ROBOTIC BEAN

COMPARE
CV SCOPE

User Guide

Version 2.0

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INTRODUCTION
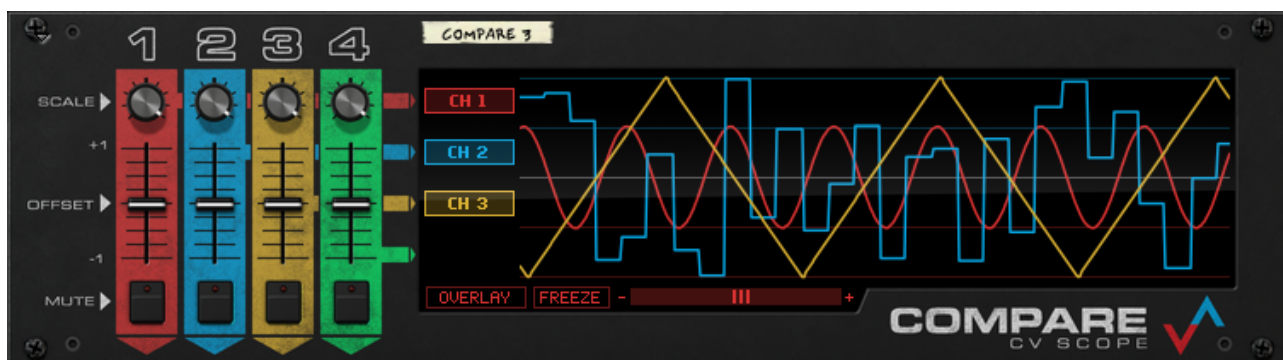
Compare CV Scope is actually three devices in one:

*   A **CV Oscilloscope** that can visualize up to four CV signals at the same time

*   Four channels of **Scale**, **Offset** and **Mute**

*   A **function generator** that combines the active signals and derives the Minimum, Maximum, Sum and Product, all at the same time

In other words, Compare CV Scope is an indispensable part of your Reason modular toolkit!

GETTING STARTED

A great way to get started with Compare is to just plug in some CV sources and see what happens. For instance, you can create a Pulsar and connect each LFO to an input on Compare:
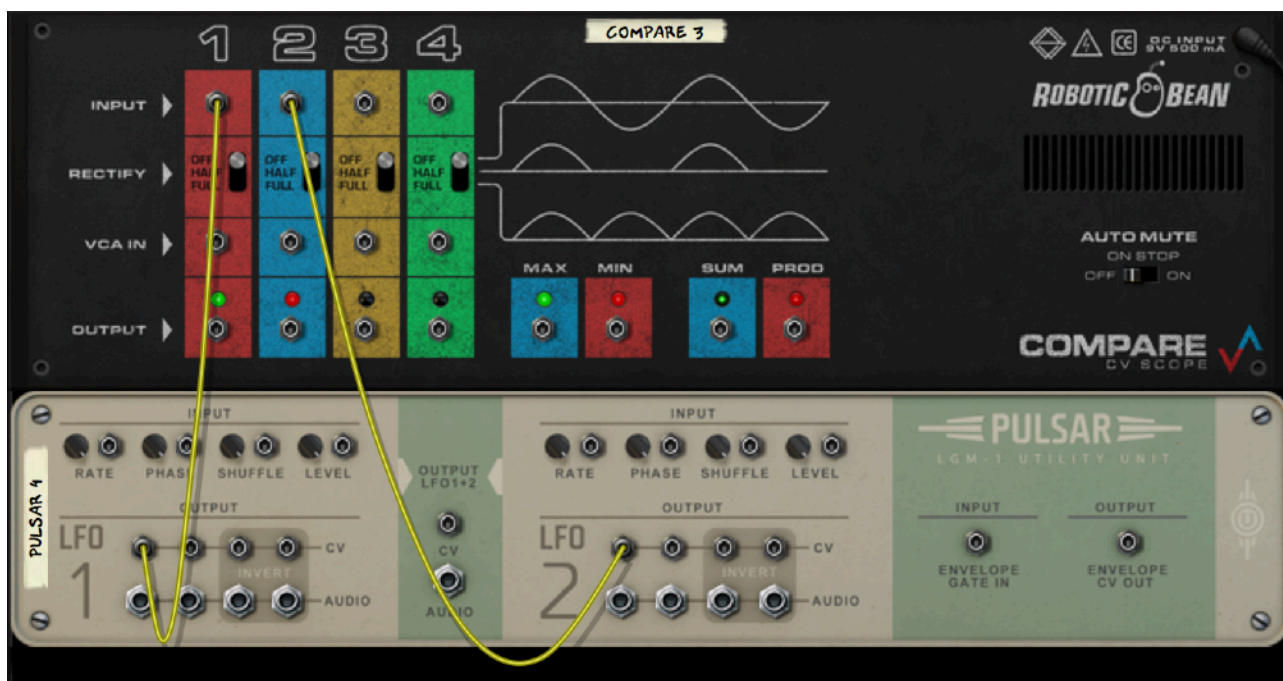
Next, flip around to the front panel, enable LFO2 on Pulsar, and set the Level of both LFO's to their maximum values (we're going to attenuate them with Compare instead).
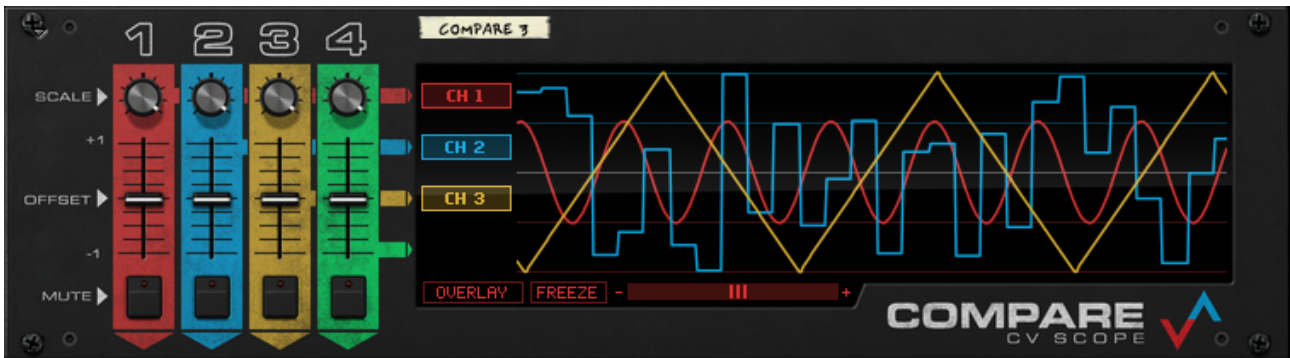
Set the waveforms and rates on the LFOs to taste while watching what happens on the scope.

Now tweak the controls on Compare's channel 1 and 2 to the left on the front panel, and select different views using the view button in the lower left corner of the display.
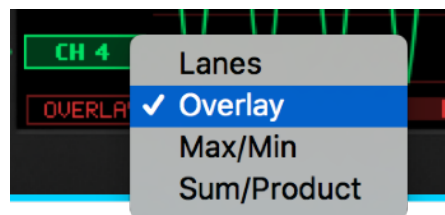
THE FRONT PANEL

Compare's front panel can be divided into two sections: The **channel controls** on the left side, and the **display** to the right.

The channel controls will affect both the appearance of the signal in the display, and the actual signals that are sent to Compare's CV outputs. In contrast, the controls in the display area will only affect the display itself, leaving the actual signals unaltered.

THE DISPLAY

The display consists of three parts: The channel toggle buttons to the left, the oscilloscope in the middle, and buttons to select the display mode and freeze the display to the right.

Toggle Buttons

The toggle buttons to the left of the Oscilloscope hide and show curves in the display, without affecting any outputs. Which toggle buttons are shown depends on the selected Display Mode.

The Oscilloscope

The oscilloscope will show up to four CV signals at one time, scrolling the image from right to left. The rightmost position represents the current point in time. The vertical range is +/- 1.0 V, and the visible time span depends on the current zoom level.

- **Zooming** - You can zoom in and out along the time axis of the oscilloscope at all times using the Zoom slider at the bottom of the display, or by clicking the +/- buttons.

- **Freezing** - You can freeze the oscilloscope view at any time by pressing the Freeze button. Freezing the display has no effect on any of the output signals.

Display Modes

There are four Display Modes that you can select from a menu by pressing the button in the lower left corner of the display.

1. In **Lanes mode**, the signals are shown side by side, each in their own lane.
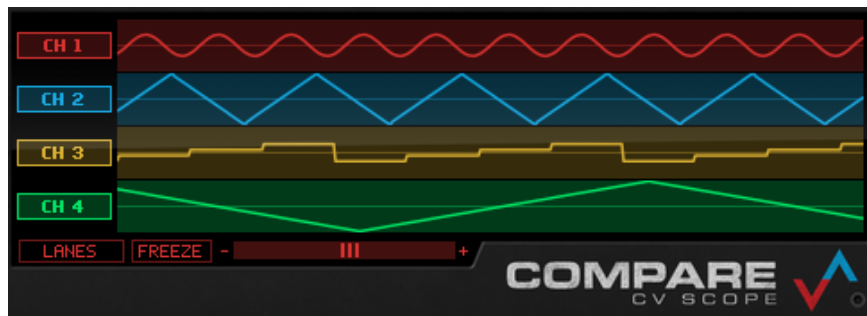
2. In **Overlay mode**, all signals are drawn on top of each other, all utilizing the full height of the display.

3. In **Max/Min mode**, you will see curves that represent the minimum and maximum values of all active input signals for every point in time. The curves reflect what is sent out on the corresponding Min and Max CV outputs on the rear panel of the device.
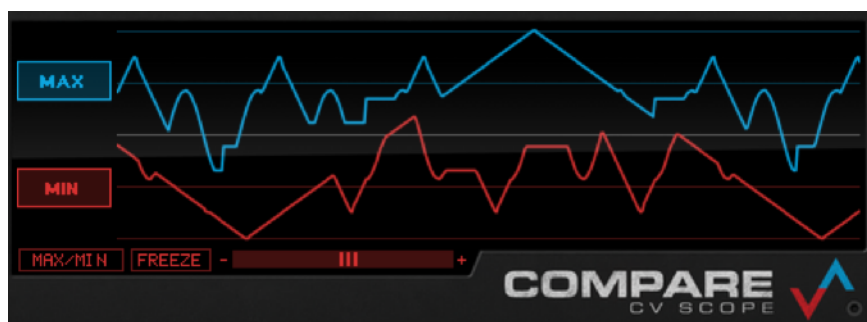
Note that the toggle buttons only control the visibility of the Max and Min curves, not the outputs.

4. In **Sum/Product mode**, the curves represent the sum and product of all active signals:
Summing the signals is the same as mixing them. You can use the Scale knobs to set the level of each signal in the mix.

Multiplying the signals is the same as having the signals scale each other, like on a VCA in a synthesizer. Note that when you have a lot of periodic signals centered around 0, the Product will usually stay close to 0.
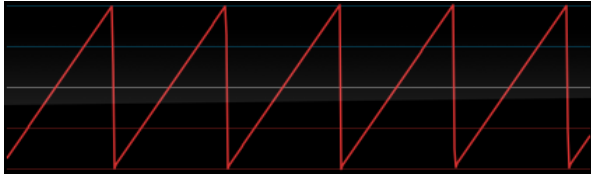
Note that the toggle buttons only control the visibility of the Sum and Product curves.
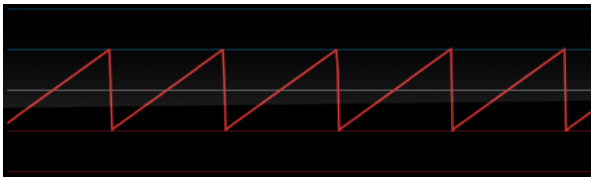
CHANNEL CONTROLS

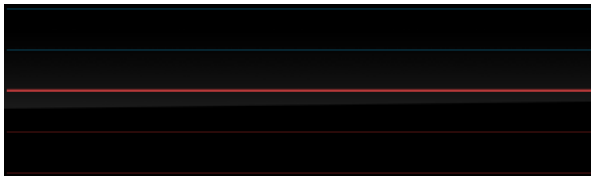There are three controls for each of the four input channels on the front panel:

Scale

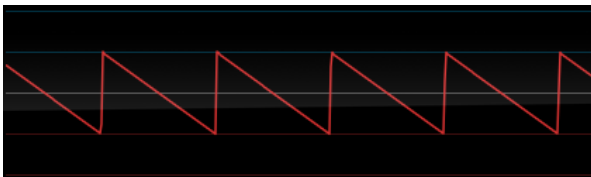The Scale knob can scale the amplitude of the incoming signal from -100% up to 100%:

100%   The original signal is unchanged
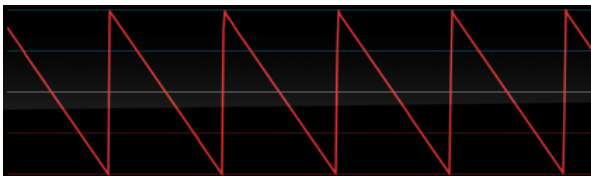

50%   The amplitude of the signal is reduced to half

0%   The amplitude of the signal is 0

-50%   The amplitude of the signal is reduced by half, and the signal's phase has been inverted

-100%   The original signal's phase has been inverted

Offset

The Offset fader adds and subtracts values from the original signal, effectively shifting the curve up and down in the oscilloscope view. The range of the Offset fader is +/- 1.0 V.
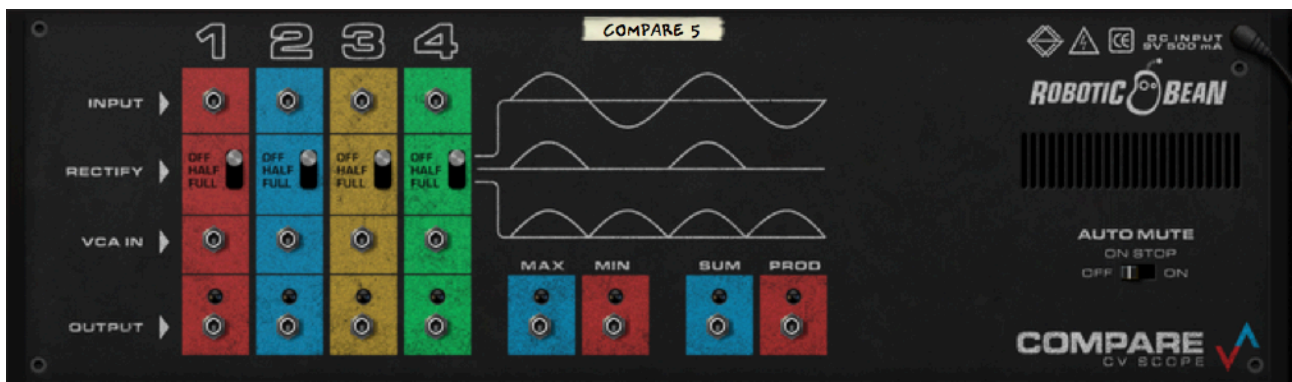

In the above image, our original sine curve has been scaled down by 50% and offset by + 0.5 V.

Mute

The Mute button will cause the corresponding CV output to go to 0 V, and the signal will be removed from the display as well as from the Min/Max and Sum/Product calculations. You could say that it's the equivalent of pulling the cable from the CV input.

THE REAR PANEL

INPUTS

There are four CV inputs, one for each of the four channels of Compare. Unconnected inputs will not be shown in the display, and will not affect any of the combined outputs.

RECTIFY

Each channel can be individually rectified. Half-rectifying a signal means that the negative part is truncated to 0. Fully rectifying a signal means mirroring the negative part in the positive domain.
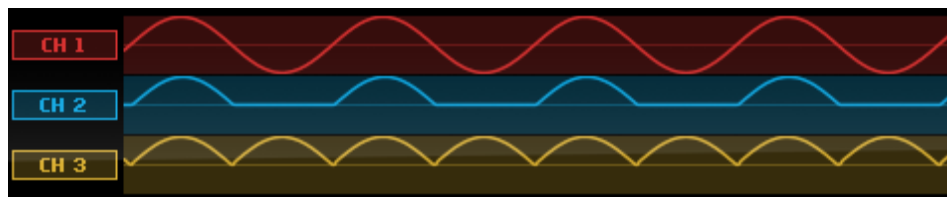
Channel 1 is a sine wave, Channel 2 is half rectified, and Channel 3 is full rectified.

Rectifying a signal can be useful for displaying and treating signals that should always be positive, for example envelopes.

VCA INPUTS

Here you can connect a CV signal to control the level for each channel. This VCA (Voltage Controlled Amplifier) is separate from the Scale knob.

0 or negative voltages on the VCA input will close the VCA, resulting in a completely "flat signal" on the channel output. 1V sets the VCA to Unity Gain, which means that the signal is unaltered. If you send signals greater than 1V, the signal will be boosted.

In the below image, channel 2 is connected to the VCA input of channel 1 to apply an envelope to the signal.
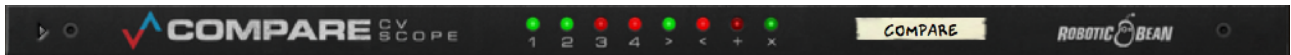
OUTPUTS

There are two types of CV outputs on Compare: The individual channel outputs, and the combined outputs.

- The individual channel outputs reflect their corresponding inputs, but with Scale, Offset, Mute, Rectification and VCA applied to them.

- The combined outputs (Max, Min, Sum and Product) reflect the values of the corresponding curves in the display.

All of the outputs can of course be used at the same time.

Each output has a signal activity LED, that lights up red for negative signals, green for positive signals. The corresponding LEDs can also be seen on the folded front panel of Compare.

AUTO MUTE ON STOP

This switch determines how Compare will behave when Reason's main transport is stopped. When set to On, all channels will output 0 whenever Reason's main transport is stopped. This is in case you want to prevent free running LFOs from being active while the song is stopped, for example.

AUTOMATION

Scale, Offset and Mute for each channel can be automated. You can create an automation lane for a control by Alt/Option-clicking on it. You can also right-click on Compare and choose "Create Track for Compare".

For more information about Reason's automation system, please refer to Reason's Operation Manual.