

DeckLink User Manual Mac OS X™

Second Edition.
July 2004



Mac OS X™

Blackmagicdesign
Leading the creative video revolution™





Mac OS X™

Welcome



Thank you for purchasing a DeckLink broadcast video card. We hope you share our dream for the television industry to become a truly creative industry by allowing anyone to have access to the highest quality video.

Previously high end television and post production required investment in millions of dollars of hardware, however with DeckLink cards, even 10 bit uncompressed is now easily affordable. We hope you get years of use from your new DeckLink card and have fun working with some of the world's hottest television and design software!

This instruction manual should contain all the information you'll need on installing your DeckLink capture card, although it's always a good idea to ask a technical assistant for help if you have not installed hardware cards into computers before. As DeckLink uses uncompressed video and the data rates are quite high, you'll need fast disk storage and a high-end Power Mac.

We think it should take you approximately 10 minutes to complete installation. Please check our web site at www.blackmagic-design.com and click the support page to download the latest updates to this manual and DeckLink driver software.

Lastly, please email us (register@blackmagic-design.com) with your DeckLink serial number so we can keep you updated when new software is released. Perhaps you can even send us your latest show reel of work completed on your DeckLink!

We are constantly working on new features and improvements, so we would love to hear from you!

Grant Petty
CEO Blackmagic Design

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Storage and data rates for uncompressed video

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

Frame Size	MB per second	MB per minute	GB per hour
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)

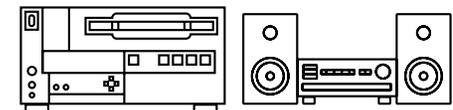
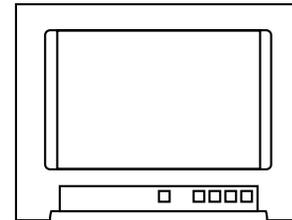
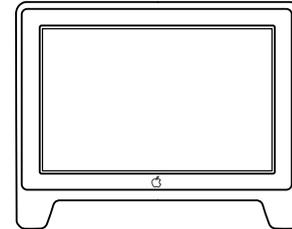
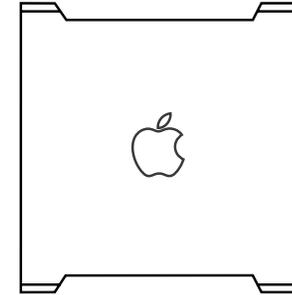
High Definition

Frame Size	MB per second	MB per minute	GB per hour
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. The degree of margin can be reduced 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 Decklink cards.





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Standard Definition on Mac OS X™

Minimum system requirements

Operating System

Mac OS X™ 10.2.3 or newer. QuickTime™ 6.1 or newer.
We currently recommend QuickTime™ 6.5.1 with Mac OS X™ 10.3.4.
[Mac OS X™ Server and Mac OS 9™ are not supported]

Processor

- Dual processor PowerMac G4/800 or faster. The G4 must have dual processors even if a faster G4 processor is used.
- Single or dual processor PowerMac G5 with PCI-X slots. Base-model G5's with PCI slots might work but are unsupported.
- The fastest system you can afford is always a good idea.
Note: We advise against using processor upgrade cards as they don't improve bus speeds and are of little help with uncompressed video.

PCI slots

- Standard definition DeckLink cards will run at both 5 volts and 3.3 volts and so are fully compatible with the slots in both G4's and G5's. DeckLink SD cards can be used in any PCI or PCI-X slot in supported Macs. DeckLink SD cards will run at 33 MHz in G4 and 66 MHz in a G5 with PCI-X.
Note: We advise against using PCI expansion chassis as they are not fast enough for uncompressed video.

Memory

- 512 MB of RAM or more. 1 GB would be preferable.

Disk Arrays

- SCSI - Ultra 160 or Ultra 320 SCSI card, especially the ATTO UL3D (PCI) and UL4D (PCI-X) cards; at least 2 x U160 or U320 SCSI disks, 10 000 rpm, software striped as RAID [0], OR;
- SATA - SATA RAID card; with at least 2 x SATA disks, 10 000 rpm, software striped as RAID [0].

Standard Definition Monitoring

For monitoring Standard Definition and High Definition video, check out Blackmagic Design's low cost HDLink. HDLink converts your SD and HD-SDI output to DVI-D, perfect for use with LCD displays such as the Apple HD Cinema™ 23" display. HDLink features 2 x resize of NTSC and PAL on 1920x1200 pixel displays and also provides analog RCA audio output.

For more information on HDLink visit www.blackmagic-design.com



DeckLink™



DeckLink Pro™



DeckLink SP™



DeckLink Extreme™





Mac OS X™

High Definition on Mac OS X™

Minimum system requirements

Operating System

Mac OS X™ 10.2.7 or newer. QuickTime 6.3 or newer. We currently recommend QuickTime™ 6.5.1 with Mac OS X™ 10.3.4.

[Mac OS X™ Server and Mac OS 9™ are not supported]

Processor

- Dual processor PowerMac G5/1.8 GHz, or faster, with PCI-X slots. The G5 must have dual processors even if a faster processor is used.
- The fastest system you can afford is always a good idea and we highly recommend the dual processor G5's which are fantastic for HD work.

PCI slots

High Definition DeckLink cards require PCI-X slots to perform both HD and SD work. Either the 133 or 100 MHz slots can be used but the 133 MHz slot is preferable. See page 8 for detailed installation instructions.

Memory

- 1.5 GB of RAM or more.

Disk Arrays

- SCSI - Ultra 320 SCSI card, with at least 8 x U320 SCSI disks, 10 000 rpm, software striped as RAID [0], OR;
- 2GB Fibre Channel

Note: Check the Blackmagic Design website for updates on hardware compatibility at www.blackmagic-design.com and "click on the support page."

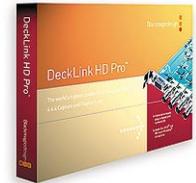
High Definition and Standard Definition Monitoring

For monitoring high definition and standard definition video, check out Blackmagic Design's low cost HDLink. HDLink converts your HD and SD-SDI output to DVI-D, perfect for use with LCD displays such as the Apple HD Cinema™ 23" display. HDLink features 2 x resize of NTSC and PAL on 1920x1200 pixel displays and also provides analog RCA audio output.

For more information on HDLink visit www.blackmagic-design.com



DeckLink HD™



DeckLink HD Pro™



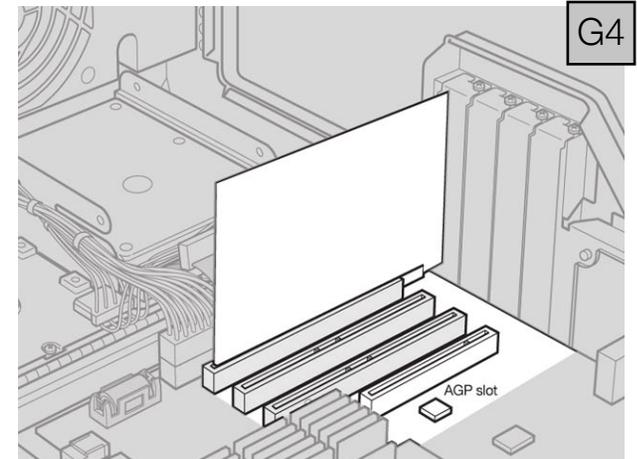
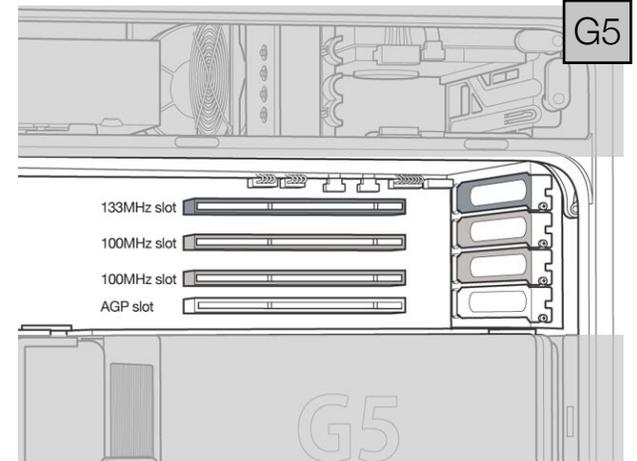


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Hardware installation

1. Remove the power plug from the back of your Mac. This is a safety precaution before opening your computer. Ensure that you are statically discharged by using a static strap.
2. Remove the side cover of your Mac to gain access to the PCI slots.
3. Remove your DeckLink card from the protective static bag making sure you don't touch the gold connectors on the base of the card. These precautions should be taken when handling any PCI card.
4. Find a spare PCI or PCI-X slot (DeckLink HD series cards require a PCI-X slot). Remove the metal port access cover, and screw, from the back of your Mac.

Note: If installing a DeckLink, DeckLink HD or DeckLink HD Pro please refer to the instructions "Which slot should I use in a PowerMac G5?" on page 7.
5. Insert your DeckLink card and ensure that it clicks firmly into place. G5's seem to have tighter slots so make sure the DeckLink card is firmly seated in to place*.
6. Secure the card by the screw.
7. The procedure for installing a RAID controller card is similar to the above.
8. Now replace the side cover of your Mac. Reconnect the power and start up the computer.





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Which slot should I use in a PowerMac G5?

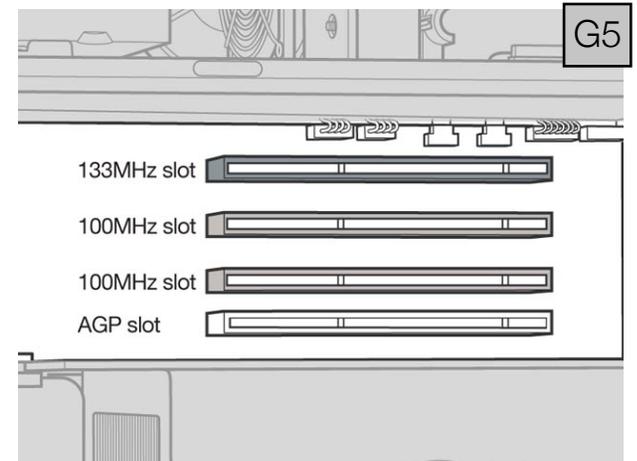
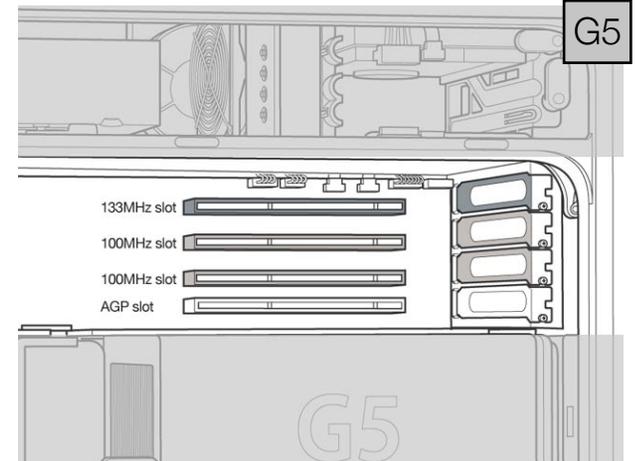
High Definition DeckLink cards require PCI-X slots to perform both HD and SD work. Either the 133 or 100 MHz slots can be used but the 133 MHz slot is preferable. See page 8 for detailed installation instructions.

The high definition DeckLink cards are PCI-X cards and it makes a lot of sense to place a HD card in the top slot. If you find the job of installing the DeckLink HD in the top slot to be too tricky, simply install it in to one of the 100 MHz slots (slots 2 or 3). It is much easier to fit the card in to these slots and we have verified that the card runs fast enough in the 100 MHz slots. Avoid placing a slower PCI card in the other 100 MHz slot as both slots will be reduced to the speed of the slower card.

If you decide to install a DeckLink (SD), DeckLink HD or DeckLink HD Pro card in the top slot of a G5, you will need to carry out the following procedure:

- Lie the G5 on its side to make it easy to insert the DeckLink card.
- Loosely seat the card in position in the top slot.
- Press the back end of the card in to the slot, i.e. the end that does not have connectors.
- Tilt the top of the card towards the top of the G5, i.e. towards the bay that can hold the two Serial ATA drives.
- Whilst tilting the card on this angle, you should be able to press down carefully on the front of the card and it will slide down in to the slot. Whilst doing this, be careful as the metal connectors on the DeckLink card will press against a black, plastic plug. The plug will flex slightly as you slide the DeckLink card in to position.

This procedure does not require much force. If you find yourself having to use too much force, or feel at all uncomfortable with this procedure, use one of the 100 MHz slots instead and you will find that you can install your card easily.





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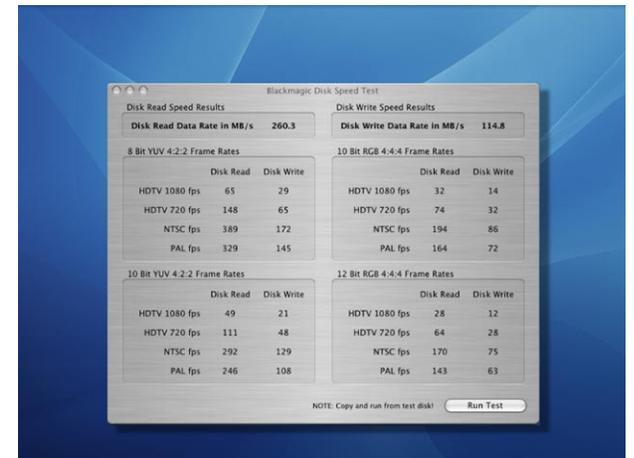
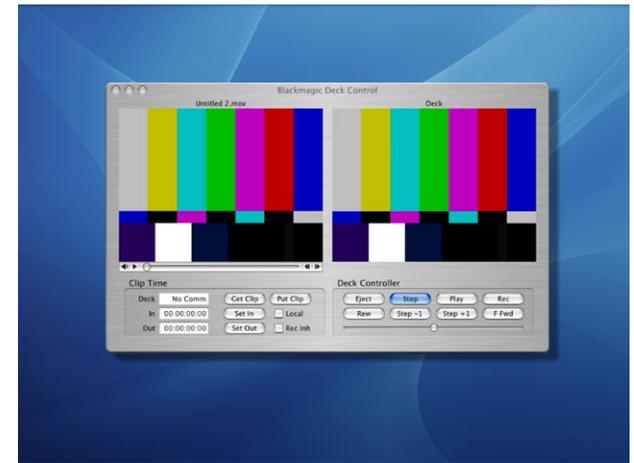
Blackmagic DeckLink Software

The Blackmagic Design software installer supports standard and high definition video formats and all Blackmagic Design DeckLink PCI cards.

The Blackmagic DeckLink software installer will install the following components.

1. Blackmagic DeckLink drivers.
2. Blackmagic Deck Control application.
3. Blackmagic DeckLink control panel.
4. Blackmagic QuickTime™ codecs.
5. Final Cut Pro™ Easy Setups, presets and enablers.
6. Blackmagic LiveKey.
7. Blackmagic Disk Speed Test.

Note: Before installing any software or hardware you will need administrator privileges.





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Pre-installation checks

SCSI Devices

Check the web site of your SCSI card vendor for the latest firmware and drivers. Firmware and drivers for the ATTO UL3D and UL4D can be found at www.attotech.com. Sometimes firmware updates are also released for SCSI disk arrays. Firmware for disk arrays from Huge Systems can be found at www.hugesystems.com.

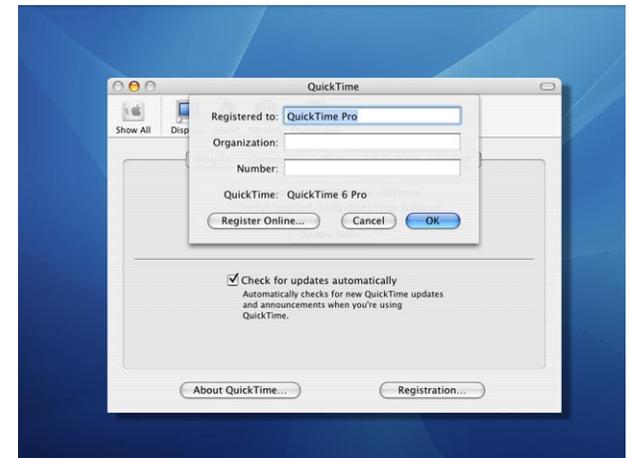
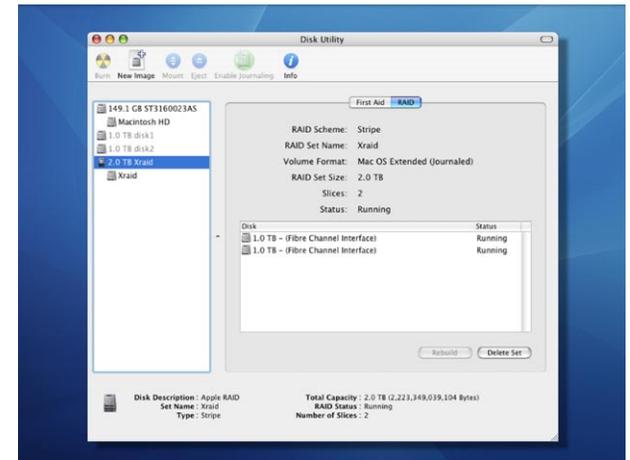
If you intend to run your disk array as a software stripe, you can use Apple's Disk Utility which is located in the /Applications/Utilities folder of Mac OS X. Use RAID tab in Disk Utility to set up your software RAID, or refer to third party instructions when using pre-configured hardware RAIDs.

QuickTime™

Make sure the latest version of QuickTime™ is installed on your Mac. QuickTime™ can be found at www.apple.com/quicktime. A QuickTime™ Pro serial number is included with Final Cut Pro HD as this is required to unlock many QuickTime™ features.

Software Applications

DeckLink cards work with applications such as Final Cut Pro HD™, Adobe After Effects™ and Discreet Combustion™. The DeckLink installer will install components into some of these applications. If you install or update these applications after installing your DeckLink card, you should reinstall the DeckLink drivers to ensure these applications will work with your DeckLink card. Having software applications pre-installed will simplify the installation of your DeckLink card.





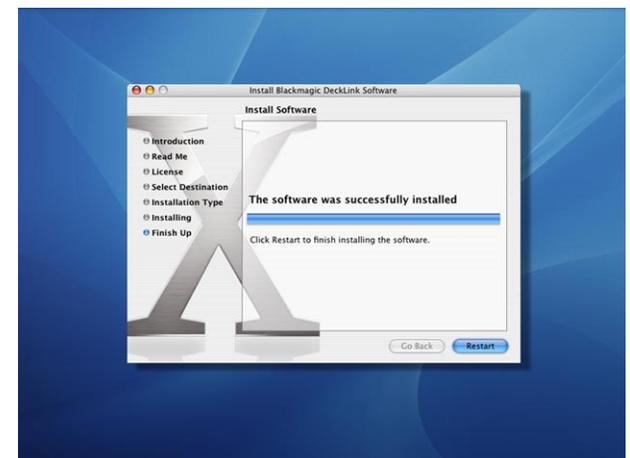
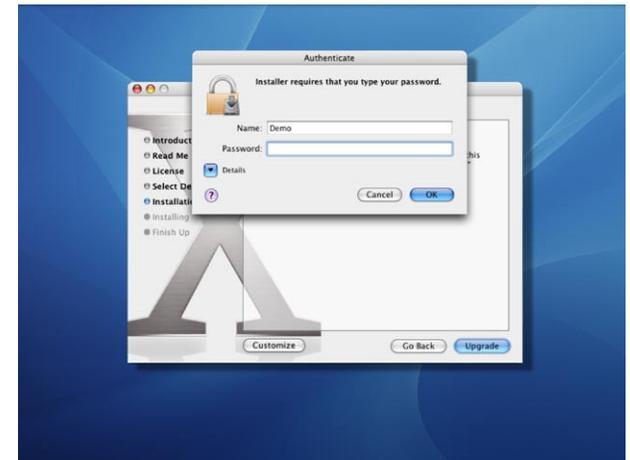
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Installing Blackmagic DeckLink software

Installing Blackmagic DeckLink software

1. The CD supplied with the DeckLink card contains the Blackmagic installer. In order to ensure that you have the very latest driver please visit www.blackmagic-design.com and click on the support page. Note: Should the installer on the website be a newer version than the one on your installer CD, download and save the zip file for future installations.
2. If you wish to uninstall existing DeckLink drivers before installing a new version, open the “Blackmagic Installer” disk and scroll down to folder named Installer Files. Open this folder and you will find the Uninstall Blackmagic utility. Run this utility and you will require an Administrator password before it will allow you to uninstall the old drivers.
3. Go to the location of the downloaded installer and double click the zip file which will then expand. Double click on the resulting “DeckLink_Macintosh.dmg” file and the “Blackmagic Installer” disk will mount on your desktop.
4. Open the “Blackmagic Installer” disk and double-click on the “Blackmagic Installer” application. You will require an Administrator password before it will allow you to install the new drivers. All DeckLink cards use the same installer.
5. Click “Continue”, “Agree” and “Install” buttons and the drivers will be installed on your system.
6. Now restart your machine to enable the new software drivers.

Note: Keep the installer available as you may need to reinstall the drivers after having installed or updated Final Cut Pro™ or QuickTime™.





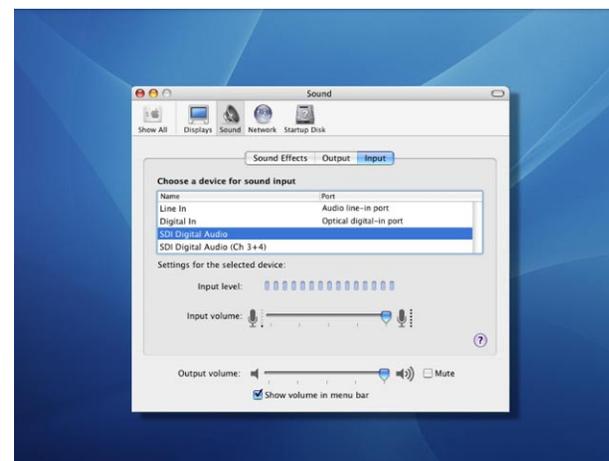
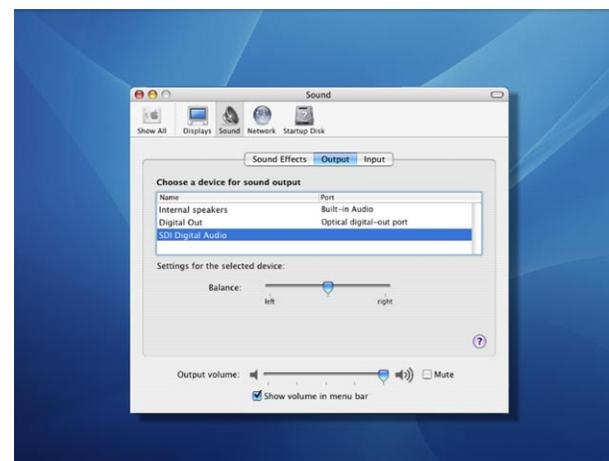
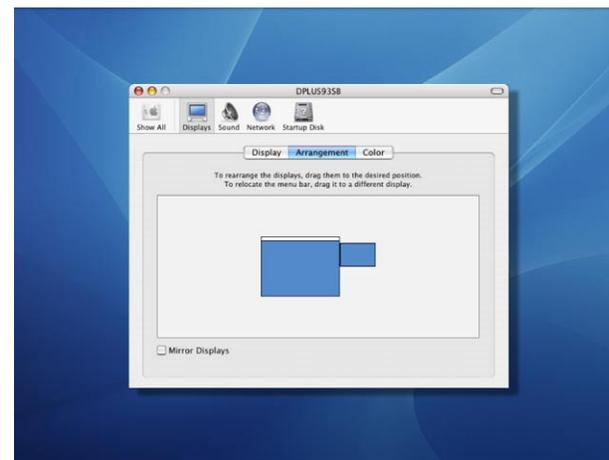
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7. To check the installation has been successful, go to the Apple menu and choose System Preferences. Click on the Displays icon and then on the Arrangement tab. You should see an extra display which represents the extended desktop feature of your DeckLink card. The size of the DeckLink display will appear different to your computer display and may be a NTSC or HDTV resolution.
8. Select where sound is routed when playing and capturing QuickTime™ movies. To do so, go to the Apple menu and choose System Preferences. Click on the Sound icon and then on the Output tab.
 - Select DeckLink's "SDI Digital Audio" to output audio channels 1 to 8.

Click on the Input tab and you will see 2 or 3 options related to your DeckLink card. Due to a current limitation in QuickTime™ in Mac OS X™, it is currently only possible to input 2 audio channels at any one time. You will need to specify which audio input you wish to use from the following options. The settings in Final Cut Pro™ override these settings and can be set independently to these settings.

- "SDI Digital Audio" will input channels 1+2.
- "SDI Digital Audio (Ch 3+4)" will input channels 3+4.
- "AES/EBU Digital Audio" will input channels 1+2 through the SPDIF/AES input of the DeckLink HD Pro.

Note: "SDI Digital Audio" should be chosen even when using analog audio with cards such as the DeckLink SP and DeckLink Extreme. Analog converters on the analog DeckLink cards ensure the audio is converted to and from analog or digital as required.





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Viruses

Viruses are an ever-increasing problem on computers. Computers will often slow down if they become infected. This can cause various problems in video, especially dropped frames and stuttering audio. For this reason, we recommend you dedicate your Mac to video work and avoid using it for other tasks which may introduce viruses, e.g. email, web browsing and sharing of ejectable disks such as USB disks and non-commercial CD's & DVD's.

It is good practice to run antivirus software and keep it up to date. However, the memory-resident component of many antivirus products is likely to cause your video to drop frames. Accordingly, we recommend disabling the memory resident component of your antivirus software while performing any video or audio work.

Most antivirus programs show an icon in the System Preferences of Mac OS X™ and clicking on this icon will usually reveal an option to disable automatic virus protection. Disable the automatic protection ("memory resident protection") while working on video or audio.

If you are also going to use your Mac for purposes other than video or audio work, it would be wise to re-enable the automatic virus protection whenever you have finished your video and audio work. At the time of writing this manual, there were no known viruses which could infect Mac OS X™ and cause system slow downs.

Given that memory resident antivirus software on Mac OS X™ will cause performance degradation during video and audio editing, many DeckLink users have chosen to permanently disable automatic virus protection for maximum performance. Anyone choosing to take the same approach should re-evaluate this decision on a regular basis, especially if new viruses become a problem on the Mac OS X™ platform.



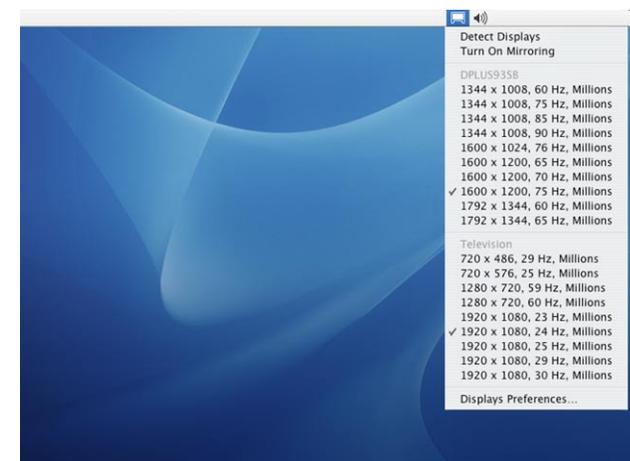
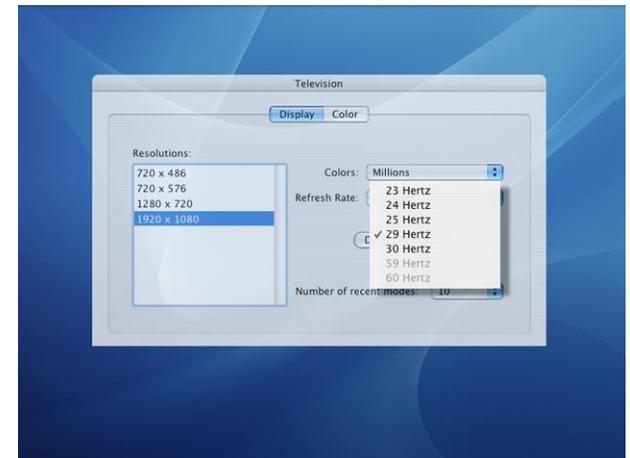
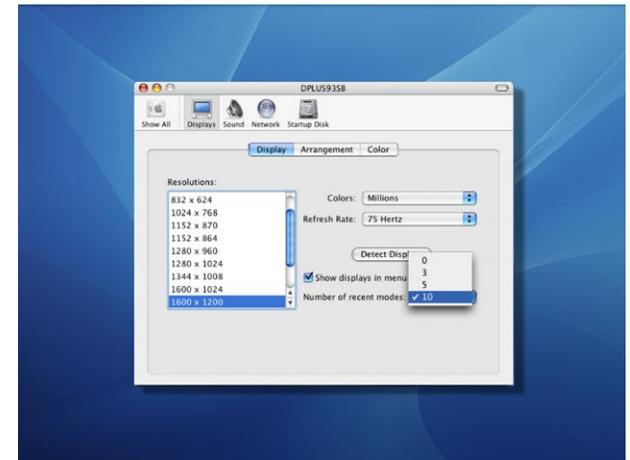
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Getting Connected: Display Settings

1. After completing the software and hardware installation, connect your DeckLink card to an external device such as a broadcast monitor, tape deck or Blackmagic HDLink. Connection diagrams, for the DeckLink family of cards, can be found towards the end of this manual from page 21 onwards.
2. Go to the Apple menu and choose System Preferences. Click on the Displays icon. Ensure that “Show displays in menu bar” is enabled. If you are using Mac OS X™ 10.2.x, ensure that “Show modes recommended by display” is disabled. If you are using Mac OS X™ 10.3 (or newer), increase the “Number of recent modes” to 10.

The same dialog box should also be appearing on your broadcast monitor and you should also increase its “Number of recent modes” to 10 especially if you are using a high definition DeckLink card. Quit out of System Preferences.

3. Go to the menu bar above your main display and you should find the Displays menu. Click on it and you will see all of the display resolutions for your 1 or 2 main computer monitors as well as for your TV monitor.
4. The standard definition DeckLink cards will list two modes, NTSC (720 x 486, 29 Hz) and PAL (720 x 576, 25 Hz). The high definition DeckLink cards will list many more modes in addition to these two modes. Select the desired mode and your TV monitor should switch to that mode. If you have a NTSC-only monitor and switch to a PAL desktop, the video will appear gray in color. The same is true if you have a PAL-only monitor and switch to NTSC. A multi-format monitor is required to display the different modes in their correct color.
5. You can switch between TV resolutions by opening the System Preferences and then selecting Displays. However using the Displays menu is usually much easier and more convenient.





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6. The SDI and analog outputs are always active on DeckLink cards. If you need to switch the analog connections between composite and component, use the Blackmagic DeckLink PrefPane located in “System Preferences.” You can adjust your analog settings in the video tab of the DeckLink control panel.
7. After installing the DeckLink Extreme, you might find that you cannot capture video. The reason for this is that you first need to specify which video input you are using, i.e. SDI, component analog or composite analog. Open the System Preferences and then click on Blackmagic DeckLink. Look at the settings for Video Connections and set the Input as desired, i.e.:
 - Digital SDI
 - Analog NTSC/PAL (Y In) - also known as composite analog.
 - Analog Y, B-Y, R-Y - also known as component analog.
8. If you wish to sync your deck to your Decklink card without using a signal generator, we have provided the option of sending a stable black signal to the deck during capture. You can set which output is used for this function with the Black Video to Deck in Capture drop-down menu. Please note that the accompanying audio output will be muted as well when in capture.
9. The video desktop feature enables you to work in applications such as Adobe Photoshop™ and Microsoft Powerpoint™ and display them on your broadcast monitor. This will immediately show you how your project will display on a TV so there will be no surprises when you output to tape. If you wish to disable this feature, choose to “Disable After Restart”. You will require an Administrator password to make this change.

Note: When using the DeckLink HD Pro video output in RGB 4:4:4 Dual Link mode, the signal from the analog component outputs will be RGB, so switch your broadcast monitor to RGB. You can still playback 8 and 10 bit YUV files, as this setting only effects the video output setting. DeckLink HD Pro will translate these files to RGB on playback in real time.





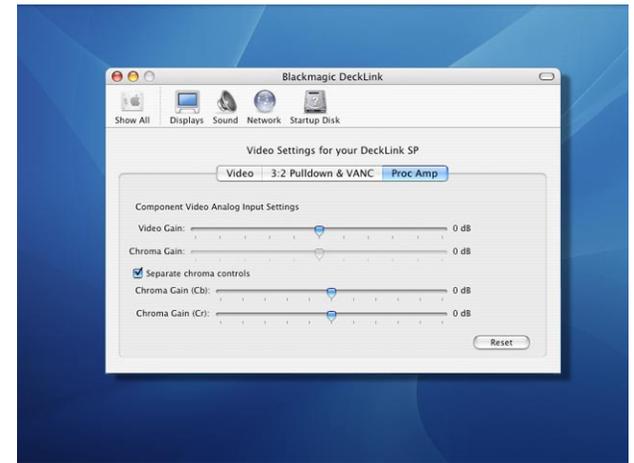
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Analog Video Input Processor Amplifier

We now include a Proc Amp tab in the Blackmagic DeckLink PrefPane located in “System Preferences.”

Proc Amp can be used to adjust gain level controls for any cards with analog input, i.e. the DeckLink SP and DeckLink Extreme. We have added this control due to variations in video output from analog tape decks.

This is also a reason why SDI is preferable to analog video, as it does not suffer from the potential gain variance issues which can be seen with analog components.



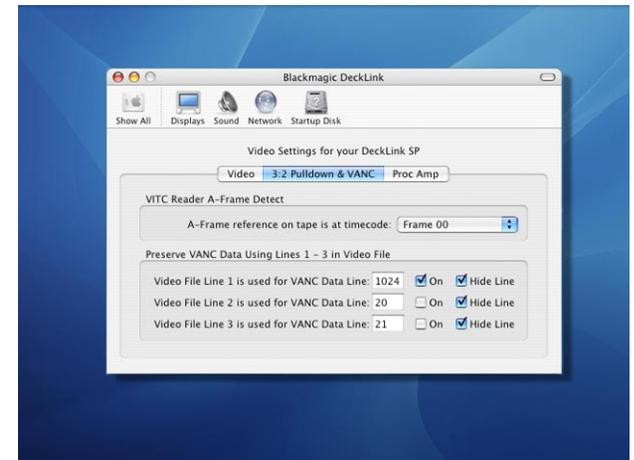
Preserving Blanking Data or VANC

To preserve VANC data when capturing, this can be enabled in the Blackmagic DeckLink PrefPane located in “System Preferences.” Now you can use up to 3 video lines at the top of a captured 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 between capture and playback. Software applications can also access these lines if required.

This uses standard QuickTime™ files, so applications such as After Effects™ and Final Cut Pro™ will be compatible. This works on all standard or high definition DeckLink cards. You can select if you want 1, 2 or 3 lines to be used.

Although an extra metadata track to the QuickTime™ file would be desirable, it would not be compatible with some video applications. We also thought about making the movie file 3 lines larger in the vertical resolution. So for example, 1080 would become 1083. However these files would be incompatible with normal files so it is not a good solution. So we thought that most people don't miss a line or two from the top of the image and it would be beneficial to include this feature and use a line or 2 or 3 for that blanking data storage.

The great advantage is we don't need to know about the data structure of the VANC data, as we just capture the lines. So if there is some special data that you want to use, that's no problem, as we just capture the lines intact, put them in the top lines of the movie file. We then put the lines back into the vertical blanking when playing back the files.





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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. This feature has unlimited uses!

You can use this feature with software, such as Deck Emulator software, to create a disk recorder that captures and preserves on playback 3-line timecode in telecine suites etc.

How the VANC Feature Works

This feature allows you to preserve lines of VANC in the vertical blanking and store them into lines 1 to 3 of the video file. These lines are then inserted back into the video blanking when the file is played back.

You can select to hide these lines from the application so they don't look ugly, or to let them be passed to the application if you are running software that interprets this data.

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 AATONTM equipped telecine suites, feature audio timecode and keycode information along with the normal timecode numbers.



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Blackmagic Deck Control

Blackmagic Deck Control is a basic utility used for capture from, and recording to your tape deck. It is controlled via RS-422 and uses the Sony™ RS-422 protocol.

It is designed to be used in conjunction with applications such as Adobe After Effects™ and Discreet Combustion™, which do not include their own deck control capabilities.

Pixel formats supported by Blackmagic Deck Control are:

- Blackmagic QuickTime™ RGB (10 bit uncompressed)
- Blackmagic QuickTime™ v210 (10 bit uncompressed)
- Blackmagic QuickTime™ (8 bit uncompressed)
- Apple QuickTime™ PhotoJPEG (compressed)
- Apple QuickTime™ DV - NTSC (compressed)
- Apple QuickTime™ DV - PAL (compressed)

This utility can capture or playback one video clip at a time. The application windows, of which there are two, are used for viewing clips and deck control. The left window is the clip playback window and the right is the capture/deck window.

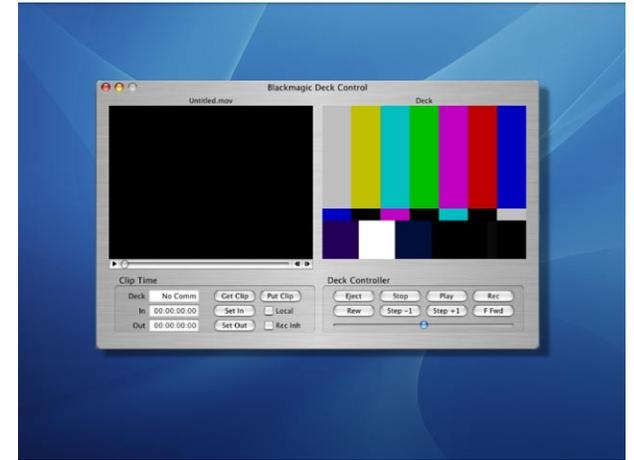
Setting Up

1. Double click the Blackmagic Deck Control icon on your desktop to open the application.
2. Open edit -> preferences. Select one of the Easy Setups from the drop down menu.
3. Select your disk array as the capture location.
4. Click "OK."

Playback

1. Select File-> open, and choose the video file you wish to playback. If you have added Blackmagic Deck Control to your **Dock**, you can also drag a movie file on to the Blackmagic Deck Control icon to open it. The file will appear in the playback window.
2. Click the "play" triangle below the clip. You can also scrub the clip just like the QuickTime™ player.

Note: Make sure the files you wish to play back are TV-formatted QuickTime™ files otherwise they will not appear on the DeckLink output.





Mac OS X™

Deck Control features

- Loop playback**
- Loop back and forth**
- Grab frame** (to Photoshop™ file)
- Copy and paste** (just like QuickTime™ player)

Inserting to Tape

1. Open the clip that you require to print to tape.
2. Enter the timecode of the desired in-point.
3. Click "Put Clip."

Capturing Clips

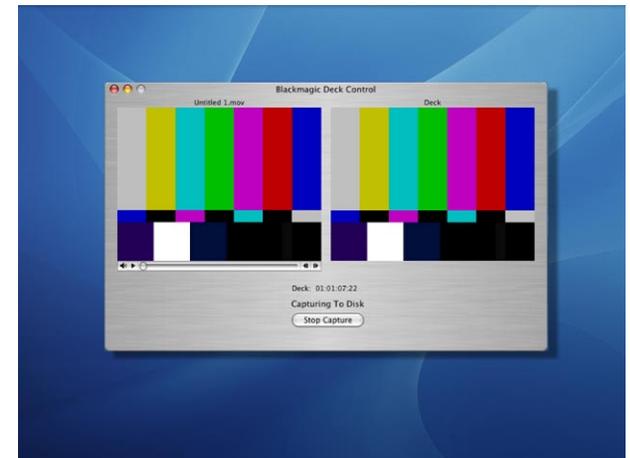
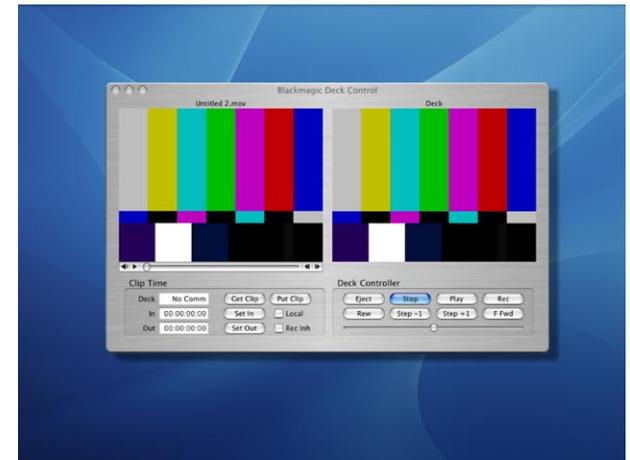
There are two ways to capture clips.

1. **Capture now** – captures video and audio instantly.
Shortcut: ⌘K
2. **Get clip** – captures frame accurate timecode, video, audio to "in" and "out-points" set by the user. [Timecode will only be available if RS-422 is connected]

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.

AppleScript™

Blackmagic Deck Control supports AppleScript™ commands for starting and stopping video capture. The status of the capture can also be requested via AppleScript™ for confirmation that capture has started or stopped.





Mac OS X™

Adobe After Effects™

Minimal configuration is required for Adobe After Effects™.

Simply, open the application and select the television standard frame size and frame rate you wish to work with.

How to use your DeckLink Card as a Frame Buffer

To allow your Adobe After Effects™ composition to be displayed in real-time from your DeckLink card, go to edit->preferences->video preview. Select Blackmagic RGB and the appropriate video standard. Now you can view your Adobe After Effects™ compositions in YUV colorspace on your broadcast monitor as well as your desktop. No more nasty surprises when you go to air or tape - what you see is what you get!

Create a New Composition

Go to the Composition menu and select New Composition.

Shortcut: ⌘N

In the dialogue box, select an appropriate television standard from the pulldown menu. Click OK.

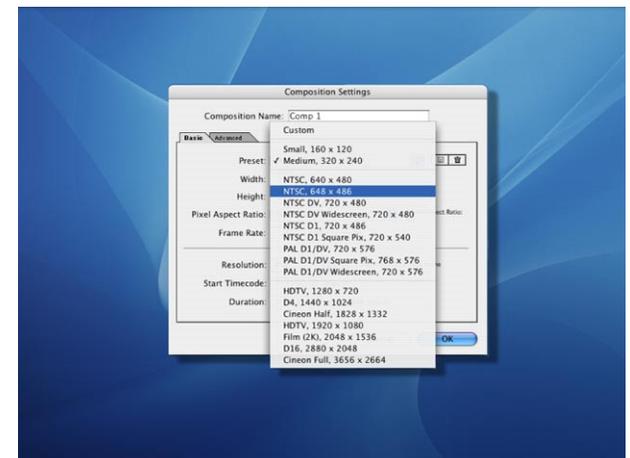
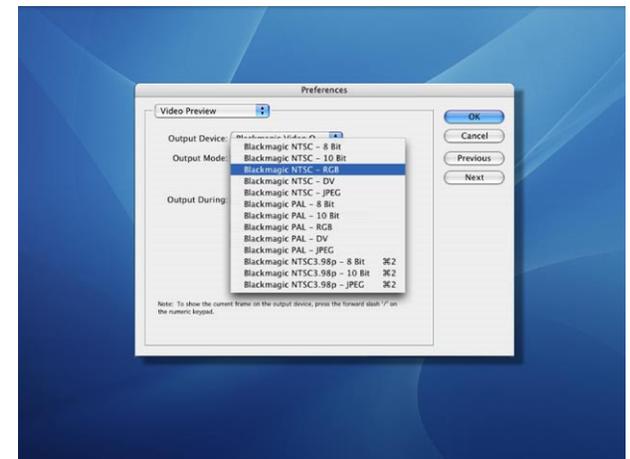
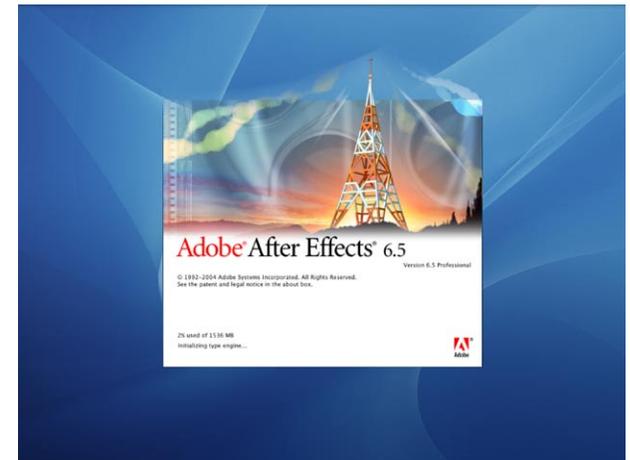
Rendering

When you have completed your composition, you will need to render to a pixel format supported by Blackmagic DeckLink.

Below is a list of supported codecs:

- Blackmagic QuickTime™ RGB (10 bit uncompressed)
- Blackmagic QuickTime™ v210 (10 bit uncompressed)
- Blackmagic QuickTime™ (8 bit uncompressed)
- Apple QuickTime™ PhotoJPEG (compressed)
- Apple QuickTime™ DV - NTSC (compressed)
- Apple QuickTime™ DV - PAL (compressed)

For all HD standards, select upper field first. For NTSC 720 x 486, select lower field first. For PAL 720 x 576, select upper field first.





Mac OS X™

Final Cut Pro HD™

Final Cut Pro HD™ is powerful real-time video and audio non-linear editing application. In conjunction with your new Decklink card, Final Cut Pro™ will allow you work in every video standard, from DV up to uncompressed 4:4:4 RGB high definition for film work.

The Blackmagic DeckLink installer will add Easy Setups for Final Cut Pro HD™.

Setting Up

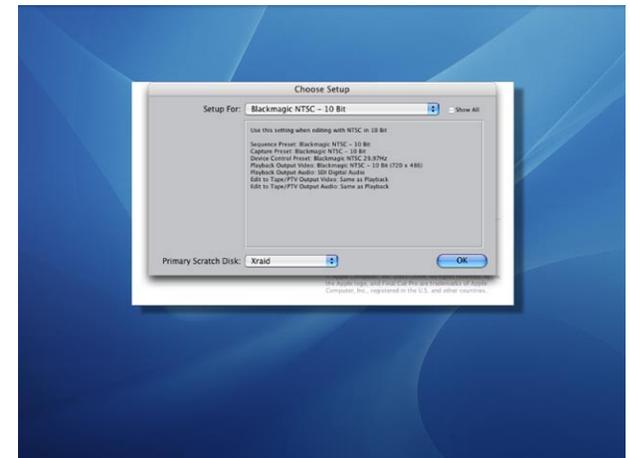
Launch Final Cut Pro HD™

1. The Easy Setup window will appear.
2. Click on the popup menu named “Setup for” and select a relevant Blackmagic Easy Setup. For each TV format (NTSC, PAL and HDTV) you will find a range of compressed and uncompressed file formats you can choose. For example, if you are working in NTSC format, you could choose one of the following Easy Setups:

Blackmagic NTSC - 10 Bit
 Blackmagic NTSC - 8 Bit
 Blackmagic NTSC - DV
 Blackmagic NTSC - DV50
 Blackmagic NTSC - JPEG.

Which Easy Setup you choose will be dictated partly by the speed of your disk array and partly by whether you already have any movie clips in a particular format. If you have a fast disk array, you can choose a 10 Bit format and the quality will be stunning. If you only have a single disk for storage, you could choose either DV or JPEG. JPEG often looks better but unfortunately Apple have not yet implemented RT Effects with JPEG. If you need to add RT Effects, then DV would be a better choice.

3. Click on the popup menu named “Primary Scratch Disk” and select your disk array from the popup menu. Then click OK.
4. Final Cut Pro HD will appear.





Mac OS X™

Playback

As a quick test to make sure everything is connected correctly, use the Blackmagic test media (bars and tone) which can be found on the installer CD. Find a test clip which matches the format of your project, eg NTSC 8 bit, and copy it to your disk array. Import this clip into your Final Cut Pro HD™ project and drop it into the timeline. You should now see the image on both your computer desktop and your DeckLink output.

If you can't see any video on your DeckLink output, check the connections again and ensure you have the correct output settings configured within Final Cut Pro HD by going to the View menu->Video Devices and, in the same menu, make sure External Video is set to 'All Frames'. You might also check in the Displays menu and also the Blackmagic DeckLink preference pane in the System Preferences of Mac OS X™.

Note: SDI and analog outputs are always active. If you have a DeckLink card which supports both component and composite analog, you will need to choose between component and composite output in the Blackmagic DeckLink preference pane in the System Preferences of Mac OS X™. It is only on a card with multiple inputs, such as the DeckLink Extreme, that you need to specify whether you are capturing via SDI, component analog or composite analog inputs.

Capture

To capture, go to the File menu and choose Log & Capture.

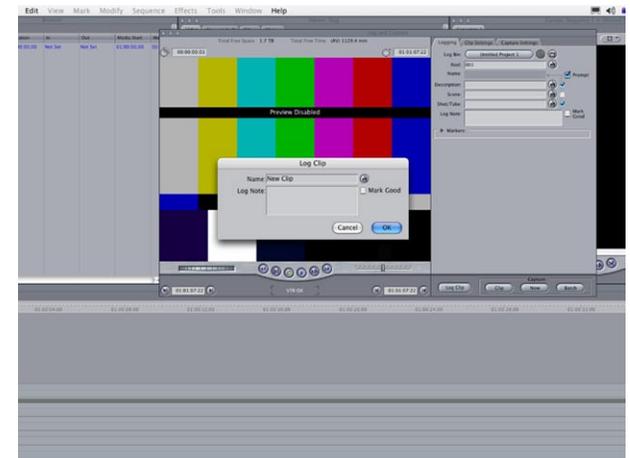
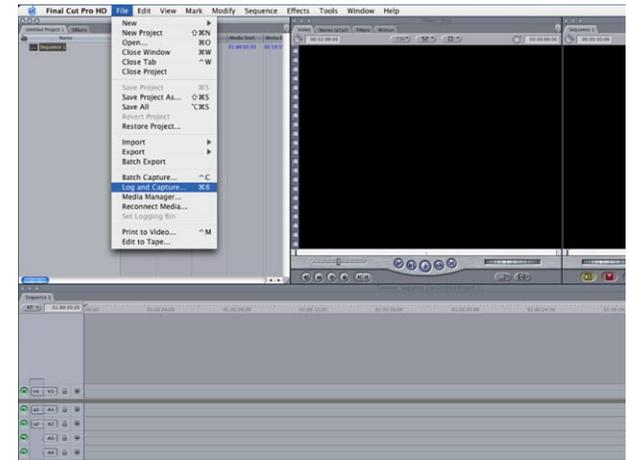
Shortcut: ⌘8

Your video deck will respond in the same way as a clip in the Timeline, via the space bar and “j”, “k”, “l” keys.

It is extremely important to set the correct tape number for your clip as this will allow you to find the same frame off tape at any time in the future.

To immediately capture, click the Capture Now button. If you wish to log the clip, enter the desired “in” and “outpoints” using either the “i” and “o” keys on your keyboard or manually, by typing in the timecode and clicking “Log Clip”. If you have the “Prompt” checkbox selected, Final Cut Pro™ will now ask you to name the clip. Name it and click OK; the clip will appear in your browser with a diagonal red line indicating that it is “offline”. Repeat this until you have logged all of the clips you wish to capture in a batch.

Note that, when logging sequential clips from tape, Final Cut Pro™ will automatically suggest a name for each clip based on the previous clip. So, if your first clip is called “Mary, MCU”, Final Cut Pro™ will suggest the next clip be called “Mary, MCU 01” and so forth. This can make the logging process much faster.





Mac OS X™

Batch Capture

Select the clips you wish to capture by marque or shift-click. Go to the File menu and choose Batch Capture or click on the Batch button in the Logging tab of the Log & Capture window.

Shortcut: ^C (i.e. Control C)

To set handles on the clips, go to the File menu and choose Batch Capture (^C). Enable the “Add Handles” box to capture additional frames (“handles”) before and after the In and Out points of a clip.

RT Extreme™ (real time effects)

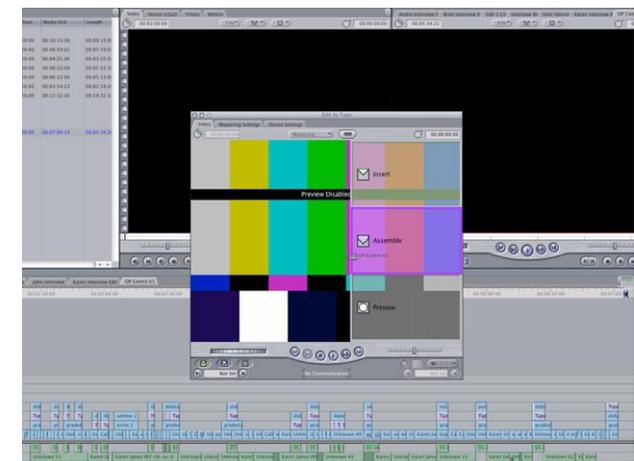
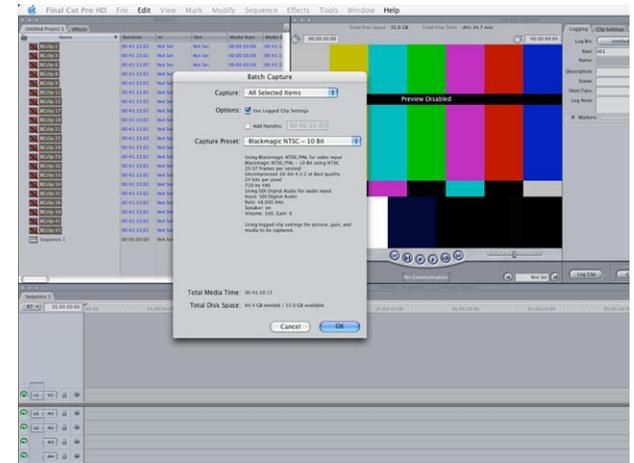
RT Effects are one of the great features of Final Cut Pro HD™ and your DeckLink card is fully compatible with Apple’s RT Extreme™. Before Apple had their own RT Effects, we included some Blackmagic RT Effects and they are also available if you want to use them. Apple added great RT Effects support to version 4 of Final Cut Pro™ and so it now makes sense to use Apple’s RT Extreme™ real time effects.

When you install the Blackmagic DeckLink driver software, the “effect handling” in Final Cut Pro HD™ will default to the “Blackmagic”. To use Apple’s RT Extreme effects, we recommend you switch this setting from Blackmagic to Final Cut Pro HD™. To do so, go to the Final Cut Pro HD™ menu, choose System Settings and click on the Effect Handling tab. Change the settings, for Uncompressed 10-bit 4:2:2 and Uncompressed 8-bit 4:2:2, from Blackmagic to Final Cut Pro HD™.

If you are working in high definition, you will not find a “Final Cut Pro HD™” setting so you need to change the settings for Blackmagic 8 Bit (2Vuy) from “Blackmagic” to “Blackmagic HD”. This is because Apple do not yet have their own codec for 8-bit HD so we supply our own. Apple will probably address this in a future update and we expect Blackmagic Design will adopt the Apple codec at that time.

Recording to Tape

Once you have captured your clips, edited them and applied any effects, you will want to record the completed project to tape. One easy method is to go to the File menu and choose Print to Video. If you want to perform precise insert and assemble edits onto a timecode striped tape, go to the File menu and choose Edit to Tape.





Mac OS X™

Trouble Shooting

Q: There is no output from my card when in desktop mode.

A: Go to the Apple menu and choose System Preferences. Click on the Blackmagic DeckLink icon. Ensure that “Video Desktop” option is set to “Enabled” and then restart the Mac. You should now see your extended desktop on your broadcast monitor. If it still does not appear, go to the /Applications/Utilities folder and launch Disk Utility.

Select your startup hard disk and then click on “Repair Disk Permissions.” A progress bar will draw across your screen and then disappear. This will usually take 5 or 10 minutes and then you can restart your Mac. Now see if the desktop displays on your broadcast monitor. If not, please contact macsupport@blackmagic-design.com.

Q: I can't get machine control of my tape deck.

A: Make sure that the deck you are using supports and is connected via the Sony RS-422 serial protocol. DeckLink does not directly support older RS-232 serial devices.

Some low-cost decks, such as the Sony UYW1400a still use RS-232. Final Cut Pro can provide deck control via RS-232 with the addition of a Keyspan “High Speed” USB Serial Adapter <http://www.keyspan.com/products/usb/USA19W>. You will need to configure the RS-232 protocol by going to the Audio/Video Settings, in Final Cut Pro, and then click on Device Control Presets. Edit each preset for which you want to use RS-232. This solution works fine if you have to use RS-232.

If using a Panasonic deck, you may need to use the deck's USER Menu to change the “ID SEL” to “other”, to make it compatible with the Sony RS-422 deck control protocol. “ID SEL” is usually USER Menu item number 202.

Q: Can I monitor audio from my Mac's internal speaker?

A: Yes you probably can, however we do not recommend it. This is because the Mac system clock and the DeckLink's clock are different. If you monitor audio through your Mac's internal speaker, the audio is likely to be out of sync with video. Furthermore, audio might stop working for no apparent reason. We strongly recommend using the SPDIF output connectors from the DeckLink card, or the audio output from your deck, to monitor your audio.



Mac OS X™

Q: When I output video to my deck (or TV monitor), the picture moves or rolls? What can I do to obtain stable video?

A: DeckLink always has a stable video output so you don't need genlock, and this is great as it saves you a lot of money on a black burst generator. We designed DeckLink to do this, as it makes the entire system cost much lower, and that's important for a low cost card. Generally you select the deck to input video sync, when connected to DeckLink, and then the deck can lock.

However if you are in a big post facility, you might need Genlock, so DeckLink Pro and DeckLink Extreme include genlock. Some Betacam SP decks (eg Sony UWW1800 and UWW1400a) don't always work well without genlock so DeckLink SP and DeckLink Extreme include genlock. If you have problems with an analog deck, you can connect the genlock.

If you are using DeckLink SP, DeckLink Pro or DeckLink Extreme, try connecting the Y output of the DeckLink card to the reference input of the deck, and then the reference loop out back into the Y input. That should let the deck lock to the DeckLink. There are a few decks where this doesn't work and in which case you might need to use a black burst generator.

Q: I cannot get stable video output out of my Betacam SP UWW1400a. What can I do?

A: This is a very popular model of deck as it is low cost. We have received a range of reports regarding the Betacam SP UWW1400a and you might or might not be able to get genlock working without a black burst generator. However, you can give it a try and this has worked for a number of our customers, especially with the latest drivers.

1. In the Video Input for component, you have the Y, R-Y and B-Y ports. Remove the "Y in (from deck)" cable from the Component Y port and connect it to the top-left Ref Video port.
2. Switch the Ref Video termination to Off.
3. Connect a cable from the top-right Ref Video port (labelled "sync") and connect it to the Component Y port.

That should let the deck lock to the DeckLink. There are a few UWW1400a decks where this doesn't work and in which case you might need to use a black burst generator.

Most decks can just lock to the DeckLink SP and DeckLink Extreme but UWW1400a owners have often reported that they had to use a blackburst generator. The one we use inhouse is a Horita BSG-50 (you have to specify NTSC or PAL) and you can see it at <http://www.horita.com/video.htm#BSG-50>.



Mac OS X™

The UWW1400a lacks RS-422 serial control but you can still use RS-232 serial control with Final Cut Pro to obtain full deck control. Please refer to the troubleshooting note “I can’t get machine control of my tape deck” for more information.

Q: I am trying to play back a DV clip in Final Cut Pro on my PowerMac G4 but the video is jerky. What can I do to fix this problem.

A: Go to the top-left corner of your timeline and you will find an RT popup menu. Pop it open and ensure that it is set to “Safe RT.” Then check the Playback Video Quality and reduce it to Medium or Low. Make sure that “Record to Tape” remains on “Full Quality.” This will enable you to monitor smooth video (at a lower quality) on your TV monitor while recording to tape at full quality.





Mac OS X™

If things go wrong

There are three steps to getting help.

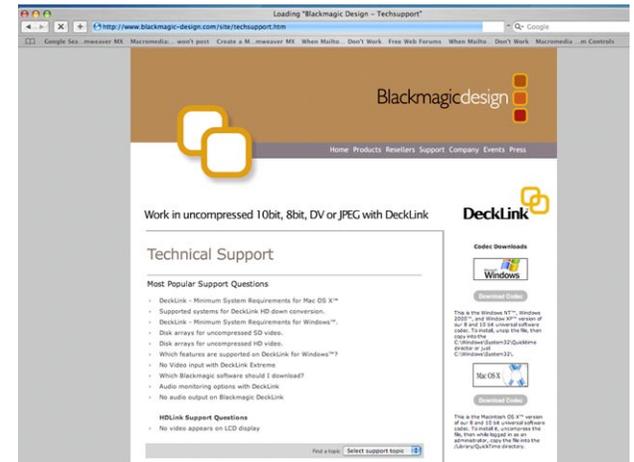
Step 1. Check out the Blackmagic Design web site www.blackmagic-design.com and “click on the support page” for the latest support information.

Step 2. Call your dealer.

Your dealer 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.

Step 4. The next option is to email us at macsupport@blackmagic-design.com with your questions.

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.





Mac OS X™

Connection Diagrams

DeckLink™

SD-SDI 4:2:2 video and audio, capture and playback card



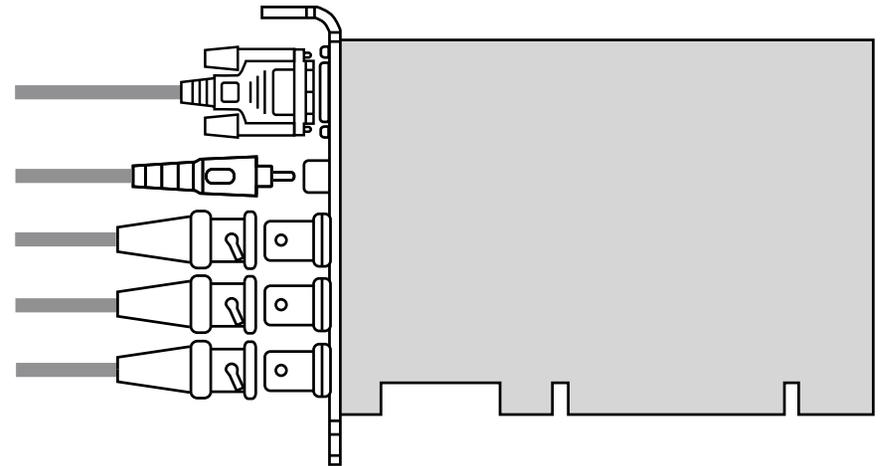
Deck Control
RS-422

AES-S/PDIF
Output

SD-SDI 4:2:2
Monitoring Output

SD-SDI 4:2:2
Output (to deck)

SD-SDI 4:2:2
Input (from deck)



This DeckLink model does not have genlock, so you need to connect your deck to the Deck SDI Output, which has stable output to sync the deck. Set the deck to input or auto reference. Be sure to set the “Black Video Output to Deck in Capture” option to “On Digital SDI Outputs” in the DeckLink control panel, when using this feature.

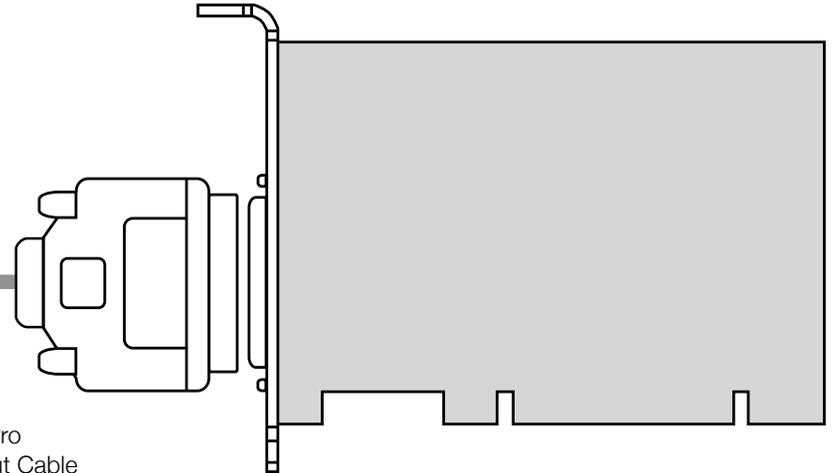
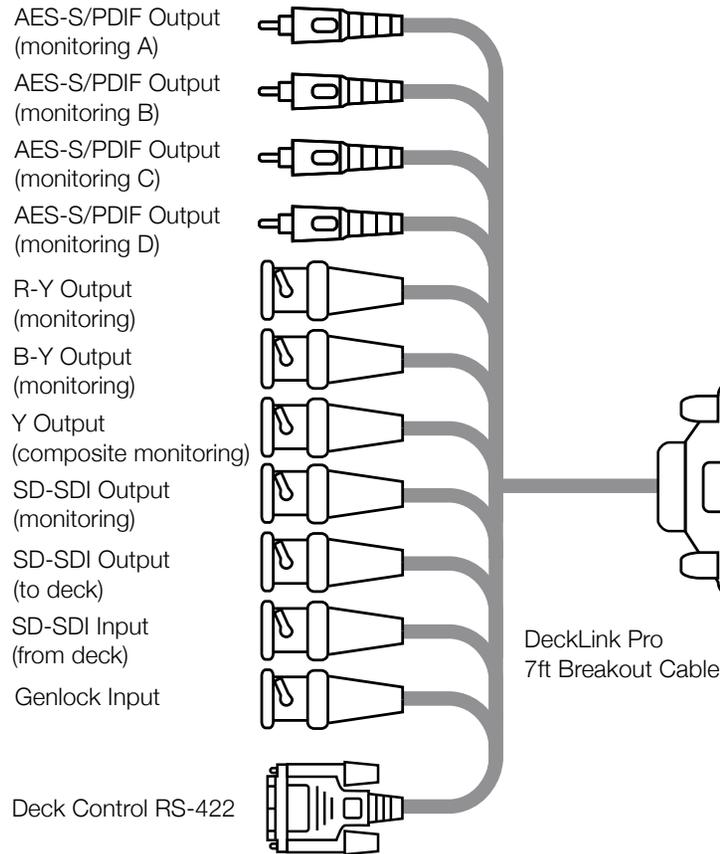
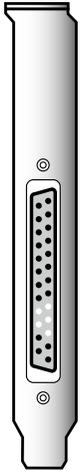


Mac OS X™

Connection Diagrams

DeckLink Pro™

SD-SDI 4:2:2 video and audio capture and playback card with analog monitoring



When you don't have genlock, you can output stable black so DeckLink Pro locks the deck. This output is always stable and allows the deck to be set to input reference or auto reference. Be sure to set the "Black Video Output to Deck in Capture" option to "On Digital SDI Outputs" in the DeckLink control panel, when using this feature.

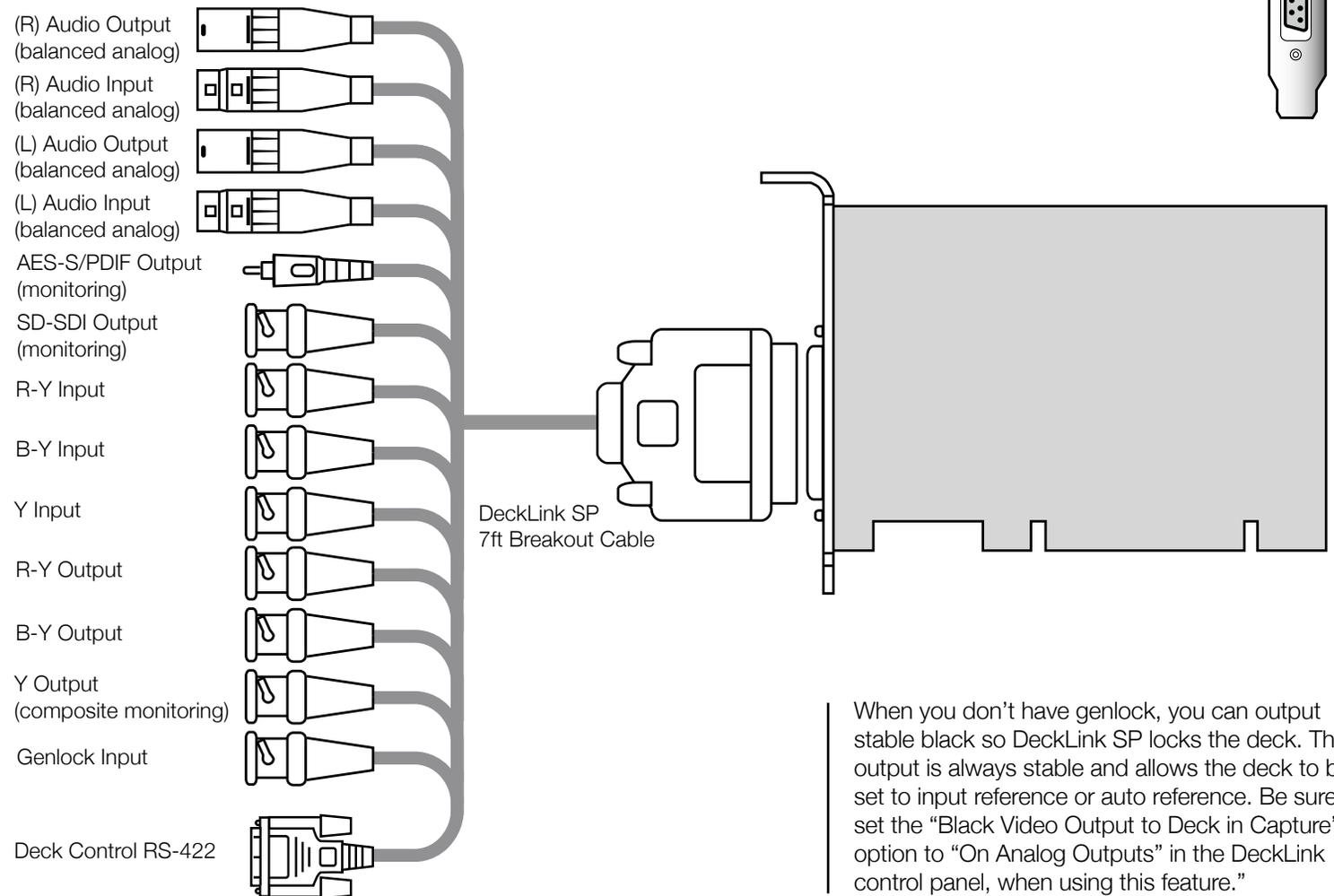


Mac OS X™

Connection Diagrams

DeckLink SP™

Analog video and audio capture and playback card with SD-SDI 4:2:2 monitoring



When you don't have genlock, you can output stable black so DeckLink SP locks the deck. This output is always stable and allows the deck to be set to input reference or auto reference. Be sure to set the "Black Video Output to Deck in Capture" option to "On Analog Outputs" in the DeckLink control panel, when using this feature."

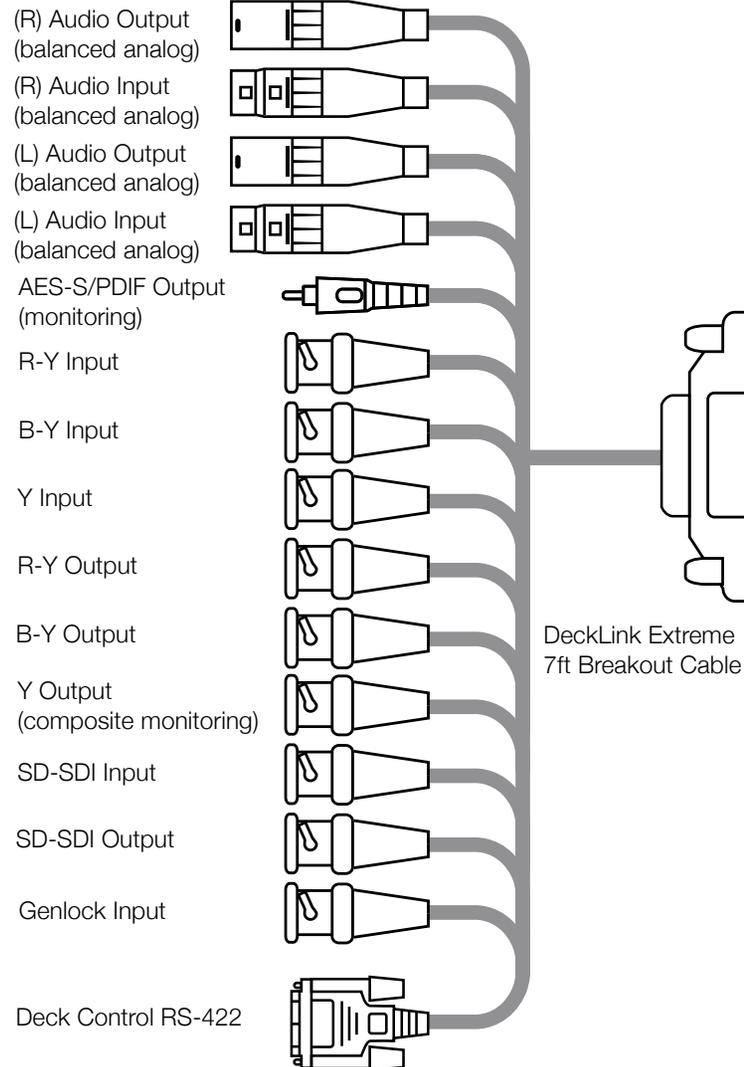
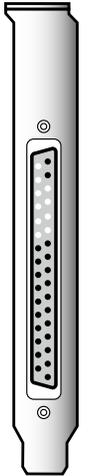


Mac OS X™

Connection Diagrams

DeckLink Extreme™

SD-SDI 4:2:2 and analog video, audio capture and playback card



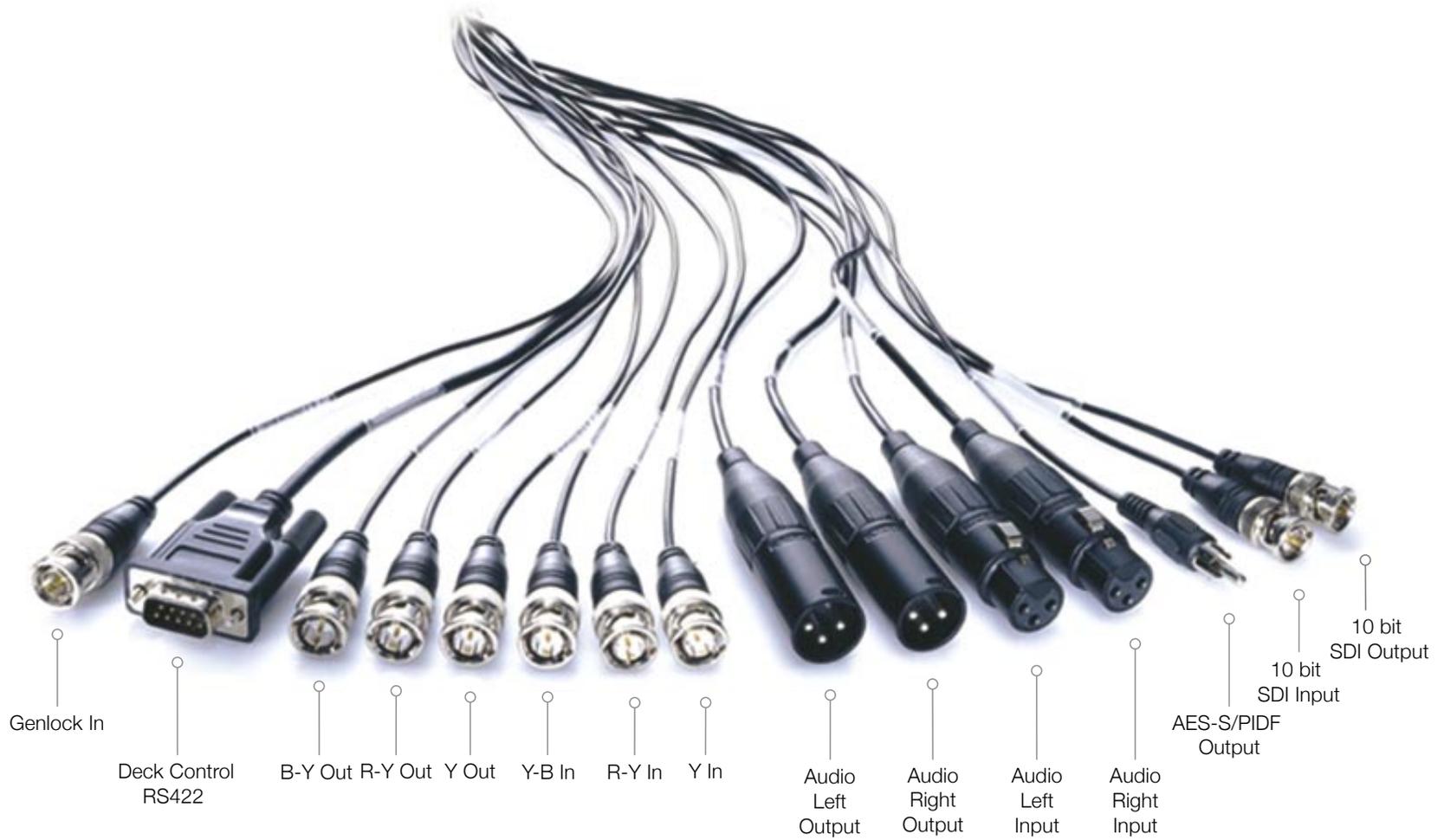
When you don't have genlock, you can output stable black so DeckLink Extreme locks the deck. This output is always stable and allows the deck to be set to input reference or auto reference. If you are using a digital deck, be sure to set the "Black Video Output to Deck in Capture" option to "On Digital SDI Outputs" in the DeckLink control panel, when using this feature. If you are using an analog deck, be sure to set the "Black Video Output to Deck in Capture" option to "On Analog Outputs".



Mac OS X™

Connection Diagrams

DeckLink Extreme™ cable



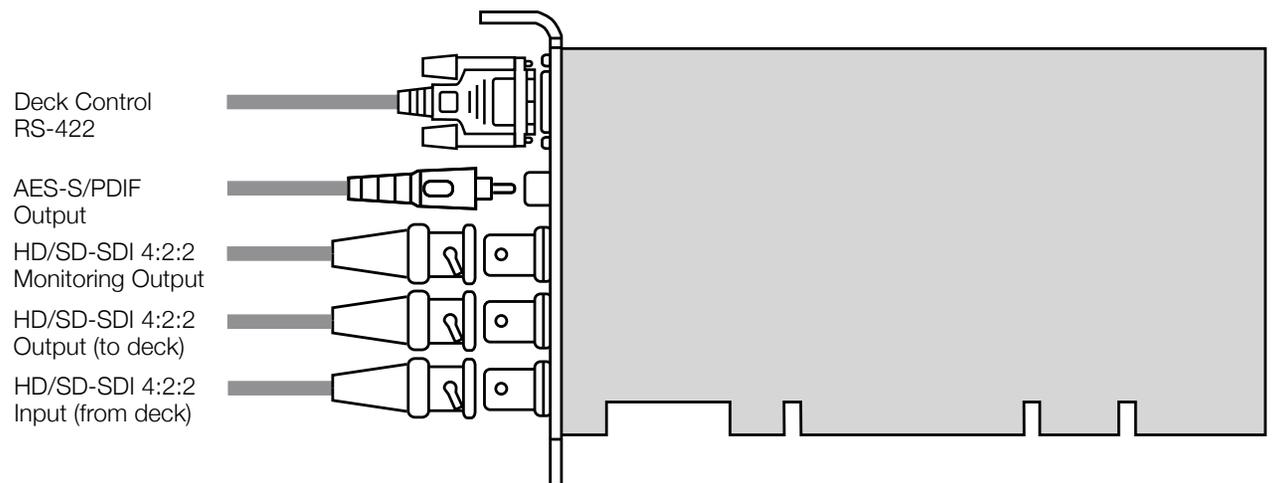


Mac OS X™

Connection Diagrams

DeckLink HD™

HD/SD-SDI 4:2:2 video, audio capture and playback card



This DeckLink HD model does not have genlock, so you need to connect your deck to the Deck SDI Output which has stable output to sync the deck. Set the deck to input or auto reference. Be sure to set the “Black Video Output to Deck in Capture” option to “On Digital SDI Outputs” in the DeckLink control panel, when using this feature.”

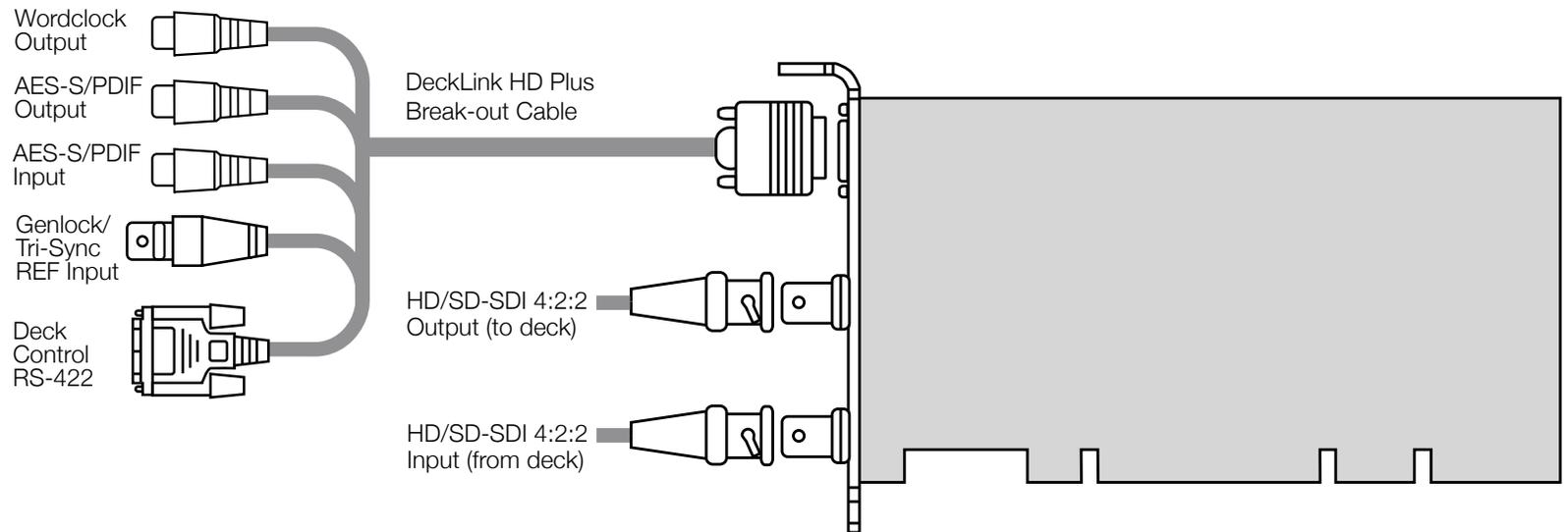


Mac OS X™

Connection Diagrams

DeckLink HD Plus™

HD/SD-SDI 4:2:2 video, audio capture and playback card



When you don't have genlock, you can output stable black so DeckLink HD Plus locks the deck. This output is always stable and allows the deck to be set to input reference or auto reference. Be sure to set the "Black Video Output to Deck in Capture" option to "On Digital SDI Outputs" in the DeckLink control panel, when using this feature.

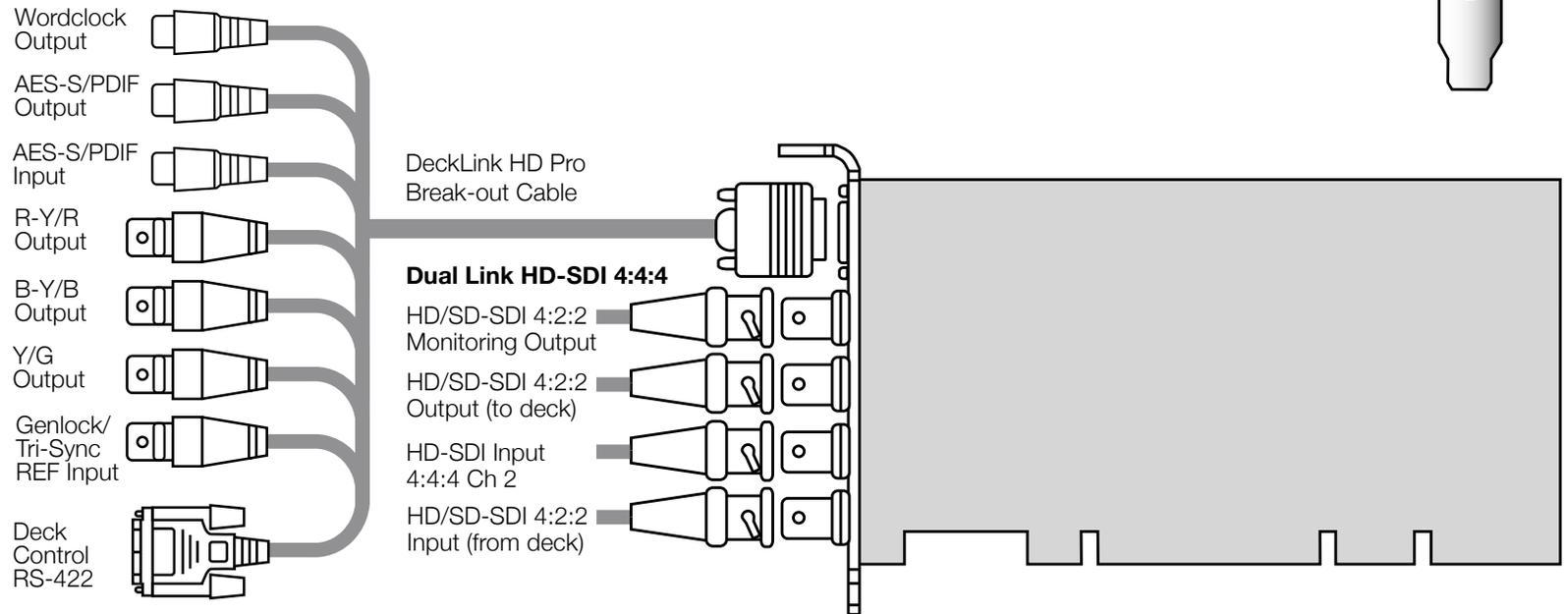
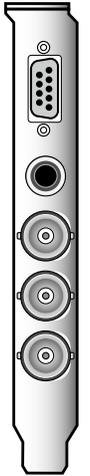


Mac OS X™

Connection Diagrams

DeckLink HD Pro™

HD/SD-SDI 4:4:4/4:2:2 video, audio capture and playback card with analog monitoring
(Dual Link Mode 4:4:4)



When you don't have genlock, you can output stable black, so DeckLink HD Pro locks the deck. This output is always stable and allows the deck to be set to input reference or auto reference. Be sure to set the "Black Video Output to Deck in Capture" option to "On Digital SDI Outputs" in the DeckLink control panel, when using this feature.

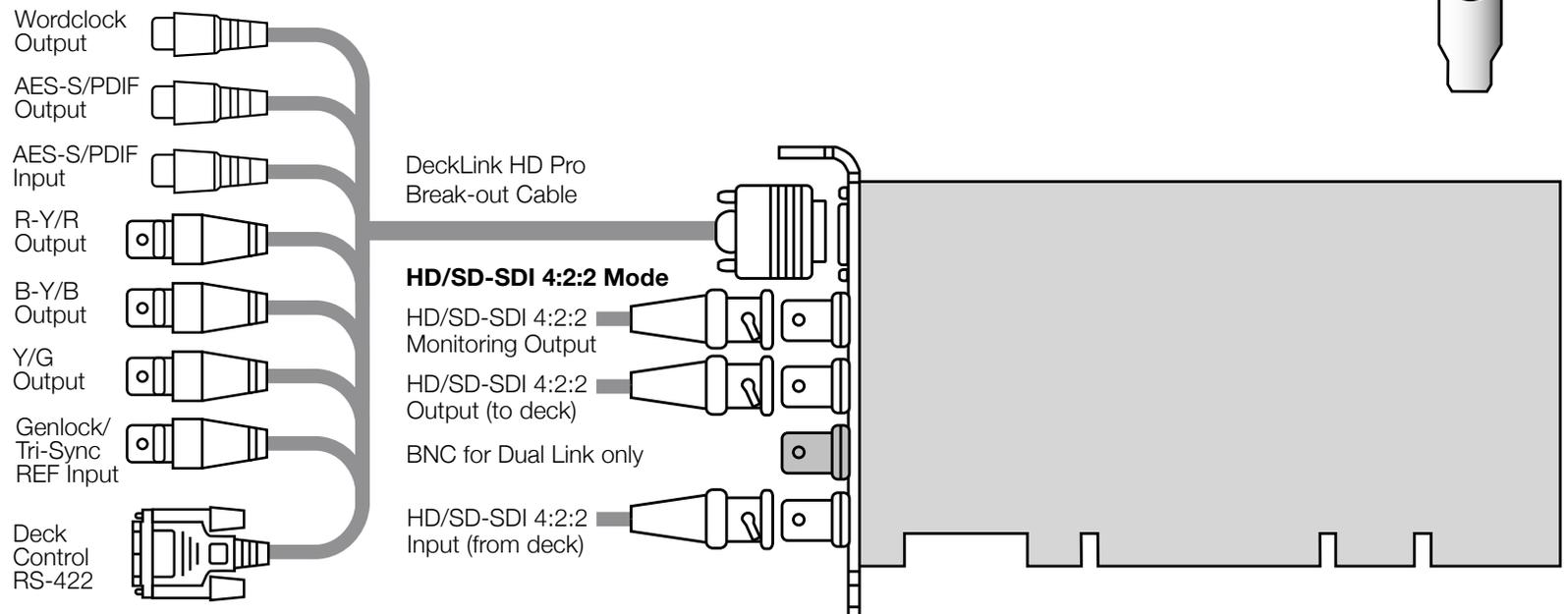


Mac OS X™

Connection Diagrams

DeckLink HD Pro™

HD/SD-SDI 4:4:4/4:2:2 video, audio capture and playback card with analog monitoring
(Single Link Mode 4:2:2)



When you don't have genlock, you can output stable black so DeckLink HD Pro locks the deck. This output is always stable and allows the deck to be set to input reference or auto reference. Be sure to set the "Black Video Output to Deck in Capture" option to "On Digital SDI Outputs" in the DeckLink control panel, when using this feature.

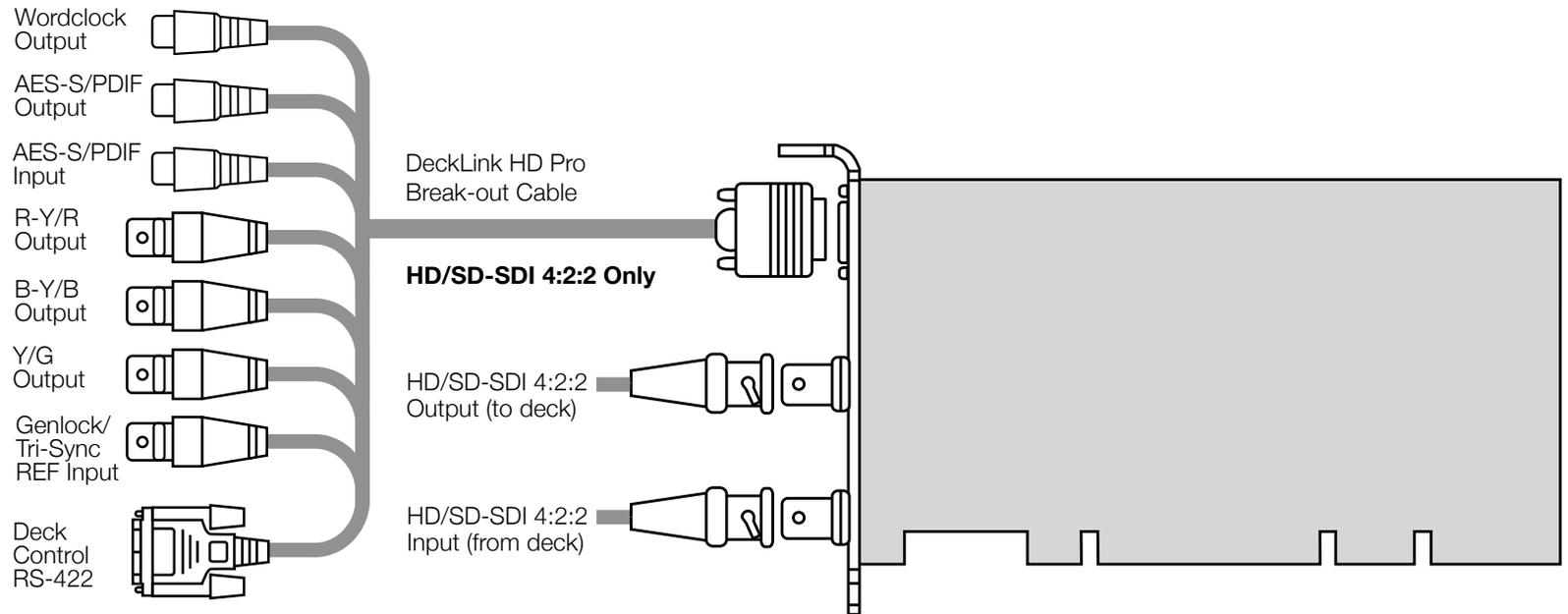


Mac OS X™

Connection Diagrams

DeckLink HD Pro™ (Single Link card)

HD/SD-SDI 4:2:2 video, audio capture and playback card with analog monitoring



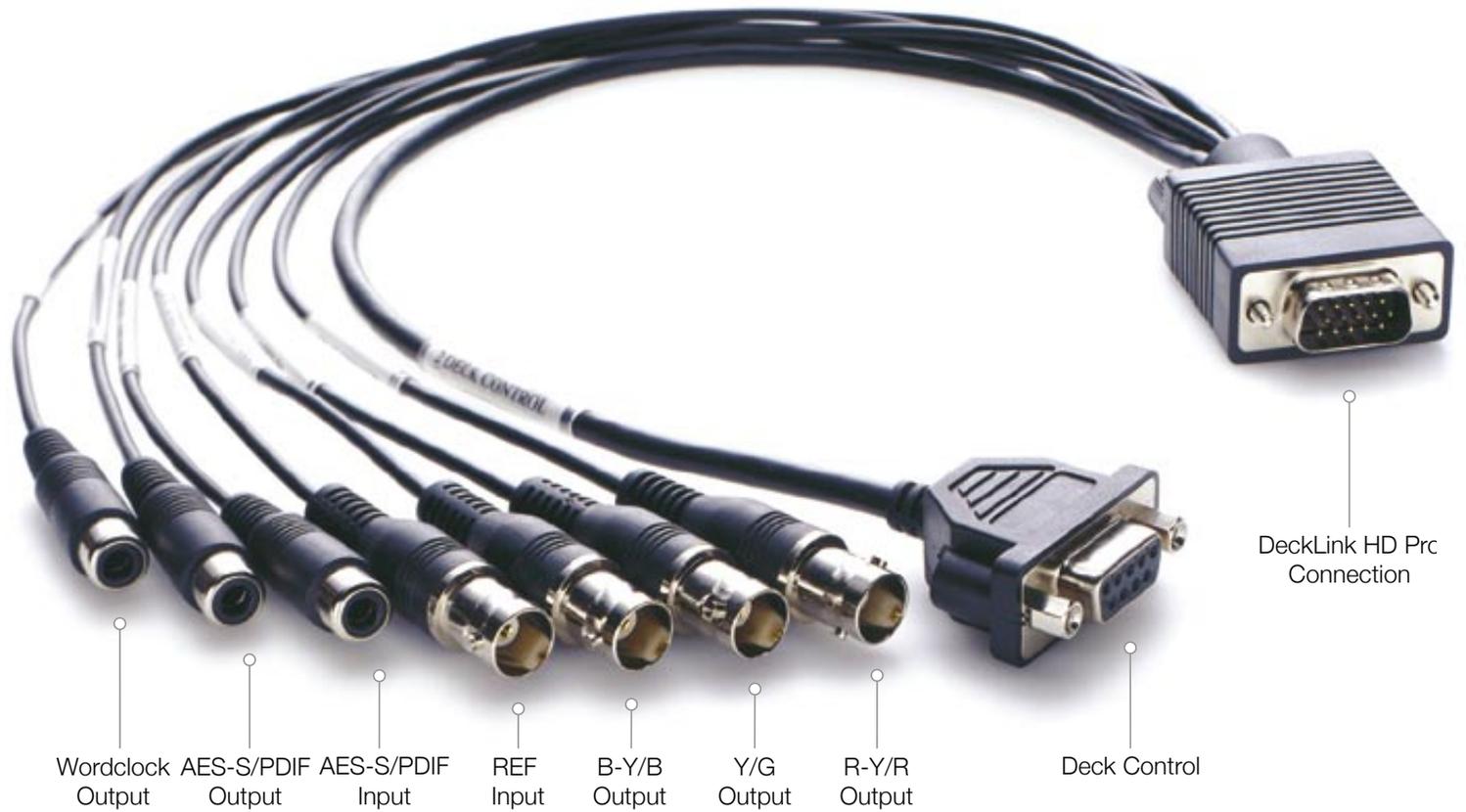
When you don't have genlock, you can output stable black so DeckLink HD Pro locks the deck. This output is always stable and allows the deck to be set to input reference or auto reference. Be sure to set the "Black Video Output to Deck in Capture" option to "On Digital SDI Outputs" in the DeckLink control panel, when using this feature.



Mac OS X™

Connection Diagrams

DeckLink HD Pro™ cable





Mac OS X™

Blackmagic Design Limited Warranty

Blackmagic Design warrants that this product 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 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.

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