



Blackmagic DeckLink  
Technical Overview  
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## Blackmagic DeckLink Technical Whitepaper

Blackmagic DeckLink is a complete re-think in uncompressed video cards and includes many technical innovations not available in any other NLE system today.

Blackmagic DeckLink cards are also priced dramatically lower than other products, enabling anyone to work in the highest video quality. In the past, television products have been expensive and restricted to a technical minority. However with Blackmagic DeckLink this has now changed, allowing the highest quality video to be available to everyone.

This enables many workflow innovations, and lets any creative user access high quality video at all times. This allows more time to experiment creatively and moves the television industry back to being a creative based industry, as compared to the technical based industry.

This document is designed to help you understand the many innovations in the Blackmagic DeckLink product family. This will benefit your system design and workflow techniques.

Because DeckLink uses an open software interface (API) based on Apple QuickTime™ any QuickTime™ software can be used with DeckLink for high quality video production.

Please check the QuickTime™ technology primer at the end of this whitepaper to learn more about QuickTime™ and how it allows you to easily integrate software and hardware products from different manufacturers.

## Blackmagic DeckLink Product Family

There are currently 4 different models of DeckLink designed for different uses. All models of DeckLink cards include the same quality modes, file formats, real time effects and other features. However the different models have different video connections and are designed for different tasks in a television facility.

Listed below is a roundup of the DeckLink family and a description of each products features:

**DeckLink** - This low cost card has one SDI input, and one SDI output for the deck connection, and one SDI output for video monitoring. It also includes an SPDIF output for monitoring, and a RS422 deck control port compatible with the Sony™ deck control standard.

This product is low cost and designed for use with SDI based digital decks. Connections are handled by separate BNC, RCA and D type connectors on the rear of the PCI card.

**DeckLink Pro** - This product is an enhanced version of the standard DeckLink model. It has similar connections, while also includes genlock input, high quality YUV/NTSC/PAL monitoring, and 4 x SPDIF monitoring outputs for 8 channel audio monitoring.

DeckLink Pro makes local video monitoring low cost because of its analog monitoring connections, while it also includes a genlock connection for large broadcast facility users. The multi channel audio monitoring allows complex audio mixes in editing.

Physical connections to DeckLink Pro are different, and are via a single long 2 meter or 7 foot break out cable.

This cable includes all the connectors for direct interface to a broadcast deck, eliminating break out box clutter, and there is no extra cables to purchase when setting up your system. You only have a single connection to the host computer eliminating cable mess. Each cable is labeled clearly so installation is simple.

**DeckLink SP** - This product is similar in features to DeckLink however the main deck connections in and out are analog YUV, switchable to NTSC/PAL for video, and analog XLR balanced audio connections. This is compatible with broadcast decks such as Betacam SPTM, or even older composite equipment.

Genlock is included, and DeckLink SP also includes a full 10 bit SDI output for monitoring or high end mastering, and a single SPDIF audio output for low cost high quality monitoring on consumer equipment.

DeckLink SP also uses a direct to deck break out cable containing all the audio, video and control connections. This makes setup easy as each cable is clearly marked.

**DeckLink HD** - This is the world's first PCIX HD and SD 10 bit uncompressed SDI video card. It has a revolutionary low price of US\$1,995 which is unprecedented for a HDTV product.

DeckLink HD is almost identical in features to the standard DeckLink model, but when plugged into a PCIX slot can be switched over to HDTV. DeckLink HD can be added into a slower 33MHz PCI based computer for standard definition use.

Uncompressed 10 bit and 8 bit modes are supported in HDTV as well as JPEG. JPEG allows slow disks to be used for full resolution HDTV offline work allowing users to ease into HDTV production at almost no extra cost.

DeckLink HD is the product that's going to enable all facilities to upgrade to HDTV now.

At only US\$1,995, it's actually the lowest priced standard definition video card on the market when compared to other manufacturers, however includes full HDTV support built in, at no extra cost.

## Lowering Costs

Blackmagic DeckLink has been designed from the ground up as a low cost but high quality uncompressed video card. Low cost created many unique design challenges for the DeckLink design team. Namely how to reduce the cost without compromising video quality, reliability or features?

Lowering the cost has only been possible by using the latest in electronic components for high performance. Unlike other companies, Blackmagic Design has in house manufacturing facilities, so improvements can be released quickly. Quality can also be maintained to the highest levels.

Another area that helps reduce costs for users was to consider the entire editing design. Many savings can be made to other parts of the system if changes are made to how the DeckLink operates.

A good example is Genlock. Other cards require genlock, however genlock has not really been used in post production since the days of linear edit bay design, where each deck needed to be "timed" into a vision mixer.

Most facilities don't use vision switchers any longer, so system timing is no longer a requirement. When connecting to broadcast tape decks, Blackmagic DeckLink will output a stable SDI sync reference to the deck to sync it. This eliminates the requirement for adding a sync generator to the edit system, and can save over US\$600 on the cost of a system by eliminating this expensive piece of equipment. This is even more of an issue with HDTV, and DeckLink HD also has this ability.

However choice is also important, so when connecting to large post production systems of low end analog decks that require genlock, (UVW-1800, BVH-2000) DeckLink SP and DeckLink Pro include genlock. On these cards, genlock connection will lock the internal sync generator to house sync, and standard NTSC or PAL black burst can be used.

Other cost savings include building in the serial control saving on custom cables and serial adapters, and the long break out cables allow direct connection to your deck and monitor. This saves a lot of money in extra connection cables normally used to connect up other brand cards. DeckLink Pro and DeckLink SP don't require any extra cables for system setup!

## A New Way to Connect

Most cards have audio connections, genlock connections, SDI video connections and you need to add separate hardware for deck control with custom cables, and hard disk arrays.

Blackmagic DeckLink breaks through this mess for a simple direct-to-deck connection.

DeckLink features video in and out connections that link directly to any SDI digital deck. Video and all audio channels are sent through a standard BNC cable for ease of connection. DeckLink also includes a second monitoring SDI video/audio connection and SPDIF audio monitoring connection, and a deck control port all on the one card.

This second monitoring output allows DeckLink cards to output black to the deck when in capture mode, eliminating annoying video feedback via the deck. This also lets the deck lock to the DeckLink cards when no sync generator is used.

### **Sony™ Compatible RS-422 Deck Control**

Blackmagic DeckLink is the first uncompressed video card to feature a standard Sony™ compatible RS-422 serial deck control port.

No custom cables or annoying modem replacement cards are required. You don't lose a PCI expansion slot, and you don't need to add modifications to the computer to add a serial port.

The DeckLink and DeckLink HD serial deck control port is fully pin-for-pin compatible with standard Sony™ and Panasonic™ broadcast decks. Any pin for pin standard DB-9 serial cable can be used for connecting the Mac to your broadcast deck. Serial deck control is low latency, and fully frame accurate.

On DeckLink Pro and DeckLink SP a break out cable is used with all connections included. On these models the RS422 control port is a 9 pin plug for direct connection to the deck, and this plug includes the fine pitch metric threads used on the Sony™ RS422 control port standard.

### **SDI Video & Audio Connections**

Blackmagic DeckLink , DeckLink Pro and DeckLink HD features two SDI serial connections for the deck. One SDI input is connected to the output of the deck, and the SDI output is connected to the SDI input of the deck.

The DeckLink card will provide stable SDI sync to the deck when in video capture mode. This means the requirement for a video black sync generator is eliminated, and no cable reconnections are required when moving from capture to output to tape.

Blackmagic DeckLink also takes advantage of the common SDI equipped decks, such as DVC Pro 25™, DVC Pro 50™, Digital Betacam™, Sony™ J Series, and many other types of decks that have SDI video connections built in. These decks have both the video and the audio channels all contained in the single BNC type cable. Generally all SDI based decks also include SDI audio, and SDI audio is very common. SDI audio is included with the sync information in with SDI video. It's sent everywhere the video is connected, making cabling simple.

Broadcast users have been taking advantage of this ability for the last few years to build large systems with only SDI video routing to save enormous costs of facility construction. No additional audio connections are required because the DeckLink uses SDI audio, so all video and audio channels are sent down the single BNC cable to the deck.

SDI audio is sometimes called embedded audio, and can allow up to 16 channels of audio, 10 bit uncompressed video and sync information to be transported down a standard BNC cable. This eliminates separate audio cabling, and allows easy interconnections, and patching between systems and decks. DeckLink audio uses the television standard sample rate of 48 KHz, 24 bit, and is available as an additional Mac audio input and output, selectable in the sound system preferences.

DeckLink does not require any reconnections when in use, as it automatically changes monitoring output from the deck to the computer output based on what the user is doing.

DeckLink SP uses analog connections so has a single SDI monitor output, due to the deck output being analog component (YUV) or NTSC/PAL format. Audio is embedded in the single SDI out in the same format as other DeckLink models, however the analog video outputs have complementary XLR analog audio outputs for connection to analog decks.

DeckLink HD has the same SDI video connections as other DeckLink cards, however these SDI connections can be switched between standard definition SDI or high definition SDI connections.

## User Monitoring

Monitoring for the user can be connected from the deck, or from additional SDI video/audio and SPDIF audio monitoring connections from the Blackmagic DeckLink card.

When monitoring from the deck, the digital or analog output connections can be used. By selecting PB/EE mode on the deck, the deck will automatically switch modes between capture and EE so you can see the output of the DeckLink card while editing.

If the deck is busy, and cannot be used for monitoring, then the Blackmagic DeckLink provides a separate SDI video/audio monitoring output. This can be connected into standard broadcast monitors, or analog converters can be used for lower cost monitoring.

DeckLink Pro includes an analog output with three separate BNC type connectors. These are labeled Y, R-Y and B-Y. These can connect to standard "component" video monitors for high quality monitoring, and this eliminates the need for an analog converter for monitoring saving cost.

If a component video monitor is not available, then in the DeckLink control panel the video output can be selected to NTSC/PAL and the Y output will be composite NTSC/PAL video. This can then be connected to a simple television or VHS deck for client dubs. The SDI monitoring output is also still available.

For audio monitoring, any consumer audio amplifier with digital audio input will connect to DeckLink's SPDIF audio outputs for low cost, but high quality audio monitoring.

DeckLink will also de-embed the SDI input and output this to the SPDIF audio monitor output when in capture mode. All pro audio bits are enabled, so this SPDIF audio monitoring output can easily be connected to full AES/EBU audio inputs for pro audio use.

SPDIF is the technical name for the consumer digital audio connection that uses RCA connectors, and is commonly found on DVD players, most good CD players, and HD set top boxes.

## Variable Quality Video

Blackmagic DeckLink offers a full range of video quality modes. Each mode has its own special benefits, and the user can choose which ever mode suites a particular task.

All Blackmagic DeckLink video modes, including 10 bit uncompressed, are fully compatible with other uncompressed video products and the Apple Uncompressed codec built into Final Cut Pro™.

The Blackmagic Software Codec can be downloaded from the Blackmagic Design web site. It allows opening and rendering to uncompressed 8 bit and 10 bit files without hardware installed. Blackmagic Software Codec's are available for Windows, Mac OS 9™, and Mac OS X™ platforms.

### Uncompressed 10 Bit

Uncompressed 10 bit is the highest quality video possible because it's the same bit

depth as the SDI video standard. Broadcast decks such as Sony Digital Betacam™ and Panasonic D5™ are full 10 bit recorders, and will provide the highest quality 10 bit video to the Blackmagic DeckLink card.

This format is great for heavily designed work, such as graphics and television commercials. All video captured will be played out in full 10 bit video. When rendering, the Blackmagic codec will use the 10 bit uncompressed video to provide extremely clean RGB images to application software.

Even if application software is 8 bit RGB, this color space is quite different to YUV, and the color space conversion is extremely precise and clean using the extra bit depth available with uncompressed 10 bit video.

For software developers, DeckLink uncompressed 10 bit video format is based on the QuickTime™ v210 file format standard, and are compatible with the Apple uncompressed 10 bit codec included with Final Cut Pro™ 4. If the Apple codec is not available then the Blackmagic codec can be used to render to the same file format.

It's also worth noting the Apple codec does not support HDTV color-space, so DeckLink HD currently uses the Blackmagic codec when working in HD.

More information can be found on the QuickTime™ develop page at [www.apple.com](http://www.apple.com). Generally QuickTime™ API's should be used for accessing file data, however if QuickTime™ is not available, then file format information can be extremely useful.

Resolution of 10 bit uncompressed is defined by the SDI video standard as 720 x 486 lower field first rendering for NTSC, and 720 x 576 upper field first rendering for PAL. Lower resolutions are supported, and in this situation video will be centered over black. Lower vertical resolution can be used for letterboxed projects as the video will center vertically over a black background automatically.

Also supported is the DV10 format, used by Digital Voodoo™ cards for 10 bit. To use this format, select the Blackmagic DV10 10 bit codec for rendering. Also, select this codec with the SDI input when you need to capture this format.

### **Uncompressed 8 Bit**

Uncompressed 8 bit video is taken from the 10 bit SDI input and rounded down to 8 bit YUV video on disk. This is similar to how almost all NLE systems handle video. By featuring uncompressed 8 bit video, the Blackmagic DeckLink saves disk space when quality requirements are not as high, and allows compatibility with other uncompressed video cards.

8 bit uncompressed is great for episodic television programming work when many hours of storage is required, however the video quality of uncompressed is critical.

DeckLink uncompressed 8 bit video format is based on the QuickTime™ 2vuy file format standard and are compatible with the Apple uncompressed 8 bit codec included with Final Cut Pro 4™. If the Apple codec is not available then the Blackmagic codec can be used to render to the same file format.

It's also worth noting the Apple codec does not support HDTV color-space, so DeckLink

HD currently uses the Blackmagic codec when working in HD.

Also included is an Uncompressed 8 bit 2Vuy codec which is compatible with the format used on the Pinnacle CineWave™. Users can mix and match different systems, and drag and drop media between edit timelines and applications without rendering or file conversions.

Also supported is the DV00 format, used by Digital Voodoo™ cards in 8 bit. To use this format, select the Blackmagic DV00 8 bit codec for rendering. Also, select this codec with the SDI input when you need to capture this format.

Resolution of 8 bit uncompressed is defined by the SDI video standard and is the same as mentioned above for uncompressed 10 bit video.

### **Online JPEG**

Online JPEG is a high quality JPEG capture and playback format that's great for television programming work, when you need extremely high amount of storage, however don't have the budget for a large disk array. The Online JPEG format has very high video quality, is full SDI resolution, and is easily good enough to broadcast.

The Online JPEG data rates are quite low, and can be stored in the internal ATA disk that's used for the system boot drive. For budget conscious users, this means no disk array is required, and a lower cost system can be put together initially, then a disk array purchased when a high quality job comes along later.

The Online JPEG data rate is so low, we have captured 5 minute duration video clips onto an iPod at a quality that showed little visual difference from uncompressed video. This demonstrates the flexibility of the DeckLink Online JPEG format.

What this means for users is they can actually capture directly to a fast FireWire hard disk using a video format that's quality that's suitable for broadcast. This means any editor can take a capture disk home and edit on a domestic iMac out of the office.

This is possible because FireWire hard disks are very portable, and rugged, and can be moved easily. Large projects can also take advantage of editing high quality video material on lower cost iMac computers. Compared to DV, Online JPEG is extremely good quality because it's full 4:2:2 video unlike 4:1:1 color limited video used by the DV format.

This quality is great for episodic television program production, but features the benefits of flexible storage options. Many flexible workflow options are possible when Online JPEG is used.

Online JPEG is fully compatible with the Apple QuickTime™ PhotoJPEG codec, and when rendering on systems without hardware, this codec can be used. When media storage disks or files are transported over to DeckLink systems, they can be played back direct out to hardware.

Resolution of Online JPEG is defined by the SDI video standard and is the same as mentioned above for uncompressed 10 bit video.

## DV Playback

DV support is also built into the Blackmagic DeckLink card for standard definition video, and allows any native DV project to be played out to video output in real time, without format conversions.

Generally users can capture material shot on DV or DVCam™ via the FireWire port, then using a native DV time line in Final Cut Pro™, edit and play out to the Blackmagic DeckLink as they work. This is an incredibly powerful format, because many users shoot on DV formats. Now they can capture and edit field originated footage, and then edit it down in duration to a sub master, and output this to tape. This eliminates the storage requirements for field originated footage when shoot ratio's are high.

Another advantage of DV playback is integration with portable editing systems. Apple Powerbook systems running Final Cut Pro™ feature a full speed 400 Mbps FireWire port that can connect to DV cameras for capture and playback. This means a complete DV edit can be completed on a standard Powerbook G4 system.

If the Powerbook is booted with the 'T' key held down, it will start in a mode called Target Disk Mode. This means the Powerbook will emulate a FireWire hard disk, and the internal disk can be mounted on any desktop Mac system if the FireWire ports are connected.

Once the internal hard disk in the Powerbook mounts on the desktop system, it's easily possible to open the project and play the DV edit to the DeckLink SDI video output. No file copies or conversions are required. Allowing an internal Powerbook hard disk to be set as the media disk on a desktop system for real time video creates exciting workflow options.

Resolution for DV is different than the SDI standards, and is 720 x 480 for NTSC, and 720 x 576 for PAL. Field order for both formats is Lower Field First. This is different to the normal SDI video standard, and DeckLink will convert these differences in real time during playback. When working with DV, it's important to render to native DV resolutions, as Blackmagic DeckLink uses native DV standard files. This avoids creating differences in the DV standard.

## High Speed PCI Interface

DeckLink, DeckLink Pro, and DeckLink SP cards feature a highly efficient and low cost 32 bit PCI interface that's actually faster than some 64 bit PCI cards. In addition, Blackmagic DeckLink is the first standard definition video card to feature a double speed 66 MHz PCI interface. DeckLink is also fully compatible with 33 MHz PCI and can plug into both tower and rack based computers.

High speed PCI interface make Blackmagic DeckLink perfect for multi stream real time effects. PCI performance is much higher than other cards due to an unique continues bursts technology, allowing DeckLink to send larger blocks of data without as many time wasting PCI reconnects. Our tests have shown that DeckLink will output perform the PCI speeds of other 64 bit cards!

DeckLink HD increases speeds by including the industries first PCIX/PCI compatible interface. DeckLink HD supports full 64 bit 133 MHz PCIX 3.3 volt interface for the highest speed HDTV work. DeckLink HD requires at least a PCIX 100 MHz slot for HDTV, however

a PCIX 133 MHz slot is recommended.

DeckLink HD can work in standard definition video only when plugged into a standard PCI 33 MHz 5.0 volt slot. DeckLink can do standard definition work in either a PCIX or the older PCI slots, allowing greater flexibility.

## Real Time Effects

Blackmagic DeckLink supports single stream, and multi stream real time effects internally, as well as built in RT Extreme effects in Final Cut Pro 4™. Real time effects can be uploaded at any time using a programable hardware arrangement that's extremely flexible.

Hardware updates can be downloaded from the Blackmagic Design web site, and users will never need to load risky "flash" firmware updates again.

Current single stream real time effects include image control sepia, desaturate, proc amp, tint, gamma, brightness contrast. Current dual stream real time effects include cross dissolve, non additive dissolve, additive dissolve, dip to color, fade in fade out, additive dissolve and 3-Way Color Corrector.

More effects will be added as downloadable updates and as DeckLink cards are plugged into faster host systems more streams of video and more effects will be enabled via built in Final Cut Pro RT Extreme effects.

## Video Desktop

One of the most popular features of the DeckLink is the video desktop. The video desktop is available when application software such as Final Cut Pro™ is not running, or switched to the background.

Video Desktop is a full featured monitor, and is available in the displays control panel. Any image or window that's dragged over to this desktop will output as full quality SDI video. This means Adobe Photoshop™ documents can be moved to the video desktop and output as video, even though Photoshop™ was not designed for video.

Even application software such as Microsoft PowerPoint™ can output in real time to uncompressed SDI video. Video Desktop television standard can be independently set via the display settings in the system preferences.

## Blackmagic Codec

Blackmagic DeckLink uses the Blackmagic Codec which provides 16 bit per pixel or 64 bit rendering in applications that support it. This includes Adobe After Effects™, which is the world's most popular broadcast design application.

When rendering in Adobe After Effects™ using 64 bit rendering, the image quality of uncompressed 10 bit video can be taken best advantage of. The quality is incredible, and independent tests confirm that the Blackmagic Codec is the best quality codec currently available on any system at any price.

## Blackmagic Deck Control

Blackmagic DeckLink includes a useful Deck Control application to allow connection to any deck compatible with the Sony™ RS-422 serial control protocol. This application uses a single window for both capture and playback to reduce clutter. This application is fully QuickTime™ based, and can be used with any hardware, however for the GET and PUT clip features to operate, Blackmagic hardware needs to be installed.

Deck Control software is important when building workstations for DVD authoring, or broadcast graphics, and effects. In these situations, users don't want to be forced into purchasing a non linear application such as Final Cut Pro™ for deck control functionality. DeckLink is also much easier to use than common NLE software, simplifying workflow.

## Windows and Macintosh Compatibility

Deck Control is available on both Mac and Windows platforms and captures to QuickTime™ files on both platforms. These files are cross platform, and can be captured on one platform while played back on the other.

DeckLink hardware cards can also be moved between platforms, and the same hardware is used on both systems. You only need to move the hardware to either platform, as PCIX/PCI slots are fully compatible between systems.

All you need to do is download the correct software installer for the platform you are installing the hardware into. Either Windows or Macintosh™. On Windows, DirectShow support will provide a pure native Windows API for developers and third party software.

The Blackmagic Software Installer CD contains a hybrid format that allows Windows systems to install the windows software, and Mac systems to install the Mac software all from the same software CD.

## Blackmagic's QuickTime™ Primer

The television industry is currently experiencing a change based on low cost video hardware working with off the shelf software tools. This is a change over the traditional pre built systems available from major manufacturers.

The reason for this change is linked back to a technology developed in the very early 90's at Apple Computer Inc. called QuickTime™. QuickTime™ was designed to allow software and hardware to be used together without the application writer adding special changes in their software to support a particular hardware card.

QuickTime™ keeps track of installed hardware and lets applications connect to video outputs and video inputs in a consistent way. Any QuickTime™ compatible hardware card will be noticed by the application software, and then this software can use it for video capture or playback. Video hardware can be changed based on the quality required by the user.

For example when a FireWire DV camera is plugged into a Macintosh, the operating system creates a QuickTime™ video input, and a QuickTime™ video output for the device. This means QuickTime™ software can list this input and output in the video settings, and users can choose to use the DV camera as a video capture source, or for playback to.

In many ways this is very similar to how printer drivers work. You can add printers either locally, or on the network, and then choose the printer you want to print to. As long as the application writer supports the standard print menu, then you can choose to print from any application you use. The PostScript™ printing standard helps make sure any printer can be printed to, whether it's a low cost laser printer, or a high end imagesetter.

In effect, QuickTime™ is the PostScript™ of the television industry.

Another area QuickTime™ demonstrates its flexibility is codecs. If there is one rule in television, it's that nothing stays the same for very long, and file formats have changed dramatically over time. QuickTime™ allows for this, with plug in codec's. Codec's stand between a QuickTime™ application and the file format, and let any application open any file as long as a QuickTime™ codec has been written for this file type.

A good example is QuickTime™ does not understand the 10 bit uncompressed file format. With the Blackmagic Codec we allow QuickTime™ to handle uncompressed 10 bit video as easy as any other format. We include software codec's downloadable from the Blackmagic Design web site to let anyone open and render these files even with no hardware installed.

The format of the file is not a problem, as a QuickTime™ codec will generally exist to allow users to simply open the file with any QuickTime™ compatible software application. That means users have complete hardware and file format flexibility and can adapt to changes in their workflow or client requirements.

When building a production system based on QuickTime™, users can choose between hardware and software products based on feature and price. This creates a situation that's never existed before in the television industry, and that's true competition between vendors of system components.

All other areas of the computer industry benefit from this competition, however the television industry has been dominated by large custom based monopoly systems that have not moved ahead in features very much over the last several years. These companies also sustain themselves on heavy support costs that users have to submit to, to be eligible for system updates. Creatively, the television industry has been strangled by this in the past.

In effect, these companies use their monopoly power to keep extracting extra cash from customers. They have total control over the customers system, and customers cannot add components to their system without being told it's "not supported". This basically scares customers into remaining compliant, and doing what the vendor tells them to do.

QuickTime™ changes everything because customers have freedom of choice.

Many products have been introduced that are QuickTime™ compatible over the last decade. In the past due to slow bus and processor speeds, data rates were too low for high quality video. Video on these older cards had to be compressed so it would fit on through the bus and not take up expensive space on disk arrays.

This is not an issue now, as system memory bus, disks, SCSI cards, and processors are now fast enough to handle uncompressed video with ease. Companies such as Blackmagic Design have produced hardware that's both low cost, and now able to handle



the highest video quality possible at 10 bit uncompressed. In addition, lower cost tape formats have become available, and now most decks have SDI digital video options.

At no other time in history has the television industry been able to choose from various hardware and software products to build a production system at the quality level that the most expensive traditional systems cannot beat.

Once a software application works with one hardware card, it generally works with all cards. This drive's competition between vendors, resulting in much greater innovation and better value for money. It breaks down the monopolies that have dominated the television industry in the past.

The single biggest benefit to low cost is the workflow changes made possible. Previously, all post production was based around the edit system, however now things can be based around production requirements or people. It's now possible to easily increase production capacity and to eliminate the time consuming offline-online process.

Adding more systems is a low cost and easy thing to do. Only client systems need nice rooms, and many of the production systems can be simply desktop based allowing editors more time to experiment and develop creative ideas. There is no reason why every Mac system in a television environment should not include a Blackmagic DeckLink card so it can be involved in the creative process if required.

Application software has been improving over the last several years, and many QuickTime™ applications are now industry leading tools used by the highest end facilities. These software applications are truly professional tools that often beat the old traditional dedicated systems on features.

Editing applications include Apple Final Cut Pro™, and Adobe Premiere™. Design and effects tools include Adobe After Effects™, Apple Shake™, Discreet Combustion™, and Commotion™. Color correction and image treatment can be completed with Color Finesse™.

Other areas in production are also covered by amazing QuickTime™ software. DVD authoring can be completed with Apple DVD Studio Pro™, or for quick DVD's even iDVD™ can be used. Streaming for the web and video on demand files can be created with Discreet Media Cleaner™.

Application software is being added constantly, and with the robust API built into QuickTime™, often software applications will work first try on the Blackmagic DeckLink without us ever testing the software beforehand. Many software tools written for the DV market come alive and are tremendously powerful when used with uncompressed video captured with Blackmagic DeckLink.

On the Windows platform, DirectShow is the native API, and provides many of the advantages of QuickTime™. This API is now very mature, and is getting adopted by an increasing number of high end software developers who develop for Windows only. DeckLink cards are also starting to support DirectShow on Windows.

This is a new era for the television industry, and before long the entire industry will be based on QuickTime or API's similar to it, as this ultimately delivers what customers need and want. That's freedom of choice.



## Summary

Blackmagic DeckLink contains features and technology that make it the leading uncompressed hardware card on the market today. Due to innovative engineering it's priced well below the cost of other products.

Many of the innovative features in the Blackmagic DeckLink card will eventually be adopted industry wide as companies offer products for this market. This is a milestone in the television industry and allows unprecedented flexibility in system design, that's never been possible before now.

Competition between vendors keeps companies thinking, and innovating. This is a new era for customers, as they develop new workflow procedures to take advantage of the flexibility and low cost of QuickTime™ based products such as Blackmagic DeckLink.

DeckLink is the product the people behind Blackmagic Design always wanted when working in post production, and is the product we started the company to build. When you realize why the television industry moved slowly in the past, it's easy to see why it needed the customers to create the company to make the products we always wanted!

Blackmagic DeckLink is that product. It's low cost enough for all of us to afford, but has the quality to make it a serious tool that we can actually use on the highest quality work.

It's an exciting time to be involved in the television industry.

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