Gefen

CAT5 • 9000HD

USER MANUAL

www.gefen.com

Technical Support:
Telephone   (818) 772-9100
                     (800) 545-6900

Fax   (818) 772-9120

Technical Support Hours:
8:00 AM to 5:00 PM Monday thru Friday.

Write To:

Gefen Inc.
C/O Customer Service
20600 Nordhoff Street
Chatsworth, CA 91311

www.gefen.com
support@gefen.com

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INTRODUCTION

Thank you for purchasing the new ex•tend•it CAT5•9000HD series by Gefen, Inc.

The ex•tend•it CAT5•9000HD by Gefen allows users the benefits of extending DVI, USB 1.1, PS/2, RS232, and audio signals beyond the desktop. In a growing number of applications, broadcast stations and production facilities there is a need to locate a computer remotely from the keyboard, mouse, and video monitor. A CPU may need to be shared between several users, for example, or moved to another room because of annoying fan noise.

The CAT5•9000HD series can be used to extend computers with noisy fans, printers, and hard drives. With the potential to cover the distance of 150 feet, industry standard Category 5e (CAT-5e) cables are used for the extension of all the devices. One can connect additional CAT5•9000HD series to the same computer, allowing access to the same computer from other locations up to 150 feet apart.

CONTENTS
The CAT5•9000HD system consists of:

(1) CAT5•9000HDS sender unit
(1) CAT5•9000HDR receiver unit
(2) 5VDC power supply
(1) DVI to HDMI cable (6FT)
(2) PS/2 cable (6FT)
(1) Audio cables (6FT)
(1) USB cable (6FT)
(1) User Manual

HOW IT WORKS
In its most basic application, the CAT5•9000HDS sender unit resides next to the computer. Supplied with the system, DVI, USB 1.1, PS/2, and audio cables connect the computer to the CAT5•9000HDS sender unit.

The CAT5•9000HDR receiver unit are placed next to the monitors and keyboard, mouse, speakers, and RS232 devices, at the remote location. The monitor, keyboard, mouse, and other devices are connected to the CAT5•9000HDR similar to the way they are connected to the back of the computer (PC or Macintosh).

READ THESE NOTES BEFORE INSTALLING
OR OPERATING THE CAT5•9000HD SYSTEM

- Use industry standard Category 5e (CAT-5e) cable to operate the CAT5•9000HD system.

- Please connect all the cables between the computer and the CAT5•9000HDS before power up the CAT5•9000HDS unit.

- The CAT5•9000HD units are housed in a metal box for better RF shielding.

* CAT6 cable is suitable for high resolutions at 50 meters.

How to Connect the CAT5•9000HD Extender to your devices

1 Connect the supplied cables from the computer outputs into the CAT5•9000HD Sender unit inputs. Only the peripherals being extended need to be connected.

2 Connect the cable from your display (monitor or projector) into the DVI out of the CAT5•9000HD Receiver unit.

3 Connect the cables from your peripherals into their respective outputs on the CAT5•9000HD Receiver unit.

4 Connect two CAT-5e cables for video and USB extension on the CAT-5 Video and CAT-5 DDC channel. Two CAT-5e cables are required for video extension.

5 Connect one CAT-5e cable for audio extension and another CAT-5e for PS/2 and RS-232 extension.

6 Plug the 5VDC power supplies into the CAT5•9000HD Sender and Receiver unit.

CAT5•9000HDS FRONT PANEL DESCRIPTIONS
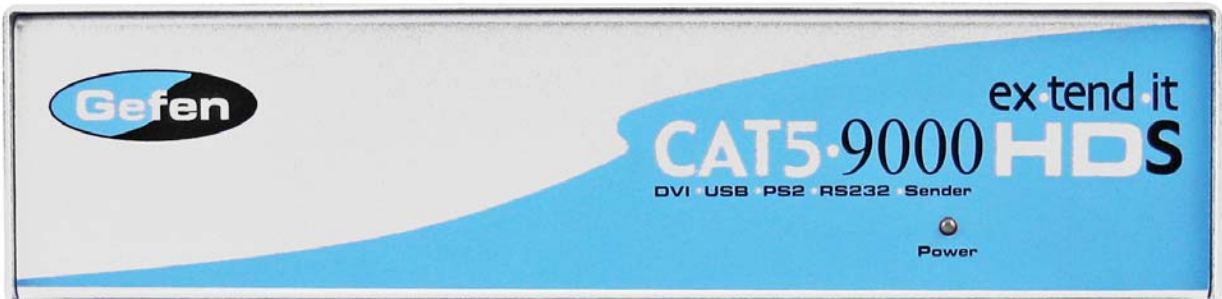
Front Panel Function Description

1   POWER ON INDICATOR - Indicates that the unit is plugged in and powered on

CAT5•9000HDR FRONT PANEL DESCRIPTIONS

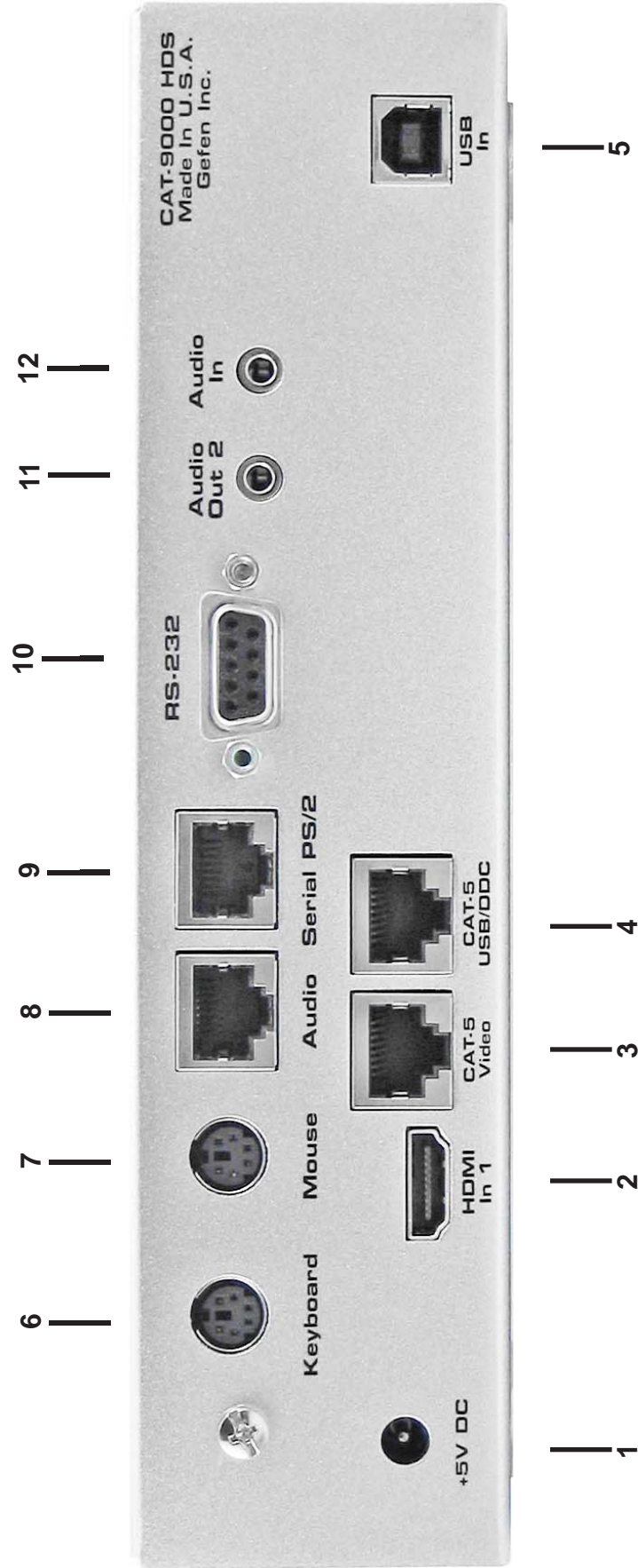**Front Panel Function Description**

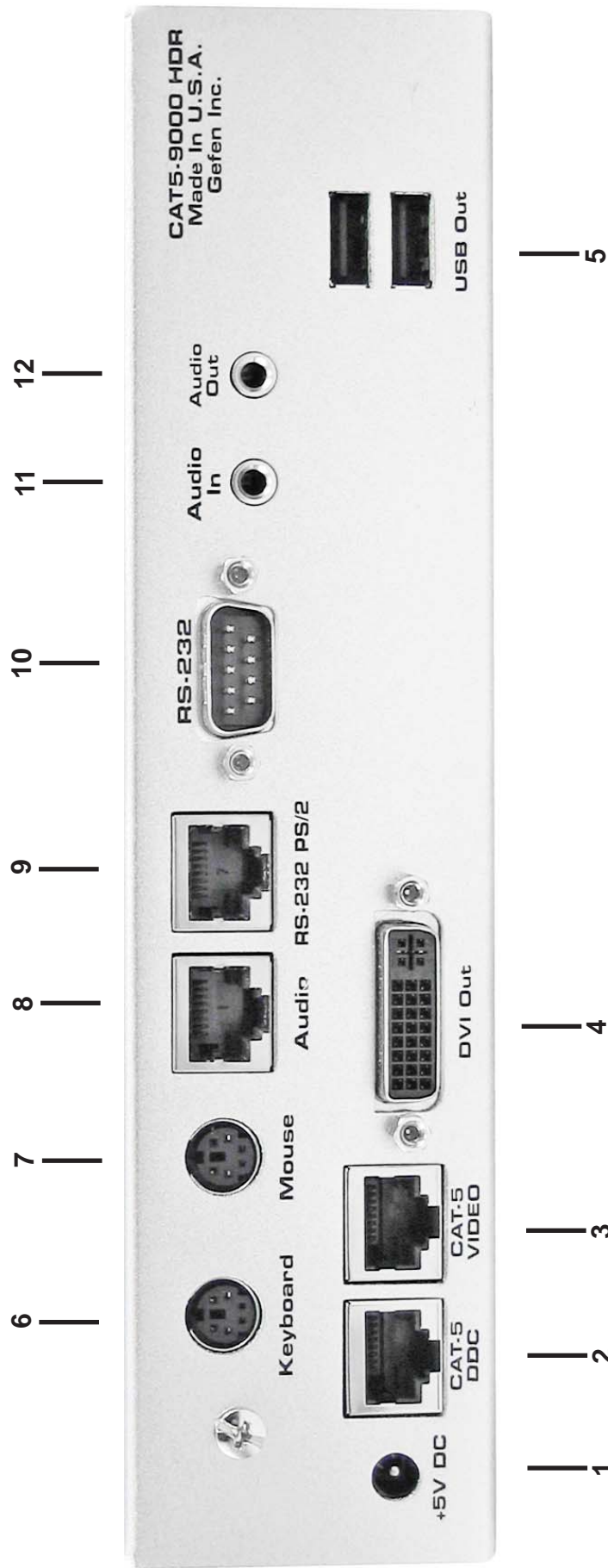**1   POWER ON INDICATOR -** Indicates that the unit is plugged in and powered on

CAT-9000 HDS
Made In U.S.A.
Gefen Inc.

USB
In
5

Audio
In
12

Audio
Out 2
11

RS-232
10

Serial PS/2
9

CAT-5
USB/DDC
4

Audio
8

CAT-5
Video
3

Mouse
7

HDMI
In 1
2

Keyboard
6

+5V DC
1

CAT5•9000HDS BACK PANEL DESCRIPTIONS

1 **POWER -** 5 VDC external power supply

2 **HDMI in 1 -** HDMI Input connects to your computer with the supplied DVI to HDMI cable

3 **CAT5 Video 1 -** RJ-45 input extends HDMI input 1 with CAT-5 cable

4 **CAT5 USB/DDC1 -** RJ-45 input extends USB and DDC1 signals with CAT-5 cable

5 **USB IN -** USB input from computer

6 **KEYBOARD -** Mini din PS/2 connector connects to PC for keyboard controls

7 **MOUSE -** Mini din PS/2 connector connects to PC for mouse controls

8 **CAT-5 AUD -** RJ-45 input extends audio out and audio 2 with CAT-5 cable

9 **CAT-5 SERIAL/PS-2-** RJ-45 input extends RS232, and PS/2 keyboard and mouse with CAT-5 cable

10 **RS232 -** DB-9 input from computer

11 **AUDIO OUT 2 -** Audio Mini Jack input from computer

12 **AUDIO IN -** Audio Mini Jack input from computer

CAT5•9000HDR BACK PANEL DESCRIPTIONS

1   **POWER -** 5 VDC external power supply

2   **CAT5 USB/DDC1 -** RJ-45 input extends USB and DDC1 signals with CAT-5 cable

3   **CAT5 Video 1 -** RJ-45 input extends video input 1 with CAT-5 cable

4   **DVI OUT 1 -** DVI output connects to the monitor 1 for local video

5   **USB Out -** USB Output to computer

6   **KEYBOARD -** PS/2 output connects to the keyboard

7   **MOUSE -** PS/2 output connects to the mouse

8   **CAT-5 AUDIO -** RJ-45 input connects CAT-5 cable to receive extended audio in and audio 2 signals

9   **CAT-5 SERIAL PS/2 -** RJ-45 input connects CAT-5 cable to receive extended RS-232 and PS/2 signals

10   **RS232 -** DB-9 connector connects to RS-232 devices

11   **AUDIO IN -** Audio mini jack connects to microphone

12   **AUDIO OUT -** Audio mini jack connects to speakers

CAT5 WIRING DIAGRAM

RJ-45 Jack

1 2 3 4 5 6 7 8

White/Orange
Orange
White/Green
Blue
White/Blue
Green
White/Brown
Brown

RJ-45 Jack

1 2 3 4 5 6 7 8

8

Gefen CAT5 DVI Extenders (sender and receiver) both contain a pair of service switches located on the board. These service switches are used to select from a set of configurations that will equalize the signal to best match the conditions in your setup.

Sender Service Switches

Option No.	Switch 1 Position	Switch 2 Position	Description
1	0 (OFF)	0 (OFF)	Strong Line Driver (Default)
2	1 (ON)	0 (OFF)	Weak Line Driver

Receiver Service Switches

Option No.	Switch 1 Position	Switch 2 Position	Description
1	0 (OFF)	0 (OFF)	EQ 0 (Default)
2	1 (ON)	0 (OFF)	EQ 1
3	0 (OFF)	1 (ON)	EQ 2
4	1 (ON)	1 (ON)	EQ 3

Adjustment Guidelines:

1)   Higher EQ level is used to equalize poor/low quality CAT-5e cables

2)   Stronger Line Driver is used to boost signals through longer cables

3)   It is an optimal balance of Line Driver and EQ that will result in the best possible picture.

DVI Out

USB Devices

PS/2 Devices

RS232 Out

Audio In

Audio Out

CAT5●9000HDR

CAT5 Video

CAT5 DDC

Audio

CAT5 Serial

PS/2

CAT5●9000HDS

DVI

RS232

USB

Audio In

Audio Out

PS/2

Computer
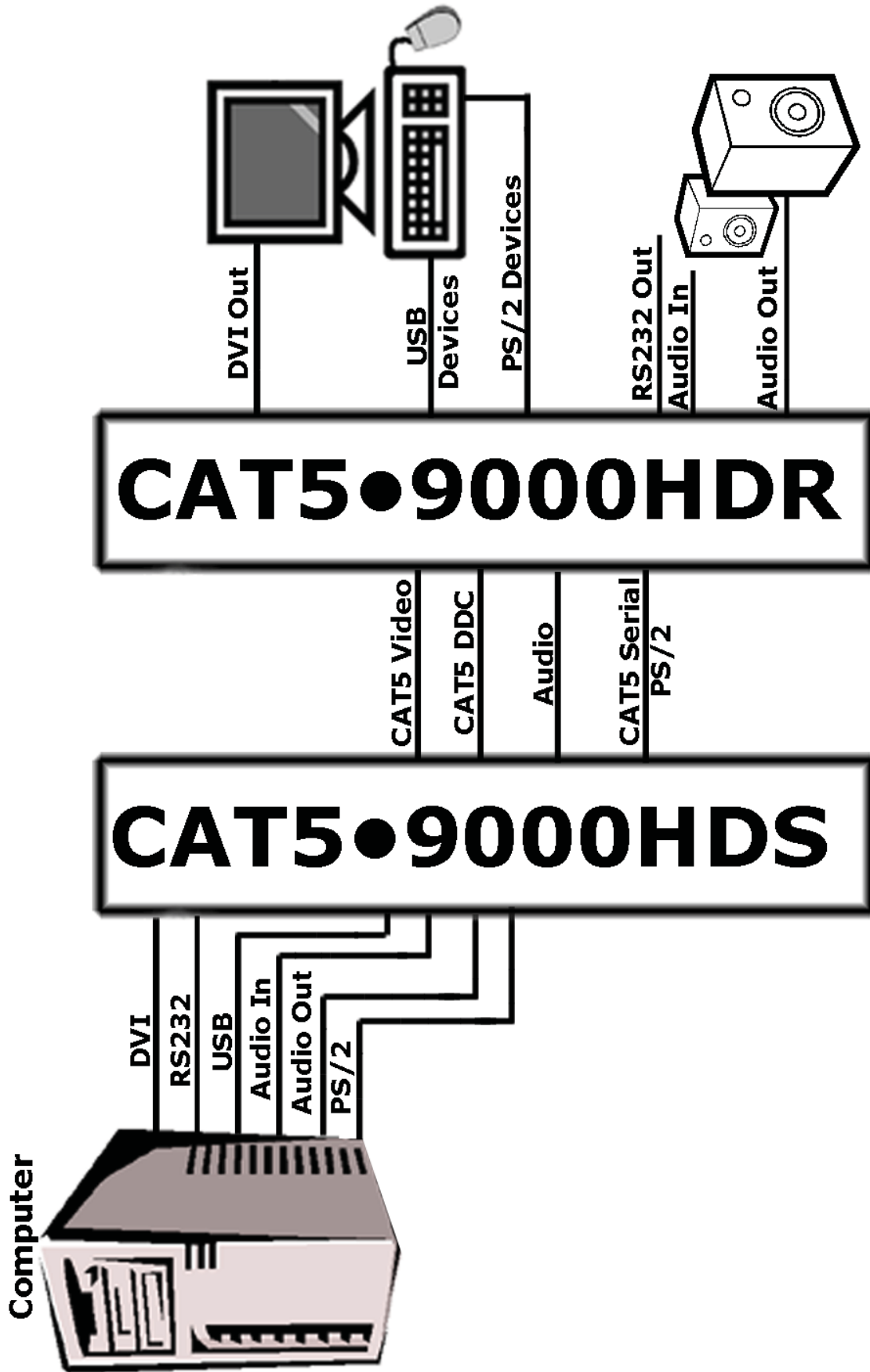
Frequently Asked Questions

What kind of CAT-5e cable should I be using?
Solid core CAT-5e cable rated at 350 Mhz, terminated in 568a or 568b is the minimum requirement. CAT-6 cables are also a viable cable to use. Higher resolutions and transmission lengths greater then 80 feet might require low skew cables for optimum performance.

Why does the CAT5 sender unit have a HDMI connector on the input?
A HDMI connector was used on the input to optimize space on the board by using the smaller connector. HDMI is electrically equivalent to DVI-D.

I'm getting no video on the screens, what can I check?
First thing to check is make sure that the video CAT5 is linked to the other video CAT5 port and the same with the DDC ports. Test to make sure the units are working with short CAT-5e cables 15-20 feet. Units shipped starting 12-2005 have the service switches inside the unit enabled. Please refer to the Service Switch Usage Guide on page 10.

I'm getting no video on the screens using ADC to DVI adapters, what is wrong?
ADC to DVI adapters remove the necessary 5V line that the extenders require on the input to operate. To enable the 5V you will need to open up the sender unit. Next to each DVI/HDMI input connector will be a jumper that needs to be shorted to enable 5V to the input. This should only be enabled when using a ADC to DVI Adapter otherwise damage to your video card may result.

How can I fix the flickering picture?
Flickering or a Blinking image is the result of a loss of sync between the display and the source. Try lowering the resolution to see if that helps, if it does, the CAT-5 cables you are using are unable to handle the bandwidth of the higher resolution and thus you are losing sync. Try a shielded CAT-5e cable on the Video to reduce interference. You can also try adjusting the service switches. Usually this is caused from either too much or too little of a boost. Please refer to the service switch guide on page 9 for the different combinations.

Why is there a green or pink tint to my picture?
A tint of green or pink in the picture is a result of incorrect colorspace being transmitted. This can be resolved by recycling power on your devices including the extender. If this does not help, the DDC data containing the colorspace is not being transmitted correctly due to loss in the CAT5 cable, try replacing the DDC cable.

I can't seem to get my RS-232 devices to detect and connect, what's wrong?
The CAT5-9000HD system only extends the Tx and Rx lines of RS232. If you need full RS232 extension of every line, you will need the standalone RS232 Extender units.

Can I run the CAT-5 cable through a patch bay?
No, the signal will not transmit reliably

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

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

USB

Universal Serial Bus. An external peripheral interface standard for communication between a computer and external peripherals over a cable using bi-serial transmission.

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.

PS/2

A port type 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. The PS/2 port is often called the mouse port.

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.

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

Input Connector Type .... HDMI type A 19 pin female

Output Connector Type .... DVI-I 29 pin female (digital only)

Link Connector RJ-45

USB - "A" Connector .... USB Out

USB - "B" Connector .... USB Device Input

PS/2 Keyboard Connector .... 8 Pin MiniDin

PS/2 Mouse Connector .... 8 Pin MiniDin

RS232 Connector DB-9

Power Consumption .... 15 watts (max)

Power Supply .... 5V DC

Dimensions .... 8.4" W x 1.75" H x 4.4" D

Shipping Weight .... 7 lbs.

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

If equipment fails because of such defects and Gefen Inc. is notified within two (2) year from the date of shipment, Gefen Inc. 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 cable must be free from any scratches, markings, and neatly coiled.

The information in this manual has been carefully checked and is believed to be accurate. However, Gefen Inc. assumes no responsibility for any inaccuracies that may be contained in this manual. In no event will Gefen Inc., 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 CAT5•9000HD features and specifications is subject to change without notice.

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