16x16 DVI Matrix

EXT-DVI-16416
User Manual

www.gefen.com

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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

Route any of the 16 connected sources to any combination of 16 displays. The Gefen EXT-DVI-16416 16x16 DVI Matrix simplifies this process without affecting picture quality or resolution. Single-Link DVI resolutions up to 1920x1200 (WUXGA) are supported. This product can be controlled via front panel buttons, IR remote, RS-232 interface, Gefen's Keyboard Controller software, or IP (Web Server Interface, Telnet, and UDP). Its firmware is field-updatable using the Gefen Syner-G™ PC software.

How It Works

Using the supplied DVI cables, connect 16 sources to the DVI input ports of the Matrix. Connect the 16 DVI outputs to the displays. Plug the included power supply to the back of the unit, and connect the AC cord between the power supply and an available electrical outlet. The connected displays will show video according to the routing selection.

NOTE: Although this product uses DVI-I connectors, the Gefen 16x16 DVI Matrix supports DVI-D only.

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, Telnet, UDP, or the built-in Web interface.
- 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 are accessible using RS-232, Telnet, UDP, or the built-in Web interface.
- Routing and EDID features can be managed using the built-in IP control features.
- This matrix supports Dynamic EDID. See pages 18 and 45 for details.
- The Gefen Syner-G Software Suite is a free downloadable application from Gefen that provides automatic download and installation of firmware upgrades for this product.

  Download the application here: http://www.gefen.com/synerg/

- The Gefen Matrix Switcher Keyboard Controller is a free downloadable application from Gefen that allows a computer keyboard to be used to switch between sources. This application uses the Telnet protocol to control any Gefen switcher or matrix that uses IP control.

  Download the application here: http://www.gefen.com/support/download.jsp

FEATURES

Features

- Supports resolutions up to 1920x1200 (WUXGA)
- Advanced EDID management for rapid integration of sources & displays
- Output masking
- Stand-by mode
- LCD Status Display
- IP Control (Web Server Interface, Telnet, and UDP)
- Easy firmware update using Gefen Syner-G™ software, available for download from Gefen website
- Compatible with Gefen Keyboard Controller Software for PC and Mac, also available for download from Gefen website
- Serial RS-232 interface for use with an automation control device
- Handheld IR remote control
- Front panel controls
- IR Sensor on front panel
- IR Extender Port on back panel
- Locking power supply connector
- Can be placed on a shelf or mounted in a standard 19” wide rack (rack ears included)

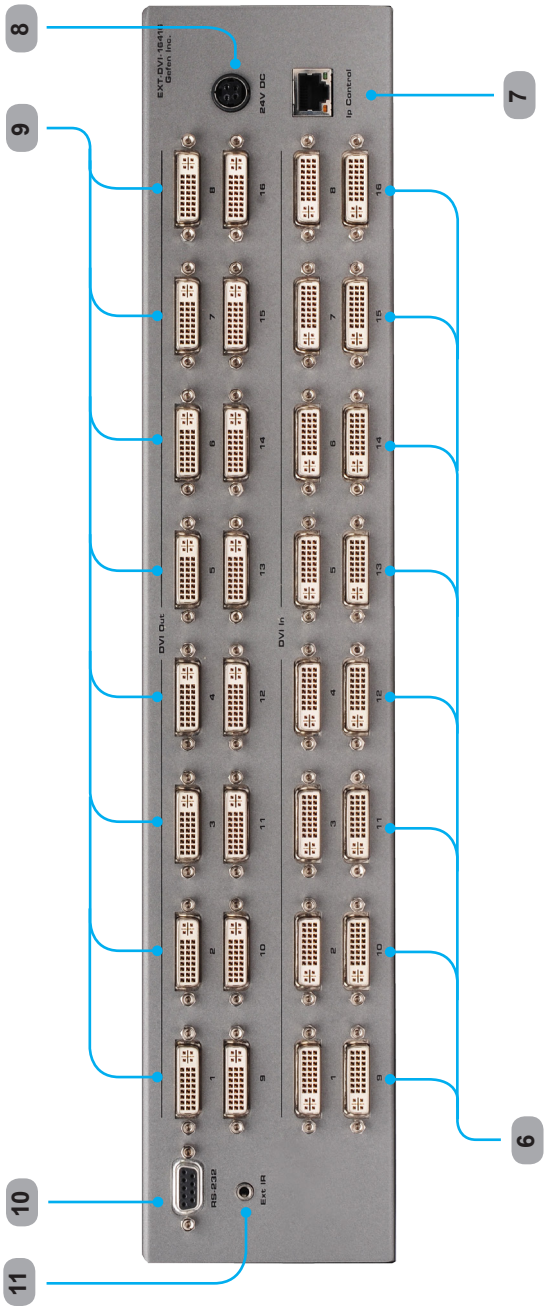
Package Includes

(1) 16x16 DVI Matrix
(16) 6 ft. DVI cables (M-M)
(1) 6 ft. DB-9 cable
(1) IR Remote control unit
(1) 24V DC power supply
(1) AC power cord
(1) Quick-Start Guide

Front Panel


5
4
3
2
1
GEFEN
16X16 DVI MATRIX
Status
IR
Power
Cancel
Select
16x16 DVI Matrix
Gefen

Back Panel


8
9
7
6
10
11
EXT DVI 1541
Gefen Inc.
24V DC
Ip Control
DVI Out
DVI In
RS-232
Ext IR

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, 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. See page 16 for more information on configuring IP settings.

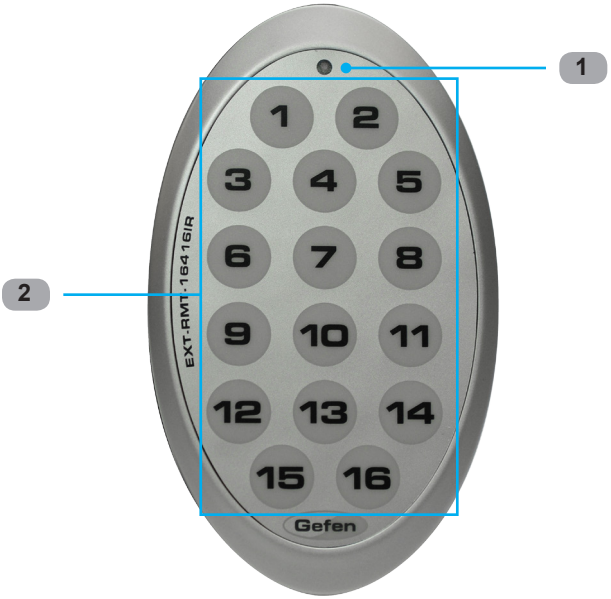
8 24V DC Power Receptacle
The port will accept power from the included 24V DC power supply.

9 DVI Output Ports 1-16
These outputs are used to connect up to 16 DVI-capable displays.

10 RS-232 Serial Communications Interface
Connects to an external control system. This port will allow switching commands as well as EDID management and configuration operations. See page 15 for more information. This port is also used in updating the matrix firmware using the Gefen Syner-G software. See page 60 for more information.

11 IR Extender Jack
Accepts an optional IR Extender (Gefen part no. EXT-RMT-EXTIRN) which allows relocation of the IR receiver up to 6 feet away from the Matrix.

RMT-16416IR Layout and Description



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

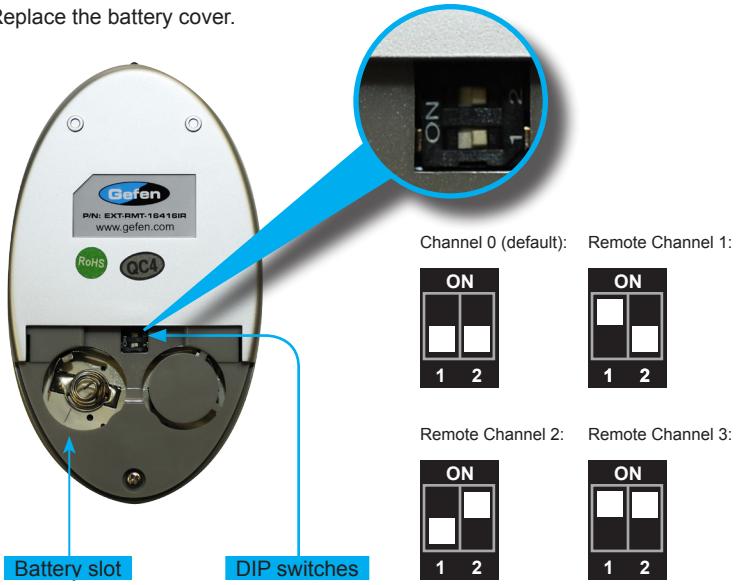
2 Display and Source Selection Buttons (1 - 16)
These buttons are used to select which source is routed to a monitor.

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.

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

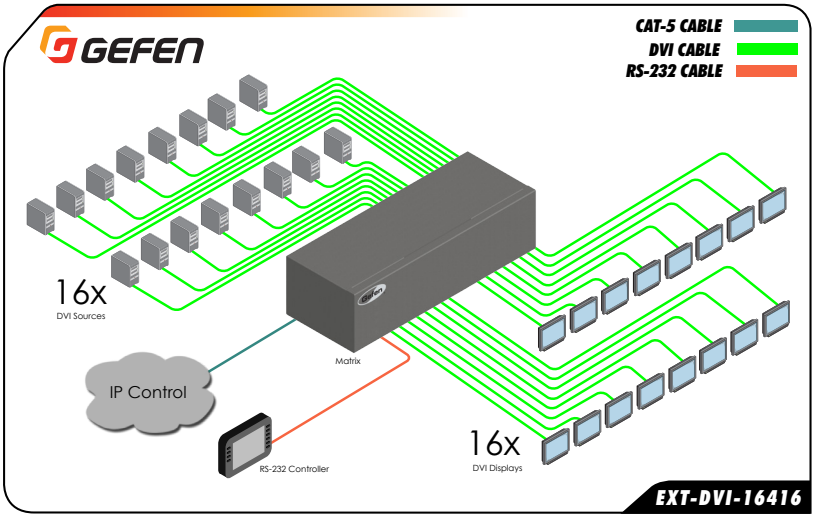
The IR channel on the IR Remote Control must match the IR channel used by the *DVI 16x16 Matrix*. For example, if both DIP switches on the IR Remote Control unit are set to IR channel 0 (both DIP switches down), then the 16x16 DVI Matrix must also be set to IR channel 0. See page 38 for information on 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.

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 24V DC power supply to the power receptacle on the rear panel of the 16x16 DVI Matrix.
4. Connect the included AC power cord between the power supply and an available electrical outlet.

Wiring Diagram for the 16x16 DVI Matrix



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

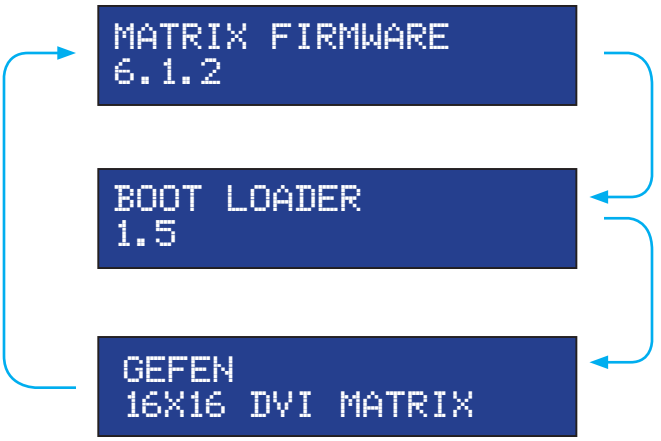
Status Screen

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:



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 input selection. Otherwise, press the Cancel button.

6 Press the Cancel button to return to the Standby screen.

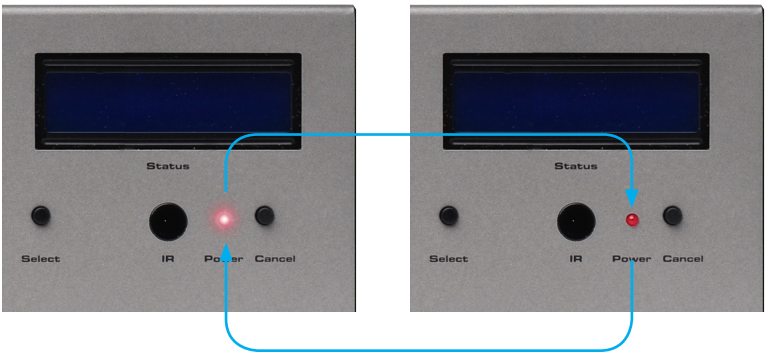
Entering Standby Mode

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.



Exiting Standby Mode

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

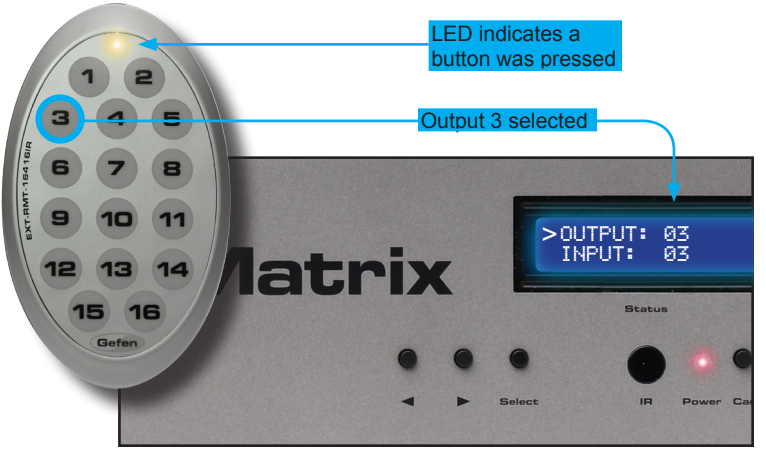
2. Once the matrix turns on, release the button.

Routing Sources using the IR Remote Control

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

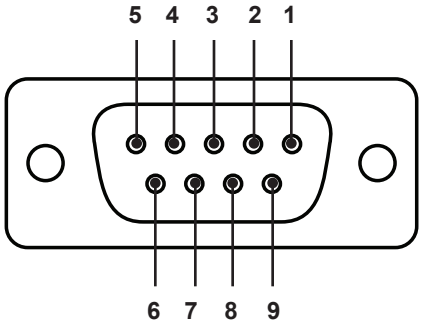
Routing Example: Route Input 12 to Output 3

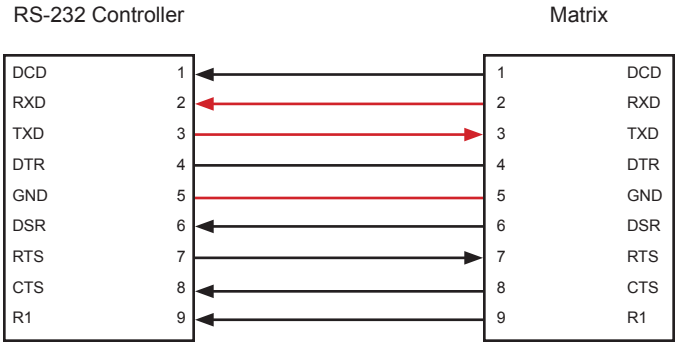
1. Select Output 3 by pressing button **3** on the IR Remote Control. The number 03 will appear next to OUTPUT, in the display:



2. The cursor will automatically advance to the input selection.
3. Select Input 12 by pressing button **12** on the IR Remote Control. The number 12 will appear next to INPUT, in the display.
4. Input 12 is now routed to Output 3, as shown on the display.
5. After the input is selected, the cursor will automatically return to the output selection.

RS-232 Interface





Only TXD, RXD, and GND are used.

RS232 Settings

Baud rate 19200
Data bits 8
Parity bits ..... None
Stop bits 1
Flow Control ..... None

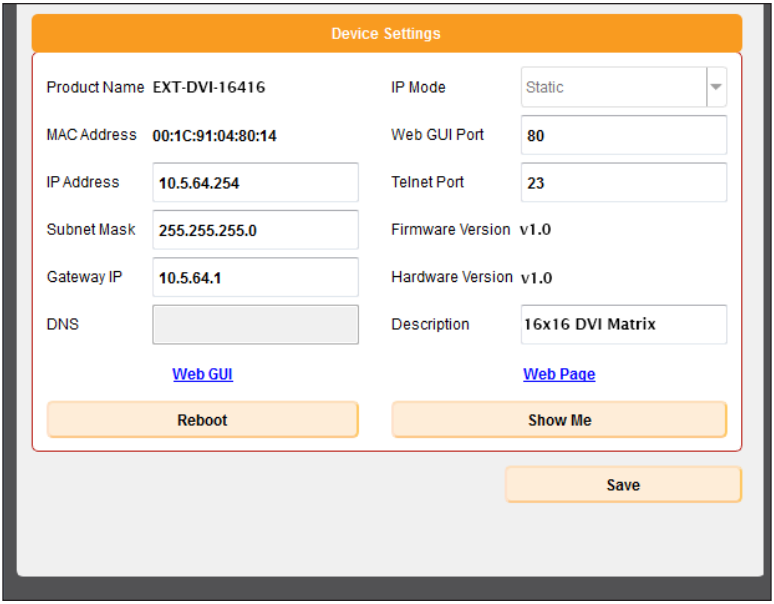
IMPORTANT: When sending RS-232 commands, a carriage return must be included at the end of the command. A space *must* be included between the command and the parameter.

Using Syner-G

When using this product for the first time, it is recommended that the unit be configured using the Gefen Syner-G™ Software Suite. The Gefen Syner-G™ Software Suite is free software that is available from the Gefen Web site.

1. Download and install the Gefen Syner-G™ Software Suite. Download the application here: http://www.gefen.com/synerg/
2. Connect an Ethernet cable from the network to the **IP control** port on the product.
3. Launch the Gefen Syner-G™ Software Suite.
4. Click the EXT-DVI-16416 from the product list.

5. Under the Device Settings section, enter the desired IP address, subnet mask, gateway IP address, Web GUI port, and Telnet port in the supplied fields.



If desired, the **Description** field can be changed as well. This is useful to identify if you have multiple units running on a network.

6. Click the **Save** button at the bottom right-corner of the screen.

7. Click the **Reboot** button.

8. Click the **Web GUI** link, above the **Reboot** button, to access the built-in web interface.

The following table lists the default IP settings for this product.

Description	Address / Port	Description	Address / Port
IP Address	192.168.1.72	Gateway	192.168.1.254
Subnet	255.255.255.0	HTTP Port	80

EDID Management

Command	Description
#dynamic_edid	Enables / disables dynamic EDID
#ediidbatolo	Read downstream EDID and stores in any Local Input
#ediiddetolo	Sets Local EDID to Default EDID
#ediiddstoba	Read downstream EDID and stores in EDID Bank
#ediiddstolo	Read downstream EDID and stores into a Local EDID
#lock_edid	Secures Local EDID
#prbaedid	Read EDID from an EDID bank and sends to serial port
#prdsedid	Read downstream EDID and sends to serial port
#predidst	Prints EDID details
#prloedid	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:

param1	EDID bank	[1 ... 3]
param2	Input	[1 ... 16]

Notes:

If *param2 = 0*, then the EDID in the specified bank is copied to all 16 inputs.

#ediddetolo Command

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

Syntax:

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

param1	Input	[1 ... 16]

Notes:

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

#ediddstoba Command

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

Syntax:

```
#ediddstoba param1 param2
```

Parameters:

param1	A downstream monitor	[1 ... 16]
param2	EDID bank offset	[1 ... 3]

#ediddstolo Command

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

Syntax:

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

Parameters:

param1	A downstream monitor	[1 ... 16]
param2	Input list	[1 ... 16]

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, then 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
```

```
#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. This feature can also be controlled using the Web Interface (see page 53).

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 it to the serial port.

Syntax:

```
#prbaedid param1
```

Parameters:

param1 EDID bank [1 ... 3]

#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	Input	[1 ... 16]

IP / Telnet Configuration

Command	Description
#ipconfig	Displays all TCP/IP settings
#resetip	Resets IP configuration to factory settings
#set_http_port	Sets the Web server listening port
#set_tcp_term_pass	Sets the TCP terminal password
#set_tcp_term_port	Sets the Telnet listening port
#set_udp_port	Sets the local UDP listening port
#set_udp_rip	Sets the remote UDP IP address
#set_udp_rport	Sets the remote UDP port
#sgateway	Sets the IP gateway address
#show_tcp_term_pass	Displays the current TCP password for login
#sipadd	Sets the IP address of the matrix
#snetmask	Sets the IP network mask
#use_tcp_term_pass	Enables / disables password prompt for TCP sessions
#use_udp_access	Enables / disables UDP listening

#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:91:01:01:01
IP add   = 192.168.1.72
Net Mask = 255.255.255.0
Gateway  = 192.168.1.254
Web Server Port = 80
TCP Terminal Server Port = 23
TCP Terminal password at login is set to ON
UDP Server Port = 25665
UDP Remote IP = 110.0.255.255
UDP Remote Port = 26989
UDP Access = Disabled
```

#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. The default port is 80.

Syntax:

```
#set_http_port param1
```

Parameters:

param1	Port	[0 ... 65535]

Notes:
The matrix must be rebooted after executing this command.

#set_tcp_term_pass Command

The #set_tcp_term_pass command sets the TCP password. The maximum length of the password is 20 characters and is case-sensitive. The default password is *Admin*.

Syntax:

```
#set_tcp_term_pass param1
```

Parameters:

param1	Current password
param2	New password
param3	New password (confirm)

Notes:
The matrix must be rebooted after executing this command.

Example:

```
#set_tcp_term_pass Admin reindeer reindeer
TCP Terminal password updated to: reindeer
```

#set_tcp_term_port Command

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

Syntax:

```
#set_tcp_term_port param1
```

Parameters:

param1	Port	[1 ... 65535]

Notes:
The matrix must be rebooted after executing this command.

Example:

```
#set_tcp_term_port 20
New TCP Terminal port set to: 20
```

#set_udp_port Command

The #set_udp_port command sets the local UDP listening port. The default port value is 8.

Syntax:

```
#set_udp_port param1
```

Parameters:

param1	Port	[1 ... 65535]

Notes:
The matrix must be rebooted after executing this command.

Example:

```
#set_udp_port 10
New UDP listening port set to: 10
```

#set_udp_rip Command

The #set_udp_rip command sets the remote UDP IP address. The default port value is 8.

Syntax:

```
#set_udp_rip param1
```

Parameters:

param1	IP Address

Notes:
The matrix must be rebooted after executing this command.

Example:

```
#set_udp_rip 192.168.1.20
New remote UDP IP address set to: 192.168.1.20
```

#set_udp_rport Command

The #set_udp_rport command sets the remote UDP port.

Syntax:

```
#set_udp_rport param1
```

Parameters:

param1	Port

Notes:
The matrix must be rebooted after executing this command.

Syntax:

```
#set_udp_rport 4096
New remote UDP port set to: 4096
```

#sgateway Command

The #sgateway sets the IP gateway (router) address. Dot-decimal notation must be used when specifying the IP address. The default gateway is 192.168.1.254.

Syntax:

```
#sgateway param1
```

Parameters:

param1	IP gateway

Notes:
The matrix must be rebooted after executing this command.

Example:

```
#sgateway 192.168.1.1
New IP Gateway set to: 192.168.1.1
```

#show_tcp_term_pass Command

The #show_tcp_term_pass command displays the current TCP password for login (if required).

Syntax:

```
#show_tcp_term_pass
```

Example:

```
#show_tcp_term_pass
TCP Terminal password: reindeer
```

#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

Notes:
The matrix must be rebooted after executing this command.

Example:

```
#sipadd 192.168.1.239
New IP set to: 192.168.1.239
```

#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

Notes:
The matrix must be rebooted after executing this command.

Example:

```
#snetmask 255.255.255.0
New IP Mask set to: 255.255.255.0
```

#use_tcp_term_pass Command

The #use_tcp_term_pass command enables / disables the password prompt at the beginning of a session. The default setting is *disabled*. This feature can also be enabled or disabled through the Web GUI (see page 55).

Syntax:

```
#use_tcp_term_pass param1
```

Parameters:

param1 State [0 ... 1]

Value	Meaning
0	Disable password
1	Enable (force) password

Example:

```
#use_tcp_term_pass 1
TCP Terminal password at login is set to ON
```

#use_udp_access Command

The #use_udp_access command enables / disables UDP listening.

Syntax:

```
#use_udp_access param1
```

Parameters:

param1 State [0 ... 1]

Value	Meaning
0	Disable password
1	Enable (force) password

Example:

```
#use_udp_access 1
UDP access is set to ON
```

Routing

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

#callpreset Command

The #callpreset command recalls a routing preset. Any masked outputs will also be re-called.

Syntax:

```
#callpreset param1
```

Parameters:

param1	Preset	[1 ... 16]

#prpreset Command

The #prpreset command displays the preset table.

Syntax:

```
#prpreset
```

Parameters:

None

Example:

```
#prpreset
PreSet|Out1| 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10| 11| 12| 13| 14| 15| 16
------|----|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---
  1   |M 0 |M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0
  2   |M 0 |M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0
  3   |M 0 |M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0
  4   |M 0 |M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0
  5   |M 0 |M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0
  6   |M 0 |M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0
  7   |M 0 |M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0
  8   |M 0 |M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0
  9   |M 0 |M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0
 10   |M 0 |M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0
 11   |M 0 |M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0
 12   |M 0 |M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0
 13   |M 0 |M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0
 14   |M 0 |M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0
 15   |M 0 |M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0
 16   |M 0 |M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0|M 0
------|----|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---
```

#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.

Syntax:

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

Parameters:

param1	Input	[1 ... 16]
param2	Outputs	[1 ... 16]

Notes:

If *param2* = 0, then the specified input is routed to all outputs.

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:

param1	Input	[1 ... 16]

Example:

```
s 1
All outputs are routed to Input 1
```

Masking

Command	Description
#maskout	Masks the selected (video) output(s)
#unmaskout	Unmasks the selected output(s)

#maskout Command

The #maskout command allows blanking of the specified outputs.

Syntax:

```
#maskout param1 param2
```

Parameters:

param1 Output [1 ... 16]

param2 State [0 ... 1]

Value	Meaning
0	Unmask
1	Mask

Notes:

If param1 = 0, then all outputs will be masked.

The current masking state will be lost if power is interrupted or if the masking state is not saved (see #savepreset on page 32).

#unmaskout Command

The #unmaskout command unmasks the specified outputs.

Syntax:

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

Parameters:

param1	Output	[1 ... 16]

Notes:

If *param1* = 0, then all outputs will be unmasked.

Examples:

```
#unmaskout 3 8 10
Activate outputs: 3 8 10

#unmaskout 0
Activate all outputs
```

Miscellaneous

Command	Description
#fadefault	Resets the matrix to factory default routing
#help	Displays all available commands
#lock_fo	Toggles the +5V lock power state
#set_input_name	Specifies a name for an input
#set_ir	Sets the IR channel of the matrix
#set_output_name	Specifies a name for an output
#show_temp	Displays the board temperatures
#show_user_name	Displays the TCP user name
#show_ver_data	Displays the current hardware
#show_voltage	Displays the board voltages
f	Toggles / displays +5V input
m	Displays the current routing status in tabular form

#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

Example:

```
#lock_fo 0
Disable Lock power mode
```

#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:

param1	Input	[1 ... 16]
param2	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:

param1	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:

param1	Output	[1 ... 16]
param2	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 50
Temperature near cross point bottom side is 44 C degree
Temperature on input board  is 43 C degree
```

#show_user_name Command

The #show_user_name command displays the current TCP terminal user name.

Syntax:

```
#show_user_name
```

Parameters:

None

Example:

```
#show_user_name
TCP Terminal login: Administrator
```

#show_ver_data Command

The #show_ver_data command displays the hardware and firmware version ot the screen.

Syntax:

```
#show_ver_data
```

Parameters:

None

Example:

```
#show_ver_data
Hardware version 2
Firmware Release version 6.1.2
Release date: Jan 21 2013
Release time: 16:38:56
Boot loader version 1.5
```

#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 3262 mV
Analog voltage 1.8 , measured 1781 mV
Analog voltage 1.2 , measured 1180 mV
```

f Command

The `f` command enables / disables the +5V on the specified input. Do not precede this command with the "#" symbol.

WARNING: Use caution when applying power to inputs. If the source device supplies +5V on the input, then enabling the +5V may cause damage to the source and/or the 16x16 DVI Matrix.

Syntax:

```
f param1 param2
```

Parameters:

param1	Input	[1 ... 16]
param2	State	[0 ... 1]

Value	Meaning
0	Disable
1	Enable

Notes:

If *param1* = 0, then all inputs will be affected.

Examples:

```
f 15 1
Enable F0 15

f 0 1
Enable All FO
```

m Command

The m command displays the routing status in tabular form. Do not precede this command with the "#" symbol.

Syntax:

```
m
```

Parameters:

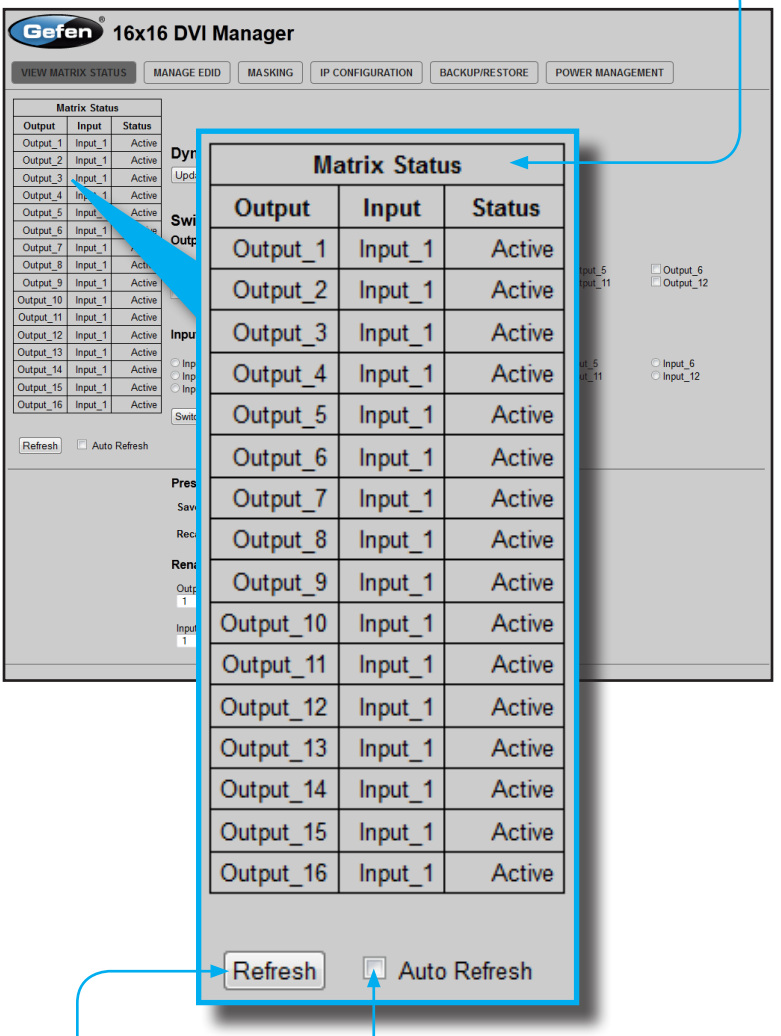
None

Example:

```
m
 Output          |   Input         |  HPD  | Status
-----------------|-----------------|-------|--------
         Output_1|          Input_1|   LOW | ACTIVE
         Output_2|          Input_1|   LOW | ACTIVE
         Output_3|          Input_1|   LOW | ACTIVE
         Output_4|          Input_1|   LOW | ACTIVE
         Output_5|          Input_1|   LOW | ACTIVE
         Output_6|          Input_1|   LOW | ACTIVE
         Output_7|          Input_1|   LOW | ACTIVE
         Output_8|          Input_1|   LOW | ACTIVE
         Output_9|          Input_1|   LOW | ACTIVE
        Output_10|          Input_1|   LOW | ACTIVE
        Output_11|          Input_1|   LOW | ACTIVE
        Output_12|          Input_1|   LOW | ACTIVE
        Output_13|          Input_1|   LOW | ACTIVE
        Output_14|          Input_1|   LOW | ACTIVE
        Output_15|          Input_1|   LOW | ACTIVE
        Output_16|          Input_1|   LOW | ACTIVE
-----------------|-----------------|-------|--------
GEFEN PRO
Dynamic EDID mode
RMT_IR - SW1=0,SW2=0
```

View Matrix Status

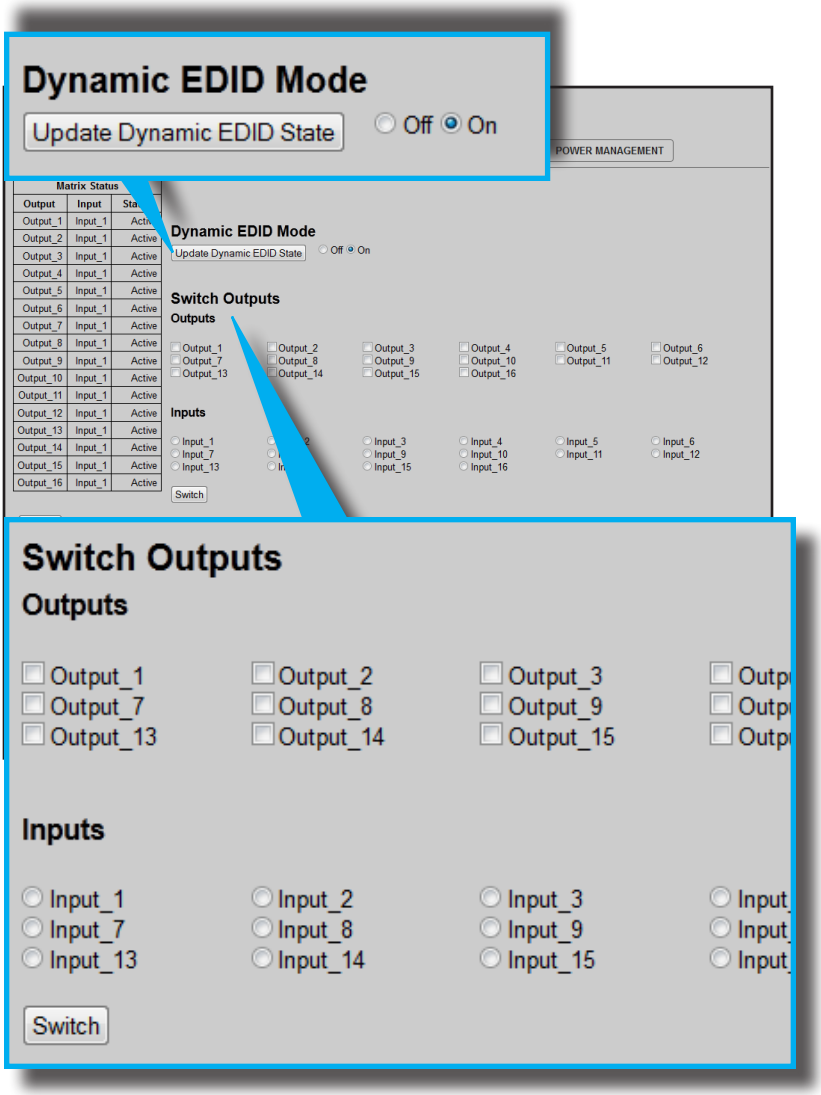
Matrix Status
Displays the current routing status of each input and output on the matrix.



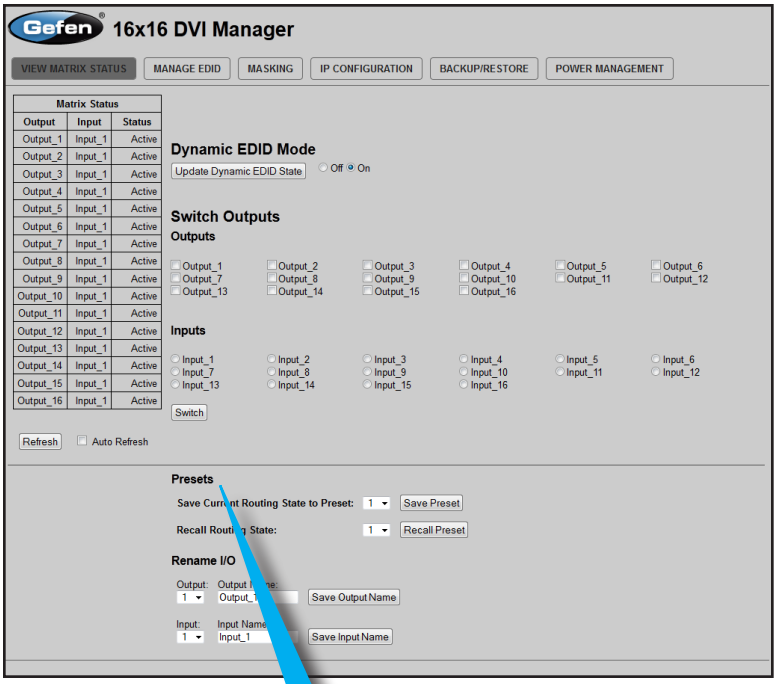
Refresh
Click to refresh the Matrix Status screen

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 18 for details on this feature. Options: On, Off. Click the Update Dynamic EDID State button after selecting either On or Off.

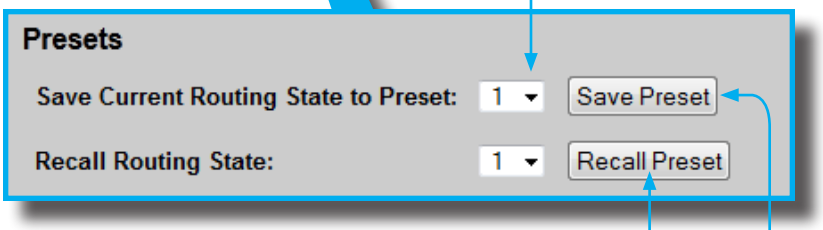


Switch Outputs
Used to route the specified input to the selected output(s). To route a source, place a check mark next to each Output. Next, click the radio button next to the desired Input. Press the Switch button to apply the routing change.



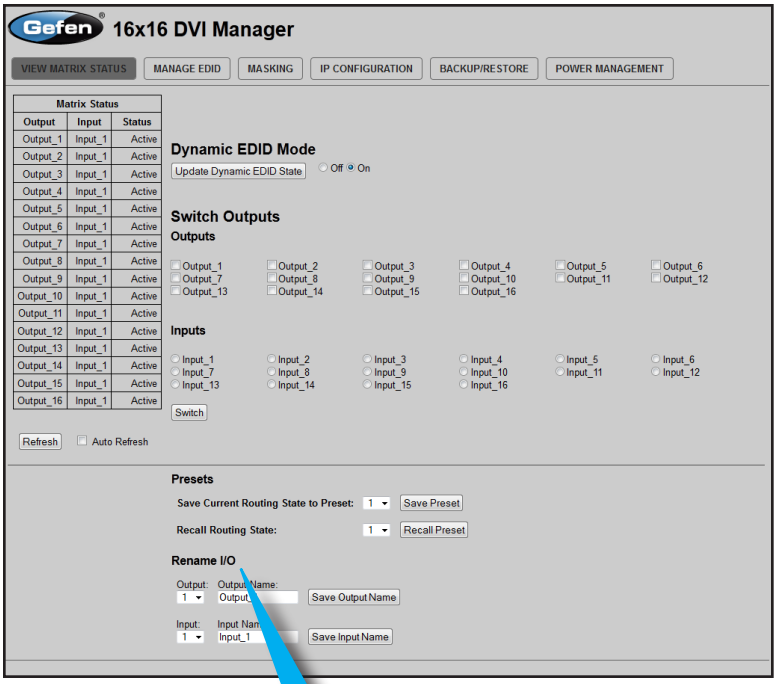
Presets
Provides saving and recalling of routing states.

Pull-down list



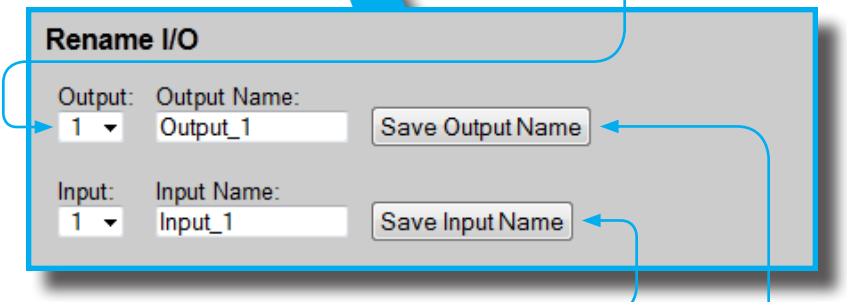
Recall Preset
Click the down-arrow on the pull-down list to select the routing state (1-16) to recall. Click the Recall Preset button to recall the preset.

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

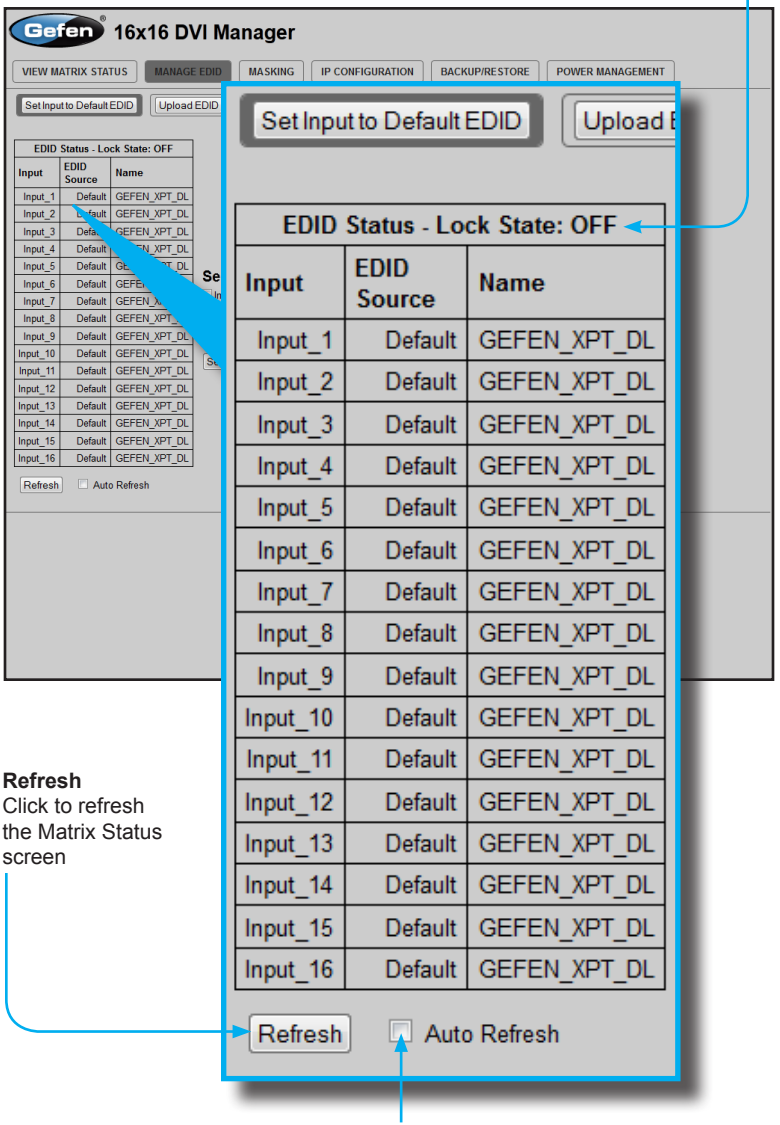


Input
Select the DVI input to rename from the pull-down list. Type the name of the input in the Input Name field. Click the Save Input Name button to save changes. See page 38 for naming restrictions.

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 39 for naming restrictions.

Manage EDID

EDID Status
Displays the current EDID status for each input on the matrix and indicates the current Lock State (page 21).

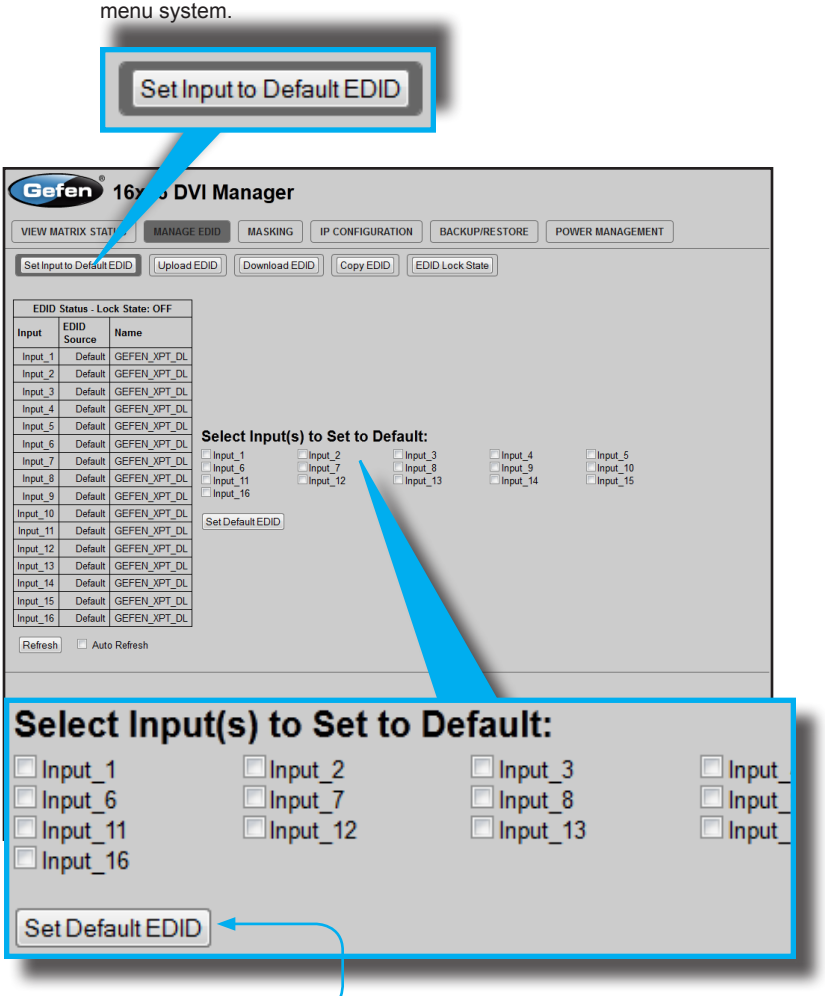


Refresh
Click to refresh the Matrix Status screen

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

Set Input to Default EDID

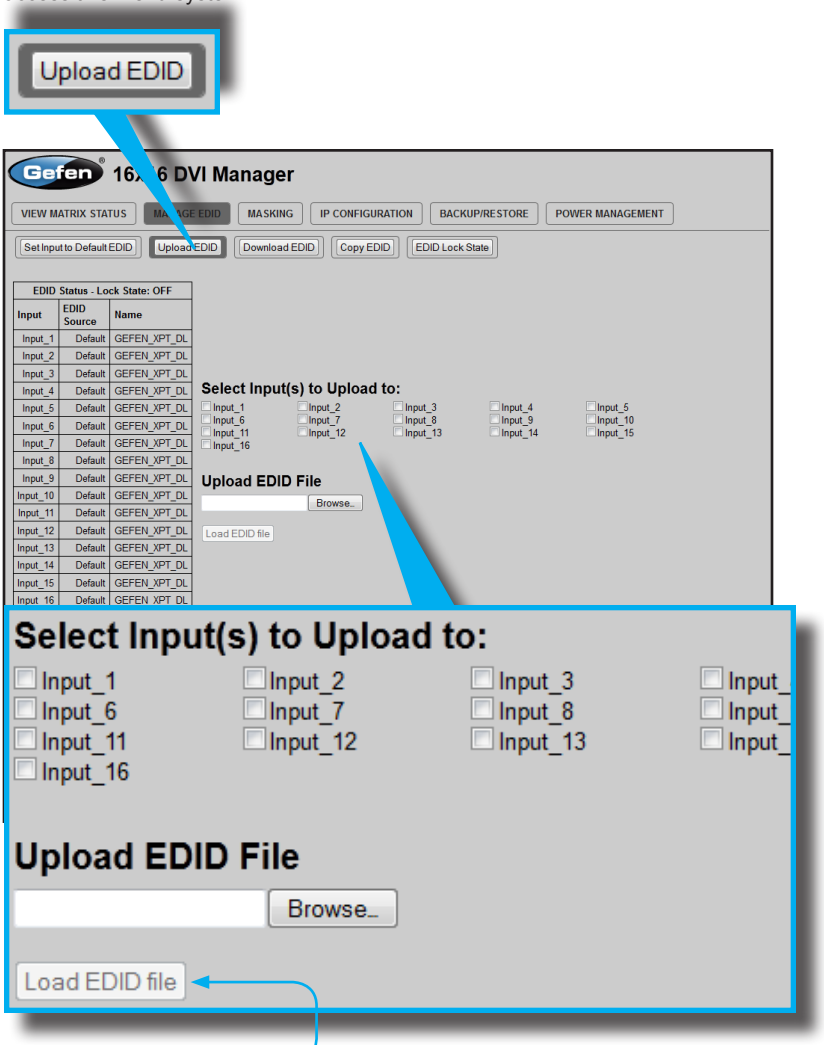
Set Input to Default EDID
Press this button from the Manage EDID screen to access this menu system.



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.

Upload EDID

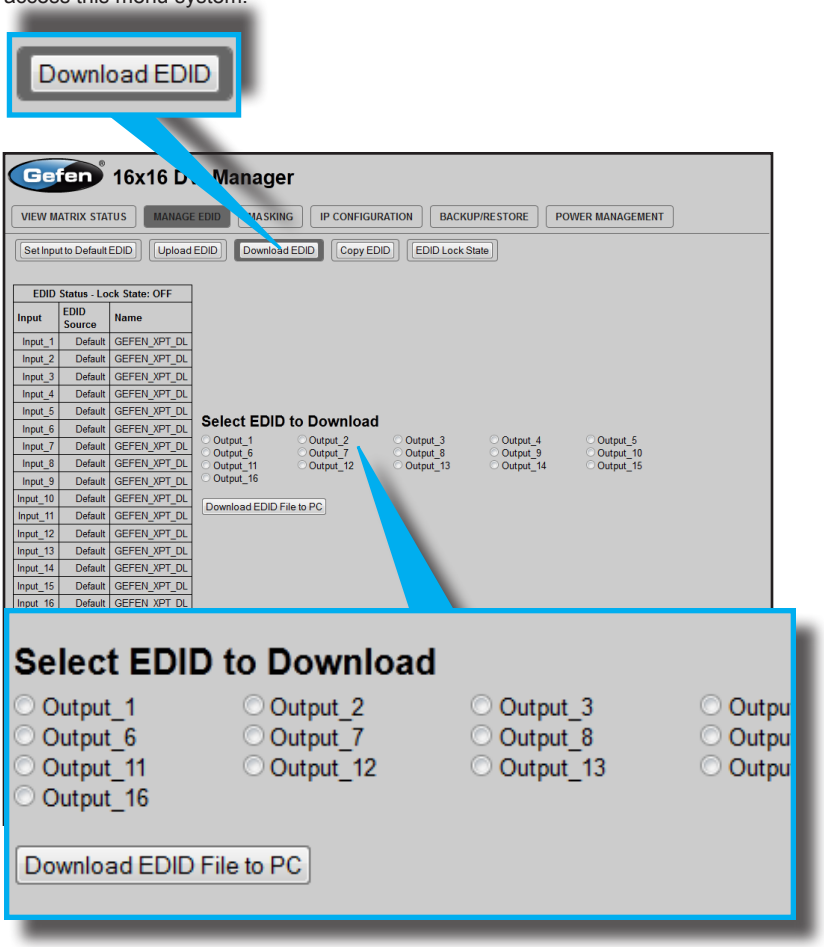
Upload EDID
Press this button from the Manage EDID screen to access this menu system.



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.

Download EDID

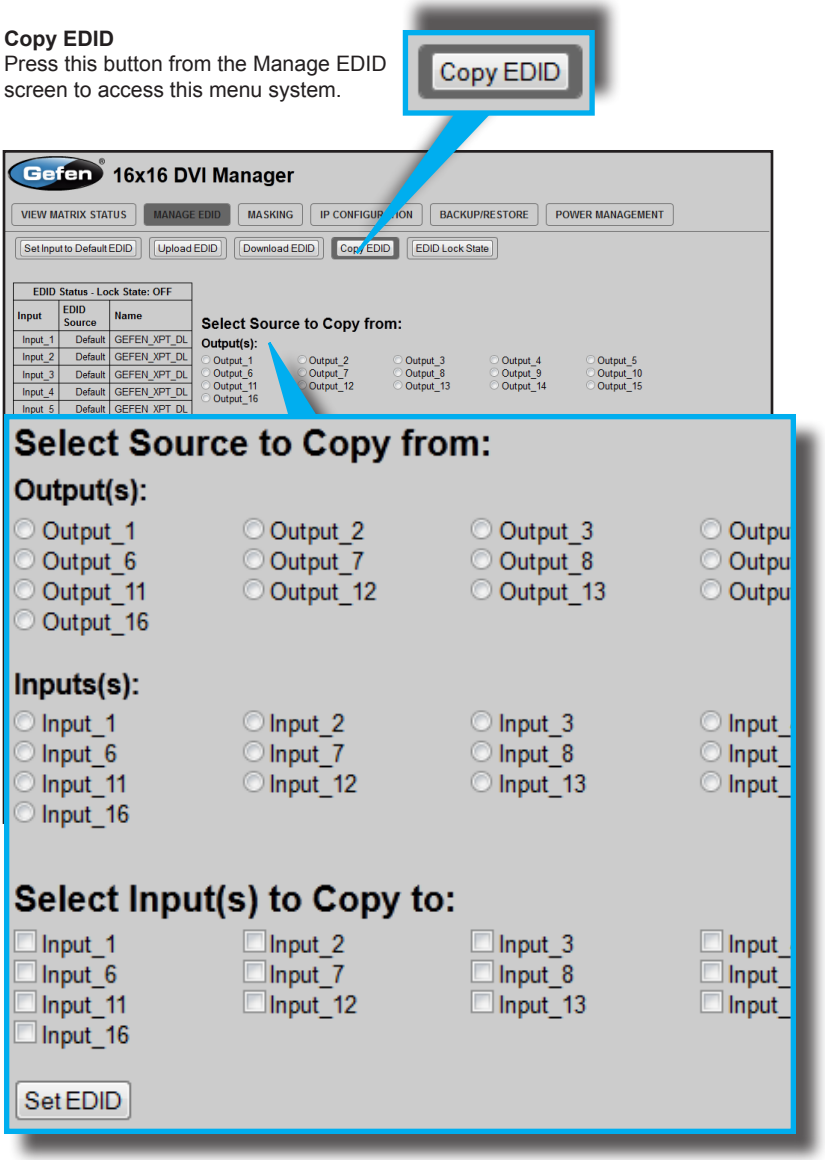
Download EDID
Press this button from the Manage EDID screen to access this menu system.



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.

Copy EDID

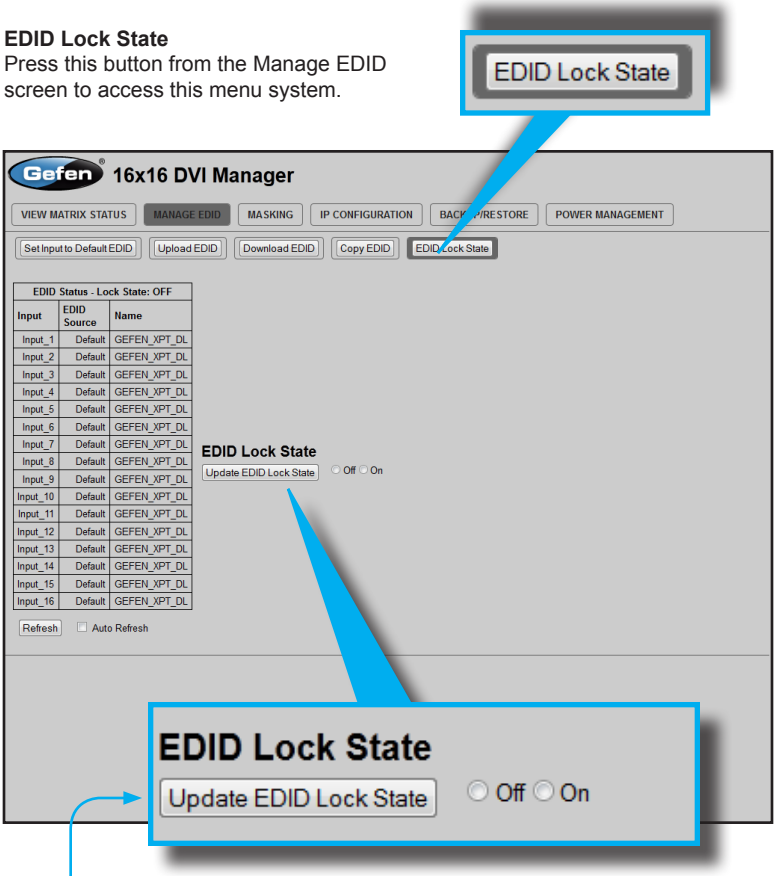
Copy EDID
Press this button from the Manage EDID screen to access this menu system.



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.

EDID Lock State

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

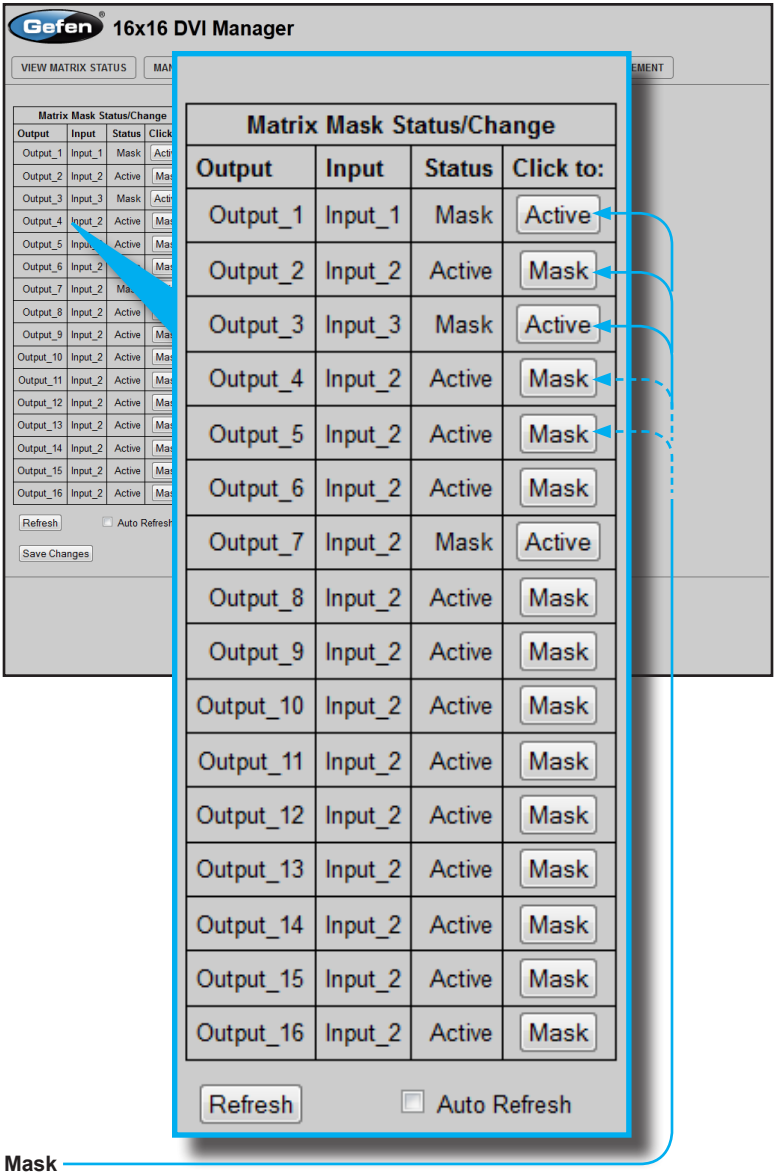


Update EDID Lock State
Secures the Local EDID and disables the automatic loading of the downstream EDID after the Matrix is powered on. Select the radio button next to the Off or On option then click the Update EDID Lock State button to apply the change.

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

Masking

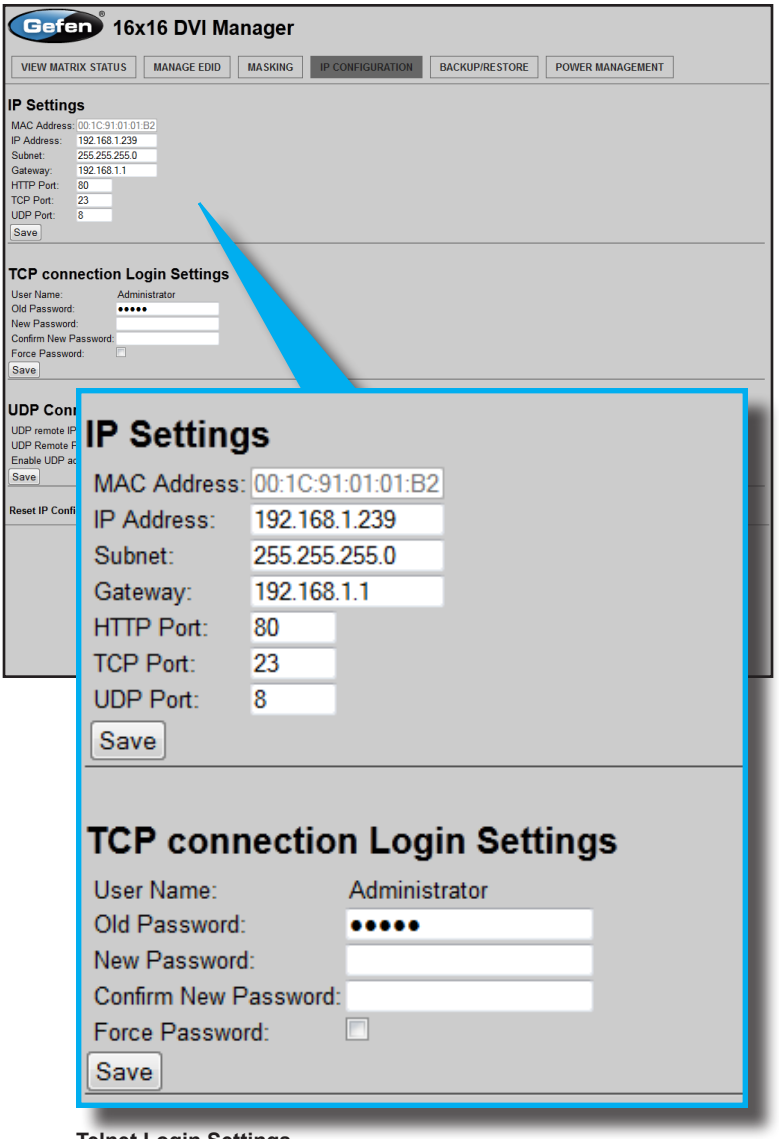
Matrix Mask Status / Change
Displays the current masking status for each output.



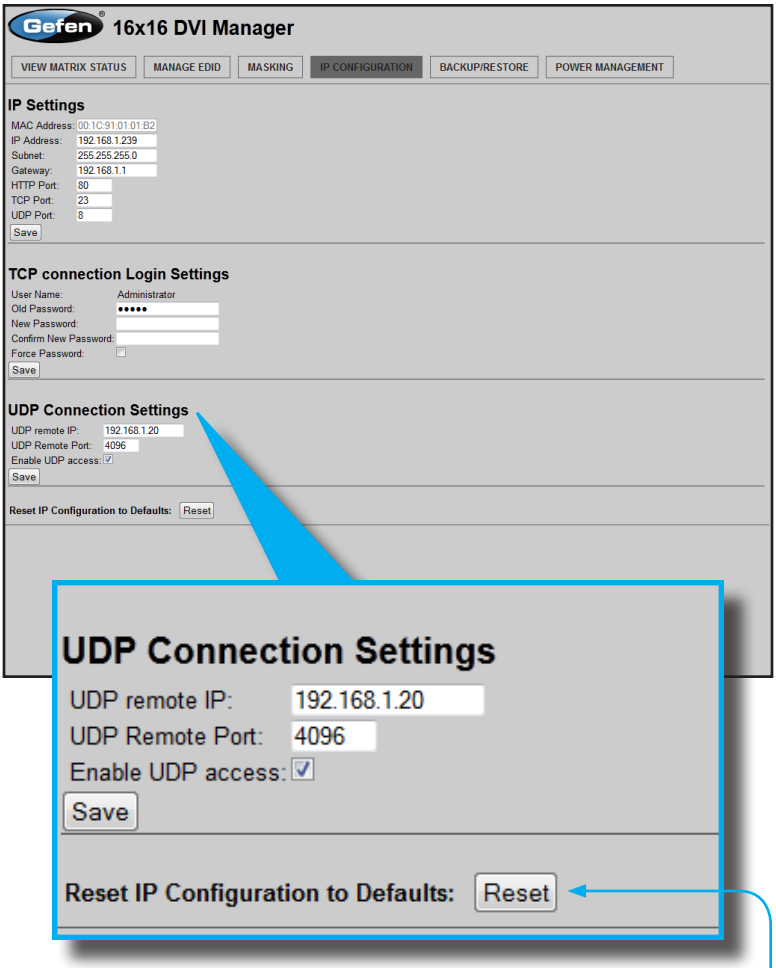
Mask
Click the Mask button to mask the selected output. If the output is already masked then the button will read “Active” (enabled). Click the (“Active”) button again to toggle the masking state to “Mask” (disabled).

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.



Telnet Login Settings
Sets / forces the password for Telnet sessions to the matrix. Click the Save button to apply changes.

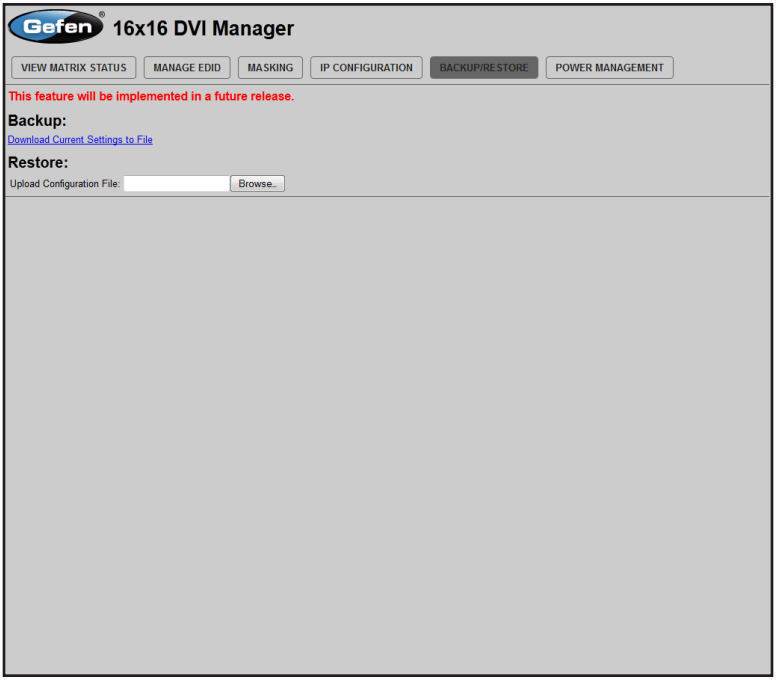


UDP Connection Settings
Sets UDP remote IP and remote port. Also enables or disables UDP access to the matrix. Click the Save button to apply changes.

Reset
Click the Reset button to restore the factory-default IP settings.

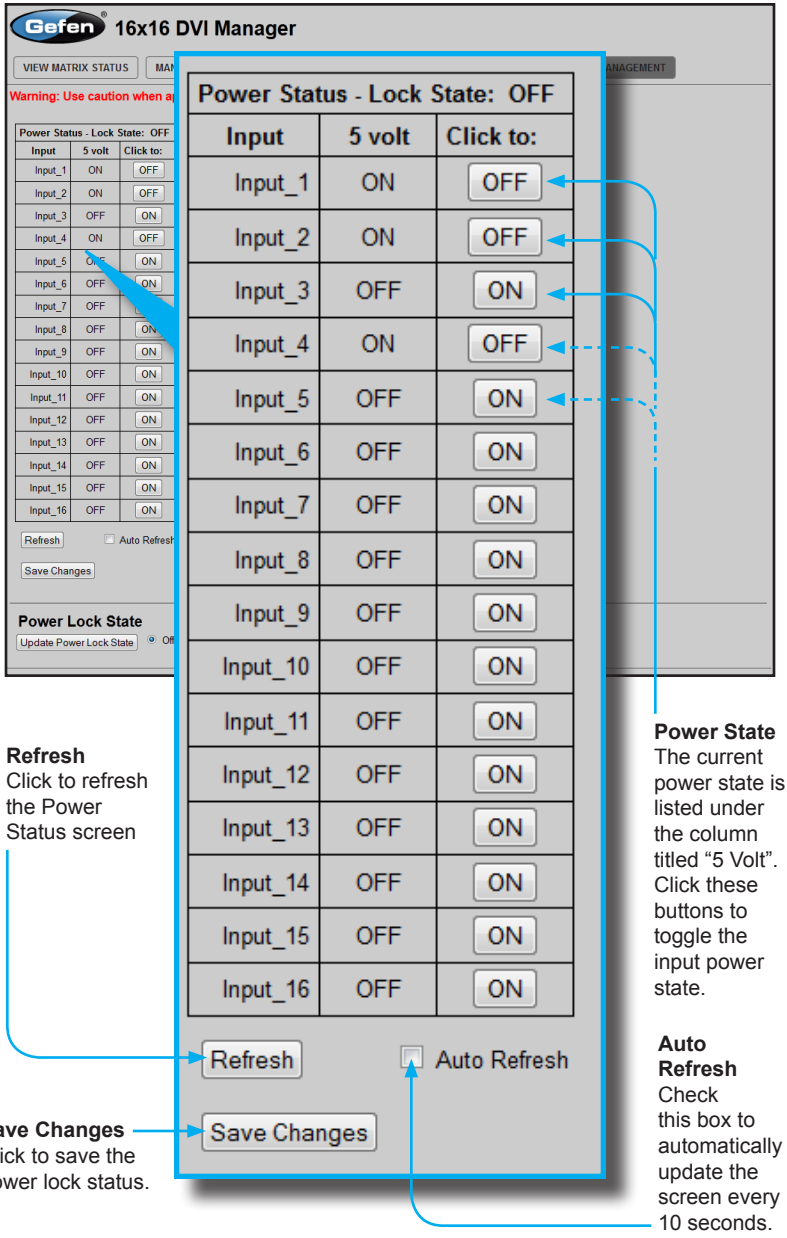
Backup / Restore

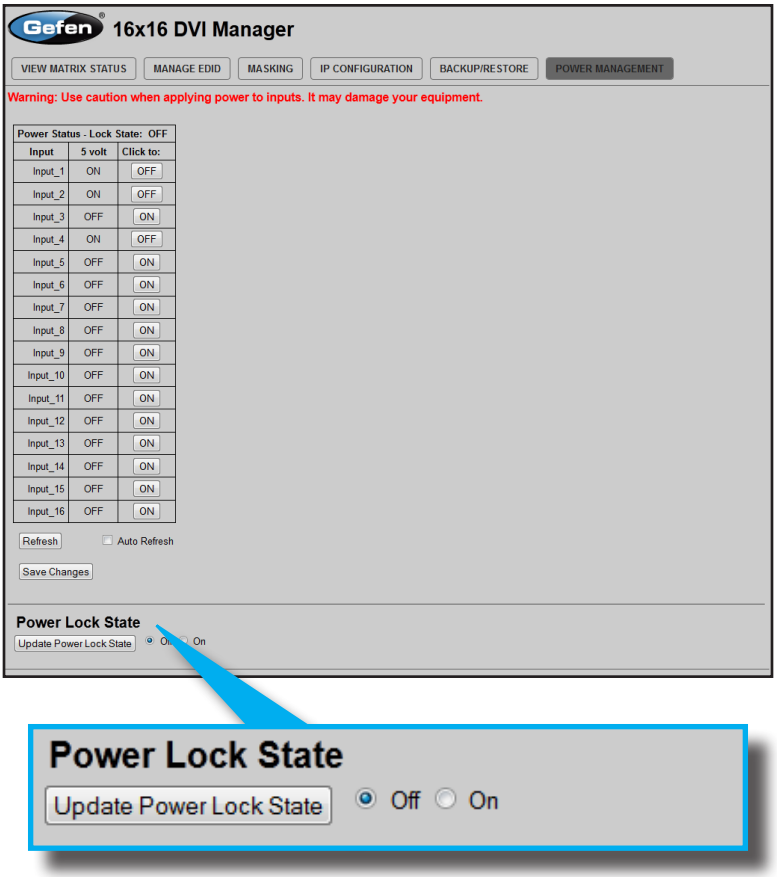
The Backup / Restore feature for the 16x16 DVI Matrix is not currently implemented and will be available in a future release of the firmware.



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.





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.

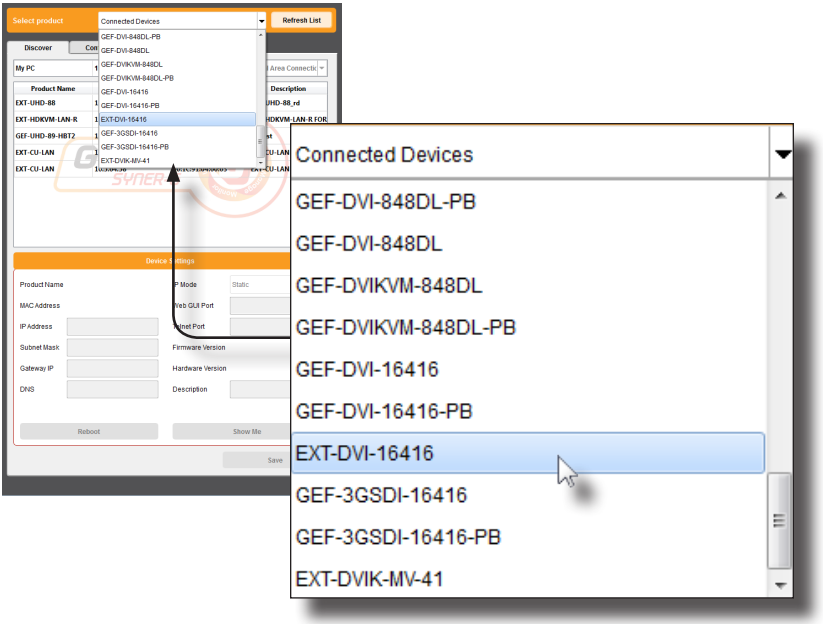
By default, this option is set to Off.

UPDATING THE FIRWMARE

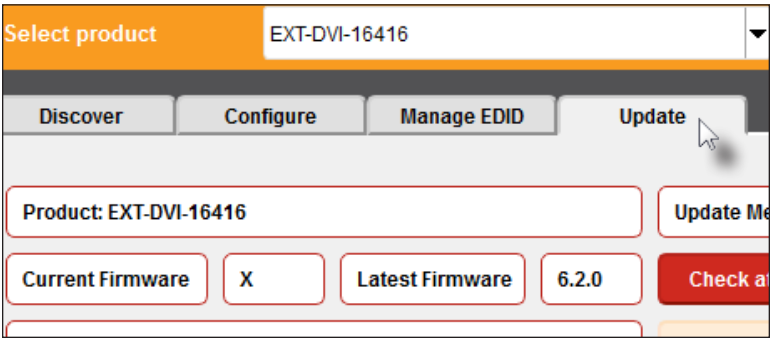
Use the Gefen Syner-G software to update the 16x16 DVI Matrix firmware the latest version. Before continuing, make sure that the computer that is running the Syner-G software is connected to the Internet and that an RS-232 cable is connected between the matrix and the PC that is running the Syner-G software.

1. Launch the Gefen Syner-G software.

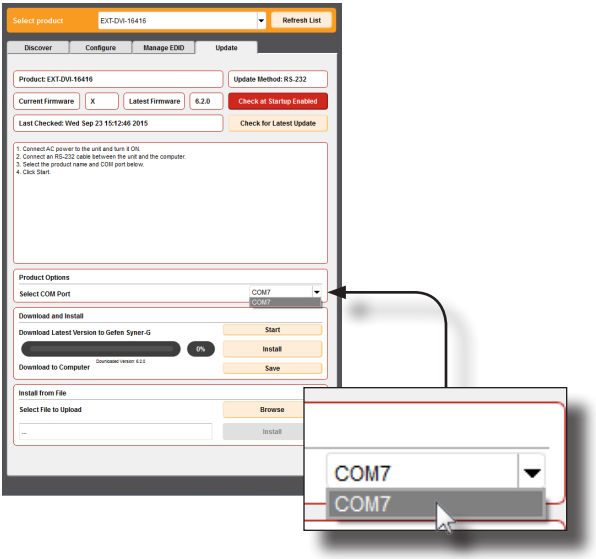
2. Select the EXT-DVI-16416 from the drop-down list.



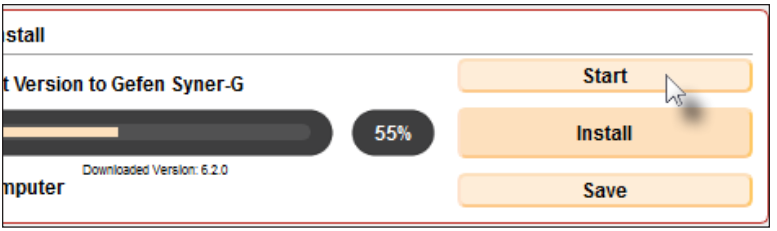
3. Click the **Update** tab.



4. Select the COM port, used by the RS-232 port on the computer, from the drop-down list.



5. Click the **Start** button, under the **Download and Install** section of the interface.



After the **Start** button is clicked, the Syner-G software will automatically download the latest firmware and begin updating the matrix. The update process will be indicated by the progress bar.

6. After the firmware update process is complete, the matrix will automatically reboot.

If multiple EXT-DVI-16416 matrixes are being updated, then click the **Install** button after connecting the RS-232 cable between the computer and the matrix.

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:

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. 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:

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 and contact Gefen Technical Support. See **Asking for Assistance** at the beginning of this manual.

Critical Malfunctions

Temperature Failure

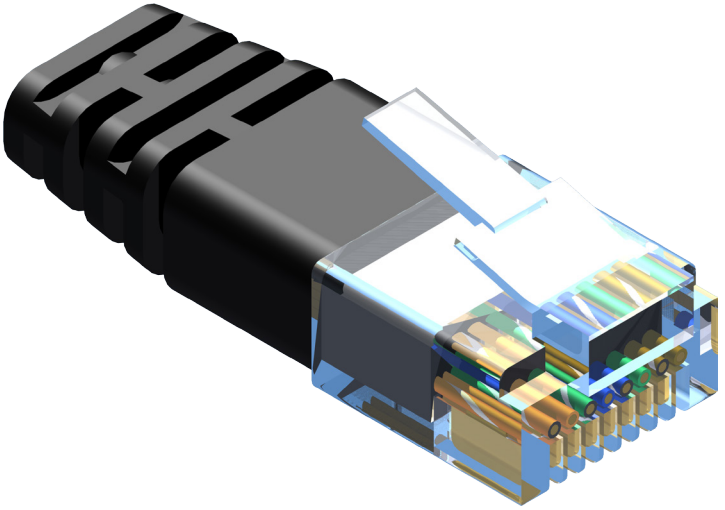
If the measured system temperature exceeds 85° C, the following message will be displayed on the LCM:

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:

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

NETWORK CABLE WIRING DIAGRAM



Gefen recommends the TIA/EIA-568-B wiring option. Please adhere to the table below when field-terminating the cable for use with Gefen products.

Pin	Color
1	Orange / White
2	Orange
3	Green / White
4	Blue
5	Blue / White
6	Green
7	Brown / White
8	Brown

Cabling comes in stranded and solid core types. Gefen recommends using solid core cabling.

It is recommended to use one continuous run from one end to the other. Connecting through a patch is not recommended.

a. Maximum recommended ambient temperature: 45 ˚C (104 ˚F).

b. Increase the air flow as needed to maintain the recommended temperature inside the rack.

c. Do not exceed maximum weight loads for the rack. Install heavier equipment in the lower part of the rack to maintain stability.

d. Connect a bonding wire between an approved safety ground and the grounding screw on the chassis.

SPECIFICATIONS

Maximum Pixel Clock.....165 MHz

Video Input Connectors.....(16) DVI-I 29-pin Female, Digital Only

Video Output Connectors.....(16) DVI-I 29-pin Female, Digital Only

RS-232 serial port.....(1) DB-9 Female

IP port.....(1) RJ-45 Female

IR Extender Port.....(1) 3.5mm Stereo

IR Extender type.....EXT-RMT-EXTIR

Power Consumption.....90 Watts maximum

Rack mountable.....2U height, standard 19” wide rack, rack ears included

Power Supply.....(1) 24V DC

Dimensions (W x H x D, not including connectors and buttons):

Without rack ears.....17.2” x 3.5” x 7.5” (435mm x 89mm x 191mm)

With rack ears.....19” x 3.5” x 7.5” (483mm x 89mm x 191mm)

Unit Weight (with rack ears).....10.6 lbs (4.8 kg)

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.

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

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

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This product uses UL or CE listed power supplies.