

# Gefen

## 8x4 CAT-5 Matrix for HDMI™

EXT-HDMI-CAT5-844

User Manual



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**Rev A**

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# INTRODUCTION

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Congratulations on your purchase of the 8x4 CAT-5 Matrix for HDMI. Your complete satisfaction is very important to us.

## **Gefen**

Gefen delivers innovative, progressive computer and electronics add-on solutions that harness integration, extension, distribution and conversion technologies. Gefen's reliable, plug-and-play products supplement cross-platform computer systems, professional audio/video environments and HDTV systems of all sizes with hard-working solutions that are easy to implement and simple to operate.

## **The Gefen 8x4 CAT-5 Matrix for HDMI**

The rack-mountable 8x4 CAT-5 Matrix for HDMI sends Full 1080p HD video and multichannel digital audio from any of 8 HDMI input sources to any 4 HDMI Displays -- be they local or remotely connected via CAT5 cable.

The HDMI inputs consist of 4 High Definition video switches that can each accept 2 video sources. This input scheme allows up to 8 sources to be available while viewing any 4 on the output displays concurrently.

The 8x4 CAT-5 Matrix for HDMI eliminates the need to disconnect and reconnect sources to displays. It works with Blu-Ray players, Set-Top boxes, Home Theater PCs, and game consoles that connect to an HDMI display. Any source is accessible at all times by any display by selecting it using an IR remote or an RS-232 remote control device. The Matrix comes with rack ears for mounting in a shelving system. HDMI displays can be located locally or remotely over CAT5 cable, making for truly flexible HDMI routing options and creative extension possibilities.

## **How It Works**

Up to 8 HDMI sources (4 viewable at any one time) connect to the Matrix's inputs and up to 4 Displays connect to the Matrix's outputs. Upon power-up, the 8x4 Matrix, HDMI sources and all connected Displays will show clear and vibrant HDMI video with multichannel digital audio. HDMI sources can now be selected on each display using the IR remote.

Important Note:

The 8x4 CAT-5 Matrix for HDMI over CAT5 incorporates a 2x1 switch in front of each of 4 inputs, each feeding into a traditional 4x4 matrix. This allows connection of up to 8 HDMI source devices. Each input to the 8x4 Matrix allows only one of its two connected "A" and "B" sources to be switched into view at one time, yielding a total of 4 HDMI sources that may be viewed simultaneously.

## OPERATION NOTES

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### READ THESE NOTES BEFORE INSTALLING OR OPERATING THE 8X4 CAT-5 MATRIX FOR HDMI

- To use the extender functionality of the 8x4 CAT-5 Matrix for HDMI the supplied 1 foot HDMI jumper cables must be used to connect the HDMI output ports to the HDMI extension input ports. Please see page 8 for details.
- Use two industry standard CAT-5, CAT-5e or CAT-6 cables to operate each of the HDMI Over CAT5 Receivers. Gefen recommends shielded CAT-6 cabling for maximum performance.
- For 1080i video, maximum extension is 300 feet (91 meters).
- For 1080p video, maximum extension is 150 feet (45 meters).
- IR repeater functionality is only from the receiving unit to the sending unit. IR data cannot be transmitted from the sending unit to the receiving unit.
- When a display connects to a source being viewed by other displays, a short flash may appear momentarily on the displays already viewing that source. This is normal operation as new handshakes for HDCP are being made.
- Local displays that are not using the extension functionality of the 8x4 CAT-5 Matrix for HDMI can only switch their viewing source via the RS-232 Serial Control Interface or the optional RMT-16IR remote control.
- **Important Note:** The 8x4 CAT-5 Matrix for HDMI incorporates a 2x1 switch in front of each input on a traditional 4x4 matrix. This allows for the connection of up to 8 different HDMI source devices with a maximum of 4 sources available for viewable at any one time. Each of the 4 switched inputs on the 8x4 CAT-5 Matrix for HDMI are labeled as "A" and "B". Both "A" and "B" for each input cannot be active at the same time.

#### **Example A (Multiple outputs viewing the same input source)**

**Devices:** 1A (DVD player) & 1B (Cable STB)

**Scenario:** Outputs 1 and 2 are both viewing input 1A (DVD).

**Action:** User viewing output 1 switches the input from 1A (DVD) to 1B (STB).

**Result:** Both outputs 1 and 2 will be switched to viewing 1B (STB).

#### **Example B (Multiple outputs viewing separate input sources)**

**Devices:** 1A (DVD player), 1B (Cable STB), and 2A (Video Game system)

**Scenario:** Output 1 is viewing 1A and output 2 is viewing 2A.

**Action:** User viewing output 1 switches the input from 1A (DVD) to 1B (STB).

**Result:** Output 2 is not affected by the change of 1A to 1B because it is viewing a source (2A) on a different input.

- Display information (EDID) from the displays attached to the 8x4 CAT-5 Matrix for HDMI need to be sent back to the input sources. Please see page 11 for EDID management features and options.

# FEATURES

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## Features

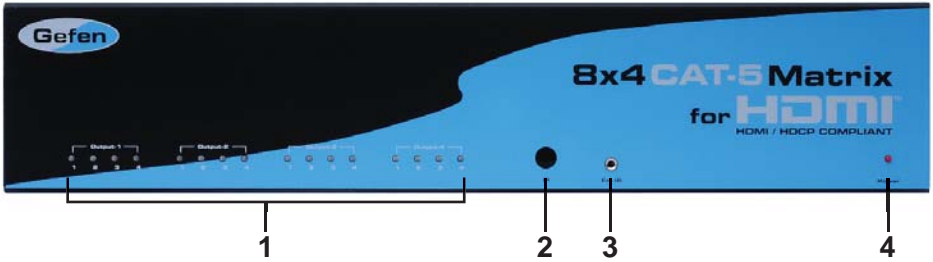
- Switches any eight HDMI™ sources to 4 Displays
- Distributes any of the four switched inputs (total of eight inputs) to any combination of the four HDMI™ output displays
- Maintains high resolution video - beautiful, sharp HDTV resolutions up to 1080p, 2k, and computer resolutions up to 1920 x 1200 are easily achieved
- Serial RS-232 remote port for switching via control automation
- HDMI™ 1.2 Compliant (HDMI 1.3 Compatible); HDCP Compliant
- Discrete IR remote (included)
- Set of rack ears included

## Package Includes

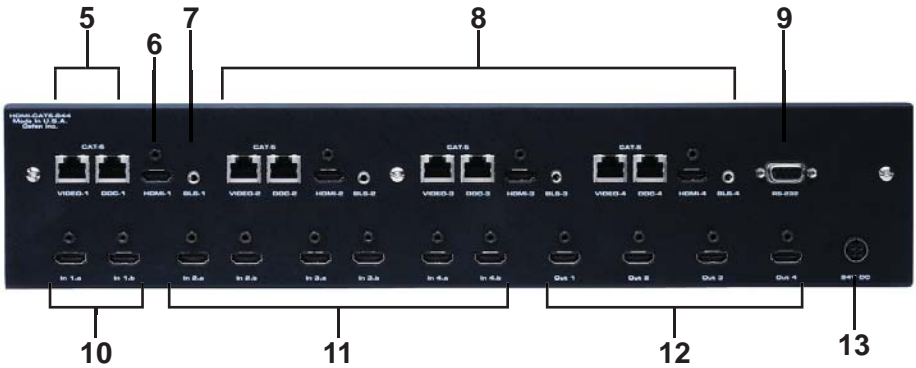
- (1) 8x4 CAT-5 Matrix for HDMI Sender
- (4) HDMI Over CAT-5 Receiver
- (4) RMT-4IR Remote Control
- (8) 6 Foot HDMI cables
- (4) 1 Foot HDMI cables
- (1) 24V DC Power Supply
- (4) 5V DC Power Supply
- (2) Rack Ears (2U size)
- (1) User's Manual

# SENDER PANEL LAYOUT

## Front Panel



## Back Panel



## SENDER PANEL DESCRIPTIONS

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### **1 HDMI Outputs 1 - 4**

The selected source for each HDMI output will be indicated by an active LED. The LED array will behave differently depending on the selected input (A or B). Please see page 13 for more information on the LED array.

### **2 IR (Infrared) Receiver**

This receiver will accept command for switching between input HDMI devices using the optional RMT-16IR remote control. Line of sight must be preserved for proper operation.

### **3 IR (Infrared) Receiver Extension**

An optional IR Receiver Extension (part # EXT-RMT-EXTIR) can be connected if the unit is placed in a location that will not provide line of sight to the included IR remote control. The IR extension can then be placed in a location where it can receive commands from the IR remote control.

### **4 Power LED Indicator**

This LED will become active once the included 24V DC power supply is properly connected between the unit and an open wall power socket.

### **5 HDMI Output 1 CAT5 Extension Ports**

DDC and video output ports for extension to a remote receiver. Both cables must be connected for proper operation.

### **6 HDMI 1 Extension Input Port**

For proper extension, the supplied 1 foot HDMI jumper cable must be attached between this port (6) and HDMI Output Port 1 (22).

### **7 HDMI 1 IR Blaster Port**

Optional IR emitter (Part# EXT-2IREMIT) can be attached to relay IR commands from the remote receiver to the blaster for remote control of devices.

### **8 HDMI Outputs 2 - 4 CAT5, Extension Input, and IR Blaster Ports**

These outputs will mirror items 5, 6, and 7 on this page for each of the other HDMI outputs.

### **9 RS-232 Serial Control Port**

Switching can be controlled via the RS-232 port. Please see page 14 for details on the available commands and pin-out scheme.

### **10 HDMI 1 Input A and B**

There are two inputs, labeled 1A and 1B, that will accept an HDMI source device. Only one of these inputs (A or B) can be active at any given time.

### **11 HDMI 2 - 4 Inputs A and B**

There are two inputs, labeled A and B, that will accept an HDMI source device for each of the inputs 2 through 4. Only one of these sources (A or B) can be active for each input at any given time.



## SENDER PANEL DESCRIPTIONS

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### **12 HDMI Outputs 1 - 4**

Each output port can be used in one of either two ways. This output can be connected directly to a local HDMI capable display or, if using the built-in extension functionality, these outputs can be connected to the HDMI extension input ports using the supplied 1 foot HDMI jumper cables.

### **13 24V DC Power Input**

Connect the supplied 24V DC Power supply to this input.

# **CONNECTING AND OPERATING THE 8X4 CAT-5 MATRIX FOR HDMI**

## **How to Connect the 8x4 CAT-5 Matrix for HDMI**

1. Connect up to 8 HDMI source devices to the 8x4 CAT-5 Matrix for HDMI using the included HDMI cables.

**NOTE:** Please be aware that each input has two available HDMI ports and that only one will be active at any given time. It is recommended that commonly used HDMI sources be put on separate inputs (i.e. 1A and 2A, not 1A and 1B) so that these devices are always available.

2. If using the extension functionality of the 8x4 CAT-5 Matrix for HDMI, please connect the HDMI output ports to the HDMI extension input ports using the supplied 1 foot jumper cables. Please see the diagram on the next page for extension input port connection instructions.

**NOTE:** All of the extension input ports are available for use but are not required for operation. The HDMI output ports can be used to directly connect a local display, or can be used in conjunction with the jumper cable to access the extension functionality of the 8x4 CAT-5 Matrix for HDMI.

3. Connect any local displays to the 8x4 CAT-5 Matrix for HDMI output ports using user supplied HDMI cables.
4. Connect both DDC and Video CAT-5e cables for each extension that is going to be used.
5. Connect both DDC and video CAT-5e cables, at the end of each cable run, to a HDMI Over CAT5 Receiver.
6. Connect the remote display(s) to each HDMI Over CAT5 Receiver using a user supplied HDMI cable.
7. Connect the included 5V DC power supply to each of the HDMI Over CAT5 Receivers.
8. Connect the included 24V DC power supply between the power input on the unit and an open wall power socket.
9. Power on all output devices first and the source devices second.

## **How to Operate the 8x4 CAT-5 Matrix for HDMI**

The 8x4 CAT-5 Matrix for HDMI can be controlled by the optional RMT-16IR remote control or the RS-232 serial communications port.

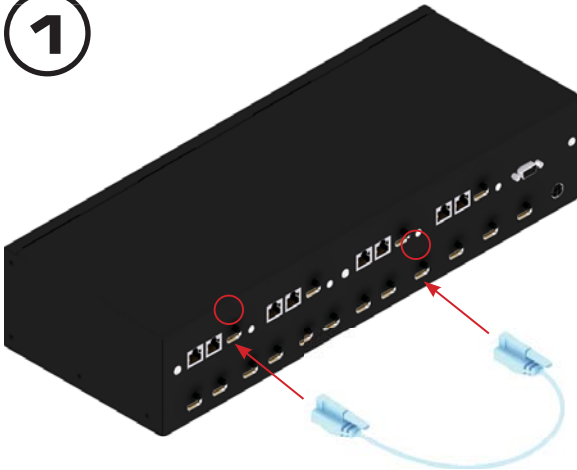
For RMT-16IR remote control functions please see page 9.

For RS-232 serial communication functions please see page 14.

## CONNECTING THE 8X4 CAT-5 MATRIX FOR HDMI JUMPERS

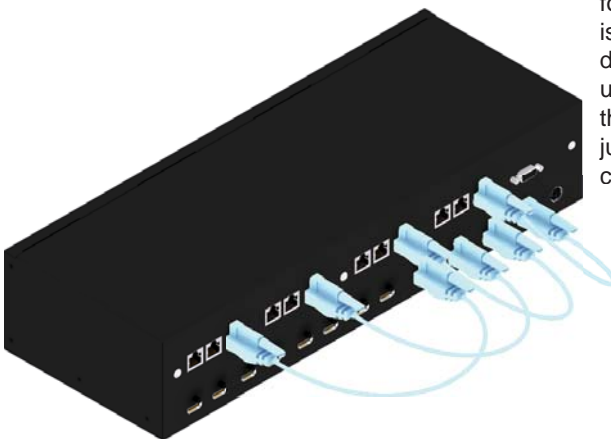
The 8x4 CAT-5 Matrix for HDMI uses a jumper cable system to link the matrix and extension portions together. These jumper cables are included. Please use the diagram below to setup extension functionality of the 8x4 CAT-5 Matrix for HDMI.

1



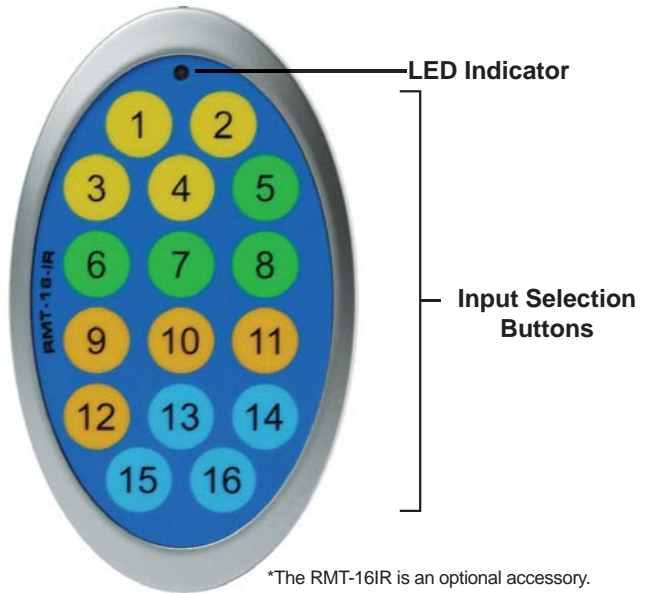
This example shows the jumper connection between HDMI output port 1 (B) and HDMI extension input port 1 (A).

2



When all jumpers are connected, extension for each HDMI output is possible. If a local display is going to be used, simply do not use that HDMI output port's jumper and extension connection.

## RMT-16IR\* REMOTE CONTROL DESCRIPTION



\*The RMT-16IR is an optional accessory.

The RMT-16IR remote control will allow the user to select which source will be routed to which output. Each of the 4 outputs are assigned a group of 4 buttons that will correspond to the 4 source inputs. Each button on the RMT-16IR remote control will toggle between the "A" and "B" sources for each input. Please use the information below when selecting the desired source for each display. The LED will blink each time a button press is detected

RMT-16IR Button	Source	Display
1	Toggle 1A and 1B	1
2	Toggle 2A and 2B	1
3	Toggle 3A and 3B	1
4	Toggle 4A and 4B	1
5	Toggle 1A and 1B	2
6	Toggle 2A and 2B	2
7	Toggle 3A and 3B	2
8	Toggle 4A and 4B	2
9	Toggle 1A and 1B	3
10	Toggle 2A and 2B	3
11	Toggle 3A and 3B	3
12	Toggle 4A and 4B	3
13	Toggle 1A and 1B	4
14	Toggle 2A and 2B	4
15	Toggle 3A and 3B	4
16	Toggle 4A and 4B	4

# RMT-161R REMOTE CHANNEL CONFIGURATION

## Why would I need to change the remote channel?

In some instances, the 8x4 CAT-5 Matrix for HDMI may use IR codes that conflict with other IR remote control devices. The unit may switch inputs when another brand IR remote control is used or the RMT-161R may cause other brand IR controlled devices to behave unexpectedly.

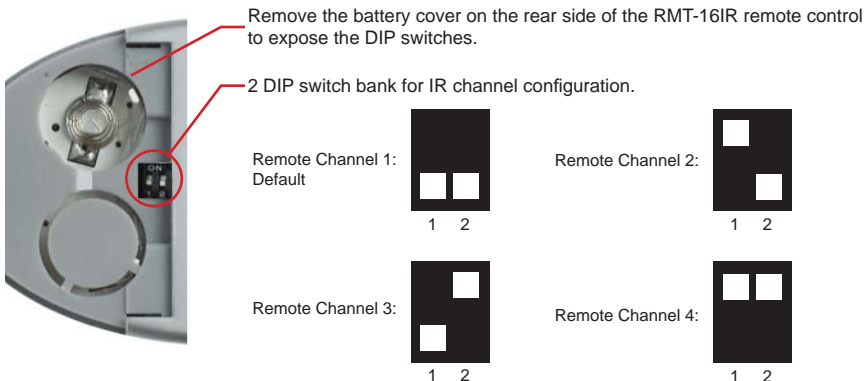
## I am experiencing the issues listed above. What do I do?

In these cases it is recommended to change the IR channel that the RMT-161R remote control and the 8x4 CAT-5 Matrix for HDMI use. The IR channel is configured independently on the RMT-161R remote control and the 8x4 CAT-5 Matrix for HDMI but the channel selection must match on both units for proper operation.

## How Do I change the Remote Channel?

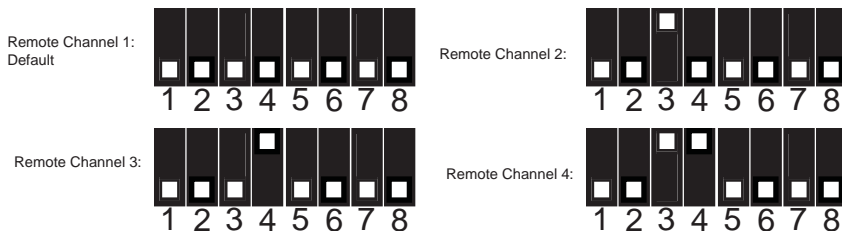
There are service DIP switches on the RMT-161R remote control and also inside the 8x4 CAT-5 Matrix for HDMI. Use the diagrams below to locate and change the IR channel to one that is not the default. Remember that the channel must match on both the unit and remote control for successful operation.

### RMT-161R Remote Control



### 8x4 CAT-5 Matrix for HDMI

The IR channel DIP switches for the 8x4 CAT-5 Matrix for HDMI are located on an 8 bank DIP switch inside of the unit and on its main-board. To open the unit, remove all screws on the underside and side of the unit. Remove all HEX screws on the rear panel. This includes the screws above each HDMI port and on each side of the RS-232 serial communications port. Carefully slide the unit apart. Locate DIP switches 3 and 4. Once adjustments are complete replace all screws and.



## EDID MANAGEMENT FEATURE

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### **EDID. What is it and what is it used for?**

Under normal circumstances, a source device (digital and analog) will require information about a connected device/display to assess what resolutions and features are available. The source can then cater its output to send only resolutions and features that are compatible with the attached device/display. This information is called EDID (Extended Display Information Data) and a source device can only accept and read one EDID from a connected device/display. Likewise, the source can only output one resolution for use by a connected device/display.

### **Why is EDID so important with the 8x4 CAT-5 Matrix for HDMI?**

The 8x4 Matrix is complex piece of technology that replicates and switches between multiple inputs and outputs. Each connected source device will require one EDID to read. EDID management is carefully handled by 8x4 CAT-5 Matrix for HDMI to provide a single EDID for each source to read.

### **What options do I have to manage the EDID in the 8x4 CAT-5 Matrix for HDMI?**

First, it is important to note that each source device can only output one video/audio signal type. This includes resolutions and timings. When multiple devices/displays are used, such as with the 8x4 CAT-5 Matrix for HDMI, it is important to use devices/displays that have similar or compatible resolutions/features. This will ensure that the single video/audio signal produced by the source device is accepted by all of the connected output devices/displays.

The user has the option, through a combination of DIP switch settings within the 8x4 CAT-5 Matrix for HDMI, to choose how the unit will manage the EDID from multiple HDMI devices/displays. Therefore the user has some control over the resolutions/features that the source devices will output. The 8x4 CAT-5 Matrix for HDMI has a multiple EDID management modes that will control how the EDID information from multiple devices/displays are combined, ignored, and routed.

### **How do I change EDID modes in the 8x4 CAT-5 Matrix for HDMI?**

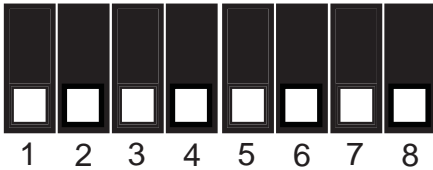
There is a bank of 8 DIP switches located on the main-board inside of the 8x4 CAT-5 Matrix for HDMI. DIP switches 1, 2, 5, and 7 are used in different combinations to manage the EDID modes.

**TIP:** EDID modes can also be managed via the RS-232 serial communications port. For this to work, all DIP switches must be in the OFF position. This is the factory default setting. If you wish to use this feature, please do not open the unit. See page 14 for more information on the RS-232 serial communication features.

To access these DIP switches it will be required to open the unit. To do this, remove all screws on the underside and side of the unit. Remove all HEX screws on the rear panel. This includes the screws above each HDMI port and on each side of the RS-232 serial communications port. Carefully slide the unit apart.

## EDID Modes

The diagram below illustrates the 8 DIP switch bank.



DIP SWITCH	Function
1	EDID Mode
2	EDID Mode
3	IR Channel
4	IR Channel
5	EDID Mode
6	N/A
7	EDID Mode
8	N/A

Use DIP switches 1, 2, 5, and 7 to select the desired EDID management mode.

### **EDID Mode 0 (Switch 1=OFF Switch2=OFF Switch5=ON)**

- EDID is copied from the device connected to the first active hdmi output port.
- All features newer than HDMI 1.2 are cleared.

### **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 output 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 output devices.

### **EDID Mode 7 (Switch 1=ON Switch2=ON Switch5=ON)**

- EDID is passed unmodified from the device connected to the first active output port.

### **EDID Mode 8 (Switch 1=OFF Switch2=OFF Switch5=OFF Switch7=ON)**

- Preloaded generic 1080p EDID is used.

### **EDID Mode 9 (Switch 1=OFF Switch2=ON Switch5=OFF Switch7=ON)**

- Same as mode 6 but will record and store the EDID in memory. This EDID will persist no matter what displays are disconnected or reconnected thereafter. EDID will remain even upon power cycle. A user submitted EDID can be uploaded in this mode using a Gefen HDMI Signal Generator.

## LED ARRAY DESCRIPTION

The LED array on the 8x4 CAT-5 Matrix for HDMI is designed to inform the user of the current source to output routes. Each output has a 4 LED array that will indicate which source is currently selected. Each input can accept two sources and therefore the LED array will act differently according to which input, "A" or "B", is active for each.

- An input's "A" source will be indicated by a single LED (the selected "A" input) that is ON.
- An input's "B" source will be indicated by the reverse; a single LED will be OFF (the selected "B" input) while the remaining 3 LEDs will be ON.

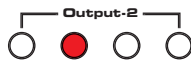
The examples below will show some scenarios to illustrate the LED array functionality. Please note that it is not possible to have both "A" and "B" inputs active at the same time for any given input.

● = LED ON    ○ = LED OFF

### Scenario 1 ("A" Example)



Output 1 is selected to 1A



Output 2 is selected to 2A

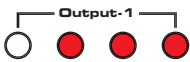


Output 3 is selected to 3A



Output 4 is selected to 4A

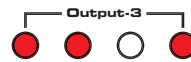
### Scenario 2 ("B" Example)



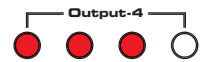
Output 1 is selected to 1B



Output 2 is selected to 2B

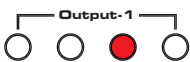


Output 3 is selected to 3B

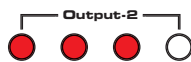


Output 4 is selected to 4B

### Scenario 3 (Mixed Example)



Output 1 is selected to 3A



Output 2 is selected to 4B



Output 3 is selected to 2A



Output 4 is selected to 1A



# 8X4 CAT-5 MATRIX FOR HDMI RS-232 SERIAL COMMUNICATION

## What features are available via the RS-232 serial communications port?

The 8x4 CAT-5 Matrix for HDMI can accept commands through the RS-232 serial communications port located on the rear panel. The current RS-232 control features are:

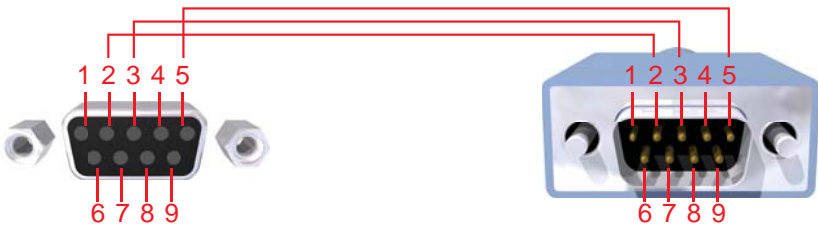
- Switching/routing of inputs to outputs without the RMT-16IR remote control.
- Switch EDID management modes without opening the unit to physically modify DIP switches.
- Print matrix routing state.

## How do I use these features?

These features were initially intended for utilization by custom installers in automated setups. However, these features can be tested by using any Windows PC with the Hyperterminal program.

## What pins are used for communication with the 8x4 CAT-5 Matrix for HDMI?

Only pins 2 (Receive), 3 (Transmit), and 5 (Ground) are used for communication. A null-modem adapter should not be used with this product.



Only Pins 2 (RX), 3 (TX), and 5 (Ground) are used on the RS-232 serial interface

## What are the communication port settings?

Bits per second .....	19200
Data bits .....	8
Parity .....	None
Stop bits .....	1
Flow Control .....	None

## 8X4 CAT-5 MATRIX FOR HDMI RS-232 COMMANDS

### Switching/Routing Binary Table

ASCII Command	Input	Output	ASCII Command	Input	Output
A1 or a1	1A	1	C1 or c1	1A	3
A2 or a2	1B	1	C2 or c2	1B	3
A3 or a3	2A	1	C3 or c3	2A	3
A4 or a4	2B	1	C4 or c4	2B	3
A5 or a5	3A	1	C5 or c5	3A	3
A6 or a6	3B	1	C6 or c6	3B	3
A7 or a7	4A	1	C7 or c7	4A	3
A8 or a8	4B	1	C8 or c8	4B	3
B1 or b1	1A	2	D1 or d1	1A	4
B2 or b2	1B	2	D2 or d2	1B	4
B3 or b3	2A	2	D3 or d3	2A	4
B4 or b4	2B	2	D4 or d4	2B	4
B5 or b5	3A	2	D5 or d5	3A	4
B6 or b6	3B	2	D6 or d6	3B	4
B7 or b7	4A	2	D7 or d7	4A	4
B8 or b8	4B	2	D8 or d8	4B	4

### EDID Management Modes

DIP switches 1, 2, 5, and 7 inside the unit must be in their default OFF position for the following commands to work. Use the ASCII commands below to change the EDID modes. For a description of each mode please see page 12.

ASCII	EDID Mode	ASCII	EDID Mode
m0	0	m5	5
m1	1	m6	6
m2	2	m7	7
m3	3	m8	8
m4	4	m9	9

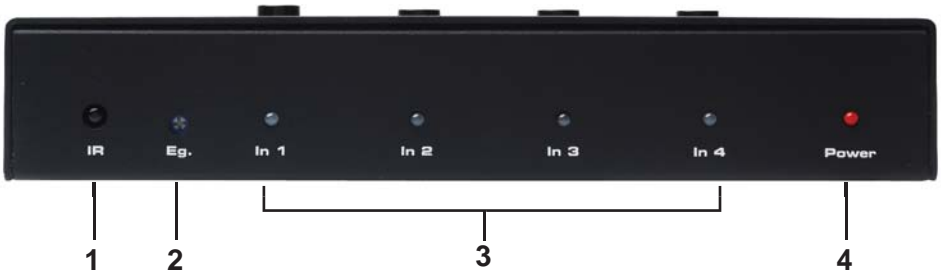
### Print Matrix Routing State

The following command will print the current matrix routing state.

ASCII
s

# RECEIVER PANEL LAYOUT

## Front Panel



## Back Panel



## Top Panel



## RECEIVER PANEL DESCRIPTIONS

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### **1 IR Relay Receiver**

This receiver will receive commands from the included IR remote control and from other commercial IR remote controls and relay it back to the optional IR blaster. This is intended for remote control of devices connected to the 8x4 CAT-5 Matrix for HDMI from the extended location.

### **2 Equalization Trim Pot**

When the receiver is set to manual equalization (see page 21), this will control the amount of EQ compensation applied to the video signal for fine tuning the HDMI video quality.

### **3 HDMI Input LED**

The currently selected input source for the receiver will be indicated by an active LED. The LED array will behave differently depending on the selected input (A or B). Please see page 22 for more information on the LED array.

### **4 Power LED**

This LED will be active when the included 5V DC power supply is connected.

### **5 IR Extension Port**

If the receiver is in a location where the IR receiver is not in direct line of sight of the remote controller, an optional IR Receiver Extension (Part# EXT-RMT-EXTIR) can be connected to this port.

### **6 CAT5 Input Ports**

DDC and video CAT5 cables from the 8x4 CAT-5 Matrix for HDMI sending unit.

### **7 HDMI Output Port**

Connect the display to this output port.

### **8 RS-232 Serial Control Port**

Switching can be controlled via the RS-232 port. Please see page 23 for details on the available commands and pin-outs.

### **9 5V DC Power Supply Input**

Insert the supplied 5V DC power supply into this port.

### **10 Input Selector Buttons**

HDMI input sources can be directly selected by using these push buttons.

Button A selects HDMI Input 1 A or B

Button B selects HDMI Input 2 A or B

Button C selects HDMI Input 3 A or B

Button D selects HDMI Input 4 A or B

## OPERATING THE HDMI OVER CAT-5 RECEIVER

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To use the HDMI Over CAT5 Receiver, the following connections must be made:

1. A HDMI jumper cable is connected between the HDMI output port and the HDMI extension input port.
2. The DDC and Video CAT-5e cable must be connected between the 8x4 CAT-5 Matrix for HDMI and the HDMI Over CAT5 Receiver.
3. A HDMI display is connected to the HDMI Over CAT5 Receiver.
4. The included power supply is connected to the HDMI Over CAT5 Receiver.

Once these connections are properly made, the HDMI Over CAT5 Receiver can be used to select which HDMI source will be viewed on the connected display. To select a HDMI source, depress the direct input buttons located on the top panel of the HDMI Over CAT5 Receiver. 2 sources (A and B) are available for each input. Each press of the Input button will toggle between the two sources connected to the input.

Button A selects HDMI Input 1 A and B

Button B selects HDMI Input 2 A and B

Button C selects HDMI Input 3 A and B

Button D selects HDMI Input 4 A and B

Switching can also be done using the included IR remote control (page 19) or via the RS-232 serial control interface (page 23).

**NOTE:** Switching of HDMI sources is limited to the one display that is connected to a particular HDMI Over CAT5 Receiver. For example, it is not possible to switch a HDMI source on a display connected to HDMI output 2 with the remote at the display location of HDMI output 1. However, if another HDMI Over CAT5 receiver is viewing the same source and the user switches

### **IR Blaster Functionality**

To control HDMI sources from the remote location, a optional IR blaster (Part# EXT-2IREMIT) can be attached for each HDMI Over CAT5 Receiver on the 8x4 CAT-5 Matrix for HDMI. IR remote control commands can then be relayed from each receiver to the device(s) connected to the blaster from the 8x4 CAT-5 Matrix for HDMI.

## RMT-4IR REMOTE CONTROL DESCRIPTION

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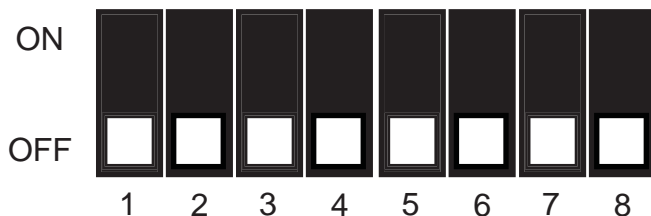


Pressing on each numbered selection buttons will switch the receiver to the corresponding HDMI Input source. Each input can have up to 2 sources connected (A and B). Each press of a input button will toggle between the A and B source. The LED will blink each time a button press is detected.

RMT-4IR Button	Source
1	Toggle 1A and 1B
2	Toggle 2A and 2B
3	Toggle 3A and 3B
4	Toggle 4A and 4B

## HDMI OVER CAT-5 RECEIVER ADVANCED CONFIGURATION

The HDMI Over CAT5 Receiver contains a bank of 8 DIP SWITCHES. These switches are located underneath each unit. Peeling back the black metallic sticker on the bottom of the HDMI Over CAT5 Receiver will reveal the DIP SWITCH bank. These service switches are used for a number of configuration options. By default, all Dip Switches are in the OFF position. Each setting is outlined below.



- Switch 1**    **Auto Equalization**
- Switch 2**    **IR Remote Channel Configuration**
- Switch 3**    **IR Remote Channel Configuration**
- Switch 4**    **Boost Setting**
- Switch 5**    **Boost Setting**
- Switch 6**    **Not Used**
- Switch 7**    **Not Used**
- Switch 8**    **Pre-Empahsis**

### **Auto Equalization & Boost Setting**

Auto equalization is enabled by default. This setting will compensate for variances in cable skew and will help eliminate the video noise that is associated with it. This feature will work reliably up to 130ft. Longer CAT-5e runs should have this feature disabled. It is important to understand that the Boost Setting and Equalization are used in conjunction with each other. The Auto-EQ feature will only function when the unit has no boost applied.

To manually equalize the video signal, turn Dip Switch 1 to the ON position. This will disable the auto equalization function and will allow the user to manually equalize the signal. From here, the Boost Settings and Equalization can be manipulated to tune-in an optimal video signal. Once Auto-EQ has been disabled, follow the steps on the next page.

# HDMI OVER CAT-5 RECEIVER ADVANCED CONFIGURATION

1. Insert a small flat head tool into the trim pot on the receiver unit.
2. Turn the trim pot in a clockwise fashion until it comes to a stop. Do not force the trim pot beyond this point. Doing so may break the trim pot.
3. Slowly turn the trim pot counter-clockwise in millimeter increments until the image stabilizes and all video noise disappears.
4. Carefully remove the adjustment tool.

**NOTE:** If your cable run is beyond 130 feet, or the following steps do not produce any video, it may be necessary to increase the boost from the sending unit. Use the chart below to increase the boost by changing the sender dip switches. Once a new boost setting is set, repeat steps 1 through 4 from above.

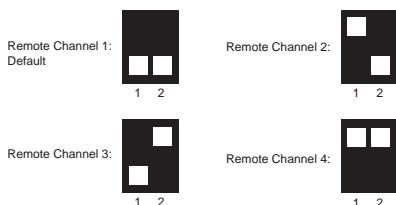
Equalization Setting	
Setting	Switch 1
Manual EQ	ON
Auto EQ (Default)	OFF

Boost Setting		
Setting	Switch 4	Switch 5
No Boost (Default)	OFF	OFF
Medium Boost	OFF	ON
High Boost	ON	OFF
Very Low Boost	ON	ON

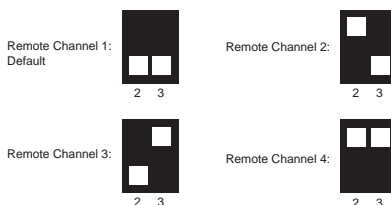
## ***IR Remote Channel Configuration***

Dip Switches 2 and 3 relate to the IR remote control channel that is used by the HDMI Over CAT5 Receiver and RMT-4IR remote control. Dip Switch 2 and 3 on the HDMI Over CAT5 Receiver must match Dip Switch 1 and 2 on the RMT-4IR remote control. Each HDMI Over CAT5 Receiver and remote pair, should be set to a different channel so that no two units do receive conflicting IR commands. Please view the table below to set the channel on each of the HDMI Over CAT5 Receiver units and IR remote controls. The remote channel for the RMT-4IR is located underneath the battery cover.

### **RMT-4IR REMOTE CONTROL**



### **HDMI Over CAT5 Receiver**





## LED ARRAY DESCRIPTION

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The LED array on the HDMI Over CAT5 Receiver is designed to inform the user of the currently selected source. Each receiver unit has a 4 LED array that will indicate which source is currently selected. Each input on the 8x4 CAT-5 Matrix for HDMI can accept two sources, therefore the LED array will act differently according to which input, "A" or "B", is currently active.

- An input's "A" source will be indicated by a single LED (the selected "A" input) that is ON.
- An input's "B" source will be indicated by the reverse; a single LED will be OFF (the selected "B" input) while the remaining 3 LEDs will be ON.

The examples below will show some scenarios to illustrate the LED array functionality. Please note that it is not possible to have both "A" and "B" inputs active at the same time for any given input.

 = LED ON     = LED OFF

### Scenario 1 ("A" Example)



In 1



In 2



In 3



In 4

Current source is 1A

### Scenario 2 ("B" Example)



In 1



In 2



In 3



In 4

Current source is 1A

# HDMI OVER CAT-5 RECEIVER RS-232 SERIAL COMMUNICATIONS

## What features are available via the RS-232 serial communications port?

The HDMI Over CAT5 Receiver can accept commands through the RS-232 serial communications port located on the rear panel. The current RS-232 control features are:

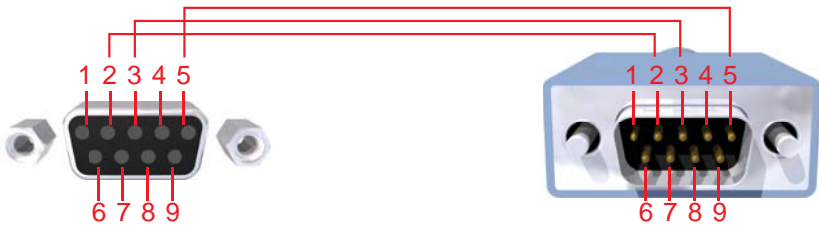
- Switching/routing of inputs to outputs without the RMT-4IR remote control.
- Setting boost settings without the switching DIP switches.

## How do I use these features?

These features were initially intended for utilization by custom installers in automated setups. However, these features can be tested by using any Windows PC with the Hyperterminal program.

## What pins are used for communication with the HDMI Over CAT5 Receiver?

Only pins 2 (Receive), 3 (Transmit), and 5 (Ground) are used for communication. A null-modem adapter should not be used with this product.



Only Pins 2 (RX), 3 (TX), and 5 (Ground) are used on the RS-232 serial interface

## What are the communication port settings?

Bits per second .....	19200
Data bits .....	8
Parity .....	None
Stop bits .....	1
Flow Control .....	None

## HDMI OVER CAT-5 RECEIVER RS-232 COMMANDS

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### Switching/Routing Binary Table

ASCII Command	Input
1	1A
2	1B
3	2A
4	2B
5	3A
6	3B
7	4A
8	4B

### Boost Settings

DIP switches 4 and 5 on the underside of the unit must be in their default OFF position for the following commands to work. Use the ASCII commands below to change the boost modes. For a description of each mode please see page 21.

ASCII	Boost Mode
a	No Boost (Default)
b	Medium Boost
c	High Boost
d	Very Low Boost

## SPECIFICATIONS

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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 .....	RS-232 Female, Mini-Stereo
Power Supply .....	24V DC
Power Consumption (Sender) .....	60 Watts (max)
Power Consumption (Receiver) .....	10 Watts (max)
Dimensions (Sender) .....	17"W x 1.75"H x 5.875"D
Dimensions (Receiver) .....	7.5"W x 1.375"H x 4.625"D
Shipping Weight .....	10 lbs.

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