

Installation and Operation Manual

Teranex Processors

Blackmagicdesign 



Mac OS X™

Windows™

June 2014



Welcome

Thank you for purchasing a Blackmagic Design Teranex converter for your facility.

The Teranex converter you have purchased is an amazing quality standards converter that you will spend hours playing with to discover all the wonderful functions it has. I am still playing with it myself to see all the other things I can use it for! We have packed it with the latest SDI, HDMI and analog connections so you can use it to convert and connect anything!

One of the exciting advantages of the Teranex converter is the amazing quality of the conversions. It features a powerful SIMD processor that allows more complex calculations, allowing the Teranex to do a better job at processing video, removing field movement, detecting cadence, noise reduction, timecode conversions, subtitle conversion and much more!

Enjoy exploring your Teranex processor and we all hope you have many years of enjoyment out of it. Please let us know of any ideas and features you would like to see, as we are constantly updating the software so it gets better and better!

Grant Petty

Grant Petty
CEO Blackmagic Design

5	Getting Started		
	Introducing Teranex	5	
	Connecting Teranex	6	
	Setting your Input	6	
	Setting your Output	6	
	Applying Settings using the Control Panel	7	
8	Using Your Teranex Converter		
9	Conversion Workflows		
	Up Conversion	9	
	Down Conversion	10	
	Cross Conversion	11	
	Standards Conversion	12	
	Cadence Removal	13	
	Clean Cadence	13	
	Presets	14	
	Audio and System Status LEDs	14	
15	Teranex Processor Settings		
	LCD Menu	15	
	Video Menu Settings	15	
	Color	15	
	Clip	16	
	Aspect	16	
	Video Setup Menu	17	
	Proc Amp Menu Settings	18	
	Test Patterns Menu	19	
	Advanced Menu Settings	19	
	Audio Menu Settings	21	
	Audio Mapping	21	
	Audio Gain	22	
	Audio Delay	22	
	Audio Setup Menu	23	
	Dolby Encode	24	
	Dolby Metadata	25	
	Noise Reduction Menu Settings	27	
	Bias	27	
	Split Screen On/Off	27	
	Red Overlay On/Off	27	
	Ancillary Data Menu Settings	28	
	Closed Caption Menu	28	
	Timecode Menu Settings	30	
	Video Index Menu	33	
	System Setup Menu Settings	34	
	Ethernet Setup Menu	34	
	IP Menu	34	
	Subnet Mask Menu	34	
	Gateway Menu	34	
	DHCP Menu	35	
	Factory Reset	35	
	Reference Menu Settings	35	
	Pixel Offset	36	
	Line Offset	36	

3D Menu Settings	37	56 Format Conversion Table	
3D Mode	37	61 Aspect Ratio Conversion Table	
Input	38	62 Installing Blackmagic Teranex Software	
Output	38	Installing Blackmagic Teranex Software on Mac OS X	63
Intensity	39	Installing Blackmagic Teranex Software on Windows	64
Depth	39	Updating the Teranex Processor Software	64
Camera Align	39		
44 Capture and Playback		65 Installing Optional Blackmagic Dolby® Encoder/Decoder	
Using your Favorite Editing Software	44	66 Developer Information	
DaVinci Resolve 10	45	67 Help	
Avid Media Composer 7	46	68 Warnings	
Apple Final Cut Pro 7	47	69 Warranty	
Apple Final Cut Pro X	48		
Adobe Premiere Pro CC	49		
Adobe After Effects CC	50		
Adobe Photoshop CC	51		
52 Waveform Monitoring			
Using Blackmagic UltraScope for Waveform Monitoring	52		



5 Getting Started



Teranex 2D Processor



Teranex 3D Processor

Introducing Teranex

Teranex is a powerful and easy to use video signal processor for real time conversion between video standards, frame rates and resolutions. The control panel features selection buttons for primary input and output settings, with soft menu buttons and rotary knob to navigate the LCD menus. Simply program your input settings, program your output settings and your conversion is ready for processing.

It won't take you long to familiarize yourself with Teranex. You'll find yourself quickly moving between selection and soft menu buttons as you program your settings. Buttons are illuminated green for currently selected or available settings, and blue when confirmed, so it's easy to see what you're doing.

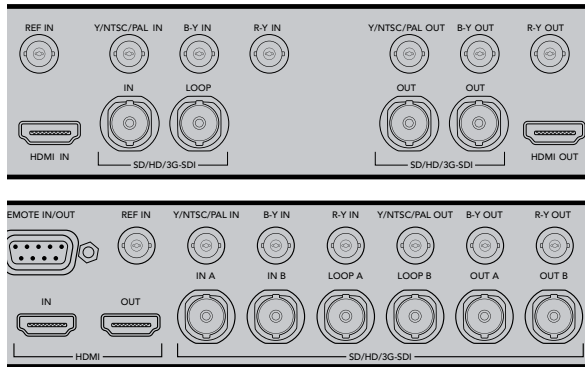
Enhance the quality of your conversions using noise reduction, sharpness, cadence removal, adjustable scaling and much more.

The primary functions you can perform with Teranex are:

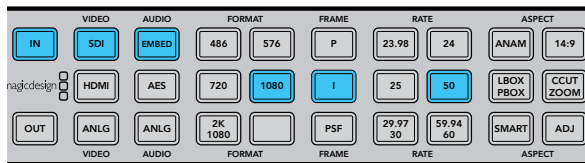
Up Conversion	Converting your video to a higher resolution. For example, SD to HD.
Down Conversion	Converting your video to a lower resolution. For example, HD to SD.
Cross Conversion	Converting the video resolution or aspect ratio of your video. For example, 720p59.94 to 1080i59.94.
Standards Conversion	Converting your video from one frame rate to another. For example, 1080i59.94 to 1080i50
Noise Reduction	Cleaning up noisy source material for higher quality conversions.
Test Signals	Generating known reference signals when they are needed in your work flow.
3D	Performing format and/or frame rate conversion of stereoscopic inputs and for conversion of 2D sources into simulated 3D in the Teranex 3D Processor.
Frame Sync	Synchronizing video sources that originate outside your facility to your internal master sync generator.

However, Teranex is more than a converter, it's a high end video processor. You can add enhancements to improve the video output from your equipment, your source material while editing, or even while capturing and playing back from your computer via Thunderbolt. Let's get started with Teranex!

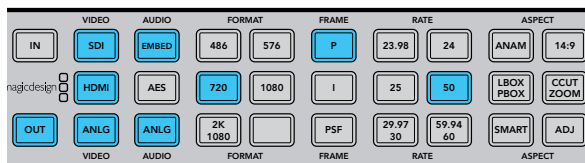
6 Getting Started



Connect your video source and destination equipment to your Teranex 2D/3D processor's SDI, HDMI or analog video connectors.



Press the IN button to display the video input format. In this example, the format is 1080i50 via SDI with embedded audio.



Press the OUT button and select a format to convert to. In this example, the conversion is set to: 720p50, embedded SDI and HDMI audio, plus analog audio.

Connecting Teranex

Getting started with Teranex is as easy as plugging in power, plugging in your video inputs and connecting your output destinations.

Step 1. The easiest way to power the Teranex 2D is connecting an IEC cable to the AC power socket. Alternatively, you can plug in via the 12V DC port for external battery power and/or a “brick” DC adapter. Connecting both AC and DC power supplies provides redundancy in case one supply fails or is accidentally disconnected. (The DC power supply is an optional purchase.) The Teranex 3D has two AC power supplies for redundancy.

Step 2. Connect your camera, deck or other video source to the video inputs on your Teranex.

Step 3. Connect the video output connectors to a video destination, such as a disk recorder or video monitor. All video outputs are simultaneously active so you can connect more equipment if needed.

Setting your Input

After connecting your equipment, verify your input signal using the control panel buttons, soft menu buttons and LCD.

Step 1. Press the IN button on the control panel.

Step 2. Select your SDI, HDMI or Analog video input using the VIDEO buttons. If selecting analog, confirm component or composite using the soft menu buttons. When your input is selected you will see the image displayed on the built-in LCD. Teranex automatically detects your input format and illuminates the corresponding buttons.

Step 3. Select your Embedded, AES or Analog audio input using the AUDIO buttons. If selecting Analog, confirm your connection as either DB25 or RCA using the soft menu buttons.

Setting your Output

Now select your desired output settings using the control panel buttons, soft menu buttons and LCD.

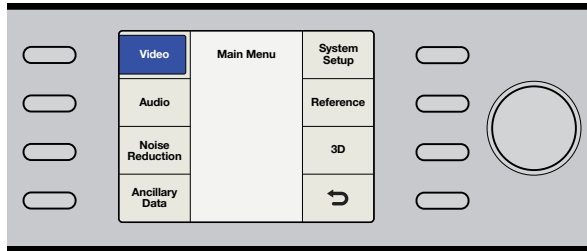
Step 1. Press the OUT button on the control panel.

Step 2. Press the FORMAT, FRAME, RATE and ASPECT buttons to set your desired output format, frame type, frame rate and aspect ratio. When using AES or analog audio outputs on the Teranex 3D, select the desired type in the AUDIO button section.

Step 3. Using the soft menu buttons, select Change to confirm your settings. The video and audio output buttons will illuminate blue, indicating the active outputs.

The converted video output will now be seen on the LCD, and sent to your connected video equipment.

7 Getting Started



Use the control panel LCD, soft menu buttons and rotary knob to navigate the menus and apply your settings.

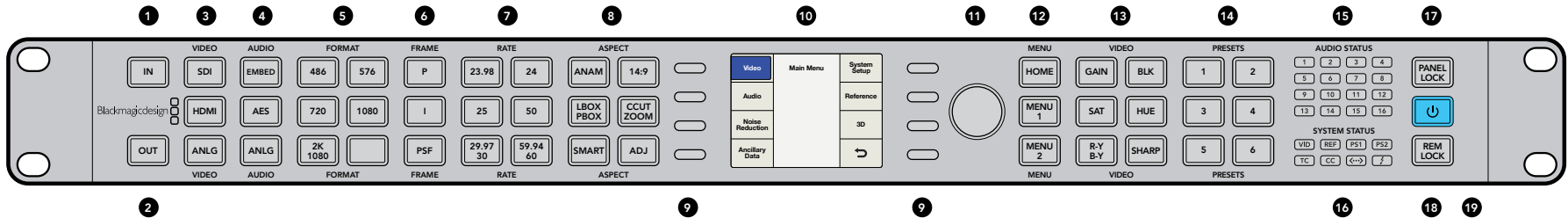
Applying Settings using the Control Panel

Use the control panel LCD, soft menu buttons and rotary knob to navigate through the menus and make your selections. For example, when setting timecode, the cursor is moved forward or backward through the timecode register using the soft menu buttons. Timecode digits are adjusted using the rotary knob. Pressing the rotary knob returns parameters to their default value.

Program your conversion settings by pressing the buttons on the control panel. Buttons are illuminated so you can quickly check the status of your audio and video connections and output settings.

Explore the Teranex menus and experiment with conversion workflows. You'll find examples of common workflows on the following pages.

Below is an overview of control panel features.



- 1. **IN** - Press to display current input settings.
- 2. **OUT** - Press to display and change current output settings.
- 3. **VIDEO** - Press to select video input type, and displays all video outputs.
- 4. **AUDIO** - Press to select audio input type, and displays available audio outputs.
- 5. **FORMAT** - Press to select the video output format, and displays the video input format.
- 6. **FRAME** - Press to select the video output frame type, and displays video input frame type.
- 7. **RATE** - Displays video input frame rate as frames or fields per second. Press to select video output rate.

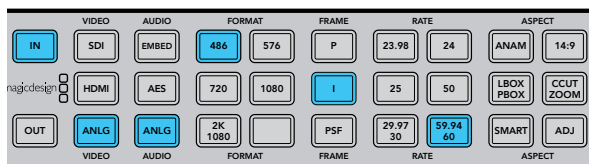
- 8. **ASPECT** - Press to select video input and output aspect ratio settings.
- 9. **SOFT MENU BUTTONS** - Press to navigate the LCD menus and apply settings.
- 10. **LCD** - Displays the video input and output, and menu settings.
- 11. **ROTARY KNOB** - Turn to adjust menu settings. Press to return settings to default.
- 12. **MENU** - Press to toggle the LCD between main menu and live video. MENU 1 and MENU 2 are programmable as page shortcuts.
- 13. **VIDEO** - Press to activate video proc amp settings.

- 14. **PRESETS** - Press to save or recall custom system configurations.
- 15. **AUDIO STATUS** - Displays available input and output audio channels.
- 16. **SYSTEM STATUS** - Displays input, output and control status information.
- 17. **PANEL LOCK** - Press and hold to lock the control panel to prevent accidental changes. Press and hold to unlock.
- 18. **REM LOCK** - Press and hold to prevent a remote device from controlling the Teranex via Ethernet. Press and hold to unlock.
- 19. **POWER** - Press to power ON. Press and hold to power OFF.

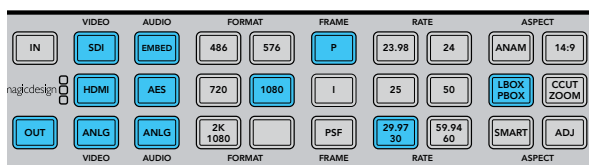
Using Your Teranex Converter



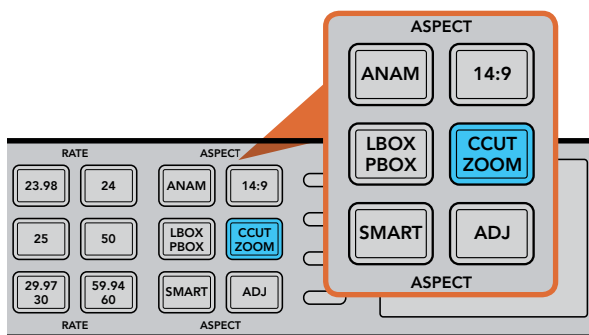
9 Conversion Workflows



Pressing the IN button displays the input format on the control panel buttons. In the above illustration, the input format is 486i59.94 via analog component with analog audio.



Press the OUT button to select your output settings. In the above illustration the output is set to 1080p29.97 with pillarbox aspect ratio.



Aspect ratios are set using the Aspect buttons on the control panel.

Up Conversion

Up Conversion is the process of converting your video to a higher resolution. For example, you may need to insert an NTSC SD source into an HD production. The NTSC clip can be converted to many 720 and 1080 HD output formats and frame rates, depending on your project's requirement. Teranex processors employ high quality de-interlacing and up conversion algorithms, assuring outstanding results. In this example 486i59.94 component analog video is converted to 1080p29.97 using zoom aspect ratio and RCA analog audio inputs.

Power your Teranex Processor and connect your inputs and outputs.

Setting your Input

- Step 1.** Press the IN button on the control panel and select ANLG video. The Analog Input menu will be displayed on the LCD.
- Step 2.** Using the rotary knob, select Component as your analog input type. Press the IN button to display your input video on the LCD. Teranex automatically detects the input format and illuminates the corresponding buttons on the control panel.
- Step 3.** Press the ANLG audio button. Using the rotary knob, select RCA as your analog audio input type.

Setting your Output

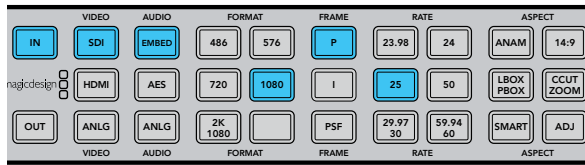
- Step 1.** Press the OUT button on the control panel. On the Teranex 2D, all output buttons will be illuminated blue. On the Teranex 3D, the EMBED audio button will be blue. Select the AES or ANLG button. AES/EBU and analog audio outputs share the XLR connectors.
- Step 2.** Press the 1080 button. Select the P button for progressive output, and the 29.97/30 button to select your frame rate. The format, frame and rate buttons are now illuminated green, ready for you to accept your conversion set up or make changes.
- Step 3.** Using the soft menu buttons, select Change. The output video is now displayed on the LCD and sent to all output connectors. The buttons will also illuminate blue to confirm your settings.

Setting your Aspect Ratio

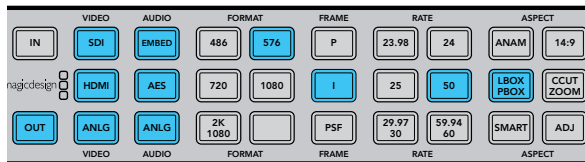
Press the CCUT/ZOOM button to set your aspect ratio to Zoom. For more information on aspect ratio conversion see pages 16 and 61-62.

Your Teranex Processor is now ready to up convert your video.

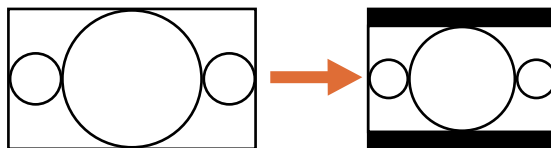
10 Conversion Workflows



Pressing the IN button displays the input format on the control panel buttons. In the above illustration, the input format is 1080p25 via SDI with embedded audio.



Press the OUT button to select your output settings. In the above illustration the output is set to 576i50 with letterbox aspect ratio.



16:9 Ratio Image

4:3 Ratio Display

Setting the LBOX/PBOX button on your SD output fits the 16:9 image inside the 4:3 frame. The 4:3 conversion will have black bars top and bottom and the correct widescreen geometry will be maintained.

Down Conversion

Down Conversion allows you to convert your video to a lower resolution. For example, you may need to distribute a PAL SD version of a 1080i50 HD program master to a client. Once again, high quality de-interlacing, down-sampling and anti-aliasing algorithms will assure outstanding down conversion results. In this example, 1080p25 video via SDI is converted to 576i50 (PAL) with letterbox aspect ratio. Audio is embedded in the input SDI signal.

Power your Teranex Processor and connect your inputs and outputs.

Setting your Input

Step 1. Press the IN button on the control panel and select SDI video. Teranex will display the input video on the LCD, automatically detect the input format and illuminate the corresponding buttons.

Step 2. Select EMBED as the audio input format.

Setting your Output

Step 1. Press the OUT button on the control panel. On the Teranex 2D, all output buttons will be illuminated blue. On the Teranex 3D, the EMBED audio button will be blue. Select the AES or ANLG button. AES/EBU and analog audio outputs share the XLR connectors.

Step 2. Press the 576 button. The button will illuminate green. Note that the I button and the 50 button are also illuminated green. This is because interlaced video and 50 fields per second are the only selections available for a PAL 576 output.

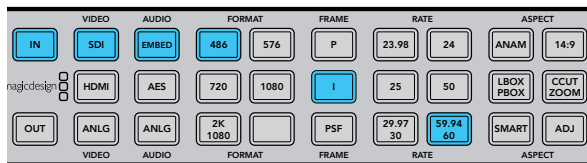
Step 3. Using the soft menu buttons, select Change. The output video is now displayed on the LCD and sent to all output connectors. The buttons will also illuminate blue to confirm your settings.

Setting your Aspect Ratio

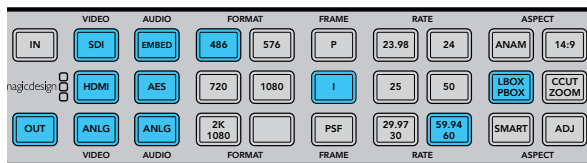
Press the LBOX/PBOX button to set your aspect ratio to letterbox. For more information on aspect ratio conversion see pages 16 and 61-62.

Your Teranex Processor is now ready to down convert your video.

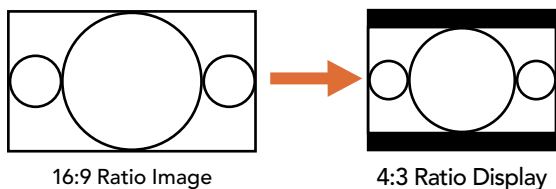
11 Conversion Workflows



Press the IN button to see the format of the video signal that you are converting. In this example, the format is 486i59.94 over SDI with embedded audio.



Press the OUT button to select your output settings. In the above illustration the output is set to 486i59.94 with letterbox aspect ratio.



Setting the LBOX/PBOX button on your SD output fits the 16:9 image inside the 4:3 frame. The 4:3 conversion will have black bars top and bottom and the correct widescreen geometry will be maintained.

Cross Conversion

Cross Conversion allows you to change the video resolution and/or aspect ratio of your program material. Cross conversions between 1080 and 720 HD formats are accomplished using a high quality de-interlacing algorithm that permits all conversions to be performed in the progressive domain. In SD formats, aspect ratio conversions between 4:3 and 16:9 are also easy to perform. In this example 486i59.94 with 16:9 aspect ratio is cross converted to letterbox 4:3 via SDI with embedded audio.

Power your Teranex Processor and connect your inputs and outputs.

Setting your Input

Step 1. Press the IN button on the control panel and select SDI video. Teranex will display the input video on the LCD, automatically detect the input format and illuminate the corresponding buttons.

Step 2. Select EMBED as the audio input format.

Setting your Input Aspect Ratio

Press the LBOX button to select letterbox, indicating that the input aspect ratio is 16:9.

Setting your Output

Step 1. Press the OUT button on the control panel. On the Teranex 2D, all output buttons will be illuminated blue. On the Teranex 3D, the EMBED audio button will be blue. Select the AES or ANLG button. AES/EBU and analog audio outputs share the XLR connectors.

Step 2. Press the 486 button. The button is illuminated green. Note that the I button and the 59.94/60 button are also illuminated green. This is because interlaced video and 59.94 fields per second are the only selections available for an NTSC 486 output.

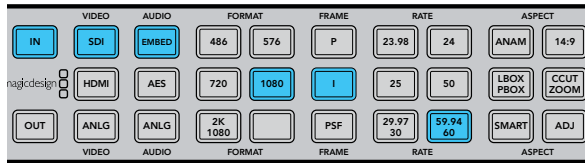
Step 3. Using the soft menu buttons, select Change. The output video is now displayed on the LCD and sent to all output connectors.

Setting your Output Aspect Ratio

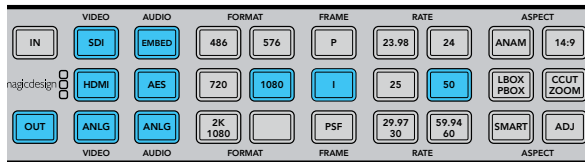
Press the LBOX/PBOX button to set your aspect ratio to letterbox. For more information on aspect ratio conversion see pages 16 and 61-62.

Your Teranex Processor is now ready to cross convert your video.

12 Conversion Workflows



Pressing the IN button displays the input format on the control panel buttons. In the above illustration, the input format is 1080i59.94 via SDI with embedded audio.



Press the OUT button to select your output settings. In the above illustration the output is set to 1080i50.

Video	Main Menu	System Setup
Audio		Reference
Noise Reduction		3D
Ancillary Data		↩

Main Menu>Video

Color	Video	Proc Amp
Clip		Test Patterns
Aspect		Advanced
Setup		↩

Video>Advanced

Clean Cadence	FRC Aperture	Source Type
Scene Detect	0 (Drama)	FRC Aperture
	1	
	2	
	3 (Sport)	↩

Advanced>FRC Aperture

Standards Conversion

Standards Conversion, also known as Frame Rate Conversion, is the process of converting one video frame rate another, such as converting NTSC at 59.94 fps to PAL at 50 fps. The powerful Teranex linear interpolation algorithm analyzes pixels between and within frames, calculating new pixels in real time to create the new output frame rate. In this example 1080i59.94 video is converted to 1080i50 via SDI with embedded audio.

Power your Teranex Processor and connect your inputs and outputs.

Setting your Input

- Step 1.** Press the IN button on the control panel and select SDI video. Teranex will display the input video on the LCD, automatically detect the input format and illuminate the corresponding buttons.
- Step 2.** Select EMBED as the audio input format.

Setting your Output

- Step 1.** Press the OUT button on the control panel. On the Teranex 2D, all output buttons will be illuminated blue. On the Teranex 3D, the EMBED audio button will be blue. Select the AES or ANLG button. AES/EBU and analog audio outputs share the XLR connectors.
- Step 2.** Press the 1080 button. The button will illuminate green. Select the I button for interlaced output and the 50 button to set the frame rate. These buttons will also illuminate green.
- Step 3.** Using the soft menu buttons, select Change. The output video is now displayed on the LCD and sent to all output connectors. The buttons will also illuminate blue to confirm your settings.

Setting your Frame Rate Conversion Aperture

When converting frame rates you'll need to set the appropriate frame rate aperture. Select your settings from 0 (Drama) to 3 (Sport) depending on the amount of motion in your video. These settings are adjusted using the soft menu buttons and rotary knob.

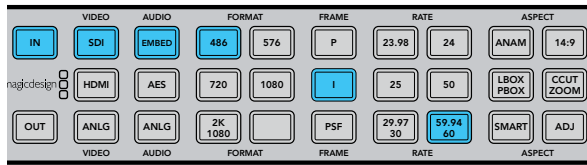
- Step 1.** Press the HOME button.
- Step 2.** Using the soft menu buttons, select Video>Advanced>FRC Aperture.
- Step 3.** Using the rotary knob, select the aperture setting most suited to your video.

Setting your Aspect Ratio

Because this standards conversion maintains an HD video format, only the ADJ aspect ratio button will be available. If converting HD 1080i59.94 to SD 576i50, all aspect ratio settings would be available. For more information on aspect ratio conversion see pages 16 and 61-62.

Your Teranex Processor is now ready to convert your 1080i59.94 video to 1080i50.

13 Conversion Workflows



Cadence Removal is applied automatically when converting from an NTSC frame rate to a film frame rate. For example, 59.94fps to 23.98fps.

Color	Video	Proc Amp
Clip		Test Patterns
Aspect		Advanced
Setup		↩

Main Menu>Video Menu>Advanced

Clean Cadence	Advanced	Source Type
Scene Detect	On	FRC Aperture
	Off	
		↩

Advanced Menu>Clean Cadence

Cadence Removal

Cadence Removal involves the removal of the 3:2 pulldown sequence. 3:2 pulldown (or 2:3 pulldown) is applied when a telecine transfers film at 24 frames per second to video at 59.94 fields per second. Teranex removes cadence automatically when converting video with a 3:2 pulldown to 24 frames per second.

Clean Cadence

Clean Cadence removes broken, non standard and mixed cadences and creates a clean 3:2 pulldown. A 3:2 cadence is found in 59.94 program material, so Clean Cadence is only available when working with 59.94 frame rates. In this example, we will perform a cross conversion to clean the cadence on a 1080i59.94 video signal via SDI with embedded audio. For more information on Clean Cadence settings, see page 19.

Power your Teranex and connect your inputs and outputs.

Setting your Input

- Step 1.** Press the IN button on the control panel and select SDI video. Teranex will display the input video on the LCD, automatically detect the input format and illuminate the corresponding buttons.
- Step 2.** Select EMBED as the audio input format.

Setting your Output

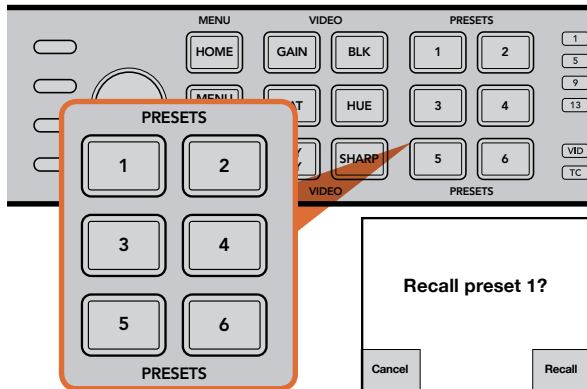
- Step 1.** Press the OUT button on the control panel. All active video output buttons are illuminated blue.
- Step 2.** Press the 1080 button. The button is now illuminated green. Select the I button for interlaced output and the 59.94/60 button to set the frame rate. These buttons will also illuminate green.
- Step 3.** Using the soft menu buttons, select Change. The output video is now displayed on the LCD and sent to all output connectors. The buttons will also illuminate blue to confirm your settings.
- Step 4.** In this example aspect ratio is locked to 16:9. However, if you wish to adjust it manually press the ADJ button and adjust your aspect ratio settings using the soft menu buttons and LCD.
- Step 5.** Press the HOME menu button, then select Video>Advanced>Clean Cadence. Use the rotary knob or soft button to set Clean Cadence to On. The 1080i59.94 output format will now contain a clean 3:2 cadence. Remember to set Clean Cadence to Off after completing your conversion.

Setting your Aspect Ratio

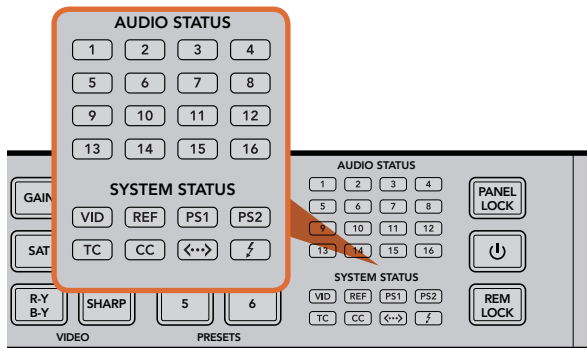
The ADJ adjustable aspect ratio button is available for custom aspect ratio settings. For more information on aspect ratio conversion see pages 16 and 61-62.

Your video output will now have a clean cadence applied.

14 Conversion Workflows



The Preset buttons are used to easily save and recall conversion settings.



Status LEDs are located on the right side of the control panel.

Presets

Use the six Preset buttons to save and recall your conversion settings.

To SAVE a preset:

HOLD the desired preset button for three seconds. The button flashes to indicate the Preset was saved and remains illuminated until a setting is adjusted.

To RECALL a preset:

Press the desired preset button and select Recall using the soft menu button. Once recalled, the preset button will illuminate until settings are changed.

Depending on the preset settings, recalling a preset may momentarily disrupt the output video and audio. An example would be a format conversion preset. A preset that only changes Proc Amp or Aspect Ratio settings will not typically cause a loss of output. Be sure to test your presets prior to using them.

Audio and System Status LEDs

While performing your conversions, keep an eye on the Status LEDs. Illuminated LEDs display signals and communications that are present. For example, indicators tell you which channels contain audio, what power connections are being used, if an external reference signal is present and more.

The maximum number of channels supported for each audio type is as follows:

Embedded Audio: 16

AES/EBU Audio: Teranex 2D: 8 Teranex 3D: 4

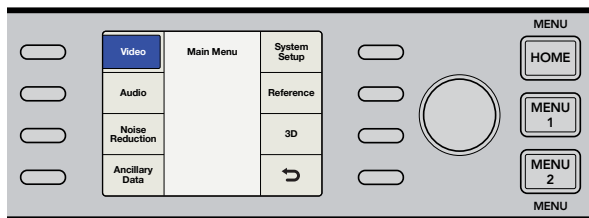
Analog Audio: Teranex 2D: 4 Teranex 3D: 2

System Status LEDs indicate the following:

- VID** Input video is present
- REF** External Reference is selected and External Reference Input is present
- PS1** Power Supply 1 is operational
- PS2** Power Supply 2 is operational
- TC** Timecode is present in input or output video
- CC** Closed Captions are present in input or output video
- <-->** Ethernet communication is present
- ⚡** Thunderbolt™ communication is present

The audio, timecode, and close caption status lights show the presence of these parameters in either the input or output video, depending on the selection of IN or OUT.

15 Teranex Processor Settings



LCD Menu

The LCD menu is controlled by 8 “soft buttons” used to make your selections. The 8 buttons are called “soft buttons” because their function changes with each menu displayed.

The rotary knob adjusts parameter values by turning clockwise or counterclockwise. If a parameter “default” setting exists, press the rotary knob to quickly reset it.

Home Button

The **HOME** button toggles the LCD between the video display and the main menu.

Menu 1 and Menu 2 Buttons

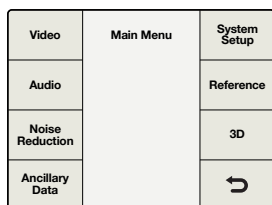
These buttons save shortcuts to frequently used menu pages and settings.

To store a menu page:

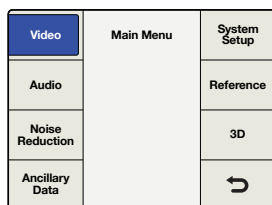
Step 1. Navigate to the menu page you want to save.

Step 2. Press and hold **MENU 1** or **MENU 2** for 3 seconds.

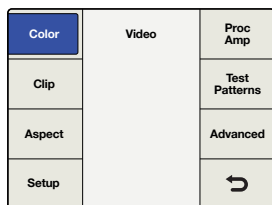
The button will illuminate to indicate a saved page. Thereafter, when the button is pressed, the LCD will switch directly to the saved page.



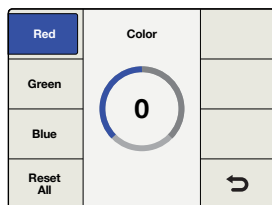
Main Menu



Main Menu>Video



Main Menu>Video Menu



Main Menu>Video Menu

Video Menu Settings

The Video Menu controls settings that adjust your video output, such as color, clipping, aspect ratio and more.

Color

To adjust your Red, Green and Blue Gain settings, turn the rotary knob on each color channel.

- The Range of each color control is -200 to +200.
- The default is 0.

16 Teranex Processor Settings

Color	Video	Proc Amp
Clip		Test Patterns
Aspect		Advanced
Setup		↩

Video Menu>Clip

Luma Low	Clip	Chroma Low
Luma High		Chroma High
4		
Reset All		↩

Clip Menu

Color	Video	Proc Amp
Clip		Test Patterns
Aspect		Advanced
Setup		↩

Video Menu>Aspect Menu

Adjust Aspect	Aspect	Fill
		Zoom Crop
Reset All		↩

Aspect Menu

Horizontal	Size	Size
Vertical		Position
Both		Trim
Reset All		↩

Horizontal>Size

Horizontal	Position	Size
Vertical		Position
		Trim
Reset All		↩

Horizontal>Position

Horizontal	Trim	Size
Vertical		Position
Both		Trim
Reset All		↩

Horizontal>Trim

Clip

To adjust luminance and chrominance clipping on your output video, go to Main Menu>Video>Clip. Adjust high and low ranges using the rotary knob.

Aspect

To adjust aspect ratio settings for your output video, go to Main Menu>Video>Aspect or press the ADJ button on the front panel. ADJUST ASPECT adjusts size, position and trim. FILL defines a color for the letterbox or pillar box bars.

Adjust Aspect

To customize the aspect ratio size, position and trim settings, use the soft menu buttons and rotary knob.

- **Size** – The Size setting adjusts the horizontal and/or vertical image size. The range is approximately -50 to +200 percent.
- **Position** – Position allows you to move the input image within the output frame. The range of adjustment is dependent on the current image size.
- **Trim** – Trim masks the edges of your input image horizontally and/or vertically.
- **Horizontal** – Used for horizontal sizing, positioning and trimming.
- **Vertical** – Used for vertical sizing, positioning and trimming.
- **Both** – Links horizontal and vertical controls together. For example, when changing the input image size, linking both controls maintains the proper aspect ratio.
- **Reset All** – Press to return all settings to their default values.

17 Teranex Processor Settings

Adjust Aspect	Aspect	Fill
		Zoom Crop
		↩

Aspect Menu>Aspect Fill

Luma	Fill	Cb
	64	Cr
Reset All		↩

Aspect Fill>Luma

Adjust Aspect	Zoom Crop	Fill
	On	Zoom Crop
	Off	↩

Aspect Menu>Zoom/Crop

Color	Video	Proc Amp
Clip		Test Patterns
Aspect		Advanced
Setup		↩

Video Menu>Setup

No Input	Setup	Video Sampling
Analog Input	Black	Dual Link Output
Analog Output	Colorbar 75%	↩

Setup Menu>No Input

No Input	Setup	Video Sampling
Analog Input	Component	Dual Link Output
Analog Output	Composite	↩

Setup Menu>Analog Input

Aspect Fill

To define the color of the bars used in pillarbox and letterbox aspect ratios, adjust the Luminance, and Cb and Cr chroma values using the rotary knob.

Zoom/Crop

Zoom/Crop is used to mask potential video disturbances that may appear at the top, bottom, left or right edges of your source image. This is performed by trimming your conversion slightly. Turning Zoom/Crop on will instantly zoom the converted image vertically by 3 lines and horizontally by 3 pixels, then crop the image by the same amount. Zoom/Crop will not effect your adjustable aspect ratio settings.

Video Setup Menu

The Video Setup menu lets you select your analog video input and output. You can also set colorbars or black video to be output when no input video is detected.

No Input Menu

Use this menu to select Black or Colorbars to be output when no video is detected. The default setting is Black.

Analog Input Video Setup Menu

This menu lets you set the analog video input.

- **Component** – Sets the analog input BNC connections as component Y, R-Y and B-Y.
- **Composite** – Sets the analog Y/NTSC/PAL input BNC connector as composite.
- The default setting is Component.

18 Teranex Processor Settings

Color	Video	Proc Amp
Clip		Test Patterns
Aspect		Advanced
Setup		↩

Video Menu>Setup

No Input	Setup	Video Sampling
Analog Input	Component	Dual Link Output
Analog Output	Composite	
		↩

Setup Menu>Analog Output

No Input	Setup	Video Sampling
Analog Input	4:2:2 YUV	Dual Link Output
Analog Output	4:4:4 YUV	
	4:4:4 RGB	↩

Setup Menu>Video Sampling

No Input	Setup	Video Sampling
Analog Input	On	Dual Link Output
Analog Output	Off	
		↩

Setup Menu>Output Dual Link

Color	Video	Proc Amp
Clip		Test Patterns
Aspect		Advanced
Setup		↩

Video Menu>Proc Amp

Gain	Proc Amp	Black
Saturate	0	Hue
R-Y / B-Y		Sharp
Reset All		↩

Proc Amp Menu>Gain

Analog Output Video Setup Menu

This menu lets you set the analog video output.

- **Component** – Sets the analog input BNC connections as component Y, R-Y and B-Y.
- **Composite** – Sets the analog Y/NTSC/PAL input BNC connector as composite.
- The default setting is Component.

Video Sampling Menu (for Teranex 3D Processor only)

The Output Sampling menu allows selection of the following sampling types for the Teranex 3D Processor.

- **4:2:2 – YUV**
- **4:4:4 – YUV**
- **4:4:4 – RGB**

Dual Link Output Menu (for Teranex 3D Processor only)

This menu allows you to turn Dual Link Output On or Off. When Off, the SDI outputs are redundant 3G Level B outputs.

- **On**
- **Off (default)**

Proc Amp Menu Settings

Use the Proc Amp Menu to adjust gain, saturation, hue, sharpness and more. The Proc Amp Menu is accessed via the Video menu. A quicker way to reach this menu is by pressing one of the Proc Amp Video buttons on the control panel. Turn the rotary knob to adjust your settings.

After adjustment, the associated button will illuminate white to indicate a non-default setting. To reset to its default setting, select the parameter via the Proc Amp Menu or control panel button and then push the rotary knob. To easily return all parameters to their default settings, go to the Proc Amp Menu and select **Reset All**.

- **Gain** – Range: -60 to +60. Default: 0
- **Saturate** (Saturation) – Range: -60 to +60. Default: 0
- **Black** – Range: -30 to +30. Default: 0
- **Hue** – Range: -179 to +180. Default: 0 degrees
- **R-Y and B-Y** – Range: -200 to +200. Default: 0
- **Sharp** (Sharpness) – Range: -50 to +50. Default: 0
- **Reset All** – Resets all Proc Amp parameters to their default values

19 Teranex Processor Settings

Color	Video	Proc Amp
Clip		Test Patterns
Aspect		Advanced
Setup		↶

Video Menu>Test Patterns

Color	Video	Proc Amp
Clip	Off	Test Patterns
Aspect	Colorbar 75% Black Grid	Advanced
Setup	SMPTE 75% Res Chart	↶

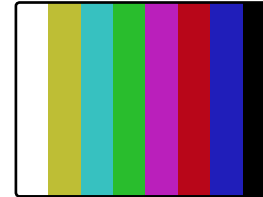
Test Patterns Menu

Test Patterns Menu

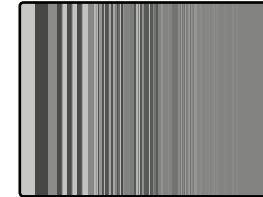
The internal test signal generator provides a Blackburst output and test patterns. You can add audio test tones via Audio Mapping in the Audio Main Menu. For more information on audio mapping see page 21.



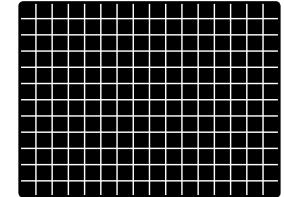
SMPTE 75%.



Colorbar 75%.



Res Chart.



Grid.

Above are test patterns available via the Video/Test Patterns menu.

Color	Video	Proc Amp
Clip		Test Patterns
Aspect		Advanced
Setup		↶

Video Menu>Advanced

Clean Cadence	Advanced	Source Type
Scene Detect	On	FRC Aperture
	Off	
		↶

Advanced Menu>Clean Cadence

Advanced Menu Settings

Clean Cadence

Creates a clean 3:2 pull down sequence in your 59.94 output video.

Setting Clean Cadence

Turn Clean Cadence on or off using the soft menu buttons and rotary knob.

- **On** – Selects the Clean Cadence mode
- **Off** – Selects the Normal video mode
- The default mode is **OFF**

Use the Clean Cadence mode when you are certain your source material was originated with a 3:2 pulldown sequence, such as film transferred to video by a telecine. If Clean Cadence is used on video without 3:2 pulldown, unwanted artifacts may be seen.

Clean Cadence is available for the following format conversions:

- 486i59.94 to 486i59.94
- 486i59.94 to 1080i59.94
- 1080i59.94 to 486i59.94
- 1080i59.94 to 1080i59.94

20 Teranex Processor Settings

Color	Video	Proc Amp
Clip		Test Patterns
Aspect		Advanced
Setup		↻

Video Menu>Advanced

Clean Cadence	Advanced	Source Type
Scene Detect	On	FRC Aperture
	Off	
		↻

Advanced Menu>Scene Detect

Scene Detect

Scene change detection minimizes field blending between cuts for a cleaner looking output. This prevents fields from previous scenes mixing with new scenes.

- **On** – Enables Scene Cut Detection
- **Off** – Disables Scene Cut Detection
- The default mode is **ON**

Most video is fine with Scene Detect ON, but some video sequences may “stutter” due to the momentary change in temporal resolution. Video with a text crawl at the bottom of the picture may show this effect. Be sure to turn Scene Detection OFF if you see this “stutter” effect.

Clean Cadence	Advanced	Source Type
Scene Detect	Auto	FRC Aperture
	Video	
	Film	↻

Advanced Menu>Source Type

Setting Source Type

Source Type sets processing based on the type of input video being received. The default mode is **Auto**, but if you want to select **Film** or **Video** modes, you can select them in the menu.

- **Auto** – This mode will look for film and video based material and select the appropriate processing algorithm. This mode should be used in most instances.
- **Film** – Select this mode when you're sure the source material contains a 3:2 pulldown cadence.
- **Video** – Select this mode when you're sure the source material does not contain a 3:2 pulldown cadence.

Clean Cadence	FRC Aperture	Source Type
Scene Detect	0 (Drama)	FRC Aperture
	1	
	2	
	3 (Sport)	↻

Advanced Menu>FRC Aperture

Frame Rate Conversion Aperture

FRC Aperture adjusts processing based on the amount of motion in your source image.

A setting of 0 is typically used for dramatic scenes with little motion and will produce a sharper image with potential for judder in motion areas. A setting of 3 is typically used for scenes with faster motion, such as sporting events, and produces a softer image with less motion judder.

21 Teranex Processor Settings

Video	Main Menu	System Setup
Audio		Reference
Noise Reduction		3D
Ancillary Data		↩

Main Menu>Audio

Audio Mapping	Audio	
Audio Gain		
Audio Delay		
Setup		↩

Audio Menu>Audio Mapping

Prev	Audio Mapping Channel 1 Source	Next
	Input 1	
	Input 2	
	Input 3	
	Input 4	
	Input 5	
Reset All	▼	↩

Audio Mapping Menu

Prev	Audio Mapping Channel 4 Source	Next
	Input 1	
	Input 2	
	Input 3	
	Input 4	
	Input 5	
Reset All	▼	↩

Input 1 mapped to Output 4

Prev	Audio Mapping Channel 13 Source	Next
	▲	
	Tone .75 kHz	
	Tone 1.5 kHz	
	Tone 3 kHz	
	Tone 6 kHz	
Reset All	Mute	↩

3 kHz tone mapped to Output 13

Prev	Audio Mapping Channel 1 Source	Next
	▲	
	Dolby 1	
	Dolby 2	
	Dolby 3	
	Dolby 4	
	Dolby 5	
Reset All	▼	↩

Dolby 1 mapped to Output 1

Prev	Audio Mapping Channel 16 Source	Next
	▲	
	Tone .75 kHz	
	Tone 1.5 kHz	
	Tone 3 kHz	
	Tone 6 kHz	
Reset All	Mute	↩

Output 16 is muted

Above are examples of audio mapping choices.

Audio Menu Settings

The Audio menu permits mapping of input audio channels, offers control of audio gain and delay and provides access to certain setup parameters.

Audio Mapping

The Audio Mapping menu allows you to map any incoming audio channel or internally generated test tone to any output channel. After selecting the desired output channel via the menu described below, you may select from any available audio source, including analog, embedded SDI, AES, decoded Dolby channels and test tones. You may also mute individual audio channels.

Select the Audio Mapping menu and then select the output channel you wish to map.

Step 1. Press the Prev or Next buttons to select the desired output channel. The current audio input for the selected output will be displayed in the drop down list as you step through the output channels.

Step 2. Once the desired output channel has been selected, turn the knob to select the input source to map to that output channel. As you turn the knob, you will progress through each group of sources:

- **Inputs 1-16** – This is a list of available audio input channels from your selected input audio source: SDI, AES, or Analog.
- **Dolby Decoded Channels** – If the optional Blackmagic Dolby decoder is installed, Dolby D (Dolby 1-6) or Dolby E (Dolby 1-8) will appear in the list.
- **Dolby Encoded Channels** – If the optional Blackmagic Dolby D or E encoder is installed, Encode 1 and Encode 2 will appear in the list.
- **Test Tones** – Select from internally generated tones: 0.75 kHz, 1.5 kHz, 3 kHz, 6 kHz.
- **Mute** – Mutes the specific output channel.

Step 3. Pressing the knob will return the current output channel to its default input. Pressing the **Reset All** button will return all output channels to their default settings, i.e. Input 1 to Output 1, Input 2 to Output 2, etc.

22 Teranex Processor Settings

Video	Main Menu	System Setup
Audio		Reference
Noise Reduction		3D
Ancillary Data		↩

Main Menu>Audio

Audio Mapping	Audio	
Audio Gain		
Audio Delay		
Setup		↩

Audio Menu>Audio Gain

	Audio Gain	
	0.0	
		↩

Turn knob to adjust gain

Audio Mapping	Audio	
Audio Gain		
Audio Delay		
Setup		↩

Audio Menu>Audio Delay

Time Delay	Audio Delay	
Frame Delay		0.000
		↩

Turn knob to adjust Time Delay

Time Delay	Audio Delay	
Frame Delay		0.0
		↩

Turn knob to adjust Frame Delay

Audio Gain

The Audio Gain control allows you to vary the output from -32 to +16 dB in 0.1 dB increments. Turn the knob to adjust. Pressing the knob will return the Gain to zero.

Audio Delay

The maximum audio delay is 1 second. In the menu, you may chose between a Time Delay or Frame Delay adjustment. Time is resolved to millisecond resolution, while frame delay is expressed in one-half frame increments. In addition, audio may be advanced by up to 1 frame. Turn the knob to adjust. Pressing the knob will return the Delay to zero.

23 Teranex Processor Settings

Video	Main Menu	System Setup
Audio		Reference
Noise Reduction		3D
Ancillary Data		↩

Main Menu>Audio

Audio Mapping	Audio	
Audio Gain		
Audio Delay		
Setup		↩

Audio Menu>Setup

Analog In Level	Setup	Analog Input
	0.0	
		↩

Setup Menu>Analog In Level

Analog In Level	Setup	Analog Input
	RCA	
	XLR	
		↩

Setup Menu>Analog Input

Audio Setup Menu

The Audio Setup menu includes analog audio input reference level adjustment and analog input type selection.

Analog In Level

Teranex 2D and 3D Processors are factory set to analog audio input reference levels of +4dBu = -20dBFS. If you are using a different analog input reference level, you may adjust the Level control to compensate. Please note that this setting will not affect the RCA audio input level.

Turn the knob to adjust. The range of adjustment is -12 to +12dB. Pressing the knob will return the level to zero.

Analog Input Menu

The Audio Setup menu lets you select between the analog audio inputs. The choices for Teranex 3D are RCA Phono or XLR. The choices for Teranex 2D are RCA Phono or DB25.

- **RCA** – Stereo RCA Phono connectors (L/R) - Default for the Teranex 2D and 3D Processors.
- **DB25 (Teranex 2D)** – Balanced analog audio input via the DB25 connector.
- **XLR (Teranex 3D)** – Balanced analog audio input via the XLR connectors.

24 Teranex Processor Settings

Video	Main Menu	System Setup
Audio		Reference
Noise Reduction		3D
Ancillary Data		↩

Main Menu>Audio

Audio Mapping	Audio	Dolby Encode
Audio Gain		Dolby Metadata
Audio Delay		
Setup		↩

Audio Menu>Dolby Encode

Prev	Dolby Encode Channel 1 Source	Next
	▲	
	Input 1	
	Input 2	
	Input 3	
	Input 4	
	Input 5	
Reset All	▼	↩

Select sources for Dolby encoder channels

When a Dolby Digital or Dolby E encoder is installed in the Teranex 3D, two additional selections will appear in the Audio Menu:

Dolby Encode

The Dolby Encode menu will allow you to select your source for each channel to be encoded. For Dolby Digital encoding, you may select up to 6 channels to be encoded. For Dolby E, you may select up to 8 channels.

You may select from discrete audio channels, Dolby decoded channels (if a Dolby decoder is also installed), test tones or mute. This menu is similar to the Audio Mapping menu, but you should understand that the sources selected in the Dolby Encode menu will be mapped to two Dolby encoded channels, which may later be mapped to your output.

As an example, let's say that you need to encode input channels 3 through 10 to Dolby E and you want your Teranex to provide Dolby E encoded audio outputs on SDI channels 9 and 10.

- First, you would use the Dolby Encode menu to route Input 3 as the source for Dolby Encode Channel 1.
- Press the Next button on the menu to move to Dolby Encode Channel 2 and route Input 4 to it. Continue this process until you have routed the remaining input channels 5-10 to Encoder channels 3-8.
- The 8 input sources routed to the Dolby E encoder module will result in two encoded output channels. Using the Audio Mapping menu on page 21, you would map the two Dolby E encoded channels, which we call Encode 1 and Encode 2, to your SDI output channels 9 and 10.

25 Teranex Processor Settings

Video	Main Menu	System Setup
Audio		Reference
Noise Reduction		3D
Ancillary Data		↩

Main Menu>Audio

Audio Mapping	Audio	Dolby Encode
Audio Gain		Dolby Metadata
Audio Delay		
Setup		↩

Audio Menu>Dolby Metadata

Dolby Metadata	Dolby Metadata	
	Pass-Thru	
	External	
	Stereo	
	5.1	↩

Dolby Metadata Menu

Dolby Metadata

Dolby Metadata describes the encoded audio and conveys information to control downstream equipment. Metadata is usually carried in the Dolby Digital or Dolby E bitstream, but can also be carried as a serial data stream between Dolby E and/or Dolby Digital equipment.

In the Teranex 3D, Dolby Metadata may be derived from incoming Dolby audio, if a Dolby decoder is installed, and may also be input as serial data via the 9-pin Dolby Metadata connector on the rear of the Teranex 3D. You may also generate your own metadata in the Teranex 3D by using one of the two commonly used configurations provided in the Dolby Metadata menu, Stereo and 5.1. See the configurations assigned by each in the table below. The variations between the two configurations are shown by bold text.

The Dolby Metadata menu provides for:

- **Pass-Thru** - If your Teranex 3D also contains a Dolby Decoder module, any metadata derived from the decoded Dolby stream will be reinserted in the Dolby encoded output.
- **External** - To add metadata from an external metadata generator to your Dolby encoded output, connect the generator to the 9-pin Dolby Metadata connector on the rear panel.
- **Stereo** - Pre-configured Metadata for Stereo output.
- **5.1** - Pre-configured Metadata for 5.1 encoding, typically used with Dolby Digital encoding.

Metadata Parameter	Stereo	5.1
Program Configuration	4x2	5.1+2
Program Description Text	(Not programmed)	(Not programmed)
Frame Rate	(Set by Conversion)	(Set by Conversion)
Bitstream Mode	Complete Main	Complete Main
Channel Mode	2/0(L/R)	3/2(L,C,R,Ls,Rs)
Center Downmix Level	-3 dB	-3 dB
Surround Downmix Level	-3 dB	-3 dB
Dolby Surround Mode	Not Indicated	Not Indicated
LFE Channel	LFE Off	LFE On
Dialogue Normalization	27	27
Audio Production Information	No	No
Mix Level	0	0

26 Teranex Processor Settings

Metadata Parameter	Stereo	5.1
Room Type	Not Indicated	Not Indicated
Copyright Bit	Yes	Yes
Original Bitstream	Yes	Yes
Extended Bitstream Info 1	Yes	Yes
Preferred Stereo Downmix	Not Indicated	Not Indicated
Lt/Rt Center Downmix Level	-3 dB	-3 dB
Lt/Rt Surround Downmix Level	-3 dB	-3 dB
Lo/Ro Center Downmix Level	-3 dB	-3 dB
Lo/Ro Surround Downmix Level	-4.5 dB	-4.5 dB
Extended Bitstream Info 2	Yes	Yes
Dolby Surround EX Mode	Not Indicated	Not Indicated
Dolby Headphone	Not Indicated	Not Indicated
A/D Converter Type	Standard	Standard
DC Filter	Enabled	Enabled
Lowpass Filter	Enabled	Enabled
LFE Lowpass Filter	Disabled	Enabled
Surround Phase Shift	Disabled	Enabled
Surround 3 dB Attenuation	Disabled	Enabled
RF Mode Compression Info	None	None
RF Mode Compression Profile	Film Standard	Film Standard
Line Mode Compression Info	None	None
Line Mode Compression Profile	Film Standard	Film Standard

27 Teranex Processor Settings

Video	Main Menu	System Setup
Audio		Reference
Noise Reduction		3D
Ancillary Data		↩

Main Menu>Noise Reduction

Enable	Noise Reduction	Split Screen
Bias	On	Red Overlay
	Off	
		↩

Noise Reduction Menu

Enable	Set Value	Split Screen
Bias	0	Red Overlay
		↩

Noise Reduction Menu>Bias

Enable	Split Screen	Split Screen
Bias	On	Red Overlay
	Off	
		↩

Noise Reduction Menu>Split Screen

Enable	Red Overlay	Split Screen
Bias	On	Red Overlay
	Off	
		↩

Noise Reduction Menu>Red Overlay



The red overlay helps to show which parts of the image have temporal recursive noise reduction applied.

Noise Reduction Menu Settings

The Noise Reduction algorithm looks at each pixel in an image and processes it based on motion and types of noise. Spatial noise reduction is applied to still areas of the picture and temporal recursive noise reduction is applied to moving areas. Using both types provides higher quality results.

To enable noise reduction, go to Main Menu>Noise Reduction and select ON using the soft menu buttons and rotary knob.

Please note that Noise Reduction is not available while performing frame rate conversions, such as 486i59.94 to 576i50 (NTSC to PAL) or 1080i59.94 to 1080i50.

Bias

Adjust the Bias level to set the amount of noise reduction. The higher the Bias value, the more aggressive the noise reduction.

- The Bias range is -6 to +6.
- The default value is 0.

Split Screen On/Off

Split Screen divides the LCD, one half with noise reduction and one half without. This lets you compare your noise reduction settings to the original image.

To enable Split Screen, go to Main Menu>Noise Reduction>Split Screen and select ON using the soft menu buttons and rotary knob.

Red Overlay On/Off

In Red Overlay mode, pixels in motion will be colored red. Temporal recursive noise reduction will NOT be applied to these pixels. Turning the Red Overlay On will also allow you to see the effect of noise reduction Bias adjustments.

To enable Red Overlay, go to Main Menu>Noise Reduction>Red Overlay and select ON using the soft menu buttons and the rotary knob.

28 Teranex Processor Settings

Video	Main Menu	System Setup
Audio		Reference
Noise Reduction		3D
Ancillary Data		↩

Main Menu>Ancillary Data

Closed Caption	Ancillary Data	Video Index
Timecode		
		↩

Ancillary Data Menu

Closed Caption	Ancillary Data	Video Index
Timecode		
		↩

Ancillary Data Menu>Closed Caption

CC Enable	Closed Caption	Service 2 Source
Analog In Line		On
Analog Out Line		Off
Reset All		↩

Closed Caption Menu>CC Enable

Ancillary Data Menu Settings

The Ancillary Data menu provides access to Closed Caption, Timecode and Video Index features.

Closed Caption Menu

The Closed Caption menu lets you configure closed captions for CEA-608B and CEA-708B standards. CEA-608B is the closed captioning reference standard for SD NTSC analog and SD-SDI. Captions are encoded on line 21 of the vertical blanking interval. CEA-708B is the standard for HD-SDI, typically encoding captions on line 9.

The Teranex Processor automatically detects digital captions in both SD and HD video formats. If digital captions are not present in an SD signal, the processor will look for analog captions on line 21. If the program has captions on line 21 but you're not seeing them, set the Analog In Line menu to look for captions on lines 20 or 22.

Closed caption processing also supports up conversion of 608 CC2 and CC3 secondary language services to 708 Service 2 (S2) via the Service 2 Source menu.

The Closed Captioning menu offers the following selections and adjustments:

- **CC Enable** – Turns Closed Captions ON or OFF in the output video.
- **Analog In Line** – Allows you to select the Analog Closed Caption Input Line.
- **Analog Out Line** – Allows you to select the Analog Closed Caption Output Line.
- **Service 2 Source** – Allows you to select between CC2 and CC3 as the Closed Caption Service 2 Source.
- **Service 1 Language** – Allows you to select the language used for Service 1.
- **Service 2 Language** – Allows you to select the language used for Service 2.

CC Enable

CC Enable is OFF by default. To enable closed captioning, go to Main Menu>Ancillary Data>Closed Caption>CC Enable and select ON using the soft menu buttons or rotary knob.

Disabling captions may be helpful if the incoming closed caption data is incorrect or corrupt.

The CC status LED on the front panel is tied to the IN or OUT selection. When IN is selected, the CC status LED will illuminate when closed captioning is detected in the input video. When OUT is selected, the CC status LED will illuminate when closed captioning data is present in the output video.

29 Teranex Processor Settings

Closed Caption	Ancillary Data	Video Index
Timecode		
		↩

Ancillary Data Menu>Closed Caption

CC Enable	Closed Caption	Service 2 Source
Analog In Line	21	Service 1 Language
Analog Out Line		Service 2 Language
Reset All		↩

Closed Caption Menu>Analog In Line

CC Enable	Closed Caption	Service 2 Source
Analog In Line	21	Service 1 Language
Analog Out Line		Service 2 Language
Reset All		↩

Closed Caption Menu>Analog Out Line

CC Enable	Set Value	Service 2 Source
Analog In Line	CC 2	Service 1 Language
Analog Out Line	CC 3	Service 2 Language
Reset All		↩

Closed Caption Menu>Service 2 Source

CC Enable	Select Language	Service 2 Source
Analog In Line	English	Service 1 Language
Analog Out Line	French	Service 2 Language
Reset All	German	
	Italian	
	Spanish	↩

Closed Caption Menu>Service 1 Language

Analog In Line

Analog In Line identifies the line on which closed caption information is located in the incoming video. This menu applies only to sources with analog closed captions. If your captions are digital, they will be automatically detected.

- The range of adjustment is lines 20 to 22.
- The default setting is line 21.

Analog Out Line

Analog Out Line identifies the line on which closed caption information is located in the output video. This menu applies only to analog SD output.

- The range of adjustment is lines 20 to 22.
- The default setting is line 21.

Service 2 Source

Service 2 Source allows you to select CEA-608 CC2 or CC3 for up converting to CEA-708, Service 2.

- The choices are CC2 and CC3.
- The default setting is CC2.

Service 1 Language

Service 1 Language is used to select the language for that Service in CEA-708 closed captions.

- The language choices are:
 - English
 - French
 - German
 - Italian
 - Spanish
- The default language is English.

30 Teranex Processor Settings

Closed Caption	Ancillary Data	Video Index
Timecode		
		↩

Ancillary Data Menu>Closed Caption

CC Enable	Select Language	Service 2 Source
Analog In Line	English	Service 1 Language
Analog Out Line	French	Service 2 Language
Reset All	German	↩
	Italian	
	Spanish	

Closed Caption Menu>Service 2 Language

Closed Caption	Ancillary Data	Video Index
Timecode		
		↩

Ancillary Data Menu>Timecode

Prev	Timecode	Next
Timecode Generator	Off	Start
Set Timecode	Input	Start Source
Setup	Input Regen	↩
	Generate	
	Jam Sync	

Timecode Menu

Prev	Timecode	Next
Timecode Generator	Off	Start
Set Timecode	Input	Start Source
Setup	Input Regen	↩
	Generate	
	Jam Sync	

Timecode Generator Menu>Input

Service 2 Language

Service 2 Language is used to select the language for that Service in CEA-708 closed captions.

- The language choices are:
 - English
 - French
 - German
 - Italian
 - Spanish
- The default language is English.

Timecode Menu Settings

Teranex lets you send incoming timecode to the output, strip incoming timecode completely or generate new timecode. Similar to broadcast decks, you can select the desired timecode mode, such as Input Regen and Jam Sync, or set specific timecode data.

To enable timecode processing, go to Main Menu>Ancillary Data>Timecode and choose your desired timecode mode.

Timecode Generator

The Timecode Generator menu lets you choose from four available timecode modes, or disable manual timecode processing.

Off No timecode data will be inserted into the output video (default).

Input Select Input mode to feed the input timecode directly to the output. This is useful if you want to preserve your source timecode and your input and output frame rates are the same.

It's important to make sure that the Drop Frame mode in the timecode Setup menu is set to Auto to ensure the output timecode will match the input timecode.

Please note, if you want to ensure the output timecode matches your input timecode, do not use an external reference. The external reference can cause a dropped or duplicated frame in the output, which will affect your timecode count.

To set the Reference menu to Input, go to Main Menu>Setup>Reference and select Input.

31 Teranex Processor Settings

Closed Caption	Ancillary Data	Video Index
Timecode		
		↩

Ancillary Data Menu>
Timecode

Prev	Timecode	Next
Timecode Generator	Off	Start
Set Timecode	Input Regen	Start Source
Setup	Generate	↩
	Jam Sync	

Timecode Menu>Input
Regen

Input Regen

The Input Regen mode synchronizes the input timecode to the output timecode and is often used when performing frame rate conversions, such as 1080i50 to 1080i59.94.

Input Regen mode should only be used when your Teranex processor is locked to your input video.

Drop frame and non drop frame modes are both supported in 23.98, 29.97 and 59.94 frame rates. However, in a conversion where the source timecode is drop frame and the output format is non drop frame timecode, the output timecode will be automatically converted to non drop frame.

Prev	Timecode	Next
Timecode Generator	Off	Start
Set Timecode	Input Regen	Start Source
Setup	Generate	↩
	Jam Sync	

Timecode Menu>Generate

Generate

The timecode generator will generate free running output timecode appropriate for the selected output format, even if timecode is not present on your video input signal.

Set Timecode

The Set Timecode menu options you will have are determined by the selection you make in the Start Source menu.

Start Source = "Input"

If the Start Source menu is set to "Input," the Set Timecode menu will show "Input" as the Start Value for the generator. When you press the Start button, the generator will capture the current input timecode value and use that value to start outputting free running timecode. If no timecode is present on your input video source, the generator will begin counting at 00:00:00:00.

Prev	Timecode	Next
Timecode Generator	Start Value Input	Start
Set Timecode		Start Source
Setup		↩

Generate>Start Source

Start Source = "Start Value"

If the Start Source menu is set to "Start Value," the Set Timecode menu will display an eight-character register that allows the entry of a specific starting value for the generator. Turn the rotary encoder to adjust the timecode generator values and use the Previous and Next buttons to move the cursor left or right. When you press the "Start" button the timecode generator will immediately output timecode from your Start Value entry.

Prev	Timecode	Next
Timecode Generator	Start Value 00:00:00:00	Start
Set Timecode		Start Source
Setup		↩

Set Timecode Menu. Use the Rotary knob to set your values, and the Previous and Next buttons to move the cursor left and right.

32 Teranex Processor Settings

Prev	Timecode	Next
Timecode Generator	Off	Start
Set Timecode	Input	Start Source
Setup	Input Regen	↩
	Generate	
	Jam Sync	

Timecode Menu>Jam Sync

Prev	Timecode	Next
Timecode Generator	Start Value	Start
Set Timecode	Input	Start Source
Setup	Jam Sync	↩
	00:00:00:00	

Jam Sync>Set Timecode

Jam Sync

The Jam Sync mode is similar to the Generate mode. However, when you press the “Start” button, Jam Sync mode allows you to hold the output timecode generator until a pre-determined timecode point is reached in your input video, called the Jam Sync value. The Jam Sync value must be entered via the Set Timecode menu.

Set Timecode

The Set Timecode menu options you will have are determined by the selection you make in the Start Source menu.

Start Source = “Input”

If the Start Source menu is set to “Input,” the Set Timecode menu will show “Input” as the Start Value for the timecode generator. When you press the “Start” button, the generator will start looking for a timecode match to the Jam Sync value you have entered. When the match occurs, the generator will use that “Input” timecode as the start value to generate free running output timecode.

Start Source = “Start Value”

If the Start Source menu is set to “Start Value,” the Set Timecode menu will display an eight-character register that allows the entry of a specific starting value for the generator. When you press the “Start” button the generator will look for a timecode match to the Jam Sync value you have entered. When the match occurs, the generator will use the start value you entered to generate free running output timecode.

33 Teranex Processor Settings

Closed Caption	Ancillary Data	Video Index
Timecode		
		↩

Ancillary Data Menu>
Video Index

Index Reaction	Index Reaction	AFD Insertion
	On	AFD Insert Line
	Off	
		↩

Video Index Menu>Index
Reaction

Video Index Menu

The Video Index menu enables or disables reaction to video indexing signals that may be embedded in your source video. The three video indexing modes that are supported are Active Format Description (AFD), Wide Screen Signaling (WSS) and SMPTE RP186.

If the Video Index Mode is turned ON, the Teranex Processor will be set to react to incoming video indexing signals. The processor will automatically scan for the presence of video index packets and will react to them if found. AFD indexing takes precedence over the WSS, which takes precedence over RP186.

- The default setting is Off.

Please note the Processor will not pass or insert WSS or RP186 codes. It will only react to them if they are present on the input.

Index Reaction	Video Index	AFD Insertion
	Off	AFD Insert Line
	Auto	
	Bypass	
	0000	
	0001	↩

Video Index Menu>AFD
Insertion

AFD Insertion Menu

This menu allows you to select the desired AFD code that will be inserted in the output video. The output line on which the code will be inserted can be selected in the AFD Insert Line menu.

- Settings include:
 - **Off** – No AFD code will be inserted in the output ancillary data space.
 - **Auto** – The appropriate code will be inserted based on the current video output format.
 - **Bypass** – Any code present in the incoming video stream will be passed through to the output.
 - **AFD codes 0000 – 1111** – These codes are manual selections which may be used as needed.
- The default setting is Off.

Index Reaction	Video Index	AFD Insertion
	11	AFD Insert Line
		↩

Video Index Menu>AFD
Insert Line

AFD Insert Line Menu

If AFD Insertion is enabled in the AFD Insertion menu above, the AFD Insert Line menu allows you to select the line on which the AFD code will be inserted in the ancillary data space of the output video signal.

- The range of adjustment is dependent on the current output video format:
 - For SD formats, the range is lines 10 to 19. The default value is line 15.
 - For HD 1080 formats, the range is lines 9 to 20. The default value is line 11.
 - For HD 720 formats, the range is lines 9 to 25. The default value is line 11.
- Press the rotary encoder to go back to the default value.

34 Teranex Processor Settings

Video	Main Menu	System Setup
Audio		Reference
Noise Reduction		3D
Ancillary Data		↩

Main Menu>System Setup

Ethernet	System Setup	Factory Reset
		↩

System Setup Menu>Ethernet

System Setup Menu Settings

The System Setup menu provides access to Ethernet and Factory Reset menus.

Ethernet Setup Menu

The Ethernet setup menu allows you to display the current settings and assign new settings for Static IP address, Subnet address and IP Gateway. This menu also permits you to turn DHCP On or Off.

When DHCP is ON, the IP, Subnet Mask and Gateway menus will display the addresses currently assigned to the chassis by the DHCP server. These values may not be adjusted unless DHCP is OFF.

Prev	Ethernet	Next
IP		192.168.10.50
Subnet Mask		
Save and Restart		↩

System Setup Menu>Ethernet>IP Menu

IP Menu

To set a Static IP Address for the Teranex processor, DHCP must be OFF.

The IP menu will display a four-field register allowing you to enter specific IP address values. Adjust the selection highlighted by the cursor by turning the rotary encoder. Use the Prev and Next buttons to move the cursor to the left or right, respectively. If you change this setting, press the "Back" button, then press the "Save and Restart" button to power cycle the chassis and establish the new setting.

Prev	Ethernet	Next
IP		255.255.255.0
Subnet Mask		
Save and Restart		↩

System Setup Menu>Ethernet>Subnet Mask Menu

Subnet Mask Menu

The Subnet Mask menu will display a four-field register allowing you to enter specific values. Adjust the selection highlighted by the cursor by turning the rotary encoder. Use the Prev and Next buttons to move the cursor left or right, respectively. If you change this setting, press the "Back" button, then press the "Save and Restart" button to power cycle the chassis and establish the new setting.

Prev	Ethernet	Next
IP		190.168.15.1
Subnet Mask		
Save and Restart		↩

System Setup Menu>Ethernet>Gateway Menu

Gateway Menu

The Gateway menu will display a four-field register allowing you to enter specific values. Adjust the selection highlighted by the cursor by turning the rotary encoder. Use the Prev and Next buttons to move the cursor left or right. To establish new settings, press the "Back" button, then "Save and Restart". Your Teranex will power cycle and apply the new settings.

35 Teranex Processor Settings

Prev	Ethernet	Next
IP	On	Gateway
Subnet Mask	Off	DHCP
Save and Restart		↩

Setup Menu>Ethernet>
DHCP Menu

DHCP Menu

The DHCP menu enables or disables the assignment of an IP address to the chassis using Dynamic Host Configuration Protocol (DHCP). You can press the DHCP soft button or turn the rotary encoder to turn DHCP ON or OFF. If you change this setting, press the "Save and Restart" button to power cycle the chassis and establish the new IP address.

- **ON** – The Teranex Processor will accept an IP address assigned by your network router.
- **OFF** – The previous Static IP address of the unit will be used if one was previously assigned.

If you press the IP button with DHCP ON and see an IP address of 0.0.0.0, this indicates that the processor was unsuccessful in obtaining an IP address from the DHCP server. Please check your Ethernet network connections.

Ethernet	System Setup	Factory Reset
		↩

System Setup>Factory Reset

Reset all settings to factory default?	
Cancel	Reset

Press Reset to restore factory settings, or Cancel to abort.

Factory Reset

Select Factory Reset to restore conversion setup settings to their factory defaults. The following settings will not be affected:

- Presets.
- Output video settings, e.g., Format, Frame, Rate.
- Aspect selection; however, any adjustable aspect ratio settings will be reset to their default values.
- Ethernet IP address settings.

Reference Menu Settings

The Reference menu lets you synchronize your video output to an input video source or external reference.

- **Input** – Selects the current input video source as the reference.
- **External** – Selects the external reference (REF) input.

Teranex auto-detects a valid reference source, but it must be compatible with the output format. The table on the following page shows which reference signal is used with each video format and frame rate.

Video	Main Menu	System Setup
Audio		Reference
Noise Reduction		3D
Ancillary Data		↩

Main Menu>Reference

Type	Reference	Pixel Offset
	Input	Line Offset
	External	
		↩

Reference Menu>Type

36 Teranex Processor Settings

Reference Signal Compatibility Chart:

Output Format and Frame Rate	Reference Signal
NTSC 486i59.94	Blackburst 59.94 (BLACK)
PAL 576i50	Blackburst 50 (BLACK)
1080i59.94	Blackburst 59.94(BLACK) or Tri-level Interlaced 59.94 (TRI-I)
1080p29.97	
1080PsF29.97	
1080i50	Blackburst 50 (BLACK) or Tri-level Interlaced 50 (TRI-I)
1080p25	
1080PsF25	
1080p59.94	Blackburst 59.94 (BLACK)
1080p50	Blackburst 50 (BLACK)

If External reference is selected and a valid reference signal is detected, the REF Status LED on the front panel will illuminate. If the external reference is removed or lost, the processor will go into a free run condition until reference is restored.

Pixel Offset

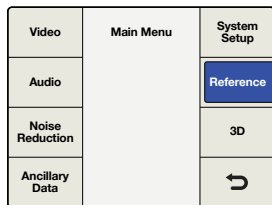
If External has been selected and a valid reference is present, this control will adjust the Pixel timing of the output relative to the supplied external reference.

- The Range is determined by the current output format selection.

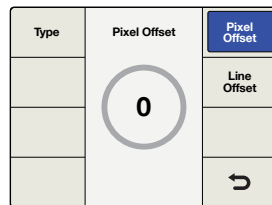
Line Offset

If External has been selected and a valid reference is present, this control will adjust the Line timing of the output relative to the supplied external reference.

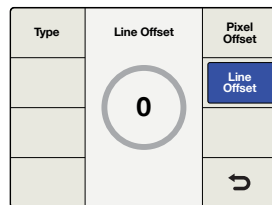
- The Range is determined by the current output format selection.



Main Menu>Reference



Reference Menu>Pixel Offset



Reference Menu>Line Offset

37 Teranex Processor Settings

Video	Main Menu	System Setup
Audio		Reference
Noise Reduction		3D
Ancillary Data		↩

Main Menu>3D

3D Mode	3D	Intensity
Input	Off	Depth
Output	Convert	Camera Align
	2D to 3D	
	3D Align	↩

3D Menu>3D Mode

3D Mode	3D	Intensity
Input	Off	Depth
Output	Convert	Camera Align
	2D to 3D	
	3D Align	↩

3D Menu>3D Mode>
3D Convert

3D Mode	3D	Intensity
Input	Off	Depth
Output	Convert	Camera Align
	2D to 3D	
	3D Align	↩

3D Menu>3D Mode>
2D to 3D

3D Mode	3D	Intensity
Input	Off	Depth
Output	Convert	Camera Align
	2D to 3D	
	3D Align	↩

Main Menu>3D>3D Mode>
3D Align

3D Menu Settings

The 3D menu is available only in the Teranex 3D Processor model. This menu enables the dual internal processors of the Teranex 3D Processor for format or frame rate conversion of stereoscopic inputs and for conversion of 2D sources into simulated 3D outputs.

3D Mode

In the 3D Mode menu, "Off" implies normal 2D processing. The following selections are available to enable 3D processing:

- Convert** – This mode enables processing of stereoscopic left and right eye inputs, which may be input via the SDI or HDMI inputs. This mode will also synchronize the incoming stereoscopic signals, which means that two non-synchronous inputs may be input to the Teranex 3D Processor and the outputs will be synchronized.
 - Connect your Left and Right Eye signals to SDI Input A and B, respectively.
- 2D to 3D** – This mode enables the 2D to 3D conversion algorithm. Any 2D video signal may be converted into a simulated 3D output.
 - If you're using an SDI input, connect your 2D source to SDI Input A.
 - When 2D to 3D is selected, the Intensity and Depth buttons will become available. Descriptions for these settings are provided a bit later in this manual.
- 3D Align** – This mode enables the 3D alignment tools, including image flip, horizontal and vertical positioning, axial rotation and toe-in.
 - Connect your Left and Right Eye signals to SDI Input A and B, respectively.

38 Teranex Processor Settings

3D Mode	Output	Intensity
Input	Full Frame	Depth
	Side by Side	
Output	Top / Bottom	Camera Align
	Line by Line	↶

3D Menu>3D Input

3D Mode	Output	Intensity
Input	Full Frame	Depth
	Side by Side	
Output	Top / Bottom	Camera Align
	Line by Line	↶

3D Menu>3D Output



Full Frame Left Eye



Full Frame Right Eye



Side by Side



Top/Bottom Encoding



Line by Line Encoding

Input

The 3D Input menu allows you to define the input formatting of your 3D source.

- **Full Frame** – Full resolution inputs for left and right eye images on SDI inputs A and B, respectively, or from an HDMI frame packed signal if using the HDMI input.
- **Side by Side** – Decodes a Side by Side encoded input via SDI Input A or the HDMI input.
- **Top / Bottom** – Decodes a Top and Bottom encoded input via SDI Input A or the HDMI input.
- **Line by Line** – Decodes a Line by Line encoded input via SDI Input A or the HDMI input.

Output

The 3D Output selection determines the output formatting for your 3D image.

- **Full Frame** – Provides full resolution outputs for left and right eyes on SDI outputs A and B respectively, while simultaneously providing a frame packed signal on the HDMI output.
- **Side by Side** – Enables Side by Side output encoding. SDI outputs A and B and the HDMI output will provide identical side by side output signals.
- **Top / Bottom** – Enables Top and Bottom output encoding. SDI outputs A and B and the HDMI output will provide identical Top/Bottom output signals.
- **Line by Line** – Enables Line by Line output encoding. SDI outputs A and B and the HDMI output will provide identical line by line output signals.

39 Teranex Processor Settings

3D Mode	3D	Intensity
Input	Off	Depth
	Convert	
Output	2D to 3D	Camera Align
	3D Align	↩

2D to 3D mode must be active to adjust Intensity and Depth.

3D Mode	Intensity	Intensity
Input	+15	Depth
Output		Camera Align
		↩

3D Menu>2D to 3D>Intensity

3D Mode	3D	Intensity
Input	0	Depth
Output		Camera Align
		↩

3D Menu>2D to 3D>Depth

3D Mode	3D	Intensity
Input	Off	Depth
	Convert	
Output	2D to 3D	Camera Align
	3D Align	↩

3D Menu>Camera Align

Position	Camera Align	Zoom
Rotation		Trim
Flip		
Reset All		↩

Camera Align Menu

Horizontal	Position	Left Eye
Vertical	0	Right Eye
		Both Eyes
Reset All		↩

Camera Align >Left Eye Horizontal

Horizontal	Position	Left Eye
Vertical	0	Right Eye
		Both Eyes
Reset All		↩

Camera Align >Left Eye Vertical

Intensity

The Intensity selection will not be available until 2D to 3D has been selected in the 3D Mode menu. The Intensity setting allows you to control the overall amount of the 3D effect.

- The range of adjustment is -40 (image is in front of the screen) to +40 (image is behind the screen). The default setting is +15. A setting of 0 provides a flat, 2D output image.

Depth

The Depth selection will not be available until 2D to 3D has been selected in the 3D Mode menu.

The Depth setting pushes the overall image deeper. This can add to the 3D effect but in most cases should be left at the default value.

- The range of adjustment is -12 to +12. The default setting is 0.

Camera Align

The Camera Align button will be enabled only when you select 3D Align in the 3D Mode menu. The Camera Alignment application performs a variety of processing adjustments to a stereoscopic stream, including image zoom, flip, horizontal & vertical positioning and axial rotation adjustment. Adjustments may be made to the individual eyes or you may link the left and right eye images and simultaneously adjust both eyes of the stereoscopic image by the same amount.

- Default Settings** – As with other menus in the Teranex Processors, you may push the rotary encoder to return the current parameter to its default setting. Use the “Reset All” menu button to return all controls in the current menu to their default settings.

Position Menu

The Position Menu provides for horizontal and vertical position adjustment of each image. You may individually select the left or right eyes, or adjust both eyes simultaneously.

- The range of values shown in the positioning dial will change depending on the output format you have chosen; however, the range will always be -50% to +50% of the picture size, horizontally and vertically. For 1080 outputs, the range of positioning is -959 to +959 pixels horizontally and -539 to +539 lines vertically. For 720 outputs, the range is -639 to +639 pixels and -359 to +359 lines.
 - A positive horizontal value indicates a shift to the right.
 - A negative horizontal value indicates a shift to the left.
 - A positive vertical value indicates a shift upward.
 - A negative vertical value indicates a shift downward.

40 Teranex Processor Settings

Position	Camera Align	Zoom
Rotation		Trim
Flip		
Reset All		↶

Camera Align>Rotation

Roll Z	Rotation	Left Eye
Tilt X	0.00	Right Eye
Toe-in Y		Both Eyes
Reset All		↶

Rotation Menu>Roll Z Axis

Roll Z	Rotation	Left Eye
Tilt X	0.0	Right Eye
Toe-in Y		Both Eyes
Reset All		↶

Rotation Menu>Tilt X Axis

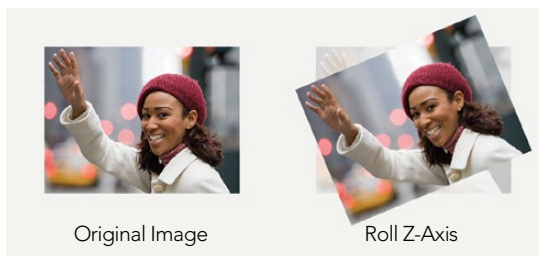
Rotation Menu

The Rotation Menu of the Camera Align application permits axial rotation adjustment of the image along the X, Y, and Z axes, either independently or in any combination of the three dimensions. Axial rotational adjustment can be used to compensate for 3D camera rigs that have mechanical misalignments.

Roll Adjustment - Z-Axis

The Roll Z adjustment provides image rotation on the Z axis.

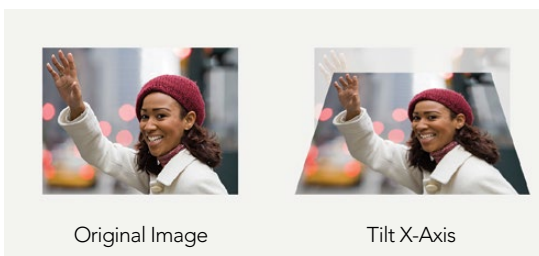
- The range of adjustment on the Z axis is -8 to +8 degrees, with a granularity of 0.02 degrees. The default setting is 0.



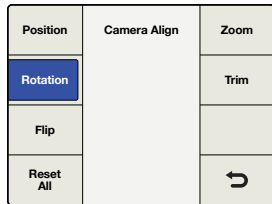
Tilt Adjustment - X Axis

The Tilt X adjustment provides image rotation on the X axis.

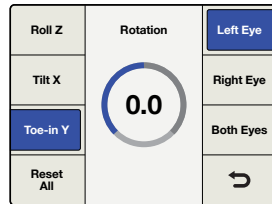
- The range of adjustment on the X axis is -8 to +8 degrees, with a granularity of 0.2 degrees. The default setting is 0.



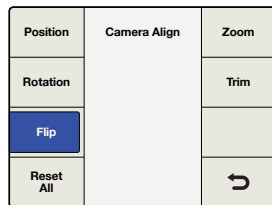
41 Teranex Processor Settings



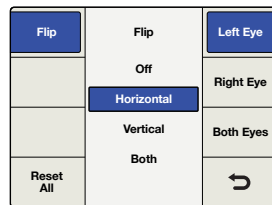
Camera Align>Rotation



Rotation Menu>Toe In Y Axis



Camera Align>Flip

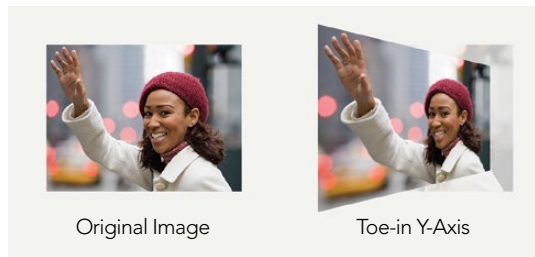


Flip Menu>Left Eye / Horizontal

Toe-In Adjustment - Y Axis

The Toe-in Y adjustment provides image rotation on the Y axis.

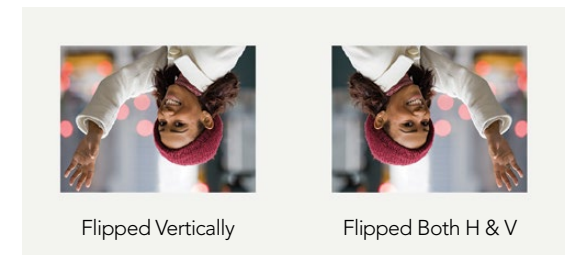
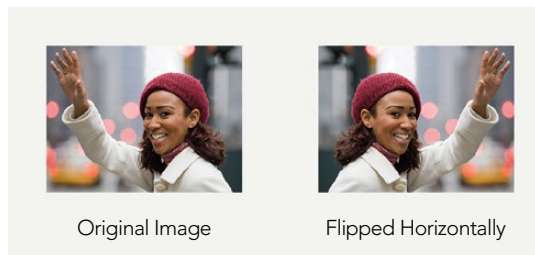
- The range of adjustment on the Y axis is -8 to +8 degrees, with a granularity of 0.2 degrees. The default setting is 0.



Flip Menu

The Camera Align Flip menu permits you to flip an incoming image horizontally, vertically or in both dimensions simultaneously. This feature may be used to compensate for inverted cameras mounted in 3D camera rigs that use mirrors or prisms.

- The Left and Right Eye signals may be flipped independently.
- Selecting the "Both Eyes" button in the Flip menu will simultaneously flip both eyes.
- Pressing **Reset All** will set Flip to **OFF**.



42 Teranex Processor Settings

Position	Camera Align	Zoom
Rotation		Trim
Flip		
Reset All		↶

Camera Align Menu>Zoom

Horizontal	Zoom	Left Eye
Vertical		Right Eye
Both		Both Eyes
Reset All		↶

Zoom Menu>Horizontal

Horizontal	Zoom	Left Eye
Vertical		Right Eye
Both		Both Eyes
Reset All		↶

Zoom Menu>Vertical

Horizontal	Zoom	Left Eye
Vertical		Right Eye
Both		Both Eyes
Reset All		↶

Zoom Menu>Both

Position	Camera Align	Zoom
Rotation		Trim
Flip		
Reset All		↶

Camera Align Menu>Trim

Horizontal	Trim	Left Eye
Vertical		Right Eye
Both		Both Eyes
Reset All		↶

Trim Menu>Horizontal

Horizontal	Trim	Left Eye
Vertical		Right Eye
Both		Both Eyes
Reset All		↶

Trim Menu>Vertical

Horizontal	Trim	Left Eye
Vertical		Right Eye
Both		Both Eyes
Reset All		↶

Trim Menu>Both

Zoom Menu

The Camera Align Zoom menu permits you to zoom the left and right images in the horizontal and vertical directions independently, or in both directions simultaneously.

- A negative parameter indicates zooming OUT on the image, while a positive parameter indicates zooming IN on the image.
- Pressing "Both" will link the horizontal and vertical zoom parameters, which will maintain the correct aspect ratio while zooming.
- Selecting "Both Eyes" will simultaneously zoom both eyes of the stereoscopic image by the same amount.

Trim Menu

The Camera Align Trim menu permits you to trim the image in the horizontal and vertical directions independently or in both directions simultaneously.

- The range of the trim is dependent on the video format in use.
- In the horizontal direction, the left and right edges will be trimmed simultaneously.
- In the vertical direction, the top and bottom edges will be trimmed simultaneously.
- Pressing "Both" will link the horizontal and vertical trim parameters, which will maintain the correct aspect ratio while trimming.
- Selecting "Both Eyes" will allow you to simultaneously trim both eyes of a stereoscopic image by the same amount.

Connections and Other Important Information for 3D Modes

Let's detail some of the connections and ancillary data handling that will affect your workflows.

Video Connections

Stereoscopic left and right video inputs should be connected to SDI inputs A and B respectively. Similarly, left and right processed outputs will be available at SDI outputs A and B respectively. The HDMI input and output connections support full frame Frame Packed signals.

43 Teranex Processor Settings

Video Formats Supported

The 2D to 3D feature supports SD and HD inputs, and converts to an HD output. The 3D Convert and 3D Camera Align features support all 3D-centric video formats that are supported by the Teranex 3D. For 3D Align, both input streams, left and right, must be of the same format and frame rate. The following video format conversions are supported:

- Pass-through, where the output format is the same as the input format.
- 1080i 50/59.94 to 1080p/sf 23.98/24/25/29.97
- 1080p/sf 23.98/24/25/29.97 to 1080i 50/59.94
- 1080i 50/59.94 to 1080i 59.94/50 (Frame Rate Conversion)
- 1080i 50/59.94 to 720p 50/59.94
- 720p 50/59.94 to 1080i 50/59.94
- 720p 50/59.94 to 720p 59.94/50 (Frame Rate Conversion)

Independent Channel Processing

Image alignment for each video channel is possible via the Camera Align application. Proc amp, timecode and noise reduction settings are applied simultaneously to both video streams.

Audio Support

Embedded, AES and Analog audio is supported for "Channel A". When selecting EMBED, the embedded audio on input A will be processed and outputted via output A.

Ancillary Data Support

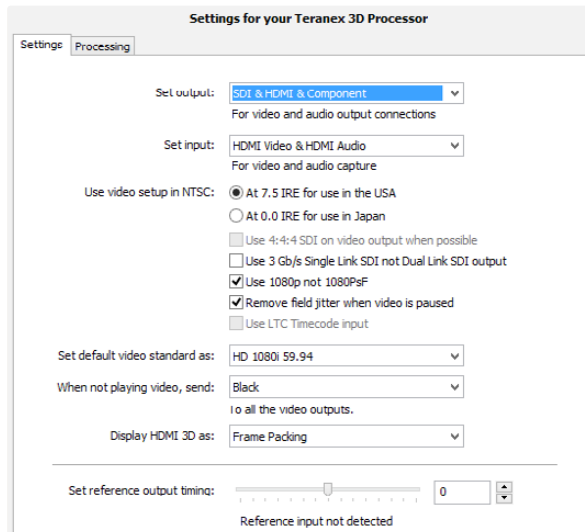
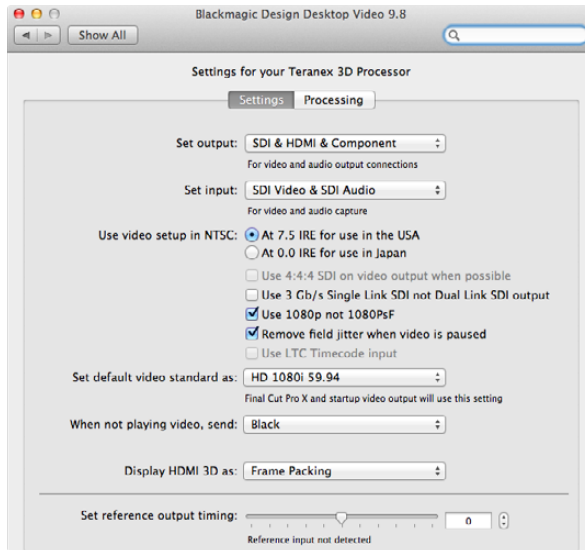
Ancillary data such as timecode and AFD is supported on input A and output A only.

External Reference

The output streams may be synchronized to either Input A or to an external reference of Blackburst or Tri-level sync supplied to the REF connector. Select the type of reference, Internal or External, using Home>Reference>Type.

When using an external reference, the user interface controls both channel A and B, enabling both output streams to remain pixel locked, even when adjusted relative to the selected reference source.

44 Capture and Playback



The Teranex Installer software installs the Blackmagic Design Desktop Video Control Panel in Mac OS X and Windows.

Using your Favorite Editing Software

When your Teranex Processor is connected to a computer with Thunderbolt technology it can be used as a powerful editing solution for video capture, conversion and playback. The Teranex software installs Blackmagic system preferences for your favorite video editing software on Mac OS X and Windows computers.

Video Capture

When an application is capturing video, the Teranex LCD will show the word "Capture" followed by the video format of the input signal. For example, "Capture: 1080p24". Applications including DaVinci Resolve 10, Avid Media Composer 7, Apple Final Cut Pro 7, Adobe Premiere Pro CC and Adobe Photoshop CC can all capture video from your Teranex Processor.

Teranex captures the converted video output. Press the OUT button on your Teranex and check your project or capture preferences match the video format, frame type and frame rate shown by the illuminated buttons.

Batch captures with RS-422 deck control may not be exactly frame accurate because of the conversion processing delay. Accordingly, it is a good idea to use an offset or add handles to your captures. Of course you can also capture without deck control.

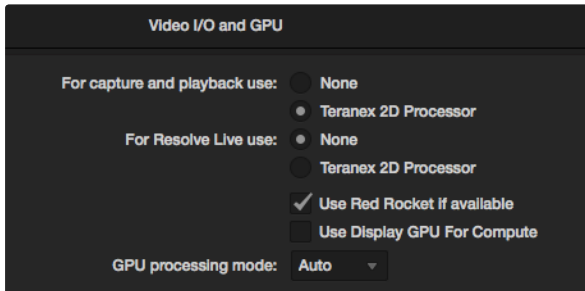
Video Playback

When any video application is in playing back a clip, the Teranex Processor LCD will show the word "Playback" followed by the video format. For example, "Playback: 1080p24". The only illuminated buttons will be those that match the video format being played. All other buttons will be unlit and unavailable as the playback format is set by the clip and so no conversions are allowed. Some applications including Adobe After Effects and Apple Final Cut Pro X are always in playback mode.

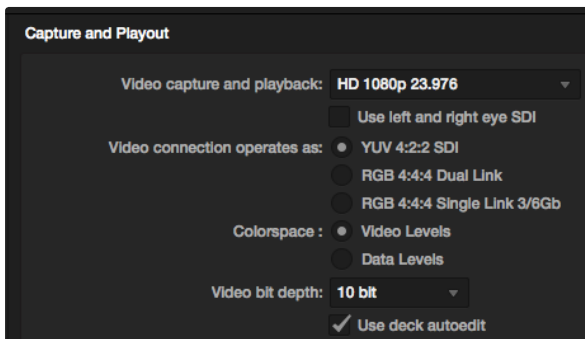
45 Capture and Playback



DaVinci Resolve 10



From Preferences select the "Video I/O and GPU" tab and select your Teranex from the "For capture and playback use" option.



Select your desired format from the "Video capture and playback" menu.

DaVinci Resolve 10

You can use DaVinci Resolve to capture both video and audio from your Teranex processor. For example, you could use Teranex to upconvert an old analog videotape and simultaneously capture the HD output with Resolve. Once the clips are captured into Resolve's Media Pool, it's easy to use the powerful editing and color grading tools to further enhance your material.

Setting Up

- Step 1.** Launch Resolve and from the Preferences menu, select the "Video I/O and GPU" tab and select your Teranex from the "For capture and playback use" option. Save your preferences and restart Resolve to apply your changes.
- Step 2.** Start a project and from within the Project Settings window, set the resolution and frame rate to match the output format of your Teranex.
- Step 3.** In the Project Settings window, go to the "Deck Capture and Playback" tab and select your desired format from the "Video capture and playback" menu.
- Step 4.** If you are capturing audio, be sure to tick the "Enable audio input" box.
- Step 5.** Use the "Save clips to" option and Browse to a location to save your captured media.

Capture

- Step 1.** From within the Media page, click on the capture icon which is located to the left of the transport controls underneath the Viewer.
- Step 2.** Within the Metadata Editor window, enter a name for your clip in the "File Name Prefix" section. If necessary you can also enter additional information such as Roll/Card, Reel Number, Clip Number, Program Name or Good Take.
- Step 3.** To begin capturing click the "Capture Now" button which is located at the bottom of the Metadata Editor window. Click the button again to stop the capture.

Playback

To playback your clips from the Media page, click the playback icon which is located immediately to the left of the capture icon. Click on a clip that you have captured to display it in the Viewer.

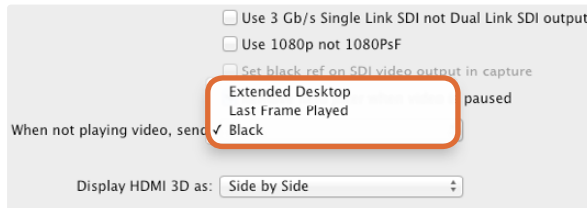
Editing and Color Grading

Once you've captured your clips, simply click the Edit page to begin using Resolve's extensive editing features. Then jump to the Color page to apply that "killer" grade. You can refer to the DaVinci Resolve manual for detailed information on these features.

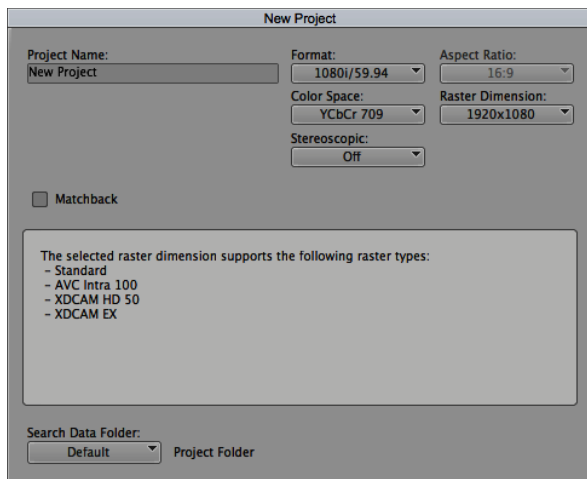
46 Capture and Playback



Avid Media Composer



If using a single computer monitor with Media Composer, open the Blackmagic Design system preferences and choose to send Black when not playing video.



Type a project name and set the project options.

Avid Media Composer 7

Avid Media Composer captures and plays back standard definition and high definition video and audio with Teranex Processor hardware and also supports RS-422 deck control. Blackmagic plug-ins for Media Composer are automatically installed if Media Composer is installed before the Desktop Video software.

For this example, the converted output from Teranex will be 1080i59.94 and we will be capturing from a non-controllable device.

Setting Up

- Step 1.** Launch Media Composer and the Select Project window will appear. Click the New Project button.
- Step 2.** In the New Project window, name your project.
- Step 3.** Go to the Format dropdown menu and select 1080i/59.94.
- Step 4.** Go to the Color Space dropdown menu and select YCbCr 709.
- Step 5.** Go to the Raster Dimension dropdown menu and select 1920x1080. Click OK.

Capture

- Step 1.** Choose Tools > Capture to open the Capture Tool.
- Step 2.** Click the Toggle Source button so that the button's icon of a deck shows a red circle-slash symbol.
- Step 3.** Set the Video and Audio input menus to "Blackmagic".
- Step 4.** Select your video and the audio source tracks.
- Step 5.** Use the Bin menu to select a Target Bin.
- Step 6.** From the Res dropdown menu, choose your codec.
- Step 7.** Select the disk storage for your captured video and audio.
- Step 8.** Click the "Tape Name?" button and select the desired tape and click OK.
- Step 9.** Ensure your video and audio source is ready or playing and then click the Capture button.
- Step 10.** Click the Capture button again to stop capturing and close the Capture Tool.

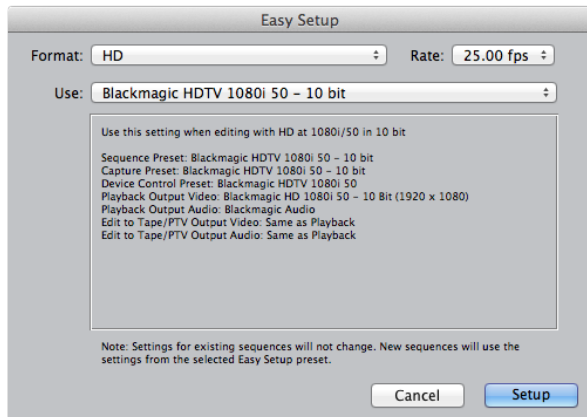
Playback

You can use the Avid Media Composer timeline to display video on a monitor or TV connected to the output of your Teranex Processor. Output Video can be toggled on and off by using the "Toggle Client Monitor" button which is located at the bottom of the timeline window.

47 Capture and Playback



Apple Final Cut Pro 7



Select a Blackmagic Easy Setup

Apple Final Cut Pro 7

“Easy Setups” for Final Cut Pro 7 are automatically installed if Final Cut Pro is installed before the Desktop Video software. Blackmagic video hardware is fully compatible with Apple’s RT Extreme™ real time effects.

For this example, the converted output from the Teranex will be 1080i50 and we will be capturing from a non-controllable device.

Setting Up

- Step 1.** Launch Final Cut Pro 7 and select File>New Project.
- Step 2.** Select File>Save Project As... and name your project.
- Step 3.** From the Final Cut Pro menu, select Easy Setup...to open the Easy Setup window.
- Step 4.** Choose "HD" for the Format and '25.00 fps" for the Rate. Select "Blackmagic HDTV 1080i 50 - 10 bit" from the Use menu. Click Setup to close the window.
- Step 5.** From the Final Cut Pro menu, select System Settings and with the Scratch Disks tab highlighted, select Set and choose the drive or drives for your scratch disks. Click OK.

Capture

- Step 1.** Choose File > Log and Capture to open the Log and Capture window.
- Step 2.** Press play on your video source and then press the "Now" button which is under the Capture heading to begin the capturing.
- Step 3.** Press the 'esc' key at the top left of your keyboard to stop capturing.
- Step 4.** Choose File > Log and Capture to close the window.

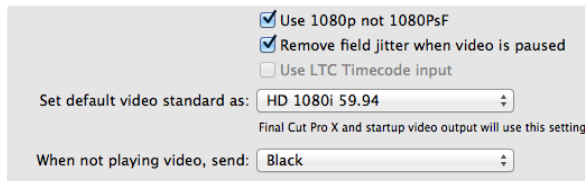
Playback

You can use the Final Cut Pro timeline to display video on a monitor or TV connected to the output of your Teranex Processor. If you can't see any video on your Blackmagic output, check the connections again and ensure you have the correct output settings configured within Final Cut Pro by going to the View > External Video and ensuring "All Frames" is selected.

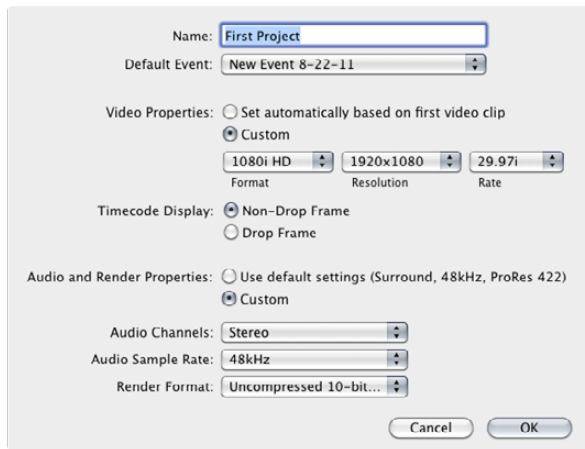
48 Capture and Playback



Final Cut Pro X



Set the default video standard in the System Preferences to match your Final Cut Pro X project.



Set the Audio and Render Properties to Custom.

Apple Final Cut Pro X

If you want to use Final Cut Pro X to play back video on an external video monitor or TV, you can use the broadcast monitoring feature of Final Cut Pro X 10.0.4 and newer to output your video through Teranex Processor hardware.

For this example, clips are Uncompressed 10 bit 4:2:2 1080i59.94 with 2 channels of audio.

Setting Up

- Step 1.** Open the System Preferences and click on Blackmagic Design. Go to the setting, "Set default video standard as" and then select HD 1080i59.94.
- Step 2.** Launch Final Cut Pro X and go to the Menu bar and select File/New Project. A window will open containing project settings.
- Step 3.** Name your project and click the "Use Custom Settings" tab.
- Step 4.** Under Video Properties, click the Custom button and set the following: Format to HD 1080i, Resolution to 1920x1080 and Rate to 29.97.
- Step 5.** Under Audio and Render Properties, click the Custom button
- Step 6.** Set the Audio and Render Properties, click the Custom button and set the following: Audio Channels to Stereo, Audio Sample Rate to 48kHz and Render Format to Uncompressed 10 bit 4:2:2. Click OK.
- Step 7.** Go to the Final Cut Pro menu, choose Preferences and then click the Playback tab. Ensure the A/V Output menu has selected "Blackmagic" and the same video standard as your project. Close the Preferences.
- Step 8.** Go to the Window menu and select A/V Output to enable video output via your Teranex Processor.

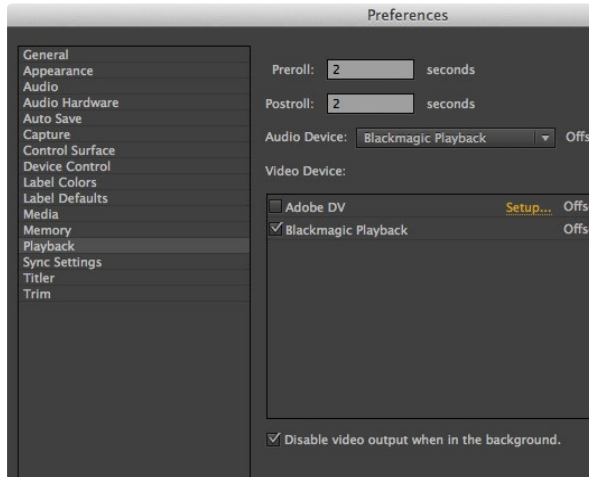
Playback

After importing your clips you can use the Final Cut Pro X timeline to display video on a monitor or TV connected to the output of your Teranex Processor. If you can't see any video on your Blackmagic output, check the connections again and ensure you have the correct output settings configured within Final Cut Pro by going to the View > External Video and ensuring "All Frames" is selected.

49 Capture and Playback



Adobe Premiere Pro



Set preferences for Playback.

Adobe Premiere Pro CC

For this example, the converted output from the Teranex will be 1080i50 and we will be capturing from a non-controllable device.

Setting Up

- Step 1.** Launch Adobe Premiere Pro CC. In the Welcome window select Create New/New Project. A window will open containing project settings.
- Step 2.** Name your project. Choose the location for your project by clicking Browse and selecting your desired folder.
- Step 3.** Set the "Capture Format" to "Blackmagic Capture" and click on the Settings button. Set "Video Standard" to 1080i50 and select a "Video Format" according to your requirements. Click OK.

Capture

- Step 1.** Select File > Capture [F5]
- Step 2.** Click the red record button [G] to begin capture.
- Step 3.** Click the stop button [S] to stop capture.

Playback

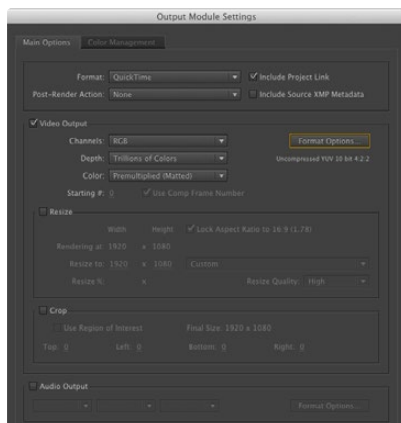
- Step 1.** Playback settings need to be selected each time a new project is created. Go to Preferences > Playback and under "Video Device," enable the checkbox for "Blackmagic Playback" and ensure the other checkboxes are empty.
- Step 2.** For audio playback, select "Blackmagic Playback" from the "Audio Device" dropdown menu.
- Step 3.** Click on a clip and you should now see the image on your Teranex Processor.



Adobe After Effects



"Video Preview" preferences



"Output Module Settings" rendering options

Adobe After Effects CC

How to use Blackmagic as a preview output frame buffer

To allow your Adobe After Effects composition to be displayed in real-time through your Teranex Processor, go to Preferences > Video Preview. Select Blackmagic Video Output and the appropriate Output Mode. This lets you view your Adobe After Effects compositions in the correct video colorspace on your broadcast monitor as you work. You will always see the correct color and interlace when working, and you don't have to wait until your composition is rendered to see what it looks like when output as video.

If you also want to listen to audio through your Teranex Processor, set the "Default Device" to "Blackmagic Audio" in Preferences > Audio Hardware and Preferences > Audio Output Mapping.

Rendering

When you have completed your composition, you will need to render to a pixel format supported by your Teranex Processor hardware. You can render to a DPX image sequence or any of the following supported codecs:

QuickTime codecs on Mac OS X

- Blackmagic RGB 10 bit (uncompressed)
- Apple Photo - JPEG (compressed)
- Apple Uncompressed YUV 10 bit 4:2:2
- Apple DV - NTSC (compressed)
- Apple Uncompressed YUV 8 bit 4:2:2
- Apple DV - PAL (compressed)

Other codecs including ProRes and DVCPRO HD will be available if Final Cut Pro is installed on the same computer.

AVI codecs on Windows

- Blackmagic 10 bit 4:4:4 (uncompressed)
- Blackmagic SD 8 bit 4:2:2 (uncompressed)
- Blackmagic 10 bit 4:2:2 (uncompressed)
- Blackmagic 8 bit MJPEG (compressed)
- Blackmagic HD 8 bit 4:2:2 (uncompressed)

Other codecs including DVCPRO HD and DVCPRO50 will be available if Premiere Pro CC is installed on the same computer.

QuickTime codecs on Windows

- Blackmagic RGB 10 bit (uncompressed)
- Apple Photo-JPEG (compressed)
- Blackmagic 10 bit (uncompressed)
- Apple DV - NTSC (compressed)
- Blackmagic 8 bit (uncompressed)
- Apple DV - PAL (compressed)

51 Capture and Playback



Adobe Photoshop

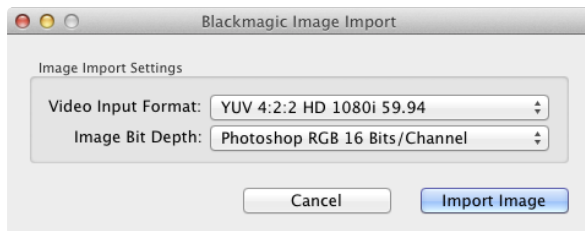


Image Capture

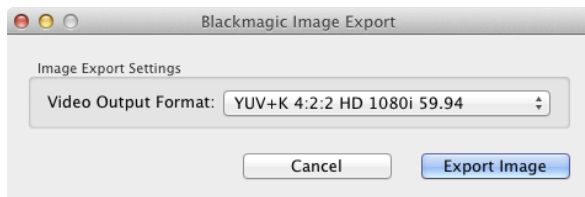


Image Export

Adobe Photoshop CC

How to grab and output video frames

Import an image into Photoshop

Step 1. From Photoshop select File > Import > Blackmagic Image Capture.

Step 2. Select the "Video Input Format" and the "Image Bit Depth" and then click Capture Image.

Export an image from Photoshop

Step 1. Select File > Export > Blackmagic Image Export.

Step 2. Select Video Output Format and then click Output Image.

Once you have set the options in the "Import" or "Export" windows, each subsequent Import and Export will not display the window, so you can grab and output frames much faster. However if you would like to change your import or export formats, hold the Option [Mac] or Ctrl [Win] key, when selecting import or export.

52 Waveform Monitoring



Blackmagic UltraScope - Full Screen View



2-Up view

Using Blackmagic UltraScope for Waveform Monitoring

Now with the Teranex Processor, you get the incredible features of Blackmagic UltraScope which you can even use with compatible Mac OS X and Windows notebook computers using Thunderbolt technology! Blackmagic UltraScope software is installed by the Teranex Processor Installer.

Blackmagic UltraScope is perfect for quality control checks of your converted output no matter which SDI, HDMI, component analog or composite analog video input you use. Simply connect a Thunderbolt cable between your Teranex Processor and your computer and launch Blackmagic UltraScope!

Installation Requirements

The Blackmagic UltraScope software interface requires a computer display with a minimum resolution of 1280 x 800 pixels to view two scopes simultaneously. Blackmagic Design recommends viewing all 6 scopes simultaneously by using a computer display resolution of 1920 x 1200 or 1920 x 1080 pixels.

Please see the support pages at www.blackmagicdesign.com for a comprehensive list of the latest minimum system requirements for Blackmagic UltraScope.

Understanding Blackmagic UltraScope Views

Blackmagic UltraScope has two different views available depending on your workflow needs and screen resolution. You have the choice of viewing six displays in "Full Screen" view, or for more compact viewing, choose any 2 displays in "2-up" view.

The display view can be selected from the **View** menu.

Choose **Full Screen** to enter Full Screen view. If this option is unchecked, 2-up view will be displayed. You can quickly switch between Full Screen view and 2-up view by using the hot key CMD-F on Mac OS X.

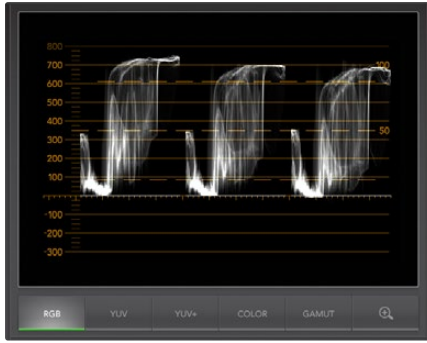
In 2-up view, select the desired left and right scopes by opening the **View** menu or by right-clicking anywhere in the UltraScope window. Make your selections from the **Left View** and **Right View** menu options.

If you want the scopes to swap sides, select the left or right view and set it to be the same as the other view. The scopes will swap sides because the 2-up view never displays the same scope in both the left and right views.

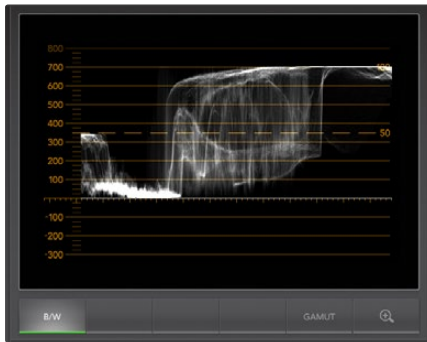
Screen Resolution Requirements for Display Views

- Full Screen view: 1920 x 1200 pixels or 1920 x 1080 pixels. If your monitor doesn't support these resolutions, then Full Screen view will not be available.
- 2-up view: minimum resolution of 1280 x 800 pixels.

53 Waveform Monitoring



RGB Parade Display



Waveform Display

Blackmagic UltraScope Displays

Blackmagic UltraScope software is a great tool for maintaining accurate broadcast legal video and audio levels from your Teranex's converted output. Scopes used to monitor your levels include RGB Parade, Waveform, Vectorscope, Histogram and Audio Metering Display.

RGB Parade Display

RGB parade displays the red, green and blue channels of your converted output. If one of the color channels appears taller, it usually indicates the presence of a color cast. This may not be desirable and you may want to try minimizing the color cast during post production using color correction software, such as Blackmagic DaVinci Resolve.

Waveform Display

The waveform is great for seeing your black and white levels and overall image contrast. An image with good contrast will display information from 0 IRE to 100 IRE. An image with poor contrast will have the majority of information centered in the display, with little information in the top or bottom areas.

If you are seeing "milky" or gray blacks on your video display, then they will appear elevated above the 0 IRE line. To adjust the black level, press the BLK button on the front of the Teranex and use the rotary knob to lower the black level. If you lower the black level below 0 IRE you will "crush" the image and you risk eliminating shadow detail. Adjust the black level and observe the change on both the monitor and the waveform.

Likewise, if your highlights appear muted or dull, they will appear below the 100 IRE line. To adjust the white level, press the GAIN button on the front of the Teranex and use the rotary knob to increase the white level. If you raise the level above 100 IRE you will "clip" the image and you risk eliminating highlight detail. Adjust the white level and observe the change on both the monitor and the waveform.

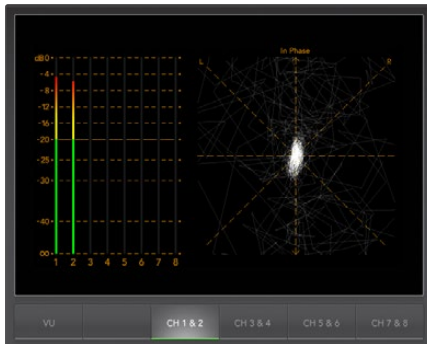
54 Waveform Monitoring



Vectorscope Display



Histogram Display



Audio Metering Display

Vectorscope Display

The Vectorscope is useful for monitoring the color balance and saturation of your Teranex's converted video output. For instance, if your signal has a dominant green color cast then the majority of image information will be located towards the green area of the vectorscope. In comparison, an image with a neutral color balance will have information evenly distributed around the center.

The center of the vectorscope represents zero saturation. The further an object is from the center, the more saturated it appears. If your material appears under or over saturated, press the SAT button on your Teranex Processor and use the rotary knob to either increase or decrease saturation.

Teranex's HUE button can be used if the overall image color appears skewed. As you turn the rotary knob you will see the color information rotate around the vectorscope's center point. Unless the original image has a dramatic color skew, small adjustments will usually be better.

Histogram Display

Using the Histogram is another way to check image contrast. The horizontal axis represents the luminance range with black on the left (0 in a 10 bit image) and white on the right (1023 in a 10 bit image). An image with good contrast will display information covering the entire horizontal axis, whereas a low contrast image will display information predominantly in the middle. Use your Teranex Processor's BLK and GAIN button settings to make the necessary adjustments.

Audio Metering Display

Audio metering display shows you the audio levels from your Teranex Processor. The audio is displayed in either dBFS or VU format. dBFS is essentially a meter of the overall digital audio signal and is common on modern digital equipment. The VU meter shows average signal levels, is easy to use and very common on older equipment.

To monitor your audio levels, watch the VU meter and ensure the levels never peak above 0dB. Peaking above 0dB means your audio is clipping.

You can also monitor audio phase and balance using the audio metering display.

55 Waveform Monitoring



From the Histogram Display, select the Logging button to switch to the Error Logging Display.

A screenshot of the Error Logging Display interface. It features a table with columns for START TC, END TC, DUR, DESCRIPTION, VALUE, and START TIME. Below the table are buttons for 'START', 'CLEAR', 'SAVE', and 'HISTOGRAM'.

START TC	END TC	DUR	DESCRIPTION	VALUE	START TIME
01:28:53.18	01:28:54.05	0.53	Audio Level 1	-1 dBFS	14:03:52.68
01:28:53.26	01:28:54.05	0.28	Audio Level 2	-1 dBFS	14:03:52.93
01:28:54.07	01:28:54.27	0.65	Audio Level 2	0 dBFS	14:03:53.29
01:28:54.07	01:28:54.27	0.65	Audio Level 1	0 dBFS	14:03:53.29
01:28:54.28	01:28:55.22	0.77	Audio Level 1	0 dBFS	14:03:54.03
01:28:54.29	01:28:55.22	0.77	Audio Level 2	0 dBFS	14:03:54.03
01:28:55.24	01:28:56.03	0.28	Audio Level 1	-1 dBFS	14:03:54.88
01:28:55.24	01:28:56.22	0.90	Audio Level 2	0 dBFS	14:03:54.88
01:28:56.05	01:28:56.15	0.33	Audio Level 1	0 dBFS	14:03:55.25
01:28:56.16	01:28:56.28	0.41	Audio Level 1	-2 dBFS	14:03:55.62
01:28:56.23	01:28:57.05	0.41	Audio Level 2	-2 dBFS	14:03:55.92
01:28:57.01	01:28:58.17	1.55	Audio Level 1	0 dBFS	14:03:56.06
01:28:57.07	01:28:58.16	1.26	Audio Level 2	0 dBFS	14:03:56.31
01:28:58.18	01:28:59.01	0.45	Audio Level 1	-0 dBFS	14:03:57.66
01:28:58.18	01:28:59.01	0.45	Audio Level 2	-1 dBFS	14:03:57.66
01:28:59.03	01:29:00.14	1.26	Audio Level 1	0 dBFS	14:03:58.18
01:28:59.03	01:29:00.14	1.26	Audio Level 2	0 dBFS	14:03:58.18
01:28:59.03	01:29:01.20	1.19	Audio Level 1	0 dBFS	14:03:59.49
01:29:00.15	01:29:01.20	1.19	Audio Level 2	0 dBFS	14:03:59.49
01:24:54.18	01:29:01.21	247.04	Red Over	114 IRE	13:59:53.68
01:24:54.18	01:29:01.21	247.04	Luma Under	-2 IRE	13:59:53.68
01:24:54.18	01:29:01.21	247.04	Luma Over	109 IRE	13:59:53.68

Error Logging Display

Error Logging records errors in video and audio and is indispensable for unattended operation, such as during long conversions. Errors may be logged for color, brightness or audio threshold levels as well as loss of video signal, change of video format or audio silence. After setting the parameters which define when an error should be logged, you can choose to start or stop error logging, save the log to a file, or clear the log. These functions can be selected from the buttons in the Error Logging Display or from the Error Logging pull-down menu.

Errors are recorded against timecode and time of day to make them easy to find. If the timecode is not present, errors can be found by reviewing the time of day at which they were recorded.

In the Full Screen view, Histogram and Error Logging Displays share the same area of the UltraScope interface. Select the LOGGING button, below the Histogram Display, to switch to Error Logging Display. Select the HISTOGRAM button to switch back to the Histogram Display.

In 2-up view, Histogram and Error Logging Displays can be viewed on two panels simultaneously.

Select the START button to commence logging. In Full Screen view, you can switch back to the Histogram Display and UltraScope will continue to perform error logging until you choose to stop it.

When error logging is being performed, the STOP button replaces the START button. When the STOP button has been selected, you can choose to START again and any new errors will be appended to the existing log. When error logging stops, you can choose to SAVE the log to a CSV file or alternatively CLEAR the log. If no errors have been recorded, the SAVE and CLEAR buttons will not appear. The CSV file can be analyzed in many applications including spreadsheet and database software.

By default, error logging is performed using the EBU-R103 standard set by the European Broadcasting Union. This standard is popular worldwide and is commonly used as a template for making new error logging profiles.

56 Format Conversion Table

Output	Input
486i59.94	480i59.94
	576i50
	720p50
	720p59.94
	1080p23.98
	1080PsF23.98
	1080p24
	1080PsF24
	1080p25
	1080PsF25
	1080p29.97
	1080PsF29.97
	1080i50
	1080p50
	1080i59.94
	1080p59.94
	2k1080p23.98
	2k1080PsF23.98
	2k1080p24
	2k1080PsF24

Output	Input
576i50	480i59.94
	576i50
	720p50
	720p59.94
	1080p23.98
	1080PsF23.98
	1080p24
	1080PsF24
	1080p25
	1080PsF25
	1080p29.97
	1080PsF29.97
	1080i50
	1080p50
	1080i59.94
	1080p59.94
	2k1080p23.98
	2k1080PsF23.98
	2k1080p24
	2k1080PsF24

Output	Input
720p50	480i59.94
	576i50
	720p50
	720p59.94
	1080p23.98
	1080PsF23.98
	1080p24
	1080PsF24
	1080p25
	1080PsF25
	1080p29.97
	1080PsF29.97
	1080i50
	1080p50
	1080i59.94
	1080p59.94
	2k1080p23.98
	2k1080PsF23.98
	2k1080p24
	2k1080PsF24

Output	Input
720p59.94	480i59.94
	576i50
	720p50
	720p59.94
	1080p23.98
	1080PsF23.98
	1080p24
	1080PsF24
	1080p25
	1080PsF25
	1080p29.97
	1080PsF29.97
	1080i50
	1080p50
	1080i59.94
	1080p59.94
	2k1080p23.98
	2k1080PsF23.98
	2k1080p24
	2k1080PsF24

57 Format Conversion Table

Output	Input
1080p23.98	480i59.94
	576i50
	720p50
	720p59.94
	1080p23.98
	1080PsF23.98
	1080p24
	1080PsF24
	1080p25
	1080PsF25
	1080p29.97
	1080PsF29.97
	1080i50
	1080p50
	1080i59.94
	1080p59.94
	2k1080p23.98
	2k1080PsF23.98
	2k1080p24
	2k1080PsF24

Output	Input
1080PsF23.98	480i59.94
	576i50
	720p50
	720p59.94
	1080p23.98
	1080PsF23.98
	1080p24
	1080PsF24
	1080p25
	1080PsF25
	1080p29.97
	1080PsF29.97
	1080i50
	1080p50
	1080i59.94
	1080p59.94
	2k1080p23.98
	2k1080PsF23.98
	2k1080p24
	2k1080PsF24

Output	Input
1080p24	480i59.94
	576i50
	720p50
	720p59.94
	1080p23.98
	1080PsF23.98
	1080p24
	1080PsF24
	1080p25
	1080PsF25
	1080p29.97
	1080PsF29.97
	1080i50
	1080p50
	1080i59.94
	1080p59.94
	2k1080p23.98
	2k1080PsF23.98
	2k1080p24
	2k1080PsF24

Output	Input
1080PsF24	480i59.94
	576i50
	720p50
	720p59.94
	1080p23.98
	1080PsF23.98
	1080p24
	1080PsF24
	1080p25
	1080PsF25
	1080p29.97
	1080PsF29.97
	1080i50
	1080p50
	1080i59.94
	1080p59.94
	2k1080p23.98
	2k1080PsF23.98
	2k1080p24
	2k1080PsF24

58 Format Conversion Table

Output	Input
1080p25	480i59.94
	576i50
	720p50
	720p59.94
	1080p23.98
	1080PsF23.98
	1080p24
	1080PsF24
	1080p25
	1080PsF25
	1080p29.97
	1080PsF29.97
	1080i50
	1080p50
	1080i59.94
	1080p59.94
	2k1080p23.98
	2k1080PsF23.98
	2k1080p24
	2k1080PsF24

Output	Input
1080PsF25	480i59.94
	576i50
	720p50
	720p59.94
	1080p23.98
	1080PsF23.98
	1080p24
	1080PsF24
	1080p25
	1080PsF25
	1080p29.97
	1080PsF29.97
	1080i50
	1080p50
	1080i59.94
	1080p59.94
	2k1080p23.98
	2k1080PsF23.98
	2k1080p24
	2k1080PsF24

Output	Input
1080p29.97	480i59.94
	576i50
	720p50
	720p59.94
	1080p23.98
	1080PsF23.98
	1080p24
	1080PsF24
	1080p25
	1080PsF25
	1080p29.97
	1080PsF29.97
	1080i50
	1080p50
	1080i59.94
	1080p59.94
	2k1080p23.98
	2k1080PsF23.98
	2k1080p24
	2k1080PsF24

Output	Input
1080PsF29.97	480i59.94
	576i50
	720p50
	720p59.94
	1080p23.98
	1080PsF23.98
	1080p24
	1080PsF24
	1080p25
	1080PsF25
	1080p29.97
	1080PsF29.97
	1080i50
	1080p50
	1080i59.94
	1080p59.94
	2k1080p23.98
	2k1080PsF23.98
	2k1080p24
	2k1080PsF24

59 Format Conversion Table

Output	Input
1080i50	480i59.94
	576i50
	720p50
	720p59.94
	1080p23.98
	1080PsF23.98
	1080p24
	1080PsF24
	1080p25
	1080PsF25
	1080p29.97
	1080PsF29.97
	1080i50
	1080p50
	1080i59.94
	1080p59.94
	2k1080p23.98
	2k1080PsF23.98
	2k1080p24
	2k1080PsF24

Output	Input
1080p50	480i59.94
	576i50
	720p50
	720p59.94
	1080p23.98
	1080PsF23.98
	1080p24
	1080PsF24
	1080p25
	1080PsF25
	1080p29.97
	1080PsF29.97
	1080i50
	1080p50
	1080i59.94
	1080p59.94

Output	Input
1080i59.94	480i59.94
	576i50
	720p50
	720p59.94
	1080p23.98
	1080PsF23.98
	1080p24
	1080PsF24
	1080p25
	1080PsF25
	1080p29.97
	1080PsF29.97
	1080i50
	1080p50
	1080i59.94
	1080p59.94
	2k1080p23.98
	2k1080PsF23.98
	2k1080p24
	2k1080PsF24

Output	Input
1080p59.94	480i59.94
	576i50
	720p50
	720p59.94
	1080p23.98
	1080PsF23.98
	1080p24
	1080PsF24
	1080p25
	1080PsF25
	1080p29.97
	1080PsF29.97
	1080i50
	1080p50
	1080i59.94
	1080p59.94

60 Format Conversion Table

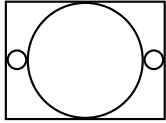
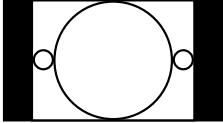
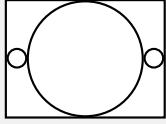
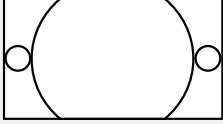
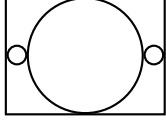
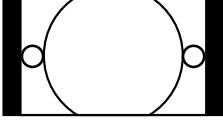
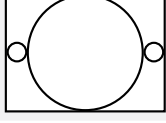
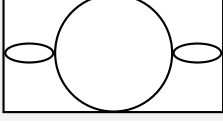
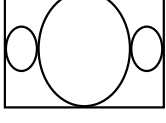
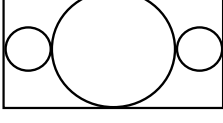
Output	Input
2k1080p23.98	480i59.94
	576i50
	720p50
	720p59.94
	1080p23.98
	1080PsF23.98
	1080p24
	1080PsF24
	1080p25
	1080PsF25
	1080p29.97
	1080PsF29.97
	1080i50
	1080i59.94
	2k1080p23.98
	2k1080PsF23.98
	2k1080p24
	2k1080PsF24

Output	Input
2k1080PsF23.98	480i59.94
	576i50
	720p50
	720p59.94
	1080p23.98
	1080PsF23.98
	1080p24
	1080PsF24
	1080p25
	1080PsF25
	1080p29.97
	1080PsF29.97
	1080i50
	1080i59.94
	2k1080p23.98
	2k1080PsF23.98
	2k1080p24
	2k1080PsF24

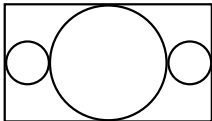
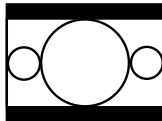
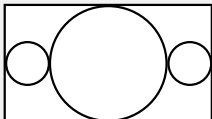
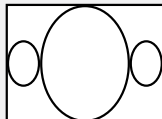
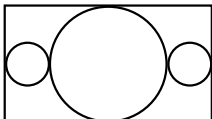
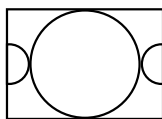
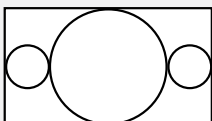
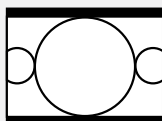
Output	Input
2k1080p24	480i59.94
	576i50
	720p50
	720p59.94
	1080p23.98
	1080PsF23.98
	1080p24
	1080PsF24
	1080p25
	1080PsF25
	1080p29.97
	1080PsF29.97
	1080i50
	1080i59.94
	2k1080p23.98
	2k1080PsF23.98
	2k1080p24
	2k1080PsF24

Output	Input
2k1080PsF24	480i59.94
	576i50
	720p50
	720p59.94
	1080p23.98
	1080PsF23.98
	1080p24
	1080PsF24
	1080p25
	1080PsF25
	1080p29.97
	1080PsF29.97
	1080i50
	1080i59.94
	2k1080p23.98
	2k1080PsF23.98
	2k1080p24
	2k1080PsF24

61 Aspect Ratio Conversion Table

Up Conversion	Input 4:3	Output 16:9	
PBOX (Pillarbox)			Displays a 4:3 SD image inside an HD 16:9 frame. Black bars feature on the sides.
ZOOM			Zooms into an SD 4:3 image until it completely fills the HD 16:9 frame. A portion of the top and bottom is lost.
14:9			A compromise between Pillarbox and Zoom. Minimal black bars with a slight crop on the top and bottom.
SMART			Incrementally stretches the sides to fit 16:9 without distorting the main action of the 4:3 image.
ANAM (Anamorphic)			Horizontally stretches the 4:3 SD image into a 16:9 HD frame.

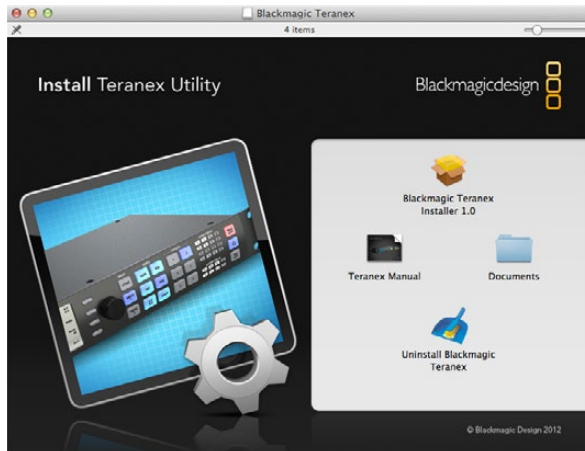
62 Aspect Ratio Conversion Table

Down Conversion	Input 16:9	Output 4:3	
LBOX (Letterbox)			Scales the entire 16:9 HD image into a 4:3 SD frame leaving black bars on the top and bottom.
ANAM (Anamorphic)			Horizontally squeezes the 16:9 HD image into a 4:3 SD frame.
CCUT (Center Cut)			Cuts a 4:3 SD frame from the 16:9 HD image.
14:9			A compromise between Letterbox and Center Cut. Minimal black bars with a slight edge crop.

63 Installing Blackmagic Teranex Software



Teranex Utility



Launch the Blackmagic Teranex Installer and follow the install prompts

Installing Blackmagic Teranex Software on Mac OS X

The Teranex installer ensures your computer has all the drivers and software needed to get the most out of your Teranex Processor. It's a good practice to regularly check the Blackmagic website for any updates to the Teranex installer, or for any new internal software using the Teranex Utility via USB.

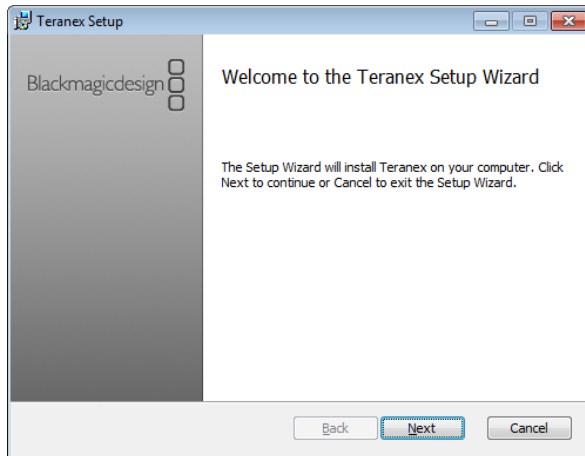
To install your Teranex software for the first time, or if you have just downloaded an updated installer from the Blackmagic website:

- Step 1.** Open the "Blackmagic Teranex" folder from the disc or downloaded disk image and launch the "Blackmagic Teranex Installer".
- Step 2.** Click Continue. Agree. Install buttons and the software will be installed on your system.
- Step 3.** Now restart your computer to enable the new software drivers.

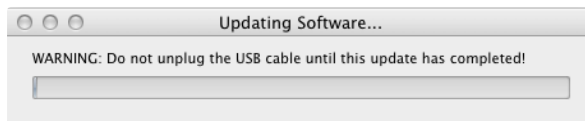
On Mac OS X, all the files needed to run your Teranex Processor will be installed into a folder called Blackmagic Teranex in the Applications folder. The folder contains the Teranex Utility which allows you to update the internal software via USB. This instruction manual is also in this folder.

The Applications folder contains Blackmagic Media Express which allows Teranex to capture and playback video when connected to a computer via Thunderbolt. Alternatively, the Thunderbolt connection allows you to perform waveform monitoring of your video input using the Blackmagic UltraScope software.

64 Installing Blackmagic Teranex Software



Launch the Blackmagic Teranex Installer and follow the install prompts.



Installing Blackmagic Teranex Software on Windows

- Step 1.** Ensure you have the very latest driver. Visit www.blackmagicdesign.com/support
- Step 2.** Open the "Blackmagic Teranex" folder and launch the "Blackmagic Teranex Installer".
- Step 3.** The software will now be installed on your system. An alert will appear: "Do you want to allow the following program to install software on this computer?" Click Yes to continue.
- Step 4.** You will see a dialog bubble saying "found new hardware" and the hardware wizard will appear. Select "install automatically" and the system will find the required Desktop Video drivers. You will then receive another dialog bubble saying "your new hardware is ready for use."
- Step 5.** Restart your computer to enable the new software drivers.

Once the computer has restarted, all the Blackmagic Teranex software applications will be installed and can be accessed from Start > Programs > Blackmagic Design.

The Teranex folder contains the Teranex Utility, which allows you to update the internal software via USB. Also included in the folder is this instruction manual.

The Media Express folder contains Blackmagic Media Express which allows Teranex to capture and playback video via a Thunderbolt connection. Alternatively, the Thunderbolt connection allows you to perform waveform monitoring using the Blackmagic UltraScope software.

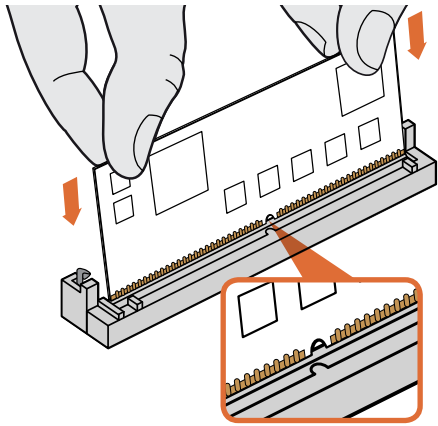
Updating the Teranex Processor Software

From time to time Blackmagic Design will release new internal software for your Teranex Processor, with new features, bug fixes, and increased compatibility with third party software and video devices.

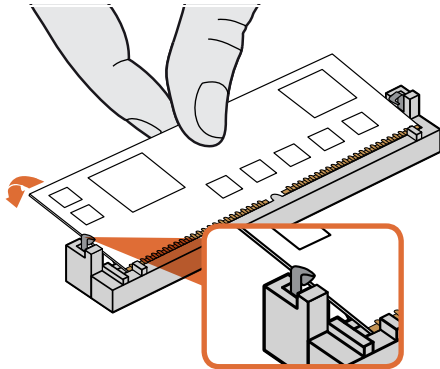
To update the internal software:

- Step 1.** Connect your Teranex to your Mac OS X or Windows computer via USB and launch the Teranex Utility. This utility checks the internal Teranex Processor software and informs you if new software is available.
- Step 2.** If the Teranex Processor software requires updating, you will be prompted by a window. Select Update Now to initiate the update process which may take a few minutes. Do not unplug power from the Teranex Processor during the update.
- Step 3.** Once the software update is complete, the Teranex Processor automatically restarts to enable the new software.

65 Installing Optional Blackmagic Dolby® Encoder/Decoder



Holding the Blackmagic Dolby encoder or decoder module by the top edges, align the module's keyway to the SIMM slot key and gently insert the module until it is firmly seated.



Lean the Blackmagic Dolby encoder or decoder module towards the rear of the chassis until the metal clips fasten to both sides.

Installing the optional Blackmagic Dolby Encoder or Decoder Module in your Teranex 3D Processor

WARNING

Installation requires removing the lid from your Teranex 3D Processor's chassis to access the motherboard and should only be performed by qualified individuals. Precautions should be taken to reduce the risk of electrostatic discharge while installing the module.

Installing the Module

By installing a Blackmagic Dolby encoder or decoder module in your Teranex 3D Processor you can input and output Dolby Digital or Dolby E audio. When installed you can output discrete Dolby channels via SDI, analog or AES/EBU. By installing the Dolby encoder, audio can be output via SDI, analog or AES/EBU using the Dolby Digital or Dolby E encoded signal.

The Blackmagic Dolby encoder and decoder are 72 pin SIMM modules that are easily installed into the empty SIMM slots on your Teranex 3D's motherboard.

To install the Blackmagic Design Dolby encoder or decoder module:

- Step 1.** Ensure the power is unplugged.
- Step 2.** Unscrew all Teranex 3D's 12 lid screws using a T10 Torx screwdriver. Carefully remove the lid, keeping the earth lead secured.
- Step 3.** Hold the Dolby encoder or decoder module with its contacts facing the empty SIMM slot labelled 'Encode' or 'Decode' respectively. The SIMM's keyway needs to be aligned with the slot key or the SIMM will not seat.
- Step 4.** Gently insert the module into the SIMM slot until the contacts are firmly seated.
- Step 5.** Lean the module towards the rear of your Teranex 3D until the metal clips fasten to each side of the module.
- Step 6.** Replace the lid and screw in all lid screws.

After installation, place the supplied Dolby sticker on the lid near the back panel so you can easily verify the Dolby module or modules have been installed.

Confirming Dolby Audio

To output Dolby audio from your Teranex 3D, map your Dolby audio output channels using the control panel LCD menus. For instructions, refer to the "Audio Mapping" section on page 21.



Developing custom software using Blackmagic Design hardware

The DeckLink SDK is available to developers who wish to programmatically control Blackmagic video hardware with their own custom software, and supports the Teranex, UltraStudio, DeckLink, Multibridge and Intensity families of products.

Low-level control of hardware and high-level interfaces is provided to allow developers to easily perform common tasks. The DeckLink SDK supports technologies including:

- Apple QuickTime
- Apple Core Media
- Microsoft DirectShow
- DeckLink API

Downloading the free Blackmagic Design SDK

The DeckLink SDK is free and can be downloaded from

<http://www.blackmagicdesign.com/support/sdks/>

Joining the Blackmagic Design developer list

The Blackmagic Developer mailing list is designed for technical questions regarding technologies used by Blackmagic Design, eg QuickTime, Core Media, DirectShow, codecs, APIs, SDKs, etc. The free mailing list is a forum where developers can discuss ideas and problems with other developers. Any subscriber may reply and the Blackmagic Design engineers may also respond when appropriate. You can subscribe to the mailing list at: <http://lists.blackmagicdesign.com/mailman/listinfo/bmd-developer>

In some cases, we might request a brief outline of the software you are developing if it is not immediately obvious from your domain name that your organization develops video software. Please don't take offence as we're simply trying to keep the list free of spam and viruses as well as end-user customers asking non-development questions, employment agents or sales people trying to promote products on the list. The list is just for developers!

Contacting Blackmagic Design developer assistance

You can also contact us via developer@blackmagicdesign.com if you have any developer related questions or wish to ask questions off the list.

Getting Help

The fastest way to obtain help is to go to the Blackmagic Design online support pages and check the latest support material available for your Teranex Processor hardware.

Blackmagic Design online support pages

The latest manual, software and support notes can be found at the Blackmagic Support Center at www.blackmagicdesign.com/support.

Contacting Blackmagic Design support

If you can't find the help you need in our support material, please use the "Send request" button, on the support page for your hardware model, to email a support request. Alternatively call your nearest Blackmagic Design support office at www.blackmagicdesign.com/company.

Checking the version currently installed

To check which version of Blackmagic Teranex software is installed on your computer, open the About Teranex Utility window.

- On Mac OS X, open Teranex Utility from the Applications folder. Select About Teranex Utility from the application menu to reveal the version number.
- On Windows 7, open Teranex Utility from your Start menu. Click on the Help menu and select About Teranex Utility to reveal the version number.
- On Windows 8, open Teranex Utility from the Blackmagic Teranex tile on your Start page. Click on the Help menu and select About Teranex Utility to reveal the version number.

How to get the latest updates

After checking the version of Blackmagic Teranex software installed on your computer, please visit the Blackmagic Support Center at www.blackmagicdesign.com/support to check for the latest updates. While it is usually a good idea to run the latest updates, it is a wise practice to avoid updating any software if you are in the middle of an important project.



Caution label
Warnetikett
Avertissement

Caution: Risk of Electric Shock

On the Teranex Processor enclosure you will see a yellow warning label marked 'Caution: Risk of Electric Shock'. This is intended to warn users that there may be the presence of uninsulated "dangerous" voltage within the Teranex Processor enclosure which may be of sufficient magnitude to constitute a risk of electric shock to the user. Blackmagic Design advises you not to open the Teranex Processor unit, but rather contact your nearest Blackmagic Design service center should assistance be required.

Achtung: Stromschlaggefahr

Auf dem Teranex Processor-Gehäuse befindet sich ein gelbes Warnetikett mit der Aufschrift 'Caution: Risk of Electric Shock'. Dieses warnt den Benutzer vor einer möglichen, nicht isolierten, "gefährlichen" Spannung innerhalb des Teranex Processor-Gehäuses, die einen Elektroschock verursachen kann. Blackmagic Design empfiehlt das Gehäuse des Teranex Processor nicht selbst zu öffnen, sondern bei Hilfebedarf das nächstgelegene Blackmagic Design Servicecenter zu kontaktieren.

Attention: Risque de choc électrique

Sur le boîtier du Teranex Processor, vous verrez une étiquette d'avertissement de couleur jaune sur laquelle est inscrit « Attention : Risque de choc électrique ». Cette mise en garde est destinée à avertir les utilisateurs de la présence possible d'une tension « dangereuse » non isolée à l'intérieur du boîtier du Teranex Processor, laquelle tension pouvant avoir une amplitude suffisante pour constituer un risque de choc électrique à l'utilisateur. Blackmagic Design vous déconseille donc d'ouvrir l'unité Teranex Processor, et vous recommande de contacter votre centre de service Blackmagic Design le plus proche en cas de nécessité.

12 Month Limited Warranty

Blackmagic Design warrants that the Teranex family products will be free from defects in materials and workmanship for a period of 12 months from the date of purchase. If a product proves to be defective during this warranty period, Blackmagic Design, at its option, either will repair the defective product without charge for parts and labor, or will provide a replacement in exchange for the defective product.

In order to obtain service under this warranty, you the Customer, must notify Blackmagic Design of the defect before the expiration of the warranty period and make suitable arrangements for the performance of service. The Customer shall be responsible for packaging and shipping the defective product to a designated service center nominated by Blackmagic Design, with shipping charges pre paid. Customer shall be responsible for paying all shipping charges, insurance, duties, taxes, and any other charges for products returned to us for any reason.

This warranty shall not apply to any defect, failure or damage caused by improper use or improper or inadequate maintenance and care. Blackmagic Design shall not be obligated to furnish service under this warranty: a) to repair damage resulting from attempts by personnel other than Blackmagic Design representatives to install, repair or service the product, b) to repair damage resulting from improper use or connection to incompatible equipment, c) to repair any damage or malfunction caused by the use of non Blackmagic Design parts or supplies, or d) to service a product that has been modified or integrated with other products when the effect of such a modification or integration increases the time or difficulty of servicing the product. THIS WARRANTY IS GIVEN BY BLACKMAGIC DESIGN IN LIEU OF ANY OTHER WARRANTIES, EXPRESS OR IMPLIED. BLACKMAGIC DESIGN AND ITS VENDORS DISCLAIM ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. BLACKMAGIC DESIGN'S RESPONSIBILITY TO REPAIR OR REPLACE DEFECTIVE PRODUCTS IS THE WHOLE AND EXCLUSIVE REMEDY PROVIDED TO THE CUSTOMER FOR ANY INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES IRRESPECTIVE OF WHETHER BLACKMAGIC DESIGN OR THE VENDOR HAS ADVANCE NOTICE OF THE POSSIBILITY OF SUCH DAMAGES. BLACKMAGIC DESIGN IS NOT LIABLE FOR ANY ILLEGAL USE OF EQUIPMENT BY CUSTOMER. BLACKMAGIC IS NOT LIABLE FOR ANY DAMAGES RESULTING FROM USE OF THIS PRODUCT. USER OPERATES THIS PRODUCT AT OWN RISK.

© Copyright 2014 Blackmagic Design. All rights reserved. 'Blackmagic Design', 'DeckLink', 'HDLINK', 'Workgroup Videohub', 'Videohub', 'DeckLink', 'Intensity' and 'Leading the creative video revolution' are registered trademarks in the US and other countries. All other company and product names may be trade marks of their respective companies with which they are associated.

Thunderbolt and the Thunderbolt logo are trademarks of Intel Corporation in the U.S. and/or other countries.