Gefen
TOOLBOX

4x1 Switcher for HDMI®

GTB-MHDMI1.3-441

GTB-MHDMI1.3-441-BLK

User Manual

www.gefentoolbox.com

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Congratulations on your purchase of the GefenToolBox 4x1 Switcher for HDMI. Your complete satisfaction is very important to us.

About Gefen

We specialize in total integration for your home theater, while also focusing on going above and beyond customer expectations to ensure you get the most from your hardware. We invite you to explore our distinct product line. Please visit http://www.gefen.com for the latest offerings in High-Definition signal solutions or call us between the hours of 8:00 am and 5:00 pm Monday-Friday, Pacific Standard Time for assistance with your A/V needs. We'll be happy to assist you.

Why GefenToolBox?

The GefenToolBox line offers portable and easy-to-install solutions for common A/V system integration setups using HDMI connectivity. GefenToolBox products are wall-mountable and small in size. GefenToolBox products are easily transported in the field and are ready for immediate and simple installations in working environments. These products come finished in a glossy color to blend in with either a white or black color scheme.

The GefenToolBox 4x1 Switcher for HDMI

The GefenToolBox 4x1 Switcher for HDMI routes high definition video at resolutions up to 1080p@60Hz with multichannel digital audio from any four Hi-Def sources to one displays. The GefenToolBox 4x1 Switcher eliminates the need to disconnect and reconnect HDMI devices. It works with any HDMI source that connects to an HDMI display, supporting advanced digital audio formats such as Dolby TrueHD and DTS-HD Master Audio. Each source is accessible at all times by selecting it with the included remote, the RS-232 port, or front panel button.

How It Works

Connect the Hi-Def sources to the GefenToolBox 4x1 Switcher's inputs using the supplied HDMI cables. Connect the HDMI output to the display using HDMI cables. 3D content can be displayed when connecting a 3DTV and 3D source. Any of the four A/V sources may now be selected by using the front panel buttons, RS-232, or the included IR remote control.

READ THESE NOTES BEFORE INSTALLING OR
OPERATING THE GEFENTOOLBOX 4X1 SWITCHER FOR HDMI

• The GefenToolBox 4x1 Switcher for HDMI has an Automatic Switching feature: Each time a connected device is powered ON, GefenToolBox 4x1 Switcher for HDMI will switch to that input. Once the connected device is powered down, the product will switch to the last active input. Switching can always be managed through IR remote control, RS-232, and the front panel buttons. See page 7 for details.

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

General Features

- Switch between four (4) HDMI 1.3 sources without signal loss.

- Maintains beautiful, sharp HDTV resolutions up to 1080p@60 Hz and 1920x1200@60Hz.

- Supports 3DTV pass-through

- Supports digital audio formats including LPCM 7.1, Dolby Digital Plus, Dolby TrueHD, and DTS-HD Master Audio.

- Supports the use of DVI sources and DVI displays with an HDMI-to-DVI converter cable or adapter.

- Input and output cables up to 15 feet in length can be used when using 8-bit or 12-bit color. Extension distance is dependent upon the quality of the cables being used.

- This product is HDMI-compliant and HDCP-compliant.

Package Includes

(1) GefenToolBox 4x1 Switcher for HDMI
(4) 6 ft HDMI cable (M-M)
(1) 5V DC Locking Power Supply
(1) IR Remote Control Unit
(1) User Manual

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Gefen
TOOLBOX

4x1 Switcher
for **HDMI**

3

IR

4   Input   1   2   3   4

8   Power

5   RS-232
EXT IR

5V DC

6   **7**

1 **HDMI Input Ports 1-4**
Connect HDMI-compliant source device(s) to any of these input ports.

2 **HDMI Output Port**
Connect an HDMI-compliant display device to this output port.

3 **IR Window**
Receives IR commands from the included IR remote (EXT-RMT-4IR), shown on page 8.

4 **Source Selector and Indicator LEDs**
The black button labeled "Input" selects the input source (1-4) to be routed to the display connected to the HDMI Output Port.

5 **RS-232C Interface for Remote Control via Serial Communications**
The GefenToolBox 4x1 Switcher for HDMI may be switched remotely using serial communications with any office computer or a control automation device. See page 13 for details.

6 **3.5mm mini-Stereo jack for connecting Optional IR Extender**
An optional IR Extender (sold separately) allows relocation of the IR sensor (eye) up to 6 feet away from the GefenToolBox 4x1 Switcher, enabling streamlined installations whereby the Switcher may be hidden away behind furniture / behind the scenes. The IR Remote need only point at the extended IR sensor to control the Switcher. Please see page 12 for a diagram.

7 **5V DC Power Receptacle**
Connect the included 5V DC power supply here and at a free wall outlet. Only use the power supply supplied. Screw the locking power tip into the socket until it fits snugly without overtightening.

8 **5V Power Indicator LED (Red)**
This LED will glow red once the included 5V DC power supply has been properly connected to the unit and a power source.

CONNECTING AND OPERATING
THE GEFENTOOLBOX 4X1 SWITCHER FOR HDMI

How to Connect the GefenToolBox 4x1 Switcher for HDMI

1. Use HDMI cables (provided) to connect the source device(s) to the HDMI input port(s) of the GefenToolBox 4x1 Switcher for HDMI.

2. Use additional user-supplied HDMI cables to connect an HDMI-compliant display to the output port on the GefenToolBox 4x1 Switcher for HDMI.

3. Connect the included 5V DC power supply to the power receptacle on the Switcher.

4. Connect the other end of the power supply to an available power outlet.

How to Operate the GefenToolBox 4x1 Switcher for HDMI

The top panel of the GefenToolBox 4x1 Switcher for HDMI contains a set of LED indicators, displaying which input (source) is being routed to the output (display). This allows for easy management and viewing of the input and output routing state.

There is a single row of LED indicators on the front panel. To the left of the LED indicator is a push button labeled "Input". The numbers along the top of each LED represents the currently selected Input (source): 1, 2, 3, or 4.

Example 1: Route Input (source) 2 to the Output

1. Ensure that an HDMI cable is connected from the source to HDMI In 2 and an HDMI cable is connected from the display to the Output port on the Switcher.

2. Press the Input Select button until the LED under column 2 glows blue. If the LED does not immediately appear under column 2, continue depressing the Input Select button until the LED under column 2 is enabled (***Fig 1.1***).

Fig 1.1
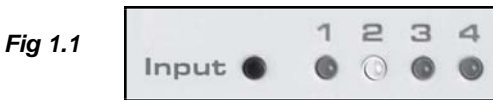
3. Once the LED under column 2 is enabled, a picture will be displayed on the display connected to the HDMI Output on the Switcher.

Example 2: Routing Input (source) 3 to the Output (display).

1.   Using **Fig 1.1** (page 6) as a starting point.

2.   Press the Input Select button once.

Fig 1.2

The row of LED indicators will now appear as in **Fig 1.2**. LED #2 will turn off and LED #3 will become enabled, indicating that Input 3 is being routed to the Output (display).

Automatic Switching

The GefenToolBox 4x1 Switcher for HDMI features Automatic Switching. When a connected source is powered ON, the GefenToolBox 4x1 Switcher for HDMI will automatically switch to that input. If the same device is powered-down, the GefenToolBox 4x1 Switcher for HDMI will revert to the (original) active source. The Switcher will always change to the last source device that was powered ON.

Automatic Switching can be enabled or disabled through RS-232. See page 14 for the command syntax.

NOTE: The IR Remote Control unit, RS-232, and the front-panel buttons will always allow manual switching of source devices, even if Automatic Switching is enabled.

IR REMOTE CONTROL UNIT DESCRIPTION

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

2   ***Display and Source Selection Buttons***
These buttons will be used to send display and source selections to the GefenToolBox 4x1 Switcher for HDMI.

Routing Sources to Displays

Issuing a routing command is a simple process. There are a total of 4 buttons on the RMT-4IR. The individual buttons represent the Inputs that are available for the Output.

For example, to route the source connected to HDMI In 2 to the display, press button 2 on the RMT-4IR.

Installing the IR Remote Control 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

Resolving IR Code Conflicts

In the event that IR commands from other remote controls conflict with the supplied IR remote control unit, changing the remote channel will alleviate this issue. The IR remote control unit has a bank of DIP switches for setting the remote IR channel.

The DIP Switch bank on the IR remote control unit is located underneath the battery cover.
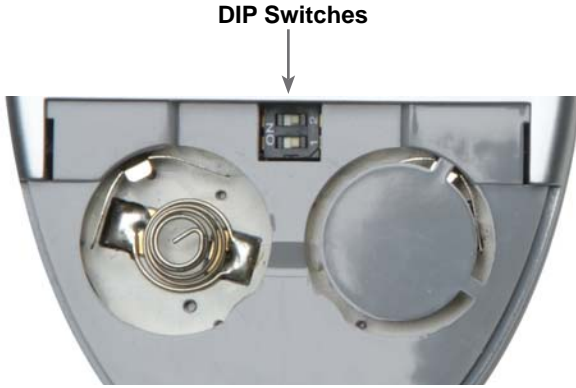
DIP Switches

It is important that the IR channel selected on the remote, match the IR channel on the GefenToolBox 4x1 Switcher for HDMI for proper operation. For example, if you set both DIP switches on the remote to the down position (toward the "1" and "2"), IR channel 0, you must set the GefenToolBox 4x1 Switcher for HDMI to use IR channel 0.
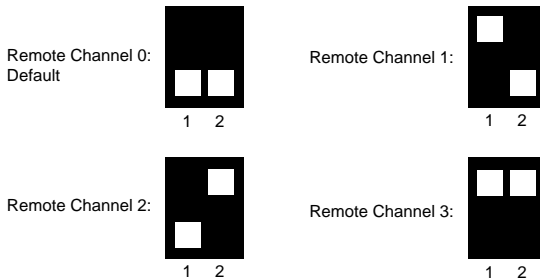
Remote Channel 0: Default

Remote Channel 1:

Remote Channel 2:

Remote Channel 3:

The RMT-4IR remote control will allow selecting the source to display on the output. Each button on the remote control corresponds to one of the of four source inputs. Please use the information below when selecting the desired source:

Table of IR Remote Commands
for the GefenToolBox 4x1 Switcher for HDMI

RMT-4IR	Source
1	**1**
2	**2**
3	**3**
4	**4**

RMT-4IR button	Source
3	**3**

Example: In the above example, if button 3 on the RMT-4IR remote control is pressed, the source connected HDMI In 3 will be routed to the Display device.

Using the IR Extender

An optional IR Extender (Gefen Part No. EXT-RMT-EXTIR) can be used to extend the IR capabilities of the GefenToolBox 4x1 Switcher for HDMI. One such application allows the Switcher to be hidden within or behind a cabinet (see illustration below).

Simply connect the IR extender to the IR extender port (see page 4).
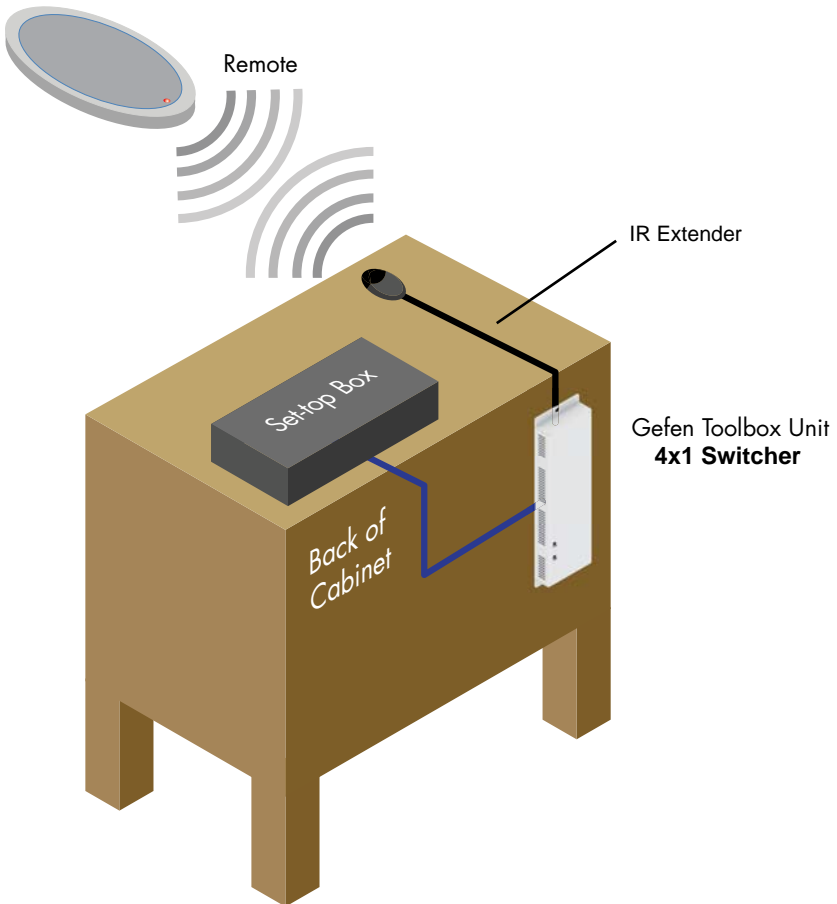
Only Pins 2 (RX), 3 (TX), and 5 (Ground) are used on the RS-232 serial interface

This feature allows for easy integration into automated systems capable of transmitting RS-232 commands. Please use the settings listed below to configure the RS-232 port of the user's system.

Transmitting the appropriate numeric ASCII character will simulate key presses on the RMT-4IR remote control.

Binary Table

ASCII	RMT-4IR Button	Binary
1	1	0011 0001
2	2	0011 0010
3	3	0011 0011
4	4	0011 0100

RS-232 Settings

Bits per second 19200

Data bits 8

Parity .... None

Stop bits 1

Flow Control .... None

Commands

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

Command	Description
A	Enable Auto-Switching
N	Disable Auto-Switching
S	Get System Status
V	Displays Firmware Version

A Command

The A command enables auto-switching. The Switcher will automatically switch to the last source device that was powered on.

Syntax:

a

Parameters:

None

N Command

The N command disables Auto-Switching.

Syntax:

n

Parameters:

None

S Command

The S command displays the current routing status of the Switcher. The S command will also display the current auto-switching status (A or N).

Syntax:

```
s
```

Parameters:

None

V Command

The V command displays the firmware version.

Syntax:

```
v
```

Parameters:

None

Changing the IR channel

Use the following procedure to set the proper IR channel on the GefenToolBox 4x1 Switcher for HDMI.

1   Press and hold the Input Select button for 5 seconds to enter IR channel selection mode. The bank of blue LED indicators will now display the currently selected IR channel.

2   Press the Input Select button to cycle through each IR channel. The currently selected IR channel will by indicated by a flashing blue LED. IMPORTANT: The selected IR channel **must** be the same as the IR channel set on the IR Remote Control Unit (page 10). Refer to the table below for setting the IR channel.

3   Once the proper IR channel has been selected, press and hold the Input Select button to confirm and exit IR channel selection mode. The currently selected input source will now be indicated.

IR Channel Table

Input LED	IR Channel
1	0
2	1
3	2
4	3
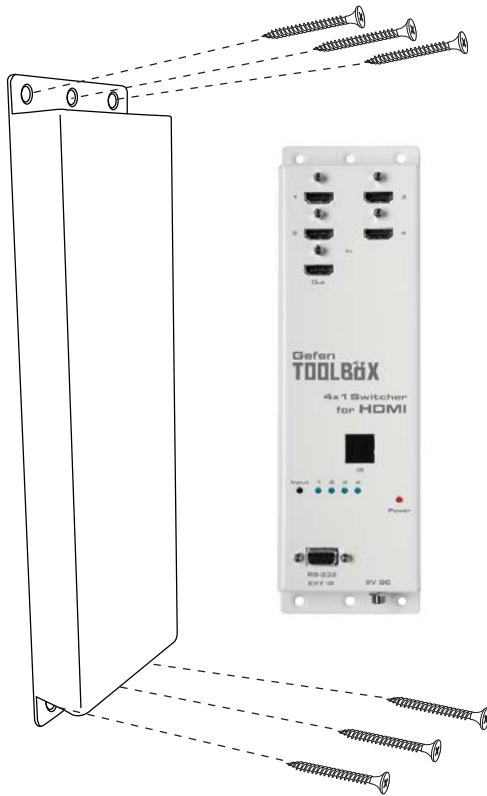
The GefenToolBox 4x1 Switcher for HDMI should be mounted vertically in a wall or cabinet with wood/drywall screws as shown in the diagram above. There should be an inch or two of clearance between the edges of the unit and any walls or vertical surfaces to allow for enough clearance for insertion and retraction of cables at the HDMI connectors.

For installation on a drywall surface, use a #6 drywall screw. It is recommended when installing on a drywall surface that studs be used to secure the Switcher should undue stress be applied when connecting and disconnecting HDMI cables.

SPECIFICATIONS

Video Bandwidth .... 225 MHz

Pixel Clock / Speed .... 165 MHz

Maximum Video Resolution .... 1080p@60Hz, 1920x1200@60Hz
with 12-bit Deep Color

Input Video Signal .... 1.2 V p-p

Input DDC Signal .... 5 V p-p (TTL)

HDMI Connector .... type A 19 pin female; (4) input, (1) output

LED Indicators (source mapping)..4 (blue)

LED Indicator (power)...1 (red)

RS-232 Interface.. DB9 serial (F)

IR Extender Port...3.5mm Mini-Stereo

Power Supply .... 5V DC

Power Consumption .... 20 W (max)

Dimensions .... 6½"W x 11¾"H x 1"D

Operating Temperature .... 0 - 40 °C

Shipping Weight ....3 lbs.

Available Colors..Ivory or Black

Compliancy............................US/EU Standards, HDMI 1.3, HDMI 1.2, HDCP 1.1,
DVI 1.0

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