



# 8x CAT6 Extender for HDMI®

EXT-HDMI1.3-CAT6-8X

User Manual





## ASKING FOR ASSISTANCE

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# INTRODUCTION

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Congratulations on your purchase of the 8x CAT6 Extender for HDMI. Your complete satisfaction is very important to us.

## **Gefen**

Gefen delivers innovative, progressive computer and electronics add-on 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 8x CAT6 Extender for HDMI**

The Gefen 8x CAT6 Extender for HDMI sends eight independent HDMI 1.3 signals, with Deep Color support, over a single CAT-6a cable to distances up to 200 feet (60 meters).

The Gefen 8x CAT6 Extender for HDMI supports HDMI 1.3 features such as 1080p Full HD and multichannel audio formats including Dolby TrueHD and DTS-HD Master Audio.

The Gefen 8x CAT6 Extender for HDMI digital transmission method insures 100% signal integrity over this single cable extension solution.

With IR Back Channel and RS-232 support, control of the 8x8 Matrix and Hi-Def sources, at any of the 8 individual zones, is at your fingertips. Each Receiver unit allows control for Matrix switching and sending IR commands back to the source located up to 200 feet (60 meters) away. The 8x CAT6 Extender for HDMI adds IP Control to the connected Gefen 8x8 Matrix for convenient access to switching and routing of the connected sources using a web browser.

## **How It Works**

The Gefen 8x CAT6 Extender for HDMI can be connected in two ways :

- 1) Matrix Mode: As a Control and Extender system for any Gefen 8x8 Matrix unit. Extend up to 8 of the Gefen 8x8 Matrix outputs up to 200 feet (60 meters) away with IR, RS-232, or IP Control at any of the remote locations. Also supports the IR Back Channel for remote control of the extended Hides sources.
- 2) Stand-alone Mode: As a stand-alone Extender system. Connect up to 8 Hi Def sources to any of the available inputs. Simply extend the connected Hi Def sources up to 200 feet (60 meters) with IR Back Channel.

## OPERATION NOTES

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### READ THESE NOTES BEFORE INSTALLING OR OPERATING THE 8X CAT6 EXTENDER FOR HDMI

- CAT-6a cables can be used up to 200 feet (60 meters).
- Shielded (STP) CAT-6a is recommended. However, unshielded (UTP) CAT-6a is acceptable.

**NOTE:** Shielded cable has an advantage by providing immunity to Electromagnetic Interference (EMI), cell phones and A/C motors.

# FEATURES

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## Supported HDMI 1.3 Features

- 225 MHz (up to 12 bit YUV 444 @ 1080p)
- Deep Color
- Dolby TrueHD and DTS-HD Master Audio
- Lip-Sync
- CEC Pass-Through

## Features

- Extends HDMI 1.3 at 1080p up to 200 feet (60 m)
- Extends DVI at 1920x1200 up to 200 feet (60 m) when using a passive HDMI-to-DVI adapter.
- 3DTV Pass-Through
- Color Space Conversion
- IR Remote Control
- Built-in IR Extender and IR Back Channel
- RS-232 serial control
- IP Control (Sender unit feature)
- Audio and video are transmitted digitally for zero signal loss
- Supports multichannel digital audio formats including Dolby TrueHD and DTS-HD Master Audio
- Metal enclosure provides better RF shielding
- Compensation for cable skew
- Maintains settings on Power-On state

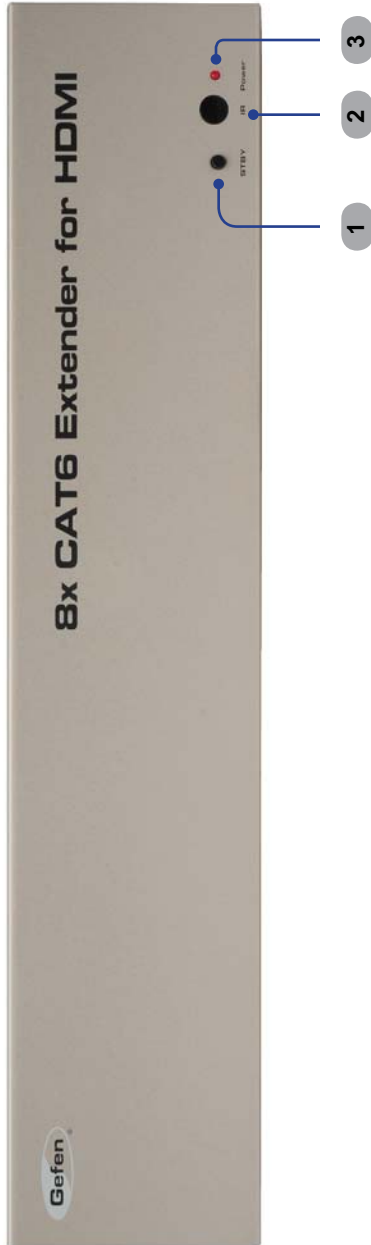
## Package Includes

- (1) 8x CAT6 Extender Sender Unit
- (8) 8x CAT6 Extender Receiver Units
- (8) 1 ft. HDMI Cables (M-M)
- (1) RS-232 Serial Cable (M-F)
- (1) 24V DC Power Supply
- (8) 5V DC Locking Power Supplies
- (1) Set of Rack Ears (Sender Unit Only)
- (1) User Manual

# SENDER UNIT LAYOUT

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Front





## SENDER UNIT DESCRIPTION

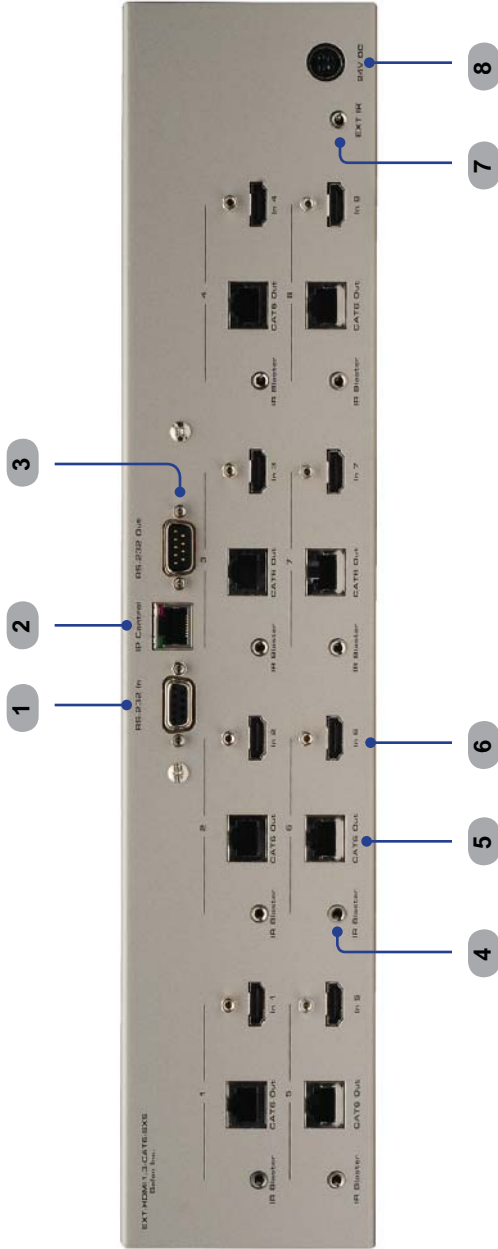
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### Front

- 1 Standby Button**  
Sets the 8x CAT6 Extender for HDMI into Standby Mode.
- 2 IR Sensor**  
Receives signals from the IR Remote Control.
- 3 Power Indicator**  
This LED will turn bright red once the locking power supply has been properly connected.

# SENDER UNIT LAYOUT

Back



## SENDER UNIT DESCRIPTIONS

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### Back

**1 RS-232 Serial Port (Input)**

The 8x8 Matrix may be switched remotely using serial communications with any office computer or a control automation device by connecting to this port. See page 25 for details.

**2 IP Control**

Connect to this port to control the 8x8 HDMI Matrix using IP Control. See page 51 for more information.

**3 RS-232 Serial Port (Output)**

Connects to the RS-232 control device. The 8x8 may be switched remotely using this port. See page 25 for details.

**4 IR Blaster (8)**

Used to connect the IR Blaster to the Source device.

**5 CAT-6 Output Jack (8)**

Connects the Sender unit to the Receiver unit using CAT-6.

**6 Locking HDMI Port (8)**

Connect a Hi-Def source to this HDMI port.

**7 IR Extender Port**

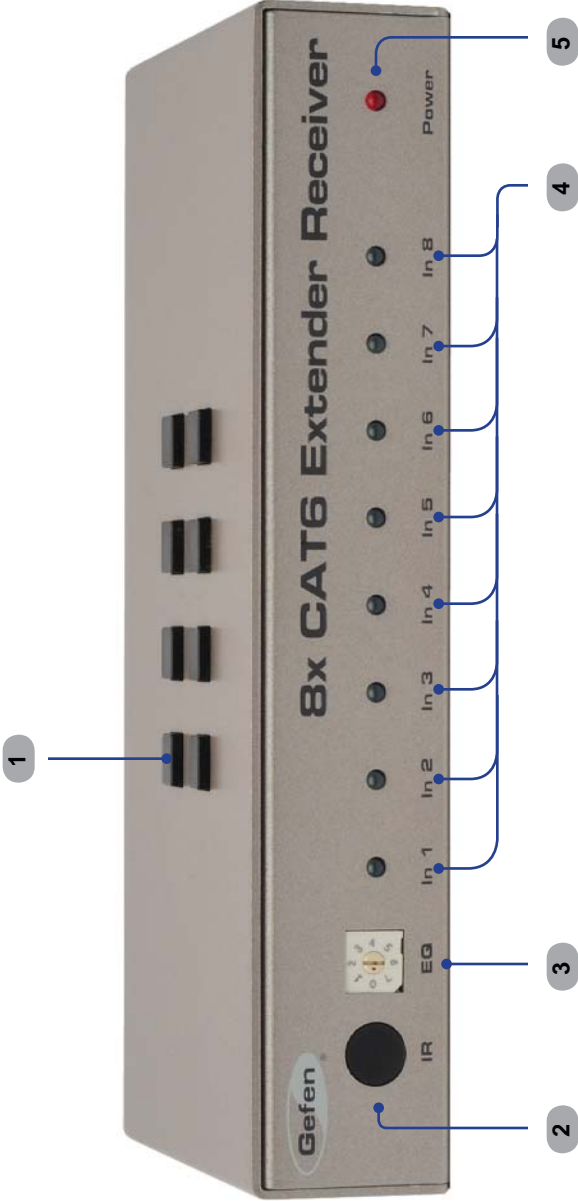
Used to extend the IR Sensor range of the Sender unit.

**8 24V DC Power Connector**

Connects the included 24V DC power supply to this receptacle.

# RECEIVER UNIT LAYOUT

Front



## RECEIVER UNIT DESCRIPTIONS

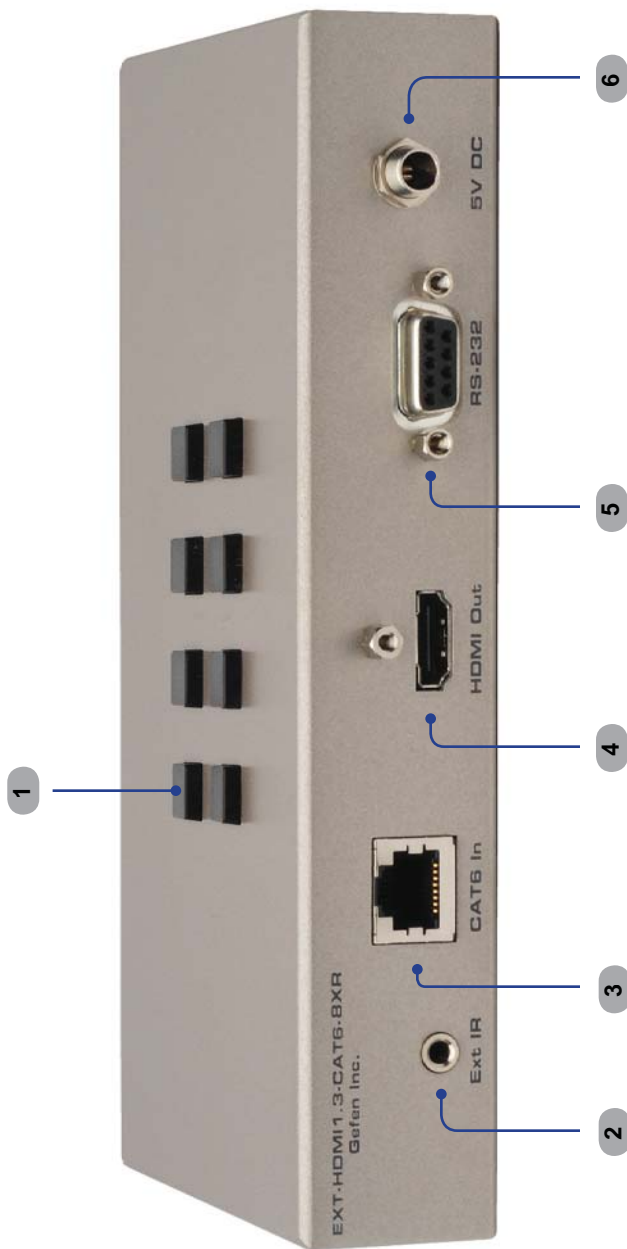
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### Front

- 1 Control Buttons (1 - 8)**  
When connected to any 8x8 Matrix for HDMI, these remote buttons on the Receiver unit can switch between the 8 Hi-Def inputs connected to the 8x8 Matrix for HDMI.
- 2 IR Sensor**  
Control the Receiver unit by pointing the IR Remote Control to the IR Sensor.
- 3 EQ Trimpot**  
Used to equalize the signal to compensate for distance and skew variations found in various brands of CAT-6 cable.
- 4 Input Indicators (HDMI In 1 - HDMI In 8)**  
Displays the current input of the 8x8 Matrix.
- 5 Power Indicator**  
This LED will turn bright red once the power supply has been properly connected.
- 6 IR Extender Port**  
Used to extend the IR Sensor range of the Receiver unit.
- 7 CAT-6 In Connector**  
Connect the CAT-6 cable from the Sender unit to the RJ-45 connector.
- 8 HDMI Out**  
Connect the HDMI cable from the HDTV display to the HDMI Out.
- 9 RS-232 Input**  
Connects a controlling device to this port.
- 10 5V DC Locking Power Connector**  
Connects the included 5V DC Locking Power Supply to this receptacle.

# RECEIVER UNIT LAYOUT

Back



## RECEIVER UNIT DESCRIPTIONS

---

### Back

**1 Control Buttons (1 - 8)**

When connected to any 8x8 Matrix for HDMI, these remote buttons on the Receiver unit can switch between the 8 Hi-Def inputs connected to the 8x8 Matrix for HDMI.

**2 IR Extender Port**

Used to extend the IR Sensor range of the Receiver unit.

**3 CAT-6 In Connector**

Connect the CAT-6 cable from the Sender unit to the RJ-45 connector.

**4 HDMI Out**

Connect the HDMI cable from the HDTV display to the HDMI Out.

**5 RS-232 Input**

Connects a controlling device to this port.

**6 5V DC Locking Power Connector**

Connects the included 5V DC Locking Power Supply to this receptacle.

## IR REMOTE DESCRIPTION

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### RMT-8IR Remote (Optional)



- 1**     ***Activity Indicator***  
This LED will be activated momentarily each time a button is pressed.
- 2**     ***Input Source Selection Buttons (1 - 8)***  
These buttons are used to select which input source is routed to the HDTV display.



# RMT-8IR REMOTE INSTALLATION

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## Installing the RMT-8IR Battery

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.

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



**Battery Slot**

# RMT-8IR REMOTE CONFIGURATION

## Setting the IR Remote Channel on the RMT-8IR

In the event that IR commands from other remote controls conflict with the supplied RMT-8IR Remote, changing the remote IR channel will fix this issue. The RMT-8IR Remote has a bank of DIP switches for setting the Remote IR channel.

The DIP Switch bank on the RMT-8IR is located underneath the battery cover.



**Left:** Picture of the opened rear battery compartment of the RMT-8IR remote showing the exposed DIP Switch bank between the battery chambers.

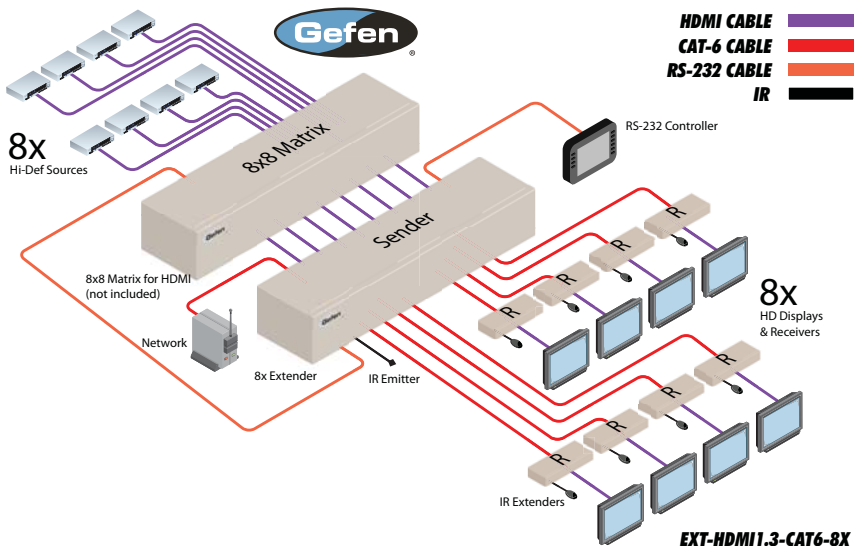
The IR channel selected on the RMT-8IR Remote must match the IR channel assigned to the 8x CAT6 Extender for HDMI. For example, if you set both DIP switches on the remote to the down position (IR channel 1), you must set the 8x CAT6 Extender for HDMI to use IR channel 1.

Please refer to page 36 and 47 on how to change the IR channel on the 8x CAT6 Extender for HDMI.

# CONNECTING AND OPERATING THE 8X CAT6 EXTENDER FOR HDMI

## How to Connect the 8x CAT6 Extender for HDMI (Matrix Mode)

1. Using any 8x8 Matrix for HDMI as a source, connect an HDMI cable from HDMI Out 1 on the 8x8 Matrix to HDMI In 1 on the 8x CAT6 Extender for HDMI Sender unit. To ensure correct operation of the 8x CAT6 Extender with the 8x8 Matrix, make sure all connections are made: Connect HDMI Out 2 on the 8x8 Matrix to HDMI In 2 on the Extender, and so on.
2. Connect the HDMI Out on the 8x CAT6 Extender Receiver unit to the display with a user-supplied HDMI cable.
3. Using one CAT-6 cable, connect CAT6 Out 1 on the Sender unit to CAT6 In on the Receiver unit.
4. Connect additional Receiver units as described above.
5. Connect the 5V DC locking power supplies to each Receiver unit. Do not overtighten the locking connectors. Plug the power cord into an available wall outlet.
6. Connect the 24V DC power supply to the 8x CAT6 Extender Sender unit and plug the power cord into an available wall outlet.



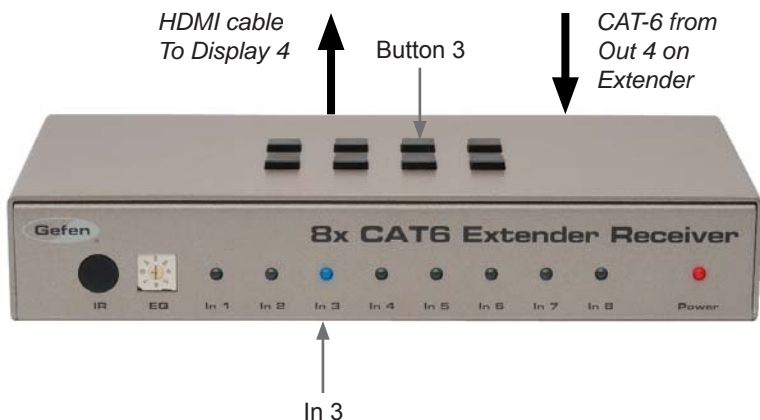
# CONNECTING AND OPERATING THE 8X CAT6 EXTENDER FOR HDMI

## How to Operate the 8x CAT6 Extender for HDMI (using an 8x8 Matrix)

The front panel of each Receiver unit for the 8x CAT6 Extender for HDMI contains a set of LED indicators which corresponds to an input (source) on the 8x8 Matrix device. A blue LED indicates which input has been routed from the 8x8 Matrix. On the top of each Receiver unit there are a set of 8 push-buttons which are used to control the switching of the 8x8 Matrix.

*Example 1: Routing Input (source) 3 to Output (display) 4.*

1. Connect an HDMI cable from HDMI Out 4 on the 8x8 Matrix to HDMI In 4 on the 8x CAT6 Extender for HDMI Sender unit.
2. Connect an 8x CAT6 Extender Receiver unit to Display 4.
3. Press button 3 on the top of the Receiver unit. Button 3 is shown below. The In 3 LED will turn bright blue, indicating that Input 3 on the 8x8 Matrix has been routed to Display 4 (Zone 4).



*Example:* HDMI input 3 is routed to HDMI Out 4 (a sample of the 8x8 Matrix display panel is shown below). The image shown on Display 4 will be the HDMI source (3), on the 8x8 Matrix input connected to Output D.



## CONNECTING AND OPERATING THE 8X CAT6 EXTENDER FOR HDMI

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### How to Connect the 8x CAT6 Extender for HDMI with RS-232 control to the 8x8 Matrix for HDMI and to the controlled device

1. Follow steps 1 - 6 on How to Connect the 8x CAT6 Extender for HDMI (see page 11).
2. Connect an RS-232 cable from the RS-232 serial port on the controlling device to the RS-232 In port on the rear of the 8x CAT6 Extender for HDMI Sender unit.
3. Connect another RS-232 serial cable from the RS-232 Out port on the rear of the 8x CAT Extender Sender unit to the RS-232 port on the rear of the 8x8 Matrix.

**NOTE:** Please refer to page 25 for details on configuring RS-232 control.

*Example 1: Routing Input (source) 3 to Output (display) 1 using the 8x8 Matrix.*

Make sure a Receiver unit is connected to CAT6 Out 1 on the Sender unit. Use the controlling device to send the following command:

r 1 3

The LED for In 3 will turn bright blue and the source from the 8x8 Matrix (In 3) will be displayed on the HDTV display connected to this Receiver unit. See page 25 for details on routing using RS-232.

# **CONNECTING AND OPERATING THE 8X CAT6 EXTENDER FOR HDMI**

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## **How to Connect the 8x CAT6 Extender for HDMI (Stand-alone Mode)**

The 8x CAT6 Extender for HDMI is dependent upon an external 8x8 Matrix to manage all the zone switching. When used as a stand-alone, without the 8x8 Matrix attached, the product functions as a one-to-one extender for each HDMI unit. Eight parallel extenders are used.

1. Connect an HDMI cable from the source device to HDMI In 1 on the back of the Sender unit.
2. Connect the Display to the 8x CAT6 Extender Receiver unit with a user-supplied HDMI cable.
3. Using a single CAT-6 cable, connect CAT6 Out 1 on the Sender unit to the CAT6 In on the Receiver unit.
4. If additional Receiver units will be used, complete these connections at this time, as described above.
5. Connect the 5V DC locking power supplies to each Receiver unit. Do not overtighten the locking connectors. Plug the power cord into an available wall outlet.
6. Connect the 24V DC power supply to the 8x CAT6 Extender for HDMI and plug the power cord into an available wall outlet.

# CONNECTING AND OPERATING THE 8X CAT6 EXTENDER FOR HDMI

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## Routing Sources using the Optional RMT-8IR Remote Unit (Matrix Mode)

There are a total of 8 buttons on the RMT-8IR remote, which represent each of the 8 buttons on the Receiver unit.

*Example 1: Route the source connected to HDMI In 3 (from the 8x8 Matrix) on the Sender unit to the display connected to HDMI Out 2.*

Point the Remote at the Receiver unit connected to Display 2, then press button 3 on the RMT-8IR.

**Table of IR Remote Commands  
for the Optional RMT-8IR Remote Unit**

RMT-8IR Button	Source
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8

The RMT-8IR remote control unit will allow the selection of any input (source) on the 8x8 Matrix unit can be will be routed to any of eight Receiver units. Use the information in the table above when routing the desired input to a display.

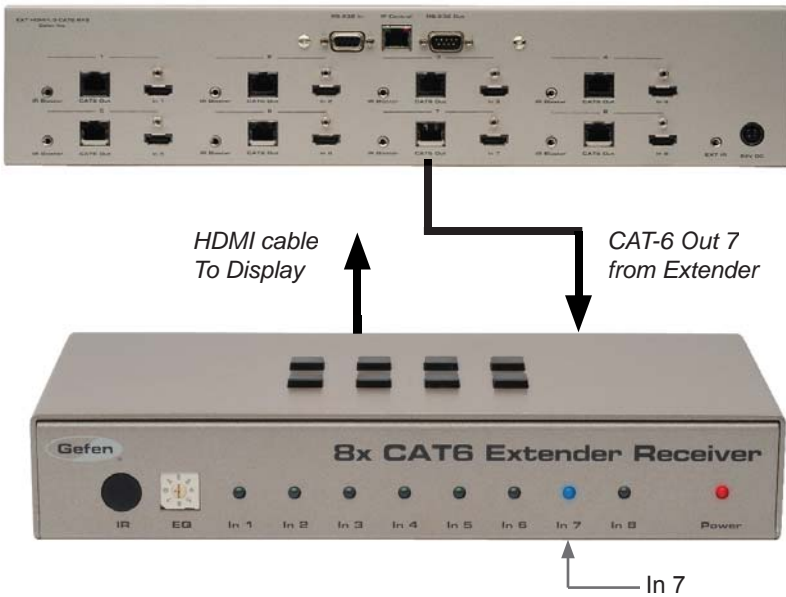
# CONNECTING AND OPERATING THE 8X CAT6 EXTENDER FOR HDMI

## How to Operate the 8x CAT6 Extender for HDMI (Stand-alone Mode)

When the 8x CAT6 Extender for HDMI is used without an 8x8 Matrix, it can only be used as an HDMI extender.

The LED on the front panel will show which HDMI is active on the Sender unit.

Example: Connect a CAT-6 cable to CAT6 Out 7 and CAT6 In, between the Sender unit and Receiver unit.





# CONNECTING AND OPERATING THE 8X CAT6 EXTENDER FOR HDMI

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## How to Equalize the 8x CAT6 Extender for HDMI (Matrix Mode / Stand-alone Mode)

The 8x CAT6 Extender for HDMI Receiver unit has an equalization trimpot to compensate for variances that can be found in different CAT-6a cable brands. If there is no output video or if output video contains artifacts and/or video noise, use the steps below to adjust the EQ trimpot.

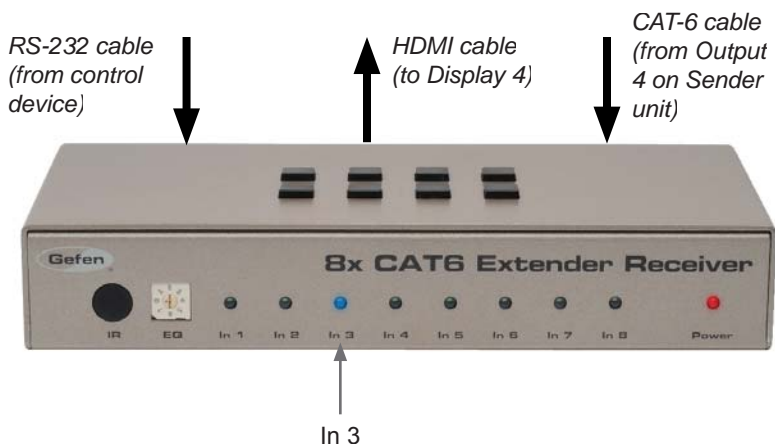


1. Insert a small flat-head screwdriver into the trimpot on the front panel of the Receiver unit.
2. The EQ trimpot can be set to one of eight different positions. Turn the trimpot clockwise until it clicks into the next position. Continue adjusting the trimpot until the signal shows best results.

# CONNECTING AND OPERATING THE 8X CAT6 EXTENDER FOR HDMI

## Controlling the Receiver Unit using RS-232 (Matrix Mode)

1. Prepare the Receiver unit by connecting an RS-232 cable from the computer or other controlling device to the RS-232 serial port on the back of the Receiver unit (see page 6 - 7).
2. Configure the controller using the RS-232 settings on page 25.



*Example 1: Route input 3 on the 8x8 Matrix to Output 4 on the 8x CAT6 Extender for HDMI.*

Use the RS-232 controller to send the following command:

r3

The blue LED for In 3 will turn bright blue and the source from Input 4 on the 8x8 Matrix will be displayed. See page 25 for details on routing using RS-232.

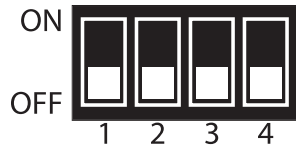
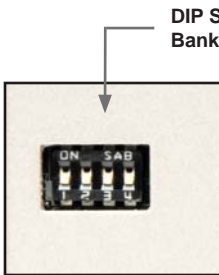
# DIP SWITCH CONFIGURATION

## DIP Switch Location (Matrix Mode / Stand-alone Mode)

On the bottom of each Receiver unit, there are four (4) DIP switches. Each DIP switch performs a different function.

Before modifying DIP switch settings, disconnect the power from the Receiver unit. After the DIP switches have been configured, reconnect the power.

### Receiver Unit (bottom)



**NOTE:** By default, all DIP switches are in the OFF position

### Default settings for DIP switches

DIP Switch	Position
1	OFF
2	OFF
3	OFF
4	OFF

# DIP SWITCH CONFIGURATION

---

## DIP Switches (Matrix Mode / Stand-alone Mode)

### DIP 1 - EDID Management

- *OFF - Local EDID*

When Local EDID mode is used, the EDID will be assembled by copying all video and audio features of the connected device. Deep Color support will be manually controlled: If Deep Color is supported by the display(s), DIP 2 should be set to the ON position (see DIP 2 - Deep Color, below). By default, the unit is shipped with DIP 1 in the OFF position.

- *ON - Pass-through EDID*

Allows all video and audio features of the connected devices to be passed to the source device without control over Deep Color.

### DIP 2 - Deep Color

- *OFF - Disables Deep Color support*

Disables Deep Color in the EDID. Deep Color management is only available when Local EDID is being used (DIP 1 = OFF).

- *ON - Enables Deep Color support*

Enables Deep Color support. In Pass-through EDID Mode, setting DIP 2 = ON has no effect since all EDID information is passed through.

### DIP 3 / DIP 4 - IR Remote Channel

The IR channel assigned to the IR Remote Control must match the IR channel assigned to the 8x CAT6 Extender for HDMI Receiver unit. The factory setting (default) for DIP 3 and DIP 4 are in the OFF position.

DIP 3	DIP 4	IR Channel
OFF	OFF	1
ON	OFF	2
OFF	ON	3
ON	ON	4

# RS-232 SERIAL CONTROL INTERFACE



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

## Binary Table

ASCII	Corresponding RMT-8IR Button	Binary
1	1	0011 0001
2	2	0011 0010
3	3	0011 0011
4	4	0011 0100
5	5	0011 0101
6	6	0011 0110
7	7	0011 0111
8	8	0011 1000

## RS-232 Settings

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

# RS-232 SERIAL FUNCTIONS - SENDER UNIT

## 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.

## EDID Management

Function	Description
#EDIDDSTOLO	Read downstream EDID and stores into a 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

### #EDIDDSTOLO Function

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

#### Syntax:

#EDIDDSTOLO param1 param2 param3...param9

#### Parameters:

<i>param1</i>	A downstream display	[1 - 8]
<i>param2 - param9</i>	Input list	[1 - 8]

#### Notes:

Set *param2* to a value of zero (0) to store the downstream EDID in all eight HDMI inputs.

## RS-232 SERIAL FUNCTIONS - SENDER UNIT

---

### #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 - 8]  
*param2* EDID size [1 - 2]

Value	Meaning
1	128 byte EDID
2	256 byte EDID

### #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 - 8]

### #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 - 8]

## RS-232 SERIAL FUNCTIONS - SENDER UNIT

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### IP Configuration - Sender Unit

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
#FADEFAULT	Reset Matrix to default settings

#### #SIPADD Function

The #SIPADD function specifies a new IP address.

#### Syntax:

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

#### Parameters:

<i>param1</i>	IP address	[0 - 255]
<i>param2</i>	IP address	[0 - 255]
<i>param3</i>	IP address	[0 - 255]
<i>param4</i>	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:

<i>param1</i>	IP address	[0 - 255]
<i>param2</i>	IP address	[0 - 255]
<i>param3</i>	IP address	[0 - 255]
<i>param4</i>	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:

<i>param1</i>	Gateway address	[0 - 255]
<i>param2</i>	Gateway address	[0 - 255]
<i>param3</i>	Gateway address	[0 - 255]
<i>param4</i>	Gateway address	[0 - 255]

### Notes:

A reboot is required after using this function.

### **#SPORT Function**

Specifies a new port.

Syntax:

```
#SPORT param1
```

Parameters:

<i>param1</i>	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*

### **#FADEFAULT Function**

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

Syntax:

```
#FADEFAULT
```

Parameters:

*None*

## RS-232 SERIAL FUNCTIONS - SENDER UNIT

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### General Functions

Function	Description
#ACTIVEBOLO	Enables the boot loader
#BLASTER	Sets the Receiver unit blaster mode
#BRIDGEM	Enable direct communication with Matrix
#CTARGET	Set Matrix route command type
#HPDMODE	Set input HPDs
#LOCKPOWER	Toggles the lock power state
#MASKOUT	Blanks selected outputs
#REBOOT	Sets local and IP configurations to default settings
#RMTIRADD	Set the remote IR channel

#### #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.

## RS-232 SERIAL FUNCTIONS - SENDER UNIT

---

### #BLASTER Function

The #BLASTER function sets the Receiver Unit blaster mode.

#### Syntax:

```
#BLASTER param1 param2
```

#### Parameters:

<i>param1</i>	Receiver	[1 - 8]
<i>param2</i>	Mode	[0 - 2]

Value	Meaning
0	Disable
1	Follow video
2	Individual routing

### #BRIDGEM Function

The #BRIDGEM function allows direct communication to the Matrix by disabling communication through the Sender Unit. When enabled, the Sender Unit “listens” to the data being received and waits for this function to be executed.

#### Syntax:

```
#BRIDGEM param1
```

#### Parameters:

<i>param1</i>	State	[0 - 1]
---------------	-------	---------

Value	Meaning
0	Disable
1	Enable

## RS-232 SERIAL FUNCTIONS - SENDER UNIT

---

### #CTARGET Function

The #CTARGET function defines how to send routing commands to the Matrix.

#### Syntax:

#CTARGET param1

#### Parameters:

param1

Type

[0 - 2]

Value	Meaning
0	'1' route input 1 to output 1 '2' route input 2 to output 1 '3' route input 3 to output 1 '4' route input 4 to output 1 '5' route input 1 to output 2 '6' route input 2 to output 2 '7' route input 3 to output 2 '8' route input 4 to output 2 '9' route input 1 to output 3 'A' route input 2 to output 3 'B' route input 3 to output 3 'C' route input 4 to output 3 'D' route input 1 to output 4 'E' route input 2 to output 4 'F' route input 3 to output 4 'G' route input 4 to output 4
1	XY X = Output (A - H) Y = Input (1 - 8)
2	rXY X = Output Y = Input

## RS-232 SERIAL FUNCTIONS - SENDER UNIT

---

### #HPDMODE Function

The #HPDMODE function sets HPD to low (OFF) or high (ON) on the HDMI inputs.

#### Syntax:

```
#HPDMODE param1 param2
```

#### Parameters:

*param1*                      Inputs                                      [1 - 8]  
*param2*                      HPD state                                      [0 - 1]

Value	Meaning
0	HPD Off
1	HPD On

#### Notes:

If *param1* is set to a value of zero (0), then all eight inputs are affected.

### #LOCKPOWER Function

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

#### Syntax:

```
#LOCKPOWER param1
```

#### Parameters:

*param1*                      State                                      [0 - 1]

Value	Meaning
0	Disable Power Lock
1	Enable Power Lock

## #MASKOUT Function

The #MASKOUT function allows blanking of selected outputs.

### Syntax:

```
#MASKOUT param1 param2
```

### Parameters:

<i>param1</i>	Output	[1 - 8]
<i>param2</i>	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.

## #REBOOT Function

The #REBOOT function performs a hardware reset on the Receiver Unit.

### Syntax:

```
#REBOOT param1 55
```

### Parameters:

<i>param1</i>	Receiver	[1 - 8]
---------------	----------	---------

### Notes:

The number 55 must be appended to the end of the function.

*Example:* #reboot 2 55 *reboots Receiver Unit 2.*

## RS-232 SERIAL FUNCTIONS - SENDER UNIT

---

### #RMTIRADD Function

The #RMTIRADD function sets the IR channel for the Matrix.

#### 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



## Command Syntax

Simplified syntax was used for command implementation for faster operation with the device. The commands are not case-sensitive.

## Commands

Command	Description
<i>F</i>	+5 V for Fiber Optic Extender Status
<i>M</i>	Routes a single input to all outputs
<i>R</i>	Routing command
<i>S</i>	Route a single input to all outputs

## Fiber Optic Extender Status F0 Command

The F0 command returns the state of pin 18 on the HDMI inputs.

### Syntax:

*F*

### Parameters:

*None*

### Notes:

“High” is returned if +5 V is present on HDMI input. “Low” is returned if +0 V is present on HDMI input. Setting *param1* to a value of 0 will return the state of pin 18 of all HDMI inputs.

## RS-232 SERIAL COMMANDS - SENDER UNIT

---

### Using parameters with the **F Command**

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

#### Syntax:

```
f param1 param2
```

#### Parameters:

*param1* HDMI input [1 - 8]

*param2* State [0 - 1]

Value	Meaning
0	Disable
1	Enable

### **M Command**

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

#### Syntax:

```
m
```

#### Parameters:

None

### R Command

The R command allows specific routing of inputs and outputs when controlling the 8x CAT6 for HDMI Sender unit.

Syntax:

```
r param1 param2
```

Parameters:

<i>param1</i>	HDMI Output	[1 - 8]
---------------	-------------	---------

<i>param2</i>	HDMI Input	[1 - 8]
---------------	------------	---------

*Example: r2 routes Input 2 on the 8x8 Matrix to the selected Receiver unit.*

### S Command

The S command routes a single input to all outputs.

Syntax:

```
s param1
```

Parameters:

<i>param1</i>	HDMI Input	[1 - 8]
---------------	------------	---------

Notes:

*Example: r2 routes Input 2 on the 8x8 Matrix to the selected Receiver unit.*

## RS-232 SERIAL FUNCTIONS - RECEIVER UNIT

---

### 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.

### EDID Management - Receiver Unit

Function	Description
#EDIDDSTOLO	Read downstream EDID and stores into a Local EDID
#EDIDMODE	Set EDID mode
#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

### #EDIDDSTOLO Function

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

Syntax:

#EDIDDSTOLO

Parameters:

None

# RS-232 SERIAL FUNCTIONS - RECEIVER UNIT

---

## #EDIDMODE Function

The #EDIDMODE function sets the EDID mode.

### Syntax:

#EDIDMODE param1

### Parameters:

param1                      EDID Mode                      [0 - 1]

Value	Meaning
0	Local
1	Pass through

### Notes:

This function only works after the hardware interface has been disabled. See page 44 for details.

## #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 - 8]

param2                      EDID size                      [1 - 2]

Value	Meaning
1	128 byte EDID
2	256 byte EDID

### **#PRLOEDID Function**

The #PRLOEDID function reads the local EDID and spools it to the serial port.

Syntax:

#PRLOEDID

Parameters:

None

### **#PRDSEDID Function**

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

Syntax:

#PRDSEDID

Parameters:

None

## RS-232 SERIAL FUNCTIONS - RECEIVER UNIT

---

### General Functions

Function	Description
#ACTIVEBOLO	Enables the boot loader
#BLASTER	Sets the blaster mode
#DEEPCOLOR	Sets the deep color mode
#EQLIZE	Sets the equalizer level
#FADEFAULT	Reset to factory defaults
#HPDMODE	Set input HPDs
#MASKOUT	Blanks selected outputs
#RMTIRADD	Sets the Remote IR channel
#STATUS	Get system status
#USERIN	Enables the user interface

#### #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.

## RS-232 SERIAL FUNCTIONS - RECEIVER UNIT

---

### #BLASTER Function

The #BLASTER function sets the Receiver Unit blaster mode.

#### Syntax:

```
#BLASTER param1 param2
```

#### Parameters:

<i>param1</i>	Receiver	[1 - 8]
<i>param2</i>	Mode	[0 - 2]

Value	Meaning
0	Disable
1	Follow video
2	Individual routing

### #DEEPCOLOR Function

The #DEEPCOLOR function sets 12-bit Deep Color mode.

#### Syntax:

```
#DEEPCOLOR param1
```

#### Parameters:

<i>param1</i>	Mode	[0 - 1]
---------------	------	---------

Value	Meaning
0	Disable Deep Color
1	Enable Deep Color



### #EQLIZE Function

The #EQLIZE function sets equalizer level on the Receiver Unit.

#### Syntax:

```
#EQLIZE param1
```

#### Parameters:

<i>param1</i>	Equalizer level	[0 - 7]
---------------	-----------------	---------

#### Notes:

This function only works after the hardware interface has been disabled. See page 44 for details.

### #FADEFAULT Function

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

#### Syntax:

```
#FADEFAULT
```

#### Parameters:

None

## RS-232 SERIAL FUNCTIONS - RECEIVER UNIT

---

### #HPDMODE Function

The #HPDMODE function sets HPD to low (OFF) or high (ON) on the HDMI inputs.

Syntax:

```
#HPDMODE param1 param2
```

Parameters:

*param1* State [0 - 4]

Value	Meaning
0	Follow sink
1	Toggle sink
2	Force low
3	Force high
4	Force toggle

### #MASKOUT Function

The #MASKOUT function allows blanking of selected outputs.

Syntax:

```
#MASKOUT param1 param2
```

Parameters:

*param1* Output [1 - 8]

*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.

## RS-232 SERIAL FUNCTIONS - RECEIVER UNIT

---

### #RMTIRADD Function

The #RMTIRADD function sets the IR channel for the Matrix.

#### 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

### #STATUS Function

The #STATUS function gets the system status.

#### Syntax:

#STATUS

#### Parameters:

None

## RS-232 SERIAL FUNCTIONS - RECEIVER UNIT

---

### #USERIN Function

The #USERIN function sets the user hardware interface.

#### Syntax:

```
#USERIN param1 param2
```

#### Parameters:

*param1* Mode [0 - 2]

*param2* Interface [0 - 1]

Value (Mode)	Meaning
0	LEDs
1	IR detect
2	Switches

Value (Interface)	Meaning
0	Enable
1	Disable

## Command Syntax

Simplified syntax was used for command implementation for faster operation with the device. The commands are not case-sensitive.

## Commands

Command	Description
<i>L</i>	Routes the IR blaster
<i>M</i>	Routes a single input to all outputs
<i>R</i>	Routing command

### L Command

The L command routes the IR blaster.

Syntax:

`l param1`

Parameters:

*param1*                      Input                      [1 - 8]

### M Command

The M command displays the current routing state.

Syntax:

`m`

Parameters:

*None*

### R Command

The R command routes the Receiver Unit to a specific input.

Syntax:

r param1

Parameters:

param1                      HDMI Input                      [1 - 8]

*Example: r 4 routes the Receiver Unit to Input 4.*

# IP CONTROL

The Gefen 8x CAT6 Extender for HDMI supports IP-based control using an integrated Web interface. To access this feature, an IP address, subnet, gateway, and port number need to be set on the 8x CAT6 Extender for HDMI (**Default IP: 192.168.0.70 Subnet: 255.255.255.0 Gateway: 192.168.0.1 Port: 80**). Consult the network administrator to obtain the proper IP address and settings for this product to properly communicate on the network.

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

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



## VIEW MATRIX STATUS

The **VIEW MATRIX STATUS** page will display the current status and can also be used to create routes.

To create a new route, follow the steps below:

1. Select which outputs will display the source by clicking on each check box.
2. Select the radio button of the input that will be routed to each output.
3. Click the **Switch** button to update the new routing configuration.

This page will automatically refresh every minute. However, at anytime the **Refresh** button can be pressed to refresh the status of the Matrix.

# IP CONTROL

## IP CONFIGURATION

MAC Address	IP Address	Subnet	Gateway	Port
0:1C:91:1:70:9	192.168.2.250	255.255.255.0	192.168.0.1	80

Refresh

### Change IP Settings

IP Address:  (default: 192.168.0.70)

Subnet:  (default: 255.255.255.0)

Gateway:  (default: 192.168.0.1)

Port:  (default: 80)

Save

Reset IP Configuration to Defaults:

The **IP CONFIGURATION** page is used to set the IP settings that will be used to access the Web interface. 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 **VIEW MATRIX STATUS** page will be displayed. Settings made on this page will not take effect until the unit is restarted: Disconnect power from the unit and reconnect power for changes to take effect.

At anytime, 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 screenshot shows the web interface for the Gefen HDMI1.3-1CAT6x8 Manager. At the top, there is a navigation bar with buttons for 'VIEW MATRIX STATUS', 'IP CONFIGURATION', 'BACKUP/RESTORE', and 'POWER MANAGEMENT'. Below the navigation bar, a warning message reads: 'Warning: Use caution when applying power to inputs. It may damage your equipment.' Underneath the warning is a table showing the power status for each of the 8 inputs. The table has two rows: 'Power Status - Lock State:OFF' and 'Input'. The 'Input' row lists inputs 1 through 8. The 'Power' row shows the current status for each input, which is 'Off' for all. Below the table is a 'Refresh' button. The next section is titled '5V to Inputs' and contains eight input controls, each with a radio button for '5v Off' and '5v On'. All '5v Off' radio buttons are selected. Below this section is an 'Update' button. The final section is titled 'Power Lock State' and contains a radio button for 'Off' and 'On', with 'Off' selected. Below this section is an 'Update Power Lock State' button.

**Gefen** HDMI1.3-1CAT6x8 Manager

VIEW MATRIX STATUS IP CONFIGURATION BACKUP/RESTORE **POWER MANAGEMENT**

Warning: Use caution when applying power to inputs. It may damage your equipment.

Power Status - Lock State:OFF								
Input	1	2	3	4	5	6	7	8
Power	Off	Off	Off	Off	Off	Off	Off	Off

Refresh

**5V to Inputs**

Input 1  5v Off  5v On    Input 2  5v Off  5v On    Input 3  5v Off  5v On    Input 4  5v Off  5v On

Input 5  5v Off  5v On    Input 6  5v Off  5v On    Input 7  5v Off  5v On    Input 8  5v Off  5v On

Update

**Power Lock State**

Update Power Lock State  Off  On

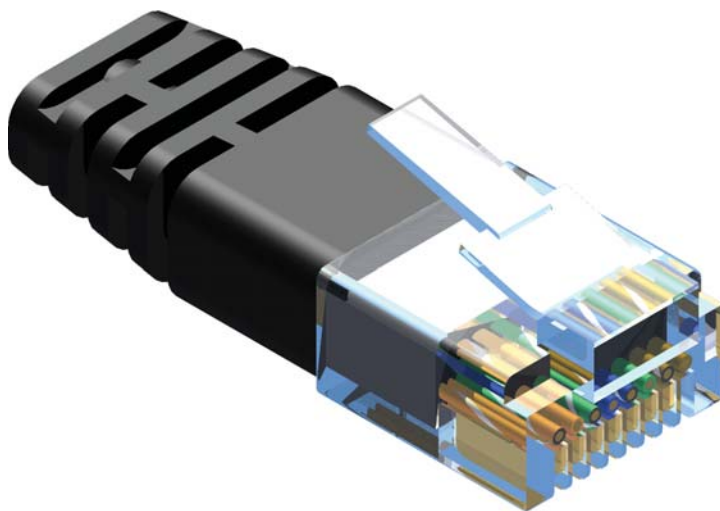
The **POWER MANAGEMENT** page is used to set optional +5V power on an input to power specific optional devices. The current status of this feature for each input can be viewed on this page. To set this feature for each input follow the steps below.

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 **VIEW MATRIX STATUS** page will be displayed.

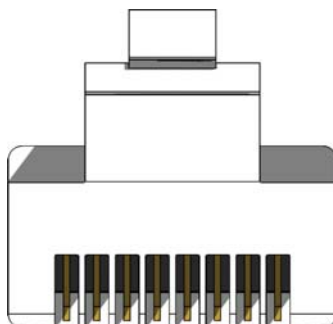
This page will automatically refresh every minute, however, at anytime the “Refresh” button can be pressed to refresh the status of the matrix.

## NETWORK CABLE WIRING DIAGRAM



Gefen recommends the TIA/EIA-568-B wiring option. Please adhere to the table below when field-terminating the CAT-6 cable for use with Gefen products.

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



CAT-6 cabling comes in stranded and solid core types. Gefen recommends using solid core cabling.

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

# FIRMWARE UPDATE

---

## Firmware Update Procedure

To begin the update procedure, the unit's Boot Loader must be activated. To activate the Boot Loader, follow the procedure outlined below:

1. Connect an RS-232 cable from the computer to the RS-232 port on the 8x CAT6 Extender for HDMI.
2. Run the terminal emulation program (e.g. Windows® Hyperterminal) and make sure the terminal settings are as follows:
  - a. Baud rate = 19200
  - b. Stop bits = 1
  - c. Data bits = 8
  - d. Flow control = None
3. Power the Sender unit.
4. Type the command: #ACTIVEBOLO\r
5. Re-type the command: #ACTIVEBOLO\r
6. Once the Boot Loader is activated, a message similar to the following should appear in the terminal program:

```
8x HDMI CAT-6 Extender Boot Loading
===== Main Menu =====
Download new program ----- 1
Cancel ----- 2
=====
```

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

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

8. Under Transfer, select "Send" and upload the firmware file (e.g. CHDMIDCAT6x8\_e\_x\_x.bin).
9. Repeat steps 4 - 7.
10. Under Transfer, select "Send" and upload the firmware file (e.g. SHDMIDCAT6x8\_e\_x\_x.bin).

## FIRMWARE UPDATE

---

11. Connect the RS-232 cable to the Receiver unit.
12. Repeat steps 4 - 7 and upload RHD MIDCAT6x8\_e\_x\_x.bin.
13. Repeat step 11 - 13 for each Receiver unit.

## SPECIFICATIONS

---

Video Amplifier Bandwidth .....	225 MHz
Input Video Signal.....	1.2 V p-p
Input DDC Signal.....	5V p-p (TTL)
Maximum Video Resolution.....	1080p / 1920 x 1200
HDMI Connector.....	Type A 19-pin
Link Connector.....	RJ-45 Shielded
Power Indicator (Sender / Receiver).....	LED (red)
Source Indicators (Receiver).....	LED (blue)
RS-232 Interface (Sender).....	1x DB9 serial (F), 1x DB9 serial (M)
RS-232 Interface (Receiver).....	1x DB9 serial (M)
Power Supply.....	24V DC (Sender), 5V DC (Receiver)
Power Consumption (Sender).....	60 W (max.)
Power Consumption (Receiver).....	10 W (max.)
Operating Temperature .....	0 - 40 °C
Sender Dimensions.....	17.1" W x 3.5" H x 4.5" D
Receiver Dimensions.....	7.5" W x 1.3" H x 3.5" D
Shipping Weight.....	16 lbs
Certifications.....	UL (power supply), RoHS, CE

## 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

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This product uses UL or CE listed power supplies.