

HDMI and DVI

to 3GSDI Scaler

GEF-HDVI-2-3GSDIS

User Manual

Release A2



GefenPRO®

Important Safety Instructions

GENERAL SAFETY INFORMATION

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this product near water.
6. Clean only with a dry cloth.
7. Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
8. Do not install or place this product near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
9. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10. Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
11. Only use attachments/accessories specified by the manufacturer.
12. To reduce the risk of electric shock and/or damage to this product, never handle or touch this unit or power cord if your hands are wet or damp. Do not expose this product to rain or moisture.
13. Unplug this apparatus during lightning storms or when unused for long periods of time.
14. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
15. Batteries that may be included with this product and/or accessories should never be exposed to open flame or excessive heat. Always dispose of used batteries according to the instructions.

RACK MOUNT SAFETY INFORMATION

- a. Maximum recommended ambient temperature: 40 °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.

Warranty Information

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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For 24 / 7 support, see the back of the product for the support number

HDMI and DVI to 3GSDI Scaler is a trademark of Gefen, LLC.

Important Notice

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

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Operating Notes

- The built-in On-Screen Display (OSD) provides access to all features of the scaler. Use the included IR remote control unit to access the OSD.
- The IR channel for both the scaler and the IR remote control unit must be the same in order for the IR remote control unit to control the OSD. See [Setting the IR Channel](#) for details.
- The internal firmware may be updated using the USB port. See the [Firmware Upgrade Procedure](#) for details.

Features and Packing List

Features

- HDMI and DVI inputs switchable via IR, RS-232, and front panel
- Input Resolutions up to 1080p Full HD, 1920 x 1200, and 2K
- 10-bit Deep Color
- LPCM 7.1, Dolby® TrueHD, and DTS-HD® Master Audio™ pass-through
- Frame rate conversion
- Supports black burst (bi-level sync) and tri-level sync Genlock
- Advanced noise reduction and detail enhancement
- Fully integrated sprite based multi-plane OSD menu system
- Pattern generation of color bars and cross-hatch patterns
- Four aspect ratio modes (Full Screen, Panoramic, Letter/Pillar, Extract/Crop)
- Film Mode produces a progressively scanned output image from an interlaced scanned input image
- Serial (RS-232) control for automation
- Field-upgradeable firmware via USB port
- 1U tall and rack-mountable – rack ears included

Packing List

The HDMI and DVI to 3GSDI Scaler ships with the items listed below. If any of these items are not present in your box when you first open it, immediately contact your dealer or Gefen.

- HDMI and DVI to 3GSDI Scaler
- 6 ft. dual-link DVI cable (M-M)
- 6 ft. locking HDMI cable (M-M)
- IR remote control unit
- AC power cord
- Rack ears (1 set)
- Quick-Start Guide

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HDMI and DVI

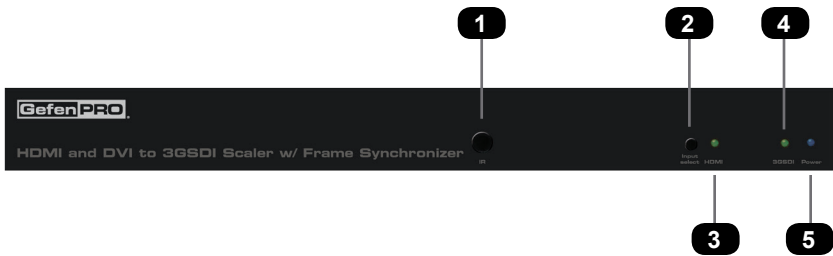
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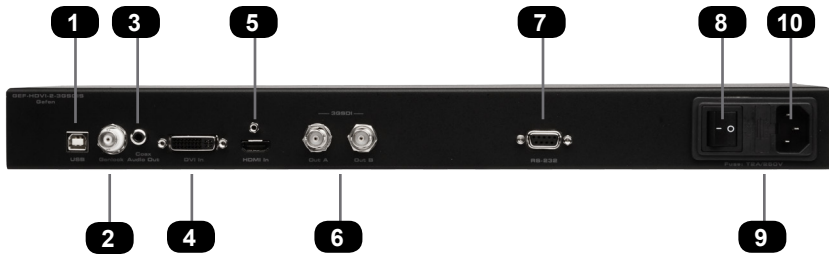
Panel Layout

Front Panel



| ID | Name | Description |
|----|--------------|---|
| 1 | IR | Receives IR signals from the included IR remote control unit. |
| 2 | Input Select | Press this button to switch between the DVI In and HDMI In inputs. |
| 3 | HDMI | This LED glows bright green when HDMI In is selected. |
| 4 | 3GSDI | This LED glows bright green when outputting 3GSDI. |
| 5 | Power | This LED glows bright blue when the unit is connected to an AC outlet and the unit is powered ON. |

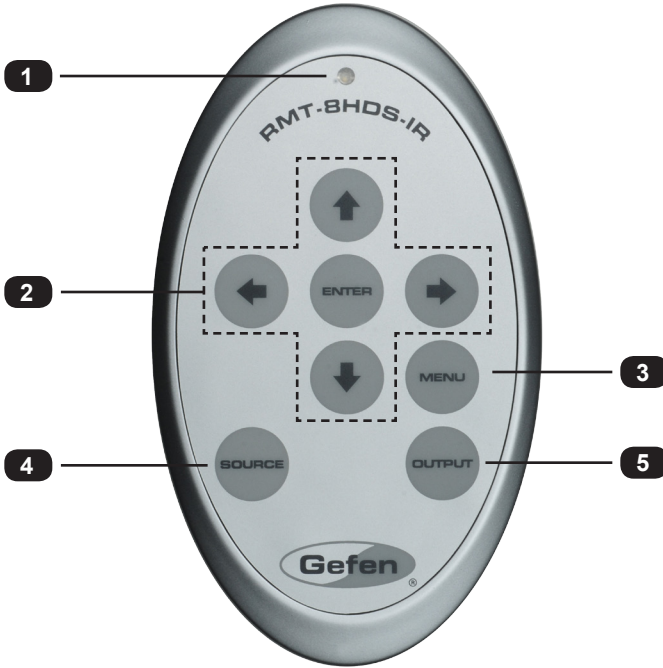
Back Panel



| ID | Name | Description |
|----|-----------------------|--|
| 1 | USB | Used for updating the firmware. See the Firmware Update Procedure for more information. |
| 2 | Genlock | Connect a BNC cable between this connector and a clock or other reference. |
| 3 | Coax Audio Out | Connect a digital audio cable from this S/PDIF connector to an external amplifier. |
| 4 | DVI In | Connect a DVI -D cable from this connector to the DVI source. |
| 5 | HDMI In | Connect an HDMI cable from this connector to the HDMI source. |
| 6 | 3GSDI (Out A / Out B) | Connect the scaler to the 3GSDI destination using BNC-type cables. |
| 7 | RS-232 | Connect an RS-232 cable from this port to an RS-232 control device. This port provides remote control of the product from a remote location. |
| 8 | Power switch | Push this switch to the “-” position to power-on the unit. Push this switch to the “o” position to power-off the unit. |
| 9 | Fuse drawer | Contains the fuse for the internal power supply. See Fuse Replacement for details on replacing the fuse. |
| 10 | IEC receptacle | Connect the included AC power cord from this power receptacle to an available electrical outlet. |

IR Remote Control Unit

Front



| ID | Name | Description |
|----|--------------------|---|
| 1 | Activity indicator | This LED glows bright orange when a key is pressed on the remote. |
| 2 | ←/↓/→/↑/ENTER | Used to control features in the On-Screen Display. See Accessing the On-Screen Display for details. |
| 3 | MENU | Displays / hides the On-Screen Display |
| 4 | SOURCE | Press this button to toggle between HDMI In and DVI In. |
| 5 | OUTPUT | Consecutively press this button to cycle through the available output resolutions. See Supported Video and Graphic Formats for details. |

Back

(shown with cover removed)



| ID | Name | Description |
|----|--|--|
| 1 | DIP switch bank | Use these DIP switches to set the IR channel of the remote. See Setting the IR Channel for details. |
| 2 | Primary battery slot (shown without battery) | Holds the battery for operating the remote. Use only 3V CR2032-type batteries. Make sure that the positive (+) side of the battery is facing up. |
| 3 | Alternate battery slot | Allows for the installation of secondary (backup) battery. |

Installing the Battery

The IR remote control unit ships with two batteries. Only one battery is required for operation. The second battery is a spare. Use only 3V CR2032-type batteries.

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



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



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

Setting the IR Channel

In order for the included IR remote control to communicate with the HDMI and DVI to 3GSDI Scaler, the IR remote control must be set to the same channel as the scaler. Use the `#remotechan` command to set the IR channel of the scaler.



DIP switches

Channel 0 (default):



Remote Channel 1:



Remote Channel 2:



Remote Channel 3:



Installation

Connecting the HDMI and DVI to 3GSDI Scaler

1. Use the included locking HDMI cable to connect a Hi-Def source to the HDMI In port on the scaler.
2. Connect the included dual link DVI cable from the scaler to a DVI source.
3. Connect a BNC-type cable from the Genlock connector to an external clock reference.
4. Connect a coax cable from the Coax Out connector to an external audio amplifier.
5. Connect a BNC-type cable from the 3GSDI Out connector(s) to the 3GSDI destination.

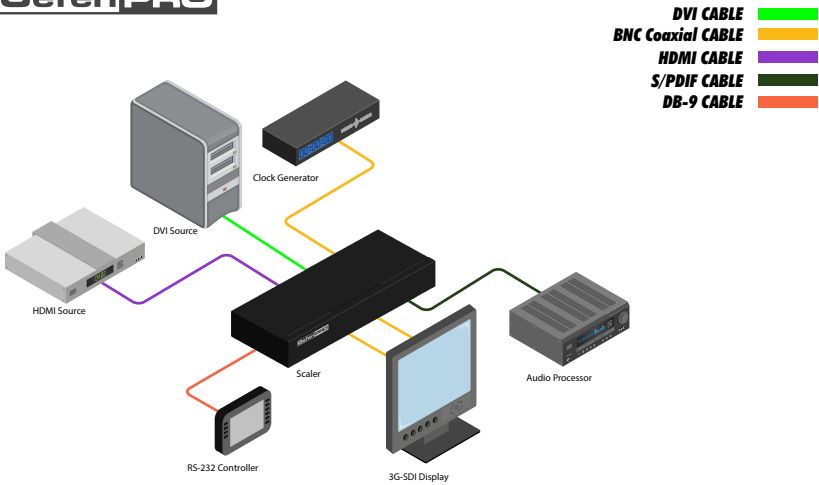


NOTE: In order to output dual link 1080p Full HD, when using HD-SDI, both Out A and Out B must be connected to the destination.

6. Connect the included AC power cord from the power supply to an available electrical outlet.

Sample Wiring Diagram

GefenPRO



GEF-HDVI-2-3GSDIS



WARNING: This product should always be connected to a grounded electrical AC outlet.

HDMI and DVI

to 3GSDI Scaler

02 Operating the HDMI and DVI to 3GSDI Scaler

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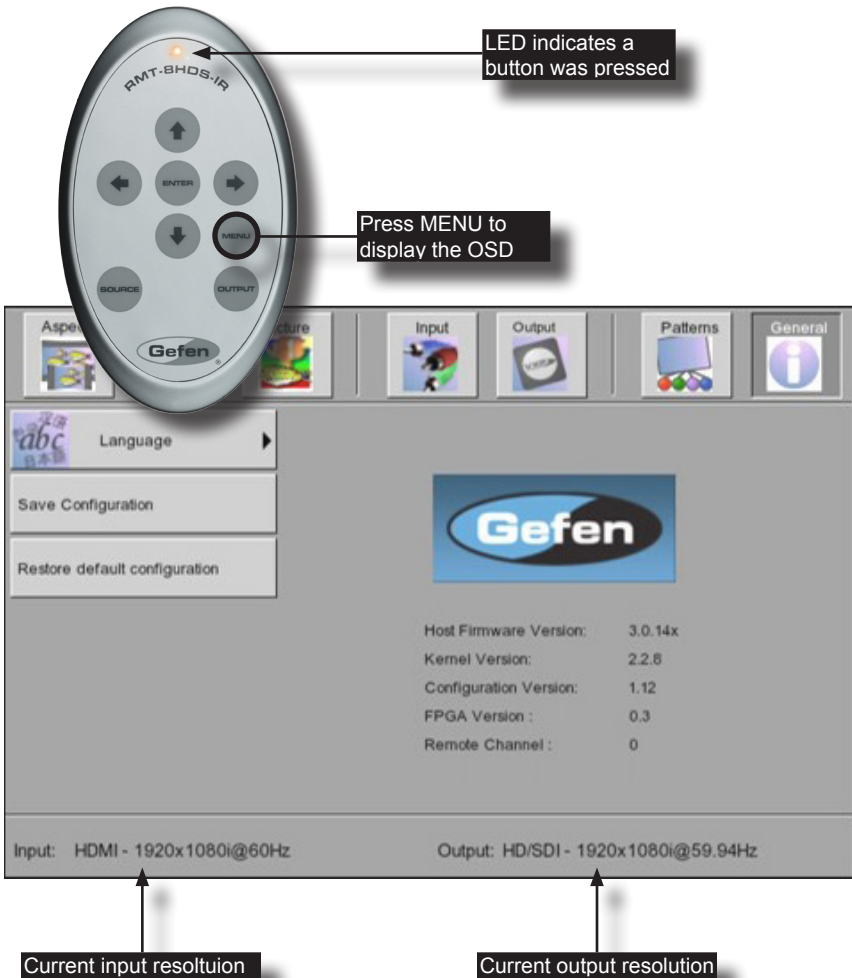
The On-Screen Display

Accessing the On-Screen Display

The *HDMI and DVI to 3GSDI Scaler* uses a built-in OSD (On-Screen Display) to manage and control all scaler features. To access the OSD, point the included IR remote control unit at the IR sensor on the front panel of the scaler and press the MENU button. Press the MENU button again to dismiss the OSD.

The OSD contains seven menu buttons, each of which contains one or more set of functions for controlling the scaler. Each time the OSD is displayed, the General menu button is automatically selected.

The bottom of the OSD will always display the current input and output resolution.

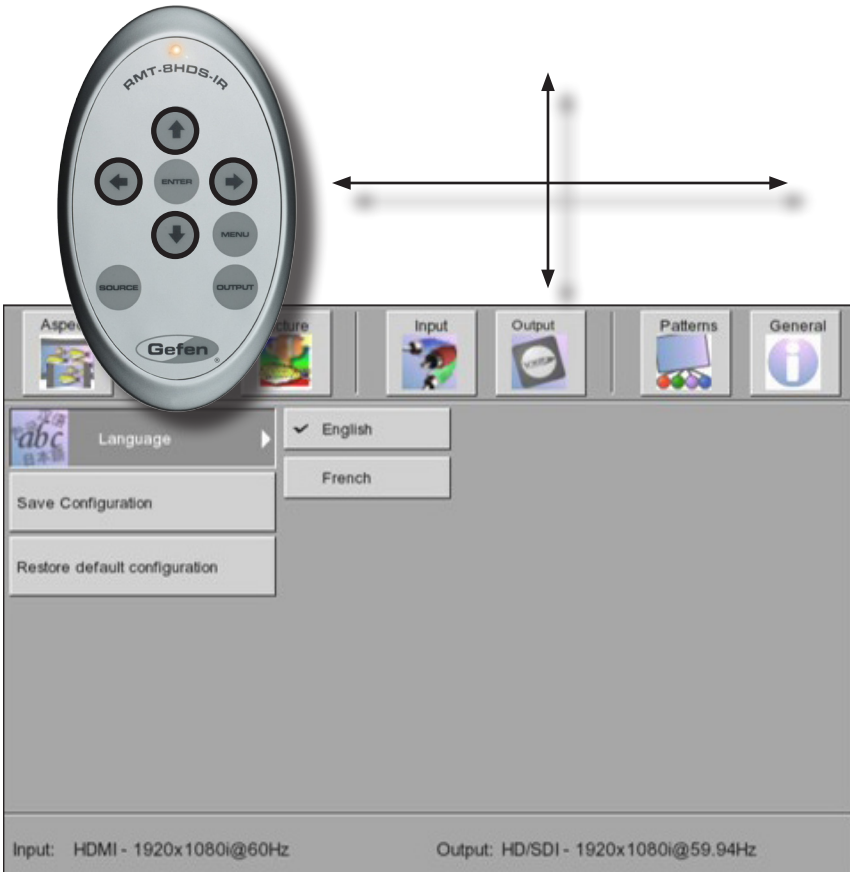


Moving Around in the OSD

Use the **← / →** buttons on the IR remote control unit to move left and right between each of the tabs. Once the desired menu is selected, press the **↓ / ↑** buttons to access each feature within the menu.

Most of the submenus have an **▶** symbol, indicating that there are additional options. If one of these menus is selected, it will automatically be expanded to show all the options.

Some submenus have check marks (as shown below), requiring the feature to be enabled or disabled. In this case, select the item using the arrow keys, then press the ENTER key to select then enable or disable the feature.



General Menu



General ► Language

Sets the language of the OSD. Select the desired language and press the ENTER key.

| Options | Description |
|---------|-----------------------------------|
| English | Sets the OSD in English (default) |
| French | Localizes the OSD in French |

General ► Save Configuration

Saves the current configuration of the scaler. The current configuration of the scaler is saved in memory.

General ► Restore default configuration

Restores the factory-default settings of the scaler.

Patterns Menu



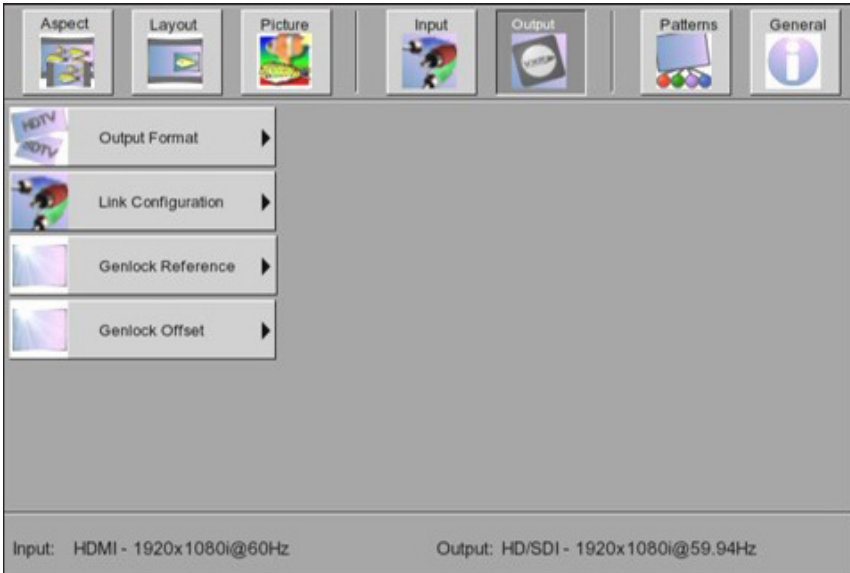
Patterns ► Color Bars

Produces a color bar pattern, similar to a standard SMPTE bar pattern used for color calibration. After selecting this option, press the ENTER button to enable / disable the color bar pattern. When the color bar pattern is enabled, no video output will be displayed.

Patterns ► Cross Hatch

Produces a color bar pattern, similar to a standard SMPTE bar pattern used for color calibration. After selecting this option, press the ENTER button to enable / disable the color bar pattern. When the color bar pattern is enabled, no video output will be displayed.

Output Menu



Output ► Output Format

Selects the output resolution. See [Supported Video and Graphic Formats](#) for a list of available output formats.

Output ► Link Configuration

Selects the link configuration in respect to color space. When using dual link SDI or HD-SDI input, YCbCr or RGB can be selected.

By default, the Single Link YCbCr 4:2:2 (SD/HD/3G) option will be used. When using 3GSDI signals, 3GSDI Level A is used. 3G Level B supports two 1.5Gbp/s signals that are combined over a single 3GSDI connection.

Options

Single Link YCbCr 4:2:2 (SD/HD/3G)

Single Link 1080p (3G Level B)

Dual Link YCbCr (HD)

Dual Link RGB (HD)

Dual Link 1080p / 576p / 480p (HD)

Output ► Genlock Reference

This option enables or disabled the automatic genlock mode.

| Options | Description |
|-------------|------------------------------------|
| Off | Disables Genlock |
| Video Input | Use video input as reference clock |
| Ref Input | Use clock attached to Ref In |

Output ► Genlock Offset

This option provides the option to adjust the output lines and output pixels.

| Options | Description |
|---------------|-------------------|
| Output Lines | Genlock to lines |
| Output Pixels | Genlock to pixels |

Input Menu



Input ► Input Video Format

Selects the resolution and timing of the input format. By default, this is set to Auto Detect which automatically senses the resolution and timing of the input signal. The available resolutions under this menu are in SD and HD format.

Input ► Input Graphic Format

Selects the resolution and timing of the input format. By default, this is set to Auto Detect which automatically senses the resolution and timing of the input signal. The available resolutions under this menu are in VESA format.

Input ► Clean Aperture

Allows adjustment of the input signal position. The clean aperture parameters allow an area within the production aperture to be defined. The minimum clean aperture size is 0 pixels by 0 lines. If the Non-Standard Sync option is enabled, then the input is set to DFP sync.

| Options | Description |
|---------------------|-----------------------------|
| Horizontal Size | Adjusts horizontal size |
| Vertical Size | Adjusts vertical size |
| Horizontal Position | Adjusts horizontal position |
| Vertical Position | Adjusts vertical position |

Input ► Film Mode

When enabled, produces a progressive output signal from an interlaced input signal. This feature automatically detects repeated field sequences present in interlaced signals, such as 50 Hz or 60 Hz field sequences (no repeated fields), 60 Hz 3:2 pull-down, including broken or edited sequence detection, 60 Hz 2:2: pull-down, 50 Hz 2:2 pull-down, static frames, and multi-directional and inter-field motion.

| Options | Description |
|---------|----------------------------|
| Enable | Enables film mode (24 fps) |
| Disable | Disables film mode |

Input ► Remote Channel

This option changes the IR channel to between 0 and 3. When the remote channel of the Scaler is changed, the DIP switches on the IR remote must be changed to the corresponding IR channel in order to operate the Scaler. See [Setting the IR Channel](#) for details on how to set the IR channel on the IR remote control unit.

| Options | Description |
|---------|------------------|
| 0 | Use IR channel 0 |
| 1 | Use IR channel 1 |
| 2 | Use IR channel 2 |
| 3 | Use IR channel 3 |

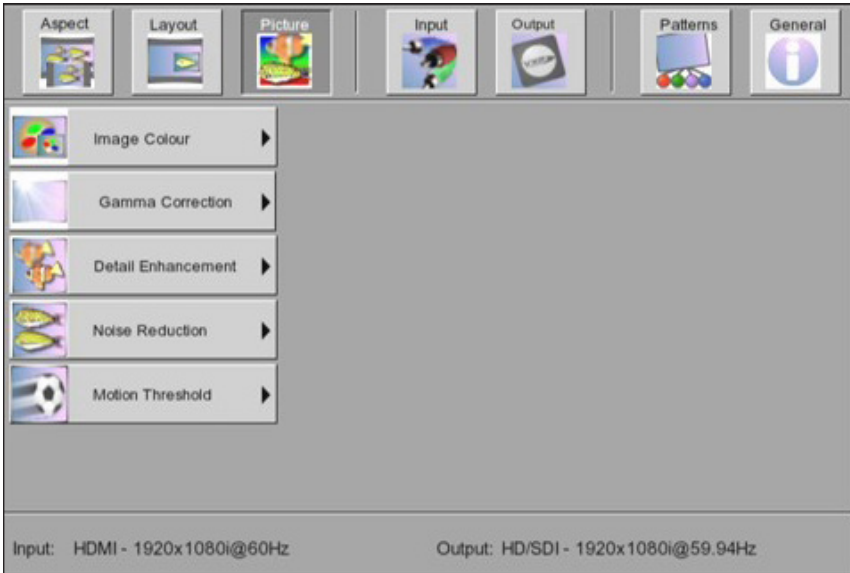
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Input ► Input Color Range

The RGB output color range may be changed/set to limited (16 - 235) or to full (0 - 255).

| Options | Description |
|------------------------|--|
| Auto | Use color range of input signal |
| 16 - 235 (Compress) | Color range of input signal is limited |
| 0 - 255 (Pass-Through) | Output color range is expanded to full-range |

Picture Menu



Picture ► Image Color

Allows individual adjustment of the Red, Green, and Blue color components, brightness, and black level (RGB/Y Output Offset) of the image.

Contrast and Brightness values: [Range: 0 ... 255]
 RGB/Y Output Offset: [Range: 0 ... 1023]

| Options | Description |
|---------------------|--|
| Contrast Red | Adjust contrast of red color component |
| Contrast Green | Adjusts contrast of green color component |
| Contrast Blue | Adjusts contrast of blue color component |
| Brightness Red | Adjust brightness of red color component |
| Brightness Green | Adjust brightness of green color component |
| Brightness Blue | Adjust brightness of blue color component |
| RGB/Y Output Offset | Adjusts the black level of the output signal |

Picture ► Gamma Correction

Adjusts the Gamma coefficient. Two predefined tables are available: Default and sRGB. The `User Table` setting will use the Gamma Lookup Table (LUT) currently stored in the EEPROM. Use the `Custom` setting in order to define a Gamma LUT. See the [Gamma Look-up Table](#) for more information.

| Options | Description |
|-------------------|---|
| Default | Sets the default Gamma coefficient |
| sRGB | For use with computers, cameras, and printers |
| User Table | Used in conjunction with a user Gamma LUT |
| Custom | Use when defining a custom Gamma LUT |
| Gamma Coefficient | Range: [0.3 ... 3.0]; default value is 1.0 |

Picture ► Detail Enhancement

These parameters processes the input data in either progressive or interlaced format. Changes to the detail enhancement are implemented at the start of the next frame of video. Both of these parameters can be adjusted within the range of 0 - 100.

| Options | Description |
|--------------------|--------------------|
| Detail Enhancement | Range: [0 ... 100] |
| Noise Threshold | Range: [0 ... 100] |

Picture ► Noise Reduction

This is an adaptive noise reduction function which processes the input data in either progressive or interlaced format. Enabling the Noise Reduction to noisy interlaced signals can optimize de-interlacer performance. Range: [0 ... 100].

Picture ► Motion Threshold

Sets the intraframe motion detection threshold for the de-interlacer on the VXP processor. Video artifacts can be created when de-interlacing (creating interlaced fields from progressive fields). This function allows adjustment of the threshold used by the de-interlacer motion detection algorithm, removing / minimizing motion artifacts in the converted video. Range: [0 ... 15].

Layout Menu



Layout ► Size and Position

Set the size and the position of the image. Note that this option is not available in the panoramic aspect mode.

| Options | Description |
|---------------------|---|
| Horizontal Size | Sets horizontal size of the output signal |
| Vertical Size | Sets vertical size of the output signal |
| Horizontal Position | Sets horizontal position of the output signal |
| Vertical Position | Sets vertical position of the output signal |

Aspect Menu



Aspect ► Full Screen

Stretches the output signal to fill the display.

Aspect ► Letter / Pillar Box

Sets the aspect ratio to fit a letter or pillar box format.

Aspect ► Panoramic

Sets the output signal to panoramic format.

Aspect ► Extract

This function allows the Scaler to zoom in on a subset of the input video signal. This feature allow you to zoom on one selected section of the input picture.

| Options | Description |
|---------------------|--------------------|
| Extract Size | Range: [0 ... 100] |
| Horizontal Position | Range: [0 ... 100] |
| Vertical Position | Range: [0 ... 100] |

Aspect ► Through

This function defines a sub-window that is always centered on the screen. The position is the relative position of the window within the full picture. This feature allow you to display one selected section of the input picture without modifying its size.

| Options | Description |
|---------------------|--------------------|
| Horizontal Size | Range: [0 ... 100] |
| Vertical Size | Range: [0 ... 100] |
| Horizontal Position | Range: [0 ... 100] |
| Vertical Position | Range: [0 ... 100] |



NOTE: When changing the input format, the scaler will try and apply the current settings to the new input format. If this is not possible (e.g. the value is beyond the zoom limit), then the default value (100% size) will be used.

HDMI and DVI

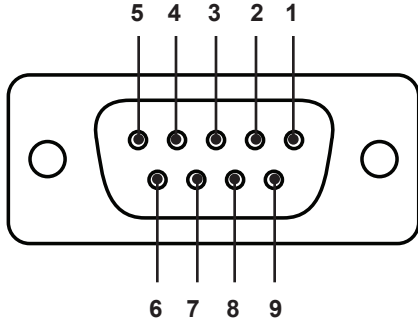
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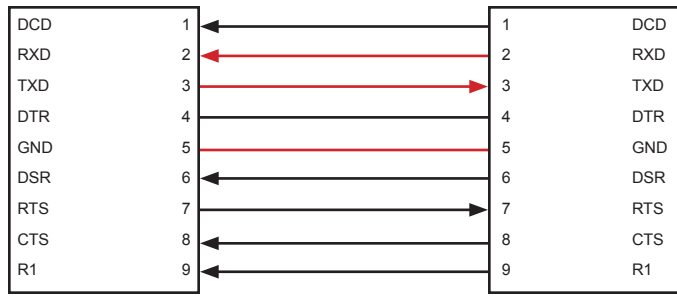
RS-232 Configuration

RS-232 Interface



RS-232 Controller


Scaler



Only TXD, RXD, and GND are used.

RS-232 Settings

| Description | Setting |
|-----------------------|---------|
| Baud rate | 115200 |
| Data bits | 8 |
| Parity | None |
| Stop bits | 1 |
| Hardware 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 each parameter.

RS-232 Commands

| Command | Description |
|--------------|---|
| #aspect | Sets the aspect ratio of the output signal |
| #autolock | Enables / disables automatic Genlock |
| #blacklev | Sets the black level of the output signal |
| #bright | Sets the brightness of the specified color component |
| #cleanaper | Defines an area within the production aperture |
| #contrast | Sets the contrast of the specified color component |
| #enhance | Sets the enhancement detail of the output signal |
| #extract | Zooms-in on specified are of the input video signal |
| #filmmode | Enables / disables film mode |
| #gamma | Sets the gamma correction mode |
| #input | Sets the input timing for the source signal |
| #insel | Switches between HDMI and DVI inputs |
| #key | Used to emulate the IR remote control unit using RS-232 |
| #language | Set the OSD to the specified language |
| #linkconf | Sets the link configuration |
| #motionthres | Sets the intraframe motion detection threshold |
| #noisereduc | Sets the noise reduction value |
| #noisethres | Sets the noise threshold value |
| #output | Sets the output resolution of the output signal |
| #pattern | Displays the specified test pattern |
| #rb | Reboots the scaler |
| #remotechan | Sets the IR channel of the scaler |
| #restore | Resets the scaler to factory-default settings |
| #save | Saves all current settings to the PROM |
| #sizepos | Sets the size and position of the output signal |
| #through | Defines an area of the output image with cropping |
| #version | Returns the current hardware and firmware information |

#aspect

The #aspect command sets the aspect ratio of the output signal.

Syntax:

```
#aspect param1
```

Parameters:

param1 Aspect ratio [1 ... 5]

| Value | Description |
|-------|---------------------|
| 1 | Full screen |
| 2 | Letter / Pillar box |
| 3 | Panoramic |
| 4 | Extract |
| 5 | Through |

Notes:

If the Extract or Through mode is selected, the default values are used. To modify the parameters for Extract or Through mode refer to these commands in this manual.

#autolock

The #autolock command enables or disables the Genlock mode. The factory-default setting is 0 (disable).

Syntax:

```
#autolock param1
```

Parameters:

param1 Aspect ratio [0 ... 1]

| Value | Description |
|-------|-------------|
| 0 | Disable |
| 1 | Enable |

#blacklev

The #blacklev command sets the black level of the output signal. This is the equivalent of adjusting the RGB/Y Output Offset using the OSD. Refer to the [Picture Menu](#) for more information.

Syntax:

```
#blacklev param1
```

Parameters:

param1 Level [0 ... 1023]

#bright

The #bright command sets the color brightness for the specified color component. The default value for *param2* (for each color component) is 50.

Syntax:

```
#bright param1 param2
```

Parameters:

param1 Color [0 ... 2]

| Value | Description |
|-------|-------------|
| 0 | Red |
| 1 | Green |
| 2 | Blue |

param2 Color level [0 ... 100]

#cleanaper

The #cleanaper command allows adjustment of the input signal position. Each parameter allows an area within the production aperture to be defined. The minimum clean aperture size is 0 pixels by 0 lines. The default value for *param1* and *param2* is 100. The default value for *param3* and *param4* is 50.

Syntax:

```
#cleanaper param1 param2 param3 param4
```

Parameters:

param1 Horizontal size (default = 100) [1 ... 100]
param2 Vertical size (default = 100) [1 ... 100]
param3 Horizontal position (default = 50) [1 ... 100]
param4 Vertical position [1 ... 100]

#contrast

The `#contrast` command sets the contrast level for the specified color component. The default value for *param2* (for each color component) is 50.

Syntax:

```
#contrast param1 param2
```

Parameters:

param1 Color [0 ... 2]

| Value | Description |
|-------|-------------|
| 0 | Red |
| 1 | Green |
| 2 | Blue |

param2 Contrast [0 ... 100]

#enhance

The `#enhance` command improves the detail of the output signal. The default value for *param1* is 0.

Syntax:

```
#enhance param1
```

Parameters:

param1 Level [0 ... 100]

#extract

The #extract command zooms-in on specified are of the input video signal. The default value for *param1* is 100. The default value for *param2* and *param3* is 50.

Syntax:

```
#bright param1 param2
```

Parameters:

| | | |
|---------------|---------------------|-------------|
| <i>param1</i> | Extract size | [1 ... 100] |
| <i>param2</i> | Horizontal position | [1 ... 100] |
| <i>param3</i> | Vertical position | [1 ... 100] |

#filmmode

The #filmmode command, when enabled, produces a progressive output signal from an interlaced input signal. This feature automatically detects repeated field sequences present in interlaced signals, such as 50 Hz or 60 Hz field sequences (no repeated fields), 60 Hz 3:2 pull-down, including broken or edited sequence detection, 60 Hz 2:2: pull-down, 50 Hz 2:2 pull-down, static frames, and multi-directional and inter-field motion.

Syntax:

```
#filmmode param1
```

Parameters:

| | | |
|---------------|-------|-----------|
| <i>param1</i> | Value | [0 ... 1] |
|---------------|-------|-----------|

| Value | Description |
|-------|-------------------|
| 0 | Disable film mode |
| 1 | Enable film mode |

#gamma

The #gamma command sets the gamma correction mode of the output signal.

Syntax:

```
#gamma param1 param2
```

Parameters:

param1 Gamma setting [0 ... 3]

| Value | Description |
|-------|-------------|
| 0 | Default |
| 1 | sRGB |
| 2 | Custom |
| 3 | User table |

param2 Mode [see below]

Notes:

If the *Custom* mode is used, then set the gamma coefficient value in the second parameter. If *User Table* is used, then set *param2* = 1 to use the table currently saved in the EEPROM. To write a new gamma LUT (Look-Up Table) file, you must use the updater with the following command:

```
updater %comport% gamma [filename].csv
```

Example: `updater com1 gamma mygamma.csv`

If the *Default* or *sRGB* mode is used, then set *param2* = 0. See the [Gamma Look-up Table](#) for details on the gamma LUT format.

#input

The #input command sets the input timing for the source signal. See [Supported Video and Graphic Formats](#) for a list of available input formats.

Syntax:

```
#input param1
```

Parameters:

param1 Value [see table]

#insel

The #insel command switches between the HDMI input and the DVI input.

Syntax:

```
#key param1
```

Parameters:

param1 Value

| Value | Description |
|-------|-------------|
| 0 | DVI In |
| 1 | HDMI In |

#key

The #key command emulates the same control used on the IR remote control. Either the full word or the first letter of the word can be used.

Syntax:

```
#key param1
```

Parameters:

param1

String

| Value | Description |
|--------|------------------------|
| menu | MENU button |
| up | ↑ (Up arrow button) |
| down | ↓ (Down arrow button) |
| left | ← (Left arrow button) |
| right | → (Right arrow button) |
| enter | ENTER button |
| source | SOURCE button |
| output | OUTPUT button |

#language

The #language command sets the OSD to the specified language.

Syntax:

```
#language param1
```

Parameters:

param1 Language [0 ... 1]

| Value | Description |
|-------|-------------|
| 0 | English |
| 1 | French |

#linkconf

The #linkconf command sets the link configuration. The link configuration is set on the input. This feature is not valid for all formats.

Syntax:

```
#linkconf param1
```

Parameters:

param1 Value [0 ... 2]

| Value | Description |
|-------|-------------------------|
| 0 | Single link |
| 1 | Dual link YCbCr (4:4:4) |
| 2 | Dual link RGB (4:4:4) |

(continued on next page)

Notes:

The following table lists the video formats which can be used when setting the link configuration

| Timings | |
|-------------------|-------------------|
| 1080i / 60 Hz | 1080sf / 24 Hz |
| 1080i / 59.94 Hz | 1080sf / 23.98 Hz |
| 1080i / 50 Hz | 1080p / 30 Hz |
| 1080i / 50M Hz | 1080p / 29.97 Hz |
| 1080sf / 29.97 Hz | 1080p / 25 Hz |
| 1080sf / 30 Hz | 1080p / 24 Hz |
| 1080sf / 25 Hz | 1080p 23.98 Hz |

Some formats automatically set the link configuration to progressive dual link 4:2:2. The table, below, lists these video formats.

| Timings | |
|------------------|-----------------|
| 1080p / 60 Hz | 480p / 59.94 Hz |
| 1080p / 59.94 Hz | 576p / 50 Hz |
| 1080p / 50 Hz | |

#motionthres

The `#motionthres` command sets the intraframe motion detection threshold for the de-interlacer on the VXP processor. Video artifacts can be created when de-interlacing (creating interlaced fields from progressive fields). This function allows adjustment of the threshold used by the de-interlacer motion detection algorithm, removing / minimizing motion artifacts in the converted video. The factory-default setting is 4.

Syntax:

```
#motionthres param1
```

Parameters:

| | | |
|---------------|-------|------------|
| <i>param1</i> | Value | [0 ... 15] |
|---------------|-------|------------|

#noisereduc

The #noisereduc command sets the noise reduction value.

Syntax:

```
#noisereduc param1
```

Parameters:

| | | |
|---------------|-------|-------------|
| <i>param1</i> | Value | [0 ... 100] |
|---------------|-------|-------------|

#noisethres

The #noisethres command sets the noise threshold.

Syntax:

```
#noisethres param1
```

Parameters:

| | | |
|---------------|-------|-------------|
| <i>param1</i> | Value | [0 ... 100] |
|---------------|-------|-------------|

#output

The #output command sets the resolution of the output signal. See [Supported Video and Graphic Formats](#) for list of available resolutions. Use the associated value in the table to specify an output resolution.

Syntax:

```
#output param1
```

Parameters:

| | | |
|---------------|-------|-------------|
| <i>param1</i> | Value | [see table] |
|---------------|-------|-------------|

#pattern

The #pattern command displays the specified test pattern. The original output signal is masked when the test pattern is displayed.

Syntax:

```
#pattern param1
```

Parameters:

param1 Value [0 ... 2]

| Value | Description |
|-------|-------------|
| 0 | No pattern |
| 1 | Color bar |
| 2 | Cross hatch |

#rb

The #rb command reboots the scaler.

Syntax:

```
#rb
```

Parameters:

None

#remotechan

The #remotechan command sets IR channel of the scaler. The specified IR channel must match the IR channel of the included IR remote control unit. See [Setting the IR Channel](#) for instructions on setting the IR channel on the IR remote control unit.

Syntax:

```
#remotechan param1
```

Parameters:

| | | |
|---------------|------------|-----------|
| <i>param1</i> | IR channel | [0 ... 3] |
|---------------|------------|-----------|

#restore

The #restore command resets the *HDMI and DVI to 3GSDI Scaler* to factory-default settings.

Syntax:

```
#restore
```

Parameters:

None

#save

The #save command saves all the current parameter settings to the PROM. These parameters will be reloaded upon the next boot up.

Syntax:

```
#save
```

Parameters:

None

#sizepos

The #sizepos command sets the size and the position of the image. This option is not available when the Aspect Mode is set to Panoramic.

Syntax:

```
#sizepos param1 param2 param3 param4
```

Parameters:

| | | |
|---------------|---------------------|-------------|
| <i>param1</i> | Horizontal size | [1 ... max] |
| <i>param2</i> | Vertical size | [1 ... max] |
| <i>param3</i> | Horizontal position | [0 ... max] |
| <i>param4</i> | Vertical position | [0 ... max] |

Notes:

Use the following formulas to calculate the maximum values for each parameter:

| | |
|-----------------|---|
| <i>param1</i> : | Current horizontal resolution - current horizontal position |
| <i>param2</i> : | Current vertical resolution - current vertical position |
| <i>param3</i> : | Current horizontal resolution - current horizontal size |
| <i>param4</i> : | Current vertical resolution - current vertical size |

#through

The `#through` command defines a sub-window that is always centered on the screen. The position of the sub-window is relative to the size and position of the original output signal.

Syntax:

```
#through param1 param2 param3 param4
```

Parameters:

| | | |
|---------------|---------------------|-------------|
| <i>param1</i> | Horizontal size | [1 ... 100] |
| <i>param2</i> | Vertical size | [1 ... 100] |
| <i>param3</i> | Horizontal position | [0 ... 100] |
| <i>param4</i> | Vertical position | [0 ... 100] |

#version

The `#version` command displays the current version of host firmware, Kernel, and the configuration version.

Syntax:

```
#version
```

Parameters:

None

HDMI and DVI

to 3GSDI Scaler

04 Appendix

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Supported Video and Graphic Formats

The following table contains all supported video and graphic formats supported by the *HDMI and DVI to 3GSDI Scaler*. The Value column are parameters used by the RS-232 Serial Control.

Video Formats

| Input | | Output | |
|-----------------|-------|-------------------|-------|
| Format | Value | Format | Value |
| 480i | 0 | 480i | 0 |
| 480p / 59.94 Hz | 6 | 480p / 59.94 Hz | 6 |
| 576i | 1 | 576 | 1 |
| 576p / 50 Hz | 7 | 576p | 7 |
| 720p / 23.97 Hz | 15 | 720p @ 23.97 | 15 |
| 720p / 24 Hz | 14 | 720p @ 24 | 14 |
| 720p @ 25 | 13 | 720p @ 25 | 13 |
| 720p @ 29.97 | 12 | 720p @ 29.97 | 12 |
| 720p @ 30 | 11 | 720p @ 30 | 11 |
| 720p @ 50 | 10 | 720p @ 50 | 10 |
| 720p @ 60 | 8 | 720p @ 60 | 8 |
| 720p @ 59.94 | 9 | 720p @ 59.94 | 9 |
| 1035i @ 59.94 | 64 | 1035i @ 59.94 | 64 |
| 1035i @ 50 | 63 | 1035i @ 50 | 63 |
| 1080i @ 50 | 24 | 1080i @ 50 | 24 |
| 1080i @ 50M | 25 | 1080i @ 50M | 25 |
| 1080i @ 59.94 | 23 | 1080i @ 59.94 | 23 |
| 1080i @ 60 | 22 | 1080i @ 60 | 22 |
| 1080p @ 23.98 | 34 | 1080p @ 23.98 | 34 |
| 1080p @ 24 | 32 | 1080p @ 24 | 32 |
| 1080p @ 25 | 30 | 1080p @ 25 | 30 |
| 1080p @ 29.97 | 28 | 1080p @ 29.97 | 28 |
| 1080p @ 30 | 26 | 1080p @ 30 | 26 |
| 1080p @ 50 | 20 | 1080p @ 50 | 20 |
| 1080p @ 50M | 21 | 1080p @ 50M | 21 |
| 1080p @ 59.94 | 19 | 1080p @ 59.94 | 19 |
| 1080p @ 60 | 18 | 1080p @ 60 | 18 |
| 1080sf @ 23.98 | 35 | 2K-p @ 23.98 | 75 |
| 1080sf @ 24 | 33 | 2K-p / 24 Hz | 76 |
| 1080sf / 25 Hz | 31 | 640 x 350 / 85 Hz | 36 |

| Input | | Output | |
|-------------------|-------|-------------------|-------|
| Format | Value | Format | Value |
| 1080sf / 29.97 Hz | 29 | 640 x 400 / 85 Hz | 37 |
| 1080sf @ 30 | 27 | 640 x 480 @ 60 | 38 |
| 2K-p @ 23.98 | 73 | 640 x 480 @ 75 | 39 |
| 2K-p @ 24 | 74 | 640 x 480 @ 85 | 40 |
| 2K-sf @ 23.98 | 75 | 800 x 600 @ 60 | 41 |
| 2K-sf @ 24 | 76 | 800 x 600 / 75 Hz | 42 |
| Auto Detect | 255 | 800 x 600 / 85 Hz | 43 |

Graphic Formats

| Input | | Output | |
|---------------------|-------|---------------------|-------|
| Format | Value | Format | Value |
| 640 x 350 / 85 Hz | 36 | 1024 x 768 / 60 Hz | 44 |
| 640 x 400 / 85 Hz | 37 | 1024 x 768 / 75 Hz | 45 |
| 640 x 480 / 60 Hz | 38 | 1024 x 768 / 85 Hz | 46 |
| 640 x 480 / 75 Hz | 39 | 1280 x 854 | 65 |
| 640 x 480 / 85 Hz | 40 | 1152 x 864 / 75 Hz | 47 |
| 800 x 600 / 60 Hz | 41 | 1280 x 768 / 60 Hz | 48 |
| 800 x 600 / 75 Hz | 42 | 1280 x 960 / 60 Hz | 49 |
| 800 x 600 / 85 Hz | 43 | 1280 x 960 / 85 Hz | 50 |
| 1024 x 768 / 60 Hz | 44 | 1280 x 1024 / 60 Hz | 51 |
| 1024 x 768 / 75 Hz | 45 | 1280 x 1024 / 75 Hz | 52 |
| 1024 x 768 / 85 Hz | 46 | 1280 x 1024 / 85 Hz | 53 |
| 1280 x 854 | 65 | 1360 x 768 / 60 Hz | 54 |
| 1152 x 864 / 75 Hz | 47 | 1366 x 768 / 60 Hz | 56 |
| 1280 x 768 / 60 Hz | 48 | 1366 x 923 / 50 Hz | 55 |
| 1280 x 960 / 60 Hz | 49 | 1440 x 900 / 60 Hz | 66 |
| 1280 x 960 / 85 Hz | 50 | 1440 x 1080 / 60 Hz | 67 |
| 1280 x 1024 / 60 Hz | 51 | 1600 x 1024 | 68 |
| 1280 x 1024 / 75 Hz | 52 | 1600 x 1200 / 60 Hz | 57 |
| 1280 x 1024 / 85 Hz | 53 | 1600 x 1200 / 65 Hz | 58 |
| 1360 x 768 / 60 Hz | 54 | 1600 x 1200 / 70 Hz | 59 |

(continued on next page)

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| Input | | Output | |
|---------------------|-------|---------------------|-------|
| Format | Value | Format | Value |
| 1366 x 768 / 60 Hz | 56 | 1600 x 1200 / 75 Hz | 69 |
| 1366 x 923 / 50 Hz | 55 | 1680 x 1050 / 60 Hz | 70 |
| 1440 x 900 / 60 Hz | 66 | 1920 x 1200 / 60 Hz | 71 |
| 1440 x 1080 / 60 Hz | 67 | 2048 x 1080 | 72 |
| 1600 x 1024 | 68 | | |
| 1600 x 1200 / 60 Hz | 57 | | |
| 1600 x 1200 / 65 Hz | 58 | | |
| 1600 x 1200 / 70 Hz | 59 | | |
| 1600 x 1200 / 75 Hz | 69 | | |
| 1680 x 1050 / 60 Hz | 70 | | |
| 1920 x 1200 / 60 Hz | 71 | | |
| 2048 x 1080 | 72 | | |

Gamma Look-up Table

The Gamma Look Up Table (LUT) can be programmed using the `GefenUpdater.exe` program from the Gefen software package. To do this, following the instructions below:

- 1 Create the Gamma LUT.
- 2 Create a standard ASCII text file with the following line:

```
GefenUpdater GAMMA filename.csv
```

where `filename.csv` is the name of the Gamma LUT file.
- 3 Save the file as `UpdateGamma.bat`. Make sure that the `GefenUpdater.exe` file resides in the same directory (or is in the path) as the `UpdateGamma.bat` file.
- 4 Connect a USB cable from the computer to the *HDMI and DVI to 3GSDI Scaler*.
- 5 Power on the *HDMI and DVI to 3GSDI Scaler*. Once the scaler has powered up, run the `UpdateGamma.bat` file.

The LUT is a standard .CSV file. Each line contains Red, Green and Blue values separate by comma ",". A value must be between 0 and 1023. A file must contain 1024 lines:

```
1023,0,0          (Line 1)
1023,0,0
1023,0,0
1023,0,0
1023,0,0
1023,0,0
1023,0,0
...
...
1023,0,0          (Line 1024)
```

Mounting Plate 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.



Fuse Replacement

The *HDMI and DVI to 3GSDI Scaler* contains a fuse as part of the internal power supply. This fuse can easily be replaced by using the following steps.



STOP: Before installing modules and prevent the risk of possible electrical shock, unplug the AC power cord from back of the scaler.

1. Disconnect the power AC power cord from the IEC connector on the scaler.
2. Locate the fuse door, between the IEC connect and the power switch, on the back of the unit.
3. Use a small flat-head screwdriver to gently pry the locking mechanism, on the fuse door, from the scaler.



4. Remove the fuse door.



5. Remove the fuse from the C-cradle on the fuse door.



6. Replace the fuse. Only use a 5mm x 20mm 250V / 2A fuse.



ATTENTION: Do not use a fuse other than the type specified by the manufacturer. Replacement of an incorrect fuse can result in electrical fire and damage to the scaler, which will void the warranty.

7. Gently replace the fuse drawer until it locks into place. Do not force the fuse drawer into place. If the fuse drawer does not lock into place, the fuse may not be centered in the C-cradle. In this case, rotate the scaler on its side and reinstall the fuse drawer. This will allow the fuse to stay centered as the fuse drawer is installed.



Firmware Update Procedure

The following items are required to update firmware:

- HDMI and DVI to 3GSDI Scaler
- Firmware files (downloaded from the Gefen Web site)
- Computer running Windows® XP or better.
- USB cable (A-B)

1. Make sure the scaler is powered ON. It is unnecessary to disconnect any source and SDI devices during the update procedure.
2. Extract the contents of the .ZIP file to a folder on the Windows Desktop.
3. Connect the USB cable between the computer and the scaler. Once the USB cable is connected, a virtual COM port will be created.
4. Open the Updater.ini file, located in the firmware files folder.
5. Locate the [Setup] section within the Updater.ini file.
6. Change the COM port setting to the virtual COM port.

Example:

```
[Setup]
comport=COM5
```

If the virtual COM port is not known, use *Control Panel ► Device Manager* and locate the *Ports* section. The virtual COM port will be listed as *Silicon Labs CP210x USB to UART Bridge*.

7. Save the Updater.ini file.
8. Execute the GefenUpdater.exe file.
9. The update process will take several minutes.

```
Successfully open the com port COM5
Wait...
Usb device : CP2103.
Flash already programmed...Updating firmware
...
...
Total Time : 0 minutes 1 seconds.

Reset Device.

Com port closed.

Exit updater.
Press any key to continue . . .
```

10. If any portion of the update process fails, run the GefenUpdater.exe again.

Specifications

| Supported Formats | |
|------------------------|---|
| Standards | <ul style="list-style-type: none"> • SD-SDI (SMPTE 259M) • ED-SDI (SMPTE 344M) • HD-SDI (SMPTE 292M) • Dual-link HD-SDI (SMPTE 372M) • 3G-SDI (SMPTE 424M) |
| Resolutions | <ul style="list-style-type: none"> • 480i / 576i • 720p / 1080p / 1080sf / 2K-p / 2K-sf @ 23.98 Hz • 720p / 1080p / 1080sf / 2K-p / 2K-sf @ 24 Hz • 720p / 1080p / 1080sf @ 25 Hz • 720p / 1080p / 1080sf @ 29.97 Hz • 720p / 1080p / 1080sf @ 30 Hz • 576p / 720p / 1035i / 1080i / 1080p @ 50 Hz • 480p / 720p / 1035i / 1080i / 1080p @ 59.94 Hz • 1080i / 1080p @ 50M Hz • 720p / 1080i / 1080p @ 60 Hz |
| Output Video Bandwidth | <ul style="list-style-type: none"> • 3.0 Gbps (max.) |

| Electrical | |
|---------------------------|---|
| Maximum Pixel Clock | <ul style="list-style-type: none"> • 225 MHz |
| Power Indicator | <ul style="list-style-type: none"> • 1 x LED, blue |
| 3GSDI Indicator | <ul style="list-style-type: none"> • 1 x LED, green |
| HDMI Input Indicator | <ul style="list-style-type: none"> • 1 x LED, green |
| Power Switch | <ul style="list-style-type: none"> • 1 x Rocker-type |
| HDMI / DVI Input Selector | <ul style="list-style-type: none"> • 1 x Tact-type |

| Connectors | |
|--------------|--|
| SDI Outputs | <ul style="list-style-type: none"> • 2 x BNC, female |
| Genlock | <ul style="list-style-type: none"> • 1 x BNC, female |
| Audio Output | <ul style="list-style-type: none"> • 1 x S/PDIF |
| USB | <ul style="list-style-type: none"> • 1 x Type-B (USB 2.0) |
| RS-232 | <ul style="list-style-type: none"> • 1 x DB-9, female |

Operational

| | |
|-------------------|----------------------------|
| Power Input | • 100 - 240V AC (50/60 Hz) |
| Power Consumption | • 20W (max.) |

Physical

| | |
|------------------------|--|
| Dimensions (W x H x D) | • 17" x 1.73" x 7.7" (432mm x 44mm x 195mm) |
| Unit Weight | • 3 lbs (1.4 kg) |



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