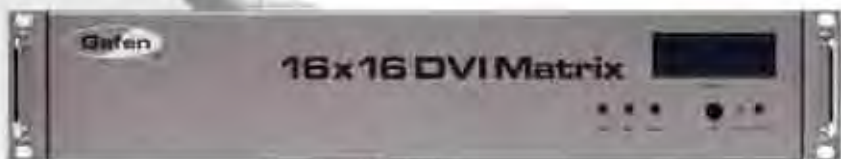




16x16 DVI Matrix

EXT-DVI-16416
User Manual



1080P
PROGRESSIVE



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INTRODUCTION

Congratulations on your purchase of the 16x16 DVI Matrix. Your complete satisfaction is very important to us.

Gefen

Gefen delivers innovative computer and electronic 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 16x16 DVI Matrix

Simplify the process of routing multiple DVI sources giving the ability to route sources without losing quality or resolution. Route 16 sources to 16 digital monitors using the Gefen 16x16 DVI Matrix. The Matrix provides a simple, reliable, and highly effective method of streamlining any installation using multiple sources and outputs. It takes the hassle out of multiple wiring schemes. Four methods are available for controlling the Gefen 16x16 DVI Matrix: Front panel buttons, IR remote, RS-232 interface, or using IP control.

How It Works

The 16x16 DVI Matrix has sixteen DVI inputs and sixteen DVI outputs. Connect your sixteen computers to the DVI input ports on the Matrix's input side. Connect the Matrix's sixteen DVI outputs to the displays. Connect the power supply to the Matrix and connect the power cord to an available wall outlet. The connected displays will show video according to the selection.

NOTE: This device only supports DVI-D.

OPERATION NOTES

READ THESE NOTES BEFORE INSTALLING OR OPERATING THE 16X16 DVI MATRIX

- The 16x16 DVI Matrix does not support HDCP content.
- Make sure that a DVI monitor is powered and connected to one of the DVI outputs on the 16x16 DVI Matrix before applying power. By default, the Local EDID is read from the connected monitor and is copied to all 16 DVI inputs once the Matrix has been turned on. If a monitor is not detected by the Matrix at power-on, a default (internal) EDID of 640x480 will be used. This functionality can be disabled using the Secure Local EDID function using RS-232 or IP control.
- There is no internal scaling in the 16x16 DVI Matrix. Each monitor attached to the Matrix must be able to display the resolutions output by the source device(s). For maximum compatibility it is recommended that only one common resolution be used by each source device.
- Advanced EDID features and IP configuration features are accessible through the RS-232 serial command set.
- Routing and EDID features can be managed using the built-in IP control feature.
- This matrix supports Dynamic EDID. See pages 16 and 40 for details.

FEATURES

Features

- Supports resolutions up to 1920 x 1200
- Status LCD (shows routing status)
- Advanced EDID management provides rapid integration of sources and displays
- Dynamic EDID support
- Serial RS-232 interface for remote control via a computer or control automation devices
- IP Control
- Output masking command
- IR Remote Control
- IR Extender
- Standby mode
- Supports DDWG standards for DVI
- Rack-mountable

Package Includes

- (1) 16x16 DVI Matrix
- (16) 6 ft. DVI cables (M-M)
- (1) IR Remote Control Unit
- (1) AC Power Cord
- (1) Quick Start Guide

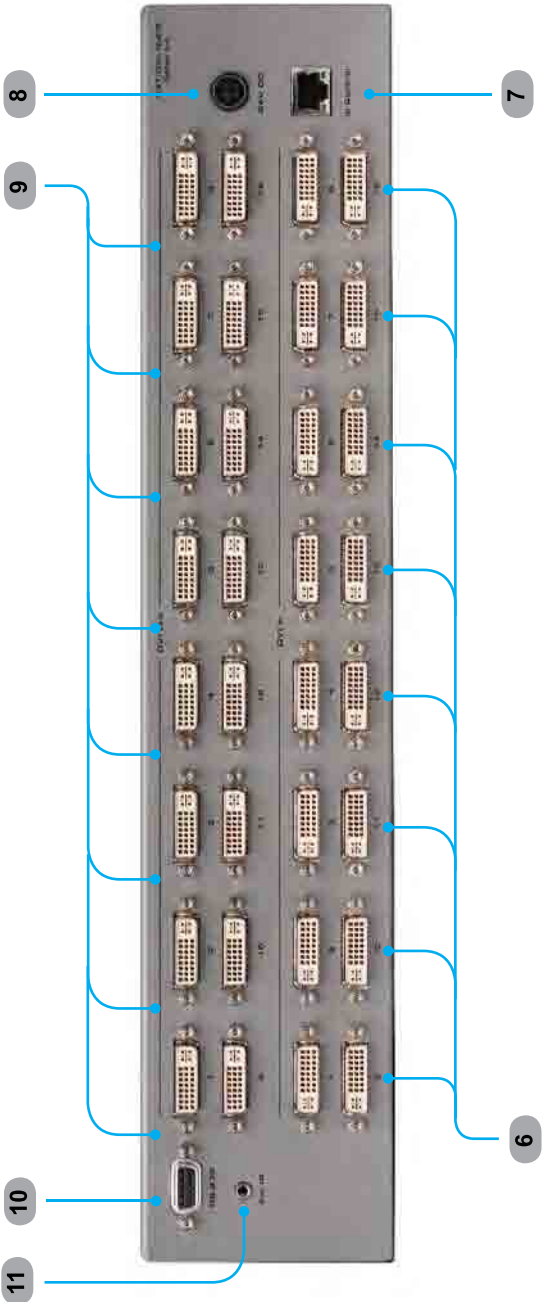
PANEL LAYOUT

Front Panel



PANEL LAYOUT

Back Panel



PANEL DESCRIPTIONS

1 Control Buttons

These buttons are used to navigate the functions of the 16x16 DVI Matrix. For complete details on these controls and how they are used, please see pages 10 - 13.

2 Infrared (IR) Receiver

This IR receiver will accept commands from the RMT-16416IR remote control. Line-of-sight between this receiver and the remote controls needs to be preserved for proper operation.

3 Power LED Indicator

This LED indicator will be active when the included 24V DC power supply is properly connected to the unit.

4 Cancel Button

This button is used to return the user to the main status screen once a routing change has been initiated and the user decides to not continue with the change.

5 Main LCD Display

This 2 line 16 character display will display status information and is also used to manage the display/source routes.

6 DVI Input Ports 1-16

These inputs are used to connect up to 16 DVI-capable sources.

7 10/100 Ethernet Control Interface

This port is used to connect the 16x16 DVI Matrix to a network for IP control. Please see page 38 for more information.

8 24V DC Power Receptacle

The port will accept power from the included 24V DC power supply.

9 DVI Output Ports 1-16

These outputs are used to connect up to 16 DVI-capable displays.

10 RS-232 Serial Communications Interface

This interface was designed to accept commands from an external control system. This port will allow switching commands as well as EDID management and configuration operations. Please see page 15 for more information.

11 IR Extender Jack

Accepts an optional IR Extender which allows relocation of the IR receiver up to 6 feet away from the Matrix.

IR REMOTE CONTROL

RMT-16416IR Layout and Description



1 **Activity Indicator**

This LED will be activated momentarily each time a button is pressed.

2 **Display and Source Selection Buttons (1 - 16)**

These buttons are used to select which source is routed to a monitor.



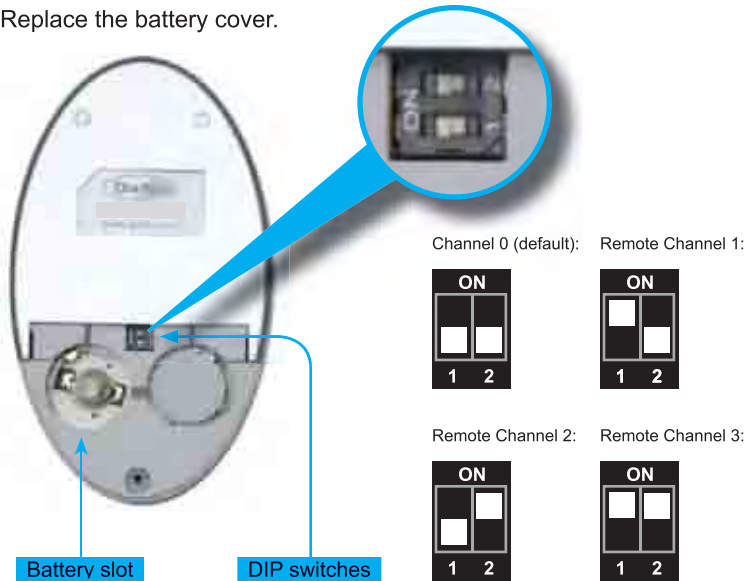
NOTE: An Activity Indicator that flashes quickly while holding down any one of the 16 buttons indicates a low battery. Replace the IR Remote Control battery as soon as possible.

IR REMOTE CONTROL

Installing the Battery

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

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.



Setting the IR Channel

The IR channel on the IR Remote Control must match the IR channel used by the *DVI 16x16 Matrix*. For example, if both DIP switches on the IR Remote Control unit are set to IR channel 0 (both DIP switches down), then the 16x16 DVI Matrix must also be set to IR channel 0. See page 35 for information on how to change the IR channel on the *DVI 16x16 Matrix*.



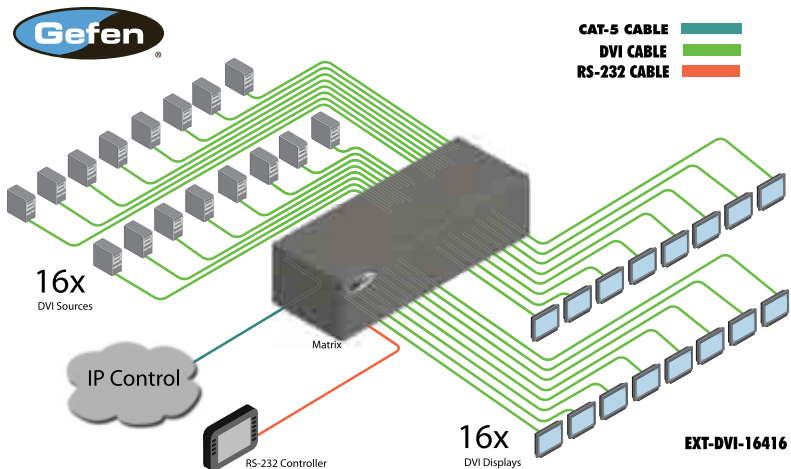
WARNING: Risk of explosion if battery is replaced by an incorrect type. Dispose of used batteries according to the instructions.

CONNECTING THE 16X16 DVI MATRIX

How to Connect the 16x16 DVI Matrix

1. Connect up to 16 DVI source devices to the DVI inputs on the rear panel of the 16x16 DVI Matrix using the supplied DVI cables.
2. Connect up to 16 DVI monitors to the DVI outputs on the rear panel of the 16x16 DVI Matrix with DVI cables.
3. Connect the included AC power cable to the power receptacle on the rear panel of the 16x16 DVI Matrix. Connect the opposite end of the cable into an available electrical outlet.

Wiring Diagram for the 16x16 DVI Matrix



ATTENTION: This product should always be connected to a grounded electrical socket.

OPERATING THE 16X16 DVI MATRIX

Status Screen

The status screen is a 16-character 2-line LCD display. This display shows the current status of the matrix and is also used to perform routing and other functions. When the unit is powered on, the following screen is displayed:

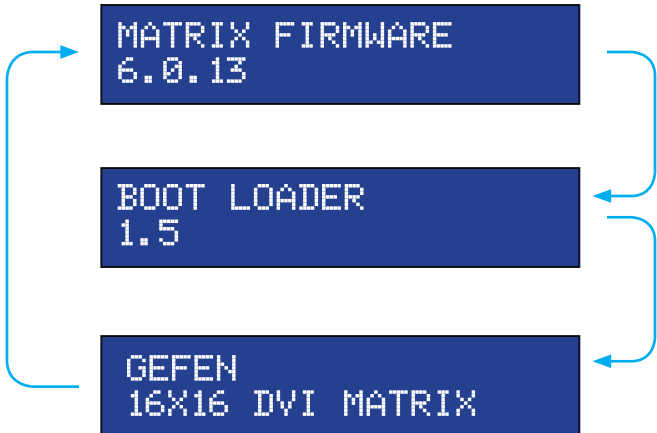


After a few moments, the following is displayed in the status screen:



Displaying Additional Information

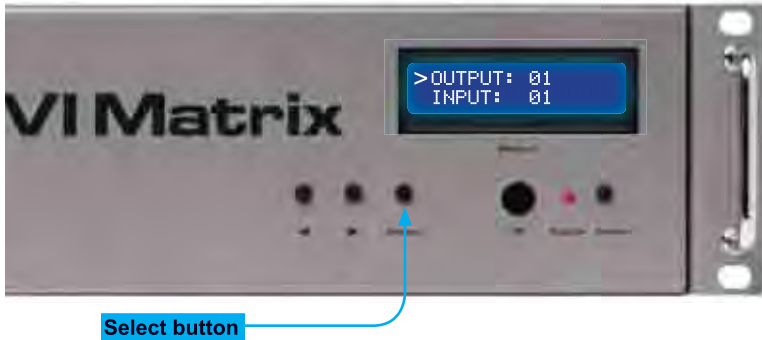
Pressing the ◀ button consecutively, will cycle through other screens such as firmware and boot loader version:



OPERATING THE 16X16 DVI MATRIX

Routing Sources

- 1 Press the Select button to display the routing screen.



- 2 Use the ◀ or ▶ buttons to select the display that will receive the source signal.
- 3 Press the Select button to confirm the output selection. Otherwise, press the Cancel button.



- 4 Use the ◀ or ▶ buttons to select the desired source to be routed to the display, which was selected in Step 2.
- 5 Press the Select button to confirm the output selection. Otherwise, press the Cancel button.
- 6 Press the Cancel button to return to the Standby screen.

OPERATING THE 16X16 DVI MATRIX

Entering Standby Mode

Entering Standby mode will place the matrix in a low power-consumption state.

1. Simultaneously press and hold the Select and Cancel buttons.



2. The matrix will power-down and go into standby mode.

When the matrix is in standby mode, the power indicator on the front-panel will flash bright red until standby mode is disabled.



OPERATING THE 16X16 DVI MATRIX

Exiting Standby Mode

1. Press and hold any button on the front panel until the front-panel LCD comes on.



2. Once the matrix turns on, release the button.

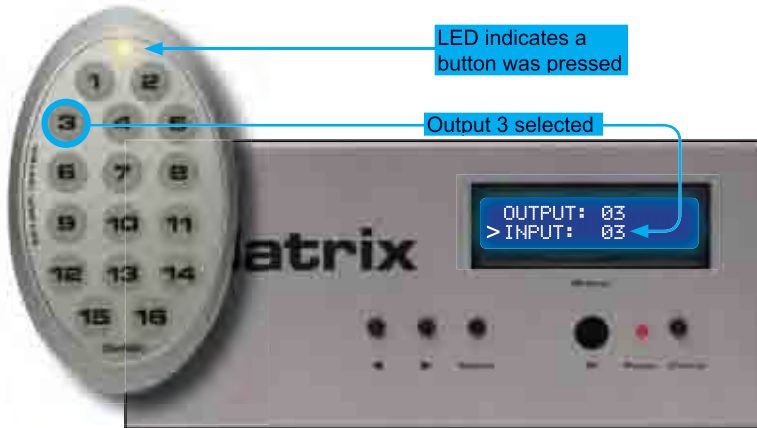
OPERATING THE 16X16 DVI MATRIX

Routing Sources using the IR Remote Control

To route sources using the IR Remote Control, select the output first, then the input.

Routing Example: Route Input 12 to Output 3

1. Select Output 3 by pressing button **3** on the IR Remote Control. Output 3 will be selected in the display. The cursor will appear next to the input, indicating that the next entry on the IR Remote Control will route the selected input.



2. Select Input 12 by pressing button **12** on the IR Remote Control. The number 12 will appear next to the input. The cursor will automatically advance to the output.



RS-232 SERIAL CONTROL



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

RS232 Settings

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



IMPORTANT: When sending RS-232 commands, a *carriage return* and a *line feed* character must be included at the end of each line. Telnet Commands, Device Names, and Command Names are all case-sensitive.

EDID Management

Command	Description
<code>#dynamic_edid</code>	Enables / disables dynamic EDID
<code>#edidbatolo</code>	Read downstream EDID and stores in any Local Input
<code>#ediddetolo</code>	Sets Local EDID to Default EDID
<code>#ediddstoba</code>	Read downstream EDID and stores in EDID Bank
<code>#ediddstolo</code>	Read downstream EDID and stores into a Local EDID
<code>#lock_edid</code>	Secures Local EDID
<code>#prbaedid</code>	Read EDID from an EDID bank and sends to serial port
<code>#prdsedid</code>	Read downstream EDID and sends to serial port
<code>#predidst</code>	Prints EDID details
<code>#prloedid</code>	Read Input Local EDID and sends to serial port

#dynamic_edid Command

The `#dynamic_edid` command provides the ability to route any downstream EDID to any input. When enabled, the EDID is copied to all inputs from the last selected active output. When disabled, the EDID is copied to all inputs from the first active display detected, starting from Output 1.

Syntax:

```
#dynamic_edid param1
```

Parameters:

param1

Value

[0 - 1]

Value	Meaning
0	Disable
1	Enable

Default:

Disabled

#edidbatolo Command

The #edidbatolo command reads the downstream EDID and stores it to any local input.

Syntax:

```
#edidbatolo param1 param2 [param3...param9]
```

Parameters:

<i>param1</i>	EDID bank offset	[1 - 5]
<i>param2</i>	Input	[1 - 16]

Notes:

If *param2* = 0, then the EDID in the specified bank is copied to all eight inputs.

#ediddetolo Command

The #ediddetolo command stores the Default EDID (640x480) in the specified Local EDID inputs.

Syntax:

```
#ediddetolo param1 param2 param3...param9
```

<i>param1</i>	Input	[1 - 16]
---------------	-------	----------

Notes:

If *param1* = 0, then all 16 DVI inputs will be set to the Default EDID.

#ediddstoba Command

The #ediddstoba command reads the downstream EDID and stores it to a specified EDID bank.

Syntax:

```
#ediddstoba param1 param2
```

Parameters:

<i>param1</i>	A downstream monitor	[1 - 16]
<i>param2</i>	EDID bank offset	[1 - 5]

#ediddstolo Command

The #ediddstolo command reads the downstream EDID and stores it to a Local EDID input.

Syntax:

```
#ediddstolo param1 param2 [param3...param9]
```

Parameters:

<i>param1</i>	A downstream monitor	[1 - 16]
<i>param2</i>	Input list	[1 - 8]

Notes:

If *param2* = 0, then the downstream EDID is stored to all 16 DVI inputs. If more than eight inputs need to be specified in order to receive the downstream EDID, the #ediddstolo command must be executed twice.

Example:

```
#ediddstolo 2 1 2 3 4 5 6 7 8 9 10 11 (not permitted!)
```

Instead, run the function twice:

```
#ediddstolo 2 1 2 3 4 5 6 7 8 9
```

```
#ediddstolo 2 10 11
```

#lock_edid Command

The #lock_edid command secures the Local EDID and disables the automatic loading of the downstream EDID after the matrix is powered on.

Syntax:

```
#lock_edid param1
```

Parameters:

param1 Input [0 - 1]

Value	Meaning
0	Disable
1	Enable

#prbaedid Command

The #PRBAEDID command reads the EDID file from the specified bank and sends to serial port.

Syntax:

```
#PRBAEDID param1
```

Parameters:

param1 Input [1 - 5]

#prdsedid Command

The #prdsedid command reads the downstream EDID and sends it to the serial port.

Syntax:

```
#prdsedid param1
```

Parameters:

param1 A downstream monitor [1 - 16]

#predidst Command

The #predidst command reads the downstream EDID. This command displays a table containing details relating to the Local EDID and the monitor name.

Syntax:

```
#predidst
```

Parameters:

None

#prloedid Command

The #prloedid command reads the local EDID of a specified input and spools it to the serial port.

Syntax:

```
#prloedid param1
```

Parameters:

param1

A specified Input

[1 - 16]

IP / Telnet Configuration

Command	Description
<i>#display_telnet_welcome</i>	Set Telnet welcome message on login
<i>#ipconfig</i>	Displays all TCP/IP settings
<i>#resetip</i>	Resets IP configuration to factory settings
<i>#set_http_port</i>	Sets the Web server listening port
<i>#set_telnet_pass</i>	Prompts for password when using Telnet
<i>#set_telnet_port</i>	Sets the Telnet listening port
<i>#set_telnet_username</i>	Sets the user name for the login procedure
<i>#sgateway</i>	Sets the IP gateway address
<i>#show_telnet_pass</i>	Prompts for password when using Telnet
<i>#show_telnet_username</i>	Prompts for user name when using Telnet
<i>#show_ver_data</i>	Displays the hardware and firmware version of the matrix
<i>#sipadd</i>	Sets the IP address of the matrix
<i>#snetmask</i>	Sets the IP network mask
<i>#use_telnet_pass</i>	Use password during Telnet sessions

#display_telnet_welcome Command

The `#display_telnet_welcome` command sets (enables/disables) the Telnet welcome message on login.

Syntax:

```
#display_telnet_welcome param1
```

Parameters:

param1 State [0 - 1]

State	Meaning
0	Do not display welcome message
1	Display welcome message

#ipconfig Command

The #ipconfig command displays all TCP/IP settings on the matrix.

Syntax:

```
#ipconfig
```

Parameters:

None

Example:

```
#ipconfig

----- TCP/IP settings -----
MAC add   = 00:1C:91:01:50:07
IP add    = 192.168.1.72
Net Mask  = 255.255.255.0
Gateway   = 192.168.2.254
Web Server Port = 80
Telnet Server Port = 23
Telnet password at login is set to ON
Telnet welcome at login is set to ON
```

#resetip Command

The #resetip command resets all TCP/IP settings to factory defaults.

Syntax:

```
#resetip
```

Parameters:

None

Notes:

The matrix must be rebooted after executing this command.

#set_http_port Command

The #set_http_port command sets the Web server listening port.

Syntax:

```
#set_http_port param1
```

Parameters:

<i>param1</i>	Port	[0 - 65535]
---------------	------	-------------

Default:

80

Notes:

The matrix must be rebooted after executing this command.

#set_telnet_pass Command

The #set_telnet_pass command sets the Telnet password. The maximum length of the password is 20 characters. The password is case-sensitive.

Syntax:

```
#set_telnet_pass param1
```

Parameters:

<i>param1</i>	Password
---------------	----------

Default:

Admin

Notes:

The matrix must be rebooted after executing this command.

#set_telnet_port Command

The #set_telnet_port command sets the Telnet listening port. The default port value is 23.

Syntax:

```
#set_telnet_port param1
```

Parameters:

<i>param1</i>	Port	[0 - 65535]
---------------	------	-------------

Notes:

The matrix must be rebooted after executing this command.

#set_telnet_username Command

The #set_telnet_username command sets the Telnet user name. The maximum length of the user name is 20 characters. The user name is case-sensitive.

Syntax:

```
#set_telnet_username param1
```

Parameters:

<i>param1</i>	User name
---------------	-----------

Default:

Admin

Notes:

The matrix must be rebooted after executing this command.

#sgateway Command

The #sgateway sets the IP gateway (router) address. Dot-decimal notation must be used when specifying the IP address.

Syntax:

```
#sgateway param1
```

Parameters:

param1 IP gateway

Example:

```
#sgateway 192.168.1.1
```

Default:

```
192.168.1.254
```

Notes:

The matrix must be rebooted after executing this command.

#show_telnet_pass Command

The #show_telnet_pass command shows the Telnet password for login (if required).

Syntax:

```
#show_telnet_pass
```

Default:

```
Admin
```

#show_telnet_username Command

The #show_telnet_username command returns the user name required for login.

Syntax:

```
#show_telnet_username
```

Parameters:

None

Default:

Admin

#show_ver_data Command

The #show_ver_data command displays the hardware and firmware version of the matrix.

Syntax:

```
#show_ver_data
```

Parameters:

None

#sipadd Command

The #sipadd command sets the IP address of the matrix. Dot-decimal notation must be used when specifying the IP address.

Syntax:

```
#sipadd param1
```

Parameters:

param1 IP address

Example:

```
#sipadd 192.168.1.72
```

Notes:

The matrix must be rebooted after executing this command.

#snetmask Command

The #snetmask command sets the IP network mask. Dot-decimal notation must be used when specifying the IP network mask.

Syntax:

```
#snetmask param1
```

Parameters:

param1 Network mask

Default:

```
255.255.255.0
```

Notes:

The matrix must be rebooted after executing this command.

#use_telnet_pass Command

The #use_telnet_pass command requires or disables login credentials.

Syntax:

```
#use_telnet_pass param1
```

Parameters:

param1

State

[0 - 1]

Value	Meaning
0	Disable password
1	Enable (force) password

Default:

Disabled (no password required)

Routing

Command	Description
<code>#callpreset</code>	Recalls a routing / mask preset
<code>#savepreset</code>	Saves the current routing/masking state to a preset
<code>r</code>	Routes the specified inputs to the specified outputs
<code>s</code>	Routes the specified input to all outputs

#callpreset Command

The `#callpreset` command recalls a routing preset. Any masked outputs will also be recalled.

Syntax:

```
#callpreset param1
```

Parameters:

param1 Preset [1 - 16]

#savepreset Command

The `#savepreset` command saves the current routing state to the specified preset. Any masked outputs will also be saved as part of the current routing state.

Syntax:

```
#savepreset param1
```

Parameters:

param1 Preset [1 - 16]

r Command

The *r* command routes the specified input to the specified outputs. If *param2* is set to 0, then the specified input is routed to all outputs.

Syntax:

```
r param1 param2[...param17]
```

Parameters:

<i>param1</i>	Input	[1 - 16]
<i>param2</i>	Outputs	[1 - 16]

Examples:

```
r 7 3 4 5 6 10 12
```

Input 7 is routed to outputs: 3 4 5 6 10 12

```
r 2 0
```

All outputs are routed to Input 2

s Command

The *s* command routes the specified input to all outputs.

Syntax:

```
s param1
```

Parameters:

<i>param1</i>	Input	[1 - 16]
---------------	-------	----------

Example:

```
s 1
```

All outputs are routed to Input 1

Masking

Command	Description
<code>#maskout</code>	Masks the selected (video) output(s)
<code>#unmaskout</code>	Unmasks the selected output(s)

#maskout Command

The #maskout command allows blanking of the specified outputs.

Syntax:

```
#maskout param1 param2
```

Parameters:

<i>param1</i>	Output	[1 - 16]
<i>param2</i>	State	[0 - 1]

Value	Meaning
0	Unmask
1	Mask

Notes:

The current masking state will be lost if power is interrupted or if the masking state is not saved (see #savepreset on page 29).

#unmaskout Command

The #unmaskout command unmask the specified outputs. If *param1* is set to 0, then all outputs will be unmasked.

Syntax:

```
#unmaskout param1...param8
```

Parameters:

<i>param1</i>	Output	[1 - 16]
---------------	--------	----------

Examples:

```
#unmaskout 3 8 10
```

Activate outputs: 3 8 10

```
#unmaskout 0
```

Activate all outputs

Miscellaneous

Command	Description
<i>#fadefault</i>	Resets the matrix to factory default routing
<i>#help</i>	Displays all available commands
<i>#lock_fo</i>	Toggles the +5V lock power state
<i>#set_input_name</i>	Specifies a name for an input
<i>#set_ir</i>	Sets the IR channel of the matrix
<i>#set_output_name</i>	Specifies a name for an output
<i>#show_temp</i>	Displays the board temperatures
<i>#show_voltage</i>	Displays the board voltages
<i>f</i>	Toggles / displays +5V input

#fadefault Command

The *#fadefault* command disables the EDID lock state, sets the default routing state (1-1, 2-2, 3-3, etc.) and resets the input and output names to the default names (e.g. Output 1, Input 1).

Syntax:

#fadefault

Parameters:

None

#help Command

The #help command displays help on the specified command. If *param1* is not specified, then the full list of commands is displayed.

Syntax:

```
#help [param1]
```

Parameters:

param1 Command name

Example:

```
#help #callpreset
```

```
Cmd #callpreset: Recall a routing and mask state preset
```

```
Syntax: #callpreset param1
```

```
Param1 = 1-16 (preset)
```

```
e.g: #callpreset 2
```

#lock_fo Command

The #lock_fo enables/disables the power lock state. Enabling this feature will store the +5V status for each input prior to shutting down the matrix. This preserves the +5V state when the unit is restarted.

Syntax:

```
#lock_fo param1
```

Parameters:

param1 State [0 - 1]

Value	Meaning
0	Disable power lock
1	Enable power lock

#set_input_name Command

The #set_input_name command provides a name to the selected input. For example, "Input 1" could be renamed as "Computer 1". The maximum string length for *param2* is 15 characters. Special characters and spaces are not permitted. If required, use the underscore character ("_") to separate characters.

Syntax:

```
#set_input_name param1 param2
```

Parameters:

<i>param1</i>	Input	[1 - 16]
<i>param2</i>	Name	

Example:

```
#set_input_name 5 computer1  
computer1 is assigned to input 5
```

#set_ir Command

The #set_ir set the IR channel for the matrix. The associated DIP switch settings for the IR remote control unit are returned. See page 8 for details on setting the IR channel for the IR remote control.

Syntax:

```
#set_ir param1
```

Parameters:

<i>param1</i>	Channel	[0 - 3]
---------------	---------	---------

Example:

```
#set_ir 2  
RMT_IR - SW1=0,SW2=1
```

#set_output_name Command

The #set_output_name command provides a name to the selected output. For example, "Output 1" could be renamed as "HDDisplay". The maximum string length for *param2* is 15 characters. Special characters and spaces are not permitted. If required, use the underscore character ("_") to separate characters.

Syntax:

```
#set_output_name param1 param2
```

Parameters:

<i>param1</i>	Output	[1 - 16]
<i>param2</i>	Name	

Example:

```
#set_output_name 3 display_3  
display_3 is assigned to output 3
```

#show_temp Command

The #show_temp command displays the board temperatures to the screen.

Syntax:

```
#show_temp
```

Parameters:

None

Example:

```
#show_temp  
Temperature near cross point top side is 53  
Temperature near power supply is 54 C degree\nTemperature near cross point bottom side is 46 C degree  
Temperature on input board is 47 C degree
```

#show_voltage Command

The #show_voltage command displays board voltages to the screen.

Syntax:

```
#show_voltage
```

Parameters:

None

Example:

```
#show_voltage
Analog voltage 3.3, measured 3265 mV
Analog voltage 1.8, measured 1781 mV
Analog voltage 1.2, measured 1180 mV
```

f Command

The f command returns the state of pin 14 on the DVI input.

Syntax:

```
f param1 param2
```

Parameters:

<i>param1</i>	Input	[1 - 16]
<i>param2</i>	State	[0 - 1]

Configuring the IP Address

The 16x16 DVI Matrix supports IP-based control using a built-in Web server or via Telnet. Before using the built-in Web server or Telnet control, the network settings for the 16x16 DVI Matrix must be configured via RS-232. The default network settings for the matrix are as follows:

IP Address: 192.168.1.72
Subnet: 255.255.255.0
Gateway: 192.168.2.254
Port: 80

To access the 16x16 DVI Matrix, make sure that the computer and the matrix are within the same subnet. Otherwise use the following procedure to change the address to match your network:

1. Connect an RS-232 cable from the PC to the DVI 16x16 Matrix.
2. Launch a terminal emulation program (e.g. HyperTerminal) and use the following settings:

Baud Rate: 19200
Data Bits: 8
Parity: None
Stop Bits: 1

3. Enter the following command with the IP address to be assigned to the matrix. See page 27 for details on the `#sipadd` command. Dot-decimal notation must be used when specifying the IP address.

Example: `#sipadd 192.168.1.236`



NOTE: If the subnet, gateway, and/or netmask need to be changed, refer to pages 25 and 27. Consult the network administrator to obtain the proper IP address and settings for this product to properly communicate on the network.

4. Power -cycle the matrix to reboot and complete the IP address change.
5. After the matrix has rebooted, the Web interface can be accessed by typing in the IP address that was specified in step 3.

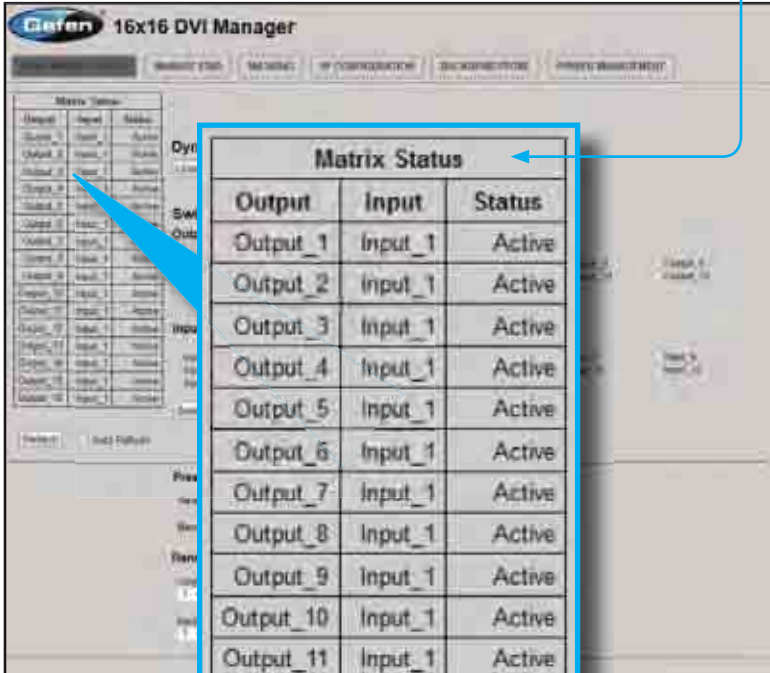
Pages 39 - 53 describe the layout and operation of each function of the built-in Web server.

WEB INTERFACE

View Matrix Status

Matrix Status

Displays the current routing status of each input and output on the matrix.



Matrix Status		
Output	Input	Status
Output_1	Input_1	Active
Output_2	Input_1	Active
Output_3	Input_1	Active
Output_4	Input_1	Active
Output_5	Input_1	Active
Output_6	Input_1	Active
Output_7	Input_1	Active
Output_8	Input_1	Active
Output_9	Input_1	Active
Output_10	Input_1	Active
Output_11	Input_1	Active
Output_12	Input_1	Active
Output_13	Input_1	Active
Output_14	Input_1	Active
Output_15	Input_1	Active
Output_16	Input_1	Active

Auto Refresh

Refresh
Click to refresh the Matrix Status screen

Auto Refresh
Check this box to enable Auto Refresh. The Auto Refresh function automatically refreshes the interface every 10 seconds.

Dynamic EDID Mode

Routes any downstream EDID to any input. See #dynamic_edid on page 16 for details on this feature. Options: On, Off. Click the Update Dynamic EDID State button after selecting either On or Off.

Dynamic EDID Mode

Update Dynamic EDID State Off On

Dynamic EDID Mode

Switch Outputs

Outputs

Input_1 Input_2 Input_3 Input_4 Input_5 Input_6 Input_7 Input_8 Input_9 Input_10 Input_11 Input_12 Input_13 Input_14 Input_15

Inputs

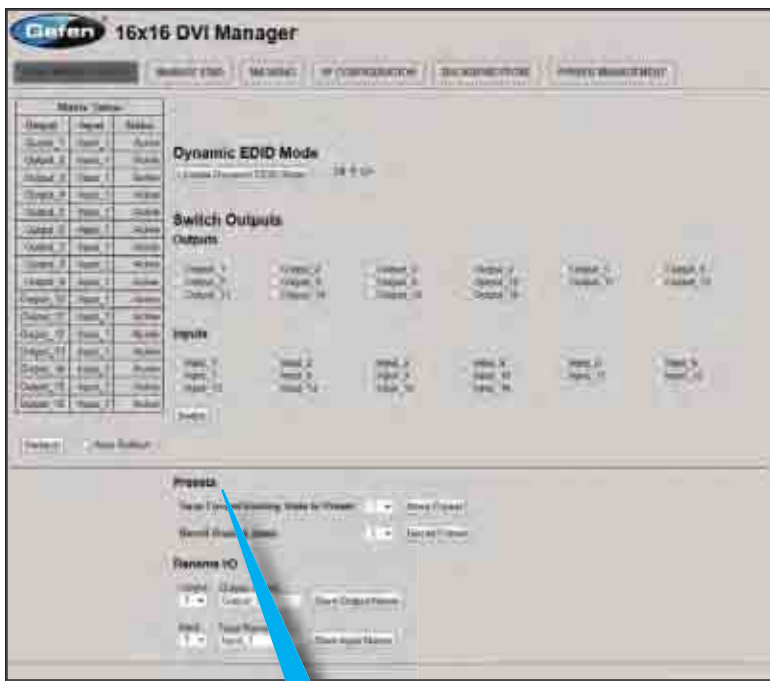
Input_1 Input_2 Input_3 Input_4 Input_5 Input_6 Input_7 Input_8 Input_9 Input_10 Input_11 Input_12 Input_13 Input_14 Input_15

Switch

Switch Outputs

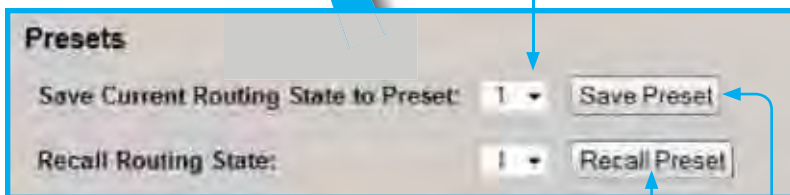
Used to route the specified input to the selected output(s). To route a source, place a check mark next to each Output. Next, click the radio button next to the desired Input. Press the Switch button to apply the routing change.

WEB INTERFACE



Presets

Provides saving and recalling of routing states.

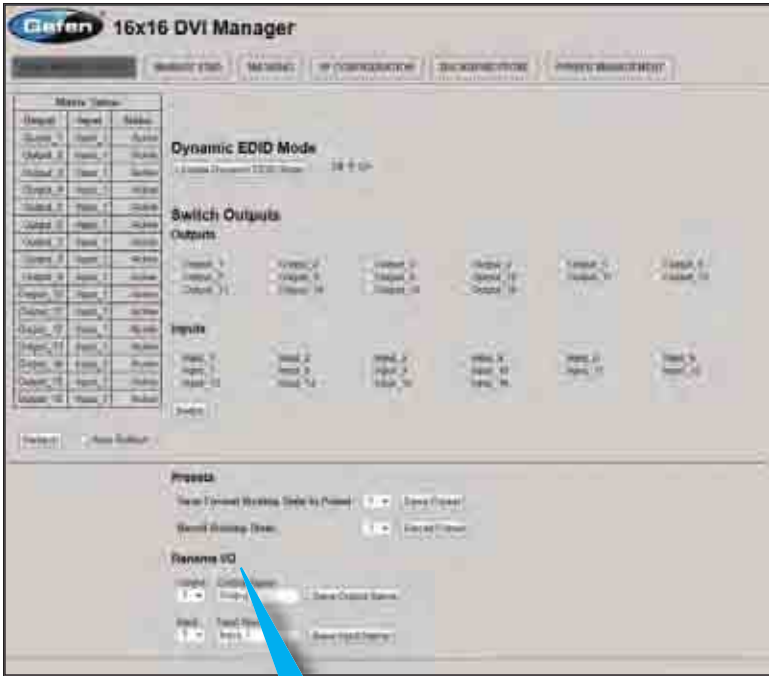


Recall Preset

Click the down-arrow on the pull-down list to select the routing state (1-16) to recall. Click the Recall Preset button to recall the preset.

Save Preset

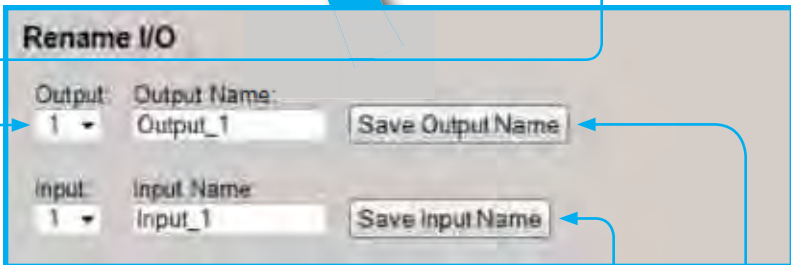
Click the down-arrow on the pull-down list to select the preset location (1-16). Click the Save Preset button to save the preset.



Rename I/O

Provides custom naming of each input and output on the matrix.

Pull-down list



Input

Select the DVI input to rename from the pull-down list. Type the name of the input in the Input Name field. Click the Save Input Name button to save changes. See page 35 for naming restrictions.

Output

Select the DVI output to rename from the pull-down list. Type the name of the output in the Output Name field. Click the Save Output Name button to save changes. See page 36 for naming restrictions.

WEB INTERFACE

Manage EDID

EDID Status

Displays the current EDID status for each input on the matrix and indicates the current Lock State (see page 19 for details).

Set Input to Default EDID Upload

EDID Status - Lock State: OFF

Input	EDID Source	Name
Input_1	Default	GEFEN_XPT_DL
Input_2	Default	GEFEN_XPT_DL
Input_3	Default	GEFEN_XPT_DL
Input_4	Default	GEFEN_XPT_DL
Input_5	Default	GEFEN_XPT_DL
Input_6	Default	GEFEN_XPT_DL
Input_7	Default	GEFEN_XPT_DL
Input_8	Default	GEFEN_XPT_DL
Input_9	Default	GEFEN_XPT_DL
Input_10	Default	GEFEN_XPT_DL
Input_11	Default	GEFEN_XPT_DL
Input_12	Default	GEFEN_XPT_DL
Input_13	Default	GEFEN_XPT_DL
Input_14	Default	GEFEN_XPT_DL
Input_15	Default	GEFEN_XPT_DL
Input_16	Default	GEFEN_XPT_DL

Refresh Auto Refresh

Refresh
Click to refresh the Matrix Status screen

Auto Refresh

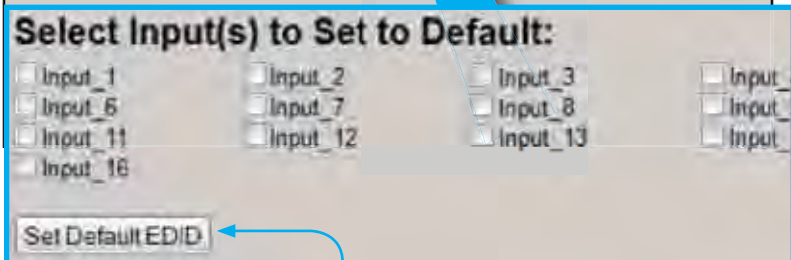
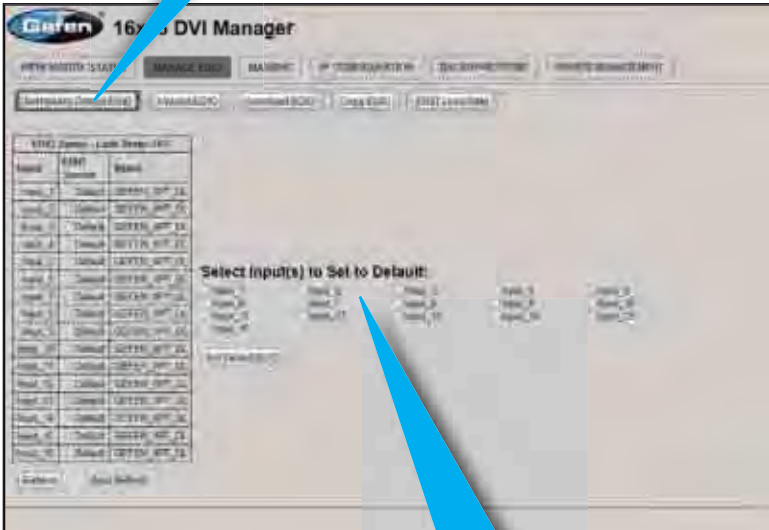
Check this box to enable Auto Refresh. Auto Refresh will automatically update the screen every 10 seconds.

WEB INTERFACE

Set Input to Default EDID

Set Input to Default EDID

Press this button from the Manage EDID screen to access this menu system.



Set Default EDID

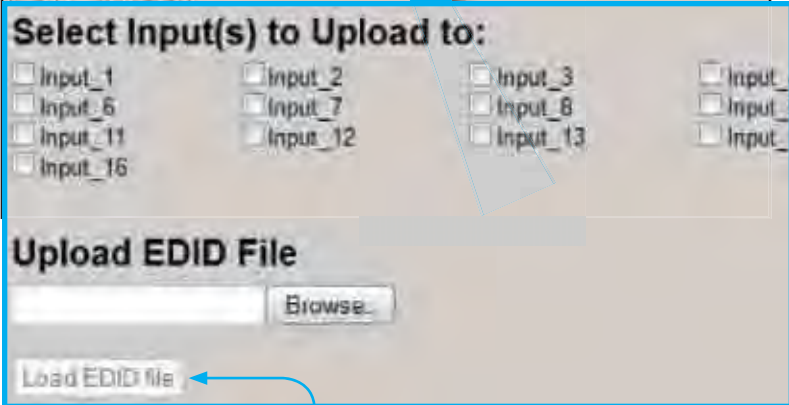
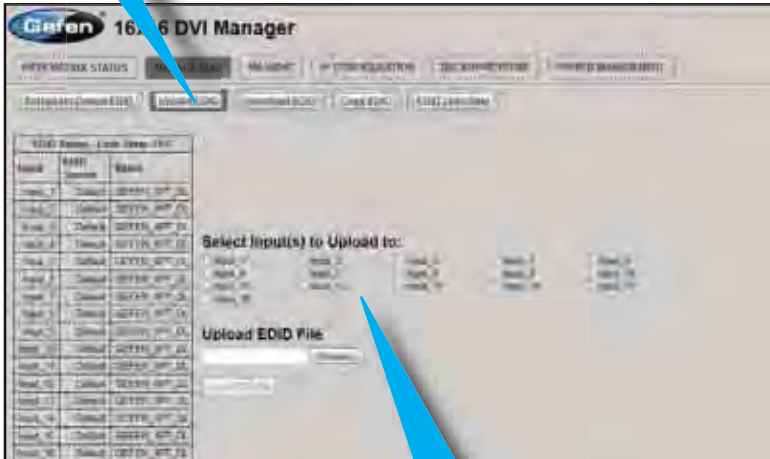
Place a check mark next to the input(s) that should be set to the default EDID. Click the Set Default EDID button to apply the default EDID to the selected inputs.

WEB INTERFACE

Upload EDID

Upload EDID

Press this button from the Manage EDID screen to access this menu system.



Load EDID file

Place a check mark next to the input(s) that will receive the EDID data from the file. The EDID file must be in .bin format. Click the Browse button to locate the EDID on the computer. Click the Load EDID file button to upload the EDID file to the matrix.

WEB INTERFACE

Download EDID

Download EDID

Press this button from the Manage EDID screen to access this menu system.



Select EDID to Download

- Output_1
- Output_2
- Output_3
- Output_4
- Output_5
- Output_6
- Output_7
- Output_8
- Output_9
- Output_10
- Output_11
- Output_12
- Output_13
- Output_14
- Output_15
- Output_16

Download EDID File to PC

Select the radio button next to the output, containing the EDID to be downloaded. Click the Download EDID File to PC button to confirm the change. The downloaded EDID file will be in .bin format.

WEB INTERFACE

Copy EDID

Copy EDID

Press this button from the Manage EDID screen to access this menu system.



Select Source to Copy from:

Output(s):

- Output_1
- Output_2
- Output_3
- Output_6
- Output_7
- Output_8
- Output_11
- Output_12
- Output_13
- Output_16

Inputs(s):

- Input_1
- Input_2
- Input_3
- Input_6
- Input_7
- Input_8
- Input_11
- Input_12
- Input_13
- Input_16

Select Input(s) to Copy to:

- Input_1
- Input_2
- Input_3
- Input_6
- Input_7
- Input_8
- Input_11
- Input_12
- Input_13
- Input_16

Select Source to Copy from / Select Input(s) to Copy to

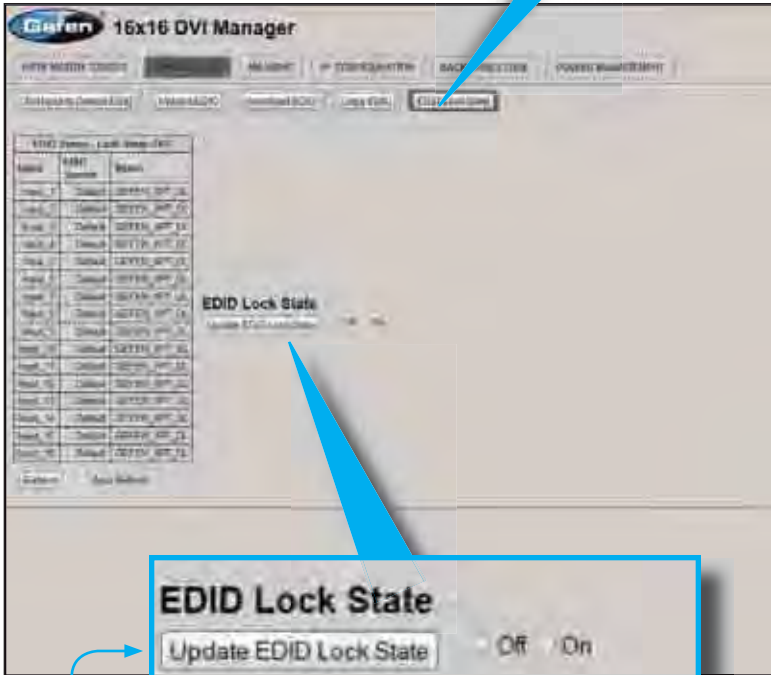
Click the radio button next to the input or output containing the EDID to copy. Note that only a single input or output can be selected at a time. Place a check mark next to the input(s) where the EDID will be copied. Click the Set EDID button to confirm the operation.

WEB INTERFACE

EDID Lock State

EDID Lock State

Press this button from the Manage EDID screen to access this menu system.



Update EDID Lock State

Secures the Local EDID and disables the automatic loading of the downstream EDID after the Matrix is powered on. Select the radio button next to the Off or On option then click the Update EDID Lock State button to apply the change.

The EDID Lock State has no effect when the Dynamic EDID function is activated.

WEB INTERFACE

Masking

Matrix Mask Status / Change

Displays the current masking status for each output.

The screenshot shows the Gefen 16x16 DVI Manager web interface. A dialog box titled "Matrix Mask Status/Change" is overlaid on the main interface. The dialog box contains a table with the following data:

Output	Input	Status	Click to:
Output_1	Input_1	Mask	Active
Output_2	Input_2	Active	Mask
Output_3	Input_3	Mask	Active
Output_4	Input_2	Active	Mask
Output_5	Input_2	Active	Mask
Output_6	Input_2	Active	Mask
Output_7	Input_2	Mask	Active
Output_8	Input_2	Active	Mask
Output_9	Input_2	Active	Mask
Output_10	Input_2	Active	Mask
Output_11	Input_2	Active	Mask
Output_12	Input_2	Active	Mask
Output_13	Input_2	Active	Mask
Output_14	Input_2	Active	Mask
Output_15	Input_2	Active	Mask
Output_16	Input_2	Active	Mask

Below the table, there is a "Refresh" button and an "Auto Refresh" checkbox which is currently unchecked. A blue arrow points from the "Mask" button in the first row of the table to the "Mask" label in the text below.

Mask

Click the Mask button to mask the selected output. If the output is already masked then the button will read "Active" (enabled). Click the ("Active") button again to toggle the masking state to "Mask" (disabled).

WEB INTERFACE

IP Configuration

IP Settings

Assigns IP address, subnet, gateway, HTTP listening port, and Telnet port. Note that the MAC address can not be changed. Click the Save button to apply changes. The matrix must be rebooted for the changes to take effect.

The screenshot shows the 'Gefen 16x16 DVI Manager' web interface. The 'IP Settings' section is highlighted with a blue callout box. The 'Telnet Login Settings' section is also visible below it.

IP Settings

MAC Address:	00 1C 91 01 0F FF	
IP Address:	192.168.2.236	(default: 192.168.7.75)
Subnet:	255.255.255.0	(default: 255.255.255.0)
Gateway:	192.168.2.1	(default: 192.168.7.254)
HTTP Port:	80	(default: 80)
Telnet Port:	23	(default: 23)

Reset IP Configuration to Defaults:

Telnet Login Settings

User Name:	Admin	(default: Admin)
Password:	Admin	(default: Admin)
Force Login:	<input checked="" type="checkbox"/>	
Welcome message:	<input type="checkbox"/>	

Telnet Login Settings

Sets the user name and password for Telnet sessions to the matrix. Click the Save button to apply changes.

Backup / Restore

The Backup / Restore feature for the 16x16 DVI Matrix is not currently implemented and will be available in a future release of the firmware.

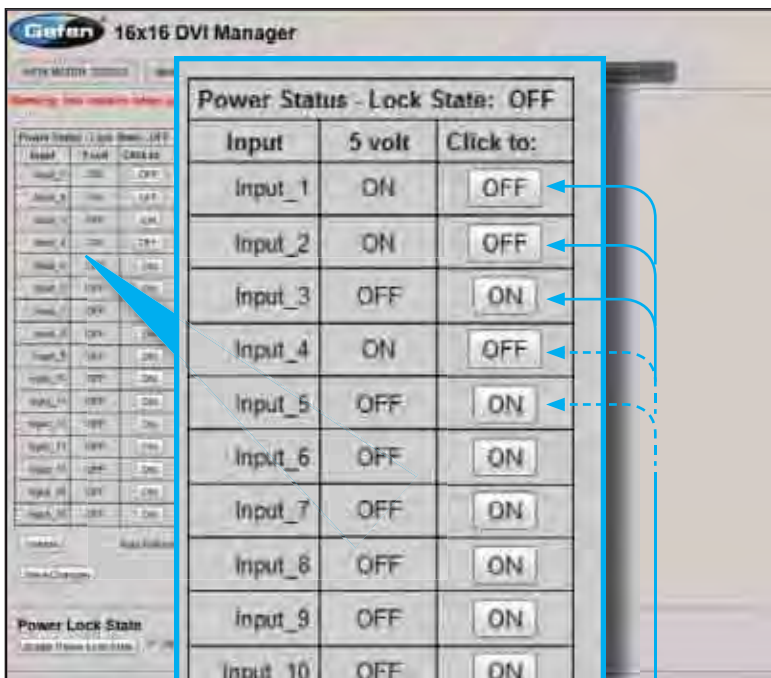


WEB INTERFACE

Power Management

Power Status

Enabling this feature will store the +5V status for that input prior to shutting down the matrix. This preserves the +5V state when the unit is restarted.



Refresh

Click to refresh the Power Status screen

Save Changes

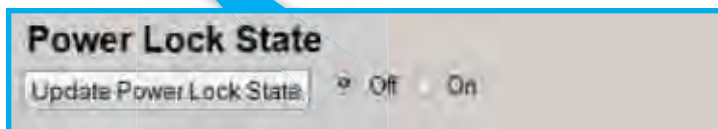
Click to save the power lock status.

Power State

The current power state is listed under the column titled "5 Volt". Click these buttons to toggle the input power state.

Auto Refresh

Check this box to automatically update the screen every 10 seconds.



Power Lock State

In the case of an accidental power loss to the matrix, the +5V state for each input can be preserved.

Set the specified Power Status buttons (see previous page) and click the radio button next to ON. Click the Update Power Lock State button to apply changes.

By default, this option is set to Off.

FIRMWARE UPDATE

Firmware Update Procedure

The following items are required to update firmware:

- RS-232 Terminal (e.g. Windows-based PC running HyperTerminal).
- RS-232 cable (do not use a null-modem cable)
- Firmware files: DVI16x16 and GEFMTXFP

To begin the update procedure the matrix Boot Loader must be activated. To activate the Boot Loader please follow the procedure below:

1. Power-on the matrix.
2. Connect an RS-232 cable to the PC and open the terminal program using the following settings:

Baud rate: 19200
Stop bits: 1
Data bits: 8
Flow control: None

3. Type the command: `#activebolo`

Two options will be provided:

To download the file DVI16x16 please type the command 'activebolo 0'
To download the file GEFMTXFP please type the command 'activebolo 1'

4. Type the command: `#activebolo 0`

This will begin the update process of the main board.

5. Once the Boot Loader is activated the following message should appear:
6. Press [1] on the computer keyboard to begin downloading program to the temporary memory

```
DVI16x16 Boot Loading
===== Main Menu =====
Download new program ----- 1
Cancel ----- 2
=====
```

7. Press [1] on the computer keyboard to begin downloading program to the temporary memory.

FIRMWARE UPDATE

8. A message will appear in the terminal program:

```
Waiting for the file to be sent ... (press 'a' to abort)
```

9. In Hyperterminal, click Transfer > Send file...
10. Click Browse... and select the .BIN file corresponding to the boot loader which was activated. In this first case, the file should start with DVI16x16.
11. Select Ymodem for the protocol.
12. Press Send on the Send File dialog box.
13. A message will appear in Hyperterminal:

```
Programming Completed Successfully!
```

14. The unit will exit the boot loader screen and return to the standard Hyperterminal window.
15. Repeat steps 3 - 12 for the file GEFMTXFP.

WARNING MESSAGES

Fan Failure

The 16x16 DVI Matrix uses an internal fan to maintain a stable operating temperature in various environments. In the case that the fan fails to start, an alert will appear on the LCM:



FAN FAILURE!

If the 16x16 Matrix is connected to a PC using a terminal program, the following message will appear on the display:

Fan failure !!!

This message will continue to be displayed at regular intervals until the fan is functioning.

Although the DVI 16x16 Matrix is still functional, it is recommended that Gefen Technical Support be notified of the issue. Please see **Asking for Assistance** at the beginning of this manual.

System Failure

In the case of a critical malfunction, the following warning message will be displayed on the LCM:



SYSTEM FAILURE!

If the 16x16 Matrix is connected to a PC using a terminal program, the following message will appear on the display:

System failure !!!

The Matrix should be powered-down immediately. Please contact Gefen Technical Support. Please see **Asking for Assistance** at the beginning of this manual.

WARNING MESSAGES

Critical Malfunctions

Temperature Failure

If the measured system temperature exceeds 85° C, the following message will be displayed on the LCM:



SYSTEM FAILURE!

Power Failure

If the power reading exceeds the tolerance rating (greater than 120% or less than 80%), the following message will be displayed on the LCM:



SYSTEM FAILURE!

In both cases, the Matrix will stop working and should be powered-down immediately. Please contact Gefen Technical Support under the **Asking for Assistance** section, at the beginning of this manual.

SPECIFICATIONS

Maximum Pixel Clock	165 MHz
Input Video Signal	1.2 Volts p-p
Video Input Connectors.....	(16) DVI-I 29-pin, female (digital only)
Video output Connectors.....	(16) DVI-I 29-pin, female (digital only)
IR Extender.....	3.5 mm mini-stereo
RS-232 Interface.....	DB-9 serial, female
Ethernet (IP control) port.....	RJ-45 (100BaseT)
Power Supply.....	100 ~ 240 V AC (x2 for redundancy)
Power Consumption	60 Watts (max.)
Operating Temperature.....	0 °C ~ 45 °C / 32 °F ~ 104 °F
Storage Temperature.....	-20 °C ~ 60 °C / -4 °F ~ 140 °F
Relative Humidity.....	20% ~ 90% (no condensation)
Dimensions	17.25" W x 3.5" H x 12" D
Rack-mountable	2U rack space, rack ears included
Shipping Weight	30 lbs.

WARRANTY

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.

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For the latest warranty coverage information, refer to the Warranty and Return Policy under the Support section of the Gefen Web site at www.gefen.com.

PRODUCT REGISTRATION

Please register your product online by visiting the Register Product page under the Support section of the Gefen Web site.

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www.gefen.com support@gefen.com



This product uses UL or CE listed power supplies.