



TV Multi Format Switcher

EXT-TV-MFS
User Manual



HDMI[®]
HIGH-DEFINITION MULTIMEDIA INTERFACE

1080P
PROGRESSIVE

www.gefen.com

ASKING FOR ASSISTANCE

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INTRODUCTION

Congratulations on your purchase of the Gefen TV Multi Format Switcher. 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.

How It Works

The rack-mountable TV Multi Format Switcher allows you to view a wide variety of analog and digital SD and HD video sources with audio at resolutions up to 1080p -- all on one HDMI-compliant display. Anything from computers, set-top boxes, satellite boxes, security cameras, Blu-ray and DVD players to the next generation of hi-def gaming consoles (including the Xbox 360 and PS3) can share a single HDMI-compliant display. Superior A/V signal quality is insured by the 3D comb filter and 3D noise reduction circuitry. The audio delay feature and de-interlacing feature for 480i sources improves Standard-Definition console gaming.

The TV Multi Format Switcher supports 2 Component, 2 Composite, 2 S-Video, and 1 VGA source -- each with L/R analog audio in up to 2 channels. 3 HDMI sources are also supported with embedded digital audio at up to 7.1 channels. (The number of audio channels present in the HDMI output signal will depend on what kind of audio is input). Any A/V source can be selected for viewing at any time using the included IR remote or the front-panel selector buttons.

How It Works

Audio/video sources connect to the TV Multi Format Switcher on its inputs. An HDMI-compliant display is connected to the HDMI output. The 5V DC power supply is connected to the TV Multi Format Switcher. The currently selected video source will appear on the output display in vibrant color.

Note: Only A/V source switching (not scaling) is performed with this product. Therefore, when selecting the VGA input source you may encounter slight shifts of the output image. Please consult your graphics card and/or display documentation for options that will allow adjusting of the image position. Any of our versatile scalers can be easily added at the HDMI output of this unit, such as our GefenTV 1080P HDMI Scaler (GTV-HDMI-1080PS, available separately).

OPERATION NOTES

READ THESE NOTES BEFORE INSTALLING OR OPERATING THE TV MULTI FORMAT SWITCHER

- All analog video inputs will be converted to digital and will be output through the HDMI outputs.
- All analog audio inputs will be converted to digital audio and will be output through the HDMI outputs. All digital audio inputs will be output through the HDMI outputs.
- The TV Multi Format Switcher is compatible with all DVI displays when used with an HDMI-to-DVI adapter.
- The TV Multi Format Switcher is not a scaler. Therefore, the output resolution will be the same as the input resolution.

FEATURES

HDMI Features Supported:

- 225 MHz (up to 12 bit YUV 444 @ 1080p)
- Deep Color (x.v.Color) at 12-bit resolution
- Dolby® TrueHD and DTS-HD® Master Audio™
- Lip-Sync

Features

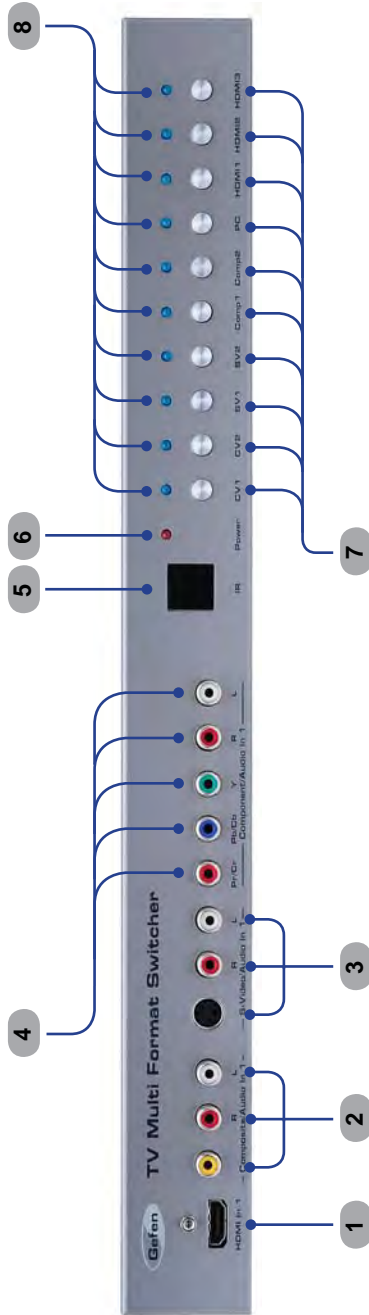
- The TV Multi Format Switcher allows many A/V sources to be switched to one HDTV display
- A/V sources include (2) Composite, (2) S-video, (2) Component, (1) VGA and (3) HDMI.
- Selectable de-interlacing of 480i/576i sources to 480p/576p
- All inputs are format converted and output through a single HDMI output
- Audio delay feature allows a delay of 150ms on all analog audio inputs
- 3D noise reduction (DNR) and 3D comb filter for cleaner A/V signals
- Switching is initiated by front panel buttons or by IR remote control (included)
- Automated or remote switching is also possible by sending control signals to the integrated RS-232 serial communications port with a computer or control automation device such as Crestron™
- De-Interlacing feature
- Rack-mountable (hardware kit included)
- HDCP-compliant

Package Includes

- (1) TV Multi Format Switcher
- (1) 6 ft. HDMI cable (M-M)
- (1) IR Remote control
- (1) 5V DC Power Supply
- (1) Set of Rack Ears
- (1) User Manual

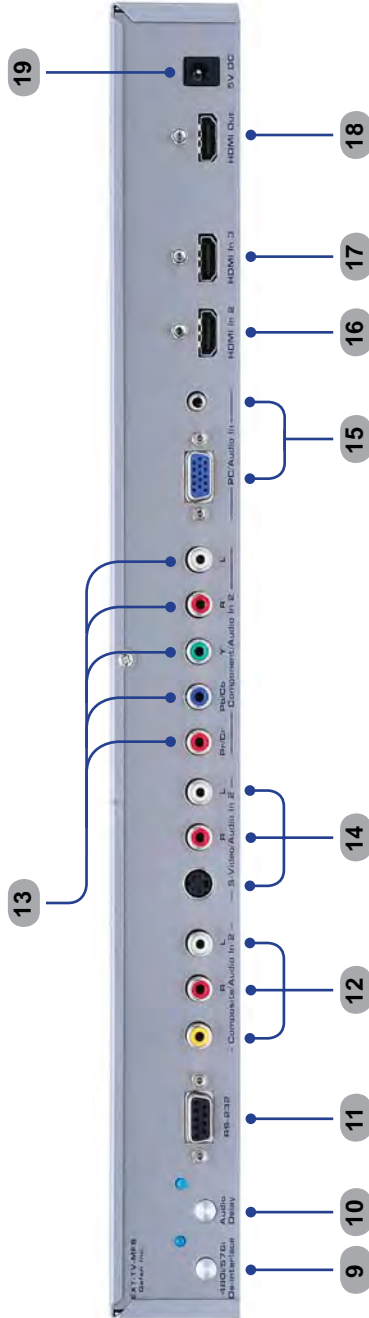
PANEL LAYOUT

Front Panel



PANEL LAYOUT

Back Panel



PANEL DESCRIPTIONS

Front Panel

- 1 HDMI In 1**
Connect a Hi-Def source device to this port using an HDMI cable.
- 2 Composite / Audio In 1**
Connect a Composite source to this input using 3x RCA cables.
- 3 S-Video / Audio In 1**
Connect an S-Video source to this input using an S-Video cable and 2x RCA cables.
- 4 Component / Audio In 1**
Connect a Component source to this input using 5x RCA cables.
- 5 IR**
Receives IR commands from the included IR remote control unit.
- 6 Power**
This LED indicator glows bright red when the switcher is connected to an AC electrical outlet.
- 7 Source Selection Buttons**
Press these buttons to select the desired source.
- 8 Source Selection Indicators**
These LED indicators will glow bright blue to indicate the currently selected source.

Back Panel

- 9 480i / 576i De-interlace**
Pressing this button de-interlaces the video signal. Improves standard definition sources such as gaming consoles and broadcast television. This function only affects input resolutions of 480i or 576i.
- 10 Audio Delay**
Pressing this button will apply a 150ms audio delay to the output audio signal. This is useful for lip sync and when using surround speakers connected to an AVR.
- 11 RS-232 Serial Port**
Connects to the RS-232 control device. The TV Multi Format Switcher may be switched remotely using this port.
- 12 Composite / Audio In 2**
Connect a Composite source to this input using 3x RCA cables.

PANEL DESCRIPTIONS

13 Component / Audio In 1

Connect a Component source to this input using 5x RCA cables.

14 S-Video / Audio In 2

Connect an S-Video source to this input using an S-Video cable and 2x RCA cables.

15 PC / Audio In

Connect a VGA cable to the DB-15 connector. Use a 3.5mm mini-stereo cable to connect the audio source to the 3.5mm mini-stereo jack.

16 HDMI In 2

Connect a Hi-Def source device to this port using an HDMI cable.

17 HDMI In 3

Connect a Hi-Def source device to this port using an HDMI cable.

18 HDMI Out

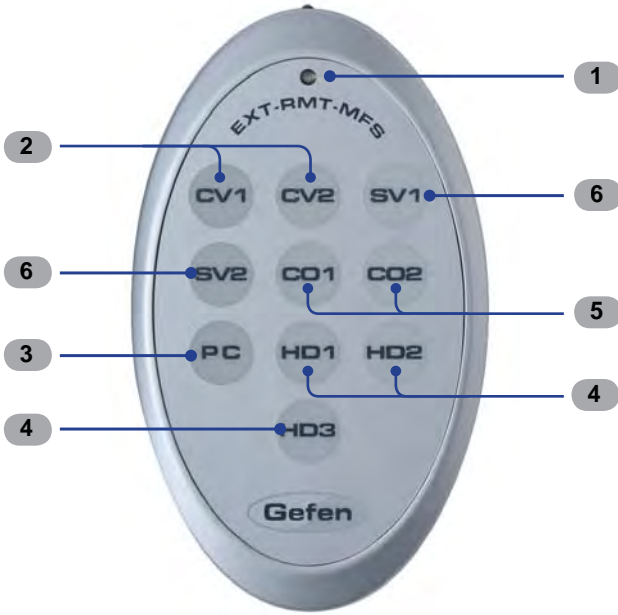
Connect an HDTV display to this port using an HDMI cable.

19 5V DC

Connect the included 5V DC power supply to this power receptacle.

IR REMOTE CONTROL

Layout and Descriptions



- 1** **LED Indicator**
This LED will be activated momentarily each time a button is pressed.
- 2** **CV1, CV2**
Selects the Composite 1 (CV1) or Composite 2 (CV2) input.
- 3** **PC**
Selects the VGA input.
- 4** **HD1, HD2, HD3**
Selects the HDMI 1 (HD1), HDMI 2 (HD2), or HDMI 3 (HD3) input.
- 5** **CO1, CO2**
Selects the Component 1(CO1) or Component 2 (CO2) input.
- 6** **SV1, SV2**
Selects the S-Video (SV1) or S-Video 2 (SV2) input.



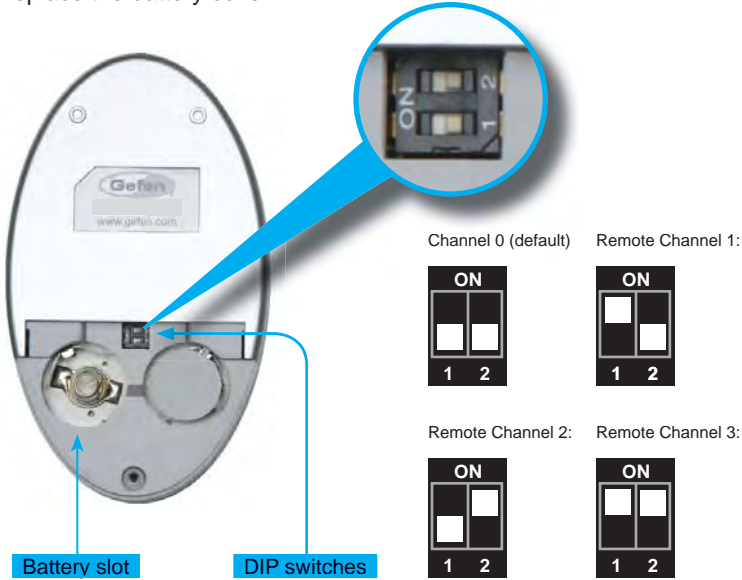
NOTE: An Activity Indicator that flashes quickly while holding down any one of the 16 buttons indicates a low battery. Replace the IR Remote Control battery as soon as possible.

IR REMOTE CONTROL

Installing the Battery

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

1. Remove the battery cover on the back of the IR Remote Control unit.
2. Insert the included battery into the open battery slot. The positive (+) side of the battery should be facing up.
3. Replace the battery cover.



Setting the IR Channel

The IR channel on the IR Remote Control must match the IR channel used by the *TV Multi Format Switcher*. For example, if both DIP switches on the IR Remote Control unit are set to IR channel 0 (both DIP switches down), then the *TV Multi Format Switcher* must also be set to IR channel 0. See page 12 for information on how to change the IR channel on the *TV Multi Format Switcher*.



WARNING: Risk of explosion if battery is replaced by an incorrect type. Dispose of used batteries according to the instructions.

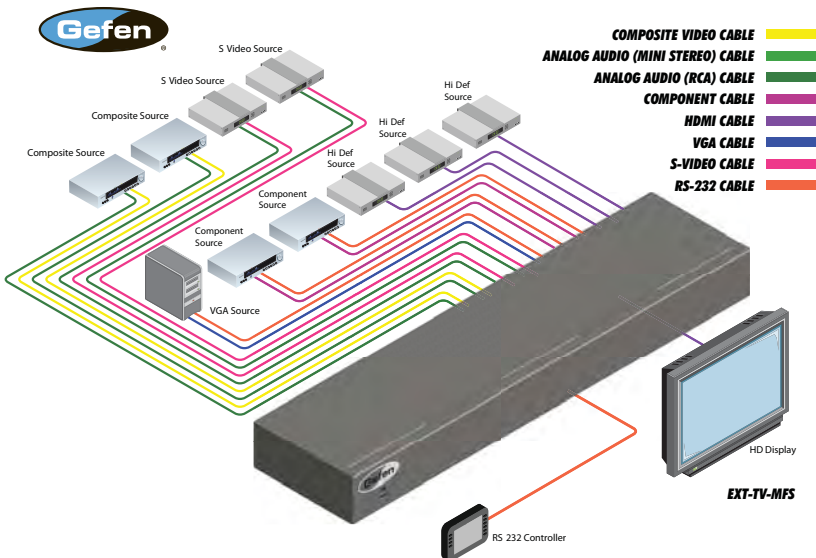
CONNECTING THE TV MULTI FORMAT SWITCHER

How to Connect the TV Multi Format Switcher

1. Connect the HDMI output on the TV Multi Format Switcher to the display using the supplied HDMI cable.
2. Connect up to three HDMI sources to the HDMI inputs.
3. Connect analog audio/video sources to the TV Multi Format Switcher using the following cables:
 - (2) 5 x RCA Component video cables to the Component inputs.
 - (2) 3 x RCA Composite video cables to the Composite inputs.
 - (1) VGA cable to the DB-15 connector.
 - (1) 3.5mm mini-stereo cable to the 3.5mm mini-stereo jack
4. Connect the included 5V DC power supply to the power receptacle on the TV Multi Format Switcher.
5. Connect the AC power cord to the power supply and connect the power cord to an available electrical outlet.

The TV Multi Format Switcher is now powered and ready for use.

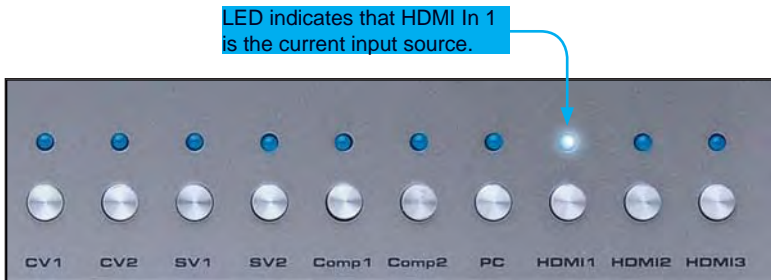
Wiring Diagram for the TV Multi Format Switcher



OPERATING THE TV MULTI FORMAT SWITCHER

Selecting the Input Source

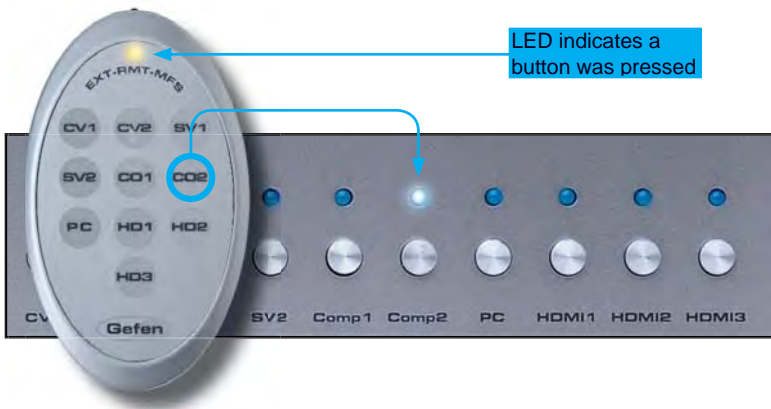
- To select an input source, press any one of the front panel buttons. In the example below, the HDMI1 button has been pressed.



Each button corresponds to a different input on the switcher, as follows:

Button	Input	Button	Input
CV1	Composite In 1	Comp2	Component In 2
CV2	Composite In 2	PC	PC / Audio In
SV1	S-Video 1	HDMI1	HDMI In 1
SV2	S-Video 2	HDMI2	HDMI In 2
Comp1	Component In 1	HDMI3	HDMI In 3

- The included IR Remote Control can also be used to select an input source. Each button on the IR Remote Control corresponds to a button on the front panel of the switcher. In the example below, Component In 2 has been selected by pressing the CO2 button on the IR Remote Control.



OPERATING THE TV MULTI FORMAT SWITCHER

Setting the IR channel

1. After the TV Multi Format Switcher is powered, press and hold the CV1 and CV2 simultaneously. After a few seconds, the power LED will begin to flash rapidly.



2. The current IR channel will be indicated by the CV1 and CV2 buttons on the front panel. In the illustration above, both LED indicators for CV1 and CV2 are not on. This indicates that the TV Multi Format Switcher is set to IR channel 0. IR channel 0 is the default setting.
3. Consecutively press the SV1 button will cycle through each IR channel, as follows.

IR channel 0



IR channel 1



IR channel 3



IR channel 2



After the SV1 button is pressed once, the power LED will glow solid red to indicate that the IR channel on the Switcher has changed.

OPERATING THE TV MULTI FORMAT SWITCHER

Once the TV Multi Format Switcher is set to the correct IR channel, simultaneously press and hold the CV1 and CV2 buttons to reboot the Switcher. All of the front panel LED switching indicators will glow bright blue momentarily, after which the Switcher will be ready for use.



IMPORTANT: The IR channel on the *TV Multi Format Switcher* must match the IR channel used by the IR Remote Control Unit. See page 12 for information on how to change the IR channel on the IR Remote Control Unit.

RS-232 SERIAL CONTROL



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

RS232 Settings

Bits per second 9600
Data bits 8
Parity None
Stop bits 1
Flow Control None



IMPORTANT: When sending RS-232 commands, a *carriage return* and a *line feed* character must be included at the end of each line. Commands are *not* case-sensitive.

RS-232 COMMANDS

Commands

Command	RS-232 return value	Description
HELP	Lists all commands	Lists all commands
S POWER 0	POWER OFF	Power OFF
S POWER 1	POWER ON	Power ON
S SOURCE 0	SOURCE HDMI1	Switch to HDMI In 1
S SOURCE 1	SOURCE HDMI2	Switch to HDMI In 2
S SOURCE 2	SOURCE HDMI3	Switch to HDMI In 3
S SOURCE 3	SOURCE PC	Switch to PC / Audio In
S SOURCE 4	SOURCE COMP1	Switch to Component/Audio In 1
S SOURCE 5	SOURCE COMP2	Switch to Component/Audio In 2
S SOURCE 6	SOURCE SV1	Switch to S-Video/Audio In 1
S SOURCE 7	SOURCE SV2	Switch to S-Video/Audio In 2
S SOURCE 8	SOURCE CV1	Switch to Composite/ Audio In 1
S SOURCE 9	SOURCE CV2	Switch to Composite/ Audio In 2
S AUDIODELAY 0	AUDIODELAY OFF	Audio delay OFF
S AUDIODELAY 1	AUDIODELAY ON	Audio delay ON
S SD_ITOP 0	480i/576i to 480p/576p ON	Enable de-interlacer
S SD_ITOP 1	480i/576i to 480p/576p OFF	Disable de-interlacer
S RESET 1	no value	Reset switcher to default settings
R POWER	POWER [ON / OFF]	The current power state
R SOURCE	SOURCE [Input]	The active input
R AUDIODELAY	AUDIODELAY [ON / OFF]	Audio delay setting
R SD_ITOP	480i/576i to 480p/576p [ON / OFF]	De-interlacer setting
R FW_VER	FIRMWARE VERSION: [version]	The current firmware version

RACK MOUNT INSTALLATION

Rack mount ears are provided for installation of this unit into a 1U rack mount space.

1. Locate the side screws on the unit.
2. Remove the front 2 screws that are located closest to the front of the unit.
3. Using the removed screws, screw the rack mounting bracket into the unit.
4. Repeat the procedure on the opposite side of the unit.



SPECIFICATIONS

Maximum Pixel Clock	225 MHz
Video Amplifier Bandwidth	350 MHz
Video Output Connector	(1) HDMI Type A, 19-pin, female
Video Input Connectors	(3) HDMI Type A 19-pin, female
	(2) Component (3x RCA)
	(2) Composite, RCA
	(1) HD-15, female
RS-232 Remote Control Port.....	DB-9, female
Analog Audio Inputs	(2) L+R RCA, (1) 3.5mm stereo mini-jack
Rack Size	1U
Power Supply	5V / 2.6A DC
Power Consumption	13W (max.)
Dimensions (W x H x D)	17.3" x 1.8" x 6.3" (439mm x 45mm x 160mm)
Shipping Weight	8 lbs. (3.6 kg)

WARRANTY

Gefen warrants the equipment it manufactures to be free from defects in material and workmanship.

If equipment fails because of such defects and Gefen is notified within two (2) years from the date of shipment, Gefen will, at its option, repair or replace the equipment, provided that the equipment has not been subjected to mechanical, electrical, or other abuse or modifications. Equipment that fails under conditions other than those covered will be repaired at the current price of parts and labor in effect at the time of repair. Such repairs are warranted for ninety (90) days from the day of reshipment to the Buyer.

This warranty is in lieu of all other warranties expressed or implied, including without limitation, any implied warranty or merchantability or fitness for any particular purpose, all of which are expressly disclaimed.

1. Proof of sale may be required in order to claim warranty.
2. Customers outside the US are responsible for shipping charges to and from Gefen.
3. Copper cables are limited to a 30 day warranty and cables must be in their original condition.

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

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

PRODUCT REGISTRATION

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



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This product uses UL or CE listed power supplies.