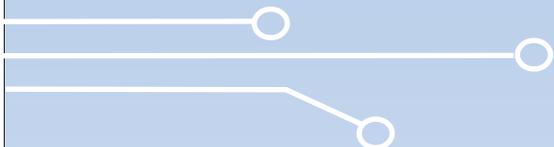


DD618CS Hi-Def

Video Comparator

Split Screen, Mix, Subtract, Freeze



Users' Manual



Colorado Video



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 DD618CS, 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

TABLE OF CONTENTS

REGULATORY 2

Section I **GENERAL DESCRIPTION**

1.1 Purpose of Equipment 4

1.2 Description of Equipment 4

1.3 Specifications 5

Section II **INSTALLATION & OPERATION** 6

Split Screen 6

Mix 7

Subtract 7

View 7

Freeze 7

Section III **WARRANTY** 8

SECTION I

GENERAL DESCRIPTION

1.1 PURPOSE OF EQUIPMENT

The Model DD618CS provides five different versions of split screen, mix (overlap), or subtraction functions for one or two live Single-Link DVI-D (HDMI) video signals.

HDMI signals at the inputs are acceptable provided they are not HDCP Encrypted. The DD618CS will not pass any audio that may be present in an HDMI signal.

1.2 DESCRIPTION OF EQUIPMENT

The Model DD618CS accepts one or two DVI-D Single- Link Video inputs, performs the user-selected split screen, mixing, or subtraction function, and provides a DVI-D Single-Link Video output for display on a compatible monitor.

The DD618CS, 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, 1.5 Amps, at its 5.5x2.5mm 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, setting its output resolution to less than 720p should deactivate the encryption.

1.3 SPECIFICATIONS

Size:	8.875"W x 6.5"L x 2.75"H sloping to 1.25"H
Mounting:	Table Top
Construction:	Solid-state, SMT PC Boards Optionally RoHS Commpliant
Power:	+5VDC, 1500mA regulated
Input Signal:	DVI-D, Single Link (HDMI with adapter) HDCP not permitted
Output Signal:	DVI-D, Single Link
Controls(8):	Mode: Split Screen / Mix / Subtract Sub-Mode: L R Split Screen Squeeze Mode / L R Split Screen Mode / T/B Split Screen Mode OR A-B+50% / A-B Freeze A: Freezes A Input (except "View A" Mode) Freeze B: Freezes B Input (except "View B" Mode) View A: Sends A Input directly to output View B: Sends B Input directly to output Input: A Only / A and B Swap: A vs B / B vs A
Indicators(16):	Input A OK Input B OK Input A Frozen Input A Frozen Viewing Input A Only Viewing Input B Only L R Split Screen Squeeze Mode L R Split Screen Mode T/B Split Screen Mode Mix (Double Exposure) Mode Subtract: A-B+50% Subtract: A-B (absolute value) A vs. B B vs. A A vs. Latest A Latest A vs. A
Connectors:	Video In & Out:: DVI Power: Coaxial 5.5mm x 2.5mm

SECTION II

INSTALLATION AND OPERATION

Connect a camera or other source of a DVI-D or HDMI video signal to the A “input” connector nearest the power connector on the rear of the DD618CS. This input must always be used. 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 DD618CS. Use of the B “input” connector for a second source is optional. When using both inputs, the sources must provide signals with identical resolution specifications.

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, >1500mA, center pin positive regulated power source. The “Input A OK” LED should appear steady. If the LED flashes, power is present but the signal at the video input is absent, encrypted, or otherwise incompatible.

If using the DD618CS with only one video source, press the “Input” button to cause either of the LEDs in the “A Only” column to light. If using two video sources either “A Only” or A vs B” input modes may be used.

If using both inputs, both DVI Input connectors must be connected to DVI sources of identical resolution. Check that either the “A vs B” or “B vs A” LED is lighted. If not press the “Input” button. The “Input A OK” and “Input B OK” LEDs should be lighted steadily, indicating valid input signals.

Split-Screen Tap the “Mode” button until a “L|R Squeeze”, “L|R”, or “T/B” LED lights. Press the “Sub-Mode” button to select the desired type of Split-Screen, as indicated by one of these three LEDs. For “L|R” and “T/B” sub-modes, adjust the split position using the knob. The position and visible portions of the inputs can be swapped by pressing the “Swap” button to select “A vs B” or “B vs A”. Either input can be frozen by pressing the “Freeze A” or “Freeze B” buttons.

Pressing the “Input” button to obtain the “A Only” function will put the A input on one side of the split and the A input delayed by one frame on the other side. Pressing the “Freeze A” button will freeze only one side of the split so that a portion of live A can be displayed with a portion of frozen A.

Mix To obtain a double exposure display, tap the “Mode” button until the “Mix” LED lights. The amount of each input present in the display can be adjusted with the knob. These amounts can be swapped by pressing the “Swap” button. Either input can be frozen by pressing the “Freeze A” or “Freeze B” buttons.

Pressing the “Input” button to obtain the “A Only” function will mix the A input with the A input delayed by one frame (to little effect). Subsequently pressing the “Freeze A” button will mix live A with frozen A, thereby making positional changes noticeable and quantifiable.

Subtract To compare DVI video pictures by subtracting one from the other, tap the “Mode” button until either the “Subtract” LED or the “Absolute Value” LED lights. Select between “Absolute Value” or “Subtract” by tapping the “Sub-Mode” button.

“Subtract” gives $Gx(A/2-B/2)+50\%$. Therefore, areas of no difference yield a 50% gray, areas where A is brighter than B yield more than 50% , and areas where A is darker than B yield less than 50%. Pressing the “Swap” button reverses the effects of A and B. “G” is gain, set by the knob, useful for setting the contrast of the resultant picture.

“Absolute Value” gives $Gx|A-B|$. Therefore areas of little difference are dark and areas of great difference are bright. Since $|A-B|=|B-A|$, the “Swap” button has no effect. “G” is gain, set by the knob, useful for setting the contrast of the resultant picture.

Pressing the “Input” button to obtain the “A Only” function will subtract the A input from itself delayed by one frame. Comparing successive frames in this manner is very effective for showing only movement or change. Motionless, unchanged objects are invisible.

View Either input can be viewed directly, regardless of other selections, by pressing their respective “View” buttons.

Freeze Either input can be frozen. If using only the A input, the Comparator will treat frozen A as one video source and live A as the other. Only one input can be frozen at a time.

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.