

Operation Manual

Blackmagicdesign



Multibridge Pro &
Multibridge Eclipse

Windows™

March 2008

Contents

Overview

Contents	2
Welcome	3
Introducing Multibridge	4

Using for Capture and Playback

Getting Started	5
Installation for Capture and Playback	6
Blackmagic Software	9
Third Party Applications	22
Supported File Formats	26
Troubleshooting Video Capture and Playback	27

Using as a Converter

Installation as a Converter	28
Blackmagic Software	30
Supported Connection Formats	35
Troubleshooting when used as a Converter	36

Connection Diagrams

Multibridge Eclipse connectors overview	37
Multibridge Pro connectors overview	38
Connecting to a Betacam SP analog deck	39
Connecting to an SDI digital deck	40
Connecting to a Sony HDCAM SR deck in 4:2:2	41
Connecting to a Sony HDCAM SR deck in 4:4:4	42
Connecting to an HDTV	43
Connecting to an NTSC/PAL monitor	44
Connecting to a YUV component monitor	45

Warranty

3 Year Warranty Details	46
-------------------------	----

Welcome

Thank you for purchasing Multibridge!

We hope you share our dream of making the television industry a truly creative industry by allowing everyone access to the highest quality video.

Previously high end television and post production required investment of millions of dollars in hardware; however, Multibridge is the first uncompressed editing solution that includes the new 3 Gb/s SDI connections, so features the highest quality video possible. We hope you get many years of use from your new Multibridge and have fun working with some of the world's hottest television and design software!

This instruction manual contains all the information you'll need for installing your Multibridge for use as either a video converter, or as a powerful PCI Express based editing, design, effects and broadcast paint solution.

If you're not much of a "tech head" and have not installed hardware cards in your computer previously, then it might be a good idea to ask a technical assistant for help. As Multibridge features uncompressed video capture and playback, and these data rates are quite high, you'll need fast disk storage and a high-end PCI Express computer if you're working with uncompressed video formats.

Before you install Multibridge, please check our website at www.blackmagic-design.com and click the support page to download the latest updates to this manual and Multibridge driver software.

Lastly, please register your Multibridge when downloading software updates. We would love to keep you updated on new software updates and new features for your Multibridge.

Perhaps you can even send us your latest show reel of work completed on your Multibridge and any suggestions for improvements to the software. We are constantly working on new features and improvements, so we would love to hear from you!

Grant Petty

CEO, Blackmagic Design



Introducing Multibridge

Multibridge Eclipse and Multibridge Pro are bi-directional converters which feature built in PCI Express. Connect to a supported PCI Express based Windows workstation for the world's highest quality and most versatile editing solution.

Connect to any deck, camera or monitor

Multibridge supports all the traditional video connections including standard and high definition SDI 4:2:2, SDI 4:4:4, analog YUV, S-video and NTSC/PAL video in and out. HDMI and 3 Gb/s SDI are also included for connection to the latest video hardware. That's great for connecting to any deck, camera or monitor. Multibridge also features multiple channels of AES audio with sample rate converters on all inputs. 12 channels are supported on Multibridge Eclipse and 8 channels on Multibridge Pro. For analog audio, Multibridge supports stereo XLR audio in and out on Multibridge Pro and 4 channels on Multibridge Eclipse, combined with two channel RCA audio outputs for low cost HiFi monitoring.

Advanced digital monitoring

Multibridge includes built-in HDMI capture and playback which is great for working with uncompressed digital video and audio without the expense associated with SDI. With HDMI, Multibridge can support large LCD and Plasma monitors or TV's as well as video projectors. The HDMI input means you can also capture uncompressed, digital video and audio from the latest video cameras which provide HDMI output.

World's highest quality

Multibridge works natively in 4:2:2 for SD and HD, as well as RGB 4:4:4 for HD or 2K digital film resolutions. Also included is the industry's only true 14 bit analog conversion for the highest quality analog video.

Converter or a capture card

When not connected to your computer for editing, Multibridge works as a bi-directional video and audio converter. Only Multibridge is two products in one so it will stay useful, long after the computer you plug it into.

Compatible with all video software

Compatible with QuickTime™ and DirectShow™, Multibridge can use a wide range of video software for video capture and playback in either standard definition, high definition 4:2:2, high definition 4:4:4 RGB, and even 2K digital film resolutions.

Multibridge lets you can customize your system for different tasks simply by selecting the video software you prefer to use. Use Premiere Pro™ or Vegas 8™ for editing, then combine Adobe After Effects™ and Photoshop™ for broadcast design and paint. Then finish your job by using DVD authoring software to give your clients a DVD.

Overview



Getting Started

Multibridge has two main modes which are distinguished by the PCI Express cable being connected to your computer (capture and playback mode) or when not connected (converter mode).

Capture mode

When the PCI Express cable and adapter card are connected to your computer, Multibridge becomes a PCI Express extension to your computer working as a video capture playback card. While independently powered, it's really a part of your system's operating hardware, just as if it was connected internally.

This unique design allows more connector space for a breakout box style solution, while totally eliminating the noise and interference from the computer's digital electronics - so you get clean audio and video, vital when working with precision broadcast quality analog signals.

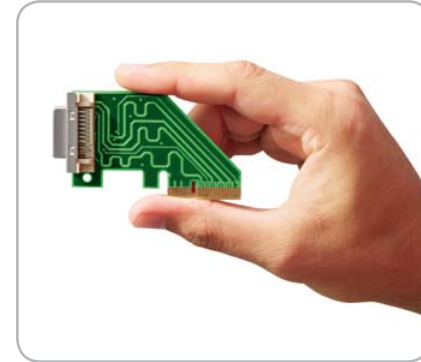
When you connect PCI Express to a host computer, Multibridge uses the same software as used on Blackmagic Design's DeckLink cards, so you get the same software compatibility, and options as a DeckLink card. This means that when used as a capture playback device all settings on Multibridge can be accessed via the DeckLink System Preferences.

Note: Do not remove the power or disconnect the PCI Express cable from the workstation while the workstation is powered on. Power off the workstation before unplugging the Multibridge power, or disconnecting the PCI Express cable. When connected, make sure you tighten the PCI Express lock screws. Also, the PCI Express cable is NOT a DVI cable and only a Blackmagic PCI Express cable should be used.

Converter mode

When the PCI Express connection is NOT connected to a computer, or the computer is connected but turned off, Multibridge instantly switches to a stand alone converter. Multibridge can then be configured via the USB 2.0 connection using the included Multibridge Utility software.

This manual has two sections, the first section describes using Multibridge as a capture and playback device, and the second section describes how to use it as a stand alone converter.



Included 4 lane PCI Express card.



Don't disconnect with computer on.
Be sure to keep lock screws tight.

Installation for Capture and Playback

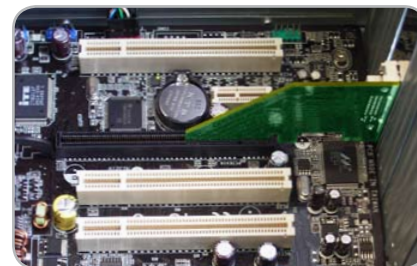
Connecting to your PC

1. Shutdown and remove the power plug from the back of your PC. This is a safety precaution before opening your computer. Ensure that you are statically discharged by using a static strap.
2. Remove the chassis cover of your PC to gain access to the PCI Express slots.
3. Remove your Multibridge PCI Express card from the protective static bag making sure you don't touch the gold connectors on the base of the card. Although there are no electronics on this card, these precautions should be taken when handling any PCI Express card.
4. Find a spare 4 lane, or faster, PCI Express slot within the PC. Remove the metal port access cover and screw, from the back of your PC.
5. Insert your Multibridge PCI Express card and ensure that it clicks firmly into place.
6. Secure the card with the screw and replace the side cover of your PC.
7. Connect the PCI Express cable to the PCI Express card at the rear of the PC and connect the other end of the cable to the PCI Express connector on your Multibridge. Please make sure you connect the cable to the PCI Express connectors, and not the PC display connectors!
8. Connect USB 2.0 cable from host computer to Multibridge.
9. Power up Multibridge first, then reconnect the computer power and start up.

If you want to disconnect your Multibridge, use this sequence:

1. Power off your PC.
2. Power off Multibridge.
3. Disconnect PCI Express cable.

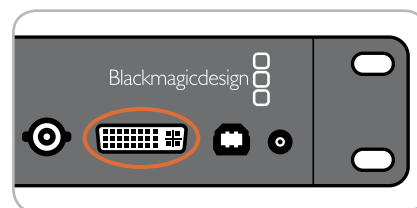
Note: Connecting audio and video cables to the Multibridge can be done at any time while the unit is powered on or off. You can leave the PCI Express card in the computer when the PCI Express cable is disconnected. It will then be ready to reconnect quickly when you need to use Multibridge as a capture and playback device again.



Insert card into PCI Express slot.



Connect PCI Express cable here.



Then connect PCI Express cable here.

Installation for Capture and Playback

Installing the software

Contents

The Multibridge software installer will install the following components for you:

- Blackmagic Multibridge drivers
- Blackmagic Deck Control application
- Blackmagic DeckLink Control Panel
- Blackmagic AVI and QuickTime™ codecs
- Project presets for Adobe Premiere Pro
- Blackmagic DirectShow™ SDK
- Blackmagic Disk Speed Test
- Blackmagic FrameLink
- Multibridge Utility

Multibridge software

1. The CD supplied with the Multibridge contains the Multibridge software. Before you install, ensure you have the very latest driver. Visit www.blackmagic-design.com/support
2. Open the "Multibridge Installer" folder and launch the "Multibridge Installer" application.
3. The drivers will now be installed on your system. A warning will appear that "Windows can't verify the publisher of this driver software" or about "logo certification". Click **Continue Anyway** to ignore this warning.
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 Multibridge drivers. You will then receive another dialog bubble saying "your new hardware is ready for use."
5. Now restart your machine to enable the new software drivers.

Automatic firmware updating

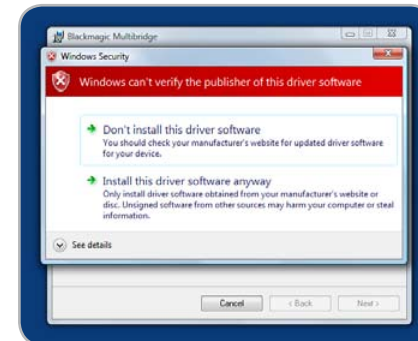
After your computer has restarted, the software will talk to the Multibridge to see what firmware is running in it's hardware. If the firmware is not the same as the Multibridge software requires, you'll be asked to download the correct version. This is automatic, and all you need to do is plug in the USB cable, then click **OK** to start the update. After the firmware updates, shut down your computer and power off the Multibridge. Power on the Multibridge, and then start up the computer.

Programmable firmware let's us release new features and we can also update your Multibridge for greater compatibility with latest third party software tools.

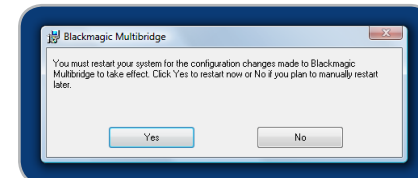
Using for Capture and Playback



Multibridge Setup Wizard.



Click "Continue Anyway".



Restart your PC!

Installation for Capture and Playback

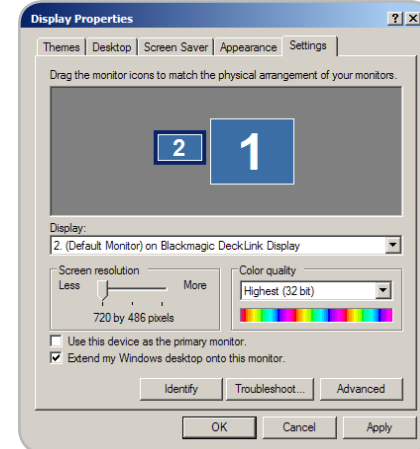
Testing your installation

Testing

To check the installation has been successful on Windows XP™ and Windows Server 2003™

1. Go to the Control Panel and open **Display**. Click on the **Settings** tab. You should see an extra display which represents the extended desktop feature of your Multibridge. The size of the Multibridge display will appear differently to your computer display, and may be in HD or SD resolution. Select the second display.
2. Then tick **Extend my Windows desktop onto this monitor**
3. Go to the Control Panel and open **DeckLink**. Check the SDI, Analog Component, Composite NTSC/PAL, and the HDMI outputs for desktop video.
Note: You won't see any output on the NTSC/PAL outputs if the desktop is set to HD modes.
4. On Multibridge, check channels 1 & 2 on the XLR analog outputs, the RCA audio monitoring outputs, and channels 1 & 2 on the AES outputs for Windows Media Player playback. You should get the same audio out to your deck via channels 1 & 2 on the SDI video connection. The same audio should also be heard on your HDMI monitor speakers.

If this is all working well, you know your Multibridge is working correctly.



Display Properties.

Using Blackmagic Media Express

Blackmagic Media Express is a simple utility for frame-accurate capture and playback with your broadcast tape deck. It uses the RS-422 port on Multibridge and DeckLink hardware to control the deck using the Sony™ RS-422 protocol.

It's great for use with applications such as Adobe After Effects™ and eyeon Fusion™ which do not include their own deck control capabilities.

Blackmagic Media Express supports capture and playback of AVI files in the following Blackmagic formats:

- Uncompressed 10-bit RGB (.avi)
- Uncompressed 10-bit YUV (.avi)
- Uncompressed 8-bit YUV (.avi)
- Compressed Motion JPEG (.avi)

Playback of the following formats is also supported:

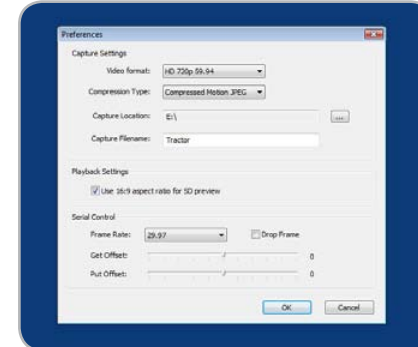
- Windows Media Video (.wmv)
- Blackmagic QuickTime Uncompressed 10-bit RGB (.mov)
- Blackmagic QuickTime Uncompressed 10-bit YUV (.mov)
- Blackmagic QuickTime Uncompressed 8-bit YUV (.mov)

Playback of other video formats is likely to work as long as the relevant codec is present on the computer and the video is in a standard TV resolution and frame rate, eg 720 x 486 at 29.97 fps. Computer resolutions such as 640x480 cannot be used. Audio must use the television standard sample rate of 48Hz and 24 bit.

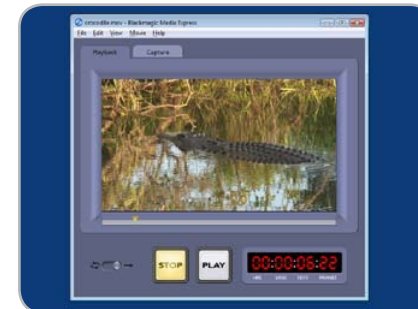
This simple utility can capture or play back one video clip at a time.

Setting Up

1. Go to the Windows Start menu and select **All Programs > Blackmagic Design > DeckLink > Media Express**.
2. Open **Edit > Preferences** and select the desired video format and compression type from the drop down menu.
3. Set your disk array as the Capture Location and enter a Capture Filename to apply to any captured clips or frame grabs.



Media Express preferences.



Media Express interface.

Playback

1. Click on the Playback tab.
2. Select **File > Open Media File** and choose the video file you wish to play back. Alternatively drag the desired video clip directly in to the Playback window. The movie will appear in the Playback window.
3. Click the Play and Stop buttons to start and stop playback. You can also use the standard keys used for video playback to start, stop, play forwards and play backwards at different speeds, i.e. "<spacebar>", "j", "k" and "l" keys.
4. You can also scrub the clip by dragging the playhead along the timeline.

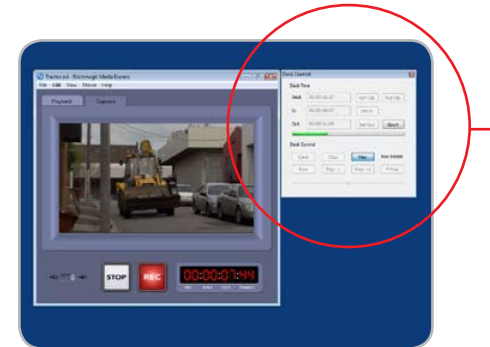
Video playback can be set to loop playback, or play once, by setting the playback switch as desired.

Inserting to Tape

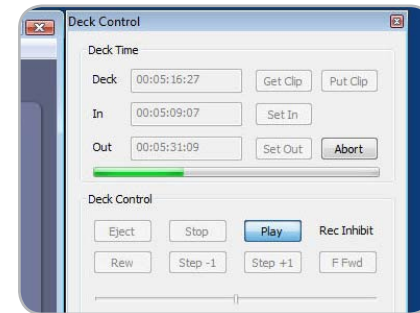
1. Connect an RS-422 cable between the video deck and the Multibridge or DeckLink RS-422 port to ensure that timecode is available.
2. Open the clip that you wish to print to tape.
3. Ensure that the video deck is configured to accept the video format of the clip, e.g. one cannot send a PAL clip to an NTSC-only deck.
3. From the View menu choose Deck Control. The Deck Control window will open.
4. Enter the timecode of the desired in-point. Blackmagic Media Express will use the clip duration to automatically calculate the out point.
5. Click **Put Clip**.

Capturing Clips

1. Click on the Capture tab
2. Connect an RS-422 cable between the video deck and the Multibridge or DeckLink RS-422 port to ensure that timecode is available.
3. Go to the Edit menu and choose Preferences.
4. Configure the capture settings to match the video format and compression type you intend to capture, e.g. HD 1080i 59.94 and Uncompressed 10-bit YUV. Set the capture location. Uncompressed video should always be captured to a disk array.



Media Express "Capturing to Disk"



Deck Control interface.

Using Blackmagic Media Express

There are two ways to capture clips:

A. Record Now

Captures video and audio instantly. (Control-R)

The REC button lights up during capture. Click the STOP button or press the Esc key on your keyboard to stop the capture.

B. Get Clip

Captures frame accurate timecode, video, audio to "in" and "out-points" set by the user.

From the View menu choose Deck Control. The Deck Control window will open.

Connect an RS-422 cable between the video deck and the Multibridge or DeckLink RS-422 port to ensure that timecode is available.

Click the Play and Stop buttons in the Deck Control window to start and stop playback of the video deck. Your video deck will respond to the standard keys used for deck control, i.e. spacebar, "j", "k" and "l" keys. In and Out points can be set using the "i" and "o" keys while playing the tape.

Grab Frame

Captures a frame of video from the video input.

1. Click on the Capture tab
2. Go to the Movie menu and choose Grab Frame As. (Control-G)
3. The frame grab will be captured as a .bmp file.

Using Blackmagic FrameLink

Blackmagic FrameLink™ provides seamless DPX support using uncompressed AVI movies.

The key to understanding FrameLink, is when you mount a movie file with FrameLink it appears as a virtual drive full of DPX frames from the movie. This virtual drive acts as a container for the DPX sequence. Any frames modified will be automatically written back into the movie when the frame is saved.

FrameLink totally eliminates the time wasted using simple movie to image-sequence conversion utilities. FrameLink is great for using software that only supports still frames, or simply open individual media file frames in Photoshop™ for dirt and scratch removal, then save the frames back into the movie file for instant playback. If an audio track is included with the media that you are converting to a DPX sequence, the length of the sequence cannot be modified. To add and remove DPX frames from a sequence, the audio tracks should be removed and restore later in your NLE.

Supported File Formats

Windows AVI and Blackmagic™ uncompressed QuickTime™ files can be used with FrameLink, including 8-bit & 10-bit YUV HD and SD, as well as 10-bit RGB 4:4:4 HD.

Mounting a FrameLink Volume

1. Right click on an AVI file and select **Mount with Blackmagic FrameLink**

The newly mounted drive will appear as next available drive letter. This volume will contain all the frames of the AVI movie in DPX format.

Creating a New Movie from DPX Files

1. Right click on the work area and select **New > Blackmagic FrameLink Movie** and format. (Matching the format of your existing DPX sequence.)

Note: New movie will appear both as a new network drive and as a file.

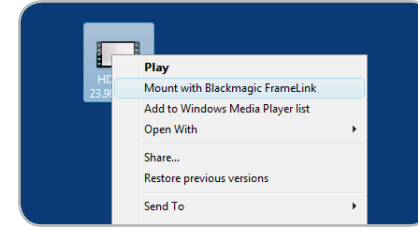
2. Copy the DPX file sequence to the appropriate drive letter.

Note: You can save your DPX files from any application to the FrameLink volume, or simply drag and drop the files into the FrameLink volume.

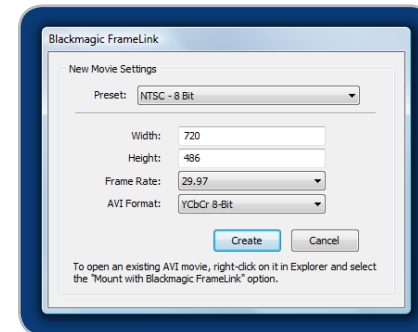
Unmounting a FrameLink Volume

1. Deselect network drive.
2. Right click drive letter and select **Unmount from Blackmagic FrameLink**

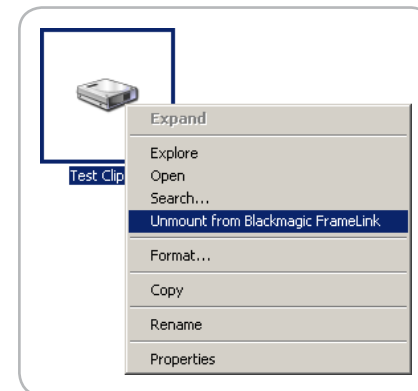
Using for Capture and Playback



Mounting FrameLink volume.



New FrameLink movie.



Unmounting FrameLink volume.

Setting Blackmagic Preferences

Multibridge preferences are located in your Windows™ Control Panel. The following preferences contain options for setting up your Multibridge:

Video & Audio

- DeckLink Video and Audio Connections
- NTSC Setup
- Reference Output Timing
- Video Desktop
- HDTV Up/Down Converter
- Video Output Behavior
- Black Video Output to Deck in Capture

Gamma

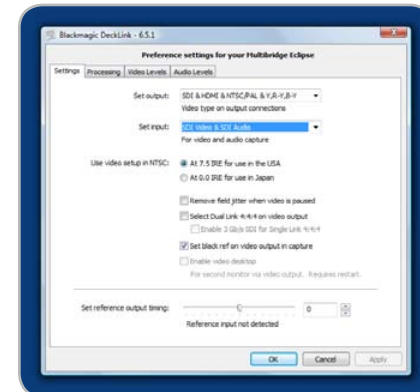
- Settings for applying gamma tables for RGB 444 capture.

VANC and 3:2 Pulldown

- 3:2 Pulldown Removal VITC Reader A Frame
- Preserve Video Blanking (VANC) Data Lines in Lines 1, 2 and 3 of Video file



Control Panel.



Multibridge Control Panel.

Setting Blackmagic Preferences

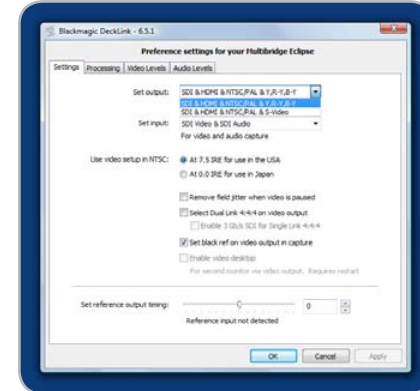
DeckLink video and audio output connections

All of the video and audio outputs of MultibrIDGE are active all of the time and the only choice you need to make is whether you wish to output S-Video or component (Y,R-Y,B-Y) analog video as they use shared connectors. The SDI, HDMI and component (Y,R-Y,B-Y) analog video outputs support HD and SD video. S-Video and composite analog video do not support high definition video and so you will not see video on these outputs when working with HD video.

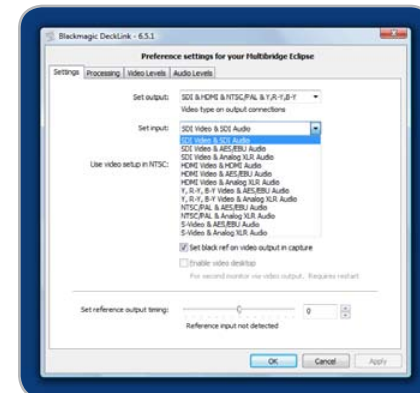
DeckLink video and audio input connections

The following combinations are available:

- SDI Video & SDI Audio
- SDI Video & AES/EBU Audio
- SDI Video & Analog XLR Audio
- HDMI Video & HDMI Audio
- HDMI Video & AES/EBU Audio
- HDMI Video & Analog XLR Audio
- Y, R-Y, B-Y Video & AES/EBU Audio
- Y, R-Y, B-Y Video & Analog XLR Audio
- NTSC/PAL & AES/EBU Audio
- NTSC/PAL & Analog XLR Audio
- S-Video & AES/EBU Audio
- S-Video & Analog XLR Audio



Video and Audio Output Connections.



Video and Audio Input Connections.

Setting Blackmagic Preferences

Reference Output Timing

Genlock, also known as black burst, reference or house sync is used to lock various equipment in your facility to the same timing point. When two or more video devices are connected to the same sync signal, their video signals can be switched without jumping or rolling. This is critical when connecting equipment in large post production facilities and broadcast stations.

To change video to reference timing:

1. Go to the **Control Panel** and select **DeckLink**
2. Select the **Settings** tab and adjust the **Set reference output timing** for timed output until the picture locks and is no longer rolling on the display.

HDTV Up/Down Conversion

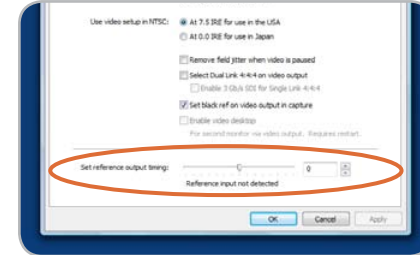
The Windows™ software drivers included with Multibridge, can be used to downconvert high definition to NTSC or PAL video in real time during capture or playback.

Output

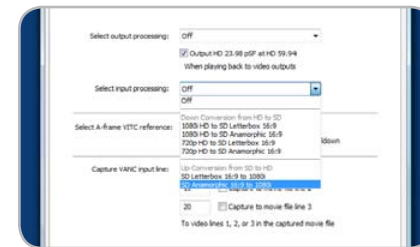
- 1080 HD to SD Letter box 16:9
- 1080 HD to SD Anamorphic 16:9
- 720 HD to 1080 HD

Input

- 1080 HD to SD letterbox 16:9
- 1080 HD to SD Anamorphic 16:9
- 720 HD to SD Letterbox 16:9
- 720 HD to SD Anamorphic 16:9



Genlock preferences.



Input Processing.

Lookup Tables (LUT's) in Multibridge for Windows

Multibridge Eclipse and Multibridge Pro can use 1D or 3D LUT's during playback. Lookup tables can be used for standard definition and high definition video as well as 2K film. Lookup tables are not implemented in standalone convertor mode.

1D LUT's are useful for altering the brightness of an image but do not affect color. They are often used when working with log video so that the image can be displayed on screen as normal linear video. Built-in 1D LUT's are provided for log to linear conversion when capturing from Panasonic Cinegamma™ and Viper Filmstream™ cameras.

3D LUT's provide the ability to increase and decrease the amount of color in each color channel, independently from brightness. This allows for precise color grading to ensure a video monitor matches the color printed to tape or film.

How to use Lookup Tables in Multibridge

When the DeckLink control panel is opened to access the DeckLink lookup table settings, your broadcast monitor will usually stop showing any video being played and instead will show black or an extended desktop. It is possible to replace this, with the last played frame of video, so that adjustments to lookup tables can immediately be seen on the frame of video.

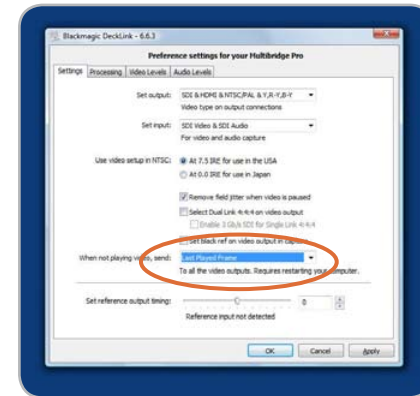
To use this feature, open the DeckLink control panel. Under the Settings tab, look for, "When not playing video, send ..." This setting is usually set to Black but might be set to Extended Desktop if using Windows XP. Switch it to "Last Played Frame" and then restart the computer.

After the computer has restarted, use your preferred video software application to play some video and then open the DeckLink control panel. The last played frame of video should remain on your broadcast monitor. Click on the Processing tab within the DeckLink control panel. A Lookup Table button is available for output processing and can be used even when all other processing functions are set to "Off". Click on the Lookup Table button and then activate the Enable Lookup Tables checkbox.

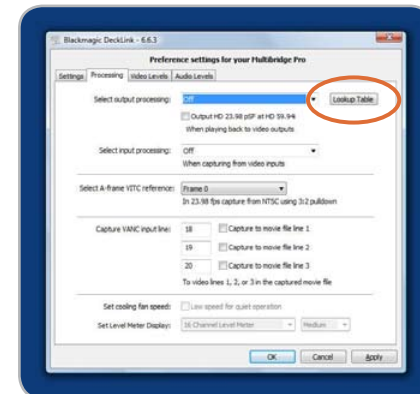
The lookup table interface in Multibridge can be adjusted using a method similar to that used for image adjustment with the Curves feature in Adobe Photoshop™. The horizontal axis of each graph represents the original color input values and the vertical axis represents the new colour output values. When first opened, each lookup table displays a straight diagonal line because the color values have not yet been changed.

Changes made to the lookup tables can immediately be seen on all SDI, analog and HDMI outputs of the Multibridge. Changes are saved to the DeckLink preferences by clicking the OK button. Lookup tables can be reset to original values by clicking the Reset Unity button. Lookup table processing can be disabled by deselecting the Enable Lookup Tables checkbox for output Lookup Tables.

Using for Capture and Playback



Enable Last Played Frame.



Click on the Lookup Table button.

Importing and exporting 3D LUT's

Multibridge Eclipse and Multibridge Pro support the popular Autodesk .3dl, IRIDAS .itx and IRIDAS .cube lookup table formats when importing 3D LUT's.

3D LUT's can also be exported from Multibridge Eclipse and Multibridge Pro in the .cube format. Multibridge uses the .cube format to store 3D LUT's internally as this is a most memory efficient way to store complex lookup tables. Both 3D LUT's created with curves in the lookup table interface, and 3D LUT's imported from .3dl, .itx and .cube files, are exported from Multibridge in the .cube format.

The .cube file format is fully compatible with the following Blackmagic Design products which share the same LUT format: Multibridge Eclipse, Multibridge Pro (October 2007 model) and HDLink Pro.

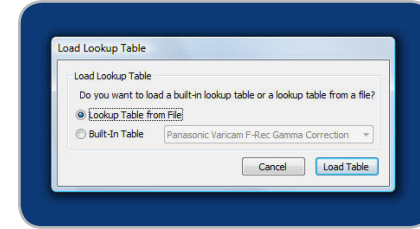
Importing and exporting 1D LUT's

Multibridge Eclipse and Multibridge Pro can import 1D LUT's. The 1D file format is any tab-delimited text file with red, green and blue values for each record and the first line (title line) is skipped. Lookup tables need to be 1024 records long with the first line reserved for the title line. A file named "HDLink Example 1D Lookup Table.txt" is included on the installer disk.

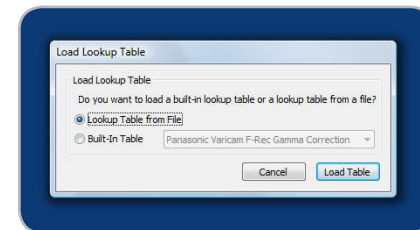
1D LUT's can also be exported from Multibridge Eclipse and Multibridge Pro in the same text format mentioned above. Both 1D LUT's created with the curves in the lookup table interface, and 1D LUT's imported from text files, are exported from Multibridge in the same text format.

The 1D LUT text file format is fully compatible with the following Blackmagic Design products which share the same LUT format: Multibridge Eclipse, Multibridge Pro (October 2007 model), Multibridge Extreme (DVI output), HDLink Pro, HDLink and DeckLink HD Pro 4:4:4 (PCI-X).

1D LUT's can also be exported in the .cube 3D LUT format for use in 3D coloring applications.



Load Lookup Table from File.



Load Built-In Lookup Table.



Lookup Table interface.

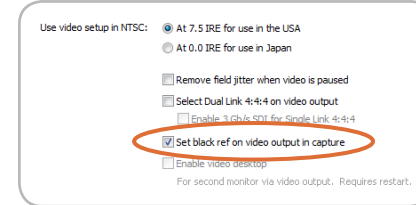
Setting Blackmagic Preferences

Black Video Output

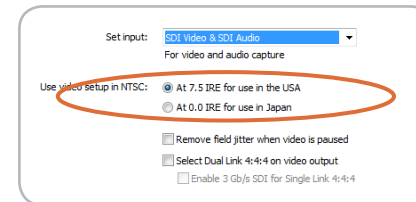
This setting allows Multibridge to output a stable black signal on one video output, while outputting video on the other output. Black Video Output is used for video referencing a deck when you don't have a sync generator available. This allows the stable black video output to connect to the deck, and then by setting the deck to "input reference" you can operate without a sync generator. If you're not using this mode, disable this setting to enable audio monitoring during capture.

NTSC setup

The NTSC composite video used in the USA, and some other countries uses 7.5% setup. However setup is only used in composite video, but is never used in SDI video. Your Multibridge will handle adding and removing setup from NTSC video automatically for you. The USA and countries that use 7.5% setup should enable this setting; if you're working in Japan and countries that don't use this setup, leave this set to 0 IRE setup. The PAL and high definition standards do not use this setup.



Black Video Output.



NTSC Setup.

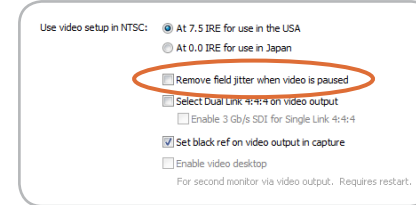
Setting Blackmagic Preferences

Video Output Behavior

Remove Filter Jitter

“Remove field jitter when video is paused” allows Multibridge to display only a single field when paused, while turning this mode off will display a complete frame in pause. Single field is similar to how Betacam SP decks work when paused, eliminating field flicker from paused images.

If you’re doing work without interlaced video, such as animation, then you can turn this mode off so you can see both fields in full resolution for best quality. Regardless of this setting, you always get the correct full frame dual field output when in playback mode, as this setting only effects paused video.



Video Output Behavior.

Setting Blackmagic Preferences

Preserving Blanking Data or VANC

This feature lets you use up to 3 video lines at the top of a captured AVI or QuickTime™ movie file to store any 3 lines from vertical blanking. This allows 3 line timecode, VITC (vertical interval test signals) subtitle info or any other VANC data to be preserved during capture. These lines are then inserted back into the video blanking when the file is played back.

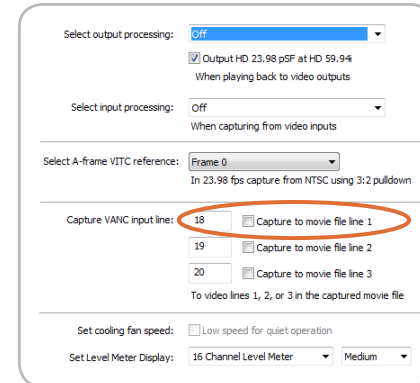
To preserve VANC data:

1. Go to **Control Panel** and select **DeckLink**
2. Select the **VANC and 3:2 Pulldown** tab and tick the **On** check box for video line 1, 2 or 3 depending on how many blanking lines you want to capture.

Note: Video file line 1 needs to be enabled for lines 2 and 3 to work.

Because these lines can be passed to the application, a developer could write software to read the VANC data and use it for various purposes, e.g. 3-line timecode and audio chasing, or other uses.

An example of VANC data is 3-line timecode, which uses lines 18, 19, and 20 in NTSC or lines 19, 20 and 21 in PAL. 3-line timecode, as used in AATON™ equipped telecine suites, featuring audio timecode and keycode information along with the normal timecode numbers.



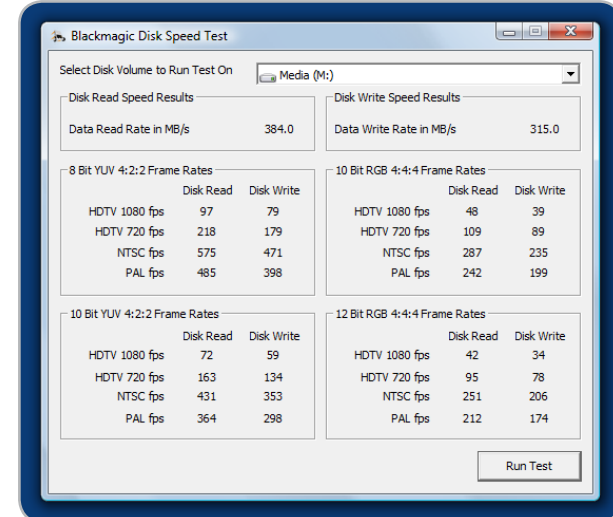
VANC preferences.

Blackmagic Disk Speed Test

If you want to check your disk array speed, Blackmagic Disk Speed Test can be run to check the array speed, and to provide the results in video frame rates. This makes it much easier to understand how various disk arrays will handle video capture and playback at various video resolutions and frame rates.

Disk Speed Test provides more accurate results for large disk arrays, as often the manufacturer provided speed results only check small data blocks; so you only get an indication of the cache speed of the disk and not the sustained data rate of the disk. Video uses sustained data rates and only Disk Speed Test provides a long burst of data for more accurate results.

When using Disk Speed Test, you need to account for disk seeking, so it's best to add a healthy margin to the results. If a disk array tests at 32 frames per second HD 1080, it doesn't mean you can do 29.95 HD capture and playback, as the margin is too tight. However it should do 24 fps ok.



Blackmagic Disk Speed Test window showing results for Media (M:).

Disk Read Speed Results		
Data Read Rate in MB/s	384.0	

Disk Write Speed Results		
Data Write Rate in MB/s	315.0	

8 Bit YUV 4:2:2 Frame Rates		
	Disk Read	Disk Write
HDTV 1080 fps	97	79
HDTV 720 fps	218	179
NTSC fps	575	471
PAL fps	485	398

10 Bit RGB 4:4:4 Frame Rates		
	Disk Read	Disk Write
HDTV 1080 fps	48	39
HDTV 720 fps	109	89
NTSC fps	287	235
PAL fps	242	199

10 Bit YUV 4:2:2 Frame Rates		
	Disk Read	Disk Write
HDTV 1080 fps	72	59
HDTV 720 fps	163	134
NTSC fps	431	353
PAL fps	364	298

12 Bit RGB 4:4:4 Frame Rates		
	Disk Read	Disk Write
HDTV 1080 fps	42	34
HDTV 720 fps	95	78
NTSC fps	251	206
PAL fps	212	174

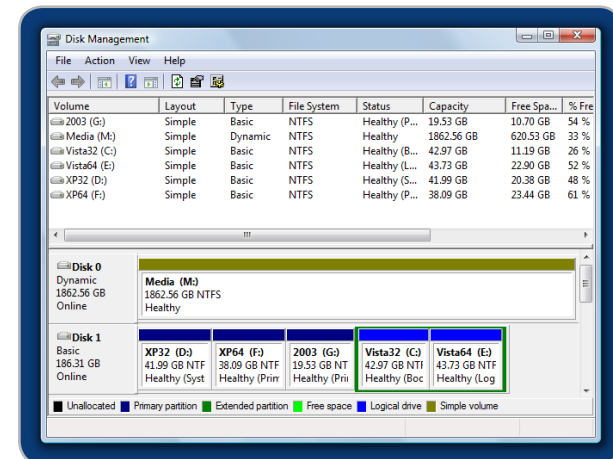
Run Test

Disk Speed RAID results after testing a disk array.

Disk arrays

If you intend to run your disk array as a software stripe, you will need to make sure that 'host RAID' is disabled. Use the "Disk Management" tool in "Computer Management" within Windows™ to set up your software RAID, or refer to third party instructions when using pre-configured hardware RAID.

Further information can be obtained via the Windows™ Help and Support. Search and review the section on "Dynamic Disks". This section will provide you with information on how to convert a basic disk to dynamic disk and configuration steps on striping your disk array.



Disk Management window showing disk configuration.

Volume	Layout	Type	File System	Status	Capacity	Free Space	% Free
2003 (G:)	Simple	Basic	NTFS	Healthy (P...)	19.53 GB	10.70 GB	54 %
Media (M:)	Simple	Dynamic	NTFS	Healthy	1862.56 GB	620.53 GB	33 %
Vista32 (C:)	Simple	Basic	NTFS	Healthy (B...)	42.97 GB	11.19 GB	26 %
Vista64 (E:)	Simple	Basic	NTFS	Healthy (L...)	43.73 GB	22.90 GB	52 %
XP32 (D:)	Simple	Basic	NTFS	Healthy (S...)	41.99 GB	20.38 GB	48 %
XP64 (F:)	Simple	Basic	NTFS	Healthy (P...)	38.09 GB	23.44 GB	61 %

Disk 0: Dynamic, 1862.56 GB, Online. Media (M:) 1862.56 GB NTFS, Healthy.

Disk 1: Basic, 186.31 GB, Online. XP32 (D:) 41.99 GB NTF, Healthy (Syst); XP64 (F:) 38.09 GB NTF, Healthy (Pri); 2003 (G:) 19.53 GB NT, Healthy (Pri); Vista32 (C:) 42.97 GB NT, Healthy (Boc); Vista64 (E:) 43.73 GB NTF, Healthy (Log).

Legend: Unallocated, Primary partition, Extended partition, Free space, Logical drive, Simple volume.

Disk Management.

Third Party Applications

Adobe Premiere Pro

Adobe Premiere Pro™ is a powerful real-time video and audio non-linear editing application. Full presets for Premiere Pro are included with Multibridge and will have been automatically loaded into your system during the installation process. Premiere Pro must be installed on your system before running the Multibridge installer.

Setting Up

1. Launch Premiere Pro.
2. Open a **New Project**
3. Select the appropriate Blackmagic preset for your project. e.g. **NTSC**, **PAL**, **HDTV** or **2K**.
4. Type the name of your project.
5. Select your disk array as the location for your media and click **OK**

Playback

As a quick test to make sure everything is connected correctly, use the Premiere Pro test media (bars and tone). Copy a test clip, which matches the format of your project to your disk array e.g. NTSC 8 bit. Take your media from within your Premiere Pro project and drop it into the timeline. You should now see the image on both your computer desktop and your Multibridge output. If you can't see any video on your Multibridge output, check the connections again and ensure you have the correct output settings configured in both the Multibridge and Displays control panels. SDI, HDMI and analog outputs are always active.

Capture

To capture choose: **File > Capture** (F5)

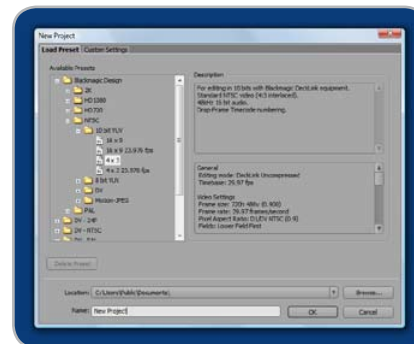
To immediately capture, click the red record button [G]. If you wish to log the clip, enter the desired "In and Out points" using either the "In" and "Out" buttons, or manually, by typing in the timecode and clicking "Log". The empty clip will now appear in the bin window. Repeat this until you have logged all of the clips you wish to batch capture.

Batch Capture

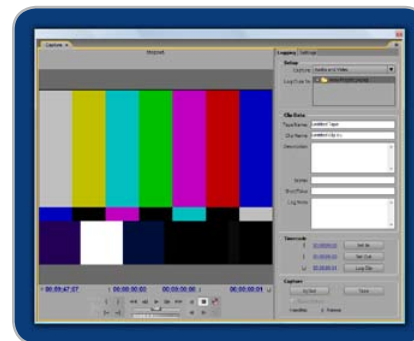
Select the clips you wish to capture by drag selecting or shift/click each clip. Then go to and choose: **File > Batch Capture**. To set handles on the clips go to the batch capture window menu and type the number of additional frames you require at the start and end of each clip.



Adobe Premiere Pro.



New Project.



Capture.

Adobe Premiere Pro

Audio

Multibridge features support for ASIO audio output drivers. This allows Premiere Pro to use Multibridge as an ASIO audio output device. When you first start your Premiere Pro project, make sure you select DeckLink Audio. This can be configured through **Edit > Preferences > Audio Hardware**

You can also select the mix of the multi-channel audio from the Audio Output Mapping menu.

Export to Tape

To export to tape, select the sequence you require **File > Export > Export to Tape**

Insert editing requires an unbroken timecode over the full length of the project you're laying to tape. This is referred to as "blackening the tape".

In **assemble mode** the tape needs only to be "blackened" until a point just beyond the start time of the project. As **assemble editing** erases the tape ahead of the record heads, it should not be used where other projects already exist on the tape after the out point of your edit.

When editing to tape, the software waits at the first frame of your program for the deck to drop into record at the predetermined timecode. At that exact moment, the program begins to play and the edit is completed. Should you find that either the first frame of your program is repeated or lost during the edit to tape procedure you will need to adjust the playback offset to bring the deck and your computer into sync. You should only need to do this once with any combination of deck and computer – and the setting will then stay correct.

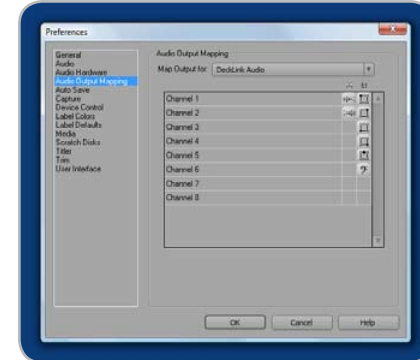
Now, simply enter the desired in point and offsets if required, and click **OK**

Device Control

Selection of the Serial Device Control is configured via:

Edit > Preferences > Device Control

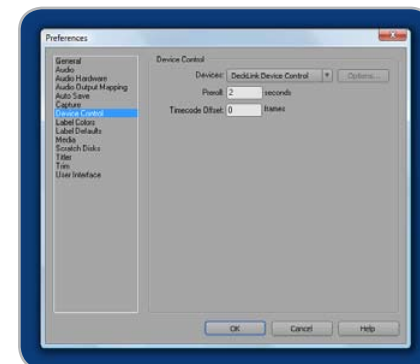
Set the Device Control to **DeckLink Device Control**. The Options button is disabled as these settings are automatically detected and configured when you choose DeckLink Device Control.



Audio Output Mapping.



Export to Tape.



Device Control.

Third Party Applications

Adobe After Effects

It's very easy to setup playback and rendering in Adobe After Effects™ for a complete broadcast and design workstation that connects direct to decks for capture and playback of clips. Multibridge also supports real time preview while working on your compositions.

First, open Adobe After Effects™ and select the television standard frame size and frame rate you wish to work with.

How to use Multibridge as a Preview Output Frame Buffer

To allow your Adobe After Effects™ composition to be displayed in real-time from your Multibridge, go to **Edit > Preferences > Video Preview**. Set the Output Device to **Blackmagic Video Output** and then select the desired Blackmagic RGB output mode. This lets you view your Adobe After Effects™ compositions in video colorspace on your broadcast monitor as you work. This means 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.

Create a New Composition

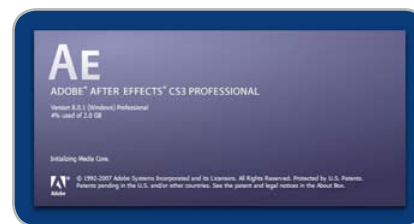
Go to the "Composition" menu and select **Composition > New Composition** (Control + n) In the dialogue box, select an appropriate television standard from the pulldown menu. Click **OK**

- For NTSC 720 x 486, select lower field first
- For PAL 720 x 576, select upper field first for uncompressed video
- For PAL DV, select lower field first
- For HD 1080i select 1920 x 1080, select upper field first
- For HD 1080 PsF select 1920 x 1080, select No Fields
- For HD 720p select 1280 x 720, select No Fields

Rendering

When you have completed your composition, you will need to render to a pixel format supported by Multibridge. Below is a list of supported codecs:

- Blackmagic QuickTime™ RGB (10 bit uncompressed)
- Blackmagic QuickTime™ (10 bit uncompressed)
- Blackmagic QuickTime™ (8 bit uncompressed)
- Apple QuickTime™ PhotoJPEG (compressed)
- Apple QuickTime™ DV - NTSC (compressed)
- Apple QuickTime™ DV - PAL (compressed)



Adobe After Effects.



Video Preview preferences.

Third Party Applications

Adobe Photoshop

Multibridge includes Adobe Photoshop™ plug-ins, so you can directly capture and output still frames from within the Photoshop™ application itself.

If you're working with 10 bit HD/SD-SDI, you can even import and export 16 bit Photoshop™ images for full quality. Use Multibridge keying to export and key graphics from the video input using Photoshop™ alpha channels.

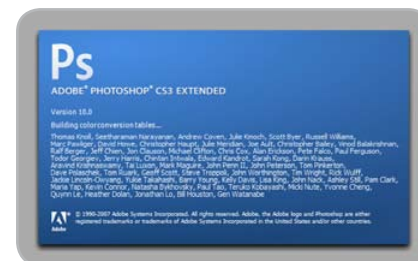
Import an image into Photoshop

1. From Photoshop select **File > Import > Blackmagic Image Capture**
2. Select the "Video Input Format" and the "Image Bit Depth" and select **Capture Image**.

Export an image from Photoshop

1. Select **File > Export > Blackmagic Image Export**
2. Select **Video Output Format** and then **Output Image**.

Note: Once you have set the options in the "Export" window, each subsequent Export will not display the window so you can output frames much faster. However, if you would like to change your export formats, hold the **Ctrl** key when selecting export.



Adobe Photoshop.

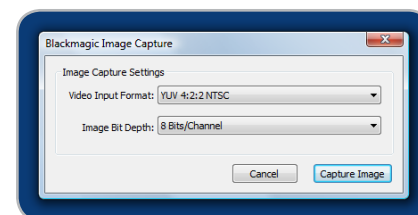


Image Capture.

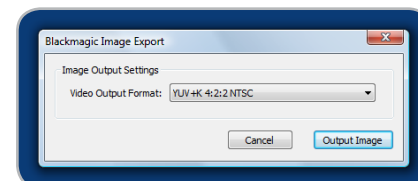


Image Export.

Uncompressed data rates for capture and playback

The data rates for uncompressed video are quite high, and listed below are minimum recommended disk requirements for uncompressed standard definition and high definition video.

Uncompressed 10 bit YUV (4:2:2)			
Standard Definition			
Frame Size	MB per second	MB per minute	GB per hour
720x486/29.97fps	27	1 600	94
720x576/25fps	26	1 582	93
High Definition			
1280x720p/60fps	141	8 438	494
1920x1080/24PsF	127	7 594	445
1920x1080/50i	132	7 910	463
1920x1080/60i	158	9 482	556
Uncompressed 10 bit RGB (4:4:4)			
High Definition			
1280x720p/60fps	211	12 656	742
1920x1080/24PsF	190	11 391	667
1920x1080/50i	198	11 865	695
1920x1080/60i	237	14 238	834

Due to disk seeks, when calculating the data rates required for your disk system, it is a good idea to add a safety margin due to fluctuations in disk speed. Disk speeds can be increased by adding more disks.

Serial ATA (SATA) disks can reduce to half their speed as they become full, so in a 2-disk SATA array you should aim for a 100% safety margin. In an 8-disk SATA array, a 30% safety margin should be adequate. SCSI disk arrays seem to display less fluctuation and so a 20% safety margin should be adequate for an 8-disk SCSI array. Generally the more disks in the array, the better.

Note: Although other vendors and third parties may provide different data rates for uncompressed video, the above recommendations are tested for use with Multibridge.

Troubleshooting Video Capture and Playback

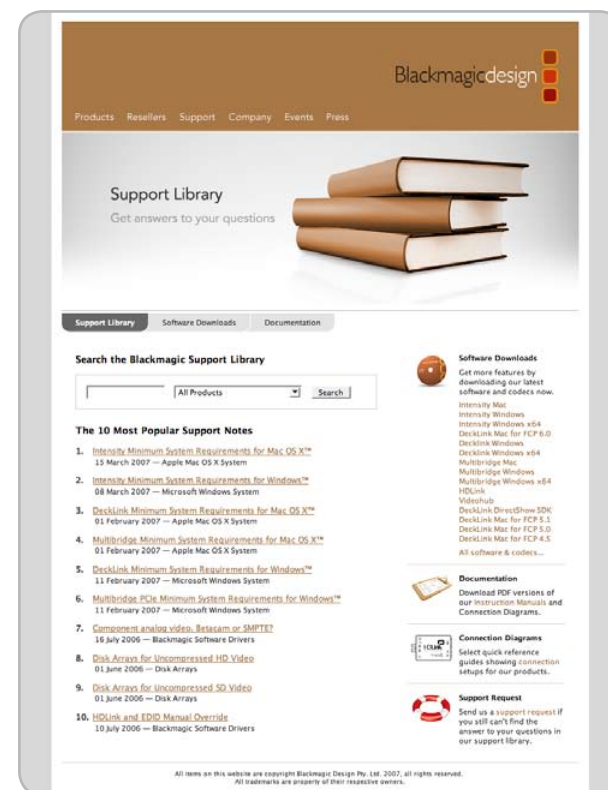
Using your Multibridge as a capture and playback solution when connected to a computer is exciting, but also complex due to the huge range of different software applications. Video data rates are also very high, so the disk array you use for video storage can have a big impact on your system's performance.

Information about a wide range of disk array solutions and compatible application software would be outside the scope of this manual, however there are three ways to get more information.

There are four steps to getting help.

1. Check out the Blackmagic Design website www.blackmagic-design.com/support for the latest support information. We have a huge number of technical notes covering all the common questions we are asked.
2. Call your reseller. Your reseller will have the latest technical updates from Blackmagic Design and should be able to give you immediate assistance. We also recommend you check out the support options your dealer offers as they can arrange various support plans based on your workflow requirements. Your reseller will also understand your disk array configuration, and as disk array problems account for around 90% of support questions with NLE systems, your reseller or disk array vendor will be able to provide expert help.
3. The next option is to email us with your questions using the web form at <http://www.blackmagic-design.com/support/contact>
4. Phone support in North America is available on +1 408 954 0500

Note: Please provide us with as much information as possible regarding your technical problem and system specifications so that we may try to reproduce your problem quickly. Also please let us know how to reproduce any problem you're having, so we can try it on our test systems before replying to your email.



Installation as a Converter

Multibridge operates as an independent converter when not connected to a computer via PCI Express, or when the computer is connected but turned off.

All that's required for converter operation, is for there to be no PCI Express connection. The default settings allow SDI to analog conversion while simultaneously converting analog into SDI with both audio and video.

These defaults can be changed to various combinations of conversion options, and you can choose which SDI audio pair are de-embedded or embedded into various audio connections on the converter.

Requirements

Supported systems

- Windows XP™
- Windows XP™ x64
- Windows Server 2003™
- Windows Server 2003™ x64
- Windows Vista™ Ultimate
- Windows Vista™ Ultimate 64-bit Edition
- USB 1.1 and USB 2.0

Environment

1. The intended use is for commercial and industrial controlled environments.
2. The unit should not be exposed to extreme environments including moisture, dirt, heat or light.

For installation in an OBV (outside broadcast vehicle) the unit should be rack-mounted to avoid extended periods of vibration.

Note: Power connectors are located at the rear of the unit.

Warning

Do not disconnect power or USB cables while firmware is being updated. It is vital the firmware update process is completed without malfunction. Stable operating conditions should be maintained to guarantee usability.

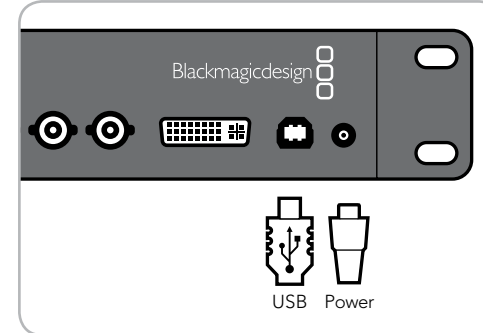
Solid copper-core HD-SDI cables will work reliably over 300 feet or 100 meters. Cables should be shielded and installed away from power supplies, generators or other potential EMF sources.

Installation procedure

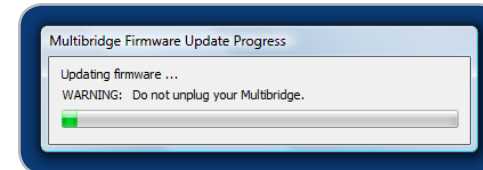
1. Install Multibridge software package.
 - This can be downloaded from www.blackmagic-design.com/support
 - Reboot after installation.
2. Start Multibridge Utility by clicking on the Multibridge Utility icon.
Start > All Programs > Blackmagic Design > Multibridge > Multibridge Utility
3. Connect power and USB cables. Multibridge will be detected by the computer.
4. A system message may appear requesting that you update firmware.
 - Select **Update Firmware** (This can take a couple of minutes.)
 - Once complete, disconnect the power.
 - Wait 5 seconds and then reconnect.

Note: If the message does not appear, your firmware is already up to date.

5. The menus of the Multibridge Utility should now be accessible and you should now be able to modify the settings. If you find any menus are grayed out and inaccessible, it may be that the menu is not relevant to the current workflow and has been automatically grayed out. If all menus are grayed out, you may need to download a newer version of the Multibridge Utility. Alternatively, the computer may not be connected to Multibridge via USB. Sometimes older USB 1.1 cables don't work well with USB 2.0 connections and it is better to use a well shielded USB cable.



Connect USB and power cables.

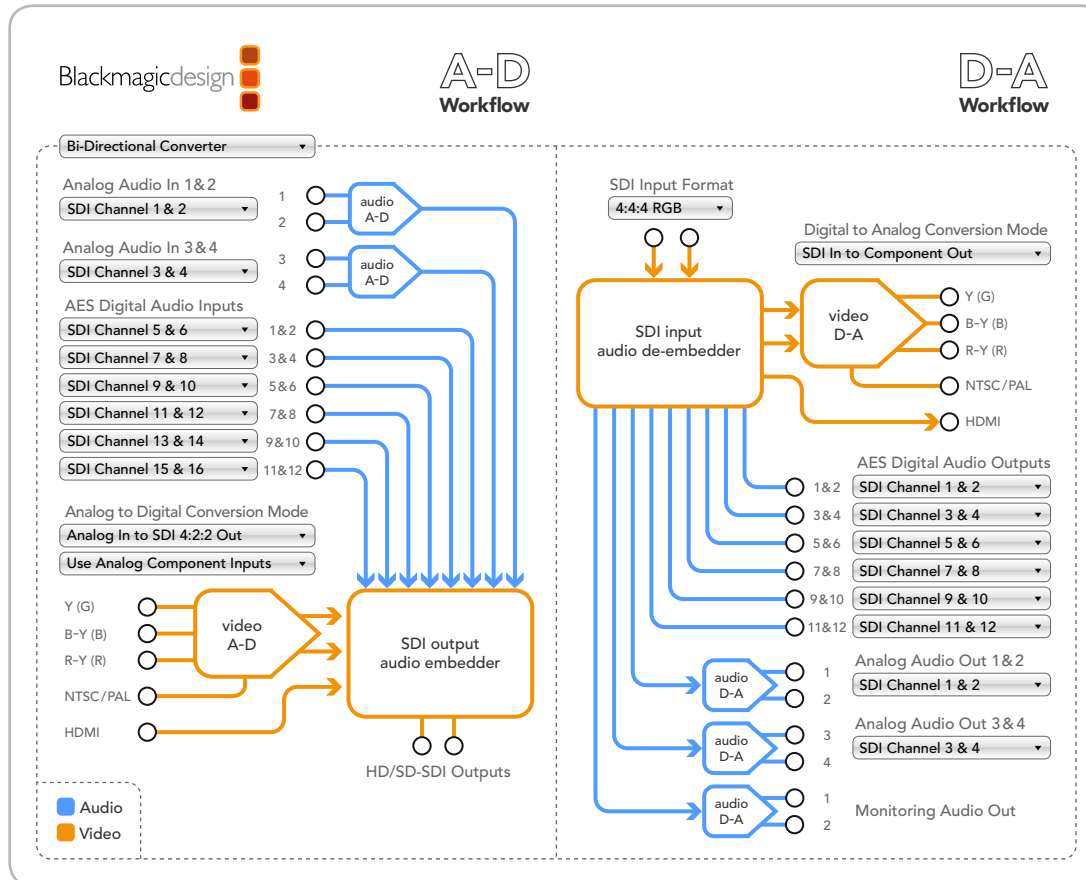


Updating firmware.

Interfaces

Workflow View

Workflow View enables users to graphically configure and depict analog-to-digital, digital-to-analog and digital-to-digital workflows.



Workflow example 1 – Connecting analog deck to SDI system

This workflow example shows how to connect a Sony Betacam SP™ deck in and out, via Multibridge for connection to an SDI based system. You can place Multibridge right next to your analog deck to “turn it into an SDI digital device” in your system, or on your routing switcher.

To begin, power on Multibridge and launch Multibridge Utility software.

Analog to digital connections

1. Connect Betacam SP analog audio out to XLR inputs 1 and 2 on your Multibridge. From the pull down menus within the Multibridge Utility select:

Analog Audio In 1 & 2 > SDI Channel 1 & 2

You may be prompted to “Embed this input” if another audio source was previously configured to embed to SDI channels 1 & 2.

2. Connect Betacam SP Y,B-Y,R-Y out to Analog Y-B-Y,R-Y Multibridge Video In. From the pull down menus in the Multibridge Utility select:

Analog to Digital Conversion Mode > Use Analog Component Inputs

Digital to analog connections

4. Connect Multibridge analog audio out to XLR inputs 1 and 2 inputs on your Betacam SP deck. From the pull down menus within the Multibridge Utility select:

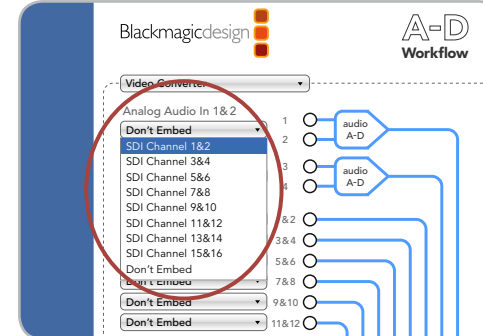
SDI Channel 1 & 2 > Analog Audio Out 1 & 2

5. Connect the Multibridge Y,B-Y,R-Y out to Analog Y-B-Y,R-Y Betacam SP video In. From the pull down menus in the Multibridge Utility select:

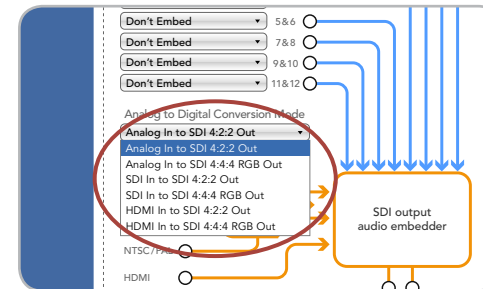
Digital to Analog Conversion Mode > SDI Input to YUV Analog Output

To store this profile for later recall, select **New Profile** from the “Profiles” menu and enter a name. You can save various profiles to make setting up Multibridge faster in the future.

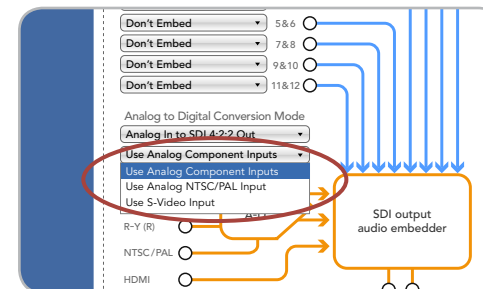
After configuring Multibridge to these settings, you will now be using Multibridge as a bi-directional converter, converting the audio and the video in and out of the Betacam SP™ deck. The deck can be directly connected into SDI based television systems and can be patched or routed into any other SDI based device.



Select “SDI Channel 1&2”.



Select “Analog In to SDI 4:2:2 Out”.



Select “Use Analog Component Inputs”.

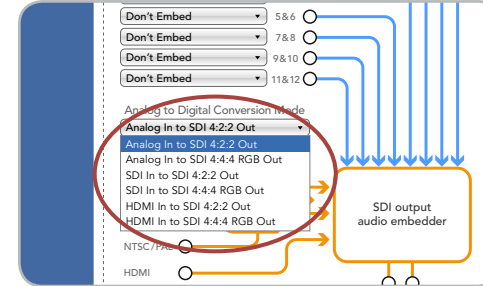
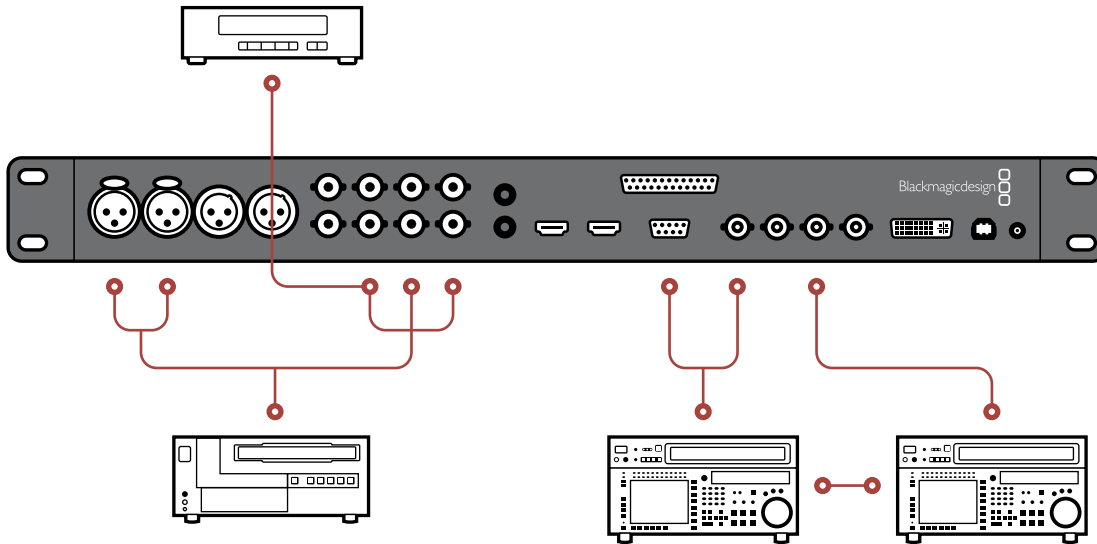
Workflow example 2 – Multiple sources to a Multibridge

Destination: SDI capture device.

Scenario – A Video Editor has three sources for video material. A Betacam SP™ (Analog), Digital Betacam™ (SDI) and a television tuner receiver (composite). Using the Multibridge, the SDI capture device is now able to capture video and audio from these varied sources.

1. Connect the Digital Betacam SDI output to the SDI Input on your Multibridge.
2. Connect the Betacam SP component output to the component input on your Multibridge.
3. Connect the television tuner receiver's composite output to composite input on your Multibridge.
4. Connect the SDI Input on your SDI capture device to the SDI Output on your Multibridge.
5. From the Multibridge Utility select:

Analog to Digital Conversion Mode > Choose the "From input" to route source

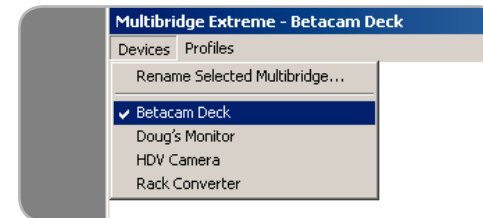
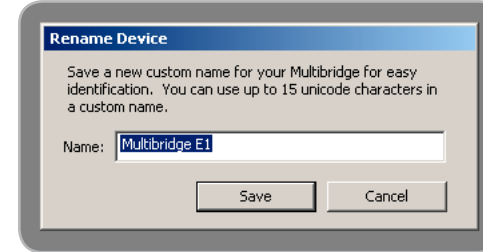


Select "Analog In to SDI 4:2:2 Out".

Device names

Device Names provide a naming convention for identifying Multibridges. Multibridge Utility can connect to many different types of Multibridge models on a single USB connection. Using the custom name, you can set names to make sure you select the correct unit when changing settings in complex systems.

Names can be in Unicode, so you can use non Roman character sets such as Japanese, Chinese, Korean, Thai, Arabic and many more.



Stored custom profiles

Profiles are a simple way of managing your configuration settings.

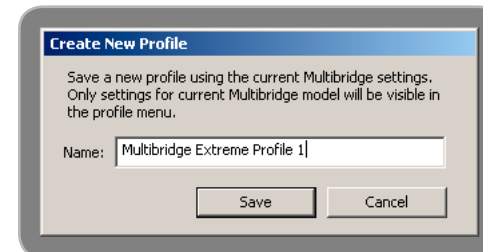
Once you have a configuration you wish to store, select:

Profiles > New Profiles > Enter a name of profile

The profile is now stored.

Once you have selected a profile, it remains in memory as the profile to be used. If the power is removed the current settings will be restored at power up.

You can save a profile any time you would like to change settings and want to restore a known setting state or when you want to use Multibridge for different tasks in your facility, and settings can be restored quickly.

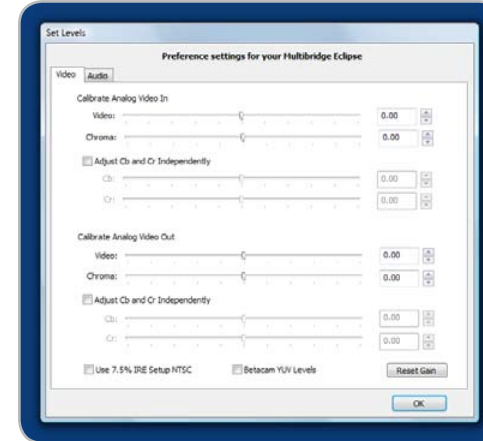


Video Levels

Although Multibridge's 14 bit analog outputs are automatically voltage calibrated at power on, by selecting **Set video Levels** you will be able to configure and adjust the output of your Multibridge to suit your equipment. This can be useful when you need to compensate for cable length to equipment connected to the Multibridge analog outputs.

Analog output sliders will allow individual color bias adjustment. Analog input settings are not currently provided as they are automatically calibrated. This will change if requested by customers.

Please consult the user manuals of your decks and monitors before configuring these options.



Supported Connection Formats

Video

- SD/HD-SDI 4:2:2, Dual link HD-SDI 4:4:4, 3 Gb/s SDI 4:4:4 input and outputs
- Analog HD or SD, YUV or RGB, Component video input and output
- S-Video input and output
- Composite NTSC or PAL input and output
- HDMI input and output

HD Format support:

- 2K 2048 x 1556 at 23.98 and 24fps
- 1080 lines at 23.98PsF, 24PsF, 50i, 59.94i and 60i
- 720 lines at 50p, 59.94p, 60p and VariCam

SD Format support:

- 565/60(NTSC) and 625/50(PAL)

SDI Compliance:

- SMPTE 292M, SMPTE 372M, SMPTE 259M, SMPTE 296M and ITU-R BT.656

Color Space support:

- 4:2:2 YUV and 4:4:4 RGB

Audio

Multibridge Eclipse

- 4 XLR balanced analog inputs and outputs
- 2 Analog RCA outputs for monitoring
- 12 AES/EBU digital audio inputs and outputs on balanced XLR connectors. All inputs have sample rate converters.

Multibridge Pro

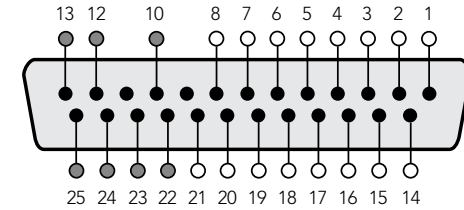
- 2 XLR balanced analog inputs and outputs
- 2 Analog RCA outputs for monitoring
- 8 AES/EBU digital audio inputs and outputs on a multi-pin DB-25 connector. All inputs have sample rate converters. The DB-25 pin out is compatible with Yamaha™, Mackie™, Sony™ and Apogee™ connectors.

Control

RS-422 serial control port, compatible with Sony™ deck control pin connections and protocol.

Multibridge features an industry standard Sony™ compatible deck control port, that has the correct pin connections for a direct connection to any deck. If you would like to use custom cables (e.g. to increase length), use the wiring diagram. You can also use pre made 9 pin cables as long as each end of the cable are wired "pin for pin" where the same pin number on each end of the cable are connected together.

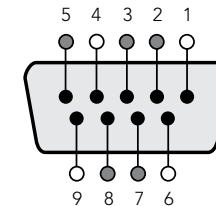
Using as a Converter



DB-25 pin outs also compatible with Yamaha™, Mackie™, Sony™ and Apogee™ connectors.

Audio Ch.	Hot Pins (+)	Cold Pins (-)	Ground Pins
1&2 IN	1	14	10
3&4 IN	2	15	12
5&6 IN	3	16	13
7&8 IN	4	17	22
1&2 OUT	5	18	23
3&4 OUT	6	19	24
5&6 OUT	7	20	25
7&8 OUT	8	21	

Multibridge Pro AES audio connector pin connections.



Receive (-)	Receive (+)	Transmit (-)	Transmit (+)	Ground Pins
2	7	8	3	1, 4, 6, 9

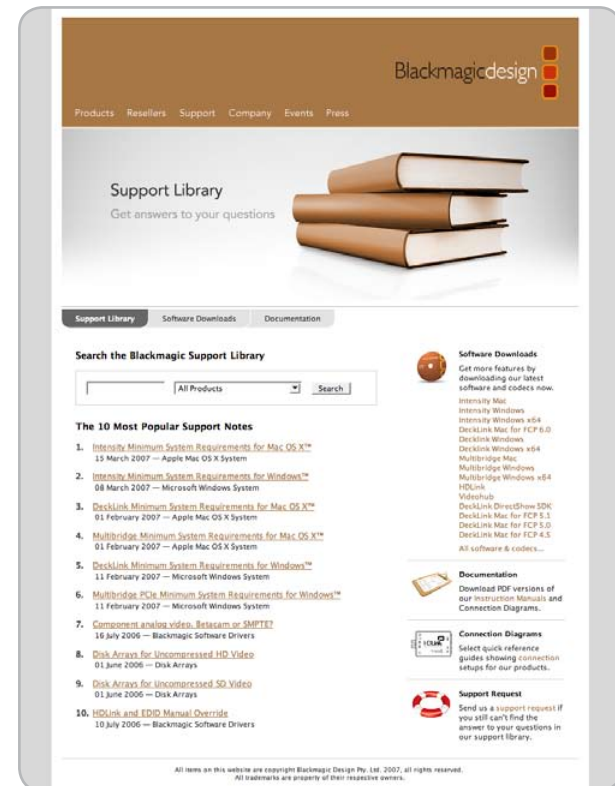
Remote pin connections.

Troubleshooting when used as a Converter

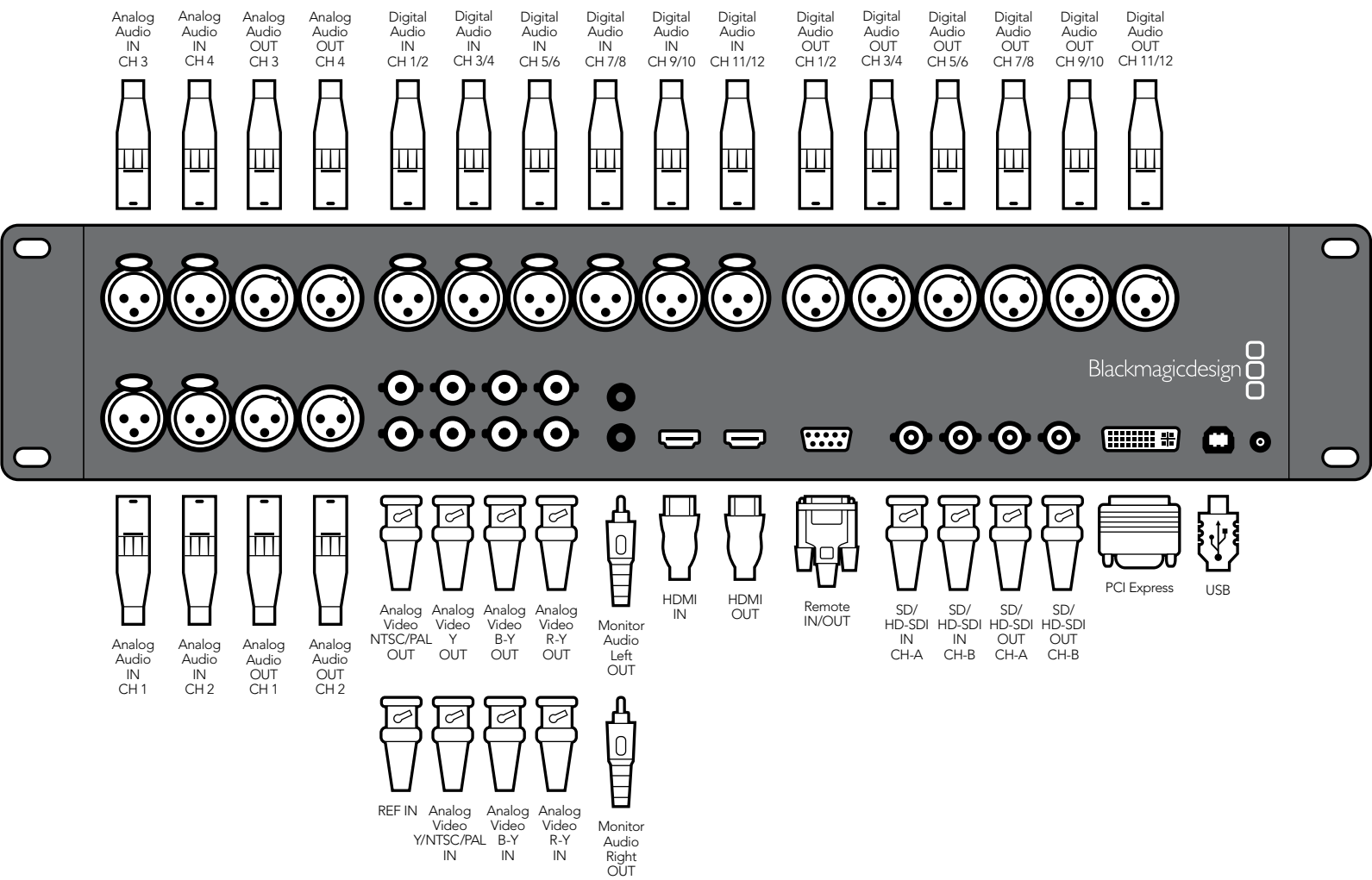
There are four steps to getting help:

1. Check out the Blackmagic Design website www.blackmagicdesign.com/support for the latest support information.
2. Call your reseller. Your reseller will have the latest technical updates from Blackmagic Design and should be able to give you immediate assistance. We also recommend you check out the support options your dealer offers as they can arrange various support plans based on your workflow requirements.
3. The next option is to email us with your questions using the web form at <http://www.blackmagicdesign.com/support/contact/>.
4. Phone support in North America is available on +1 408 954 0500.

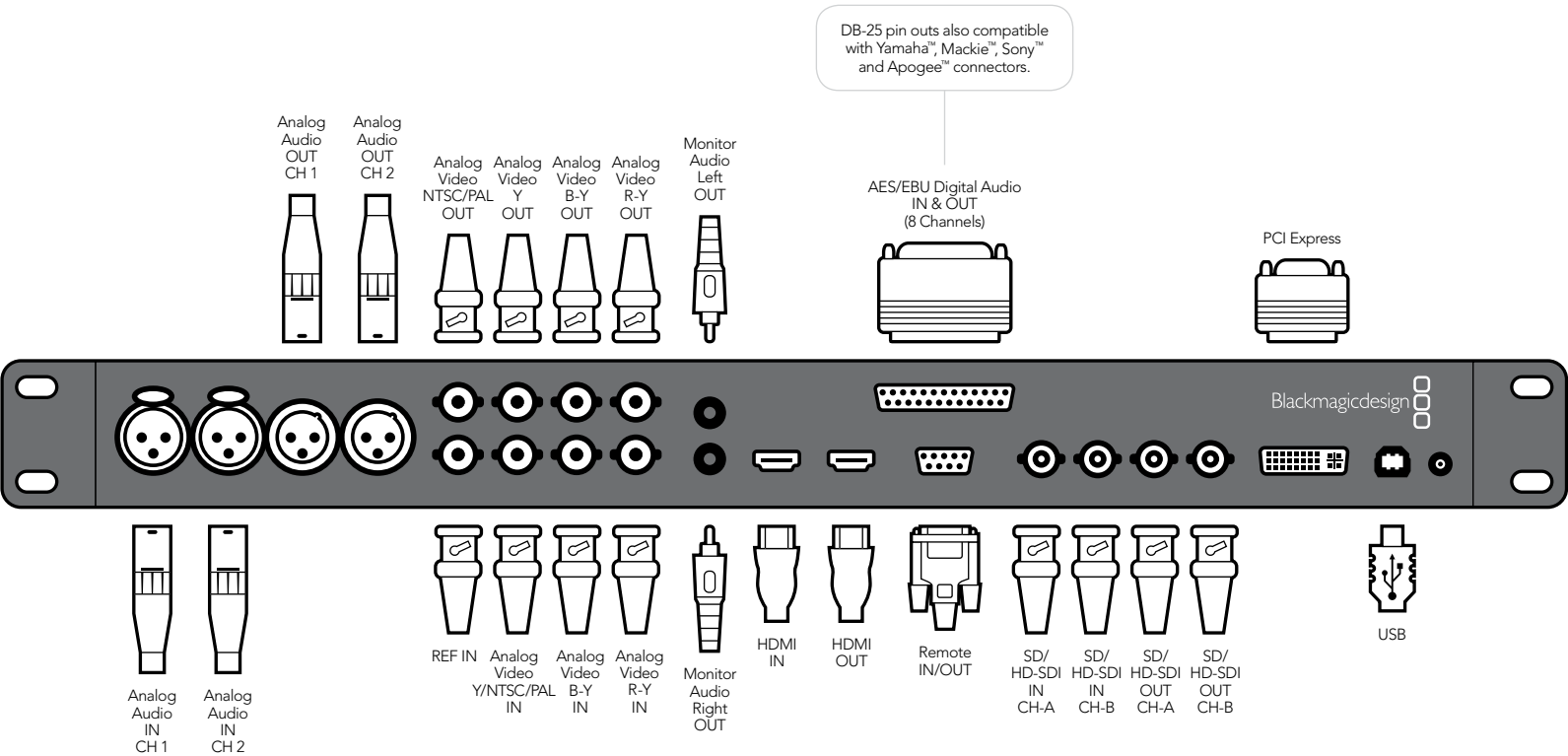
Note: Please provide us with as much information as possible regarding your technical problem and system specifications so that we may try to reproduce your problem quickly. Also please let us know how to reproduce any problem you're having, so we can try it on our test systems before replying to your email.



Multibridge Eclipse connectors overview



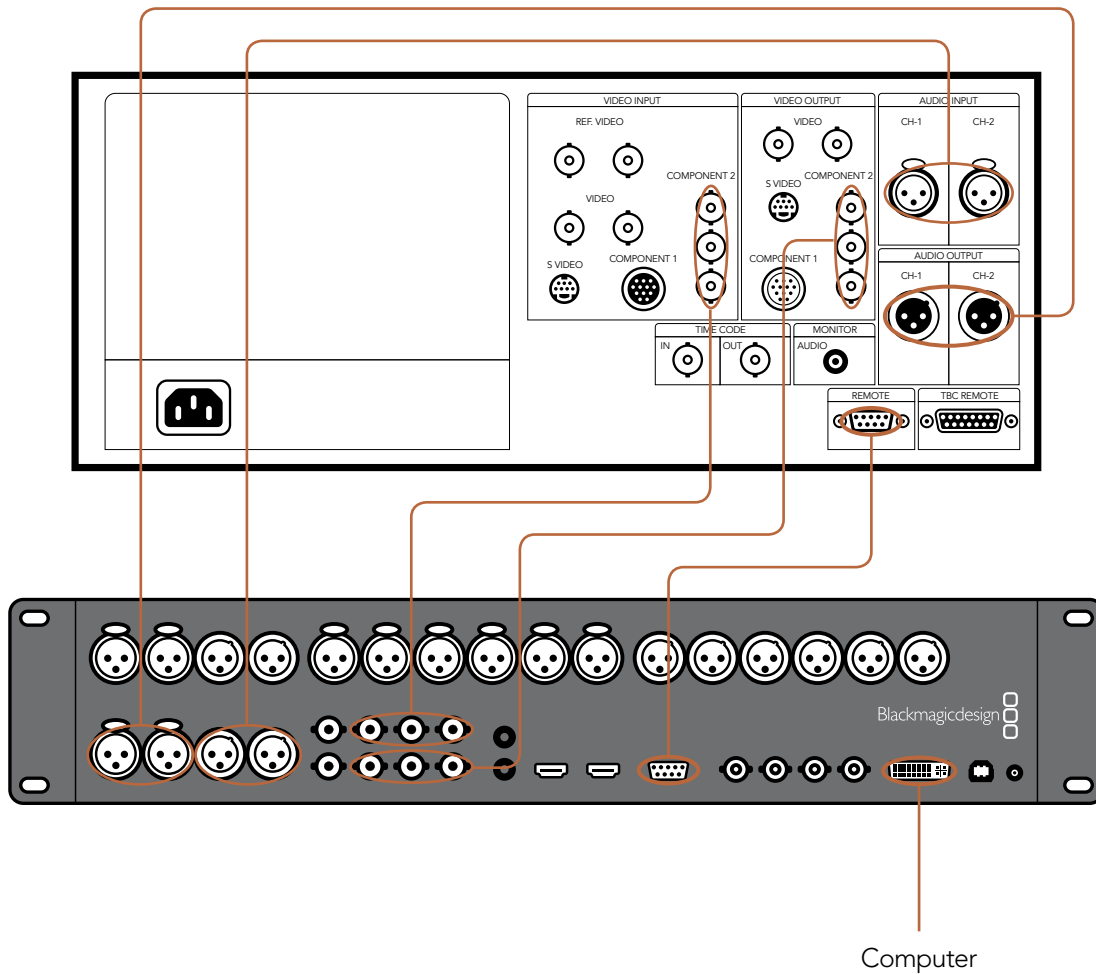
Multibridge Pro connectors overview



Connection Diagrams

Connecting to a Betacam SP analog deck

This example shows Multibridge connected to an analog deck. If PCI Express is connected you can capture and play back video to the analog deck. If PCI Express is not connected, Multibridge will operate as a bi-directional converter with the SDI connections used to connect the deck to SDI based systems. The HDMI output can be used in both modes for local monitoring.

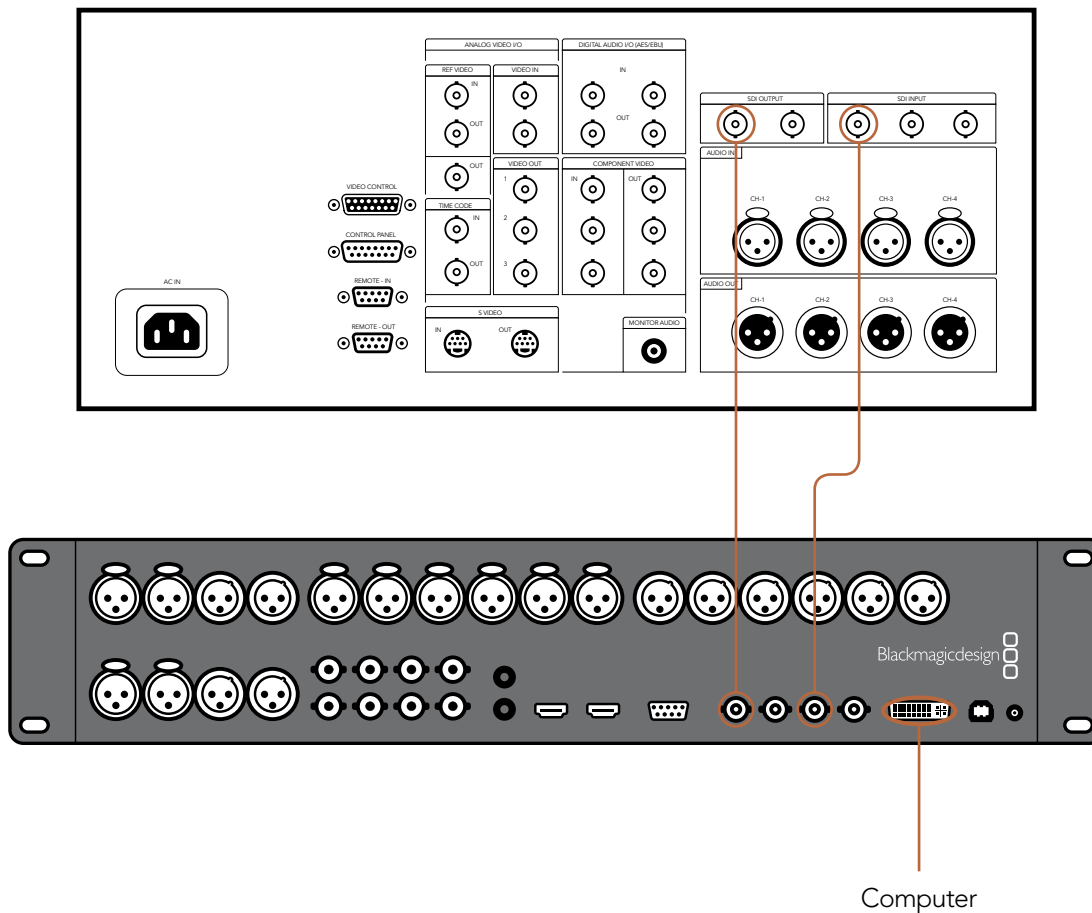


Connection Diagrams

Connecting to an SDI digital deck

This example shows Multibridge connected to an digital deck in 4:2:2 SD mode. If PCI Express is connected you can capture and playback video to the SDI deck. If PCI Express is not connected, Multibridge will operate as a bi-directional converter with the analog video connections, and the analog audio connections used to connect the deck to analog equipment or monitors. The HDMI output can be used in both modes for local monitoring.

40

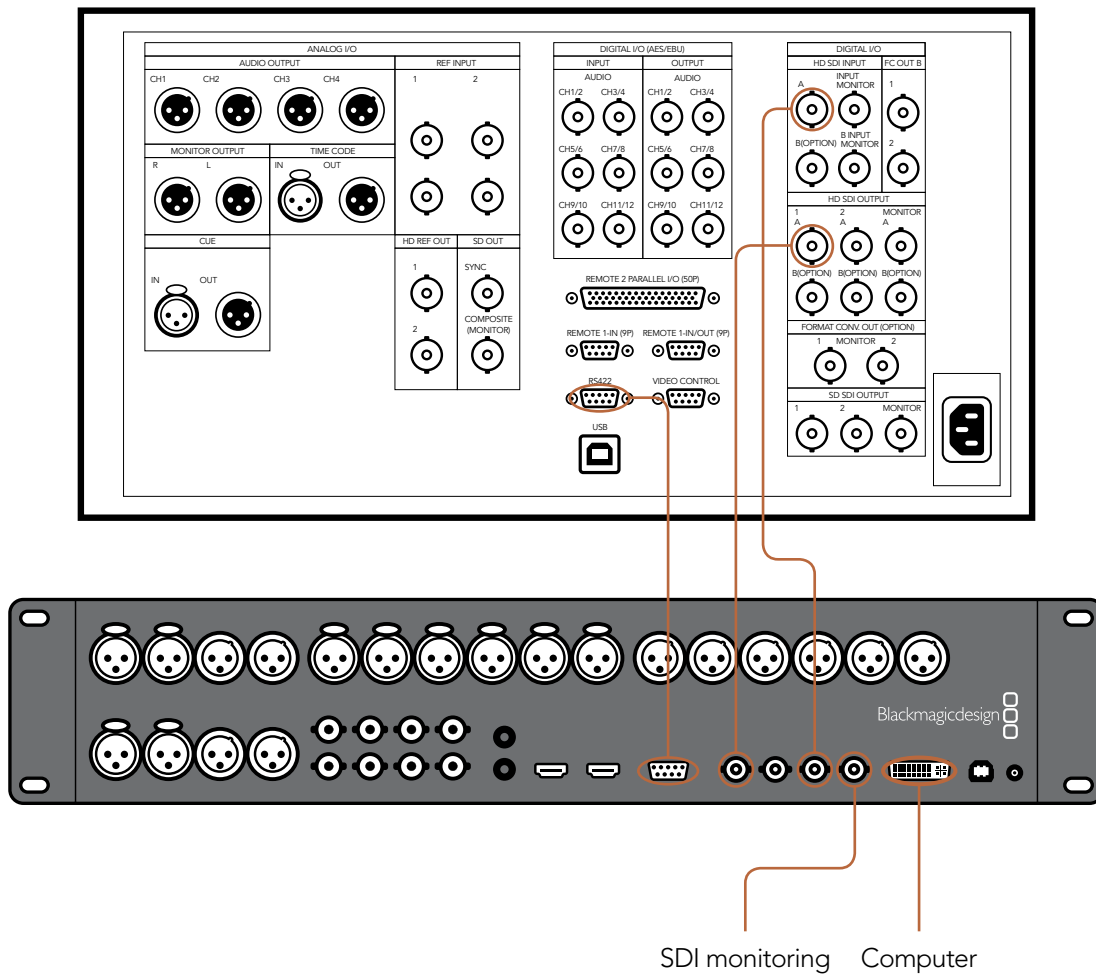


Computer

Connection Diagrams

Connecting to a Sony HDCAM SR deck in 4:2:2

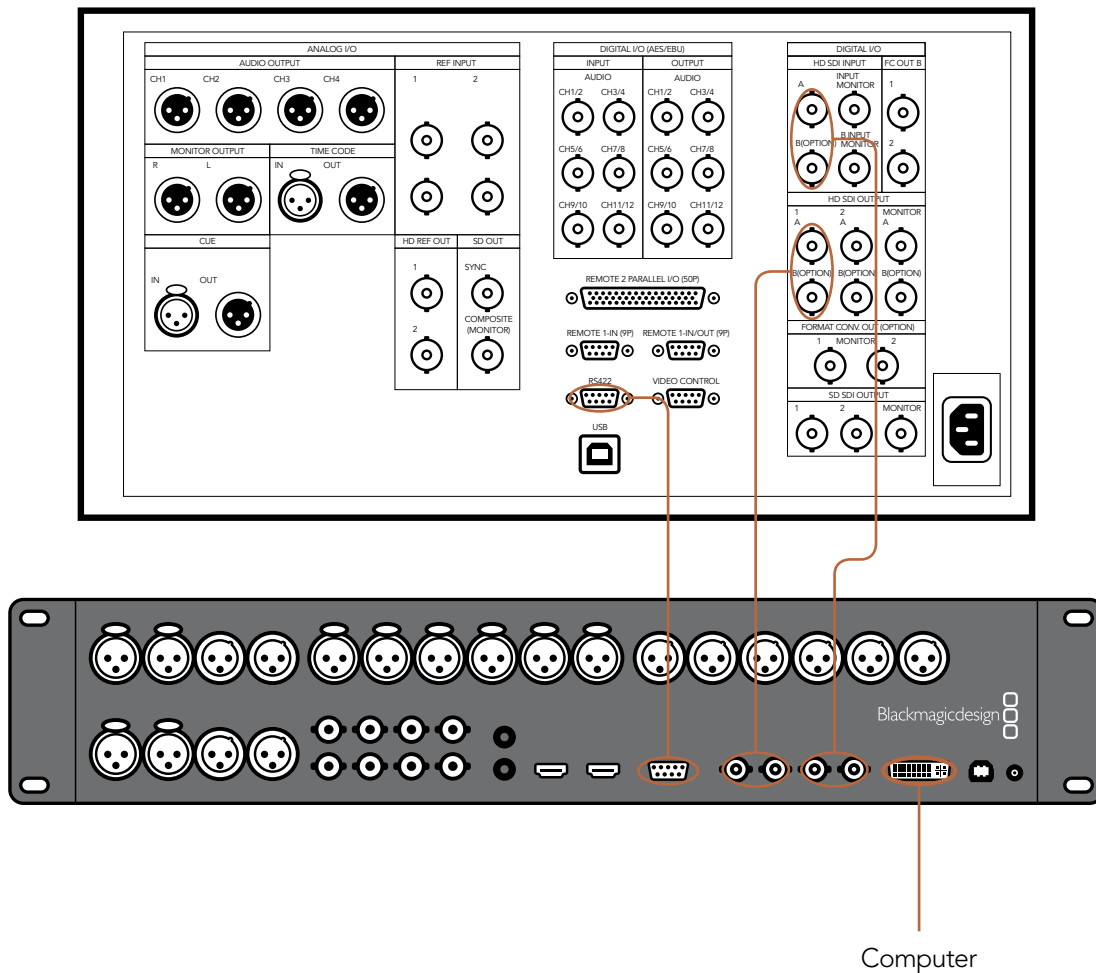
This example shows Multibridge connected to a Sony HDCAM SR™ series digital 4:2:2/4:4:4 deck in 4:2:2 HD mode. If PCI Express is connected you can capture and playback video to the SDI deck. If PCI Express is not connected, Multibridge will operate as a bi-directional converter with the analog video connections. The HDMI output can be used in both modes for local monitoring.



Connection Diagrams

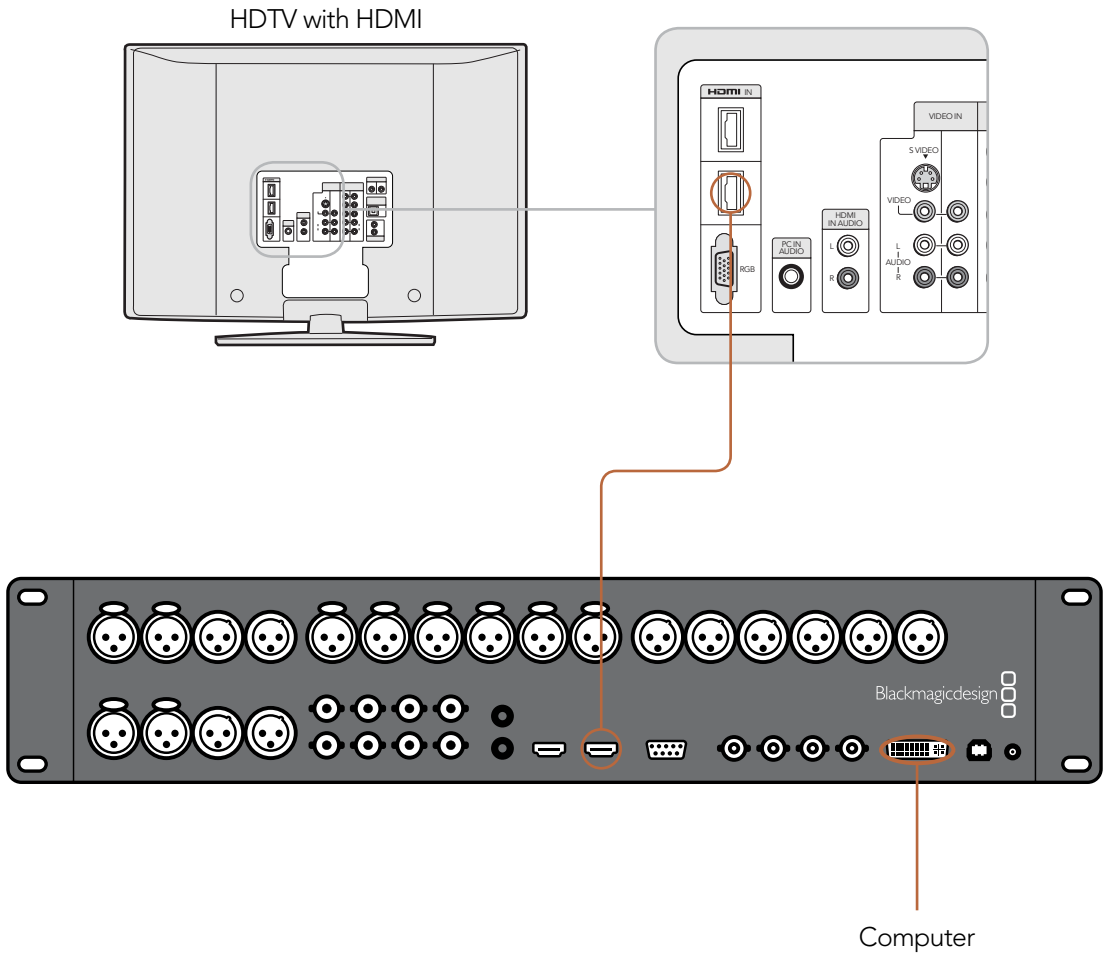
Connecting to a Sony HDCAM SR deck in 4:4:4

This example shows Multibridge connected to an digital deck in 4:4:4 HD mode. In this case 2 SDI connections are used for 4:4:4 SDI video in and out. If PCI Express is connected you can capture and playback video to the SDI deck. If PCI Express is not connected, Multibridge will operate as a bi-directional converter using the analog video connections. The HDMI output can be used in both modes and monitoring will be in 4:4:4.



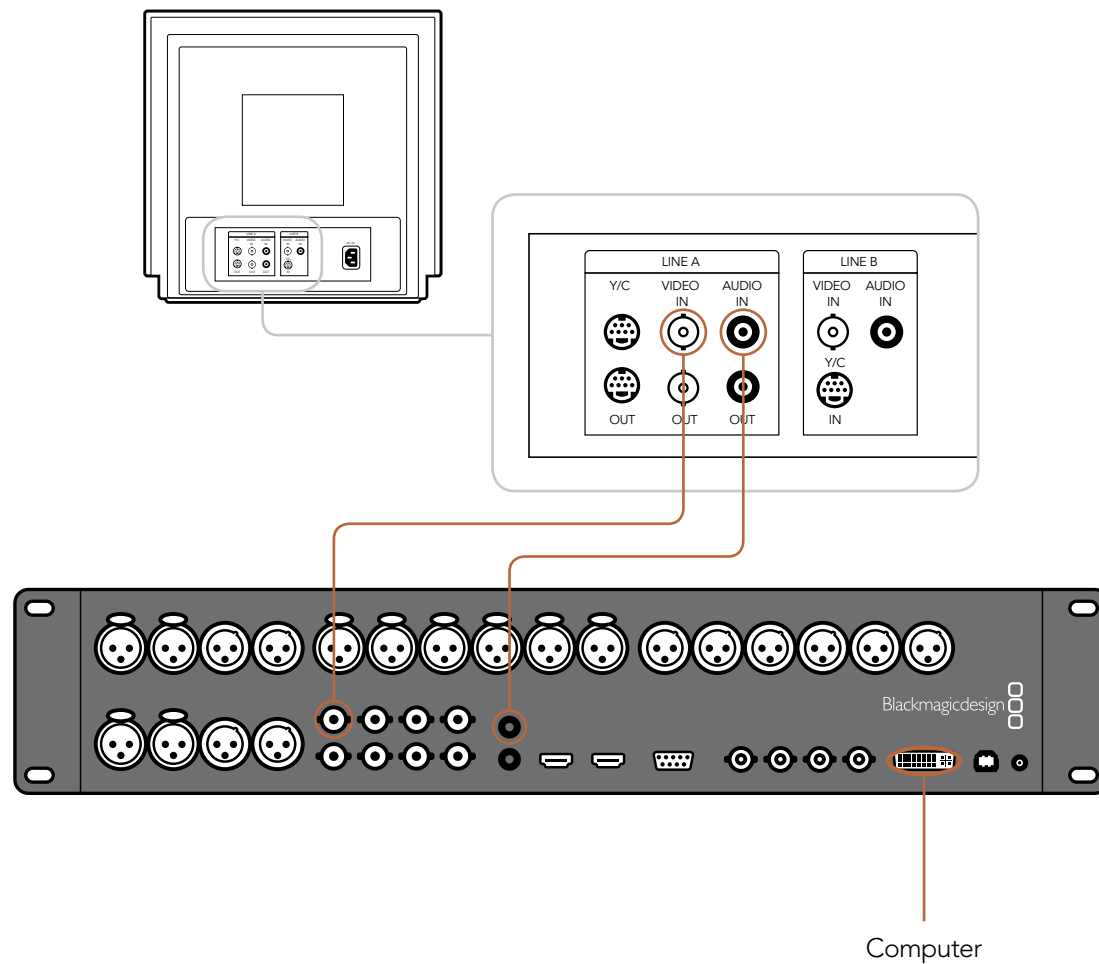
Connecting to an HDTV

This example shows Multibridge connected to a consumer HDTV with HDMI input. Connect the HDMI cable from the HDTV to Multibridge's HDMI output.



Connecting to an NTSC/PAL monitor

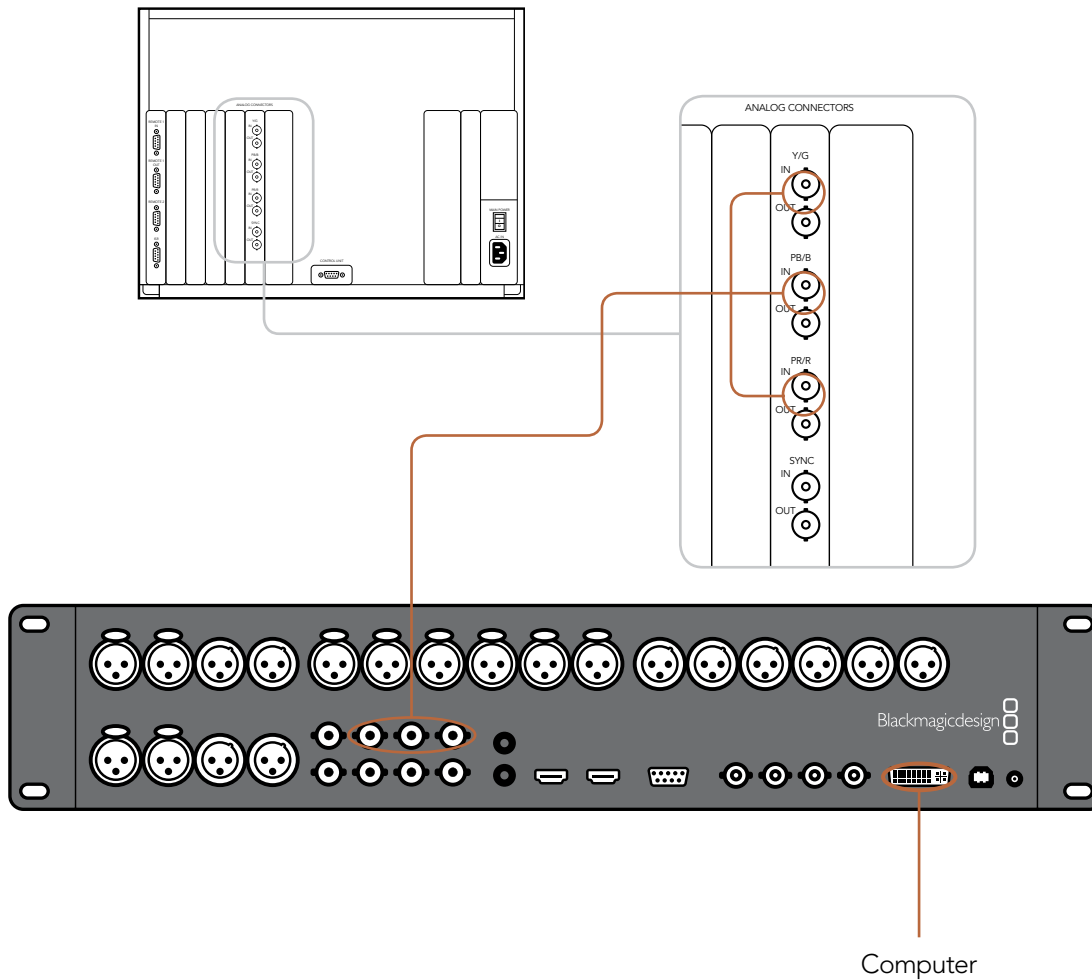
This example shows Multibridge connected to a Sony PVM monitor via composite analog video. You can use this for capture and playback monitoring when Multibridge is connected via PCI Express. When Multibridge is used as a standalone convertor, you can monitor the SDI input on the composite output of Multibridge.



Connection Diagrams

Connecting to a YUV component monitor

This example shows Multibridge connected to a Sony BVM monitor. You can use this for capture and playback monitoring when Multibridge is connected via PCI Express. When Multibridge is used as a standalone convertor, you can monitor the SDI input in either 4:2:2 or 4:4:4. Multibridge will automatically switch between HD and SD.



3 Year Limited Warranty

Blackmagic Design warrants that this product will be free from defects in materials and workmanship for a period of 36 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 changes, 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 personal 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 2007 Blackmagic Design. All rights reserved. 'Blackmagic Design', 'DeckLink', 'HDLink', 'Workgroup Videohub', 'Videohub', 'Multibridge', '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.