 Local HDMI In
Connect a secondary Hi-Def source device to this locking HDMI port.

CONNECTING THE EXTENDER FOR HDMI ELR WITH POL 2 OVER CAT5

1. Connect the Hi-Def source to the Sender Unit using the included HDMI cable.

2. Optionally connect a secondary Hi-Def source to the Receiver Unit.

   Connecting a secondary Hi-Def source to the Receiver Unit provides the ability to switch between the a Hi-Def source connected to the Sender Unit and the Hi-Def source connected to the Receiver Unit. In this way, the Extender for HDMI ELR with PoL 2 over CAT5 functions as both a 2x1 switcher and an extender.

3. Use an HDMI cable to connect the HDTV display to the Receiver Unit.

4. Connect the Ethernet device/router to the Ethernet input port on the Sender unit using a CAT-5, CAT-5e or CAT-6 cable. Connect the Ethernet output port on the Receiver Unit to the remote device/router with a CAT-5, CAT-5e or CAT-6 cable.

5. Use a CAT-5 or CAT-6 cable up to 330 ft (100 meters) to connect the Link ports on both the Sender Unit and Receiver Unit.

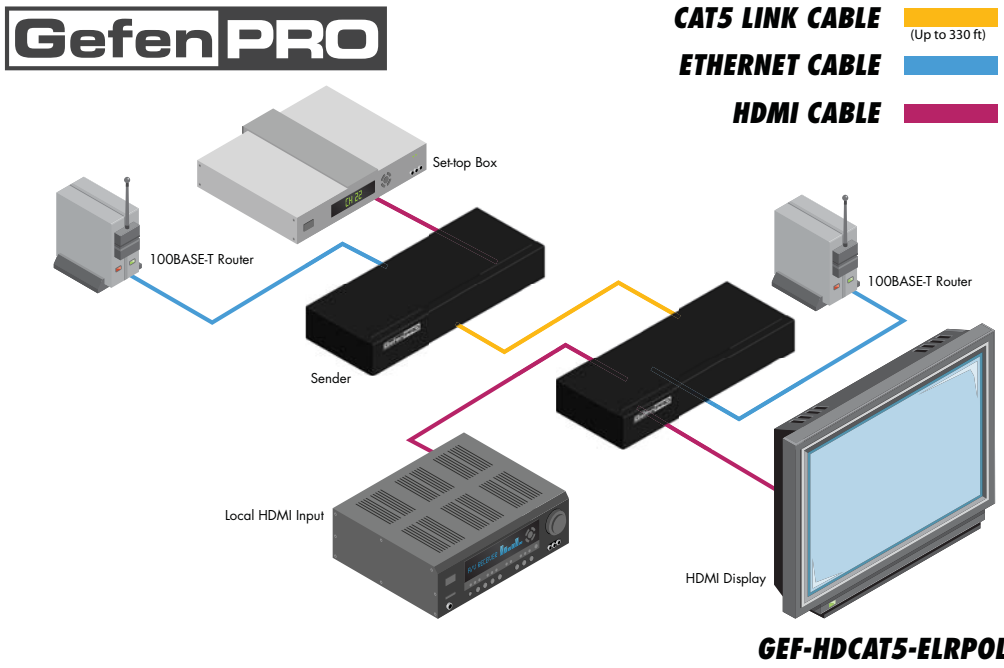
If terminating network cables in the field, please adhere to the TIA/EIA568B specification. See page 15 for details.

6. Connect the included AC power cord to the Sender Unit Plug the power cord into an available electrical outlet.

Connect an optional power cable (CAB-PWR-06LL or CAB-PWR-06NL) to the Receiver Unit. The Receiver Unit supplies 5 V DC (@ 2A) to power an additional device.

7. Power on the HDTV display and the Hi-Def source(s) connected to the Sender Unit and the Receiver Unit.

Wiring Diagram for the Extender for HDMI ELR with PoL 2 over CAT5



Attention: This product should always be connected to a grounded electrical socket.

Sender Unit

The GefenPRO Extender for HDMI ELR with PoL 2 over CAT5 contains DIP switches on the bottom of the Sender Unit. Each DIP switch performs a different function.

Two DIP switches located on the bottom of the Sender Unit.

DIP Switch 1 - Green Mode (Default = ON)

- ***OFF*** - Enable Green Mode

  When DIP switch 1 on the Sender Unt is set to the OFF position, the Sender Unit is placed in Green Mode. In this mode, the unit is not powered unless +5V is detected on pin 18 of the HDMI cable. Green Mode consumes less than 1 Watt of power.

- ***ON*** - Disable Green Mode

  If DIP switch 1 is set to the ON position, then the Sender Unit is always powered.

Both the Sender Unit and Receiver Unit must be placed in Green Mode in order to use the Green Mode feature.

Sender Unit

DIP Switch 2 - External Boot Loader Enable (Default = OFF)

- ***OFF*** - Disable

  Setting DIP switch 1 to the OFF position disables the boot loader function.

- ***ON*** - Enable

  Set DIP switch 1 to the ON position when using the bootloader to update the firmware on the Sender Unit. In this mode, the Sender Unit will not function as an Extender.

Receiver Unit

The GefenPRO Extender for HDMI ELR with PoL 2 over CAT5 contains DIP switches on the bottom of the Receiver Unit. Each of these DIP switch performs a different function.

Six DIP switches located on the bottom of the Receiver Unit.

See the next page for a description of the DIP switches.

DIP SWITCH CONFIGURATION

Receiver Unit

DIP Switch 1 - EDID Mode (Default = OFF)

- ***ON*** - Pass-Through Mode

  DDC and HPD are passed through. Both the connection status and the full video capabilities of the monitor are used by the source device.

- ***OFF*** - Local EDID Mode

  Local EDID is used instead of the EDID from the display device. EDID features newer than HDMI 1.3 are removed when the display is read. This provides a general EDID which is compatible with more displays.

DIP Switch 2 - Hot Plug Detect (Default = OFF)*

- ***ON*** - HPD Pass-Through

  HPD follows upstream HPD towards the source. The HPD signal will reflect the connection status between the display device and the source device. If the source or monitor is temporarily disconnected then reconnected, there will be a delay of 20 - 30 seconds before the content is restored to the monitor.

- ***OFF*** - HPD Always High

  The HPD signal remains high regardless of the downstream HPD state. If the source or monitor does not properly handle HPD (no picture after connecting / reconnecting source or display), set this DIP switch to the OFF position.

DIP Switch 3* - Supports DVI Connections *(Default = ON)*

- ***ON*** - Disable HDCP

  If a DVI connection is used, set DIP 3 to the ON position. DVI is supported by disabling HDCP pass-through.

- ***OFF*** - Enable HDCP

  If an HDMI device is connected, set DIP 3 in the OFF position.

*DIP switch is only operational when using Local EDID (DIP 1 = OFF).

Receiver Unit

DIP Switch 4 - Green Mode (Default = OFF)

- ***OFF*** - Enable Green Mode

  When DIP switch 1 on the Receiver Unit is set to the OFF position, the Receiver Unit is placed in Green Mode. In this mode, the unit is not powered unless +5V is detected on pin 18 of the HDMI cable. Green Mode consumes less than 1 Watt of power.

- ***ON*** - Disable Green Mode

  If DIP switch 1 is set to the ON position, then the Sender Unit is always powered.

Both the Sender Unit and Receiver Unit must be placed in Green Mode in order to use the Green Mode feature.

DIP Switch 5 - External Boot Loader Enable (Default = OFF)

- ***OFF*** - Disable

  Setting DIP switch 1 to the OFF position disables the boot loader function.

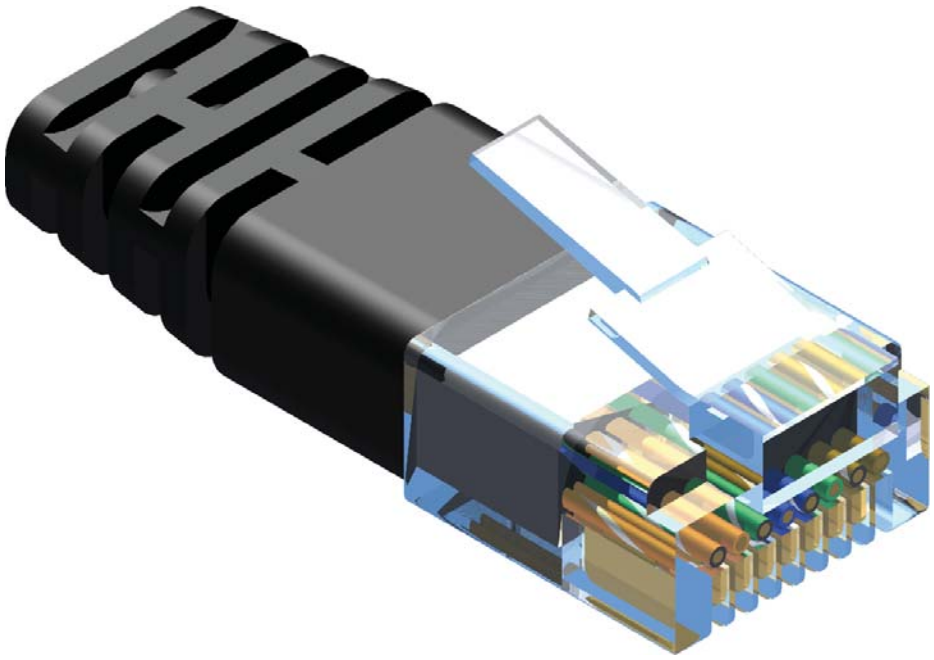
- ***ON*** - Enable

  Set DIP switch 1 to the ON position when using the bootloader to update the firmware on the Receiver Unit. In this mode, the Receiver Unit will not function as an Extender.

DIP Switch 6 - Not Used

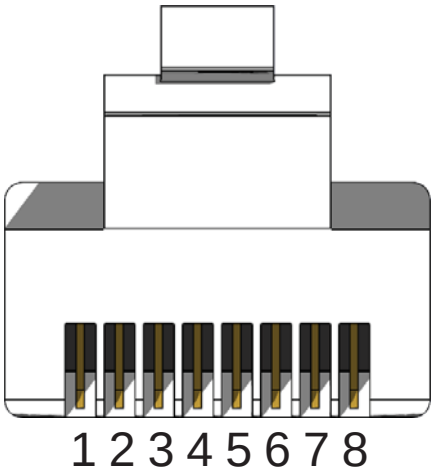
- Reserved for future expansion.

NETWORK CABLE WIRING DIAGRAM



Gefen recommends the TIA/EIA-568-B wiring option. Please adhere to the table below when field terminating cable for use with Gefen products.

Pin	Color
1	Orange / White
2	Orange
3	Green / White
4	Blue
5	Blue / White
6	Green
7	Brown / White
8	Brown



CAT-5, CAT-5e, and CAT-6 cabling comes in stranded and solid core types. Gefen recommends using solid core cabling. CAT-6 cable is also recommended.

It is recommended to use one continuous run from one end to the other. In some cases, connecting through a patch might not work.

Cable recommendations

Solid core CAT-5e cable rated at 350 MHz and terminated in 568a or 568b is the minimum requirement. For resolutions greater than 1280x1024 or 1080i, Gefen recommends solid shielded CAT-6 cables.

No video

Make sure that DIP switch 2 on the Sender Unit is set to the OFF position. Also make sure that DIP switch 5 on the Receiver Unit is set to the OFF position. If either of these DIP switches are in the ON position (*External Boot Loader Enable*, see page 10 and 14) then the Sender Unit or Receiver Unit will not function as an extender. Next, make sure that the CAT-5 cable, connecting the Sender Unit and Receiver Unit is connected to the LINK port. If this does not solve the issue, try disconnecting and then reconnecting the AC power cord from the Sender Unit. Also, verify that both units are working with short CAT-5e cables (15 - 20 feet).

Intermittent loss of video

Flickering or a blinking image is the result of a loss of sync between the display and the source. Try lowering the source resolution (e.g. from 1080p to 720p). If this solves the issue, then the CAT-5 cables being used to connect the Sender Unit and the Receiver Unit are unable to handle the bandwidth of the higher resolution and thus you are losing sync. Replace the existing CAT-5 cables with a shielded CAT-6 cable. Electromagnetic Interference (EMI) from fluorescent lights, generators, and A/C unit motors can also cause intermittent loss of video. Shielded CAT-6 cable with the drain wire soldered to the connectors will resolve the issue. Also make sure to eliminate any patch panels and wall plates. Patch panels and wall plates are prone to EMI if they are not shielded properly.

Image is tinted green or pink

An image that is tinted green or pink is the result of the incorrect color space being transmitted. Make sure that the display and source both support the same color space. Setting DIP switch 1 on the Receiver Unit, to the OFF position, will use the Local EDID. EDID features newer than HDMI 1.3 are removed when the display is read. This provides a general EDID which is compatible with more displays.

A

ADC

Apple Display Connector. The ADC interface is a proprietary interface developed by Apple that combines analog and digital signals, USB, and power in a single cable.

C

CAT-5

Category-5 cable, commonly known as Cat-5, is an unshielded twisted pair type cable designed for high signal integrity. The actual standard defines specific electrical properties of the wire, but it is most commonly known as being rated for its Ethernet capability of 100 Mbit/s. Its specific standard designation is EIA/TIA-568. Cat 5 cable typically has three twists per inch of each twisted pair of 24 gauge copper wires within the cable.

CAT-5e

Similar to Cat 5 cable, but is enhanced to support speeds of up to 1000 megabits per second.

CRT

An acronym for Cathode Ray Tube: a common type of computer display hardware.

D

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

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

Dolby Digital®

This is a digital surround sound technology used in movie theaters and upscale home theater systems that enhances audio. Home theater components with this technology work in conjunction with a “8.1-speaker” system (Eight speakers plus a low-frequency subwoofer) to produce true-to-life audio that draws the listener into the onscreen action.

DTS™

DTS is the acronym for Digital Theater Systems. DTS is a discrete 8.1 channel surround system similar to Dolby Digital. Dolby Digital is the DTV standard, but DTS competes with Dolby on DVD and in the movie theaters.

DVI

The acronym for Digital Visual Interface. DVI is the 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.

E

EDID

The acronym for Extended Display Identification Data. The EDID is a data structure provided by a digital display to describe its capabilities to a video source device. EDID is defined and standardized by the Video Electronics Standards Association (VESA). Among other things, the EDID includes manufacturer name, ID, serial number, product type, and timings supported by the display.

F

Fiber Optic

Refers to the medium and the technology associated with the transmission of information as light pulses along a glass or plastic wire or fiber. Optical fiber carries much more information than conventional copper wire and is in general not subject to electromagnetic interference and the need to retransmit signals.

H

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 Multimedia 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).

HD-SDI

HD-SDI is the acronym for High-Definition Serial Digital Interface. HD-SDI provides a data rate of 1.485 Gb/s for high-definition video and audio.

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 x 720p and 1920 x 1080i are typically accepted as high-definition scan rates.

I

IEEE 1394a

A type of cabling technology for transferring data to and from digital devices at high speed. Some professional digital cameras and memory card readers connect to the computer over FireWire. FireWire card readers are typically faster than those that connect via USB. Also known as IEEE 1394, FireWire was invented by Apple Computer but is now commonly used with Windows-based PCs as well.

IR remote

A type of wireless transmission using infrared light waves.

K

KVM

An acronym for Keyboard / Video / Mouse. A KVM switch is a hardware device that allows control of multiple computers from a single keyboard, video monitor and mouse.

L

LCD

Liquid Crystal Display. A display that consists of two polarizing transparent panels and a liquid crystal surface sandwiched in between. Voltage is applied to certain areas, causing the crystal to turn dark. A light source behind the panel transmits through transparent crystals and is mostly blocked by dark crystals.

N

NTSC

NTSC is an acronym for National Television Systems Committee. NTSC is the current analog television standard used in North America, most of South America, Burma, South Korea, Taiwan, Japan, and the Philippines.

P

PAL

An acronym for Phase Alternate Line. PAL is the analog television display standard that is used in Europe and certain other parts of the world. North America uses the NTSC standard. PAL typically uses 625 scan lines, compared to the NTSC standard of 525 scan lines.

PS/2

A serial interface developed by IBM for the purpose of connecting a keyboard or mouse to a PC. The PS/2 port has a mini DIN plug containing 6 pins. PS/2 ports are used so that the serial port can be used by another device.

R

RS-232

The acronym for Recommended Standard 232. RS-232 is the name for a series of standards for serial data and control signals frequently used by computers serial ports.

S

SDI

SDI is the acronym for Serial Digital Interface. SDI is used for standard definition applications (SMPTE 259M) with bit rates of 270 Mb/s, 360 Mb/s, 143 Mb/s, and 177 Mb/s. 270 Mb/s is the most common. Bit rates below 270 Mb/s were designed for the digital transmission of composite (NTSC or PAL) video. *See HD-SDI*.

SMPTE

The acronym for Society of Motion Picture and Television Engineers. SMPTE was founded in 1916 and is an international professional association, based in the U.S. SMPTE has over 400 standards and engineering guidelines for television, motion pictures, digital cinema, as well as audio and medical applications.

S/PDIF

S/PDIF is the acronym for Sony / Philips Digital Interconnect Format but is more commonly known as Sony / Philips Digital Interface. S/PDIF is a digital audio interface used in consumer audio equipment used to carry digital audio signals over a relatively short distance. The digital signal is transmitted over a coaxial cable with RCA connectors.

T

TOSLINK

TOSLINK is an abbreviated format of the two words *Toshiba Link*. TOSLINK is a standardized optical fiber connection system used to transmit digital audio between various pieces of consumer audio equipment. TOSLINK can support several different audio formats including LPCM, Dolby®, and DTS™.

U

USB

USB is an acronym for Universal Serial Bus. USB can connect computer peripherals such as mice, keyboards, digital cameras, printers, personal media players, flash drives, Network Adapters, and external hard drives. For the most part, USB has made interfaces such as serial and parallel ports obsolete.

V

VESA

VESA (Video Electronics Standards Association) is an international standards entity for computer graphics. The initial goal of VESA was to produce a standard for the 800 x 600 SVGA resolution displays. However, the VESA standard has produced several standards which relate to the function of video devices on personal computers. DisplayPort is also a VESA technology that supports connections to digital displays.

VGA

Video Graphics Array (VGA) initially refers to the display hardware which was introduced with the IBM PS/2 line of computers in 1987. However, it is also used to define the 15-pin D-subminiature VGA connector, as well as a resolution of 640 x 480.

SPECIFICATIONS

Maximum Pixel Clock ..... 225 MHz

Input Video Signal ..... 1.2 Volts p-p

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

HDMI Input Connector (Sender / Receiver) ..... (1) 19-pin, Type A, female

HDMI Output Connector (Receiver) .....(1) 19-pin, Type A, female

RS-232 Connector (Sender) ..... (1) DB-9, female

RS-232 Connector (Receiver) ..... (1) DB-9, male

Ethernet Connector (Sender / Receiver) ..... (1) RJ-45, shielded

Link Connectors (Sender / Receiver) ..... (1) RJ-45, shielded

IR Blaster connector (Sender) ..... (1) 3.5 mm mini-mono jack

IR Extender connector (Receiver) ..... (1) 3.5 mm mini-stereo jack

Power Supply (Sender) ..... 110 / 240 V AC, IEC connector

Power Output Connector (Receiver) ..... 5 V DC, locking

Dimensions (Sender / Receiver) ..... 8.4” W x 1.7” H x 6.7” D

Shipping Weight ..... 8 lbs.

WARRANTY

Gefen warrants the equipment it manufactures to be free from defects in material and workmanship.

If equipment fails because of such defects and Gefen is notified within two (2) years from the date of shipment, Gefen will, at its option, repair or replace the equipment, provided that the equipment has not been subjected to mechanical, electrical, or other abuse or modifications. Equipment that fails under conditions other than those covered will be repaired at the current price of parts and labor in effect at the time of repair. Such repairs are warranted for ninety (90) days from the day of reshipment to the Buyer.

This warranty is in lieu of all other warranties expressed or implied, including without limitation, any implied warranty or merchantability or fitness for any particular purpose, all of which are expressly disclaimed.

1. Proof of sale may be required in order to claim warranty.

2. Customers outside the US are responsible for shipping charges to and from Gefen.

3. Copper cables are limited to a 30 day warranty and cables must be in their original condition.

The information in this manual has been carefully checked and is believed to be accurate. However, Gefen assumes no responsibility for any inaccuracies that may be contained in this manual. In no event will Gefen be liable for direct, indirect, special, incidental, or consequential damages resulting from any defect or omission in this manual, even if advised of the possibility of such damages. The technical information contained herein regarding the features and specifications is subject to change without notice.

For the latest warranty coverage information, please visit Gefen's Warranty web page at http://www.gefen.com/kvm/aboutus/warranty.jsp

PRODUCT REGISTRATION

Please register your product online by visiting Gefen's web site at http://www.gefen.com/kvm/Registry/Registration.jsp

Rev A2

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