



# DD424CS Hi-Def Video Picture Rotator

## Users' Manual

## WARNING

This equipment generates, uses and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual, may cause interference to radio communications.

It has been tested and found to comply with the limits for a class A computing device pursuant to subpart of J of part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

### **If Your Unit Carries the Optional CE Mark:**

Colorado Video Inc., Boulder CO, USA, declare under our sole responsibility that the Model DD424CS, if installed and operated in accordance with instructions, is in conformity with the following European, harmonized and published standards at date of this declaration:

#### *Safety:*

*EN/IEC 60950-1:2001:* safety of information technology equipment

#### *Electro-Magnetic Compatibility:*

*EN 55022:1998:* Electro magnetic *emissions:* Class A

*EN 61000-3-2:1996:* Harmonic current emissions

*EN 61000-3-3:1995* Limitation of voltage fluctuations

*EN 55024:1998:* Product group *immunity* standard IT equipment:

*EN 61000-4-2:* electrostatic discharge (ESD) immunity

*EN 61000-4-3:* Radiated Electro-Magnetic field immunity

*ENV 50204:1995:* Digital radio telephones immunity

*EN 61000-4-4:1995:* Electrical fast transients (EFT) immunity

*EN 61000-4-5:1995:* Surge transient immunity

*EN 61000-4-6: 1996:* Conducted Radio-Frequency disturbances imm.

*EN 61000-4-8: 1993:* Power frequency magnetic field immunity.

*EN 61000-4-11: 1994:* Immunity to voltage dips and short interrupts

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## SECTION I

### GENERAL DESCRIPTION

#### 1.1 PURPOSE OF EQUIPMENT

The DD424CS High Definition Video Picture Rotator allows you to rotate, mirror, and/or resize a high definition DVI-D (HDMI) video signal.

An HDMI signal at the input by means of a simple adapter is acceptable provided it is not HDCP Encrypted. The DD424CS will not pass any audio or encrypted content that may be present in an HDMI signal.

#### 1.2 DESCRIPTION OF EQUIPMENT

The Model DD424CS accepts DVI-D Single Link Video at its input, performs the selected transforms, and provides a DVI-D Single Link Video output for display on a compatible monitor.

The DD424CS, constructed in an ABS plastic and aluminum chassis with an internal EMI shield coating, is free standing with a sloping face for bench top use. It requires an external power supply to provide 5 Volts DC regulated, 2 Amps, at its 5.5x2.1mm coaxial power connector.

The Input/Output connectors are physically compatible with all DVI cables. The signal must be DVI-D Single Link or HDMI without HDCP Encryption. Passive adapters and cables to interconnect DVI and HDMI equipment are widely available. Generally, cameras are free of HDCP but DVD, Blu-Ray, and Satellite sources are frequently encrypted. If a source is found to be encrypted, use of its Hi-Def Component-Analog outputs, if present, and a Model CC424CS Video Rotator should be considered.

#### 1.3 SPECIFICATIONS

<b>Size:</b>	8.875"W x 6.5"L x 2.75"H sloping to 1.25"H
<b>Mounting:</b>	Table Top
<b>Construction:</b>	Solid-state, SMT PC Board, Optionally RoHS Compliant
<b>Power:</b>	+5VDC, 2000mA regulated
<b>Input Signal:</b>	DVI-D, Single Link (HDMI with adapter) HDCP not permitted
<b>Output Signal:</b>	DVI-D, Single Link, Output Resolution always follows Input Resolution
<b>Controls:</b>	Multifunction Button Multifunction Knob
<b>Indicator:</b>	Power (Flashing), Video OK (Steady)
<b>Connectors:</b>	Video In & Out: DVI Power: Coaxial 5.5mm x 2.1mm

## SECTION II

### 2.1 INSTALLATION

Connect a camera or other source of a DVI-D or HDMI video signal to the “input” connector on the rear of the DD424CS. If the video source provides HDMI, a simple HDMI-DVI adapter or cable will be required. HDCP encrypted video is not permitted and any audio will not pass through the DD424CS. Some consumer HDMI equipment may operate only if its output is set to 480p or 480i.

Connect a DVI-D video monitor to the “output” connector. HDMI monitors are also suitable with use of a DVI-HDMI adapter or cable.

Connect the coaxial power input to a regulated 5VDC, >2000mA, center pin positive regulated power source. After flashing for a few seconds, the “Power/Video OK” LED should appear steady. If the LED continues to flash, power is present but the signal at the video input is absent or incompatible.

A steady green “Video OK” indicator but blank picture indicates that the DVI or HDMI source is HDCP encrypted and processing by the DD424CS is not permitted.

### 2.2 OPERATION

#### 2.2.1 Display Menu Settings

The menu appears when the control button is tapped or the knob is turned. Its size, position, and persistence are controllable. To adjust these parameters:

1. Tap the button to enter the "Main Menu".
2. Use the knob to select the "Tools" icon and tap the button.
3. Use the knob to select the "Menu Settings" icon and tap the button.
4. To adjust the menu's persistence, use the knob to select the "Persistence" icon, tap the button, use the knob to make your setting, and tap the button.
5. To adjust the menu's size, use the knob to select the "Size" icon, tap the button, use the knob to make your setting, and tap the button.
6. To adjust the menu's position, use the knob to select the "Vert Position" or “Horiz Position” icon, and tap the button. Use the knob to adjust, then tap the button.
7. Select the "Return to Tools" icon and tap the button to exit the "Menu Settings" menu.
8. Select the "Return to Main Menu" icon and tap the button to exit the "Menu Settings" menu.
9. Select the "Exit Menu" icon and tap the button to exit the "Main Menu”.

### **2.2.2 Video Settings: Format Information, Interlace Mode (Action/Still)**

The Video Settings menu allows determination of the input signal format and processing optimization for interlaced formats depending on the amount of motion in the picture.

1. Tap the button to enter the "Main Menu".
2. Use the knob to select the "Tools" icon and tap the button.
3. Use the knob to select the "Video Settings" icon and tap the button.
4. To view information on the input signal format, use the knob to select the "Video Info" icon, tap the button, and read the data from the menu window.
6. Tap the button to exit the "Video Info" window.
7. To optimize processing for interlaced video formats such as 1080i, use the knob to select the "Interlacing Mode" icon and tap the button. Next, use the knob to select "Stills" or "Action" depending on your anticipated picture content, and tap the button.
8. Select the "Return to Tools" icon and tap the button.
9. Select the "Return to Main Menu" icon and tap the button to exit the "Menu Settings" menu.
10. Select the "Exit Menu" icon and tap the button to exit the "Main Menu".

### **2.2.3 Factory Reset**

To restore factory settings to the Video Rotator:

1. Tap the button to enter the "Main Menu".
2. Use the knob to select the "Tools" icon and tap the button.
3. Use the knob to select the "Factory Reset" icon and tap the button.
4. Use the knob to select the "Yes" or "No" icon and tap the button.
5. If necessary, use the knob to select the "Return to Main Menu" icon and tap the button.
8. Select the "Exit Menu" icon and tap the button.

### **2.2.4 Selecting Picture Rotation**

1. Tap the button to enter the "Main Menu".
2. Use the knob to select the "Orientation" icon and tap the button.
3. Use the knob to select one of the eight possible picture orientations and tap the button.
4. Use the knob to select the "Exit Menu" icon and tap the button to exit the "Main Menu".

### **2.2.5 Selecting the Picture Scaling Mode**

Because rotating the picture 90 or 270 degrees causes the picture to no longer fit on the display screen, the Video Rotator can resize the picture. There are three available picture Scaling Modes; “1:1”, “Adaptive”, and “Uniform”. “1:1” does not resize the picture so that in 90 and 270 rotation modes parts of the screen are dark and parts of the picture are lost. “Uniform” uses the selected resizing for *all* modes. “Adaptive” resizes the picture only in modes where a 1:1 picture will not fit the screen. To select the Scaling Mode:

1. Tap the button to enter the “Main Menu”.
2. Use the knob to select the “Scaling Mode” icon and tap the button.
3. Use the knob to select the desired mode and tap the button.
4. Use the knob to select the “Exit Menu” icon and tap the button.

### **2.2.6 Setting the Image Fitting (Scaling)**

Image Fitting allows control of the picture size in all rotation modes if the scaling mode is set to “Uniform”. It will allow picture size control in “Adaptive” mode only if the picture is rotated 90 or 270 degrees. 1:1 mode disables Image Fitting settings. To set Image Fitting:

1. Tap the button to enter the Main Menu.
2. Use the knob to select the “Image Fitting” icon and tap the button.
3. Use the knob to set the desired scaling. A setting of 0% will allow the entire picture to fit on the display screen when rotation is set to 90 or 270 degrees. A setting of 100% will fill the screen completely. A setting of 50% will leave the picture size unchanged from the input. Tap the button.
4. Use the knob to select the “Exit Menu” icon and tap the button.

## warranty

Colorado Video, Incorporated warrants the equipment of its manufacture to be free of defects in material and/or workmanship under normal use and service. Colorado Video, Incorporated's obligation under this warranty is limited to making good at its laboratories any part or parts thereof, which shall within one (1) year after delivery to the original purchaser be returned to Colorado Video, Incorporated at its laboratories, with transportation charges prepaid, and which Colorado Video, Incorporated's examination shall disclose to its satisfaction to have been defective.

This warranty is expressly in lieu of all other warranties and representation, express or implied, and of all other obligations or liabilities on the part of Colorado Video, Incorporated. In no event shall Colorado Video, Incorporated be liable for damages of any kind connected with the use of its equipment or its failure to function properly.

This warranty shall not apply to any equipment which shall have been repaired or altered outside of Colorado Video, Incorporated's laboratories so as to, in Colorado Video, Incorporated's judgement, affect its use, function, reliability, or which shall have been subject to misuse, alteration, improper installation, negligence, or accident.

Before any equipment is returned to Colorado Video, Incorporated for repairs or adjustments, shipping instructions should be obtained from Colorado Video, Incorporated. Colorado Video, Incorporated assumes no responsibility for unauthorized returns.