GefenPRO®

4x4 Matrix for HDMI w/4 ELR-POL Outputs

GEF-HDFST-444-4ELR
User Manual

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Rev A1

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OPERATION NOTES

• EDID contains the A/V capabilities of a display device in regards to video resolutions and audio formats supported. This information is used by the source device to determine the format of the A/V signal on the outputs. The *4x4 Matrix for HDMI w/4 ELR-POL Outputs* incorporates advanced EDID management to ensure compatibility with all sources and display devices. See pages 33 for more details.

• The *4x4 Matrix for HDMI w/4 ELR-POL Outputs* can detect the presence of Deep Color (12-bit signal) automatically and will disable Deep Color EDID features across all other outputs if any connected device or display is not capable of processing Deep Color. This automatic behavior ensures compatibility among all output devices in a mixed-device environment. This feature cannot be disabled.

INTRODUCTION

Congratulations on your purchase of the GefenPRO *4x4 Matrix for HDMI w/4 ELR-POL Outputs.* Your complete satisfaction is very important to us.

GefenPRO

In the realm of video distribution, certain features are invaluable in a commercial or broadcast environment. Accommodations such as a build-in power supply and flat black rack-mount enclosures set GefenPRO apart from our traditional products. Complex distr bution units allow for professional DVI, 3G-SDI, and HDMI signals to be routed and converted easily and seamlessly, while being backed up by a renowned and dependable technical support team. Gefen invites you to explore the GefenPRO product line and hopes that you find the solution that fits your needs.

The GefenPRO 4x4 Matrix for HDMI w/4 ELR-POL Outputs

The GefenPRO 4x4 Matrix for HDMI w/4 ELR-POL Outputs and Bi-Directional IR routes up to four Hi-Def sources at resolutions up to 1080p Full HD with Deep Color and multi-channel digital audio to any of four HDTV displays, using FST to speed up the HDCP authentication process. Each of the included ELR-POL Receivers units are used to extend HDMI to four locations, using Gefen ELR (Extra Long Range) and POL (Power Over Line) technologies. ELR is based on HDBaseT® and allows the extension of HDMI using a single CAT-5e cable. POL eliminates the need to externally power the Receiver units. The GefenPRO 4x4 Matrix for HDMI w/4 ELR-POL Outputs supports 3DTV pass-through and eight channel digital audio formats such as Dolby® TrueHD and DTS-HD® Master Audio™. 3D content can be displayed when connecting a 3DTV and 3D source. Each source is accessible at all times from any display location. Bi-Directional IR allows each connected source to be controlled from any of the viewing locations, as well as each Hi-Def display being controlled from the source location. The IR All Out port on the matrix broadcasts IR commands from any of the viewing locations to all sources. The IR All In port on the matrix broadcasts IR commands from an automation control device by the matrix to all remote displays. The matrix can be controlled by using the included IR Remote, RS-232, IP control (Telnet or Web server interface), or by using the front-panel push buttons.

How It Works

Using HDMI cables, connect up to four Hi-Def sources to the four HDMI inputs on the matrix. Connect up to four HDTV displays to the included Receiver units, also using HDMI cables. Use a single CAT-5e cable, up to 330 feet (100 meters), to connect each of the Receiver units to the matrix.

Connect the included AC power cord to the matrix and connect it to an available electrical outlet. Power to each of the Receiver units is delivered from the matrix. To control each Hi-Def source from the display location, connect an IR Extender (Gefen part no. EXT-RMT-EXTIRC or EXT-RMT-EXTIRN) to the IR Ext jack on each Receiver unit. Connect an IR Emitter (Gefen part no. EXT-IREMIT) to the corresponding IR Out for each source input on the matrix and place the IR emitter over the IR sensor of the Hi-Def source. Point the IR remote of that source towards the IR Extender at the display location to control the source. To control the display placed near the Receiver unit, connect the IR Emitter output from an automation device (such as the Gefen PACS or MINI-PACS) to the corresponding IR Input on the matrix. Connect an IR emitter (Gefen part no. EXT-IREMIT) to the IR Out on each Receiver unit, and attach the IR emitter over the IR sensor of the display.

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Supported HDMI Features

- Resolutions up to 1080p Full HD
- HDCP compliant
- 12-bit Deep Color
- LPCM 7.1 audio, Dolby® TrueHD, Do by Digital® Plus, and DTS-HD® Master Audio™
- 3DTV pass-through
- Lip Sync pass-through

Features

- Routes any four Hi-Def sources to any four HD displays independently

- Sends and Receives IR signals from any of the 4 remote locations to the matrix

- Includes four ELR-POL receiver units

- ELR and HDBaseT® technologies allow extension up to 330 feet (100 meters)

- POL feature provides power to each ELR receiver

- Gefen FST speeds up the HDCP authentication process

- Fast and Slow FST Modes

- Advanced EDID Management for rapid integration of sources and displays

- Ability to save and recall presets

- Supports DVI sources and displays

- Field-upgradeable firmware via IP or RS-232

- Front Panel Switching

- IR Control of the matrix via front panel sensor and from each Receiver location (using EXT-RMT-EXTIRC or EXT-RMT-EXTIRN)

- Broadcast of IR commands from the matrix side to all viewing locations, and from each receiver location to all sources

- Serial (RS-232) control

- IP Control via web server interface and telnet

- Rack mountable (2U tall, rack ears included)

- Internal power supply with detachable IEC AC cord

- Back panel master power switch

Package Includes
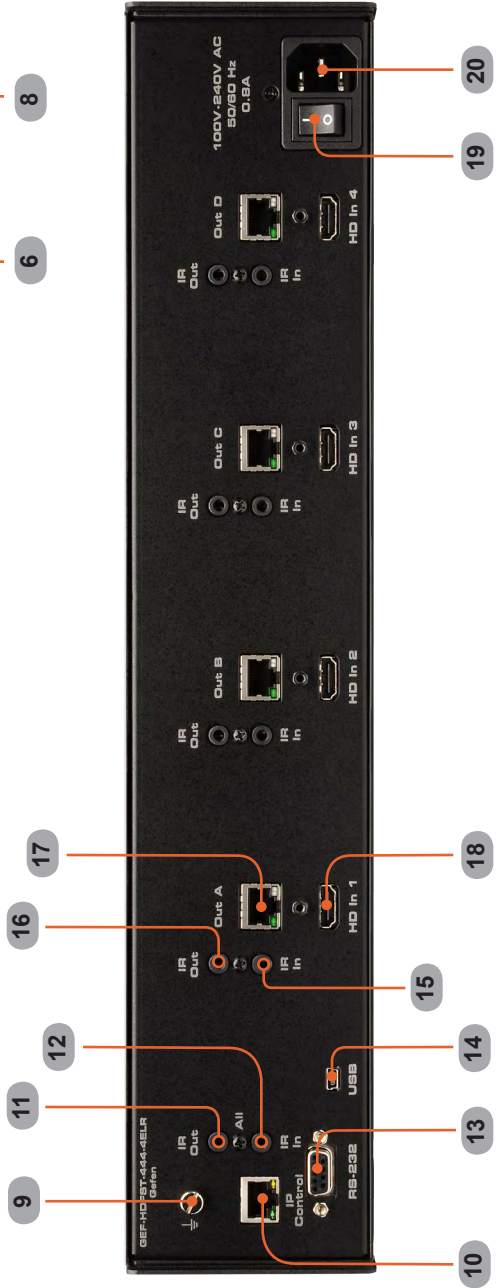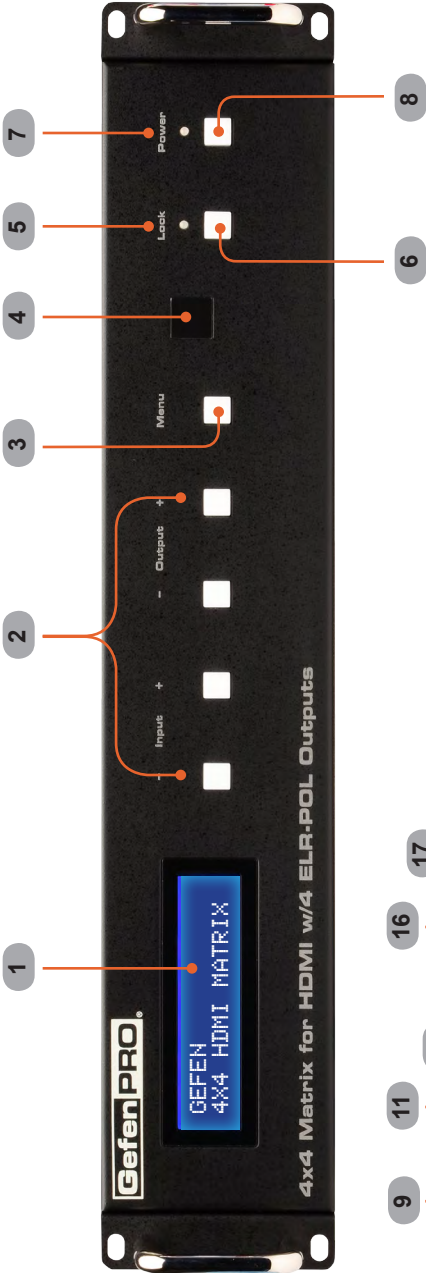
(1) 4x4 Matrix for HDMI w/4 ELR-POL Outputs
(4) Extender for HDMI ELR-POL w Bi-Directional IR (Receiver Unit)
(1) IR Remote Control unit
(1) AC Power Cord
(1) Set of Rack Ears (Attached)
(1) Quick-Start Guide

Front

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INTRODUCTION

Front

1 *LCD Display*
This is a two-line, sixteen-character display that shows status information and is also used to manage display / source routing.

2 *Navigation Buttons*
Used for routing and adjusting settings of the *4x4 Matrix for HDMI w/4 ELR-POL Outputs*. See the information beginning on page 13 for details on using these buttons.

3 *Menu*
Press this button to display routing, switching mode, and IP address information.

4 *IR Sensor*
Receives signals from the IR Remote Control.

5 *Lock Indicator*
This LED glows bright blue when the front panel is locked.

6 *Lock Button*
Pressing this button temporarily locks the front panel controls.

7 *Power Indicator*
This LED indicator will glow bright blue when the matrix is powered on. When the matrix is in standby mode, this LED indicator will glow bright red. The power switch, on the back of the matrix, must be switched to the ON position in order for this LED indicator to function.

8 *Power Button*
Press this button to power-on and power-off the matrix.

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9   Grounding Terminal
Provides a discharge path to ground in case a short circuit occurs between the "hot" lead of the power supply and the enclosure of the Matrix. The grounding wire should be attached from the grounding terminal to an approved ground path.

10   IP Control
Connect an Ethernet cable to this port to control the *4x4 Matrix for HDMI w/4 ELR-POL Outputs* using IP Control. See page 35 for more information on configuring the matrix for IP control.

11   IR Out (All)
Connect an IR extender cable to this jack (Gefen part no. EXT-RMT-EXTIR).

12   IR In (All)
Connect an IR Extender (Gefen part no. EXT-RMT-EXTIR) cable to this jack.

13   RS-232
Connect an RS-232 cable from this DB-9 connector to the RS-232 control device. See page 34 for more information.

14   USB
Service port for manufacturer use only.

15   IR In (A - D)
Connect a 3.5mm-to-3.5mm mini-mono cable between each of these IR jacks and the Gefen PACS or Gefen Mini PACS. IR Emitters or IR Extenders will not function if connected to this jack.

16   IR Out (A - D)
Connect an IR Emitter (Gefen part no. EXT-2IREMIT) cable from each of these jacks and each source device.

17   ELR-POL Outputs (A - D)
Connect a CAT-5e (or better) cable from each of these jacks to the ELR-POL In jacks on the ELR-POL Receiver units.

18   HDMI Inputs (1 - 4)
Connect a Hi-Def source to each of these ports using HDMI cables.

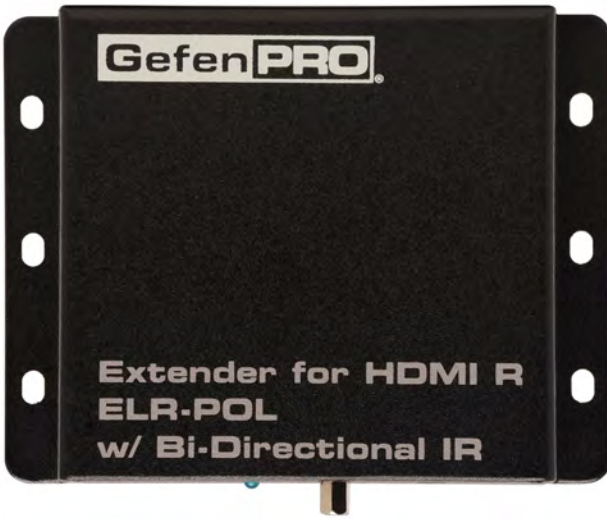**19   Power Switch**
Turn the power ON or OFF using this switch.

20   100/240 AC Power Receptacle
Connect the included AC power cord to this receptacle and connect the plug to an available electrical outlet.

Top
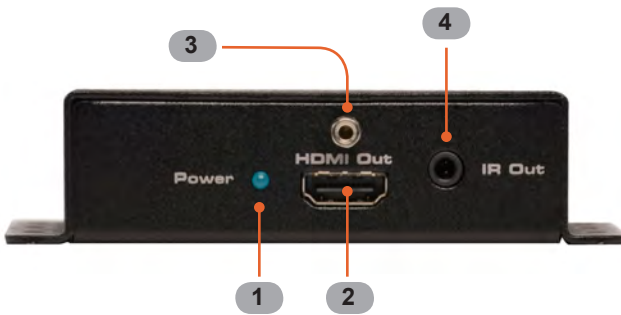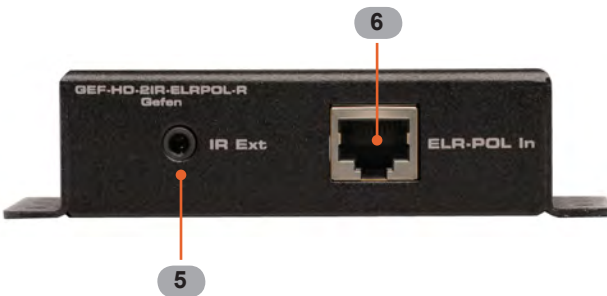
Front

Back

Top / Front / Back

1   Power Indicator
This LED indicator will glow bright blue when the matrix is powered and the ELR-POL Receiver unit is connected to the matrix using CAT-5e (or better) cable.

2   HDMI Out
Connect an HDTV display to the HDMI Out port using an HDMI cable.

3   HDMI Locking Connector
Used to lock the HDMI cable in place.

4   IR Out
Connect an IR Emitter (Gefen part no. EXT-IREMIT) cable from this jack to the HDTV display.

5   IR Ext
Connect an IR Extender (Gefen part no. EXT-RMT-EXTIRC) cable to this jack.

> ⚠ **WARNING:** *Do not* connect the Gefen PACS or Mini PACS to the IR Ext jack on the ELR-POL Receiver unit. Doing so will cause fatal damage to the power supply for the PACS / Mini PACS.

6   ELR-POL In
Connect a CAT-5e (or better) cable from this jack to one of the ELR-POL jacks on the *4x4 Matrix for HDMI w/4 ELR-POL Outputs.*

Layout and Description (RMT-16IRN)
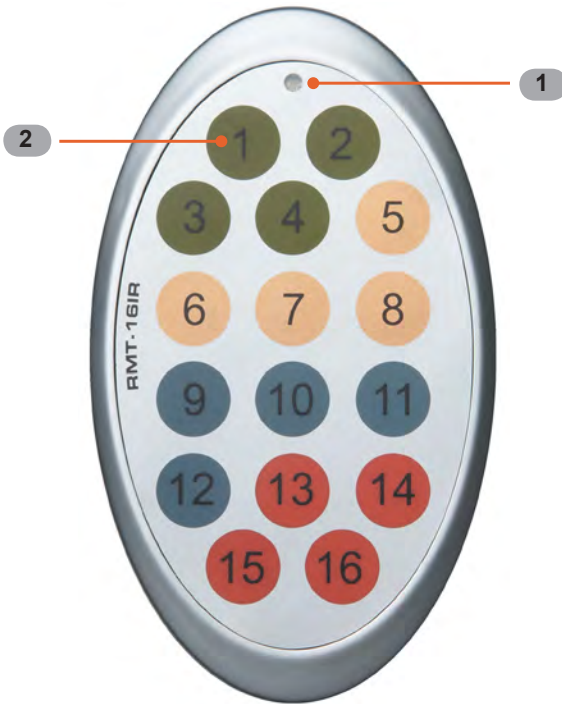
1   ***LED Button Press Indicator***
        This LED will be activated momentarily each time a button is pressed.

2   ***Display and Source Selection Buttons***
        These buttons are used to select which source is routed to a display.
        The Source and Display buttons are mapped as follows:

> **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 (CR2032 lithium battery). 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.

DIP switches

Channel 0 (default):   Remote Channel 1:

Remote Channel 2:   Remote Channel 3:

Battery slot
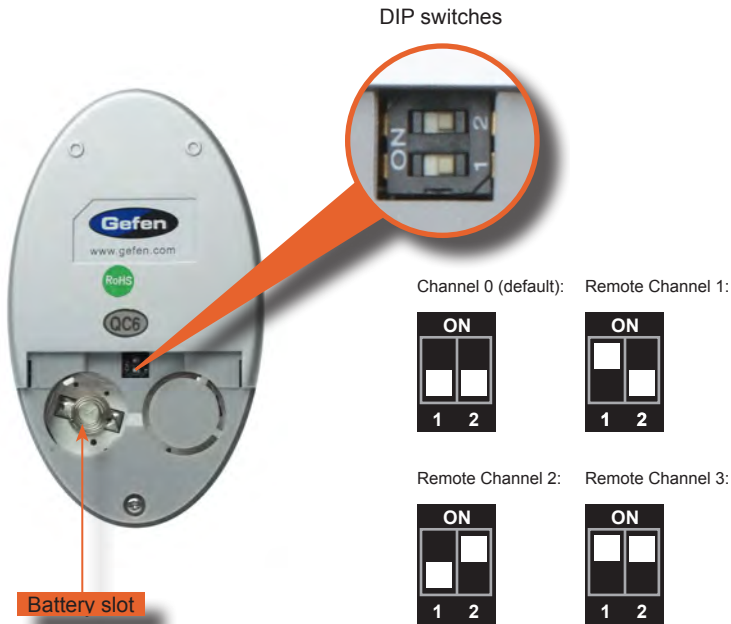
Setting the IR Channel

The IR channel on the IR Remote Control must match the IR channel used by the
4x4 Matrix for HDMI w/4 ELR-POL. For example, if both DIP switches on the IR Remote
Control unit are set to IR channel 0 (both DIP switches down), then the *4x4 Matrix for HDMI
w/4 ELR-POL* must also be set to IR channel 0. See pages 21 and 75 for information on
how to change the IR channel on the *4x4 Matrix for HDMI w/4 ELR-POL*.

> ⚠ **WARNING:** Risk of explosion if battery is replaced by an incorrect
> type**.** Use only 3V lithium batteries CR-2032.

How to Connect the 4x4 Matrix for HDMI w/4 ELR-POL Outputs

1. Connect up to four Hi-Def sources to the *4x4 Matrix for HDMI w/4 ELR-POL Outputs* using HDMI cables.

2. Connect up to four HDTV displays to the supplied ELR-POL Receiver units using HDMI cables.

3. Connect each ELR-POL Receiver unit to the *4x4 Matrix for HDMI w/4 ELR-POL Outputs* using CAT-5e (or better) cables.

> **NOTE:** When connected to the matrix, each ELR-POL Receiver unit is powered over the CAT-5e cable. No external power supplies are required for the ELR-POL Receiver units.

4. IR Control: For details on using the Bi-directional IR feature on the matrix, see page 24.

5. Connect the AC power cord to the matrix and connect the plug to an available electrical outlet.

Wiring Diagram

GEF-HDFST-444-4ELR
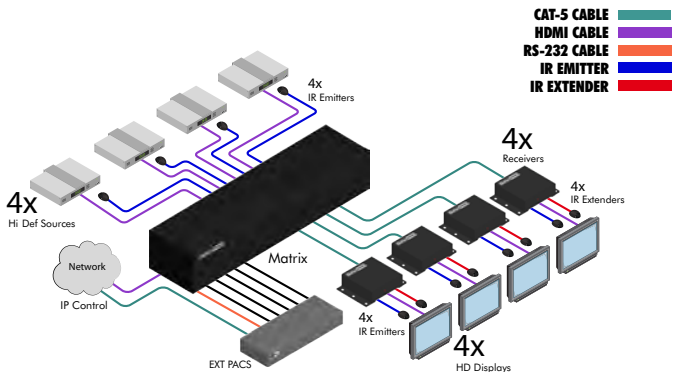
Main Display

The **Main Display** of the *4x4 Matrix for HDMI w/4 ELR-POL Outputs* is a 16-character 2-line display. This display shows the current routing status of the matrix and is also used to display additional system information. When the unit is powered on, the following screen is displayed:

```
GEFEN
4X4 HDMI MATRIX
```

After a few moments, the status screen is displayed. The status screen is shown below:

```
OUT:1234
  IN:3214
```

Displaying Additional Information

Consecutively pressing the **Menu** button, on the front panel, will cycle through other screens such as FST mode and IP information:

```
OUT:1234
  IN:3214
```

```
  IN:1234
MODE:FFFF
```

```
1.IP ADDRESS
192.168.1.72
```
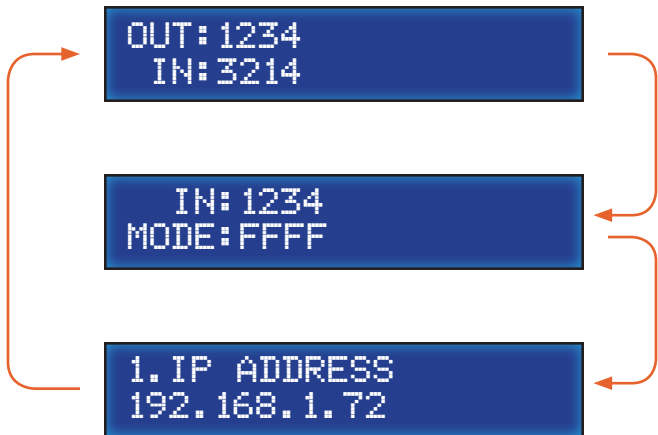
Determining the Current Routing State

In the example below, the first row (OUT) represents each HDMI output on the matrix. The bottom row (IN) represents each HDMI input on the matrix. Together, these two rows display the current routing state.

Starting on the bottom row, we can see that Input 3 has been routed to Output 1, Input 2 has been routed to Output 2, Input 1 has been routed to Output 3, and Input 4 has been routed to Output 4.

If all inputs are routed to their respective outputs, the front-panel display will appear as follows:

This is referred to as a "1-to-1" routing state. This is the factory (default) setting for the *4x4 Matrix for HDMI w/4 ELR-POL*.

Routing Sources

Selecting the Output

1. To select the output, press the **Out -** or **Out +** button once. The routing state for Output A will be displayed.

2. Press the **Out +** button to cycle through each Output, from left to right. The Output with the currently routed Input will be displayed.

3. Consecutively pressing the **Out -** button will cycle through each output, from right to left.

Changing the Source

4. Once the desired output has been selected, press the **Input +** or **Input -** button. Consecutively pressing the **Input +** button will increment the input value by a factor of 1 (within a range of 1 - 4). For example, if Input 1 was originally routed to Output 3, then pressing the **Input +** button will route Input 2 to Output 3.

   Note that if the maximum Input value (4) is reached, then pressing the **Input +** button will set the Input to 1. Conversely, if the minimum Input value (1) is reached, then pressing the **Input -** button will set the Input to 4.

5.   Consecutively pressing the **Input -** button will decrease the input value by a factor of 1 (within a range of 1 - 4). For example, if Input 4 was originally routed to Output 4, pressing the **Input -** button will route Input 3 to Output 4.

Source changed from Input 4 to Input 3.

To change the routing status of another output, press the **Output +** or **Output -** buttons to select the desired output. Use the **Input +** or **Input -** buttons to change the source.

6.   Press the **Menu** button to return to the Routing Screen. The updated routing status will be displayed.

> **NOTE:** If the Menu button is not pressed after a routing change has been made, then the *4x4 Matrix for HDMI w/4 ELR-POL* will automatically return to the Routing Screen after about 20 seconds.

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Locking / Unlocking the Front Panel

To prevent an accidental routing change or power-down (by pressing the **Lock** button), the front-panel buttons on the *4x4 Matrix for HDMI w/4 ELR-POL Outputs* can be locked. Locking the matrix also disables many RS-232 / Telnet commands.

1. To lock the matrix, press the **Lock** button on the front-panel:
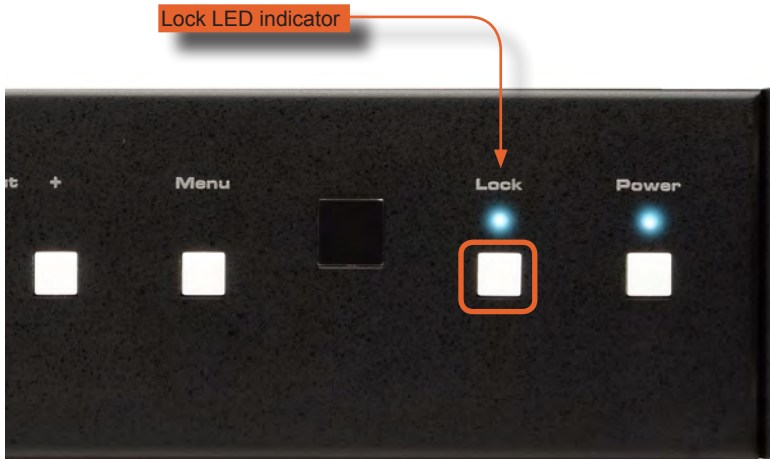
The Lock LED will glow bright blue to indicate that the front-panel buttons on the *4x4 Matrix for HDMI w/4 ELR-POL Outputs* have been locked.

If any buttons (other than the **Lock** button) are pressed while the The *4x4 Matrix for HDMI w/4 ELR-POL* is Locked, the following message will be displayed:
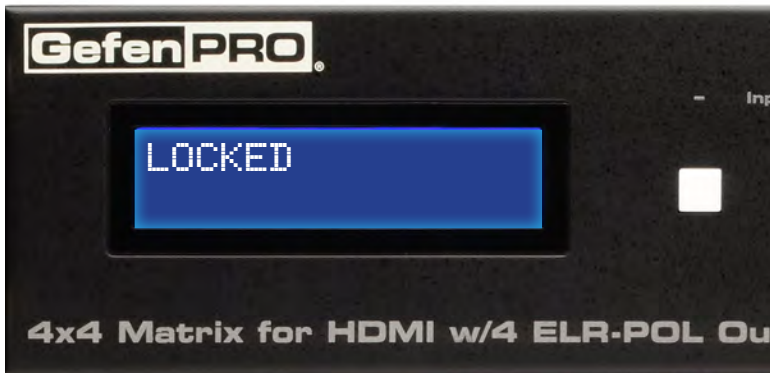
2. To unlock the *4x4 Matrix for HDMI w/4 ELR-POL Outputs*, press the **Lock** button a second time. The Lock LED indicator will turn off.

Fast Switching Technology

Fast Switching Technology (FST) is a Gefen software implementation for HDMI products. FST was created to improve the lengthy HDMI authentication process, based on the HDMI and HDCP specifications.

FST provides quicker audio/video source switching and greatly improves the overall audio/video system behavior and performance when more than one HDTV display is used in the system setup.

FST allows connecting / disconnecting or turning ON / OFF of HDTV displays without having these activities affect other Hi-Def sources routed to any other HDTV display in the same system.

Fast Mode:

Setting the *4x4 Matrix for HDMI w/4 ELR-POL* to **Fast Mode** will improve performance when connecting / disconnecting Hi-Def sources, and powering ON / OFF HDTV displays.

> **NOTE:** When switching from Slow Mode to Fast Mode, the HDTV displays that are connected to the Matrix will blink, momentarily. This is normal operation.

Slow Mode:

When set to **Slow Mode**, the Matrix will follow the standard authentication process, based on the HDMI and HDCP specifications. **Slow Mode** is recommended when the source does not support multiple devices.

Determining the Current Switching Mode

Each HDMI input can be set to **Fast Mode** or **Slow Mode**. It is recommended that each HDMI input be set to **Fast Mode** for best performance.

1. Consecutively press the **Menu** button on the front panel until the switching modes screen is displayed.

    The first row (IN) represents each HDMI input on the matrix. The bottom row (MODE) represents the current switching mode of each HDMI input.

Selecting the Input

2. To change the switching mode on an HDMI input, press the **Output -** (or **Output +**) button once. The switching mode for Input 1 will be displayed:

The letter **F** indicates that the HDMI input is using Fast Mode switching.
If the HDMI input is set to Slow Mode switching, a letter **S** will be displayed under the input.

3. Press the **Output -** or **Output +** button again to cycle through the routing state for each output. Consecutively pressing the **Output +** button will cycle through each input, from left to right, starting with Input 1:

> **NOTE:** In Routing mode, the **Output +** and **Output -** buttons cycle through each *output*. In Switching mode, these same buttons are used to cycle through each *input*.

4. Consecutively pressing the **Output -** button will cycle through each output, from right to left:

Changing the Switching Mode

5. Once the desired input has been selected, press the **Input +** or **Input -** button to toggle between Fast or Slow switching mode.

Switching mode changed from Slow to Fast on Input 2.

To change the switching mode of another input, press the **Output +** or **Output -** button to navigate to the desired input. Press the **Input +** or **Input -** button to toggle the switching mode between Fast (F) or Slow (S).

6. Press the **Menu** button to return to the Switching mode Screen.

Press the **Menu** button a second time to return to the Routing screen.

Setting the IR Channel

In order for the *4x4 Matrix for HDMI w/4 ELR-POL* to communicate with the included IR Remote Control, both the matrix and the IR Remote Control must be set to the same IR channel. Follow the procedure outlined below to set the IR channel on the *4x4 Matrix for HDMI w/4 ELR-POL*.

1. From the Routing screen, simultaneously press the **Input -** , **Input +**, and the **Output -** buttons to display the IR address screen. The current IR address will be displayed along with the DIP switch settings for the IR remote control:

2. Use the **Input +** (or **Input -**) button to change the IR channel. Press the **Input -** button to decrease the IR channel value. Press the **Input +** button to increase the IR channel value.

3.   After setting the IR address, make sure that the DIP switches on the IR Remote Control are set according to the information in the LCD display. See page 9 for information on setting the IR channel for the IR Remote Control unit.

In the example above, the *4x4 Matrix for HDMI w/4 ELR-POL* is set to IR channel 1. Therefore, DIP switch 1 on the IR Remote Control must be set to the ON position and DIP switch 2 must be set to the OFF position.

4.   Press the **Menu** button to return to the Routing screen.

Routing Sources using the IR Remote Control

The included IR Remote Control unit provides discrete switching for each output. The IR remote control unit consists of 16 buttons. Buttons are color-coded and arranged in groups of four. There are a total of four outputs on the matrix. The first set of buttons on the IR remote represent Output 1. The second set of four buttons represent Output 2, and so on. Each individual button within a group, represents an input.

Example 1: Route Input 4 to Output 1

•   The first group of buttons represent Output 1. Therefore, we need to select Input 4 by pressing button 4 in the first group of buttons. Input 4 is now routed to Output 1.

Example 2: Route Input 1 to Output 2

•   The second group of buttons represent Output 2. Therefore, we need to select Input 1 by pressing button 1 in the second group of buttons. Input 1 is now routed to Output 2, as indicated on the front-panel LCM:

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Bi-Directional IR

The Bi-Directional IR feature allows two simultaneous methods of control:

Control of the source device / matrix and control of the display.

Each source device can be controlled from the viewing location by connecting an IR Extender (Gefen part no. EXT-RMT-EXTIR) to each Receiver unit. The display is controlled by connecting a PACS / Mini PACS to the matrix.

Controlling the Source and Matrix

In the example below, we will be setting up IR control for both the matrix and source devices. Up to four source devices can be controlled from the viewing location. The following illustrations assume all A/V devices have already been connected. See the wiring diagram on page 10.

1.   Connect an IR Extender to the **IR Ext. jack** on each Receiver unit. Each of the Receiver units should already be connected to their respective CAT-5 outputs on the matrix.

Connect the IR extender to the IR Ext jack.

2.   Connect an IR Emitter from each of the corresponding outputs on the matrix to the IR sensor window of each respective display (e.g. Receiver A = Source A, Receiver B = Source B, etc).

Connect the IR emitter from the IR Out jacks to the IR sensor on the source.
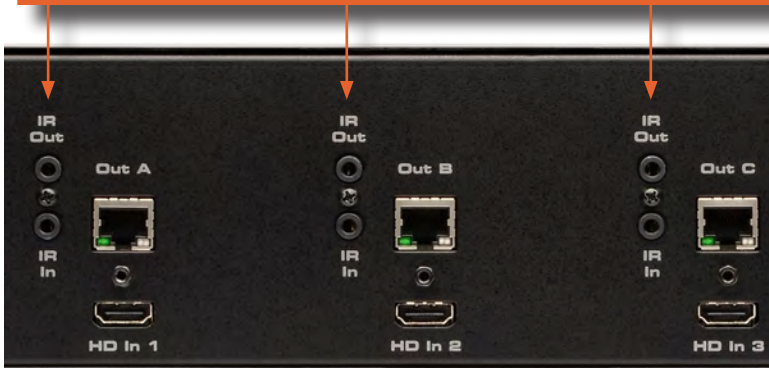
3.   Refer to page 10 and make sure all remaining connections are made between the matrix and all source and display devices.

Controlling the Source from the viewing location

Point the source's IR remote control at the IR Extender. The illustration below shows how the source, connected to **HDMI In 1,** is controlled from the Receiver unit (viewing location). IR signals are transmitted over the CAT-5 cable to the matrix.
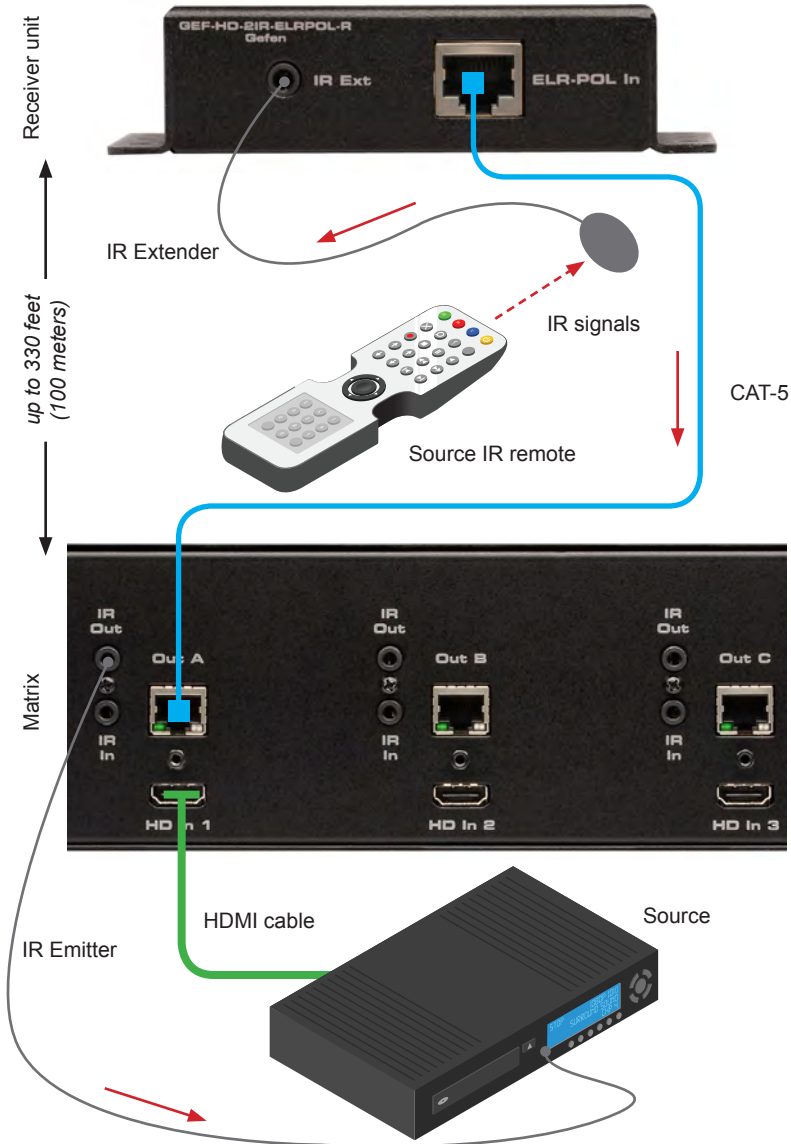
Switching between Sources

Matrix switching can also be controlled by using the same setup. Use the included IR remote control (Gefen part no. RMT-16IRN) to switch between sources. In the example below, the source connected to **HD In 2** has been routed to the Receiver unit connected to **Out A**. See page 23 for details on routing sources using the included IR remote control.
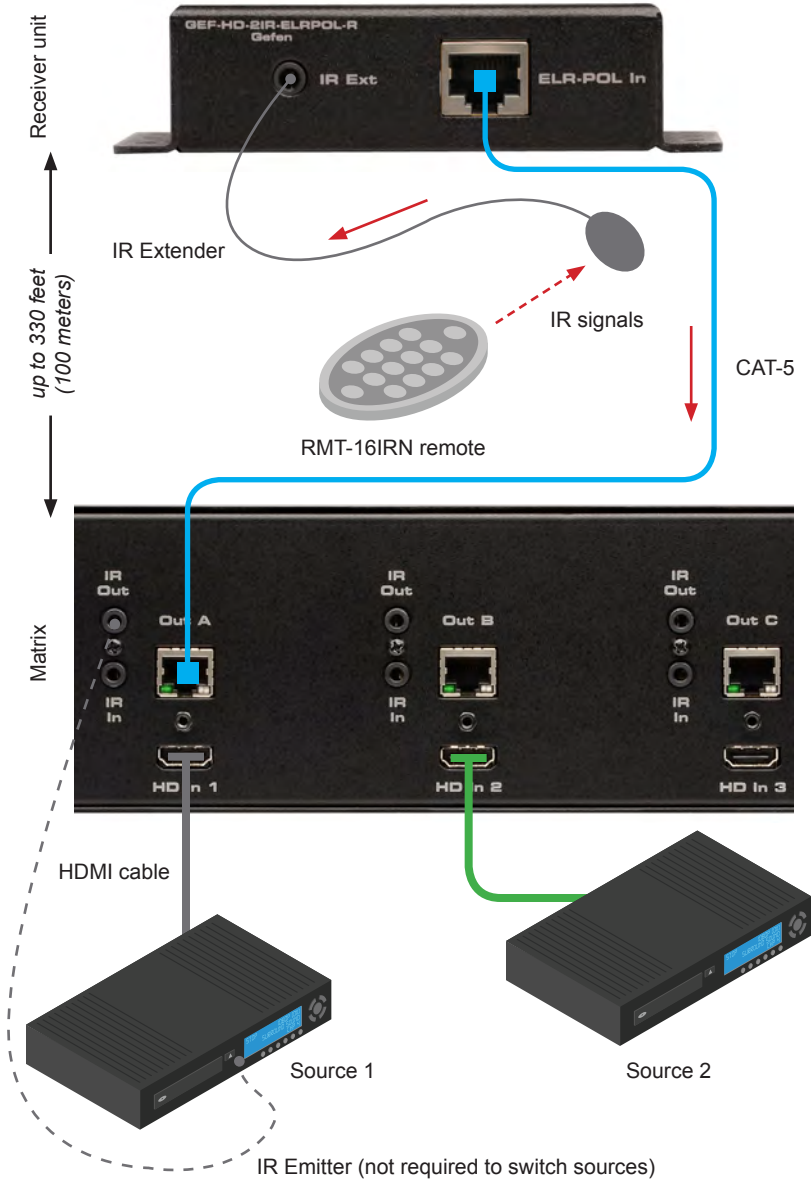
Controlling the Display

Displays can also be controlled by connecting the Gefen PACS (or Mini PACS) to the matrix.

1.   Connect up to four 3.5mm-to-3.5mm mini-mono cables from the IR Emitter outputs on the Gefen PACS (or Mini PACS) to the respective **IR In** ports on the matrix. The red arrows indicate IR signals from the PACS / Mini PACS.
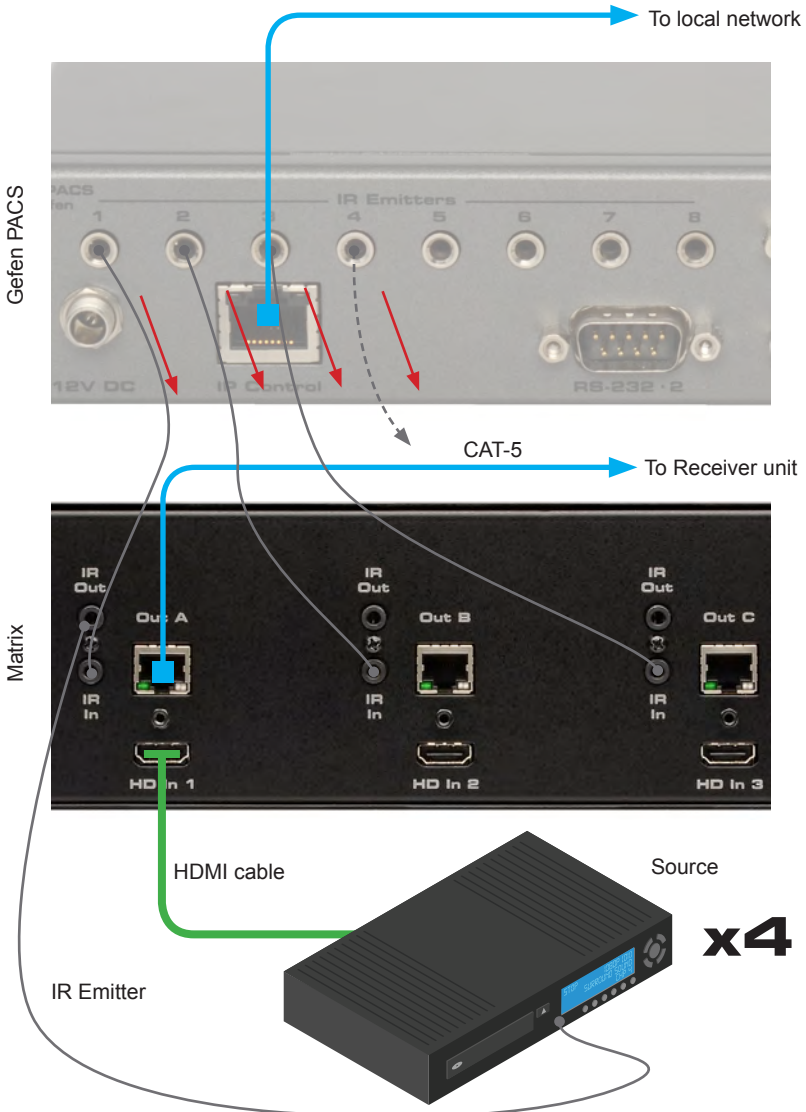
To local network

Gefen PACS

CAT-5

To Receiver unit

Matrix

HDMI cable

Source

x4

IR Emitter

2. Connect an IR Emitter from each **IR Out jack**, on the Receiver unit, to the IR sensor on the HDTV display.

Receiver unit

HDMI cable

IR signals

HDTV display

IR Emitter
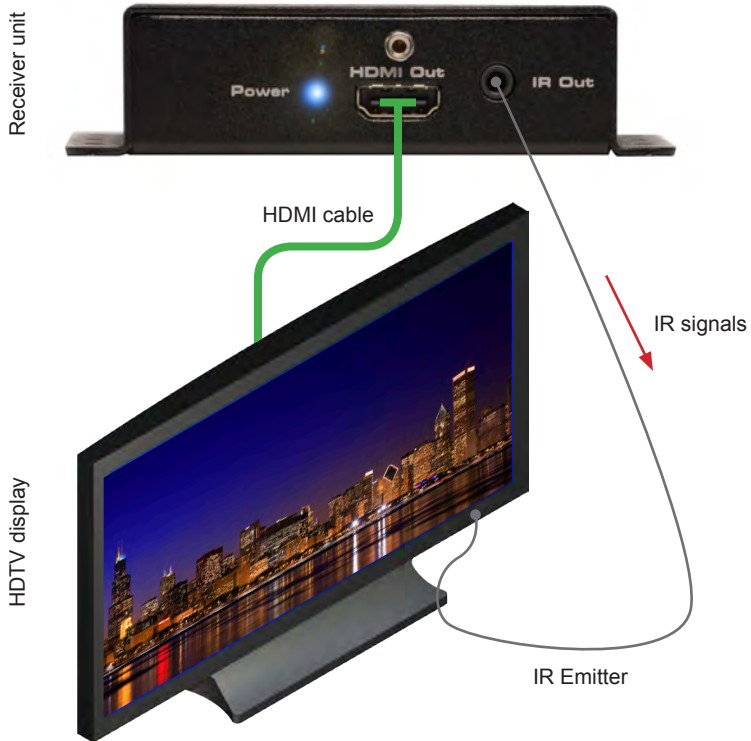
Each display can now receive IR commands from the PACS or Mini PACS.

Refer to the PACS or Mini PACS User Manual for more information on using IR commands.

IR Broadcasting to Sources

In addition to sending IR commands to a single source, the *4x4 Matrix for HDMI w/ 4 ELR-POL Outputs* also allows IR commands to be broadcast to all source devices.

1.   Connect an IR Extender to the **IR Ext** jack on each Receiver unit. Each of the Receiver units should already be connected to their respective CAT-5 outputs on the matrix. See the next page for more information on this type of setup.
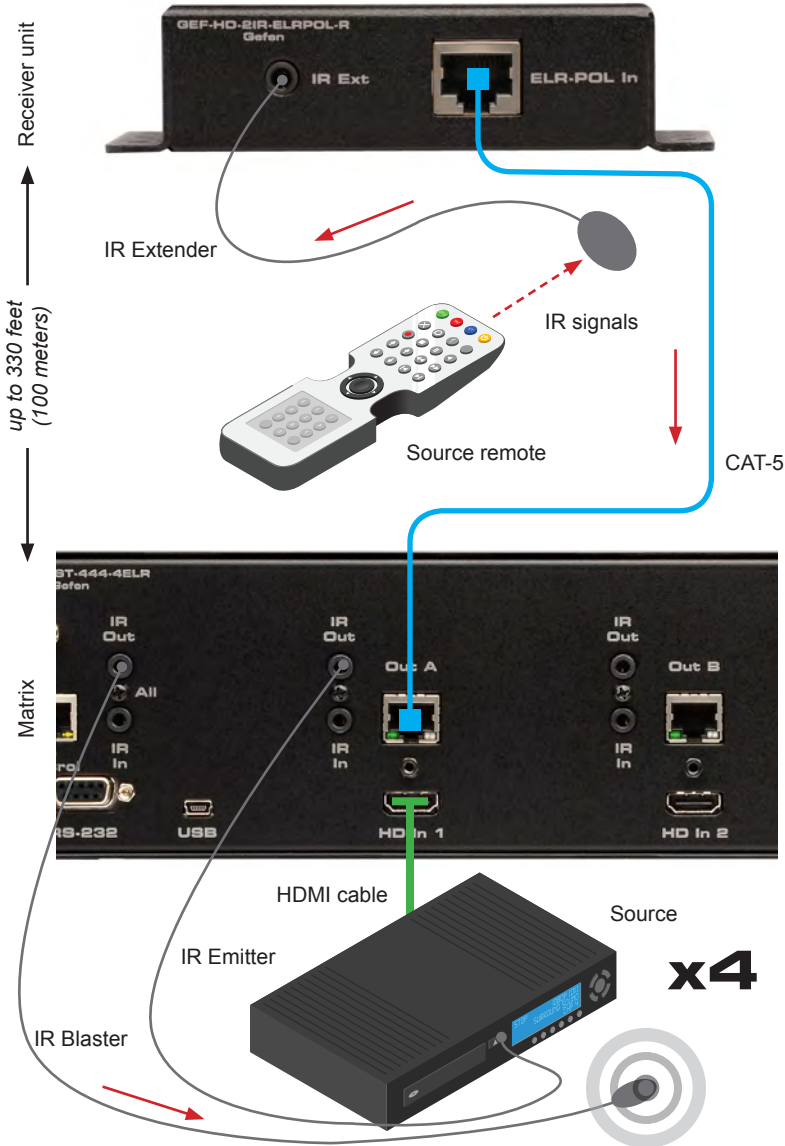
In the illustration on the previous page, the source remote is being used to send IR commands to the source device. The IR Blaster will broadcast the IR command(s) to all source devices in the room (or within the range of the IR Blaster).

This feature has many useful applications. For example, let's say we have four Sony Blu-ray players connected and we want to send a "play" command to these source devices. Although it is poss ble that we may have other sources (e.g. gaming consoles, media centers, etc) connected to the matrix, it should be noted that only the Sony Blu-ray players will acknowledge the "play" command, sent from the IR Blaster.

IR Emitters can still be connected to each individual source device for discrete control. However, if an IR Blaster is present, the IR commands will be broadcast independent of the current routing state.

IR Broadcasting to Displays

In addition to sending IR commands to a single display, the *4x4 Matrix for HDMI w/ 4 ELR-POL Outputs* also allows IR commands to be broadcast to all displays devices.

1. Connect a 3.5mm-to-3.5mm mini-mono cable from one of the IR Emitter outputs on the Gefen PACS to the IR In All port on the matrix.
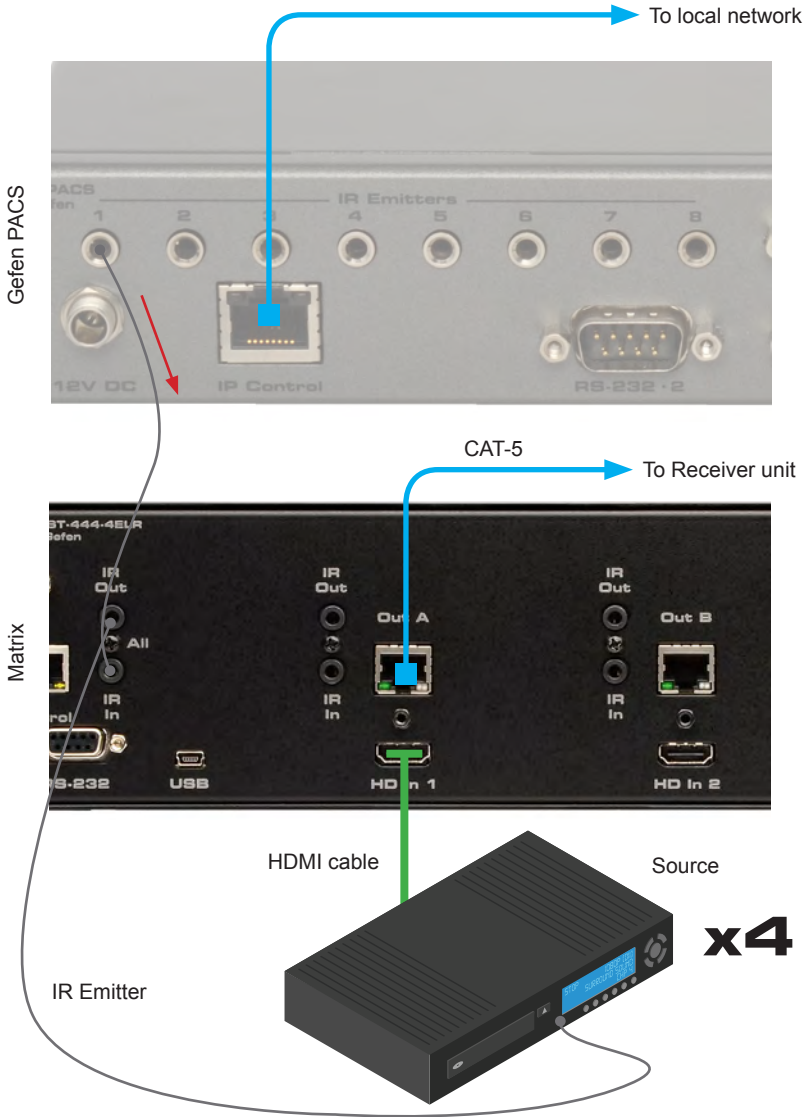
2. Connect an IR Emitter from each **IR Out** jack, on the Receiver unit, to the IR sensor on the HDTV display.

Receiver unit

HDMI cable

IR signals

HDTV display

IR Emitter
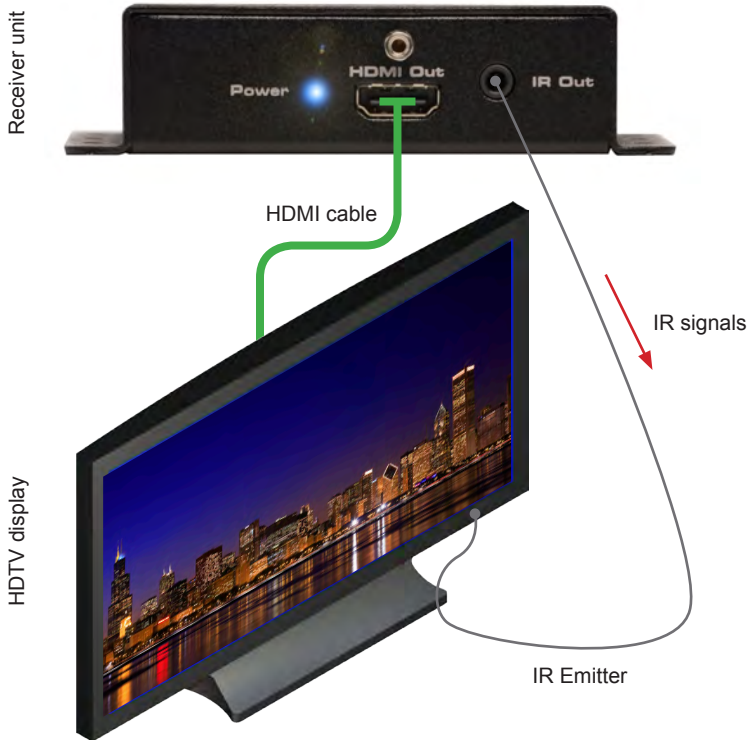
When an IR command is sent from the Gefen PACS / Mini PACS, the command will be sent to every Receiver unit that is connected to the matrix. This operation occurs independently of the current routing status.

This feature has many applications. For example, let's say we have a setup that uses three Panasonic displays and four Sony displays. If we send a "power off" command from the PACS for the Sony displays, then all Receiver units will receive the command but only the Sony displays will acknowledge the "power off" command.

External EDID Management

The *4x4 Matrix for HDMI w/4 ELR-POL* features EDID Management. Before the source can send video or audio signals, the source device reads the EDID (Extended Display Identification Data) from the output devices connected to the matrix. The EDID contains information about what type of audio/video data that the source can send to each output device.

The *4x4 Matrix for HDMI w/4 ELR-POL* routes multiple sources to multiple output devices. This involves reading EDID data from more than one device. Management of the EDID data is important to maintain compatibility between all devices.

The following EDID features are copied from Output 1:

- Supported Resolutions

- 3D Support

- Audio Features

Display Connections:

- If a device is not connected to Output 1, then no EDID changes are made, meaning that the previous EDID information will be used. This state will be in effect until a display is connected to Output 1 and the Matrix is power-cycled.

- EDID is built from Output 1 to the Input. The audio block will be copied from Output 1. EDID-copying is performed only when the Matrix is reset or power-cycled.

Dynamic EDID

The *4x4 Matrix for HDMI w/4 ELR-POL* also incorporates a "dynamic" EDID. This feature is useful if different displays (different manufacturers, different models, etc) are used within a setup.

When an input is set to *Dynamic EDID*, the input will use the EDID of the last selected output during the routing process. The order in which outputs are routed are important when using *Dynamic EDID*. See page 74 and 75 for information on examples using the *Dynamic EDID* feature.

RS-232 Interface

5   4   3   2   1

6   7   8   9
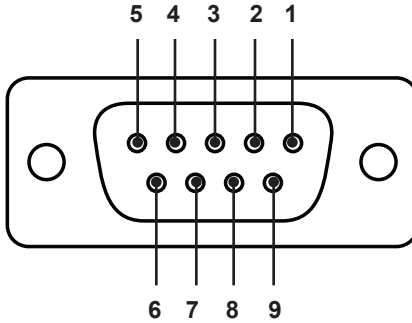
RS-232 Controller   Matrix

DCD	1		1	DCD
RXD	2		2	RXD
TXD	3		3	TXD
DTR	4		4	DTR
GND	5		5	GND
DSR	6		6	DSR
RTS	7		7	RTS
CTS	8		8	CTS
R1	9		9	R1
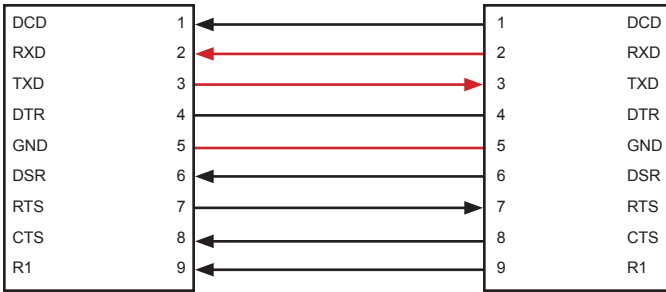
Only TXD, RXD, and GND are used.

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.

Configuring the IP Address

The *4x4 Crosspoint Matrix for HDMI* supports IP-based control using the built-in Web GUI and Telnet protocol. To set up Telnet control, the network settings for the matrix must be configured via RS-232. The default network settings for the matrix are as follows:

IP Address: `192.168.1.72`
Subnet: `255.255.255.0`
Gateway: `192.168.1.254`
HTTP Port: `80`
Telnet Port: `23`

1.   Connect an RS-232 cable from the PC to the matrix.

2.   Launch a terminal emulation program (e.g. HyperTerminal) and use the following settings:

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

> **NOTE:** Depending upon the network, the IP address, subnet mask, gateway (router) IP, Telnet port, and HTTP port will need to be set. Consult your network administrator to obtain the proper settings.

3.   Set the IP address for the matrix using the `#sipadd` command (see page 49 for details).

4.   Set the subnet mask using the `#snetmask` command (see page 50 for details).

5.   Set the gateway (router) IP address using the `#sgateway` command (see page 44 for details).

6.   Set the Telnet listening port using the `#set_telnet_port` command (see page 41 for details).

7.   Set the HTTP listening port using the `#set_http_port` command (see page 39 for details)

8.   Power-cycle the matrix to reboot and complete all IP setting changes.

9.   After the matrix has rebooted, use the IP address that was specified in step 3 to Telnet to the matrix.

IP / Telnet Configuration	
Command	**Description**
#display_telnet_welcome	Set Telnet welcome message on login
#ipconfig	Displays all TCP/IP settings
#resetip	Resets IP configuration to factory settings
#set_http_port	Sets the Web server listening port
#set_telnet_pass	Prompts for password when using Telnet
#set_telnet_port	Sets the Telnet listening port
#set_webui_ad_pass	Sets the Web UI administrator password
#set_webui_op_pass	Sets the Web UI operator password
#sgateway	Sets the IP gateway address
#show_gateway	Displays the gateway address
#show_http_port	Displays the HTTP listening port
#show_ip	Displays the IP address of the Matrix
#show_mac_addr	Displays the MAC address of the Matrix
#show_netmask	Displays the netmask address
#show_telnet_port	Displays the Telnet listening port
#show_telnet_username	Prompts for user name when using Telnet
#show_ver_data	Displays the hardware / software version
#show_webui_username	Displays the user name for the Web interface
#sipadd	Sets the IP address of the matrix
#snetmask	Sets the IP network mask
#use_telnet_pass	Use password during Telnet sessions

#display_telnet_welcome Command

The #display_telnet_welcome command enables or disables the Telnet welcome message on login.

Syntax:

#display_telnet_welcome param1

Parameters:

param1   Value   [0 ... 1]

Value	Description
0	Do not display welcome message
1	Display welcome message

Example:

#display_telnet_welcome 1

#Telnet Welcome Screen is Enable

#ipconfig Command

The #ipconfig command displays the current TCP/IP settings for the matrix.

Syntax:

#ipconfig

Parameters:

None

Example:

#ipconfig

IP Configuration is :

IP: 192.168.1.72

NETMASK: 255.255.255.0

GATEWAY: 192.168.1.254

#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.

Example:

```
#resetip
IP Configuration Was Reset To Factory Defaults.
```

After rebooting the matrix, the IP settings will be cleared. Running the `#ipconfig` command will display the updated information:

```
#ipconfig
IP: 192.168.1.120
NETMASK: 255.255.255.0
GATEWAY: 192.168.1.254
```

#set_http_port Command

The `#set_http_port` command sets the Web server listening port. The default port setting is 80. Also see the `#show_http_port` on page 45.

Syntax:

```
#set_http_port param1
```

Parameters:

param1	Port	[0 ... 1024]

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

Example:

```
#set_http_port 80
HTTP Communication Port 80 Is Set. Please Reboot The Unit.
```

#set_telnet_pass Command

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

Syntax:

```
#set_telnet_pass param1
```

Parameters:

param1   Password   [20 chars max.]

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

Example:

```
#set_telnet_pass reindeer
TELNET Interface Password Is Set.
```

#set_telnet_port Command

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

Syntax:

`#set_telnet_port param1`

Parameters:

param1	Port	[0 ... 1024]

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

Example:

`#set_telnet_port 23`

`Telnet Communication Port 23 Is Set.  Please Reboot The Unit.`

#set_webui_ad_pass Command

The `#set_webui_ad_pass` command sets the Administrator password for the Web interface. The maximum length of the password is 8 characters.

Syntax:

```
#set_webui_ad_pass param1
```

Parameters:

param1	Password	[8 chars max.]

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

Example:

```
#set_webui_ad_pass Everest
Web UI Administrator Password Is Set.
```

#set_webui_op_pass Command

The `#set_webui_op_pass` command sets the Operator password for the Web interface. The maximum length of the password is 8 characters.

Syntax:

```
#set_webui_op_pass param1
```

Parameters:

param1   Password   [8 chars max.]

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

Example:

```
#set_webui_op_pass Denali
Web UI Operator Password Is Set.
```

#sgateway Command

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

Syntax:

`#sgateway param1`

Parameters:

param1   Gateway address

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

Example:

`#sgateway 192.168.2.1`

`GateWay Address 192.168.2.1 Is Set. Please Reboot The Unit.`

#show_gateway Command

The `#show_gateway` command shows the current gateway address.

Syntax:

`#show_gateway`

Parameters:

None

Example:

`#show_gateway`

`GATEWAY ADDRESS IS: 192.168.2.1`

#show_http_port Command

The #show_http_port command displays the current HTTP listening port.

Syntax:

#show_http_port

Parameters:

None

Example:

#show_http_port

HTTP COMMUNICATION PORT IS: 80

#show_ip Command

The #show_ip command shows the current IP address of the Matrix.

Syntax:

#show_ip

Parameters:

None

Example:

#show_ip

IP ADDRESS IS: 192.168.1.72

#show_mac_addr Command

The #show_mac_addr command displays the MAC address of the Matrix.

Syntax:

#show_mac_addr

Parameters:

None

Example:

#show_mac_addr

MAC ADDRESS IS: 00-12-0e-f1-7a-ea

#show_netmask Command

The #show_netmask displays the netmask address.

Syntax:

#show_netmask

Parameters:

None

Example:

#show_netmask

NET MASK ADDRESS IS: 255.255.255.0

#**show_telnet_port Command**

The #show_telnet_port command displays the current Telnet listening port.

Syntax:

#show_telnet_port

Parameters:

None

Example:

#show_telnet_port
TELNET COMMUNICATION PORT IS: 23

#show_telnet_username Command

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

Syntax:

#show_telnet_username

Parameters:

None

Example:

#show_telnet_username
User Name For TELNET Is : Admin

#show_ver_data Command

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

Syntax:

```
#show_ver_data
```

Parameters:

None

Example:

```
#show_ver_data
SOFTWARE AND HARDWARE VERSION: v3.0K PCB-1707*B
```

#show_webui_username Command

The #show_webui_username command displays the current user name required for login.

Syntax:

```
#show_webui_username
```

Parameters:

None

Example:

```
#show_webui_username
The User Name For The Web UI is: holly_jolly
```

#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 192.168.1.238
IP Address 192.168.1.238 Is Set. Please Reboot The Unit.
```

#snetmask Command

The #snetmask command sets the IP network subnet mask. Dot-decimal notation must be used when specifying the IP network mask. The default subnet mask is: `255.255.255.0`

Syntax:

```
#snetmask param1
```

Parameters:

param1   Subnet mask

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

Syntax:

```
#snetmask 255.255.0.0
NetMask Address 255.255.0.0 Is Set.  Please Reboot The Unit.
```

#use_telnet_pass Command

The #use_telnet_pass command requires or disables Telnet login credentials. The default setting is disabled (param1 = 0).

Syntax:

```
#use_telnet_pass param1
```

Parameters:

param1   State   [0 ... 1]

Value	Description
0	Disable password
1	Enable (force) password

Example:

```
#use_telnet_pass 1

Telnet Interface Password Is Enable
```

Routing / Naming / Presets	
Command	**Description**
#lock_matrix	Locks / unlocks the Matrix
#recall_preset	Recalls a routing / mask preset
#save_preset	Saves the current routing/masking state to a preset
#set_bank_name	Names the specified EDID bank
#set_input_name	Specifies a name for an input
#set_output_name	Specifies a name for an output
#set_preset_name	Names the specified preset
#show_bank_name	Displays the name of the specified bank
#show_input_name	Displays the specified input name
#show_output_name	Displays the specified output name
#show_preset_name	Displays the name of the specified preset
#show_r	Displays the current routing state of the specified output
r	Routes the specified inputs to the specified outputs
s	Routes all outputs are routed to the specified input

#lock_matrix Command

The `#lock_matrix` command locks / unlocks the Matrix. When the Matrix is locked, all functions are disabled including the front panel, RS-232, and Telnet.

Syntax:

```
#lock_matrix param1
```

Parameters:

param1   Value   [0 ... 1]

Value	Description
0	Unlock Matrix
1	Lock Matrix

Example:

```
#lock_matrix 1
MATRIX IS LOCKED
```

#recall_preset Command

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

Syntax:

```
#recall_preset param1
```

Parameters:

param1   Preset   [1 ... 8]

Example:

```
#recall_preset 1
RECALLED THE ROUTING STATE OF PRESET 1
```

#save_preset Command

The `#save_preset` 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:

```
#save_preset param1
```

Parameters:

param1   Preset   [1 ... 8]

Example:

```
#save_preset 1
CURRENT ROUTING STATE IS SAVED TO PRESET/INPUT 1
```

#set_bank_name Command

The #set_bank_name command names the specified EDID bank.

Syntax:

```
#set_bank_name param1
```

Parameters:

param1   Bank   [1 ... 8]
param2   Name   [20 chars max.]

Example:

```
#set_bank_name Dell_30
Dell_30 NAME IS ASSIGNED TO BANK 1
```

#set_input_name Command

The #set_input_name command provides a name to the selected input. For example, "Input 1" could be renamed as "DVD_Player".

Syntax:

```
#set_input_name param1 param2
```

Parameters:

param1	Input	[1 ... 4]
param2	Name	[15 chars max.]

Example:

```
#set_input_name 4 Blu-ray
Blu_ray NAME IS ASSIGNED TO INPUT 5
```

#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".

Syntax:

```
#set_output_name param1 param2
```

Parameters:

param1	Output	[1 ... 4]
param2	Name	[8 chars max.]

Example:

```
#set_output_name 2 Sony_XBR
Sony_XBR NAME IS ASSIGNED TO OUTPUT 2
```

#set_preset_name Command

The #set_preset_name command assigns a preset with the specified name.

Syntax:

#set_preset_name param1

Parameters:

param1	Preset	[1 ... 8]
param2	Name	[20 chars max.]

Example:

#set_preset_name 6 monitor_booth

monitor_booth NAME IS ASSIGNED TO PRESET 6

#show_bank_name Command

The #set_bank_name command displays the specified EDID bank name.

Syntax:

#show_bank_name param1

Parameters:

param1	Bank	[1 ... 8]

Example:

#show_bank_name 1

THE NAME FOR BANK 1 IS: Dell_30

#show_input_name Command

The #show_input_name command displays the specified input name.

Syntax:

```
#show_input_name param1
```

Parameters:

param1	Input	[1 ... 8]

Example:

```
#show_input_name 4
THE NAME FOR INPUT 4 IS: Blu-ray
```

#show_output_name Command

The #show_output_name command displays the name of the specified output.

Syntax:

```
#show_output_name param1
```

Parameters:

param1	Output	[1 ... 4]

Example:

```
#show_output_name 2
THE NAME FOR OUTPUT 2 IS: Sony_XBR
```

#show_preset_name Command

The #show_preset_name command displays the name of the specified preset.

Syntax:

```
#show_preset_name param1
```

Parameters:

param1   Preset   [1 ... 8]

Example:

```
#show_preset_name 6
THE NAME FOR PRESET 6 IS: monitor_booth
```

#show_r Command

The #show_r command shows the current routing status of the specified output. The underscore character ("_") must be included when typing the command name.

Syntax:

```
#show_r param1
```

Parameters:

param1   Output   [1 ... 4]

Notes:

The current name of each output and input is also included in parentheses.

Example:

```
#show_r 2
OUTPUT 2(Sony_XBR) IS ROUTED TO INPUT 2(INPUT2)
```

r Command

The r command routes the specified input to the specified outputs. Do not precede the `r` command with the "#" symbol.

<u>*Syntax*</u>:

```
r param1 param2[...param9]
```

<u>*Parameters*</u>:

param1	Input	[1 ... 4]
param2	Outputs	[1 ... 4]

<u>*Notes*</u>:

If *param2* = 0, then the specified input is routed to all outputs. See the `s` command on the following page.

<u>*Examples:*</u>

```
r 4 1 2 3
INPUT 4 IS SET TO OUTPUTS 1, 2, 3

r 2 0
INPUT 4 IS SET TO ALL OUTPUTS.
```

s Command

The s command routes the specified input to all outputs. Do not precede the s command with the "#' symbol.

Syntax:

s param1

Parameters:

param1   Input   [1 - 8]

Examples:

s 2

INPUT 2 IS SET TO ALL OUTPUTS.

Status	
Command	**Description**
#help	Displays all available commands
#show_fw	Displays the Matrix firmware version
#show_hpd	Displays the HPD status of the specified output
#show_rsense	Displays the RSENSE status of the specified output
m	Displays the current matrix routing status in table format
n	Displays the routing status for the specified output

#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 (optional)

Examples:
```
#help #recall_preset

#RECALL_PRESET PARAM 1

RECALL A ROUTING STATE PRESET

PARAM 1 = 1 - 8 (PRESET/INPUT)
```

#show_fw Command

The #show_fw command displays the current firmware version of the Matrix.

Syntax:

```
#show_fw
```

Parameters:

None

Example:

```
#show_fw
FIRMWARE VERSION = GEF-HDFST-444-4ELR v3.0K
```

#show_hdp Command

The #show_hpd command displays the HPD (Hot-Plug Detect) status of the specified output. The underscore character ("_") must be included when typing the command name.

Syntax:

```
#show_hpd param1
```

Parameters:

param1	Output	[1 ... 4]

Notes:

If the output has been renamed using the #set_output_name command, then the name that is assigned to the output will be included in parentheses.

Examples:

```
#show_hpd 2
HPD OF OUTPUT 2(Sony_XBR) IS LOW
```

#show_rsense Command

The #show_rsense command displays Rsense status of the specified output.

Syntax:

```
#show_rsense param1
```

Parameters:

param1	Output	[1 ... 4]

Notes:

The alternate name of the output (see the `#set_output_name` command) will be displayed in parentheses, next to the physical name of the output.

Examples:

```
#show_rsense 2
RSENSE OF OUTPUT 2(OUTPUT1) IS LOW
```

m Command

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

Syntax:

m

Parameters:

None

Example:

```
m
Out: 1 2 3 4
 In: 2 2 2 2

ALL OUTPUTS ARE UNMASKED
MATRIX IS UNLOCKED
```

n Command

The n command displays the current input-output routing state for the specified output.
Do not precede this command with the "#' symbol.

Syntax:

n param1

Parameters:

param1   Output   [1 ... 4]

Notes:

If *param1* = 0, then the routing status for all outputs will be displayed.

 In the second example, n 0 returns the routing state for all Outputs.

Examples:

The return result is read as pairs of numbers. The first number is the output and the
second number is the input. In the example below, n 1 returns the routing state for
Output 1. "12" means that Output 1 is routed to Input 2:

n 1

12

n 0

12223242

In the second example, above, "12223242" is read as:

Output 1 > Input 2

Output 2 > Input 2

Output 3 > Input 2

Output 4 > Input 2

FST	
Command	**Description**
#fst_fast	Sets the specified inputs to Fast switching mode
#fst_slow	Sets the specified inputs to Slow switching mode
#show_fst	Displays the current switching mode for the specified input

#fst_fast Command

The #fst_fast command sets the specified inputs to Fast switching mode.

Syntax:

```
#fst_fast param1
```

Parameters:

param1   Input   [1 ... 4]

Notes:

If *param1* = 0, then all inputs will be set to Fast switching mode.

Example:

```
#fst_fast 1
INPUT 1 IS SET TO FST FAST MODE
```

NOTE: See page 17 for more information on the FST feature.

#fst_slow Command

The #fst_slow command sets the specified inputs to Slow switching mode.

Syntax:

```
#fst_slow param1
```

Parameters:

param1   Input   [1 ... 4]

Notes:

If *param1* = 0, then all inputs will be set to Slow switching mode.

Example:

```
#fst_slow 1
INPUT 1 IS SET TO FST SLOW MODE
```

#show_fst Command

The #fst_slow command sets the specified inputs to Slow switching mode.

Syntax:

```
#show_fst param1
```

Parameters:

param1   Input   [1 ... 4]

Notes:

If *param1* = 0, then the switching mode status for all inputs will be displayed.

Example:

```
#show_fst 1
INPUT 1(INPUT1) IS IN FAST SWITCHING MODE
```

Masking	
Command	**Description**
#echo	Enables / disables RS-232 feedback
#fadefault	Resets the matrix to factory defaults
#hdcp	Disables HDCP on the specified input
#hpd_pulse	Cycles the HPD line on the specified input
#lock_edid	Locks the local EDID when powering the matrix
#mask	Masks the specified outputs
#power	Powers the matrix on or off
#reboot	Reboots the matrix
#set_edid	Copies EDID data between inputs, outputs, and banks
#set_ir	Sets the IR channel of the matrix
#show_hdcp	Displays the HDCP status on the specified input
#show_ir	Displays the current IR channel of the matrix
#show_mask	Displays the output masking status
#show_out_colordpt	Shows the highest color depth supported by the display based on the EDID
#show_out_res	Shows the highest resolution supported by the display based on the EDID
#unmask	Unmasks the selected outputs

#echo Command

The #echo command enables / disables serial port (terminal) echo when typing command. However, any command feedback will always be displayed.

Syntax:

```
#echo
```

Parameters:

param1   Value   [0 - 1]

Value	Description
0	Disable feedback
1	Enable feedback

Examples:

```
#echo 1
LOCAL ECHO IS ON


#echo 0
LOCAL ECHO IS OFF
```

#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

Example:

```
#fadefault

MATRIX WAS RESET TO FACTORY DEFAULTS
INPUT 1 IS ROUTED TO OUTPUT 1
INPUT 2 IS ROUTED TO OUTPUT 2
INPUT 3 IS ROUTED TO OUTPUT 3
INPUT 4 IS ROUTED TO OUTPUT 4
LOCAL ECHO IS ON
ALL OUTPUTS ARE UNMASKED
ALL INPUTS ARE SET TO FST FAST MODE
IP ADDRESS IS: 192.168.1.72
GATEWAY ADDRESS IS: 192.168.1.254
NET MASK ADDRESS IS: 255.255.255.0
HTTP Communication Port 80 Is Set.
Telnet Communication Port 23 Is Set.
Telnet Interace Password Is Disable
TELNET User Name Admin Is Set.
...
...
GEF-HDFST-444-4ELR v3.0K
INPUT 1 IS ROUTED TO OUTPUT 1
INPUT 2 IS ROUTED TO OUTPUT 2
INPUT 3 IS ROUTED TO OUTPUT 3
INPUT 4 IS ROUTED TO OUTPUT 4
```

#hdcp Command

The #hdcp command disables HDCP on the selected input.

> **NOTE:** Some computers will enable HDCP if an HDCP-compliant display is detected. Set param2 = 1 to force the computer to ignore detection of an HDCP-compliant display. Note that using this command does **not** decrypt HDCP content.

Syntax:

```
#hdcp param1 param2
```

Parameters:

param1	Input	[1 ... 4]
param2	Value	[0 ... 1]

Value	Description
0	Disable
1	Enable

Examples:

```
#hdcp 2 0
INPUT 2 HDCP IS DISABLE

#hdcp 0 1
ALL INPUTS HDCP ARE ENABLE
```

#hpd_pulse Command

The #hpd_pulse command cycles the HPD line on the specified input. Issuing this command is identical to physically disconnecting and reconnecting the cable between the source and the matrix.

Syntax:

```
#hpd_pulse param1
```

Parameters:

param1	Input	[1 ... 4]

Notes:

Set *param1* = 0 to cycle the HPD line on all inputs.

Examples:

```
#hpd_pulse 1
HPD PULSE HAS BEEN SENT TO INPUT 1

#hpd_pulse 0
HPD PULSE HAS BEEN SENT TO ALL INPUTS
```

#lock_edid Command

The #lock_edid command secures the Local EDID by disabling the automatic loading of the downstream EDID after the matrix is powered.

Syntax:

```
#lock_edid param1
```

Parameters:

param1   Value   [0 ... 1]

Value	Description
0	Disable
1	Enable

Examples:

```
#lock_edid 0
Disable Lock EDID mode
```

#mask Command

The #mask command masks the specified outputs.

Syntax:
```
#mask param1[...param4]
```

Parameters:

param1   Output   [1 ... 4]

Notes:

If *param1* = 0, then all outputs are masked.

Examples:
```
#mask 2 3
OUTPUTS 2, 3 ARE MASKED
```

#power Command

The #power command toggles the power state on the matrix.

Syntax:

```
#power param1
```

Parameters:

param1   Value   [0 ... 1]

Value	Description
0	Power matrix OFF
1	Power matrix ON

Notes:

Each time the matrix is powered, the current routing status will be echoed to the terminal.

Examples:

```
#power 0
MATRIX IS OFF


#power 1

MATRIX IS ON
INPUT 1 IS ROUTED TO OUTPUT 1
INPUT 2 IS ROUTED TO OUTPUT 2
INPUT 3 IS ROUTED TO OUTPUT 3
INPUT 4 IS ROUTED TO OUTPUT 4
```

#reboot Command

The #reboot command reboots the matrix.

Syntax:

```
#reboot
```

Parameters:

None

Notes:

Each time the matrix is rebooted, the current routing status will be echoed to the terminal.

Example:

```
#reboot

MATRIX WILL REBOOT SHORTLY *REBOOT UNIT IN 2 SECONDS
GEF-HDFST-444-4ELR v3.0K
INPUT 1 IS ROUTED TO OUTPUT 1
INPUT 2 IS ROUTED TO OUTPUT 2
INPUT 3 IS ROUTED TO OUTPUT 3
INPUT 4 IS ROUTED TO OUTPUT 4
```

#set_edid Command

The #set_edid command sets the specified EDID type to an input or bank.

Syntax:

```
#set_edid param1 param2 param3 param4
```

Parameters:

param1   Source type   [STRING]

String	Description
default	Uses default EDID
dynamic	Uses Dynamic EDID
bank	Uses EDID bank
output	Uses EDID on Output (sink)

param2   Source number   [0 ... 8]

Value	Description
0	Default EDID
1 ... 8	EDID Bank
1 ... 4	Output

param3   Target type   [STRING]

String	Description
input	Specifies an input
bank	Specifies an EDID bank

param2   Target number   [1 ... 4,
                                                      1 ... 8]

Value	Description
1 ... 4	Input
1 ... 8	EDID Bank

Notes:

If *param1* = default or *param1* = dynamic, set *param2* = 0.

Using Dynamic EDID

When *param1* = dynamic, the specified input will be set to *Dynamic EDID*. This can be observed by accessing the Manage EDID tab, in the Web interface (see page 92). When an input is set to *Dynamic EDID*, the input will use the EDID of the last selected output during the routing process. The order in which outputs are routed are important when using *Dynamic EDID*. See the example below.

Examples:

Using Dynamic EDID:


```
#set_edid dynamic 0 input 4
COPY DYNAMIC EDID TO INPUT4.
```

In the example above, Input 4 is set to *Dynamic EDID*. If the following routing command is issued, then the EDID from Output 3 will be used (not Output 2) by Input 1.

```
r 4 2 3
INPUT 4 IS SET TO OUTPUTS 2, 3
```


However, if we wanted to use the EDID from Output 2, we would write the command as:

```
r 4 3 2
INPUT 4 IS SET TO OUTPUTS 3, 2
```

Since Output 2 was the last output that was specified, this will be the EDID that Input 4 will use.

This second example does not use Dynamic EDID but uses the EDID from the specified downstream sink (display, etc):


```
#set_edid output 1 input 3
COPY OUTPUT1 EDID TO INPUT3.
```

#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 9 for details on setting the IR channel for the IR remote control.

Syntax:

```
#set_ir param1
```

Parameters:

param1	Channel	[0 ... 3]

Example:

```
#set_ir 0
IR CHANNEL IS SET TO CHANNEL 0
```

#show_ir Command

The #show_ir displays the current IR channel for the matrix.

Syntax:

```
#show_ir
```

Parameters:

None

Example:

```
#show_ir
CURRENT IR CHANNEL IS: 0
```

#show_hdcp Command

The #show_hdcp command displays the HDCP status on the specified input

Syntax:

```
#show_hdcp param1
```

Parameters:

param1   Input   [1 ... 4]

Notes:

Set *param1* = 0 to displays the HDCP status of all inputs.

Examples:

```
#show_hdcp 3
INPUT 3 HDCP IS ENABLED
```

```
#show_hdcp 0
INPUT 1, 3, 4 HDCP ARE ENABLED
```

#show_mask Command

The #show_mask command displays the mask status for the specified output.

Syntax:

```
#show_mask param1
```

Parameters:

param1   Output   [1 ... 4]

Example:

```
#show_mask 4
OUTPUT 4(OUTPUT4) IS UNMASKED
```

#show_out_colordpt Command

The #show_out_colordpt command displays the highest color depth supported by the specified display based on the EDID. The underscore characters ("_") must be included when typing the command name.

Syntax:

```
#show_out_colordpt param1
```

Parameters:

param1   Output   [1 ... 4]

Notes:

If no display (sink) signal is detected, then the `#show_out_colordpt` command will return the following:

```
NO SIGNAL
```

Example:

```
#show_out_colordpt 1
8 BITS HDMI
```

#show_out_res Command

The #show_out_res command displays the highest resolution supported by the specified display based on the EDID.

Syntax:

```
#show_out_res param1
```

Parameters:

param1	Output	[1 ... 4]

Notes:

If no display (sink) signal is detected, then the #show_out_res will return the following:

```
NO SIGNAL
```

Example:

```
#show_out_res 1
1080P 60HZ HDMI
```

#unmask Command

The #unmask command unmasks the specified outputs.

Syntax:

```
#unmask param1[...param9]
```

Parameters:

param1   Output   [1 ... 4]

Notes:

If *param1 = 0*, then all outputs are unmasked.

Examples:

```
#unmask 4
OUTPUT 4 IS UNMASKED
```
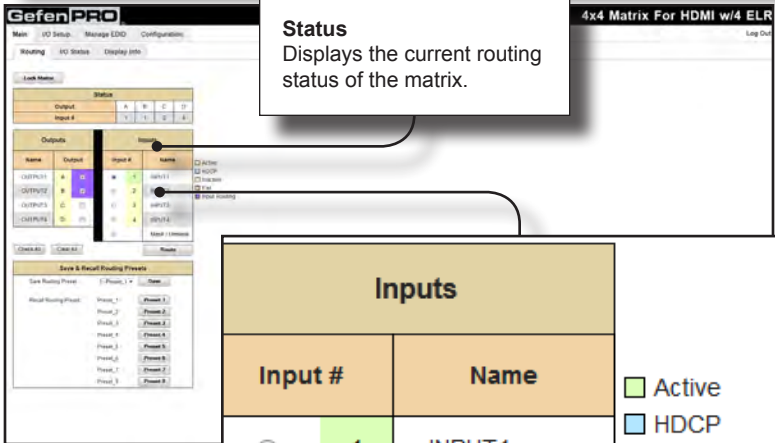
Using the Built-in Web server

The Web GUI is divided into four main pages: **Main**, **I/O Setup**, **Manage EDID**, and **Configuration**. Each main page is represented by a tab at the top-most portion of the screen. The **Main**, **I/O Setup**, and **Manage EDID** pages have their own set of sub-tabs. Click on the desired tab / sub-tab to open the desired page. When the Web GUI is opened in a Web browser, the **Main** page / tab will be displayed. See page 35 for information on how to connect to the built-in Web GUI.

> **NOTE:** In order to view all four tabs, the operator must be logged in as "Administrator".

Main >> Routing

Status
Displays the current routing status of the matrix.

Inputs

Input #
Click the radio button next to the desired input to be routed. Only one input can be selected at a time.

Name
Displays the current name of the input. The name of each input can be changed. See page 55 for more information.

Lock Matrix
Locks / unlocks the matrix. When the matrix is locked, no modifications can be made using the Web GUI. When the matrix is locked, the button text will read "Unlock Matrix" and a red bar will appear across the top portion of the screen with the text "Matrix is LOCKED". Click the "Unlock Matrix" button to unlock the matrix. See the illustration at the bottom of the page.

Legend
Provides color-coded information on the status of each Input and Output.

Name
Displays the current name of
each output. The name of each
input can be changed.
Refer to the `#set_input_name`
command on page 55 for details
on naming inputs.

Output
Click to place a check mark in
the box and select the desired
output. Multiple outputs can be
selected at a time.

Outputs		
Name	**Output**	
OUTPUT1	A	☑
OUTPUT2	B	☑
OUTPUT3	C	☐
OUTPUT4	D	☐
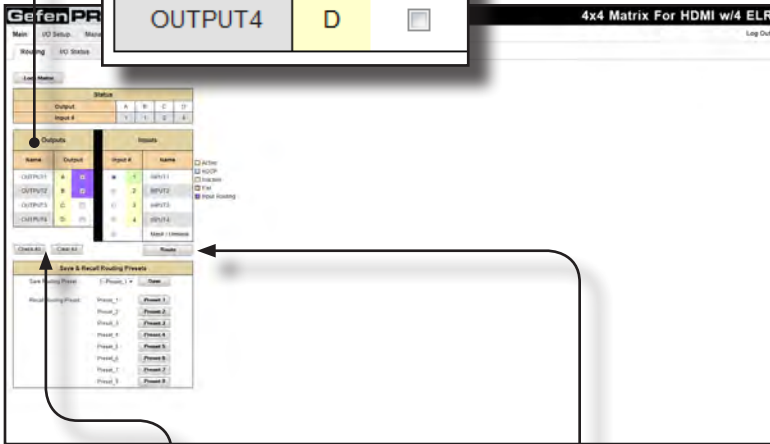
Check All
Places a check mark in each box
under the Output # column.

Clear All
Clears all check marks from the
Output # column.

Route
Click this button to route
the current input and output
selection(s).

Save & Recall Routing Presets

Save Routing Preset: 1 - Preset_1 ▾ **Save**

Recall Routing Preset:
Preset_1 **Preset 1**
Preset_2 **Preset 2**
Preset_3 **Preset 3**
Preset_4 **Preset 4**
Preset_5 **Preset 5**
Preset_6 **Preset 6**
Preset_7 **Preset 7**
Preset_8 **Preset 8**
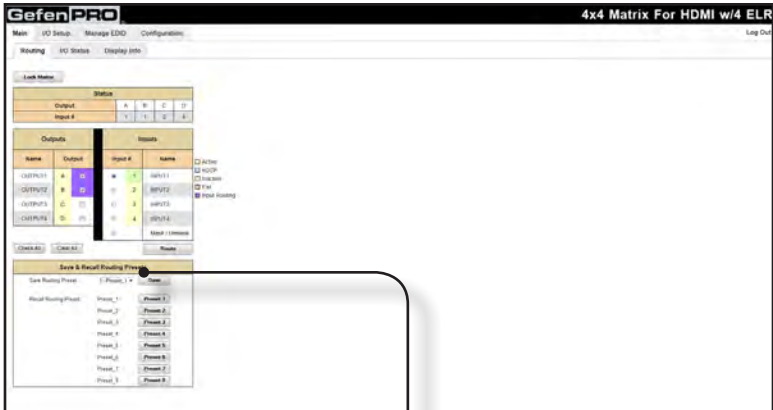
Save Routing Preset
Saves the current routing state to memory.
Click the drop-down list to select the desired
routing preset, then click the **Save** button to
save the preset to memory.

Recall Routing Preset
Loads the selected routing state into
memory. Click the desired button to load
the desired routing preset into memory.

Main >> I/O Status

Output	A	B
Name	OUTPUT1	OUTPUT2
RSENSE	On	Off
Mask	Off	Off
HPD	Low	Low
HDCP	Inactive	Inactive
POL	N/A	N/A

Output
Displays the state of each output for each of the following: Output name, RSENSE, Mask, HPD (Hot-Plug Detect), HDCP, and POL.

Input	1	2	3
Name	INPUT1	INPUT2	INPU
Color Depth	8bit	-	-
Color Space	RGB	-	-
HDCP	No	No	No
3D	No	No	No
Active Signal	Yes	No	No
Vertical Resolution	720	-	-
Horizontal Resolution	1280	-	-
Progressive / Interlaced	p	-	-
Refresh Rate	60Hz	-	-

Input
Displays the state of each input for each of the following: Input name, Color Depth, Color Space, HDCP, 3D, Active Signal, Vertical Resolution, Horizontal Resolution, Progressive / Interlaces, and Refresh Rate.

Main >> Display Info

Choose EDID

Select the EDID from the drop-down list. The selected
EDID will be copied from the selected EDID Bank or
Output to the desired input(s) and used by the source.

Options:
Default EDID, Bank 1 ... Bank 8, Output 1 ... Output 4

Feature	
24Hz Frame Rate	TRUE
Max Resolution	1080P@60Hz
Max Color Depth	12 bit
3D Capable	FALSE
Mode (DVI/HDMI)	HDMI
Max Audio Channels	2 Ch
Audio Formats	
LPCM	TRUE
DTS-HD	FALSE
DTS Digital Surround	FALSE
Dolby Digital (AC3)	FALSE
Dolby TrueHD	FALSE

Feature / Audio Formats
Displays the capabilities of the display (or sink device),
based on the EDID.

I/O Setup >> Preset Names
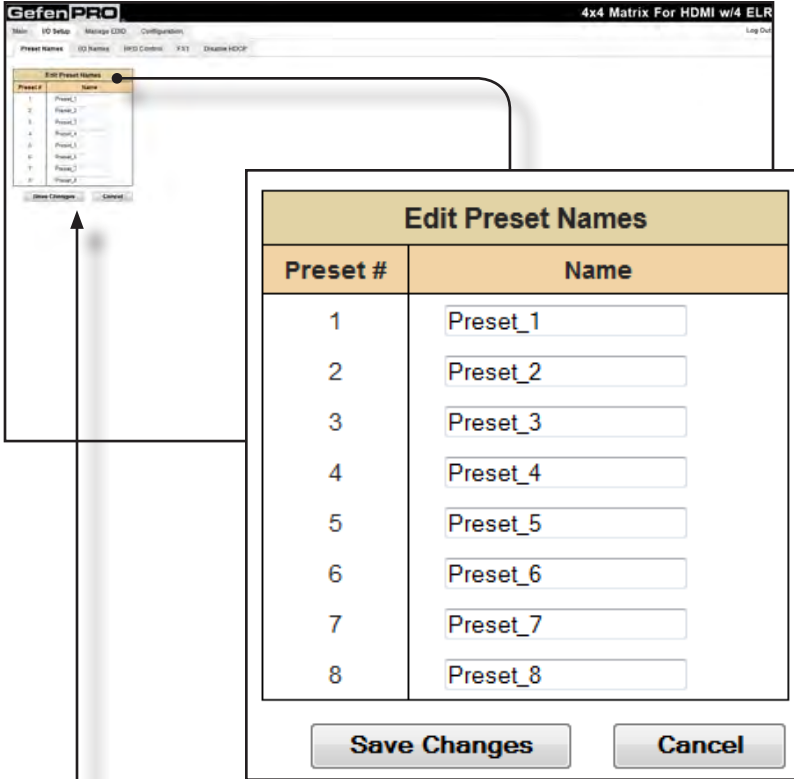
Name
Type the desired name of the Preset in this field.
Click the **Save Changes** button to save the Preset Name.
Click the **Cancel** button to restore the previous name.

Save Changes
Saves the current changes.

Cancel
Restores the previous names for each
Preset, if a change was made.

I/O Setup >> I/O Names

Edit Output & Input Names

Output	Name	Input #	Name
A	OUTPUT1	1	INPUT1
B	OUTPUT2	2	INPUT2
C	OUTPUT3	3	INPUT3
D	OUTPUT4	4	INPUT4

Save Changes   **Cancel**

Save Changes
Saves the current changes.

Cancel
Restores the previous names for each
Preset, if a change was made.

Name
Type the desired name of each Output or Input in these fields. Click
the **Save Changes** button or click the **Cancel** button to restore the
previous name.

I/O Setup >> HPD Control

HPD Control		
Input #	Name	
1	INPUT1	Pulse
2	INPUT2	Pulse
3	INPUT3	Pulse
4	INPUT4	Pulse
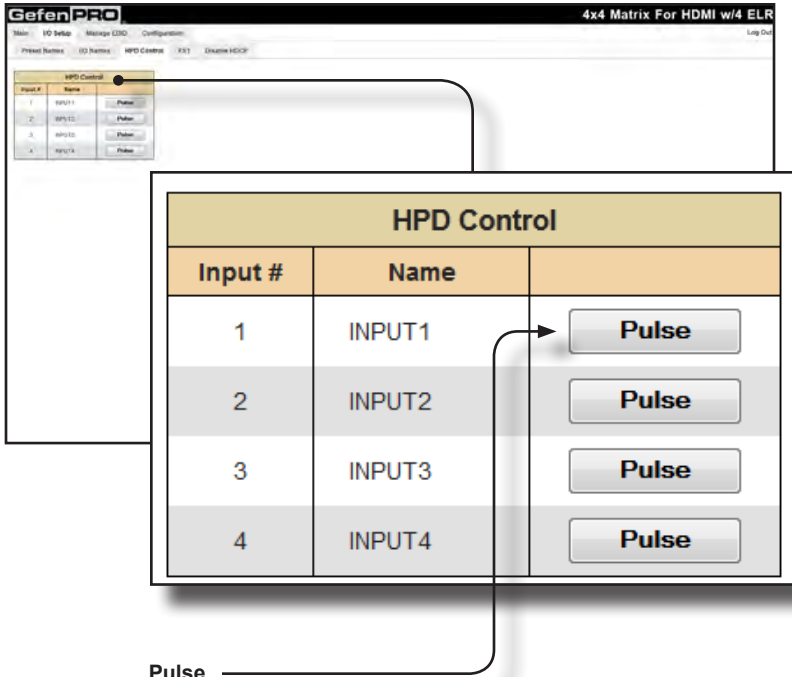
Pulse
Click the Pulse button to cycle the HPD line on the desired input. This is the equivalent of physically disconnecting and reconnecting the HDMI cable between the source device and the matrix.

I/O Setup >> FST

Check All
Places a check mark in each box under the FST column.

Clear All
Clears all check marks from the FST column.

Set
Click this button to enable FST on the selected input(s). The Web GUI will display a prompt to verify the selected operation.

Cancel
Restores the previous FST state for each input, if a change was made.

FST
Click to select the desired input(s). Selecting the input does *not* automatically enable the FST feature. Use the **Set** button to enable FST on the selected input.

I/O Setup >> HDCP

> **NOTE:** Some computers will enable HDCP if an HDCP-compliant display is detected. Use the Disable feature to force the computer to ignore detection of an HDCP-compliant display. Note that using the Disable feature does **not** decrypt HDCP content.

HDCP Pass Through

Disable	Input #	Name
☑	1	Input_1
☐	2	Input_2
☑	3	Input_3
☐	4	Input_4

Check All   Set   Cancel

Clear All

Check All
Places a check mark in each box under the HDCP column.

Clear All
Clears all check marks from the HDCP column.

Set
Click this button to disable HDCP on the selected input(s).

Cancel
Restores the previous HDCP state for each input, if a change was made.

Disable
Click to select the desired input(s) and use the **Set** button to force the computer to ignore detection of an HDCP-compliant display.

Manage EDID >> Assign

Lock EDID
Secures the Local EDID and disables the automatic loading after power-up. See the `#lock_edid` command on page 70 for more information.

Copy EDID From
Select the EDID from the drop-down list. The EDID will be copied from the selected destination to the desired input or EDID bank.

Options:
Default EDID, Bank 1 ... Bank 8, Output 1 ... Output 4

Copy To
Click to select
the desired input(s).

Inputs					
Copy To	**EDID Modes**	**Input #**	**Name**	**EDID Source**	**EDID Name**
☐	Custom ▾	1	INPUT1	OUTPUT1	
☐	Custom ▾	2	INPUT2	OUTPUT1	
☐	Custom ▾	3	INPUT3	OUTPUT1	
☐	Custom ▾	4	INPUT4	OUTPUT1	

Check All
Clear All

EDID Modes
Click the drop-down list to select the EDID mode.

Options:
Custom, Last Output

Check All
Places a check mark in each box
under the **Copy To** column.

Clear All
Clears all check marks from the
Copy To column.

If the EDID Mode is set to *Last Output*, then the
EDID source will be set to Dynamic EDID.

If the EDID Mode is set to *Custom*, then the EDID
of the display that is connected to Output 1 will be
used.
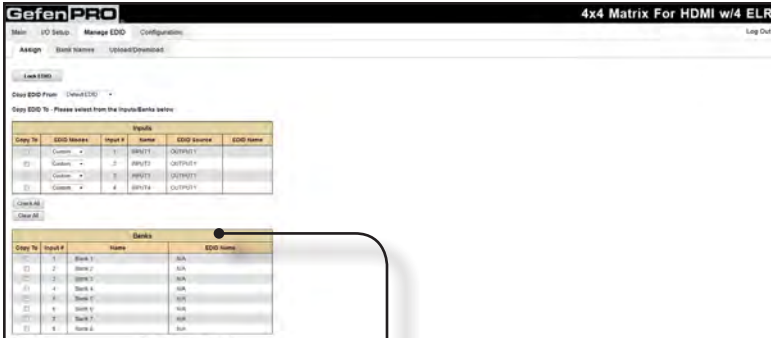
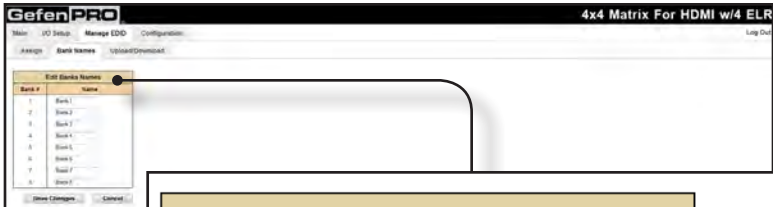| Banks			
Copy To	Input #	Name	EDID Name
☐	1	Bank 1	N/A
☐	2	Bank 2	N/A
☐	3	Bank 3	N/A
☐	4	Bank 4	N/A
☐	5	Bank 5	N/A
☐	6	Bank 6	N/A
☐	7	Bank 7	N/A
☐	8	Bank 8	N/A

Check All   **Copy**   **Cancel**

Clear All

Copy To
Click this button to copy the specified EDID to the selected inputs / banks.

Cancel
Restores the previous EDID state for each input, if a change was made.

Check All
Places a check mark in each box under the **Copy To** column.

Clear All
Clears all check marks from the **Copy To** column.

Manage EDID >> Bank Names

Bank #
Indicates the EDID bank number.

Name
Type the desired name of the EDID bank in this field.
Click the **Save Changes** button to save the bank name.
Click the Cancel button to restore the previous name.

Save Changes	**Cancel**
Saves the current name change to the EDID bank(s).	Restores the previous names for each EDID bank, if a change was made.

Manage EDID >> Upload / Download

Upload
Click this button to upload the EDID to the specified bank.

Select Bank Location
Click this drop-down list to select the bank to where the EDID will be uploaded.

Options:
Bank 1 ... Bank 8

Browse...
Click this button to select the EDID file to be uploaded.

Upload EDID

Select EDID File to Upload:

[   ] Browse_

Select Bank Location:

[1 - Bank 1   ▼]   **Upload**

GefenPR

Download EDID

Select EDID File to Download:

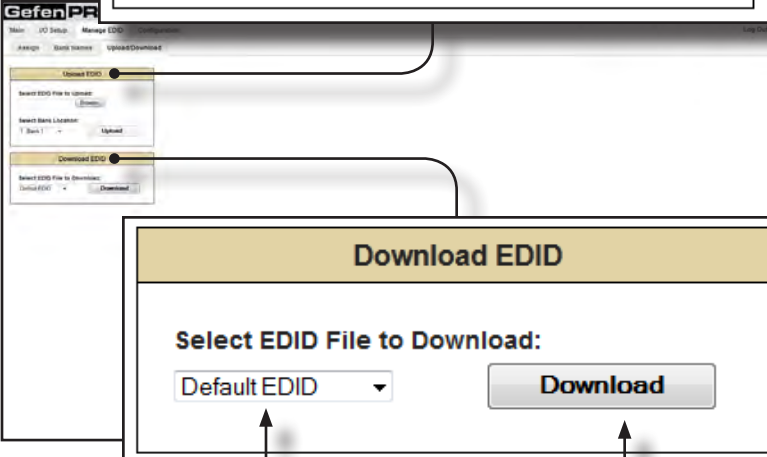[Default EDID   ▼]   **Download**

Drop-down list
Click this box to select the EDID that is to be saved to a file. The EDID file will be saved in binary format (.bin).

Options:
Bank 1 ... Bank 8, Output 1 ... Output 4,
Input 1 ... Input 4

Download
Click this button to download the selected EDID to a file.

Configuration >> Change IP Settings

Change IP Settings
Assigns IP address, subnet, gateway, HTTP listening port, and Telnet port. The MAC address cannot be changed.

Save Settings
Saves the current settings for the Change IP Settings. After clicking this button, the Web interface will display a dialog indicating that the matrix must be rebooted for changes to take effect.

Set Defaults
Click this button to restore the factory-default IP settings. After clicking this button, the Web interface will display a dialog indicating that the matrix must be rebooted for changes to take effect.

Configuration >> Telnet Login Settings
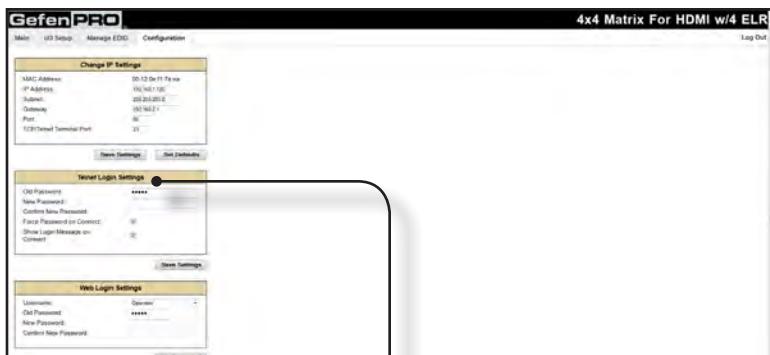
Telnet Login Settings

Old Password:	●●●●●
New Password:	
Confirm New Password:	
Force Password on Connect:	☑
Show Login Message on Connect:	☑

Save Settings

Old Password
Type the current (old) password in this field.

New Password
Type the new password in this field.

Force Password on Connect
Click this check box to have the matrix prompt for a password each time a Telnet session is started.

Show Login Message on Connect
Click this check box to have the matrix display the Telnet welcome message each time a Telnet session is started. The welcome message appears as: "Welcome to GEF-HDFST-444-4ELR TELNET"

Save Settings
Saves the current changes to the Telnet Login Settings.

Configuration >> Web Login Settings
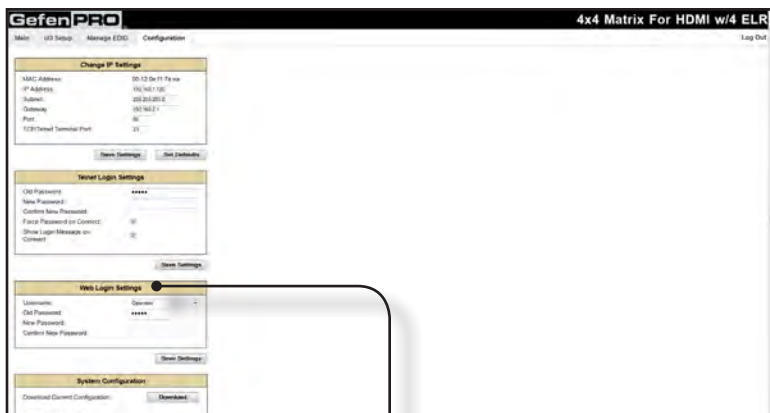
Username
Click this drop-down list to select the username to be changed.

Old Password
Type the current (old) password in this field.

New Password
Type the new password in this field.

Confirm Password
Re-type the new password in this field.

Save Settings
Saves the current changes to the Web Login Settings.

Configuration >> System Configuration

System Configuration

Download Current Configuration   **Download**

Restore Configuration

[_____] Browse...

Warning: All current settings will be lost   **Restore**

Firmware Update (UI ver: v3.0L)

[_____] Browse...   **Update**

Factory Reset   **Reset**

Reboot   **Reboot**

Download Current Configuration
Click this button to download the current configuration to a file.

System Configuration

Download Current Configuration — **Download**

Restore Configuration

[ ] Browse...

Warning: All current settings will be lost

Restore

Firmware Update (UI ver: v3.0L)

[ ] Browse...

Update

Factory Reset — **Reset**

Reboot — **Reboot**

Browse
Click this button to select the firmware file to be uploaded. See page 101 for details on updating the firmware.

Browse
Click this button to select the saved configuration file to be loaded into memory.

Restore
Uploads the selected configuration file to the matrix.

Update
Updates the matrix with the selected firmware file.

Reset
Click this button to set the matrix to factory-default settings. The IP settings are preserved.

Reboot
Click this button to reboot the matrix.

Firmware Update Procedure

1. Make sure the 4x4 Matrix for HDMI is powered.

2. Connect an Ethernet cable between the matrix and the computer running the Web GUI.

3. Go to the **Configuration** tab in the Web GUI and click the **Browse...** button under the **System Configuration** section.
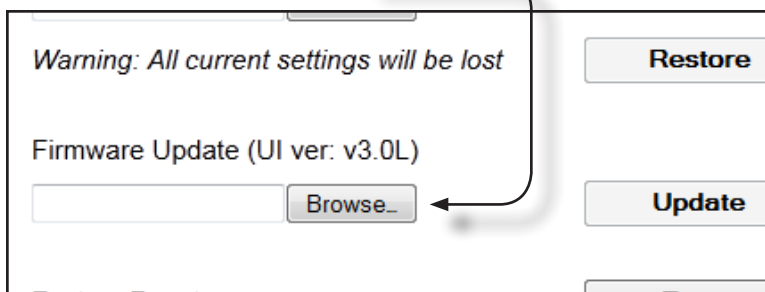
4. Select the firmware file and click the **Update** button

5. The matrix will prompt you to verify that you want to overwrite the current firmware. Click the **OK** button on the Web GUI dialog to begin uploading the firmware file.

6. Once the firmware file has been uploaded, the matrix will verify the firmware content. The front-panel LCM will display the following if the firmware passes:

7. After the firmware file integrity has been verified, the matrix will begin the upgrade procedure. The upgrade progress will be displayed in the front-panel LCM.

8. After the matrix has been updated, the unit will automatically initiate a countdown to reboot. The LCM will display the following message:

9. After the matrix reboots, the firmware upgrade process will be complete.

105

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.. 225 MHz

ELR extension range... Up to 330 feet (100 meters)

Matrix Video Input Connectors................................. (4) HDMI Type A 19-pin, female, locking

Matrix Video Output Connectors.. (4) ELR-POL RJ45, female

Receiver ELR-POL Input Connector.. (1) RJ45, female

Receiver Video Output Connector........................... (1) HDMI Type A 19-pin, female, locking

Power Indicator (Matrix/Receiver)... LED, blue=On, red=Standby

Lock Indicator (Matrix).. LED, blue

USB Port (Matrix)... Mini-B, female (factory use only)

Ethernet Port (Matrix)... (1) RJ45, female, shielded

RS-232 Port (Matrix).. (1) DB-9, female

IR Input Port (Matrix)... (5) 3.5mm mini-mono jacks

IR Output Port (Matrix).. (5) 3.5mm mini-mono jacks

IR Extender Port (Receiver)... (1) 3.5mm mini-stereo jack

IR Output Port (Receiver).. (1) 3.5mm mini-mono jack

Power Supply.............................. Internal, 100V to 240V AC, 50/60 Hz, detachable IEC cord

Power Consumption (Matrix).. 200W (max.)

Operating Temperature... 0 to + 104 °F (0 to + 40 °C)

Rack mounting requirements (Matrix).. Standard 19" rack, 2U high

Dimensions (Matrix - W x H x D).. 17.25" x 3.5" x 12"
(440mm x 89mm x 305mm)

Dimensions (Receivers - W x H x D)... 4.4" x 1.1" x 3.35"
(110mm x 27mm x 85mm)

Shipping Weight (1 Matrix and 4 Receivers).. 37 lbs. (16.8 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.

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

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