



# Four Sources to Four Displays. Independently.



EXT-DVI-444N

## Switches four DVI computers to any four DVI displays

Now you can easily combine four cross-platform computers and four digital displays without networking. Our 4x4 DVI Matrix provides a simple, reliable and highly effective method of creating multiple computer workstations, with each workstation capable of accessing any one of the computers or sources DVI output at any time by remote control. You also have the option of setting up the four stations locally or extending them with a Gefen extender.

### Features:

- Increases your productivity by providing you with access to four computers from four workstations
- Maintains highest resolution digital video with no loss of quality
- Discrete IR Remote (included)
- Supports resolutions up to 1080p, 2K, and 1920 x 1200
- Supports DDWG standards for DVI monitors
- Includes rack ears

## How it works

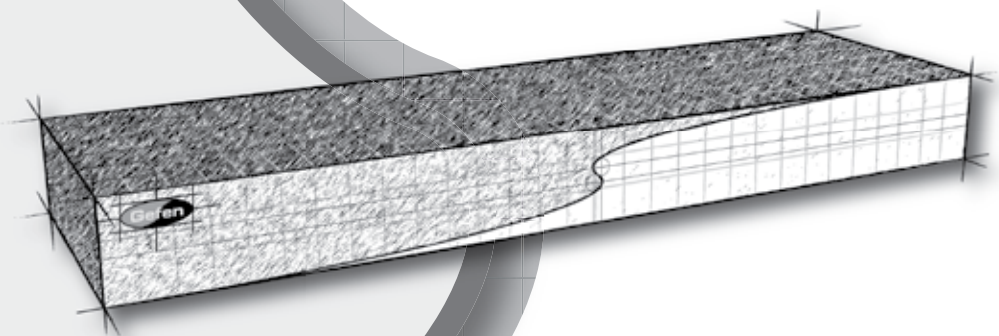
The 4x4 Matrix Switcher has four DVI inputs and four DVI outputs. Simply connect the four computers' DVI ports to the Switcher's inputs, then connect the four DVI displays to the Switcher's outputs.

### Specifications:

- Video Amplifier Bandwidth: 165 MHz
- Input Video Signal: 1.2 Volts p-p
- Input DDC Signal: 5 EXT-DVI-444Nolts p-p (TTL)
- Single Link Range: 1080p/1920 x 1200
- DVI Connector: DVI 29 Pin Female (digital only)
- Power Supply: 24V DC
- Power Consumption: 60 Watts (max)
- Dimensions: 17"W x 1.75"H x 5.875"D
- Rackmountable: 1U rack space
- Shipping Weight: 10 lbs.

# Gefen

## 4x4 DVI Matrix USER MANUAL



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

## ASKING FOR ASSISTANCE

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### Technical Support:

Telephone (818) 772-9100  
(800) 545-6900

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### Technical Support Hours:

8:00 AM to 5:00 PM Monday thru Friday.

### Write To:

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### Notice

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

**The 4x4 DVI Matrix** is a trademark of Gefen Inc.

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## INTRODUCTION

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Thank you for purchasing the 4x4 DVI Matrix.

The 4x4 DVI Matrix switches four DVI sources to any four DVI displays.

The 4x4 DVI Matrix switcher has four DVI inputs and four DVI outputs. Matrix input #1 and the DVI port of DVI source #1 connects using a male to male DVI cable. The DVI port of DVI source #2 connects to DVI input #2. The DVI port of DVI source #3 connects to DVI input #3. The DVI port of DVI source #4 connects to DVI input #4. There are four (4) DVI outputs connecting to four (4) different displays.

Note: The switching is done by using either the RMT-16-IR remote control or through the RS232 port. The 4x4 DVI Matrix is rack mountable.

## OPERATION NOTES

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### READ THESE NOTES BEFORE INSTALLING OR OPERATING THE 4X4 DVI MATRIX

- The 4x4 DVI Matrix is housed in a metal box for better RF shielding.
- The 4x4 DVI Matrix works with all DVI and HDMI displays.
- The 4x4 DVI Matrix supports VIDEO signals only.

***NOTE: The 4x4 DVI Matrix is not HDCP compliant.***

# FEATURES

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## Features

- Allows any DVI display to view any source at any time
- Allows any source to be displayed on multiple displays at the same time
- Maintains resolutions up to 1080p, 2K, and 1920x1200
- Maintains highest DVI single link video resolution
- DVI or HDMI to DVI cables are used to connect the inputs and outputs of the matrix
- Each display's inputs can be switched with the IR remote control or through RS232

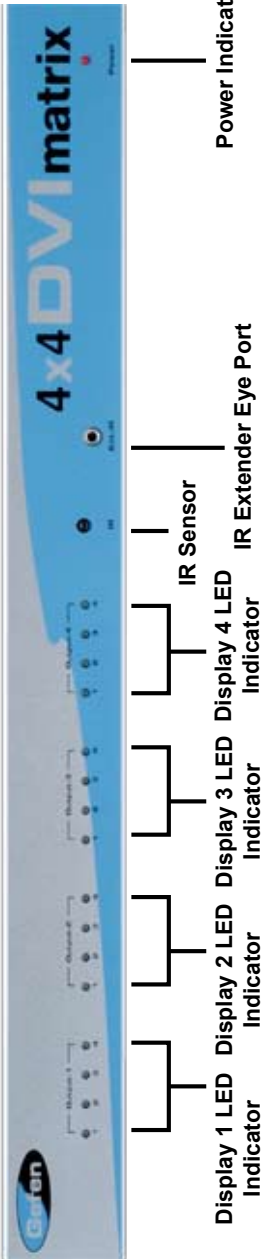
## Includes:

- (1) 4x4 DVI Matrix
- (4) DVI 6ft Male to Male Cables
- (1) 5VDC Power Supply
- (1) User Manual
- (1) RMT-16IR Remote Control
- (1) Rack Ears

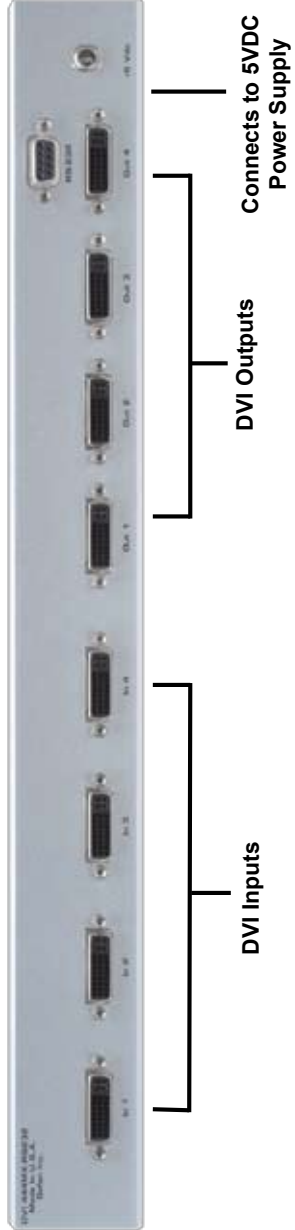


# PANEL LAYOUT

## Front Panel



## Back Panel



## USING THE 4X4 DVI MATRIX

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- 1 Connect all the sources to the DVI inputs on the 4x4 DVI Matrix, using the supplied cables.
- 2 Connect the HDMI/DVI displays to the outputs on the 4x4 DVI Matrix.
- 3 Connect the power supply to the 4x4 DVI Matrix
- 4 Controlling the 4x4 DVI Matrix using the RMT16-IR:

Pressing Buttons...	Switches...
1-4	Display 1 to view Source 1, 2, 3, or 4
5-8	Display 2 to view Source 1, 2, 3, or 4
9-12	Display 3 to view Source 1, 2, 3, or 4
13-16	Display 4 to view Source 1, 2, 3, or 4

**\*Note for computers connected to the DVI Matrix** - When your computer boots up, it looks for an EDID (extended display identification data) from the display to tell it what monitor is connected and what resolution to output. During boot up of the computer you should have ONLY one output selected to one input at a time so that the computer gets the EDID of the display that is selected. If you have multiple outputs selected to one computer, the computer will read the EDID of the last output selected to it. If all your displays are the same, or all displays are capable of running at the same resolution then this step does not matter.

You can also use a DVI Detective to eliminate the need to have that matrix selected to the computer during bootup.



## RMT16-IR Installation

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1. Remove battery cover from the back of the RMT16-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 RMT16-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 RMT16-IR ships with two batteries. One battery is required for operation, the second battery is complimentary.



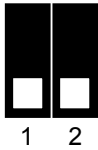
## IR CODES

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In the event of IR conflicts, please do the following:

1. Remove the battery cover from the back of the RMT16-IR remote.
2. Locate the Dip Switches above the batteries
3. Switch the Dip Switches on the RMT16-IR to any of the combinations pictured below.
4. Dip Switches 1 and 2 in the RMT16-IR correspond with Dip Switches 1 and 2 inside the 4x4 DVI Matrix respectively. Switch the switches inside the 4x4 DVI Matrix to match the same Remote Channel as the RMT16-IR. The 4x4 DVI Matrix is now set to a new IR Code.

Remote Channel 0:



Remote Channel 1:



Remote Channel 2:



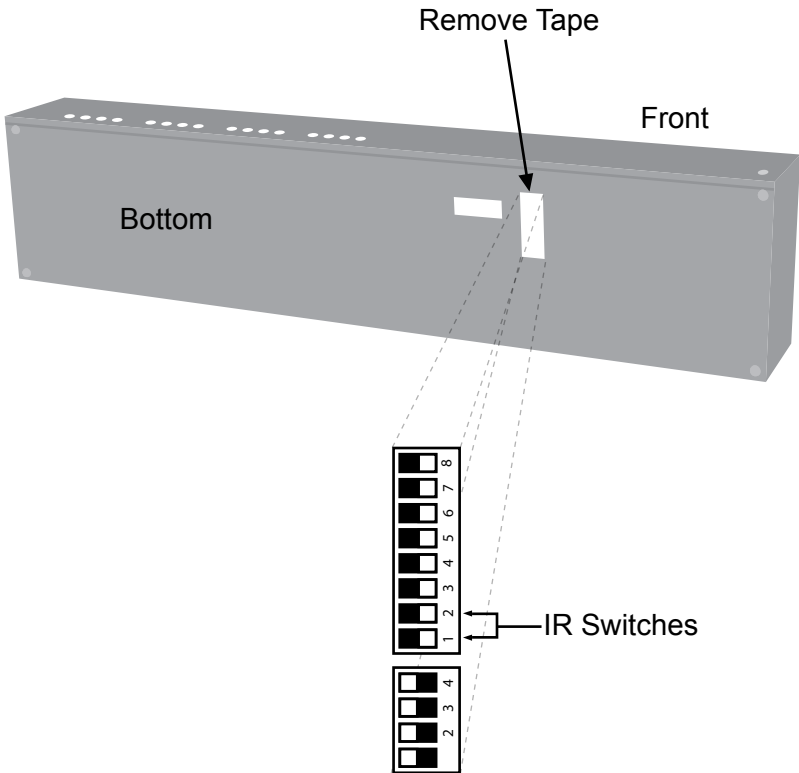
Remote Channel 3:



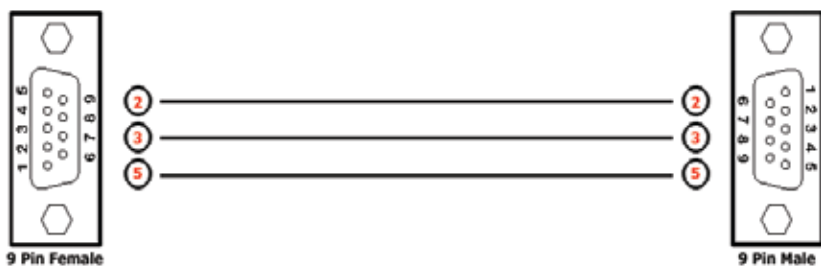
## DIP SWITCH GUIDELINES

Underneath the 4x4 DVI Matrix are two banks of Dip Switches. Below is a table describing their functions. By default, the Bank of 8 switches are set of to the Off position and the other bank of 4 switches are set to ON. The bank of 4 dip switches are service switches and should not be changed from their ON position.

Dip Switch#	Name	Description
1	IR Code Dip Switch	Corresponds to Dip Switch 1 on RMT-16-IR
2	IR Code Dip Switch	Corresponds to Dip Switch 2 on RMT-16-IR
3	Unused	Unused
4	Unused	Unused
5	Unused	Unused
6	Unused	Unused
7	Unused	Unused
8	Unused	Unused



# RS-232 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

## RS232 Settings

Bits per second ..... 19200

Data bits ..... 8

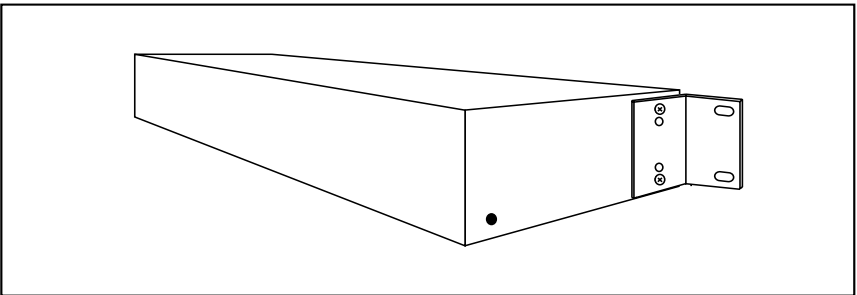
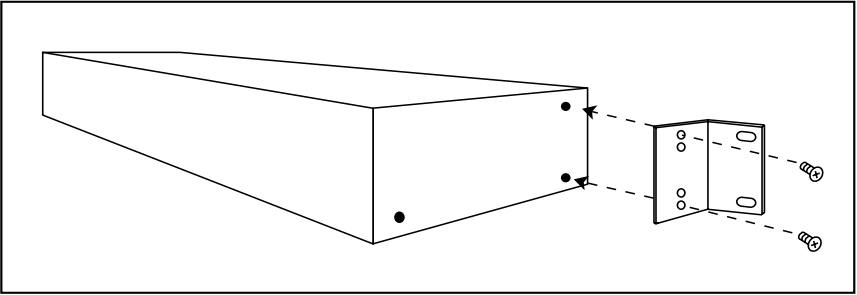
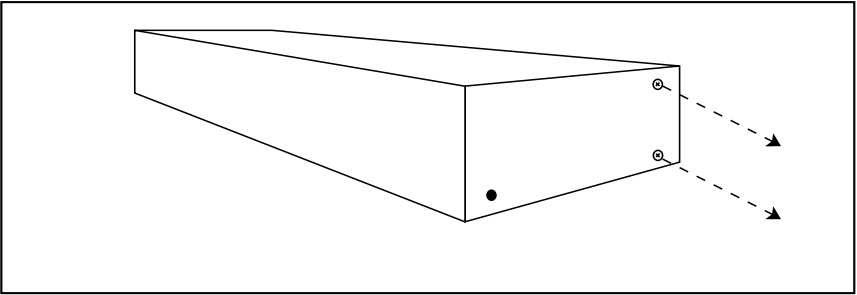
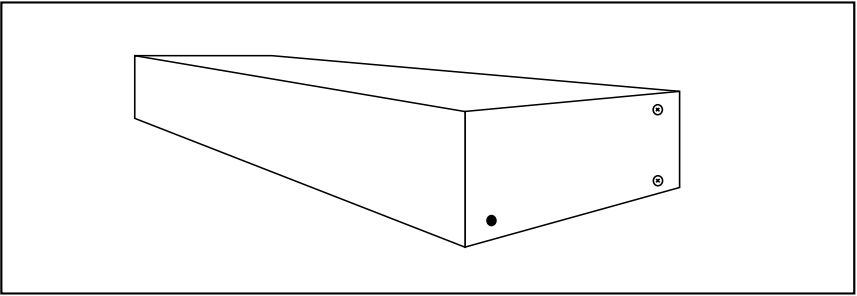
Parity ..... None

Stop bits ..... 1

Flow Control ..... None

# 4x4 DVI MATRIX RACK MOUNT DIAGRAM

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## SPECIFICATIONS

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Video Amplifier Bandwidth .....	1.65 Gbps
Input Video Signal .....	1.2 volts p-p
Input DDC Signal .....	5 volts p-p (TTL)
DVI Connector.....	DVI-I 29 pin female (digital only)
Single Link Range .....	1080p / 1920 x 1200
Remote Control Port .....	RS-232 Female, Mini-Stereo
Power Consumption .....	30 watts (max)
Power Supply .....	5V DC
Dimensions .....	17" W x 1.75" H x 5.875" D
Shipping Weight .....	10 lbs.

# TROUBLESHOOTING

If there is any video noise that appears on your output displays, you can resolve them by using the methods described in this section.

## AUTO EQUALIZATION

Auto equalization is set to ON by default, but in some cases you may have to manually equalize the incoming source signal to eliminate video noise that occurs. Since the equalization is used only on the incoming source signal, manual adjustment of equalization should only be used when the video noise is coming through on a particular incoming source. This is easy to test, as all displays that access this source will exhibit the same type of noise, while other sources will not. Typical video noise can be described as "snow" or brightly colored pixels that are sometimes referred to as "sparkles".

To switch auto equalization off, look on the underside of the 4x4 Matrix and locate the 2 banks of dip switches. They will be covered by some metallic tape that normally conceals their location. There is a bank of 8 dip switches with a bank of 4 dip switches right below it. By default, the bank of 8 dip switches will all be set in the OFF position while the bank of 4 dip switches, which are for auto equalization, will be set to ON. First, determine which display output port is exhibiting the image issue and turn OFF the corresponding auto equalization dip switch using the guide below. Then locate the corresponding equalization trim pot (Located on the diagram on the next page) on the underside of the 4x4 Matrix and turn it in small increments in either a clockwise or counter-clockwise motion until the image clears and no longer exhibits any noise.

## PRE-EMPHASIS

If your input source signals are displaying fine, whether it is using auto or manual equalization, but you're experiencing issues with particular displays, your cable run may be too long and a pre-emphasis can be added to account for the distance that the signal will have to travel. To do this, first determine which display output port is exhibiting this issue, and using the dip switch guideline below, turn on pre-emphasis for that particular port.

Using both of these techniques, individually or in conjunction, will help you tune in your signal to get the best possible image quality out of your Gefen 4x4 DVI KVM Matrix.

### 8 Dip Switch Bank (Pre-emphasis)

Dip Switch #	Name	Description
1	IR Code Dip Switch	Corresponds to Dip Switch 1 on RMT16-IR
2	IR Code Dip Switch	Corresponds to Dip Switch 2 on RMT16-IR
3	Unused	Unused
4	Unused	Unused
5	Output 4 pre-emphasis	Output 4 pre-emphasis
6	Output 3 pre-emphasis	Output 3 pre-emphasis
7	Output 2 pre-emphasis	Output 2 pre-emphasis
8	Output 1 pre-emphasis	Output 1 pre-emphasis

### 4 Dip Switch Bank (Auto-Equalization)

Dip Switch #	Name	Description
1	Auto EQ for Display 1	Auto/Manual Equalization for display 1
2	Auto EQ for Display 2	Auto/Manual Equalization for display 2
3	Auto EQ for Display 3	Auto/Manual Equalization for display 3
4	Auto EQ for Display 4	Auto/Manual Equalization for display 4

# TROUBLESHOOTING - DIAGRAM

