

The Gefen logo is a stylized oval with a gradient from light grey to black. The word "Gefen" is written in a bold, white, sans-serif font across the center of the oval.

**Gefen**

®

# **4x4 Matrix for HDMI® 1.3**

**EXT-HDMI1.3-444  
User Manual**



**[www.gefen.com](http://www.gefen.com)**

## ASKING FOR ASSISTANCE

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### Notice

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

**4x4 Matrix for HDMI 1.3** is a trademark of Gefen, LLC

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# INTRODUCTION

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Congratulations on your purchase of the 4x4 Matrix for HDMI 1.3. 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 4x4 Matrix for HDMI 1.3**

The 4x4 Matrix for HDMI 1.3 routes high definition at resolutions up to 1080p with multichannel digital audio from any four HDMI sources to any four displays. The 4x4 Matrix eliminates the need to disconnect and reconnect HDMI sources. It works with any HDMI source that connects to an HDMI display, supporting advanced digital audio formats such as Dolby TrueHD and DTS-HD Master Audio. 3D content can be displayed when connecting a 3DTV and 3D source. Each source is accessible at all times by any display by selecting it with an IR remote, or using the RS-232 port to switch the unit.

## **How It Works**

Connect any four HDMI sources to the Matrix's HDMI inputs. Then connect four HDMI devices or displays to the Matrix's outputs. Once the sources, the Matrix and the displays are powered on and connected, select which sources you want to view on the displays using the IR remote or RS-232 connectivity.

## OPERATION NOTES

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### **READ THESE NOTES BEFORE INSTALLING OR OPERATING THE 4X4 MATRIX FOR HDMI 1.3**

- You should connect all the cables and power supply prior to connecting power to the HDMI sources and 4x4 Matrix for HDMI 1.3.
- When powering the sources, the display needs to point to the source input.
- 3D content can be displayed by connecting a 3DTV and 3D source.
- Display information (EDID) is needed by the source devices to determine the capabilities of the connected display. This is especially important for HDMI 1.3 sources because without the right information in the EDID none of the features for HDMI 1.3 will be enabled. The 4x4 Matrix for HDMI 1.3 features an EDID selection that will allow the user to choose from a external EDID from an attached display or a built-in internal EDID. Please see page 7 for more details.

# FEATURES

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## Supported HDMI 1.3 Features:

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

## Features:

- Route any of four (4) Hi-Def sources to any four (4) HDTV displays, independently.
- Supports resolutions up to 1080p, 1920x1200, and 2K
- 3DTV pass-through
- Color Space Conversion
- IR Remote Control
- RS-232 Control
- Supports DVI sources and DVI displays with an HDMI to DVI converter cable or adapter.
- Rack-mountable
- HDCP compliant

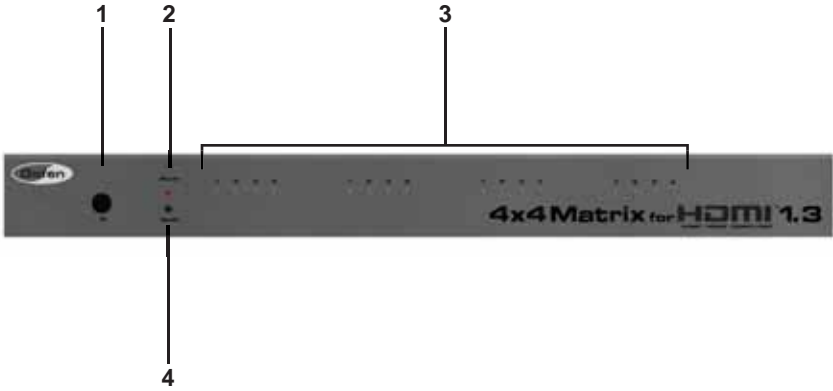
## Package Includes:

- (1) Gefen 4x4 Matrix for HDMI 1.3
- (4) 6 ft. HDMI cables (M-M)
- (1) IR Remote Control Unit
- (1) 5V DC Locking Power Supply
- (1) Set of Rack Ears
- (1) User Manual

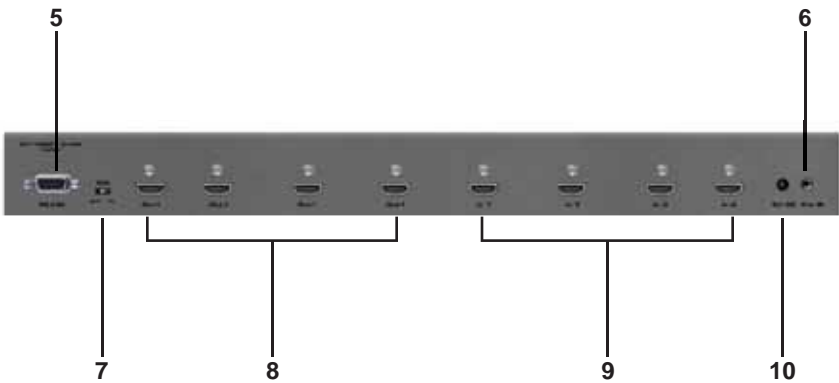
# PANEL LAYOUT

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## Front Panel



## Back Panel



## PANEL DESCRIPTIONS

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### **1 *IR (Infrared) Receiver***

This receiver will accept command for switching between HDMI input devices using the included RMT-16IR remote control.

### **2 *Power LED Indicator***

This LED will become active once the included 5V DC power supply is properly connected between the unit and a open wall power receptacle.

### **3 *Display 1-4 Selected Input LED Indicator***

There is a set of 4 LEDs for each of the four output ports. Each of the four LED output sets contain 4 individual LED's that will indicate which input source is active for that output. The currently selected input will be indicated by an active LED.

### **4 *Reset Button***

This button will reset the unit and force all devices in the chain to re-transmit/re-read EDID. It is essential that the unit be reset after the EDID mode has been changed (see page 7 for more details). This button is also used to configure the IR channel (see page 10 for more details).

### **5 *RS-232 Serial Communications Interface***

This input is provided for switching and advanced feature control via an external RS-232 device. Please see page 11 for more information.

### **6 *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.

### **7 *EDID Selection Toggle Button***

This button will toggle between the internal and external EDID modes.

### **8 *HDMI Output Ports 1-4***

Connect up to 4 HDMI capable devices to these HDMI output ports.

### **9 *HDMI Input Ports 1-4***

Connect up to 4 HDMI source devices to these HDMI input ports.

### **10 *5V DC Power Input Port***

Connect the included 5V DC power supply between this port and an open wall power receptacle.



# CONNECTING AND OPERATING THE 4X4 MATRIX FOR HDMI 1.3

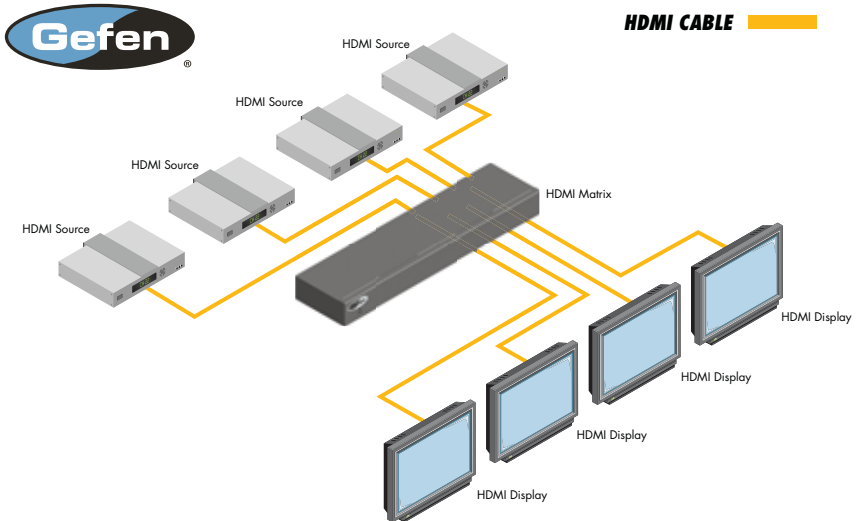
## How to Connect the 4x4 Matrix for HDMI 1.3

1. Connect up to 4 HDMI source devices to the 4x4 Matrix for HDMI 1.3 using the included HDMI cables.

**NOTE:** The display connected to the port labeled OUT 1 will have its EDID used when the external EDID mode is active. If there are displays with different resolutions in the setup it is recommended that the display with the lowest resolution be placed on the HDMI port labeled OUT 1. This way, all of the displays should be able to display an image when the external EDID mode is active.

2. Connect up to 4 HDMI capable devices (i.e. displays) to the 4x4 Matrix for HDMI 1.3 using user supplied HDMI cables.
3. Connect the included 5V DC power supply between the power input on the unit and an open wall power socket.
4. Power on all output devices (i.e. displays) first and the source devices second.

## Wiring Diagram for the 4x4 Matrix for HDMI 1.3



**EXT-HDMI1.3-444**

## EDID MODES

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

Under normal circumstances, an 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 4x4 Matrix for HDMI 1.3?**

The 4x4 Matrix for HDMI 1.3 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 4x4 Matrix for HDMI 1.3 to provide a single EDID for each source to read.

### **What options do I have to manage the EDID in the 4x4 Matrix for HDMI 1.3?**

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 4x4 Matrix for HDMI 1.3, 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 switch on the rear panel of the unit, to change between a external EDID (provided by the display connected to HDMI output port labeled OUT 1) or a pre-programed internal EDID.

### **How do I change EDID modes in the 4x4 Matrix for HDMI 1.3?**

Simply change the switch on the back panel of the 4x4 Matrix for HDMI 1.3 to the desired EDID mode. The unit must be reset once the EDID mode has been changed. Please press the RESET button on the front panel once the EDID mode has changed.

## RMT-16IR REMOTE DESCRIPTION

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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. Please use the information below when selecting the desired source for each display.

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

## 4X4 MATRIX FOR HDMI 1.3 REMOTE INSTALLATION

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### Installing the IR Remote Control Battery

1. Remove the battery cover on the back of the IR Remote Control unit.
2. Insert the included battery into the open battery slot. The positive (+) side of the battery should be facing up.
3. Replace the battery cover.

The Remote Control unit ships with two batteries. One battery is required for operation and the other battery is a spare.

## RMT-16IR Rear Panel

Battery Chamber



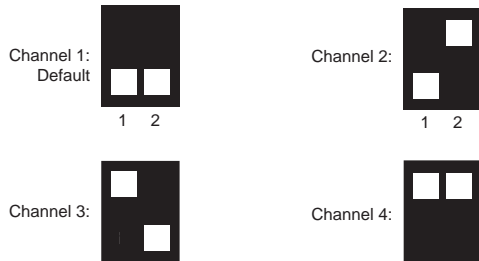
DIP Switches

# IR CHANNEL CONFIGURATION

## How to Resolve IR Code Conflicts

In the event that IR commands from other remote controls conflict with the supplied RMT-16IR remote control, changing the remote channel will alleviate this issue. The RMT-16IR remote control has a bank of DIP switches for configuring the remote channel that both units use to communicate. The 4x4 Matrix for HDMI 1.3 can be put into a mode that will use its front LED array to indicate which remote channel is being used and also give the user the ability to modify the currently used IR remote channel. These IR channel settings must exactly match each other for proper operation.

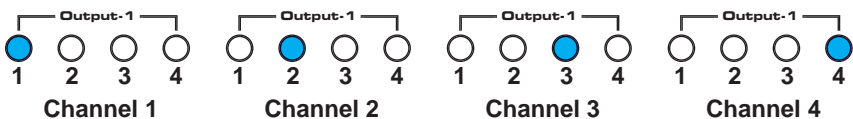
The DIP Switch bank on the RMT-16IR is located underneath the battery cover.



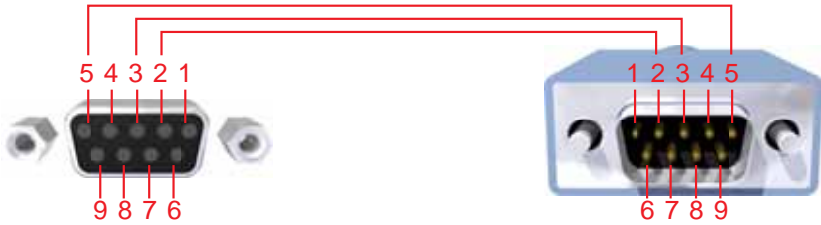
**Left:** Picture of the opened rear battery compartment of the RMT-16IR remote showing the exposed DIP Switch bank between the battery chambers.

Follow these steps to place the 4x4 Matrix for HDMI 1.3 into IR channel setup mode.

1. Remove the power cable from the rear side of the 4x4 Matrix for HDMI 1.3
2. Press and hold the front panel RESET button while re-inserting the power cable to enter the setup mode. All output LED banks will be active except for Output 1 which will display the currently selected IR channel.
3. Note the IR channel used on the RMT-16IR remote and press the RESET button to cycle to the IR channel that matches.
4. Reset the unit by removing and re-inserting the power cable from the rear panel. Changes will be active when this is complete.



# RS-232 SERIAL COMMUNICATION CONTROL



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

### 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 Features

ASCII	Command
X or x	Power Off
Y or y	Power On

### RS232 Settings

Bits per second ..... 19200

Data bits ..... 8

Parity ..... None

Stop bits ..... 1

Flow Control ..... None

## SPECIFICATIONS

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Video Amplifier Bandwidth .....	225 MHz
Input Video Signal .....	1.2 V p-p
Input DDC Signal .....	5 V 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 .....	5V DC
Power Consumption .....	16.5 W (max.)
Dimensions .....	17" W x 1.75" H x 5.875" D
Shipping Weight .....	10 lbs.

## WARRANTY

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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>**





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This product uses UL listed power supplies.