

## Chroma Keyer (with DVI IN)

# DVK-200



## Quick Start Guide

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## Disclaimer of Product and Services

The information offered in this instruction manual is intended as a guide only. At all times, Datavideo Technologies will try to give correct, complete and suitable information. However, Datavideo Technologies cannot exclude that some information in this manual, from time to time, may not be correct or may be incomplete. This manual may contain typing errors, omissions or incorrect information. Datavideo Technologies always recommend that you double check the information in this document for accuracy before making any purchase decision or using the product. Datavideo Technologies is not responsible for any omissions or errors, or for any subsequent loss or damage caused by using the information contained within this manual. Further advice on the content of this manual or on the product can be obtained by contacting your local Datavideo Office or dealer.

## Warnings and Precautions

1. Read all of these warnings and save them for later reference.
2. Follow all warnings and instructions marked on this unit.
3. Unplug this unit from the wall outlet before cleaning. Do not use liquid or aerosol cleaners. Use a damp cloth for cleaning.
4. Do not use this unit in or near water.
5. Do not place this unit on an unstable cart, stand, or table. The unit may fall, causing serious damage.
6. Slots and openings on the cabinet top, back, and bottom are provided for ventilation. To ensure safe and reliable operation of this unit, and to protect it from overheating, do not block or cover these openings. Do not place this unit on a bed, sofa, rug, or similar surface, as the ventilation openings on the bottom of the cabinet will be blocked. This unit should never be placed near or over a heat register or radiator. This unit should not be placed in a built-in installation unless proper ventilation is provided.
7. This product should only be operated from the type of power source indicated on the marking label of the AC adapter. If you are not sure of the type of power available, consult your Datavideo dealer or your local power company.
8. Do not allow anything to rest on the power cord. Do not locate this unit where the power cord will be walked on, rolled over, or otherwise stressed.
9. If an extension cord must be used with this unit, make sure that the total of the ampere ratings on the products plugged into the extension cord do not exceed the extension cord's rating.
10. Make sure that the total amperes of all the units that are plugged into a single wall outlet do not exceed 15 amperes.
11. Never push objects of any kind into this unit through the cabinet ventilation slots, as they may touch dangerous voltage points or short out parts that could result in risk of fire or electric shock. Never spill liquid of any kind onto or into this unit.
12. Except as specifically explained elsewhere in this manual, do not attempt to service this product yourself. Opening or removing covers that are marked "Do Not Remove" may expose you to dangerous voltage points or other risks, and will void your warranty. Refer all service issues to qualified service personnel.
13. Unplug this product from the wall outlet and refer to qualified service personnel under the following conditions:
  - a. When the power cord is damaged or frayed;
  - b. When liquid has spilled into the unit;
  - c. When the product has been exposed to rain or water;
  - d. When the product does not operate normally under normal operating conditions. Adjust only those controls that are covered by the operating instructions in this manual; improper adjustment of other controls may result in damage to the unit and may often require extensive work by a qualified technician to restore the unit to normal operation;
  - e. When the product has been dropped or the cabinet has been damaged;
  - f. When the product exhibits a distinct change in performance, indicating a need for service.

## Warranty

### Standard Warranty

- Datavideo equipment is guaranteed against any manufacturing defects for one year from the date of purchase.
- The original purchase invoice or other documentary evidence should be supplied at the time of any request for repair under warranty.
- Damage caused by accident, misuse, unauthorized repairs, sand, grit or water is not covered by this warranty.
- All mail or transportation costs including insurance are at the expense of the owner.
- All other claims of any nature are not covered.
- Cables & batteries are not covered under warranty.
- Warranty only valid within the country or region of purchase.
- Your statutory rights are not affected.

### Two Year Warranty

- All Datavideo products purchased after 01-Oct.-2008 qualify for a free one year extension to the standard Warranty, providing the product is registered with Datavideo within 30 days of purchase. For information on how to register please visit [www.datavideo-tek.com](http://www.datavideo-tek.com) or contact your local Datavideo office or authorized Distributors
- Certain parts with limited lifetime expectancy such as LCD Panels, DVD Drives, Hard Drives are only covered for the first 10,000 hours, or 1 year (whichever comes first).

Any second year warranty claims must be made to your local Datavideo office or one of its authorized Distributors before the extended warranty expires.

## Disposal



### For EU Customers only - WEEE Marking

This symbol on the product indicates that it will not be treated as household waste. It must be handed over to the applicable take back scheme for the recycling of Waste Electrical and Electronic Equipment. For more detailed information about the recycling of this product, please contact your local Datavideo office.

## Packing List

1	x	Power Cord
1	x	Background (animation) DVD
1	x	Switching adaptor DC 12V / 30W
1	x	DVK -200 Instruction Manual

## **Introduction**

The Standard Definition Datavideo DVK-200 has many advanced features which can give excellent results even from less than perfect Chroma Key setups.

Please read these advisory notes before using the DVK-200 as the camera, backdrop and lighting setups all play an important role in producing the best result. Although the DVK-200 is equipped with excellent edge controls it is always best to start with the best keyable image your setup is able to produce.

We would strongly recommend the use of a three chip (3 CCD) camera for chroma effect shooting. The extra image clarity that a three chip camera produces greatly improves the quality of the keying. It is also best to use Component (YUV) and S-Video (Y/C) cables wherever possible. These cables allow better colour separation than a Composite video cable or signal, and again this greatly improves the quality of the keying.

## **Backdrops**

There are many different possibilities when it comes to setting up a Chroma Key Studio.

In a permanent set up the use of Green Screen or Blue Screen Paint is ideal. Painting a wall is the cheapest way of producing a Green or Blue backdrop and there are several suppliers of specialist backdrop paint which is exactly the right shade and texture for keying purposes.

For a less permanent arrangement cloth is an excellent option. Again there are specialist manufacturers producing Green and Blue Screen cloth which is the right shade and texture to give excellent keying results. Cloth is quick to setup, and roll away, and is far more durable than paper. Cloth is also less likely to fade than paper, and generally gives far better performance. It is important to ensure there are no creases or folds in the backdrop as these may produce areas of uneven lighting.

Another alternative well worth considering is a Retro Reflective Cloth Backdrop, such as the Datavideo RF1225FP. Retro Reflective Backdrops are used in conjunction with LED Light Rings that mount onto the lens of the camera, such as the Datavideo CKL-200. The unique properties of the backdrop will allow you to get away with having the odd crease line, and the whole system is quick to set up. If you are looking for a portable system you will be hard pushed to beat the LED Light Ring / Retro Reflective Cloth combination.

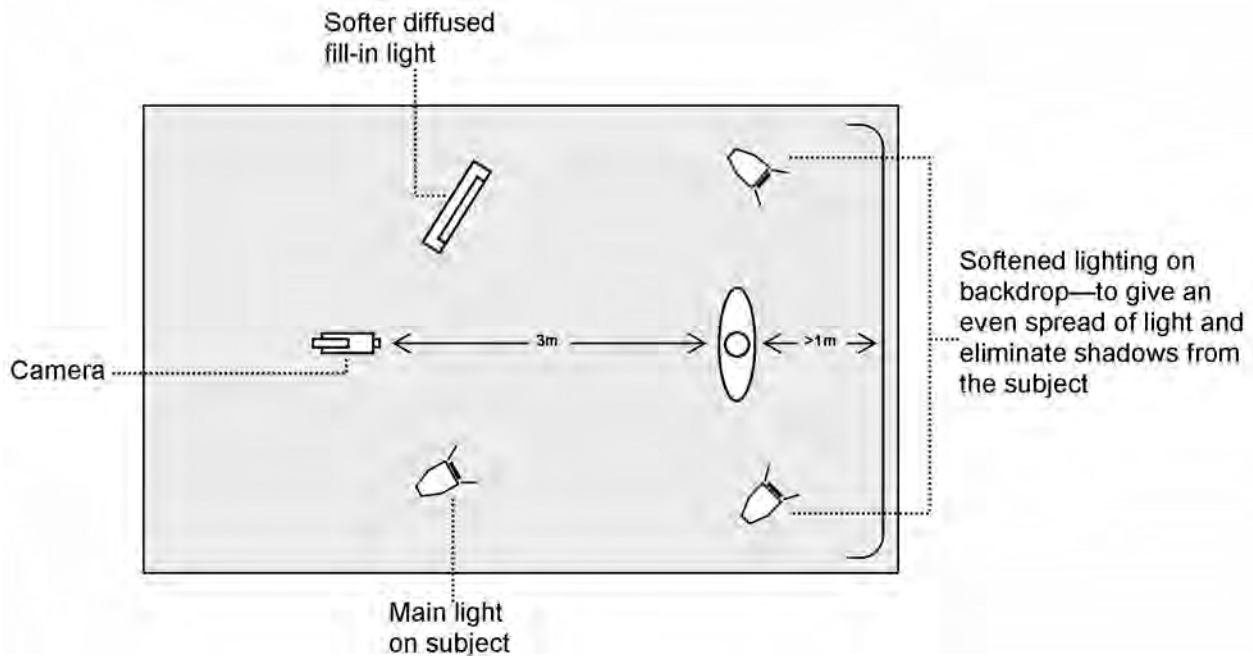
## **White Balance**

White Balance is extremely important when setting up a chroma key studio. The camera must be correctly white balanced to prevent the subject picking up any colour cast from the background. Of course the white balance settings will vary according to the type of lighting you are using, but neutral whites are the all important target.

To set the white balance you will need a white reference card (or a sheet of white paper). Focus the camera on the reference card and light it evenly using the main light. Set the cameras iris / aperture so that the card is correctly exposed. Use the Auto White Balance function, or set the white balance manually so that the card appears white. If in any doubt about how to white balance your camera, please refer to your camera instruction manual for details.

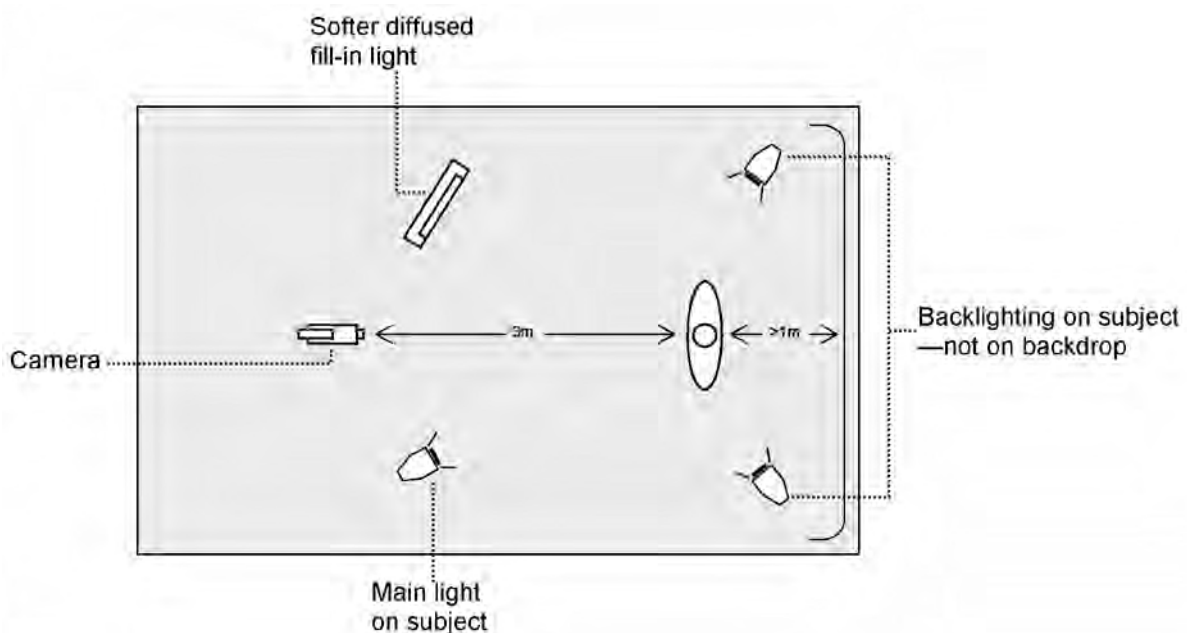
## Lighting

Lighting of your chosen backdrop is extremely important; the more even the lighting on the backdrop the better the finished result. Lighting setups for the foreground subject will vary according to the effect you want. For chroma keying backdrops even lighting with no hotspots or shadow areas is the aim. This is easiest to achieve with a set up something like this:



In the diagram you will see we recommend a minimum of 1m between subject and backdrop, it is always easier to get even lighting if this distance is greater, so please think of 1m as the absolute minimum. The foreground lighting on the subject will obviously vary according to the effect that you are looking for and as long as the backdrop is evenly lit this should not be a problem.

With Retro Reflective Cloth the lighting is a little different. The backdrop requires no lighting as the LED Light Ring, which is mounted on the camera provides all the lighting for the backdrop. A Retro Reflective Cloth set up would be more like this:



## Functions

The DVK-200 has two inputs (one camera input and one background input). Each of the inputs can be set to CV (Composite Video), S (S-Video (Y/C), YUV (Component) or DVI-I. All of the outputs, one Y/C (S-Video) and two Composite, are simultaneously live. We recommend that YUV or Y/C is used for the camera or source inputs wherever possible.



### Front Panel

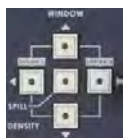


Key-1 and Key-2 are used to save two setting modes, when you are setting up the DVK-200 front panel functions.

The active settings key will be illuminated in red. The settings are non-volatile (they remain stored even when the DVK-200 is switched off).



The Adjustment Knob is used to alter whichever function is active. The unity position, indicated in green, is the neutral setting. The adjustment scale is marked in nominal settings from -3 to +3. The adjustment can also be used to reset any value to the factory default; activate the function you want to reset by pressing the appropriate function button, and then push the adjustment knob in, you will see the LED meter return to unity.



The Arrow Buttons adjust the window size (garbage matte) and the left and right edge. The spill button adjusts the colour balance of the keyed image; it enables you to correct any colour imbalance that remains on the foreground image once the backdrop has been keyed out.

The window size can be set to remove any unwanted garbage from the foreground image. Often your backdrop does not fill the whole screen, particularly if you want your subject to appear small in the finished image. You can use the Up / Down / Left / Right arrows to make the keying window smaller so that only your backdrop is being keyed.

To adjust left or right edge press and hold the Left or Right Arrow for two seconds, the button LED will then flash. While the button LED is flashing you can adjust the edge detail of the subject, you will see the value on the LED meter above the adjustment knob.



The Colour Processor button activates the colour processor adjustments for Foreground (subject) or Background. The button will be illuminated red when foreground is selected.



The Colour Processor Adjustments allow colour saturation, brightness, contrast and tint (NTSC only) to be adjusted for both the foreground (GREEN / BLUE) and background images. The selected parameter, which will be illuminated red, is adjusted using the Adjustment Knob. GREEN and BLUE store separate values, so different colour processor settings can be used on each.



The Still button enables you to grab a freeze frame image from either the background or foreground inputs. This can be useful when setting up.

**N.B. The colour processor adjustments will not function if you are holding a still / freeze frame.**



The Reset button resets a foreground channel (GREEN or BLUE) to factory default. This will reset all characteristics of a channel (COLOR PROC. /GREEN / BLUE / LUMA / LEVEL / WINDOW / SHRINK / DENSITY / SPILL)

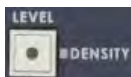


The Chroma Key button switches the keying effect on or off. In the off position the foreground channel (GREEN or BLUE) will pass directly to the output monitor, complete with backdrop. When switched on the button will be illuminated red together with the chosen keying option (Green, Blue or Luma) see below.



Green, Blue and Luma are the three keying options available. With the Chroma Key button switched on, you can select the keying option to suit your needs. The selected option will be illuminated red. When the button is illuminated red you can adjust the keying colour, to fine tune it for your studio; you can see the setting on the LED meter above the adjustment knob (although what appears on your monitor is more important).

If another adjustment has been selected, such as density or spill, the keying option light will be illuminated 50% to indicate which option you have selected.



Level or Density adjusts the range of the keyer. The button will be illuminated red when active. The value is adjusted using the adjustment knob, you will see the level on the LED meter above the knob (although what appears on your monitor is more important).

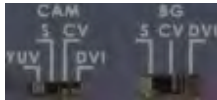
If the background / cloth is perfectly lit a low value on the LED meter will be adequate. A higher value may allow you to resolve any problem areas in the picture.

The subject density can also be adjusted. If you press and hold the button for two seconds the button will flash, while the density button is flashing you can adjust subject density. In Green or Blue modes a low value makes the subject solid, the edges will be sharper and any shadow noise will be higher, a higher value makes the subject more transparent, the edges will be softer and the shadow noise lower.

In Luma mode the subject density will adjust the white gradient of the subject.



## Rear Panel



The Input Select Switches can be set to CV (Composite Video), S (S-Video (Y/C)), YUV (Component) or DVI-I Signal. Set each input switch according to the video signal you are connecting.

CAM = Camera/Foreground image    BG = Background image



CAM IN Video Inputs for connecting the 4 types foreground video images. These are CV (Composite Video), S (S-Video (Y/C)), YUV (Component) or DVI-I Input.

Loop through outputs of Composite, Component and S-Video are provided below the input connections. There is no loop through option for DVI-I.



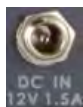
Background Input (BG Input) for connecting the video feed from your background source. This could be from a VTR or DVD player for example. The Composite and S-Video Inputs are at the top, and the Loop Through Outputs are below. The S-Video input can be monitored from the Composite Video Loop Through if required. **The S-Video Loop Through is only active if the S-Video input is used.**



The Main Video Output shows the final result of the keyer. There are two composite outputs and one S-Video (Y/C), all three are active at the same time. It is advisable to connect a monitor to one of these outputs so that you can see exactly what the DVK-200 is outputting.



Power Switch, switches the DVK-200 On/Off.

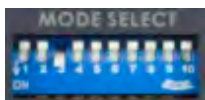


DC In. Connect the supplied adaptor to the DC In socket, there is a locking collar on the power supply lead which screws onto the socket thread to ensure a positive connection. It is also possible to power the DVK-200 from a suitable 12V Battery Pack, but please ensure that the power is regulated.



Grounding Terminal. When connecting this unit to any other equipment, make sure that it is properly grounded by connecting this terminal to an appropriate point. When connecting, use the socket and be sure to use

wire with a cross-sectional area (csa) of at least 1.0 mm<sup>2</sup>.



#### Dip Switches / Mode Select

The DVK-200 can be set to various modes using the Dip Switches.

- Dip Switch 1 : OFF = NTSC, ON = PAL output
- 2 : OFF = 0 IRE, ON = 7.5IRE input/output
- 3 : OFF = Fixed, ON = PAL/NTSC auto detection (Detected from the input signal)
- 4 : OFF = Dark / Bright Enhancement, ON = Dark / Bright Enhancement Off
- 5, 8 : RESERVED
- 6 : OFF = VIDEO, ON = Colour Bars shown on main output
- 7 : DVI Zoom ( ON = 90% ) / ( OFF = 95%)
- 9 : OFF = 1024x768, ON = 800x600
- 10: OFF = DVI, ON = VGA



The DVK-200 can be fully controlled via RS 232 please refer to the RS 232 protocols section at the rear of this manual for further details.

The DVK-200 can be switched via GPI trigger.



Using the GPI In socket you can switch from KEY-1 (Green) to KEY-2 (Blue) remotely (via a 3.5mm cable with a latching switch)

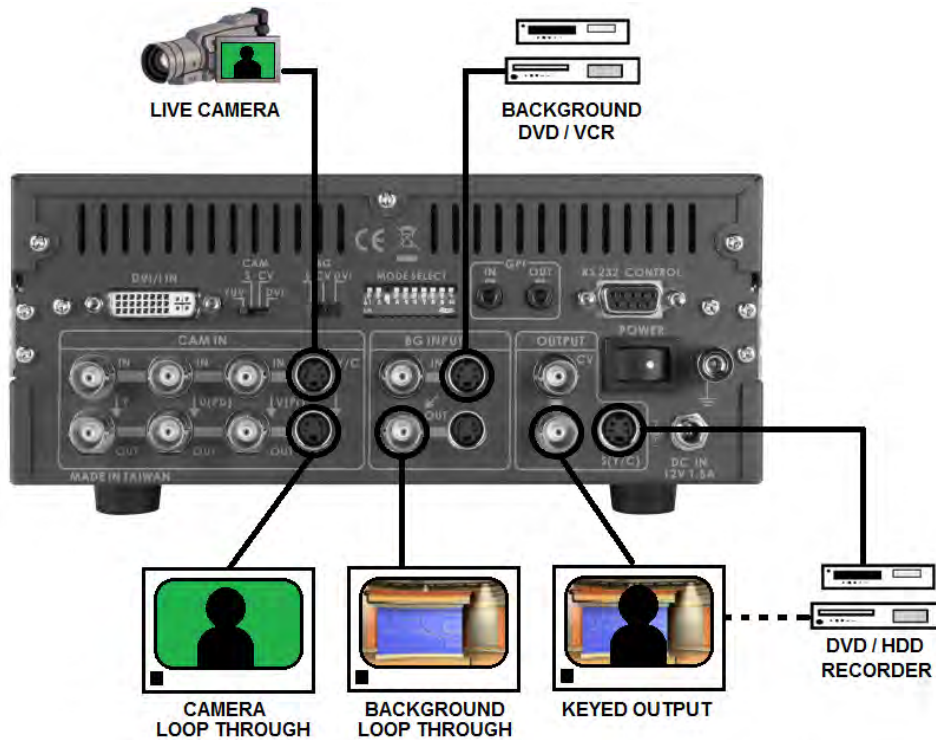
The GPI Out Socket allows the DVK-200 to switch external devices.

The GPI Sockets are also used to connect the Datavideo TD-1 Light Ring Controller. The TD-1 can switch the DVK-200 from KEY-1 (Green) to KEY-2 (Blue), or the TD-1 can be controlled from the DVK-200.

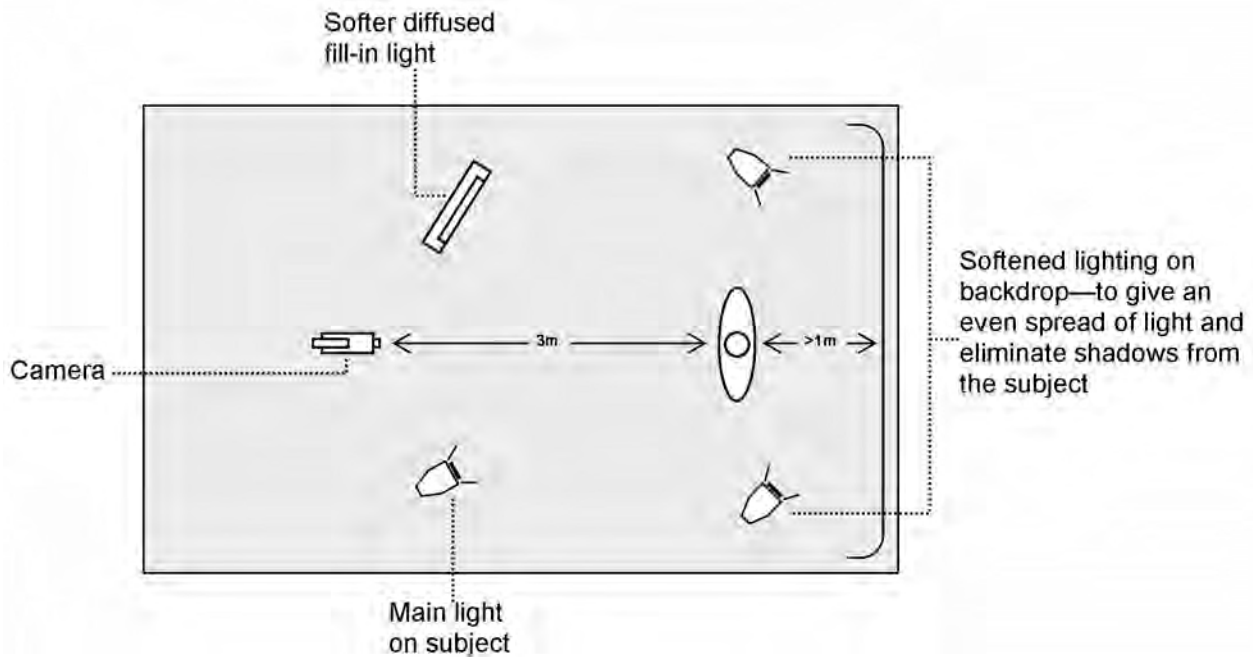
***Please see Using the DVK-200 with the Datavideo TD-1.***

# Installation

Here is an example chroma key installation diagram



The Studio Set-Up for this example would be something like this:



In this example a Camera is connected using an S-Video (Y/C) cable. The Camera is set as a close-up of the anchorman.

The Background footage is being fed from a DVD Player, and again it is connected using S-Video. You could alternatively use a VCR or even another camera.

The Output is being recorded to a DVD Recorder via an S-Video cable. You could alternatively record to a VCR or a Hard Drive Recorder, or send the output to a PC for a live webcast.

The Output Monitor is taking a Composite Video Output from the DVK-200; optionally it could be taking a feed from the DVD Recorder output.

A bank of 3 small monitors such as the Datavideo TLM-433 may be sufficient for this purpose.

There are no audio connections in the diagram, as the DVK-200 only needs to process the video signal. The audio would typically be fed via an audio mixer directly to the audio inputs of the DVD Recorder / VCR or AD-100 audio delay unit.

## Setting Up

The DVK-200 is quite easy to set up, and over the next few pages we will look at all aspects of configuring the DVK-200 within your studio. We will start with connections.

## Connections

### Power

The DVK-200 is supplied with a 12V / 30W / 1.5A Power adaptor to connect it to a mains supply socket. The Power Supply has a 2.1mm in-line plug with a screw threaded locking collar.

Push the plug into the DC In Socket of the DVK-200



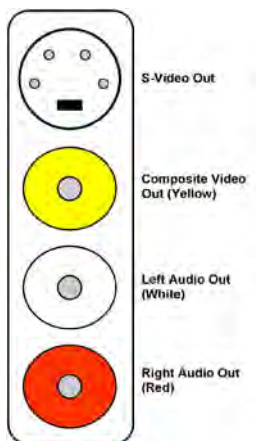
and screw the locking collar into place.

Connect the power cord to the power supply and then to an appropriate mains power outlet.

### Camera

It is best wherever possible to use an S-Video (Y/C) or YUV cable for connecting the camera. Good results can be achieved using Composite Video, but S-Video or YUV connections will always give better results.

Most cameras have video outputs that look something like this:



S-Video (Y/C) Output via 4 Pin Mini Din Plug

Composite Video Output via RCA / Phono Plug (Generally colour coded yellow)

Left and Right Audio Out (Generally colour coded white for left, and red for right)

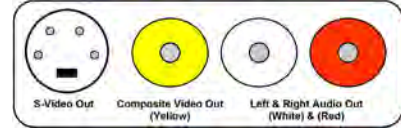
The DVK-200 only requires a video connection, so we do not need to worry about the audio connections.

## Background Video

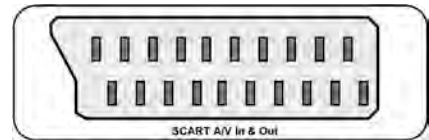
Next we will connect the background video source. The background video is the footage that you want behind your subject in the finished keyed video. A few examples of backgrounds would be a virtual studio, or a weather map or perhaps a famous building or landmark. You can feed any video signal as the background source; most often the footage will be coming from a Deck or DVD Player.

DVD Players and VCRs generally have one of two types of video output:

Most DVD Players and VCRs have outputs like these, although the layout may differ slightly. There is a mini 4 pin din socket for S-Video (Y/C) out, and a RCA / Phono socket (almost always colour coded yellow) for Composite Video Out. In addition there will be two RCA / Phono sockets for left and right audio (almost always colour coded white and red).



Some DVD Players and VCRs (mostly in Europe) use a SCART connector instead of the above. A SCART connector carries many different types of signal in one multi pin socket. The easiest thing to do if you have a SCART connector is to purchase a SCART to RCA / Phono Adaptor as illustrated below.



**SCART ADAPTOR with In / Out Switch**

A SCART Adaptor simply plugs into the SCART Socket and breaks it out to RCA / Phono Sockets. Some adaptors have an Input / Output switch which changes the direction of the connections, whereas others are specified as In or Out only.

Some adaptors have an S-Video Socket whereas others do not. If you are buying a SCART adaptor for your playback device make sure that it is an OUT adaptor.



**SCART Adaptor with S-Video Socket**

***N.B. If your VCR or DVD Player does not support S-Video output via the SCART connection, using an S-Video port on a SCART Adaptor will only give you a black & white picture.***

If your player has an S-Video Out connect it to the BG (Background) S-Video Input on the DVK-200 rear



As you are using an S-Video connection, set the BG Input Select Switch to S Input



Background (BG) S-Video Input Connector

If your player does not have an S-Video Out, connect the Composite Video Out (Yellow RCA/Phono) to the BG Composite Video BNC Input on the rear of the DVK-200.

***(You may need a BNC to RCA / Phono Adaptor to connect the BNC cable to your player)***



As you are using a Composite Video connection, set the BG Input Select Switch to CV Input



Background (BG) Composite Video Input Connector

## Monitors

It is possible to use the DVK-200 with just one monitor, connected to one of the output sockets, but many users prefer to monitor the Camera (Foreground) and the Background Video in addition to the main keyed output.

Monitors can be connected using either S-Video or Composite Video cables. Many monitors do not feature an S-Video input, and therefore must be connected using Composite Video cables. The DVK-200 allows you to use Composite Video monitors even if you are using S-Video inputs from your camera and background source.

To connect the output monitor to the DVK-200 use one of the Composite Video Outputs.

**If your monitor does not have a BNC Video Input connector you may need to purchase a BNC to RCA / Phono adaptor, as shown here.**



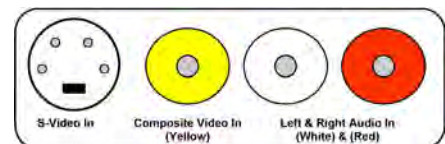
Use either one of the Composite Video outputs to feed your master monitor.

## Output

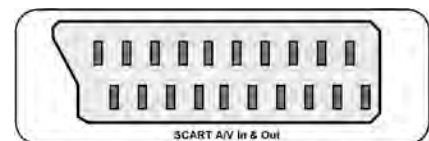
The final connection is the output to a deck, or recorder. This could be a VCR, DVD Recorder, HDD recorder, or perhaps a Converter to stream DV to a PC for a live webcast, a distribution amplifier to several live monitors and a recorder, or simply a live monitor.

The connections are much the same whatever you intend to connect to. As there are a number of different possibilities we will describe the item you intend to connect as your "recording device"

Most DVD Recorders, VTRs, and DV Converters have inputs like these, although the layout may differ slightly. There is a mini 4 pin din socket for S-Video (Y/C) In, and a RCA / Phono socket (almost always colour coded yellow) for Composite Video In. In addition there will be two RCA / Phono sockets for left and right audio (almost always colour coded white and red).



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**SCART ADAPTOR with In / Out Switch**

A SCART Adaptor simply plugs into the SCART Socket and breaks it out to RCA / Phono Sockets. Some adaptors have an Input / Output switch which changes the direction of the connections, whereas others are specified as In or Out.

Some adaptors have an S-Video Socket whereas others do not. If you are buying a SCART adaptor for your recording device make sure that it is an IN adaptor.

**N.B. If your Recording Device does not support S-Video input via the SCART, using an S-Video port on a SCART Adaptor will only give you a black & white picture.**



If your recording device has an S-Video Input, connect using an S-Video cable from the DVK-200 S-Video Output.



If your recording device does not have an S-Video Input, connect using a BNC cable from one of the DVK-200 Composite Video Outputs.

## Using the DVK-200

With all devices and monitors connected correctly we can now look at how to operate the DVK-200. Firstly we will look at Chroma Keying. In this example we are using a Green Backdrop; the principle is exactly same if you are using a Blue Backdrop, just press the Blue Key-2 button instead of Green.

### Powering Up

Make sure the power cord is plugged into an appropriate mains socket, and that the socket is switched on.



Switch the DVK-200 on, using the On / Off switch on the rear of the unit. All the buttons on the front panel should light up for a couple of seconds, and then the DVK-200 is ready.

### Chroma Keying

Switch on your cameras, lighting, background video player and monitors.

**Before starting please ensure that the White Balance is correctly set on your cameras.**

The DVK-200 stores separate settings for GREEN and BLUE, so we will start by setting up GREEN; BLUE will follow the same routine.

Press the Green KEY-1 button on the front of the DVK-200, once pressed it should be illuminated red.



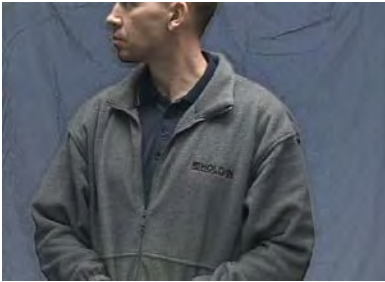
**We are using a Green Backdrop in this example; if you are using a Blue Backdrop please press the Blue button.**

Press the Chroma Key button and the Green button, both should be illuminated red.



Use the Adjustment Knob to adjust the Green Keying level. You should see the effect changing on the output monitor. Set the Green Keying Level to eliminate as much of the Backdrop as possible. In the following example the backdrop has been deliberately set up poorly so that the different adjustments can be seen.





Subject in front of the Backdrop



Subject and Backdrop after Green Keying Level Adjustment

Now press the Density (Level) button.

The Chroma Key and Density buttons should both be illuminated red.



Again use the Adjustment Knob to eliminate as much backdrop as possible.



Before Density Adjustment-  
Creases and areas of shadow can be seen in the background video.



After Density Adjustment-  
The background video now has a more even and solid appearance.

### Edge Adjustment (Shrink)

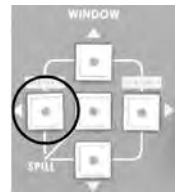
Once Density has been adjusted we should be getting a pretty good Chroma Key Effect. It is often worth going back to the Green Keying Level Adjustment to fine tune after the density has been adjusted. If your backdrop and subject are well lit you may not need to fine tune the result. However, there will be occasions when the subject still has a dark edge even when you have set the Green Keying and Density Levels correctly. This is why the DVK-200 has Left and Right Edge Shrink Functions. If we look closely at the subject in our example we can see there is an edge running along the left of the image (this is due to the uneven lighting set up that we have used).



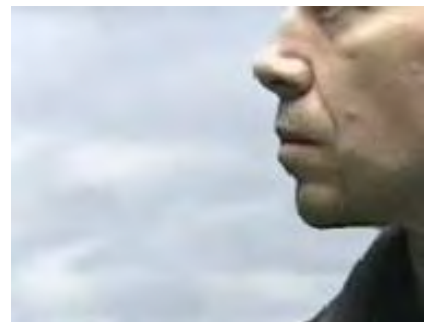


We can see in these images that a strong dark edge is running along the left edge of the subject. To correct this we will use the Left Shrink Adjustment. If there is an edge on the right we would use the Right Shrink Adjustment, the procedure is the same for either side.

Press and hold the Shrink Left button in for two seconds, the button should flash red (if the red LED is on constantly - i.e. not flashing - press and hold the button until it is flashing).



Turn the Adjustment Knob; you will see the edge getting larger or smaller as you rotate the knob. Fine tune the setting until the edge is correct.



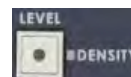
Before Left Shrink Adjustment

After Left Shrink Adjustment

## Subject Density

In some circumstances you may find it is almost impossible to remove the edge from one side of your subject or the other. Or you might find that parts of your subject are too similar to the backdrop colour, and your subject is also becoming partly transparent; for example if you are using a blue backdrop and the subject is wearing a pale blue shirt. The DVK-200 has another fine tune adjustment called Subject (or Foreground) Density. This adjustment will make your subject more or less opaque / transparent; as a result the edges will become more or less defined.

Press and hold the Density (Level) button for two seconds, until the button flashes red. (If the red LED is on constantly - i.e. not flashing - press and hold the button until it is flashing).



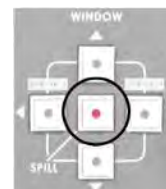
Turn the Adjustment Knob; you will see the subject getting more or less opaque as you rotate the knob. Fine tune the setting until you have the desired effect.



## Spill Adjustment

The final setting in this section is the Spill Adjustment. Often, due to the green / blue backdrop, the subject can pick up an unwanted colour cast; the Spill Adjustment will remove it.

Press the Spill button, it will illuminate red



Turn the Adjustment Knob; on the output monitor you will see the colour hue of the subject changing. Fine tune the setting until you have the desired effect.



All of the settings we have looked at so far work together to achieve the best possible end result. It is often worth going back to the various settings (Green Keying Level, Density, Edge, Subject Density, Spill) and fine tuning, as adjusting density, for example, may have an affect on the best Green Keying Level. Any one of the adjustments can be changed in any order. The procedure above is the sequence that we find quickest in achieving the best results.

## Window Adjustment

There will be occasions when your backdrop isn't big enough to fill the whole shot. This is most frequently a problem if you want your subject to appear small in the final shot. In this example you can see there are not enough backdrops for the effect that we are after so we have to use the Window Adjustment to remove the garbage.

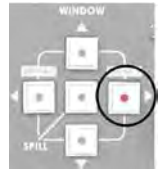


Our Wide-Shot extends beyond the backdrop, so we need to adjust the window size

There are four parameters that we can adjust Left, Right, Top and Bottom. We will start with the Right.



Press the Right Arrow button so that it is illuminated red.



Turn the Adjustment Knob to the left; On the output monitor you will see the background gradually coming in from the right to cover the un-keyable area of the camera image. **As the adjustment is being made you will notice the background image is in black & white, this is to help you see the edge of the window.**



Now we will adjust the Left.



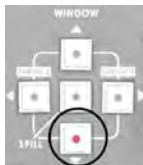
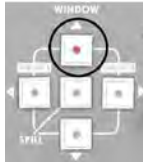
Press the Left Arrow button so that it is illuminated red.



Turn the Adjustment Knob to the right; On the output monitor you will see the background gradually coming in from the left to cover the un-keyable area of the camera image.



We can now adjust the Top and Bottom using the same routine





With the window size adjusted correctly we can set the Green Keying Level, Density, Edge, Subject Density and Spill, to produce the finished shot.

### Settings Lock

Once you have set all the parameters of the DVK-200 to produce the perfect effect from both of your cameras you can then lock in the settings. **Once locked none of the DVK-200 front panel controls will respond protecting the stored settings.**

To lock the DVK-200 front panel, press and hold the GREEN Key-1 or BLUE Key-2 button for two seconds. The button will then be illuminated yellow, instead of the usual red, and the front panel will be locked.

To unlock press and hold the GREEN Key-1 or BLUE Key-2 button, again for two seconds, until the button returns to being illuminated red.

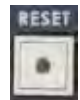
All of the settings are non-volatile, so they are held in memory even after the DVK-200 is switched off. When the DVK-200 is switched on all the parameters will be as you left them.

### Reset

If you want to return all parameters of the KEY-1 or KEY-2 channels to factory default, press the respective button KEY-1 or KEY-2 so that it is illuminated red.

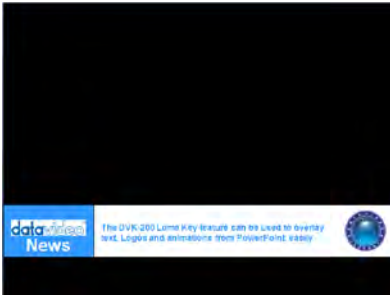


Then press the Reset button. After about two seconds all parameters for the channel will be restored to the factory defaults.



## Luma Keying

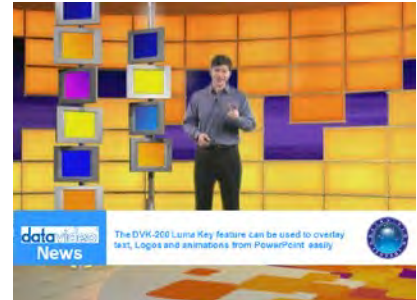
As well as being a Chroma Keyer the DVK-200 can also be used as a Luma Keyer. A Luma Keyer can key out luminance values. In simple terms this means you can key either with the Black end of the grey scale, or the White end of the grey scale. If for example you have an image on a white or black background it is possible to use Luma Keying to replace the black or white area with another video source. Here is an example based on Luma keying with a Black Matte.



Foreground DVI-I supplied Image with Black Matte Area



Background Y/C or CV Video



Luma Keyed Image with Background Video showing through the Black Matte Area

## Luma Key Installation

The following Luma Key overlay installation offers a number of possibilities. Please bear in mind that, despite their name, GREEN and BLUE, these keys do not necessarily have any reference to the connected Foreground or Background video inputs in a Luma Key set up. Whichever key is lit this is the active Luma Key channel that you are working with. Although later in this manual we suggest setting up these buttons for keying out a white or black area.

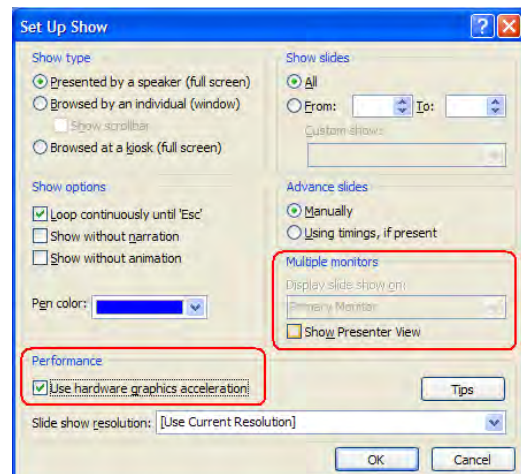
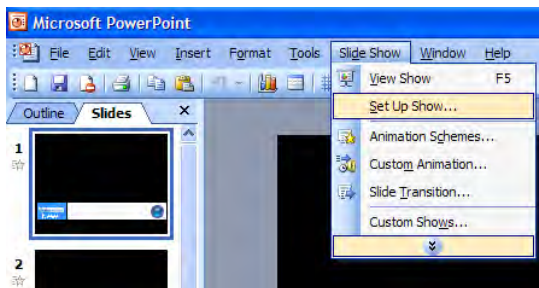


For this set up you will need a computer fitted with a graphics card that can support two DVI-I connections at a resolution of 1024x768. DVI-I Connection 1 will go to the computers own monitor and connection 2 will go to the DVI-I input on the DVK-200. Ensure the CAM input selection switch on the DVK-200 rear panel is moved to the DVI position.

A live camera view or recorded video source is then connected via the background S video or composite video connector. Ensure the BG (Background) input selection switch matches the video BG input connection being used.

Using the attached computer monitor extend the desktop of the computer to the second monitor (in this set up the DVK-200 acts as the second monitor). Set the second monitor output resolution to match 1024x768. This second monitor output from the computer will then be seen by the DVK-200 DVI-I input.

Open up PowerPoint on the PC and use **Set Up Show** so that the presentations play back on Monitor 2 (the DVK-200) and the presentator's output is sent to Monitor 1 (the PC's own monitor).



Using a prepared PowerPoint Presentation, slides with a black background can be played into the DVK-200. The black portion of these PowerPoint slides can then be Luma keyed out and replaced with Background video. The Background Video could be live video from a camera/mixer, or pre-recorded footage from a DVD Player or VTR.

The DVK-200 output connections could run to a DVD Recorder or HDD Recorder, but it could just as easily be going to a distribution amplifier supplying a number of live screens, or a converter supplying a DV stream to a PC or laptop for a live webcast.

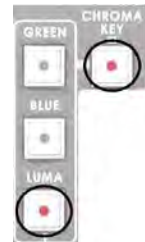
### Luma Key Settings

The Luma Key Settings for KEY-1 or KEY-2 will be set at opposite ends of the scale, on KEY-1 we want to remove white and on KEY-2 we want to remove black. Let's start with KEY-1.

Press the KEY-1 button on the front of the DVK-200, once pressed it should be illuminated red.



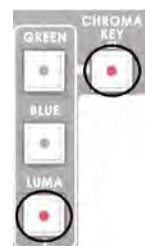
Press the Chroma Key button and the Luma button, both should be illuminated red. Luma Key has two modes and you will see if you press and hold the Luma button for two seconds it flashes. If the button is constantly red it is in Mode 1, which is for removing dark colours – If it is flashing it is in Mode 2, which is for removing light colours. As Key-1 button will be working with a white background that we want to remove, we need Luma Mode 2, so press and hold the Luma button until it is flashing.



Use the Adjustment Knob to adjust the Luma Keying level. You should see the effect on the output monitor. Set the Luma Keying Level to eliminate as much of the white background as possible.



You can also apply Luma Key Mode 1 to fine tune the overlay. This will start to key out the darker areas of the overlay.



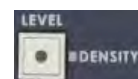
Press and hold in the Luma button for two seconds, until it stops flashing and is illuminated constantly red.

Use the Adjustment Knob to adjust the Luma Keying level. You should see the effect on the output monitor. The darker areas of the overlay will start to disappear. This is really a fine tune adjustment, if you go too far everything will appear.



Now press the Density (Level) button.

The Chroma Key and Density buttons should both be illuminated red. When using Luma Key, the Density button has two modes and you will see if you press and hold the Density button for two seconds it flashes. If the button is constantly red it is in Mode 1, which adjusts the density of dark colours – If it is flashing it is in Mode 2, which adjusts the density of light colours. You can use both Modes 1 and 2 to fine tune the overlay effect.



Use the Adjustment Knob to fine tune the overlay effect. You will see that in Mode 1 the darker areas gradually become more transparent, and in Mode 2 the lighter areas gradually become more transparent.



If you need to reset any of the parameters to factory default, simply activate the function you want to reset by pressing the appropriate function button, and then push the adjustment knob in; after a second the parameter will reset to factory default.



Now we will set up the KEY-2 overlay, which will be for black areas that we want to key out.

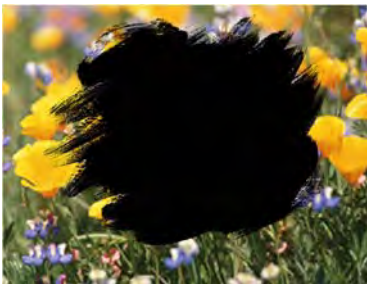
Press the KEY-2 button on the front of the DVK-200, once pressed it should be illuminated red.



Press the Chroma Key button and the Luma button, both should be illuminated red. Luma Key has two modes and you will see if you press and hold the Luma button for two seconds it flashes. If the button is constantly red it is in Mode 1, which is for removing dark colours – If it is flashing it is in Mode 2, which is for removing light colours. As KEY-2 is working with a black background that we want to remove, we need Luma Mode 1, so press the Luma button so until it is illuminated constantly red.



Use the Adjustment Knob to adjust the Luma Keying level. You should see the effect on the output monitor. Set the Luma Keying Level to eliminate as much of the black background as possible.



Overlay with Black Matte Area



Overlay after Luma Keying Level Adjustment

You can also apply Luma Key Mode 2 to fine tune the overlay. This will start to key out the lighter areas of the overlay.

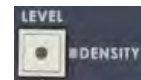
Press and hold in the Luma button for two seconds, until it starts flashing red.



Use the Adjustment Knob to adjust the Luma Keying level. You should see the effect on the output monitor. The lighter areas of the overlay will start to disappear. This is really a fine tune adjustment, if you go too far everything will appear.



Now press the Density (Level) button. The Chroma Key and Density buttons should both be illuminated red. When using Luma Key, the Density button has two modes and you will see if you press and hold the Density button for two seconds it flashes. If the button is constantly red it is in Mode 1, which adjusts the density of dark colours – If it is flashing it is in Mode 2, which adjusts the density of light colours. You can use both Modes 1 and 2 to fine tune the overlay effect.



Use the Adjustment Knob to fine tune the overlay effect. You will see that in Mode 1 the darker areas gradually become more transparent, and in Mode 2 the lighter areas gradually become more transparent.



If you need to reset any of the parameters to factory default, simply activate the function you want to reset by pressing the appropriate function button, and then push the adjustment knob in; after a second the parameter will reset to factory default.



Once you have set all the parameters of the DVK-200 to produce the perfect effect from both of your inputs you can then lock in the settings. **Once locked none of the DVK-200 front panel controls will respond protecting the stored Luma Key settings.**

To lock the DVK-200 front panel, press and hold the GREEN Key-1 or BLUE Key-2 button for two seconds. The button will then be illuminated yellow, instead of the usual red, and the front panel will then be locked.

To unlock press and hold the GREEN Key-1 or BLUE Key-2 button, again for two seconds, until the button returns to being illuminated red.

All of the settings are non-volatile, so they are held in memory even after the DVK-200 is switched off. When the DVK-200 is switched back on all the parameters should be as you left them.

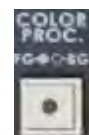
## Colour Processor

The DVK-200 has a built in colour processor which allows each input channel (GREEN, BLUE and Background) to be individually adjusted. The settings are non-volatile, so once set they remain the same even when the unit is switched off.

**Please bear in mind that adjustments made to the Foreground channels (GREEN, BLUE) will affect the Chroma or Luma Keying, so it may be necessary to re-adjust your keying settings if you have changed the colour processor settings of a channel.**

To select the channel that you want to correct press the Colour Processor button.

If the Red LED is illuminated the adjustments will be applied to the Foreground (FG) channel (The DVK-200 has a built in colour processor which allows each input channel (GREEN or BLUE and Background) to be individually adjusted. The settings are non-volatile, so once set they remain the same even when the unit is switched off.





**Please bear in mind that adjustments made to the Foreground channels (GREEN, BLUE) will affect the Chroma or Luma Keying, so it may be necessary to re-adjust your keying settings if you have changed the colour processor settings of a channel.**

If the Colour Processor button LED is not lit any adjustments will be applied to the Background (BG) video image

Select the parameter that you want to alter (Colour Saturation, Brightness, Contrast, Tint (Tint is only necessary for NTSC)) by pressing the relevant button. The button of the selected parameter will be illuminated red.



**N.B. The colour processor adjustments will not function if you are holding a freeze frame.**

Use the Adjustment Knob to set the level you require. You will see the effect on the output monitor. Once you are happy with the setting you can choose another parameter and set it in the same way.



If you need to reset any of the parameters to factory default, simply push the adjustment knob in; after a second the parameter will reset to factory default.

## Still – Freeze Frame

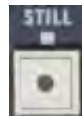
The DVK-200 has a still image grab feature that enables you to grab a freeze frame image on both the Foreground (GREEN or BLUE) and Background video channels.

To grab a still image first press the Colour Processor button.

If the Red LED is illuminated the Foreground (GREEN or BLUE, whichever is active) will become a freeze frame, if the LED is not lit the Background Video channel will become a freeze frame.

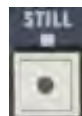


To grab the freeze frame image press the Still button. The Still button will be illuminated red, it will remain red while the freeze frame is being held. You will see the Foreground or Background image freeze on the output monitor.



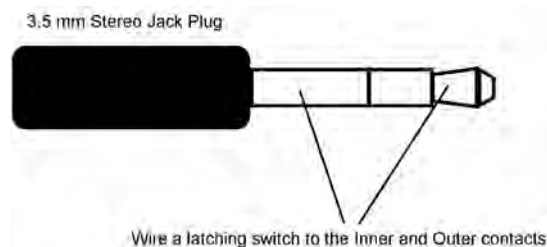
**N.B. The colour processor adjustments will not function if you are holding a freeze frame.**

To release the freeze frame and return to running video, press the Still button again – the LED should go out.



## GPI Control

The DVK-200 has a GPI In and Out port. The GPI In will allow remote switching between the GREEN and BLUE Inputs. This feature works well with the Datavideo CKL-200 LED light ring. The GPI In Socket is based on a 3.5mm jack socket. If you wish to make your own GPI solution wire a cable as follows:



If the switch is closed the DVK-200 will switch to BLUE, if the switch is open it will switch to GREEN.

The GPI Out Socket will replicate the GPI In socket, like a loop through. You could use this to control a second device simultaneously; or maybe to remotely monitor which channel is active (GREEN or BLUE)

The GPI Out will also switch when the GREEN or BLUE buttons are pressed, GREEN is open circuit, BLUE is closed circuit. It could be possible to also use the GPI Out to start / stop a device each time you switch from GREEN to BLUE, or possibly switch devices.

# RS 232 Protocols

## Package Format :

00 FE CH\_ID[4X] CMD[6X-DF] Param0~ParamN[3X] CRCH[5X] CRCL[5X] FF  
 CH\_ID : PC=40~47, 40=Current Camera, 41=CAM1, 42=CAM2  
 Panel=48~4F, 48=Current Camera, 49=CAM1, 4A=CAM2

## Param Data Types :

hex : 1-byte [3X] means X=0~Fh  
 int2 : 2-bytes [3X 3Y] means XYh (signed)  
 uint2 : 2-bytes [3X 3Y] means XYh (unsigned)  
 int3 : 3-bytes [3X 3Y 3Z] means XYZh  
 hex4 : 4 hex for version N.NNN  
 hex6 : 6 hex for date YYMMDD  
 str2N : N\*2 bytes, MSB first ASCII \* N

CRCH/L = 8-bit CRC for error protection, generated by lookup table from (CH\_ID / CMD / Param0~ParamN)

## Command & Parameter Lists

DVKCMD ( - used by Get command)	use CH_ID	Param0~ParamN (Data Type )
DVKCMD_GetVersion	60	FirmwareVersion(hex4) [31 32 33 34] = v1.234 FirmwareDate(hex6) [30 35 31 32 32 35] = 2005/12/25 PanelVersion(hex4) [3132 33 34] = v1.234 ModelName(str2N) [34 34 35 36 34 3B] = 44 56 4B = "DVK"
DVKCMD_GetFeature	61	HardwareVer(hex4) [31 32 33 34] = v1.234 MaxCameraUnit (32) 32 = support 2 Cameras
DVKCMD_GetStatus	62	CAM1_Status b0-1=None/NTSC/PAL b2-3=CV/S CAM2_Status b0-1=None/NTSC/PAL b2-3=CV/S BG_Status b0-1=None/NTSC/PAL b2-3=CV/S IRE 30=0IRE, 31=7.5IRE ColorBar 30=off, 31=on
DVKCMD_Get/SetOutput	64/65	FG/BG/Comp (30/31/32)
DVKCMD_Get/SetCameraUnit	66/67	CAM1/CAM2 (30/31)
DVKCMD_Get/SetColorProc	68/69	Cur/CAM1,2 FG/BG (30/31) Bright(int2=-128~127) def=0 [30 30] Contrast(uint2=0~255) def=128 [38 30] Color(uint2=0~255) def=128 Tint(int2=-127~128) def=0 (-90 ~ +90deg)
DVKCMD_Get/SetFreeze	6A/6B	FGFreeze 30=off / 31=on BGFreeze 30=off / 31=on
DVKCMD_Get/SetKeyMode	70/71	Cur/CAM1,2 Green/Blue/Luma (30~32)
DVKCMD_Get/SetCKBackColor	72/73	Cur/CAM1,2 HueOffset(int2=-60~60) def=0
DVKCMD_Get/SetCKParam	74/75	Cur/CAM1,2 Level(int2=0~100) def=40 Density(int2=0~100) def=30 SpillSuppress(int2=-32~64) def=16
DVKCMD_Get/SetLKParam	7A/7B	Cur/CAM1,2 DarkLevel(int2=0~100)def=10 DarkGrad(int2=0~100) def=10 BrightLevel(int2=0~100)def=0 BrightGrad(int2=0~100) def=0
DVKCMD_Get/SetEdgeShrink7C/7D		Cur/CAM1,2 Left (0~6) def=0 Right (0~6) def=0
DVKCMD_Get/SetWindowPosition	80/81	Cur/CAM1,2 Xleft(int3=0~720) def=0 [30 30 30] Xright(int3=0~720) def=720 [32 3D 30] Ytop(int3=0~576) def=0 Ybottom(int3=0~576)def=486 (NTSC) or 576 (PAL)
DVKCMD_Get/SetWindowBorder	82/83	BorderOn/Off 30=off / 31=on
DVKCMD_Get/SetBlankColor	86/87	R(int2=0~100)def=0 G(int2=0~100) def=70 B(int2=0~100) def=70

# Specifications

## Input

### 4 Inputs:

CAM In (YUV, S-Video, CV or DVI-I)	For foreground use (FG)
BG In (S-Video, CV or DVI-I)	For background use (BG)
Each input has selectable Composite or Y/C signal:	
Y/C In	4-pin 75 ohm DIN Connector
Component, Composite In	75 ohm RCA connector, level: 1.0Vp-p
DVI In	DVI-I Interface (1024x768 or 800x600)

## Output

### Simultaneous output

1Y/C Out	4-pin 75 ohm DIN Connector
2 Component, Composite Out	75 ohm RCA Connector, level: 1.0Vp-p

### Output modes

FG or FG with BG	Choose Chroma key ON or OFF
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### Loop through out

Composite Out from Y/C or Composite In
Y/C Out from Y/C In only

## Video Processing

Component	8-bit, 4:2:2, Y: 13.5MHz
Frame Synchronization	Two Channel Full Frame TBC
Frequency Response (S input)	5.0 MHz +/-3dB
DG, DP	+/- 3%, 3°
S/N Ratio	>50 dB

## General

Power Input	DC 12V/1.5A (AC adapter included)
RS232 & GPI interface	for remote control
Ambient Temperature	32° - 122° F (0° - 50° C)
Ambient Humidity	Less than 90%

## Service & Support

It is our goal to make your products ownership a satisfying experience. Our supporting staff are available to assist you in setting up and operating your system. Please refer to our web site [www.datavideo-tek.com](http://www.datavideo-tek.com) for answers to common questions, support requests or contact your local office below.

Datavideo Global Website: [www.datavideo-tek.com](http://www.datavideo-tek.com)

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Tel: +86 21-5603 6599	Fax: +86 21-5603 6770	E-mail: <a href="mailto:service@datavideo.cn">service@datavideo.cn</a>
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Tel: +65-6749 6866	Fax: +65-6749 3266	E-mail: <a href="mailto:service@datavideo.sg">service@datavideo.sg</a>
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