16x16 DVI Matrix

EXT-DVI-16416

User Manual

www.gefen.com

ASKING FOR ASSISTANCE

Technical Support:

Telephone	(818) 772-9100
	(800) 545-6900
Fax	(818) 772-9120

Technical Support Hours:
8:00 AM to 5:00 PM Monday thru Friday PST

Write To:

Gefen, LLC
c/o Customer Service
20600 Nordhoff St
Chatsworth, CA 91311

www.gefen.com
support@gefen.com

Notice

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

16x16 DVI Matrix is a trademark of Gefen, LLC

Rev C14

CONTENTS

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

Now you can easily combine sixteen cross-platform computers and sixteen digital displays using the 16x16 DVI Matrix. The 16x16 DVI Matrix provides a simple, reliable and highly effective method of routing multiple computer workstations. Each computer is capable of displaying video on any one of the 16 monitors. There are 4 methods of controlling the Matrix - by using the front panel buttons, the IR remote, a built-in RS-232 interface, or through IP Control over a local area network.

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.

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

- The 16x16 DVI Matrix will not pass HDCP content.
- There is no internal scaling in the 16x16 DVI Matrix. All of the attached monitors must be able to display the resolutions output by the source devices. For maximum compatibility it is recommended that only one compatible/common resolution be used by all of the source devices.
- Advanced EDID features and IP configuration features are accessible via the RS-232 serial communication port. Please see page 14 for more information.
- Routing and EDID features can be accessed via a web browser using the IP control feature, built into the 16x16 DVI Matrix.

Features

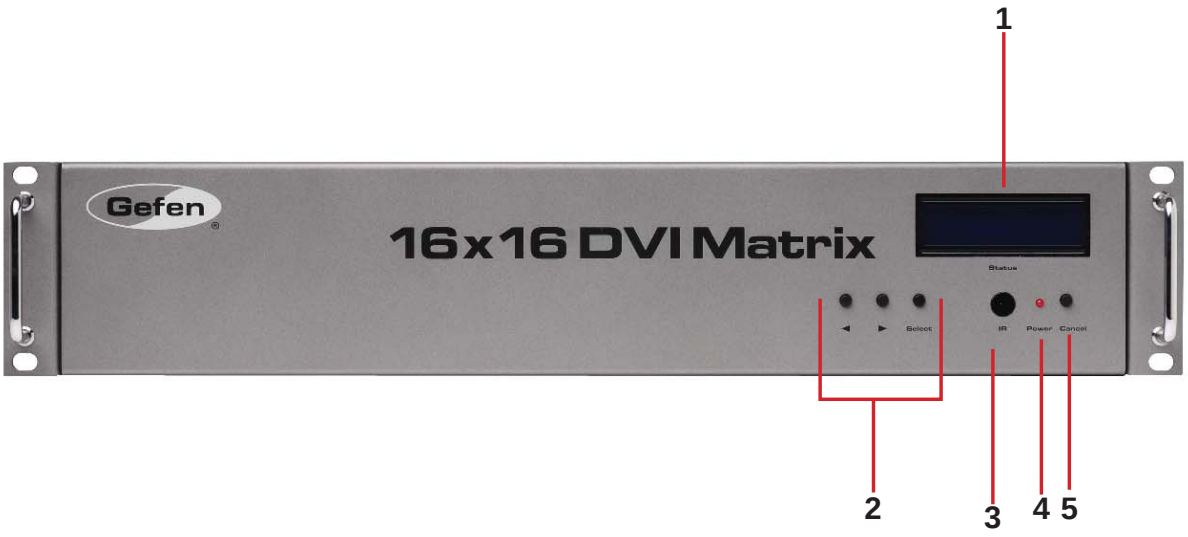
- Increases productivity by providing access to 16 displays from any 16 computers.
- Web-based control switching
- Maintains beautiful, sharp resolutions up to 1920x1200.
- Serial RS-232 port for remote control via a computer or control automation device.
- Supports DDWG standards for DVI monitors

Package Includes

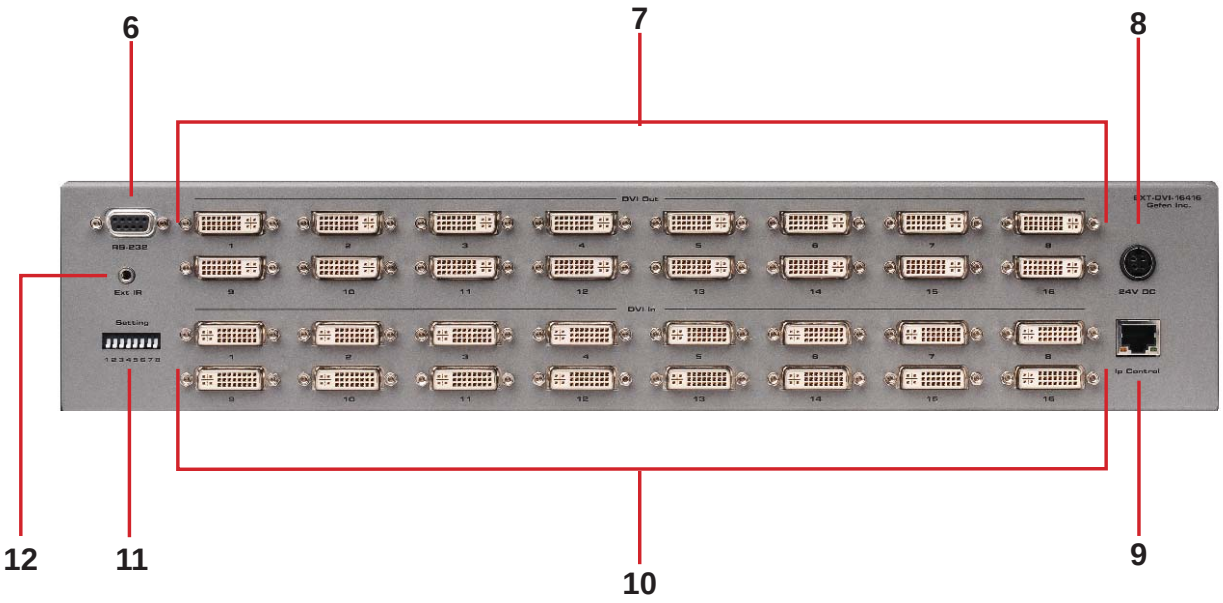
(1) 16x16 DVI Matrix
(16) 6-foot DVI cables
(1) IR Remote (EXT-RMT-16416IR)
(1) 24 V DC Power Supply
(1) Set of Rack Ears
(1) User Manual

PANEL LAYOUT

Front Panel



Back Panel



PANEL DESCRIPTIONS

1 Main LCD Display

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

2 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 page 7 and 8.

3 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.

4 Power LED Indicator

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

5 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.

6 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 14 for more information.

7 DVI Output Ports 1-16

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

8 24V DC Power Receptacle

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

9 10/100 Ethernet Control Interface

This port is used to connect the 16x16 DVI Matrix to a network for IP control. Please see page 29 for more information.

10 DVI Input Ports 1-16

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

11 DIP Switch Configuration Bank

These DIP switches are not used and are for future use.

12 IR Extender Jack

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

2. Connect up to 16 DVI capable display to the DVI outputs on the rear panel of the 16x16 DVI Matrix using DVI cables.

3. Connect the included 24V DC power supply to the power input receptacle on the rear panel of the 16x16 DVI Matrix. Connect the opposite end of the cable into a open wall power socket.

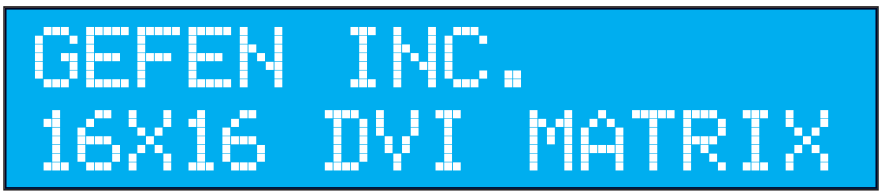
How to Operate the 16x16 DVI Matrix

The 16x16 DVI Matrix offers a number of control options. The following options can be used to control basic routing functions of the 16x16 DVI Matrix:

1. Front Panel Control Buttons - Page 7 - 8
2. RMT-16416IR Remote Control - Page 9 - 11
3. RS-232 Serial Control - Page 14 -28
4. IP Control - Page 29-35

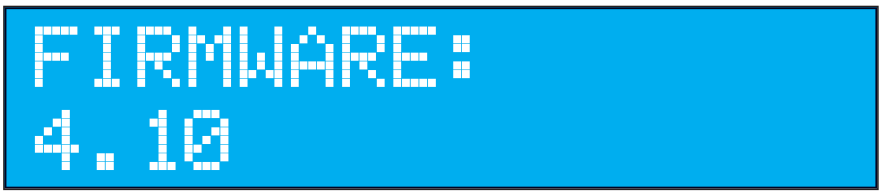
MAIN DISPLAY

The **Main Display** of the 16x16 DVI Matrix is a 16 character 2 line display. This display will show the standby screen and will also be used to aid in performing routing commands. After the Matrix has been turned on, the following screen will be displayed:

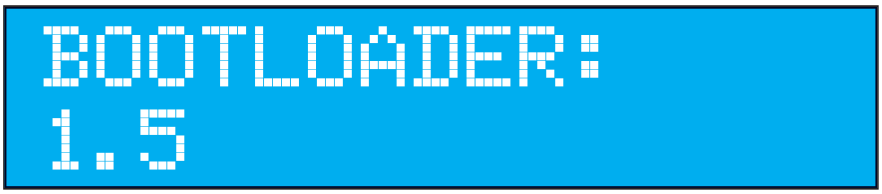


This screen will display the company and product name.

Pressing the ◄ will display the firmware version:



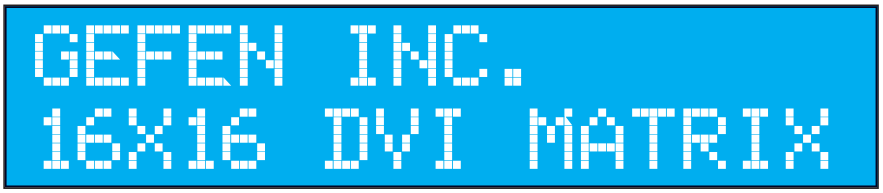
Pressing the ◄ button again will display the bootloader version:



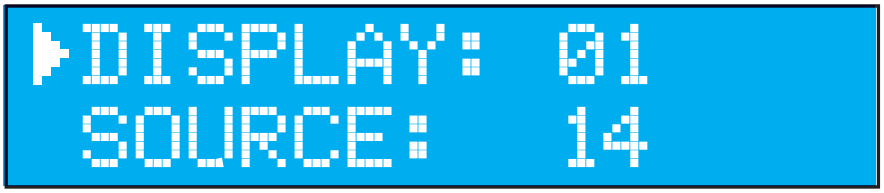
The ► button can also be used to switch the LCM display between firmware version and the bootloader version.

ROUTING

To route sources to a display:

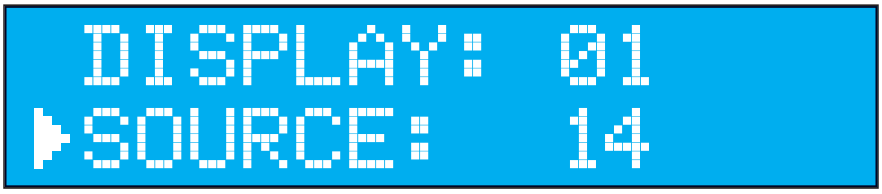


Starting at the standby screen, press the SELECT button. The display selection screen will now be displayed:



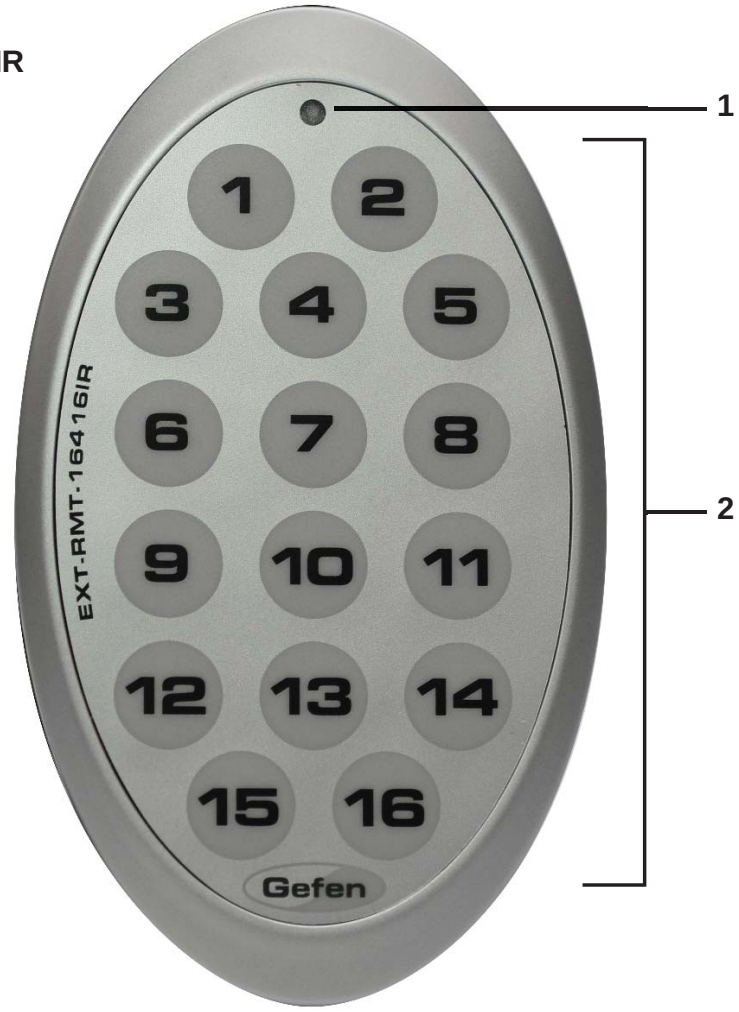
On this screen use the ◄ or ► buttons to select the desired display that will have a source routed to it in the next step. Once selection is complete press the SELECT button to confirm the selection. To cancel this operation at this time press the CANCEL button.

Once the display has been selected and confirmed, the source can then be chosen which will be routed to the selected display. The following is the source selection screen:



On this screen use the ◄ or ► buttons to select the desired display that will be routed to the display selected in the previous step. Once selection is complete press the SELECT button to confirm the selection. The selected source will now be routed to the selected display. Once the routing is complete, the user will be returned to the standby screen. To cancel this operation at this time press the CANCEL button.

RMT-16416IR



1 LED Button Press Indicator

This LED will activate momentarily upon each button press. This visual indicator is to inform the user that a command has been sent by the IR remote control.

2 Display and Source Selection Buttons

These buttons will be used to send display and source selections to the 16x16 DVI Matrix.

Routing Sources to Displays

Issuing a routing command is a two step process. The first step will be to select a the display (1-16) which a source will be routed to in the next step. Once the display has been entered, the source can then be selected. Select the source (1-16) which will be routed to the display selected in the previous step. For example, to route the source connected to input 6 to the display connected to output 4 the input steps would be the following:

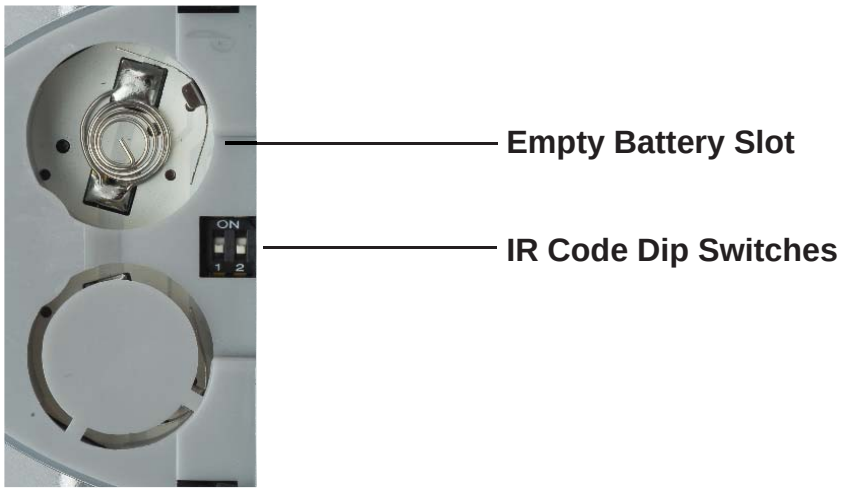
1 Press button 4 (display) on the RMT-16416IR remote control.

2 Press button 6 (source) on the RMT-16416IR remote control.

3 The source will immediately be routed to the display.

RMT-16416IR REMOTE INSTALLATION

To use the RMT-16416IR remote, remove the battery cover on the back of the remote to reveal the battery compartment. Insert the included battery into the open battery slot. The positive (+) side should be facing up. Ensure that both DIP (Dual In-line Package) switches are in the OFF position. Replace the battery cover. The remote ships with 2 batteries. One battery is needed for operation and the other battery is complimentary.



How to Resolve IR Code Conflicts

In the event that IR commands from other remote controls conflict with the RMT-16416IR remote control, changing the remote channel will alleviate this issue. The RMT-16416IR remote contains a set of DIP (Dual In-line Package) switches for setting the IR channel for the remote.

The DIP Switch bank on the RMT-16416IR is located underneath the battery cover.

IMPORTANT: The IR channel on the Matrix must match the IR channel on the remote. Please see page 26 for details.

Remote Channel 1: Default

Remote Channel 2:

Remote Channel 3:

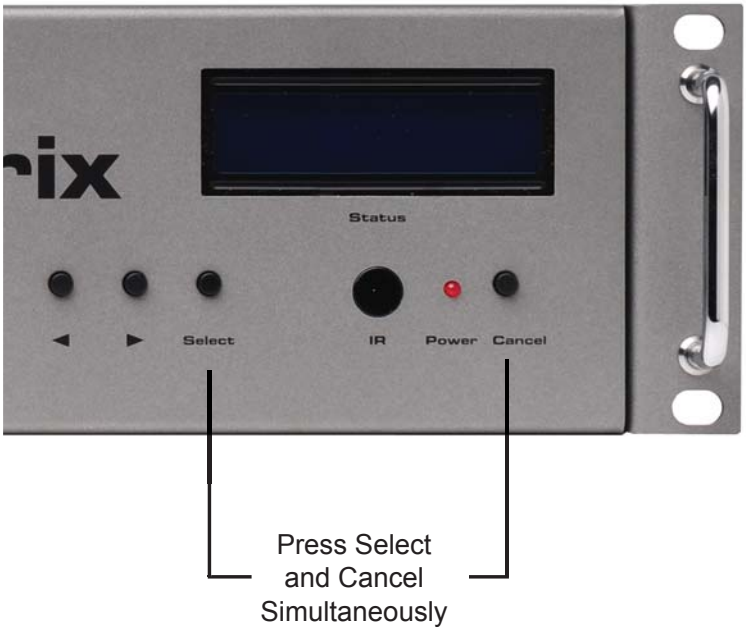
Remote Channel 4:

Left: Picture of the opened rear battery compartment of the RMT-16416IR remote showing the exposed DIP Switch bank between the battery chambers.

STANDBY MODE FEATURE

Invoking Standby Mode

To place the 16x16 DVI Matrix into Stand-by mode, simultaneously press and hold the SELECT and CANCEL buttons for 5 seconds, then release.



Exiting Standby Mode

To exit Standby Mode and return to normal operation, press and hold any button on the front panel for 5 seconds, then release.

Standby Mode can also be invoked using RS-232 by using the #STBYMODE function. Please see page 28 for details.

EDID MANAGEMENT FEATURE

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

Under normal circumstances, a source device (digital and analog) will require information about a connected device/display to assess what resolutions and features are available. The source can then tailor its output to send only resolutions and features that are compatible with the attached device/display. This information is called EDID (Extended Display Information Data) and a source device can only accept and read one EDID from a connected device/display. Likewise, the source an only output one resolution for use by a connected device/display.

Why is EDID so important with the 16x16 DVI Matrix?

The 16x16 DVI Matrix is a complex piece of technology that replicates and switches between multiple inputs and outputs. Each connected source device will require one EDID to read. EDID management is carefully handled by the 16x16 DVI Matrix to provide a single EDID for each source to read.

What options do I have to manage the EDID in the 16x16 DVI Matrix?

First, it is important to note that each source device can only output one video/audio signal type. This includes resolutions and timings. When multiple devices/displays are used, such as with the 16x16 DVI Matrix, it is important to use devices/displays that have similar or compatible resolutions and features. This will ensure that the single video/audio signal produced by the source device is accepted by all of the connected output devices/displays.

The user has the option, through utilization of the RS-232 serial interface, to choose how the unit will manage the EDID from multiple DVI devices/displays. Therefore the user has some control over the resolutions and features that the source devices will output. The 16x16 DVI Matrix has a LOCAL EDID management mode that will control how the EDID information is handled.

How do I change EDID modes in the 16x16 DVI Matrix?

EDID modes and IP configuration is managed via the RS-232 serial communications port. See page 14 for more information on the RS-232 serial communication features.

What features are available via the RS-232 serial communications port?

The GefenPRO 16x16 DVI Matrix can accept commands through the RS-232 serial communications port located on the rear panel. The current RS-232 control features are:

- Switching/routing of inputs to outputs without the IR remote control.
- Managing the EDID bank and EDID that is loaded into the LOCAL EDID.
- Upload new EDID's to the EDID bank or directly to the LOCAL EDID location.
- Manage IP settings.

How do I use these features?

These features were initially intended for utilization by custom installers in automated setups. However, these features can be tested and used by using any Windows PC with a terminal program.

What pins are used for communication with the GefenPRO 16x16 DVI Matrix?

Only pins 2 (Receive), 3 (Transmit), and 5 (Ground) are used for communication. A null-modem adapter should not be used with this product.

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

RS-232 Settings

Bits per second 19200

Data bits 8

Parity ..... None

Stop bits 1

Flow Control ..... None

RS-232 Features

RS-232 remote functions are used to control of this product's features. Features include input to output routing, EDID storage, EDID management, etc.

Functions Syntax

The syntax for each function is always the same:

#Character as the start flag → Function name → Space (_) as function name end flag → Parameter 1 → Space → Parameter n → Carriage Return (\r) →

Sample:

#FunctionName_param1_param2_param3_param4...\r

Syntax is NOT case sensitive.

Commands

Simplified syntax was used for command implementation for faster operation with the device: # character – isn't needed, the command name is reduced to 1 letter. The commands are not case-sensitive.

Command	Description
R	Routing command
S	Routes a single input to all outputs
M	Returns the current routing status of matrix
F	Toggle 5V fiber optic extender feature

R Command

The R command allows specific routing of inputs and outputs.

Syntax:

```
r param1 param2
```

Parameters:

param1	DVI Ouput	[1 - 16]
param2	DVI Input	[1 - 16]

S Command

The S command routes a single input to all 16 DVI outputs.

Syntax:

```
s param1
```

Parameters:

param1	Input	[0 - 16]

Notes:

Setting *param1* to a value of 0 will place the matrix in *one-to-one mode*. This means that Input1 will be routed to Output1, Input2 will be routed to Output2, and so on.

M Command

The M command displays the current routing status of the matrix.

Syntax:

```
m
```

Parameters:

None

F Command

The F command returns the state of pin 14 of the DVI inputs.

Syntax:

`f`

Parameters:
None

Notes:

"High" is returned if +5V is enabled on the DVI input. "Low" is returned if +5V is disabled on the DVI input.

Using parameters with the **F Command**

Permits disabling / enabling of +5V for Fiber Optic Extenders.

Syntax:

`f param1 param2`

Parameters:

param1	DVI input	[1 - 16]
param2	State	[0 - 1]

Value	Meaning
0	Disable
1	Enable

Notes:

Setting *param1* to a value of 0 will apply the value of *param2* to all inputs.

EDID Management

Function	Description
#EDIDDSTOLO	Read downstream EDID and stores into a Local EDID
#EDIDDSTOBA	Read downstream EDID and stores in EDID Bank
#EDIDBATOLO	Read downstream EDID and stores in any Local Input
#EDIDDETOLO	Stores the default EDID in any input Local EDID
#LOEDIDTOLO	Load EDID file using serial port to one of the local memories
#PRLOEDID	Prints the Local EDID
#PRDSEDID	Read downstream EDID and sends to serial port
#PRBAEDID	Read EDID from bank and sends to serial port
#PREDIDST	Print EDID from stored Local banks.
#LOCKEDID	Secures the Local EDID

#EDIDDSTOLO Function
The **#**EDIDDSTOLO function reads the downstream EDID and stores it to a Local EDID.

Syntax:

```
#EDIDDSTOLO param1 param2 param3...param9
```

Parameters:

param1	A downstream display	[1 - 16]
param2	Input list	[0 - 16]
param3 - 9 (optional)	Input list	[1 - 16]

Notes:

By specifying zero as the second parameter, 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 #EDIDSDTOLO function must be executed twice:

Example:

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

Instead, this function must be run twice:

```
#EDIDDSTOLO 2 1 2 3 4 5 6 7 8           max 8 inputs!
#EDIDDSTOLO 2 9 10 11                   remaining inputs
```

#EDIDDSTOBA Function

The #EDIDDSTOBA function reads the downstream EDID and stores it to a specified EDID bank.

Syntax:

```
#EDIDDSTOBA param1 param2
```

Parameters:

param1	A downstream display	[1 - 16]
param2	EDID bank offset	[1 - 5]

#EDIDBATOLO Function

The #EDIDBATOLO function reads an EDID from an EDID bank and stores it to any local input.

Syntax:

```
#EDIDBATOLO param1 param2 param3...param9
```

Parameters:

param1	EDID bank offset	[1 - 5]
param2	Input list	[0 - 16]
param3 - 9 (optional)	Input list	[1 - 16]

Notes:

By specifying zero as the second parameter, the EDID in the specified bank is copied to all sixteen inputs. If more than eight inputs need to be specified in order to receive the EDID in the specified bank, the #EDIDBATOLO function must be executed twice.

Example:

```
#EDIDBATOLO 5 2 3 4 5 6 7 8 9 10 11 12  not permitted!
```

Function must be run twice:

```
#EDIDBATOLO 5 2 3 4 5 6 7 8 9           max 8 inputs
#EDIDBATOLO 5 10 11 12                  remaining inputs
```

#EDIDDETOLO Function

The #EDIDDETOLO function stores the Default EDID in any Local EDID.

Syntax:

```
#EDIDDETOLO param1 param2 param3...param9
```

Parameters:

param1	Input list	[0 - 16]
param2 - 9 (optional)	Input list	[1 - 16]

Notes:

By specifying 0 for *param1*, all inputs will receive the Default EDID or use *param1 - param9* to specify individual local inputs which will receive the Default EDID.

#LOEDIDTOLO Function

The #LOEDIDTOLO function loads the specified EDID file to a specified local input via RS-232.

Syntax:

```
#LOEDIDTOLO param1 param2 param3
```

Parameters:

param1	Input	[1 - 16]
param2	EDID size	[1 - 2]

Value	Meaning
1	128 byte EDID
2	256 byte EDID

param3	eco	[0 - 1]

Notes:

Set *param1* to a value of 0 in order to specify all inputs. When using HyperTerminal, *param3* must be set to 1. Otherwise, set *param3* to 0.

#PRDSEDID Function

The #PRDSEDID function reads the downstream EDID and sends it to the serial port.

Syntax:

```
#PRDSEDID param1
```

Parameters:

param1	A downstream display	[1 - 16]

#PRLOEDID Function

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

Syntax:

```
#PRLOEDID param1
```

Parameters:

param1	Input	[1 - 16]

#PRBAEDID Function

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

Syntax:

```
#PRBAEDID param1
```

Parameters:

param1	Bank	[1 - 5]

#PREDIDST Function

The #PREDIDST function prints a table that contains details relating to the Local EDID source and the display name.

Syntax:

`#PREDIDST`

Parameters:

None

#LOCKEDID Function

The #LOCKEDID function secures the Local EDID and disables the automatic loading after power-up.

Syntax:

`#LOCKEDID param1`

Parameters:

param1 EDID lock state [0 - 1]

Value	Meaning
0	Disable
1	Enable

IP Configuration

Function	Description
#SIPADD	Specifies a new IP address
#SNETMASK	Specifies a new net mask
#SGATEWAY	Specifies the new gateway
#SPORT	Specifies a new port
#PRWEBADD	Displays IP configuration and release details
#RSTIP	Sets default IP configuration

#SIPADD Function

The #SIPADD function specifies a new IP address.

Syntax:

```
#SIPADD param1 param2 param3 param4
```

Parameters:

param1	IP address	[0 - 255]
param2	IP address	[0 - 255]
param3	IP address	[0 - 255]
param4	IP address	[0 - 255]

Notes:

A reboot is required after using this function.

#SNETMASK Function

The #SNETMASK function specifies a new net mask.

Syntax:

```
#SNETMASK param1 param2 param3 param4
```

Parameters:

param1	IP address	[0 - 255]
param2	IP address	[0 - 255]
param3	IP address	[0 - 255]
param4	IP address	[0 - 255]

Notes:

A reboot is required after using this function.

#SGATEWAY Function

Specifies the new IP gateway.

Syntax:

```
#SGATEWAY param1 param2 param3 param4
```

Parameters:

param1	Gateway address	[0 - 255]
param2	Gateway address	[0 - 255]
param3	Gateway address	[0 - 255]
param4	Gateway address	[0 - 255]

Notes:

A reboot is required after using this function.

#SPORT Function

Specifies a new port.

Syntax:

```
#SPORT param1
```

Parameters:

param1	Port	[0 - 255]

Notes:

A reboot is required after using this function.

#PRWEBADD Function

Prints the current IP configuration on the screen.

Syntax:

```
#PRWEBADD
```

Parameters:

None

#RSTIP Function

Sets IP configuration to default.

Syntax:

```
#RSTIP
```

Parameters:

None

Notes:

This command requires the unit to be rebooted in order to take effect.

General Functions

Function	Description
#FADEFAULT	Reset Matrix to default settings
#RMTIRADD	Set the remote IR channel
#MASKOUT	Blanks selected outputs
#ACTIVEBOLO	Enables the boot loader
#LOCKPOWER	Toggles the lock power state
#STBYMODE	Set system to Standby Mode

#FADEFAULT Function

The #FADEFAULT function will erase all local memory EDID banks, reset default routing, and clear all IP settings.

Syntax:

`#FADEFAULT`

Parameters:

None

#RMTIRADD Function

The #RMTIRADD function set the remote IR channel.

Syntax:

`#RMTIRADD param1`

Parameters:

param1 IR channel [0 - 3]

Value	Meaning
0	IR channel 1
1	IR channel 2
2	IR channel 3
3	IR channel 4

#MASKOUT Function

The #MASKOUT function allows blanking of selected outputs.

Syntax:

```
#MASKOUT param1 param2
```

Parameters:

param1	Output	[1 - 16]
param2	Masking state	[0 - 1]

Value	Meaning
0	Unmask
1	Mask

Notes:

The current masking state will be lost if the unit is rebooted or power is lost.

#ACTIVEBOLO Function

The #ACTIVEBOLO function enables the boot loader.

Syntax:

```
#ACTIVEBOLO
```

Parameters:

None

Notes:

This command must be typed twice in order to activate the boot loader.

#STBYMODE Function

The #STBYMODE places the Matrix in stand-by mode. Stand-by mode reduces power consumption.

Syntax:

```
#STBYMODE param1
```

Parameters:

param1 State [0 - 1]

Value	Meaning
0	Disable stand-by mode
1	Enable stand-by mode

#LOCKPOWER Function

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

Syntax:

```
#LOCKPOWER param1
```

Parameters:

param1 State [0 - 1]

Value	Meaning
0	Disable Power Lock
1	Enable Power Lock

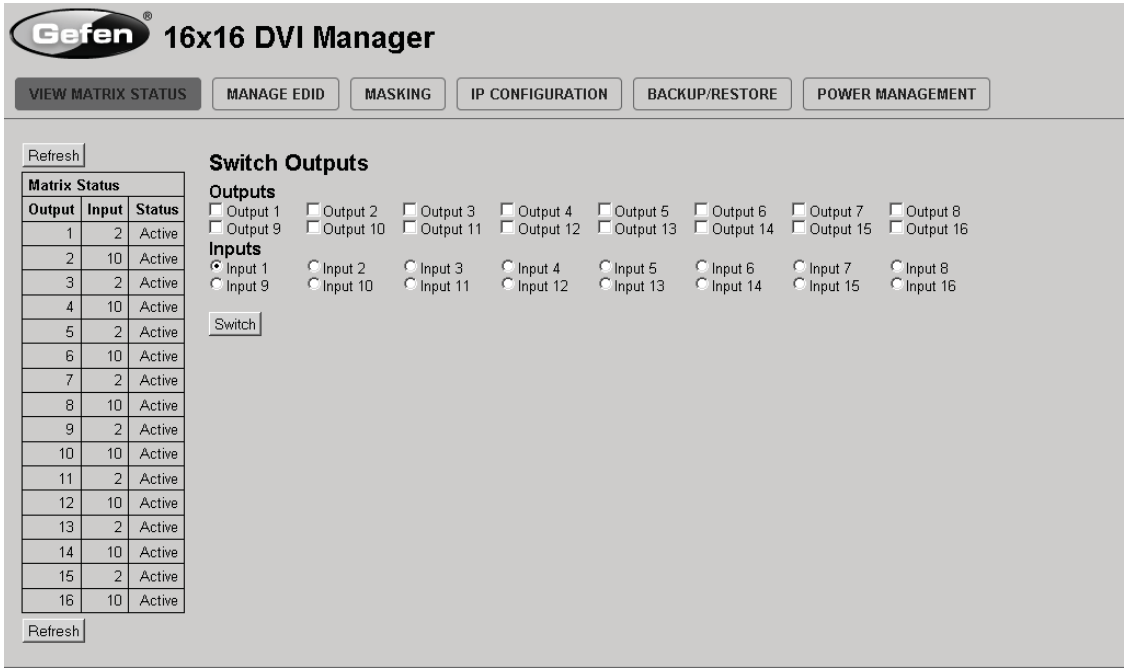
IP CONTROL - MAIN PAGE

The 16x16 DVI Matrix supports IP based control via an IP Control. To access this feature an IP address, subnet, gateway, and port need to be set on the 16x16 DVI Matrix (**Default IP: 192.168.0.70 Subnet: 255.255.255.0 Gateway: 192.168.0.1 Port: 80**). These settings must fall within your networks IP address range. Please consult your network administrator to obtain the proper IP address and settings for this product to properly communicate on your network.

The IP control setting can be configured via the RS-232 control interface. Once this has been accomplished, access using IP Control is possible.

Simply type the IP address that was assigned to the product in a web browser to access the **Main Page**. It should look like the image below.

MAIN PAGE



The **Main Page** will display the current status and can also be used to create routes.

To create a new route, follow the steps below:

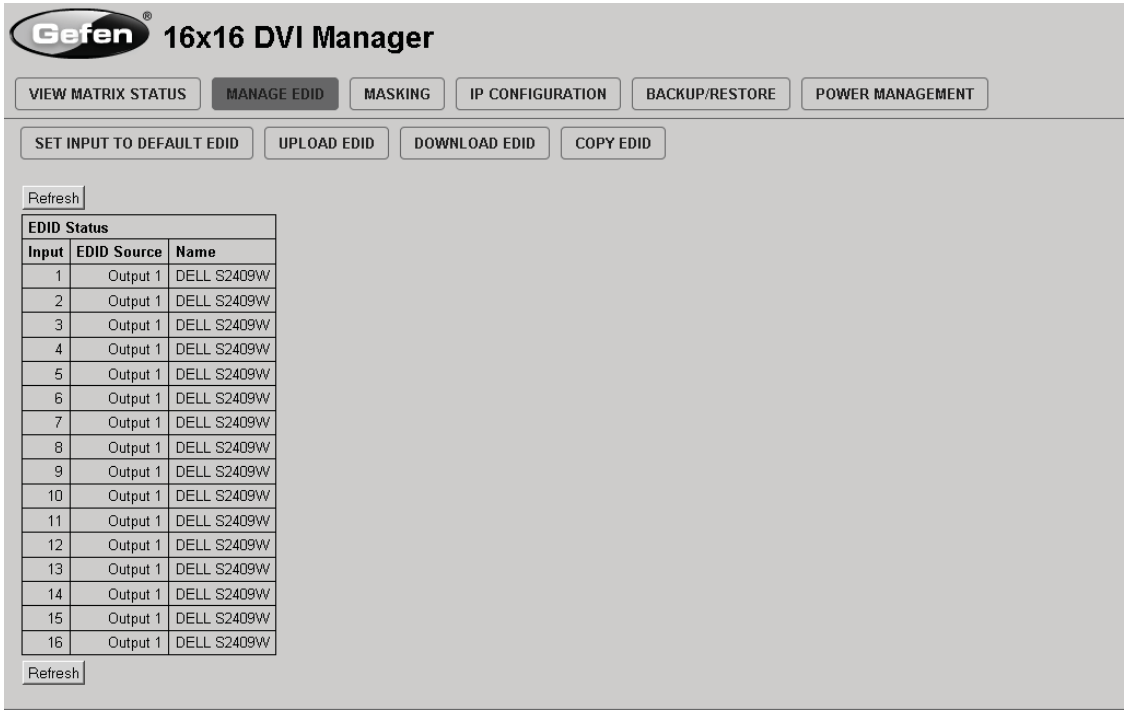
1. Click on the check boxes of all of the outputs that you would like to route an input to.

2. Click on the input that will be routed to the selected outputs.

3. Click the “Switch” button to initiate the change(s).

This page will automatically refresh every minute, however, at anytime the “Refresh” button can be pressed to refresh the status of the matrix.

MANAGE EDID



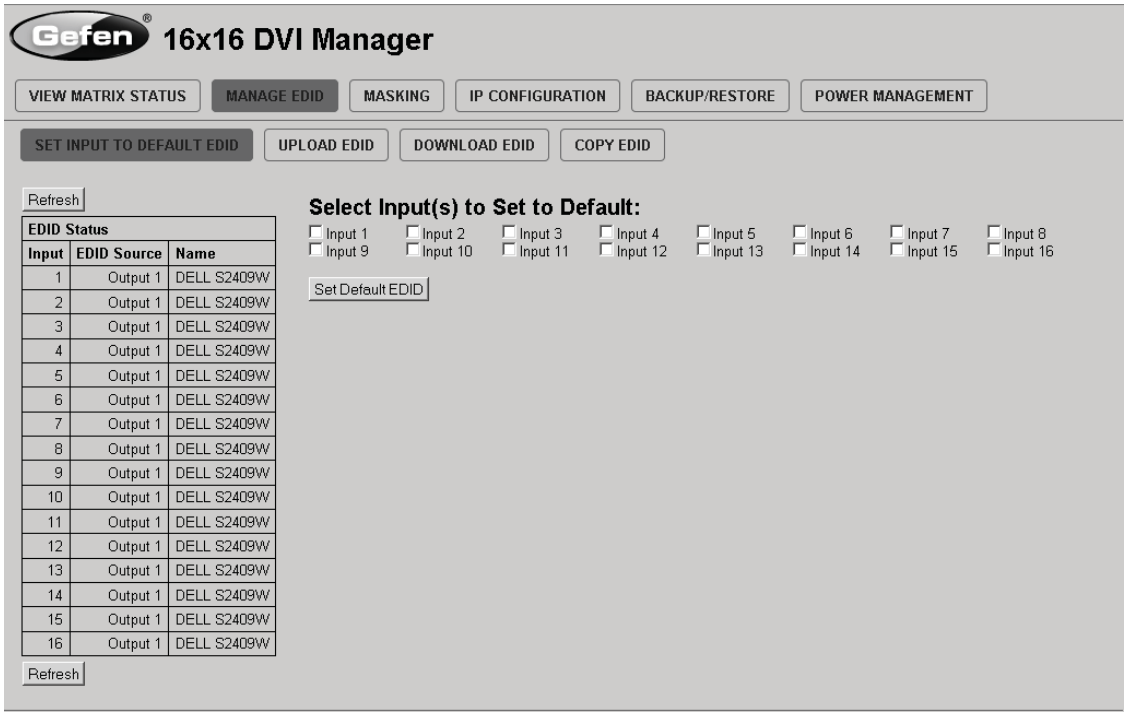
The **Manage EDID** page is used to see the status of the EDID saved in the LOCAL storage location for each input. This section has additional tabs for advanced EDID functions. These tabs are:

- SET INPUT TO DEFAULT EDID
- UPLOAD EDID (Future Implementation)
- DOWNLOAD EDID (Future Implementation)
- COPY EDID

This page will automatically refresh every minute, however, at anytime the “Refresh” button can be pressed to refresh the status of the matrix.

SET INPUT TO DEFAULT EDID

Pressing the “SET INPUT TO DEFAULT EDID” button will display additional options. The following page will open.



On this page the user can select which LOCAL memory locations will be overwritten with a built-in EDID stored in the 16x16 DVI Matrix. To set an input’s LOCAL memory location to the default EDID follow the steps below.

1. Select any number of inputs from the section “Select Input(s) to Set to Default”.

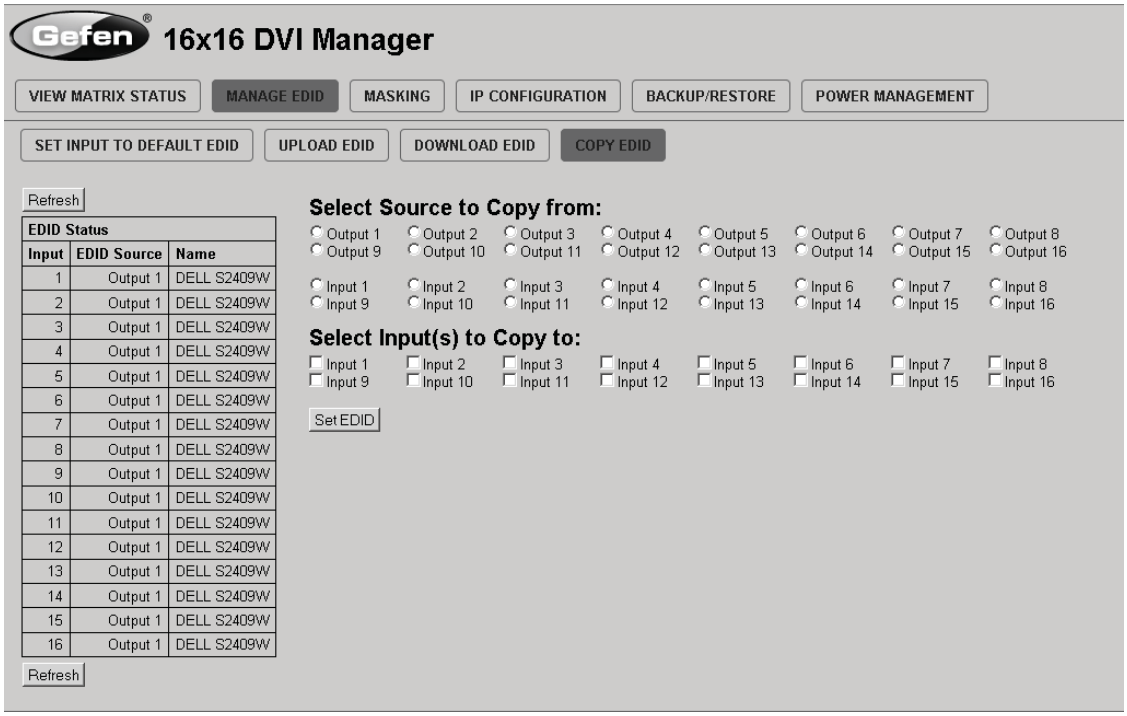
2. Click on the “Set Default EDID” button to initiate the change(s).

NOTE: After this command is complete the user will be returned to the **Main Page**.

This page will automatically refresh every minute, however, at anytime the “Refresh” button can be pressed to refresh the status of the matrix.

COPY EDID

Pressing the “COPY EDID” button will display additional options. The following page will open.



On this page, the user can select an EDID from either the LOCAL memory locations (Input) or from a display that is currently attached to any output, and copy that EDID to any other LOCAL memory location. This will allow the user to manage what EDID information will be passed to each source connected to the 16x16 DVI Matrix.

To copy an EDID follow the steps below.

1. Select an EDID from the section ”Select Source to Copy from”. The user can choose an EDID from a display connected to one of the outputs or from an EDID already loaded into one of the LOCAL memory locations (Input).

NOTE: Please note that only one EDID can be selected for copying.

2. Select the LOCAL memory locations that will receive the selected EDID in the section “Select Input(s) to Copy to”.

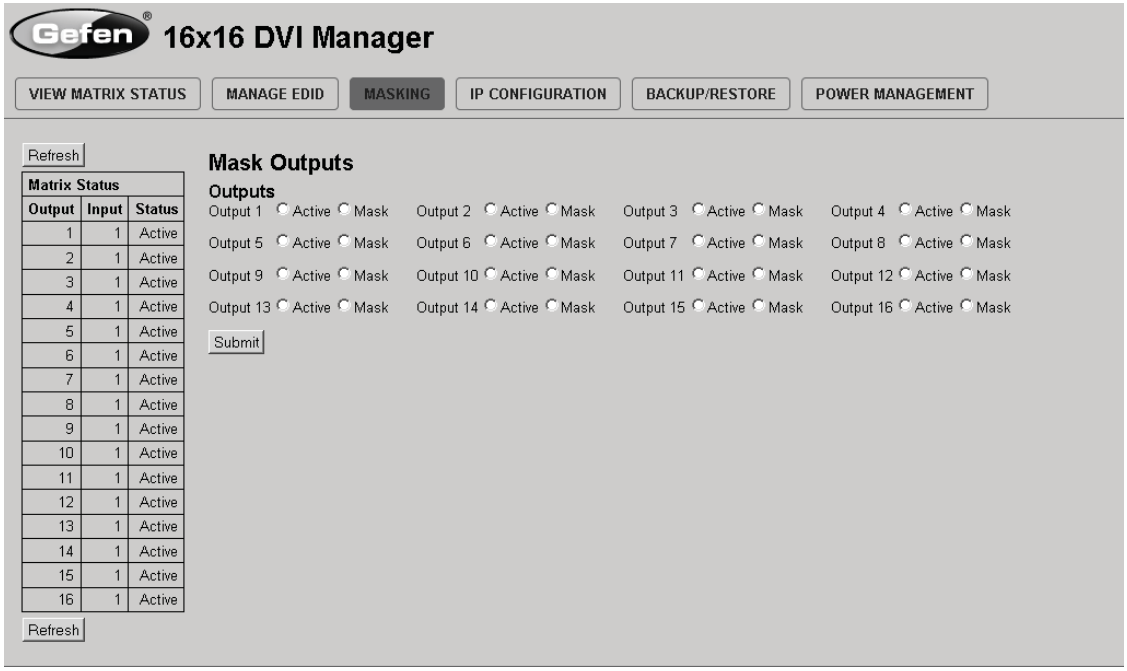
NOTE: Multiple LOCAL memory locations can be specified during this step.

3. Click on the “Set EDID” button to initiate the change(s).

NOTE: After this command is complete the user will be returned to the **Main Page**.

This page will automatically refresh every minute, however, at anytime the “Refresh” button can be pressed to refresh the status of the matrix.

MASKING



The **Masking** page is used to hide an output from displaying any video. From this page, all outputs can be set to “Active” or “Mask”. When an output is set to “Active”, it will function normally. When an output is set to “Mask”, it will not output any video. To set the “Active” or “Mask” mode, follow the steps below.

1. Select either “Active” or “Mask” for any number of desired outputs.

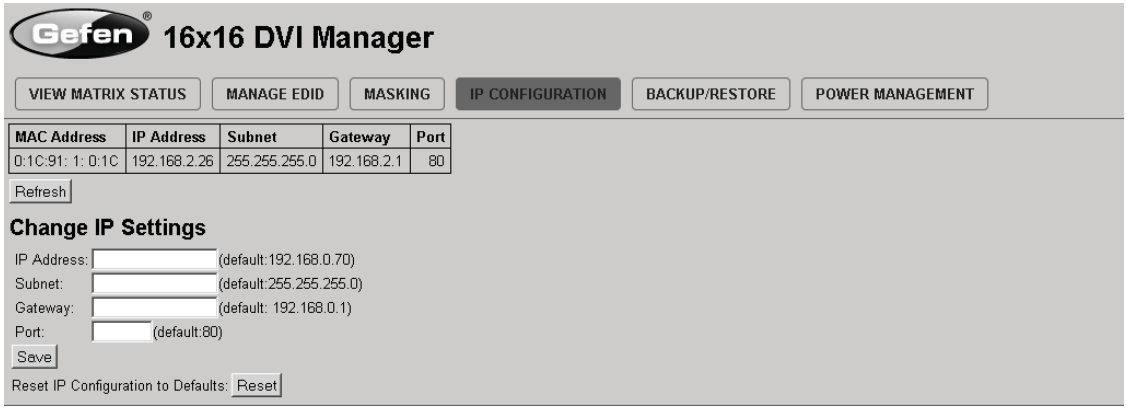
2. Press the “Submit” button to initiate the change(s).

NOTE: After this command is complete the user will be returned to the **Main Page**.

This page will automatically refresh every minute, however, at anytime the “Refresh” button can be pressed to refresh the status of the matrix.

NOTE: Routing and Masking can also be managed without the Web Interface. Please see page 36 for details.

IP CONFIGURATION



The **IP Configuration** page is used to set the IP settings that will be used to access the unit using IP Control. The following items can be configured from this menu.

- IP Address (Default: 192.168.0.70)
- Subnet (Default: 255.255.255.0)
- Gateway (192.168.0.1)
- Port (Default: 80)

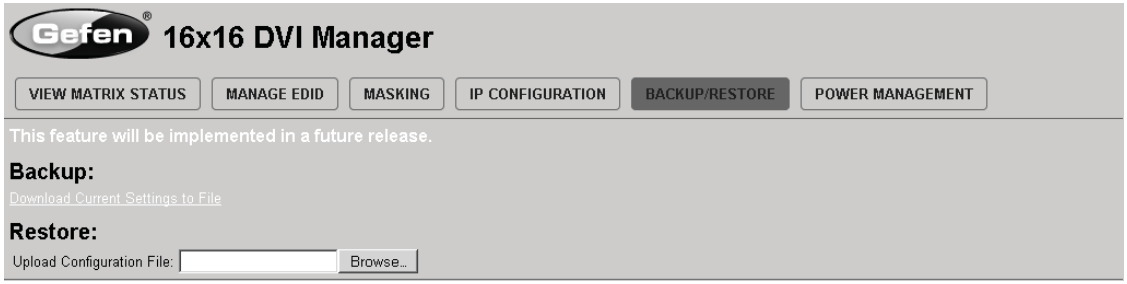
To change these settings follow the steps below.

1. Enter the desired network information into the fields provided.
2. Press the “Save” button to initiate the change(s).

NOTE: After this command is complete the user will be returned to the **Main Page**. Setting made on this page will not take effect until the unit is restarted. Please disconnect power from the unit and reconnect power for changes to take effect.

At any time, the “Reset” button can be pressed to return the IP settings to their defaults.

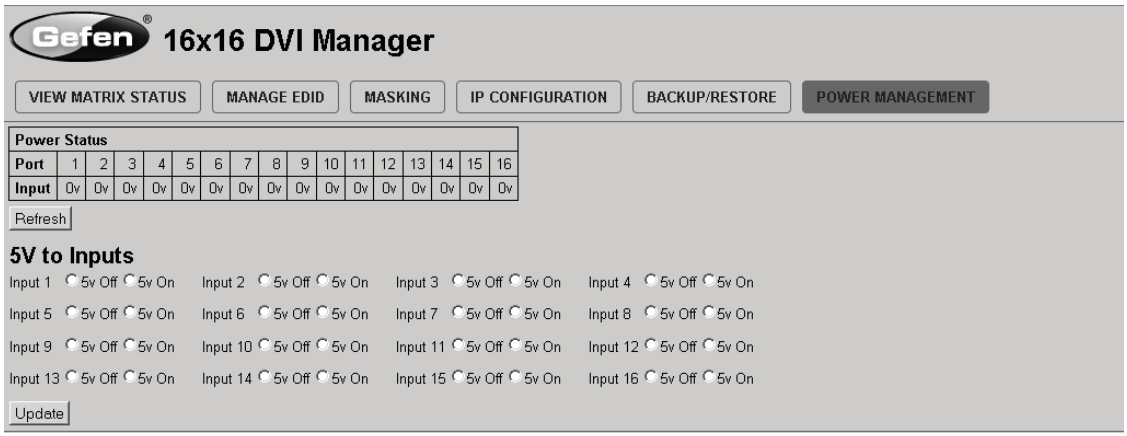
BACKUP/RESTORE



The **Backup/Restore** page is used to backup and restore complete setup configurations.

NOTE: This feature will be implemented in a future release.

POWER MANAGEMENT



The **Power Management** page is used to set optional +5V power on an input to power specific optional devices. The current status of this feature for each input can be viewed on this page. To set this feature for each input follow the steps below.

1. Select the +5V option, either “On” or “Off” for each desired input.

2. Click on the “Update” button to initiate the change(s).

NOTE: After this command is complete the user will be returned to the **Main Page**.

This page will automatically refresh every minute, however, at anytime the “Refresh” button can be pressed to refresh the status of the matrix.

Switching and Masking without the Web Interface

The Gefen 16x16 DVI Matrix uses HTML form attributes to communicate to the box. It uses the 'method' attribute with the 'get' value to send a command. The Matrix has a set of values that sends a valid command to perform switching and masking. If a command is valid, an "OK" message will be displayed. If the command is invalid, a "FAIL" message will be displayed.

Switching

Below is the syntax for the SWITCH command. The table below lists the only values that can be entered to perform a successful switch. All values are case-sensitive.

Syntax

Single Output

```
http://<matrix IP address>/cgibin.shtml?a=s&o=<output
value>&i=<input value>*
```

* Brackets should be removed and replaced with values according to the Switching Table on page 37.

Multiple Outputs

```
http://<matrix IP address>/cgibin.shtml?a=s&o=<output
value>&o=<output value 2>&o=<output value 3>&o=<output value
n>i=<input value> **
```

** When working with multiple outputs, a maximum of 16 output ports can be entered. To specify additional ports to switch, type:

```
&o=<output value>
```

Do not use the angled brackets when typing the command.

Switching Table

Input / Output Port	Value
1	0
2	1
3	2
4	3
5	4
6	5
7	6
8	7
9	8
10	9
11	A
12	B
13	C
14	D
15	E
16	F

Examples

Single Output

`http://192.168.0.70/cgibin.shtml?a=s&o=0&i=0`

Assigns Input 1 to Output 1.

`http://192.168.0.70/cgibin.shtml?a=s&o=a&i=2`

Assigns Input 3 to Output 11.

Multiple Outputs

`http://192.168.0.70/cgibin.shtml?a=s&o=0&o=1&o=2&o=3&i=0`

Output 1, 2, 3 and 4 will be assigned to Input 1

`http://192.168.0.70/cgibin.shtml?a=s&o=5&o=8&o=a&o=d&o=e&i=a`

Output 6, 9, 11, 14 and 15 will be assigned to Input 1.

Masking

When masking output ports, there are two states: Active and Masked. Multiple ports or all ports can be masked with a single command. It is possible to combine masking and activating multiple ports using a single command.

Below is the syntax for the MASK command. The table below lists the range of values permitted to perform a successful mask. If you enter the wrong value, the command will return a “FAIL” message. All values are case-sensitive.

Syntax

```
http://<matrix IP address>/cgibin.shtml?a=m&<Output
port>=<Value: Masking Command: Activate/Mask> *
```

* Remove the angled brackets and replace their values according to the values provided in the table, below.

Masking Table

Output Port	Value
1	o0
2	o1
3	o2
4	o3
5	o4
6	o5
7	o6
8	o7
9	o8
10	o9
11	oA
12	oB
13	oC
14	oD
15	oE
16	oF

Masking Command

Masking Command	Value
Activate	0
Mask	1

Examples

`http://192.168.0.70/cgibin.shtml?a=m&o0=1 *`

Masks Output 1. If the masking command value is set to 0, Output 1 will be re-enabled.

`http://192.168.0.70/cgibin.shtml?a=m&o5=0&oA=1&o3=1&oF=0`

Masks Output 11 and 4 while activating Output 6 and Output 16.

FIRMWARE UPDATE PROCEDURE

To Begin the update procedure the unit's Boot Loader must be activated. To activate the Boot Loader please follow the procedure below:

If the unit is already powered on, the following RS-232 command can be used to activate the Boot Loader:

1. Connect RS-232 cable to PC and activate the Hyper Terminal program.
2. Type the command: #ACTIVEBOLO\r
3. Re-type the command: #ACTIVEBOLO\r

If the unit is not powered on, follow the instructions below to activate the Boot Loader:

1. Connect RS-232 cable to PC and activate the Hyper Terminal program.
2. Make sure Hyperterminal is set to the following:
    a. Baud rate = 19200
    b. Stop bits = 1
    c. Data bits = 8
    d. Flow control = None
3. Press the following three buttons on the front panel of the 16x16 simultaneously, while powering-on the unit:
    a. select
    b. < (left cursor)
    c. > (right cursor)

Once the Boot Loader is activated the following message should appear:

```
16x16 Boot Loading
================= Main Menu ============================
Download new program -------- 1
Cancel --------------------- 2
=======================================================
```

Follow the on-screen instructions to complete the firmware update process:

1. Press [1] on the computer keyboard to begin downloading program to the temporary memory.
2. A message will appear in Hyperterminal:

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

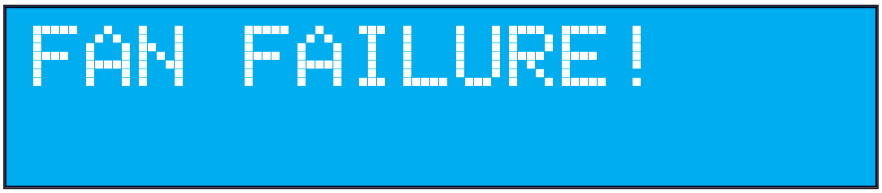
3. In Hyperterminal, click Transfer > Send File...
4. Click Browse... and select the .BIN file you wish to upload.
5. Select Ymodem for the protocol.
6. Press Send on the Send File dialog box.
7. Wait until the download process is finished. The next text will appear on the screen:

   ```
   Download Completed Successfully!

   ------------------------------------------

   Name:     DVI16x16_e_4_10.bin

   Size:     200416       Bytes

   ----------------------------------

   Memory copy, please wait..............Finished to copy

   Execute the new version

    GEFEN
    16x16 DVI MATRIX
   ```

8. The updated process is now complete.

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:

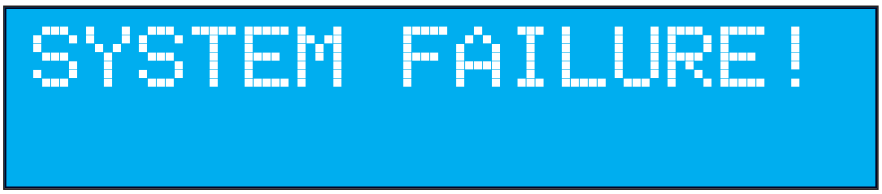
```
Fan failure !!!
```

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. 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:



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

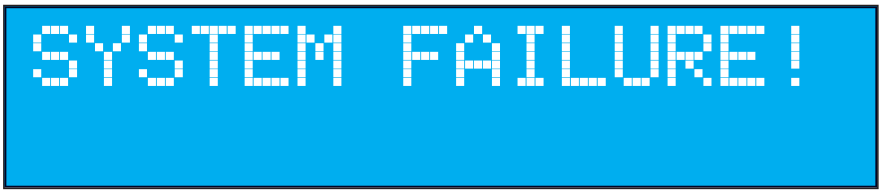
```
System failure !!!
```

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

Critical Malfunctions

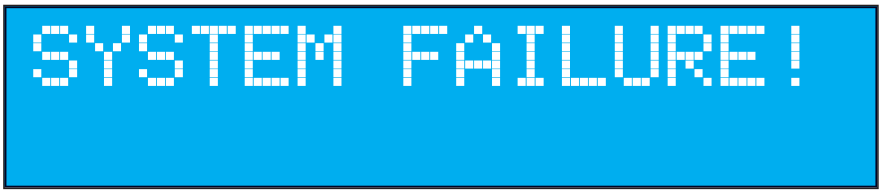
Temperature Failure

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. Please contact Gefen Technical Support under the **Asking for Assistance** section, at the beginning of this manual.

SPECIFICATIONS

Video Amplifier Bandwidth ..... 165 MHz per channel

Single Link Range 1920x1200

Input Video Signal ..... 1.2 Volts p-p

DVI Connector ..... DVI-D 29 Pin (F)

Remote Control Ports ..... One RS232 female

Power Supply ..... 24V DC

Power Consumption ..... 60 Watts (max)

Dimensions ..... 17'' W x 3.5" H x 7.3" D

Rack mountable ..... 2U rack space, rack ears included

Shipping Weight ..... 29 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.

The information in this manual has been carefully checked and is believed to be accurate. However, Gefen assumes no responsibility for any inaccuracies that may be contained in this manual. In no event will Gefen be liable for direct, indirect, special, incidental, or consequential damages resulting from any defect or omission in this manual, even if advised of the possibility of such damages. The technical information contained herein regarding the features and specifications is subject to change without notice.

For the latest warranty coverage information, please visit Gefen's Warranty web page at http://www.gefen.com/kvm/aboutus/warranty.jsp

PRODUCT REGISTRATION

Please register your product online by visiting Gefen's web site at http://www.gefen.com/kvm/Registry/Registration.jsp

LICENSING

lwIP is licensed under the BSD licence:

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.

2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.

3. The name of the author may not be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE AUTHOR ``AS IS'' AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

Rev C14

20600 Nordhoff St., Chatsworth CA 91311

1-800-545-6900 818-772-9100 fax: 818-772-9120

www.gefen.com support@gefen.com

This product uses UL listed power supplies.