

ColourCV Designer's Toolkit

Electrical Characteristics

In order to ensure that your ColourCV plays nicely with others, design your ColourCV to the following specifications.

- **Gain:** 1 (0db) / or if doing a distortion, gain can be greater than 1.
- **Input Impedance:** $>10k\Omega$
- **Output Impedance:** $\leq 1k\Omega$
- **Power Consumption:** 50ma
- **Supply Voltage:** $\pm 12V$
- **DC Offset:** $\leq 20mv$
- **Nominal Operating Level:** +4dBu / 3.47 Vpp
- **Control Voltage:** -5V to +5V nominal (CTRL knob range).

It's okay if you don't know the exact specifications of your ColourCV.

Notes & Recommendations:

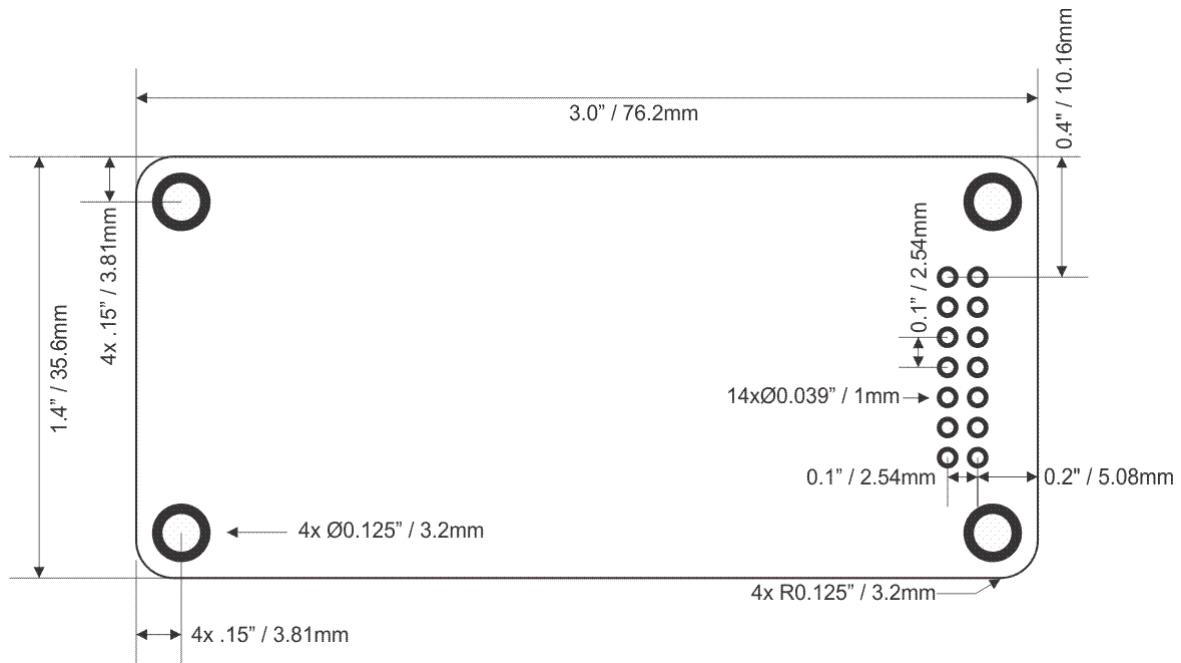
- Buffer the input and output of your circuit with [opamp buffers](#).
- To use standard Eurorack levels of ± 10 Vpp nominal level: use a gain stage with a gain of 2.879 (+9.2dB) at the input to your colour. For the output to be unity, use a gain stage of 0.347 (-9.2dB) just before the output pin. This shifting is necessary for compatibility with original Colours operating at +4dBu.
- Outputs can be AC or DC coupled, and should have a 100 ohm to 1k output series resistor.
- The Palette for ColourCV will clip any signal levels greater than 20Vpp.
- The primary power rails are $\pm 12V$. There are $\pm 16V$ rails available for extra headroom and legacy Colour designs. You are limited to 38mA/Colour on the $\pm 16V$ rails.

Dimensions

Your ColourCV's PCB should be made from standard, 1/16" (1.6mm) thickness, rigid FR4. For aesthetic continuity, we recommend $\varnothing.125$ " (3.2mm) beveled corners, but they are not necessary.

- **Width:** 3" (76.2mm)
- **Height:** 1.4" (35.6mm)

- **Clearance Below PCB:** 0.1”(2.54mm) minimum
- **Clearance Above PCB:** 0.58” (14.7mm) max for compatibility with 500 Series Palette
- **Mounting Hole Size:** \varnothing .125” (3.2mm)
- **Mounting Hole Keepout Clearance:** \varnothing 0.289 (7.4mm)



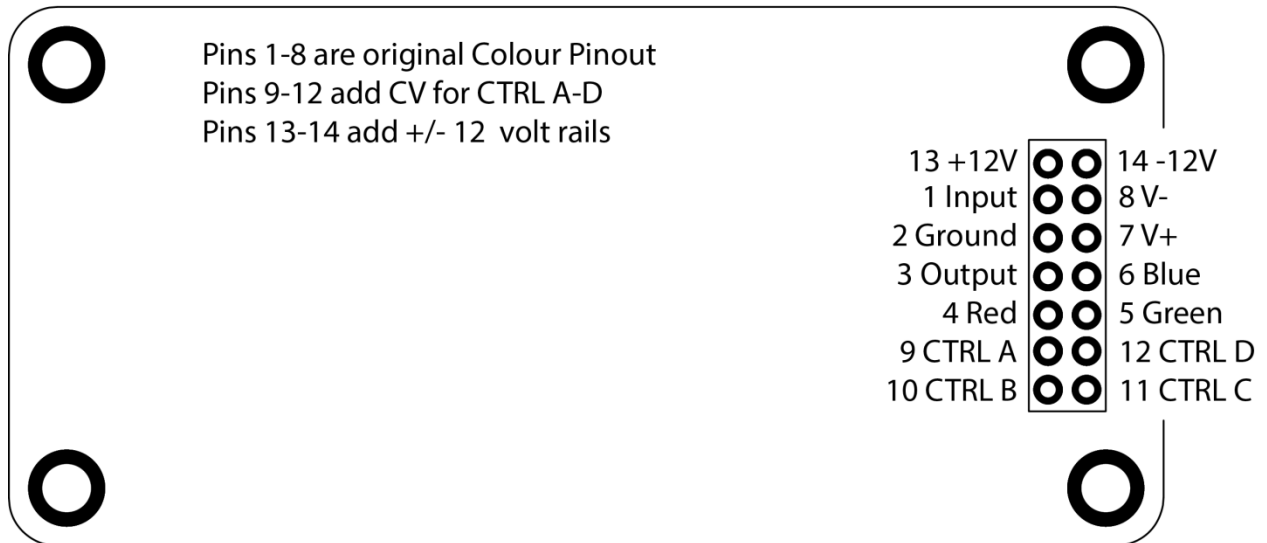
Pinout

ColourCV mates with the eurorack Colour Palette via a 14 pin connector. *NOTE original studio Colours will connect directly to a studio Colour Palette, however ColourCV boards must use the optional ColourADPTR adaptor board to mate with the studio Colour Palette.

- 1 – Audio In
- 2 – Ground
- 3 – Audio Out
- 4 – Red LED
- 5 – Green LED
- 6 – Blue LED
- 7 – 16V+
- 8 – 16V-
- 9 – CTRL A
- 10 – CTRL B
- 11 – CTRL C

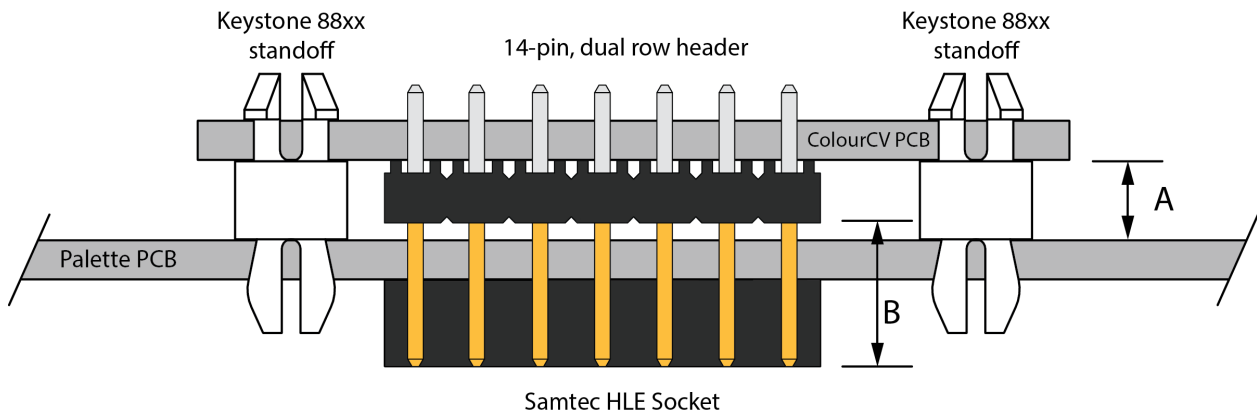
- 12 – CTRL D
- 13 – 12V+
- 14 – 12V-

COLOURCV PINOUT



Connectors

ColourCVs mount to the Palette via five connectors—four mechanical and one electrical.



ColourCVs are mechanically secured to the Palette via four nylon standoffs. These standoffs are available in 9 lengths ("A" in the connector drawing), allowing you to customize your ColourCV's mounting height from the Palette. The nylon standoffs are locking on one end and removable, press-fit on the other. The locking ends should be inserted into the ColourCV's mounting holes so that the standoffs are permanently attached to the colour. ColourCVs make an electrical connection to the Palette via one 14-pin connector mounted on the bottom of the ColourCV PCB. The connector's pin length ("B" in the connector drawing) has to correspond with your chosen standoff height, "A." B must be .1" longer than A.

Sourcing Connectors:

If you are selling your ColourCV, you must include the mechanical and electrical connectors in your kit or assembled unit. Both the mechanical and electrical connectors are standard off-the-shelf components available worldwide.

Mechanical Connectors:

Manufacturer	Part #	Height ("A")	Datasheet	Source
Keystone	8879	.125"	Datasheet	Octopart Search
Keystone	8880	.187"	Datasheet	Octopart Search
Keystone	8881	.25"	Datasheet	Octopart Search
Keystone	8882	.375"	Datasheet	Octopart Search
Keystone	8883	.5"	Datasheet	Octopart Search
Keystone	8884	.625"	Datasheet	Octopart Search

Keystone	8885	.75"	Datasheet	Octopart Search
Keystone	8886	.875"	Datasheet	Octopart Search
Richco	MSPM-2-01	.125"	Datasheet	Octopart Search , Essentra
Richco	MSPM-3-01	.187"	Datasheet	Octopart Search , Essentra
Richco	MSPM-4-01	.25"	Datasheet	Octopart Search , Essentra
Richco	MSPM-5-01	.313"	Datasheet	Octopart Search , Essentra
Richco	MSPM-6-01	.375"	Datasheet	Octopart Search , Essentra
Richco	MSPM-7-01	.438"	Datasheet	Octopart Search , Essentra
Richco	MSPM-8-01	.5"	Datasheet	Octopart Search , Essentra
Richco	MSPM-9-01	.563"	Datasheet	Octopart Search , Essentra
Richco	MSPM-10-01	.63"	Datasheet	Octopart Search , Essentra

Richco	MSPM-12-01	.75"	Datasheet	Octopart Search , Essentra
Richco	MSPM-13-01	.811"	Datasheet	Octopart Search , Essentra
Richco	MSPM-14-01	.875"	Datasheet	Octopart Search , Essentra

Electrical Connectors:

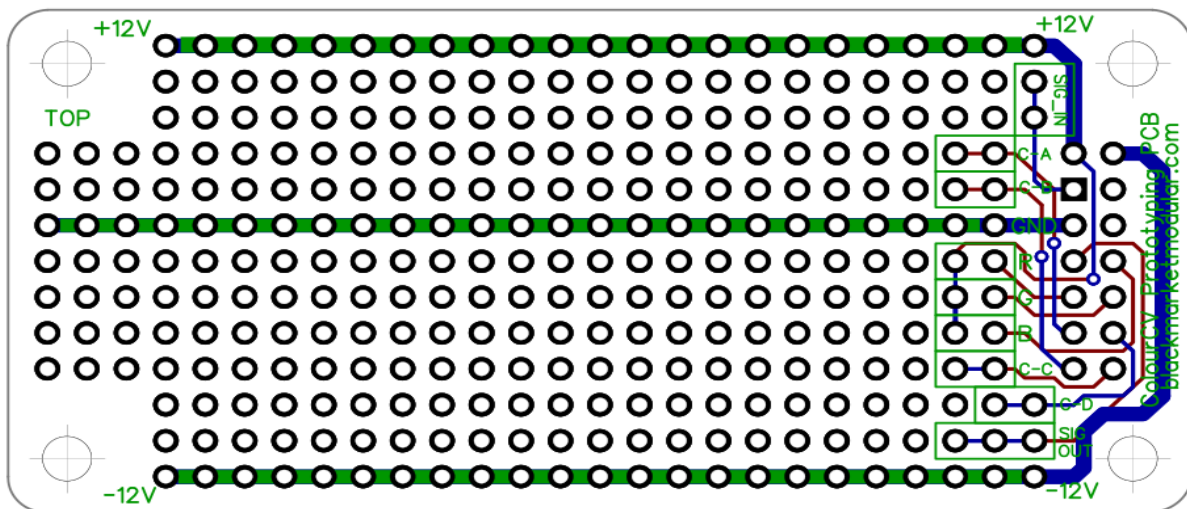
Manufacturer	Part #	Pin Length ("B")	Datasheet	Source
Samtec	TSW-107-07-F-D	.23"	Datasheet	Octopart Search , Samtec
Samtec	TSW-107-14-F-D	.32"	Datasheet	Octopart Search , Samtec
Samtec	TSW-107-15-F-D	.52"	Datasheet	Octopart Search , Samtec
Samtec	TSW-107-17-F-D	.62"	Datasheet	Octopart Search , Samtec
Samtec	TSW-107-18-F-D	.72"	Datasheet	Octopart Search , Samtec
Samtec	TSW-107-19-F-D	.82"	Datasheet	Octopart Search , Samtec

Samtec TSW-107-19-F-D .82" [Datasheet](#) [Octopart Search, Samtec](#)

Samtec TSW-107-20-F-D 1.02" [Datasheet](#) [Octopart Search, Samtec](#)

Coloring Your ColourCV

Your ColourCV will be identified on the front panel by an RGB LED. In order to set the color of the LED, you must include the red, green, and blue LED current setting resistors in your ColourCV PCB. You feed one side of the resistors with V+ and return the other side to their respective pins on the 14-pin connector. See the ColourCV prototyping board below for an example. Connecting these resistors to the two pins in each box marked "R, G, B" will easily let you define your colour. Rough values should be 20k to 300k.



ColourCV Prototyping Kit

It's easy to DIY and design circuits with our ColourCV Prototyping Kit. Just follow the specs in the [Designer's Toolkit Guide](#). ColourCV is an open platform and you are free to share, manufacture, and sell your ideas to anyone you wish!

- Includes (1) Prototyping PCB, (4) Snap-In Standoffs, and (1) 14 pin Header
- Prototyping PCB includes labeled busses for ground, power, cv, and audio i/o
- Compatible with the eurorack Colour Palette (*will not work with 500-Series Palette unless it is used with ColourADPTR)

- Retail Price \$4.99 USD