Gefen

4x4 Matrix for HDMI 1.3

EXT-HDMI1.3-444

User Manual

www.gefen.com

1080P PROGRESSIVE   HDMI HIGH-DEFINITION MULTIMEDIA INTERFACE   HDTV   Blu-ray Disc™

ASKING FOR ASSISTANCE

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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 video in multiple resolutions up to 1080p with multichannel digital audio from any of the four HDMI™ 1.3 sources to four HDMI 1.3 capable devices or displays. Any four to any four matrix switching allows for maximum versatility for integrated systems. The 4x4 Matrix for HDMI 1.3 eliminates the need to disconnect and reconnect sources to a display equipped with one input. It works with any source that connects to an HDMI display with up to 1080p full HD switching and support for new audio formats such as Dolby True HD and DTS HD Master audio. Each source is accessible at all times by any display by selecting it with an IR remote, or using the RS232 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 RS232 connectivity.

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.

- The 4x4 Matrix for HDMI 1.3 is housed in a metal box for better RF shielding.

- The 4x4 Matrix for HDMI 1.3 works with all DVI and HDMI displays.

- The 4x4 Matrix for HDMI 1.3 supports both AUDIO and VIDEO signals.

- The 4x4 Matrix for HDMI 1.3 is fully HDCP compliant.

- The 4x4 Matrix for HDMI 1.3 is HDMI 1.3 compliant. Please see page 3 for a listing of supported HDMI 1.3 features.

- 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

- Switch easily between any four HDMI 1.3 sources

- Distributes any of the four inputs to any or any combination of the four HDMI output displays

- Maintains high resolution video - beautiful, sharp HDTV resolutions up to 1080p, 2k, and computer resolutions up to 1920 x 1200 are easily achieved

- Discrete IR remote (included)

- Serial RS-232 remote port

- Rack ears included

- HDMI and HDCP compliant

HDMI 1.3 Features
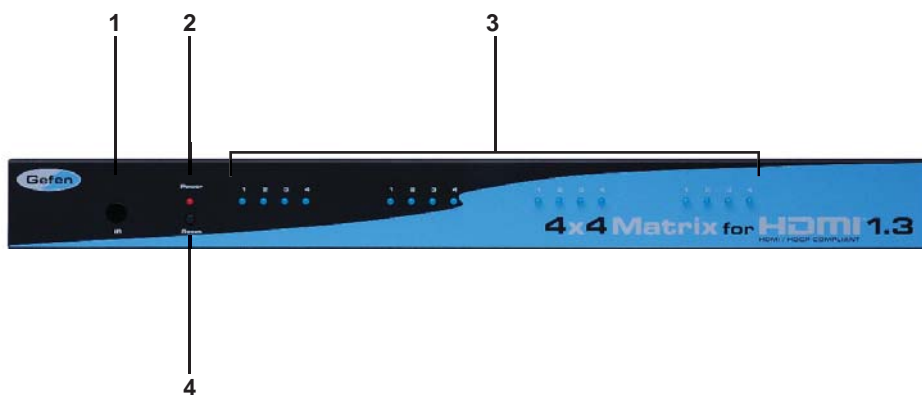
- Dolby TrueHD & DTS-HD Master Audio

- Deep Color (XV Color)

- 225 MHz (up to 12 bit YUV 444 @ 1080p)

- Lip-Sync Pass Through

- Color Space Conversion

- CEC Pass Through

Package Includes

(1) 4x4 Matrix for HDMI 1.3
(4) 6-Foot HDMI locking cables (M-M)
(1) 24V DC Locking Power Supply
(1) RMT-16IR Remote Control
(1) Set of Rack Ears
(1) User's Manual

Front Panel

Back Panel

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 form the IR remote control.

7   **EDID Selection Toggle Button**
    This button will toggle between the internal external EDID modes. To determine which mode is currently being used, please note which EDID mode LED is active on the front panel of the unit.

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.

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.

How to Operate the 4x4 Matrix for HDMI 1.3

The 4x4 Matrix for HDMI 1.3 can be controlled by either the included RMT16-IR remote control or through the RS-232 serial communications port.

EDID MODES

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 an 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.

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

1. Remove battery cover from the back of the RMT-16-IR remote.

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

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

4. Test the RMT-16-IR remote by pressing ONLY one button at a time. The indicator light on the remote will flash once each time you press a button.

WARNING: Do not press multiple buttons simultaneously and do NOT press buttons rapidly. These actions will cause the remote to reset and steps 1-4 will have to be repeated.

NOTE: The RMT-16-IR ships with two batteries. One battery is required for operation, the second battery is complimentary.

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 (Dual Inline Package) 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 uses 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.

Channel 1:
Default

1   2

Channel 2:

1   2

Channel 3:

1   2

Channel 4:

1   2
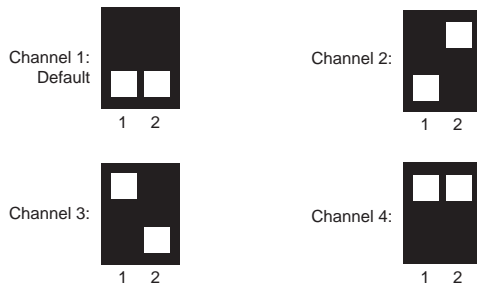
Left: Picture of the opened rear battery compartment of the RMT-16IR remote showing the exposed DIP Switch bank between the battery chambers.

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.

Output-1				Output-1				Output-1				Output-1			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Channel 1				Channel 2				Channel 3				Channel 4			
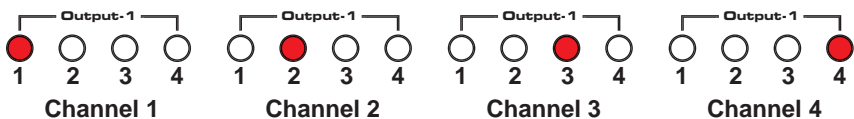
Only Pins 2 (RX), 3 (TX), and 5 (Ground) are used on the RS-232 serial interface

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

Video Amplifier Bandwidth .... 225 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 Consumption .... 60 Watts (max)

Power Supply .... 24V DC

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

Shipping Weight .... 10 lbs.