

4K UP/DOWN/CROSS CONVERTER

DAC-45

Instruction Manual

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Disclaimer of Product & 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.

FCC Compliance Statement

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference, and
- (2) This device must accept any interference received, including interference that may cause undesired operation.

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.
- 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.
- 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.
- 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 rating.
- 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.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 or on its packaging indicates that this product must not be disposed of with your other household waste. Instead, it is your responsibility to dispose of your waste equipment by handing it over to a designated collection point for the recycling of waste electrical and electronic equipment. The separate collection and recycling of your waste equipment at the time of disposal will help to conserve natural resources and ensure that it is

recycled in a manner that protects human health and the environment. For more information about where you can drop off your waste equipment for recycling, please contact your local city office, your household waste disposal service or the shop where you purchased the product.



CE Marking is the symbol as shown on the left of this page. The letters "**CE**" are the abbreviation of French phrase "Conformité Européene" which literally means "European Conformity". The term initially used was "EC Mark" and it was officially replaced by "CE Marking" in the Directive 93/68/EEC in 1993. "CE Marking" is now used in all EU official documents.

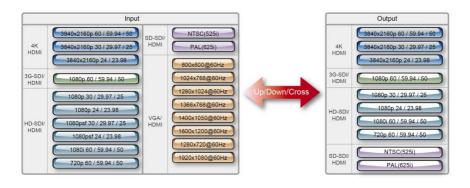
Chapter 1 Product Overview

Datavideo DAC-45 4K up / down / cross converter is designed to convert video signals from VGA, HDMI, SDI with Audio input to 4K HDMI or 3G-SDI output. It allows instant and automatic switch between 4K, HD and SD video formats when the video input changes.

1.1 Features

- HDMI 2.0 input/output with 4:2:2 processing
- Up/Down/Cross convert between SD, HD, 3G and 4K formats
- SDI(3G)/HDMI(4K)/VGA Input
- SDI(3G)/HDMI(4K) Output
- Support 3G-SDI Level A/B
- Reference input (Black Burst and Tri-Level Sync.)
- Built-in Super Resolution Engine for 4K Up Conversion
- Built-in Resolution & Frame rate Up/Down Conversion Engine
- Built-in De-interlacer and Interlacer (I <-> P conversion)

1.2 Formats Conversion Table



Chapter 2 Connections and Controls

2.1 Front Panel





Power Switch

Turns ON/OFF the device



Source LED Indicators

Only one input can be enabled at a time. For details on how to select the source, see the DIP Switch descriptions in the *Rear Panel* section.

ON (Red): Enabled but signal not detected **ON (Green)**: Enabled with valid connection

OFF: Disabled

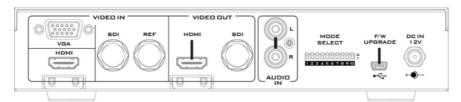


Output Mode LED Indicators

Only one output mode can be enabled at a time. For details on how the output mode can be selected, see the DIP Switch descriptions in the *Rear Panel* section.

ON (Green): Enabled **OFF:** Disabled

2.2 Rear Panel



Video IN				
VGA	VGA IN This port connects the VGA source device. Set the DIP SW 1/2 to 00 before connecting the VGA source device to this port.			
HDMI	HDMI IN This port connects the HDMI source device. Set the DIP SW 1/2 to 01 before connecting the HDMI source device to this port.			
SDI	SDI IN This port connects the SDI source device. Set the DIP SW 1/2 to 10 before connecting the SDI source device to this port.			
REF	REF IN (Genlock) The DAC-45 can be synchronized with the connected input device. REF IN will accept Tri-level and Black Burst sync. Set DIP SW 3 to 1 to enable the Genlock feature. To disable this port, simply set DIP SW 3 to 0.			
	Video OUT			
НОМІ	HDMI OUT This port connects the HDMI destination device.			
SDI	SDI OUT This port connects the SDI destination device.			
Audio IN				
L	Audio Input – Stereo RCA (Left/Right) Connects unbalanced analog audio source (stereo) for audio embedding.			

Mode Select

DIP Switch

The **DIP Switch** allows you to configure the device settings. The table below provides details of the DIP Switch Settings.

SOURCE sets the type of the input device connected.

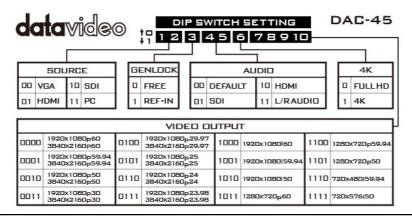
GENLOCK enables/disables the REF IN port.

AUDIO allows you to determine the audio source.

Note: No audio is heard after switching the VGA IN audio source to the HDMI audio source.

4K toggles between Full HD and 4K modes.

VIDEO OUTPUT sets the resolution and frame rate (the output mode). Please note the low nibble determines the resolution and frame rate of the output depending on the setting of the 4K bit.



Firmware Upgrade





USB firmware upgrade port

Connects the DAC-45 device to the PC for firmware upgrade. See the Firmware Update section for details.





DC In Socket

Connects the supplied 12V PSU to this socket. The connection can be secured by screwing the outer fastening ring of the DC In plug to the socket.

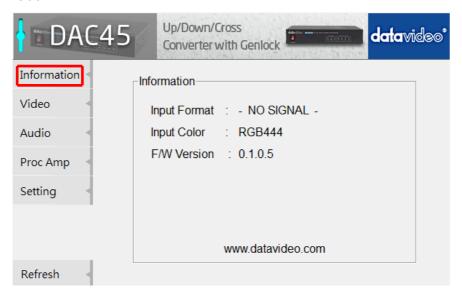
Chapter 3 DAC Center

DAC-45 Center Utility is a Graphical User Interface that allows the user to obtain the device information and perform various video and audio settings.

To use the utility, the user should first copy the *DAC-45 Center.exe* utility software from the installation CD to the computer running Windows. After that, connect the DAC-45 to the same computer using the USB cable. Switch on the DAC-45 and open the DAC-45 Center Utility software.

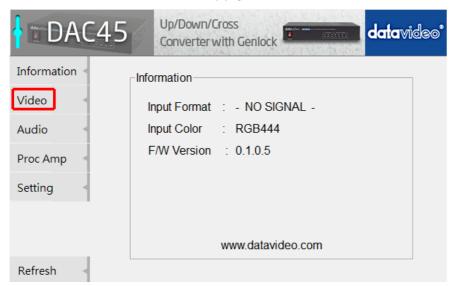
Information

Click the **Information tab** to obtain the information on input format and firmware version.

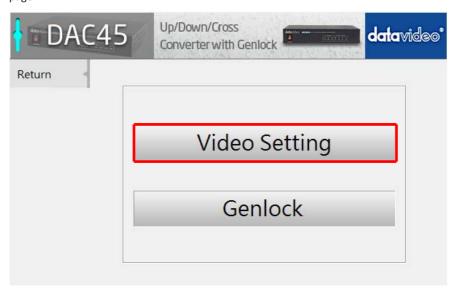


Video

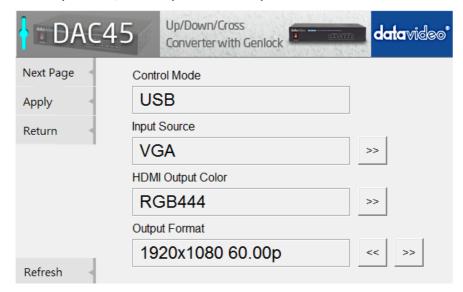
Click the Video tab to enter the video setup page.



On the video setup page, click the **Video Setting** button to enter the video configuration page.



Set the Input Source, HDMI Output Color and Output Format.



Input Source

- VGA
- **HDMI**
- SDI

HDMI Output Color

- YUV422
- **YUV444**
- **RGB444**

Output Format

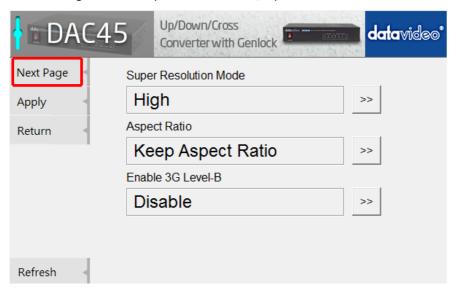
- 720x480 59.94i
- 720x576 50.00i
- 3840x2160 60.00p
- 3840x2160 59.94p
- 3840x2160 50.00p
- 3840x2160 30.00p
- 3840x2160 29.97p
- 3840x2160 25.00p
- 3840x2160 24.00p
- 3840x2160 23.98p
- 1920x1080 60.00p
- 1920x1080 59.94p

- 1920x1080 50.00p
- 1920x1080 30.00p
- 1920x1080 29.97p
- 1920x1080 25.00p
- 1920x1080 24.00p
- 1920x1080 23.98p
- 1920x1080 60.00i
- 1920x1080 59.94i
- 1920x1080 50.00i
- 1280x720 60.00p
- 1280x720 59.94p
- 1280x720 50.00p

Click **Apply** after all settings are configured.

Note: When **Control Mode** displays **USB**, it indicates that the device is accessible by the PC. When **Control Mode** displays **DipSwitch**, the device is only configurable by the DIP Switch.

Click **Next Page** to set the Super Resolution Mode, Aspect Ratio and 3G Level-B.



Super Resolution Mode

- Low
- Middle
- High

Disable

Aspect Ratio

- Keep Aspect Ratio
- Full Screen (16:9)
- Dot By Dot
- 4:3
- 14:9
- UnderScan
- Pan Scan 16:9

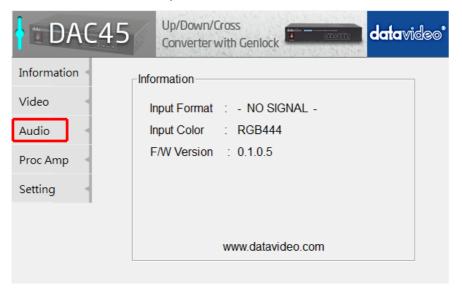
Enable 3G Level-B

- Enable
- Disable

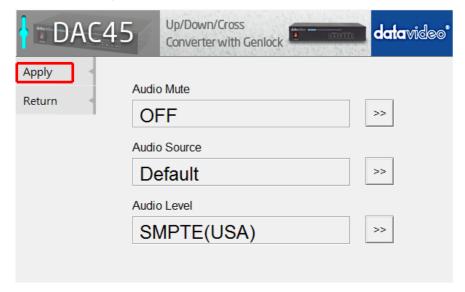
Click **Apply** after all settings are configured.

Audio

Click the **Audio tab** to set audio parameters.



Set the Audio Mute, Audio Source and Audio Level.



Audio Mute

- ON
- OFF

Audio Source

- Default
- SDI
- HDMI
- L/R Audio

Audio Level

- SMPTE(USA)
- EBU(Europe)

Note: Audio Level allows the user to select EBU or SMPTE standards.

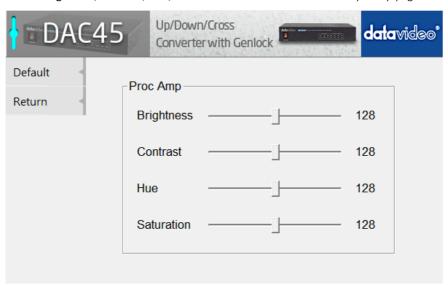
Click **Apply** after setting the Audio Mute, Audio Source and Audio Level.

Proc Amp

Click the **Proc AMP tab** to adjust the picture settings.



Set the **Brightness**, **Contrast**, **Hue**, and **Saturation** levels on the Proc Amp setup page.

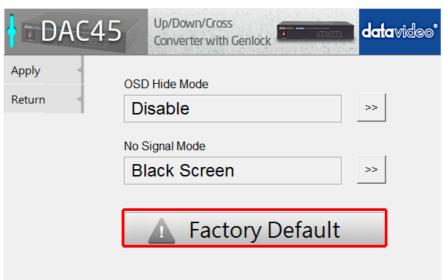


Setting

To restore the factory default settings, click the **Setting tab**.



Click the Factory Default button to reset the DAC-45 to factory defaults.



In addition, the user can also set **OSD Hide Mode** and **No Signal Mode**. Details of these two modes are described in the table below.

OSD Hide Mode	When enabled, source information and output resolution will not be displayed on the screen upon resolution change.	
No Signal Mode	This sets how the screen looks like when there is no signal. The available options are listed below. Black Screen Blue Screen Disable Output	

Firmware Update

Datavideo usually releases new firmware containing new features or reported bug fixes from time to time. Customers can either download the DAC-45 firmware as they wish or contact their local dealer or reseller for assistance.

This section outlines the firmware upgrade process which should take *approximately 10 minutes to complete*.

The existing DAC-45 settings should persist through the *firmware upgrade process*, which should not be interrupted once started as this could result in a non-responsive unit.

Successful firmware upgrade on DAC-45 requires:

- The latest firmware file for the DAC-45. This can be obtained from your local Datavideo dealer or office.
- The Upload Firmware utility. This can also be obtained from your local Datavideo dealer or office.
- 3. A Windows PC with USB 2.0 port.
- 4. A USB A to micro USB cable (USB 2.0).

How to update the DAC-45 firmware

- 1. Switch off the DAC-45 power.
- 2. Save the latest firmware file and the Upload Firmware utility to the PC desktop.



DataVideo Upload Firmware.exe DataVideo Upload Firmware

Datavideo Technologies Co., Ltd

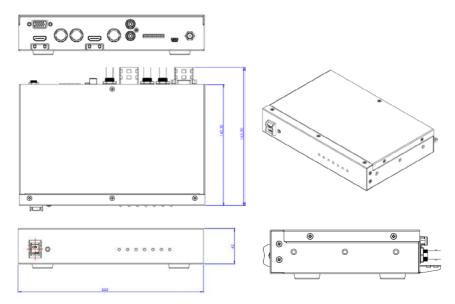
- 3. Use USB 2.0 cable to connect the DAC-45 to the computer.
- Open the Datavideo Upload Firmware utility, which will show Disconnected and the connect button is greyed out.
- Switch on the DAC-45 power and the connect button will now be enabled. Click the connect button and the Utility will show Connected.
- 6. Click the Open File button and select the new firmware file.
- 7. Click the Start button and wait for the progress bar to finish.
- 8. After the update is finished, the utility will show PASS to confirm that the unit has been updated successfully.
- 9. The utility will automatically disconnect the DAC-45 unit.
- 10. Unplug the USB cable from the DAC-45 and power cycle the unit.
- 11. The updated DAC-45 is now ready for use.

Frequently-Asked Questions

This section describes problems that you may encounter while using DAC-45. If you have any questions, please refer to related sections and follow all suggested solutions. If problem still exists, please contact your distributor or the service center.

No.	Problems	Solutions
1.	Must Genlock IN and SDI IN / OUT	Genlock IN only needs to have the
	have the same frame rate in order to	same frame rate with SDI OUT in order
	be in sync?	to be in sync.
		For example, SDI IN is at 1080p60,
		Genlock IN is at 1080p50 and SDI OUT
		is at 720p50.
2.	Are SD and HD cross referenceable?	SD and HD are cross referenceable.
	For example, Genlock IN is SD Black	
	Burst and SDI OUT is HD tri-level	
	OR	
	Genlock IN is HD tri-level and SDI	
	OUT is SD Black Burst.	
3.	Image distortion occurs when using	This issue can be eliminated by
	the DIP Switch to set resolution and	rebooting the device.
	frame rate.	

Dimensions



All measurements in millimeters (mm)

Specifications

lubouf				
Interfaces				
Inputs	VGA x 1 , HDMI x 1 , HD/SD-SDI x 1 RCA x 2 (Unbalanced Audio L/R), Reference Input x 1			
Outputs	SDI x 1, HDMI x 1			
	Power LED x 1			
Indicator	Source LED x 3 (VGA, HDMI, SDI)			
	Output Format LED x 3 (4K, 3G, HD, SD)			
F/W Updates and	Mini USB x 1			
Configuration				
DC IN	DC Jack Standard			
	SDI (YUV)			
	1080p60/59.94/50, 1080p30/29.97/25/24/23.98			
	1080psf30/29.97/25/24/23.98			
	1080i60/59.94/50, 720p60/59.94/50			
	525i, 625i			
	HDMI (YUV / RGB)			
	3840x2160p60/59.94/50			
	3840x2160p30/29.97/25/24/23.98			
Supported Video	1080p60/59.94/50, 1080p30/29.97/25/24/23.98			
Input Format	1080psf30/29.97/25/24/23.98			
	1080i60/59.94/50, 720p60/59.94/50			
	480p, 576p, 480i, 576i			
	800x600@60Hz, 1024x768@60Hz, 1280x1024@60Hz			
	1366x768@60Hz, 1400x1050@60Hz, 1600x1200@60Hz			
	VGA (RGB)			
	800x600@60Hz, 1024x768@60Hz, 1280x1024@60Hz			
	1366x768@60Hz, 1400x1050@60Hz, 1600x1200@60Hz			
	1280x720@60Hz, 1920x1080@60Hz			
	SDI (YUV)			
	1080p60/59.94/50, 1080p30/29.97/25/24/23.98			
Supported Video	1080i60/59.94/50, 720p60/59.94/50			
Output Format	525i, 625i			
	323, 3231			

	HDMI (YUV)		
	3840x2160p60/59.94/50		
	<u> </u>		
	3840x2160p30/29.97/25/24/23.98		
	1080p60/59.94/50, 1080p30/29.97/25/24/23.98		
	1080i60/59.94/50, 720p60/59.94/50		
	480p, 576p, 480i, 576i		
Video Process	SDI: YUV422		
Video Process	HDMI: YUV422/YUV444/RGB444/YUV420(4K only)		
	Input		
	Unbalanced Audio L/R : stereo audio		
	SDI embedded audio : up to 8ch, 48KHz, PCM audio		
	HDMI embedded audio : up to 8ch, 44.1/48/96KHz, PCM audio		
Supported Audio	, , , , , , , , , , , , , , , , , , , ,		
Format	Output		
	SDI embedded audio : up to 8ch, 48KHz, PCM audio		
	HDMI embedded audio : up to 8ch, 48KHz, PCM audio		
	Audio lock after conversion		
Frame Delay	I: 2~3 fields		
Frame Delay	P: 0~1 frames.		
	Features		
Cross Reference	✓		
Plug & Play	✓		
	General		
Settings Control	Dip Switch		
Power Supply	DC 12V / 1A (9.4W)		
Operating	0°C to 40°C (32°F to 104°F)		
Temperature	,		
Humidity	10% to 80%		
Dimensions (mm)	220 x 143.3 x 42		
Weight	1.0 Kg		
Certification	CE, FCC		

Audio Input and Output Level					
	HDMI	SDI	Note		
INT (-20 dBFS)	-20 dBFS	-20 dBFS			
INT (0 dBFS)	0 dBFS	0 dBFS			
RCA-IN EXT (-14dBV)	-24 dBFS	-24 dBFS	SMPTE		
RCA-IN EXT (-14dBV)	-18 dBFS	-18 dBFS	EBU		

Service & Support

It is our goal to make owning and using Datavideo products a satisfying experience. Our support staff is available to assist you to set up and operate your system. Contact your local office for specific support requests. Plus, please visit www.datavideo.com to access our FAQ section.

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