# CV Express

## Overview

The CV Express module is a dual input module functioning primarily as an expression pedal interface for modular synthesizers which produces a variety of outputs for use in controlling other modules.

It offers three Control Voltage outputs. One that produces a rising voltage as you move the expression pedal heal to toe, one that produces a falling voltage for the same action and one that can be a scaled version of either. Offset controls on all three channels allow the outputs to range between -5v to +5v and 0v to +10v.

The inclusion of a comparator producing gate and trigger signals enables the module to be used to generate timing events for use by other modules in your system.

The additional CV input allows another signal to be mixed with the signal from the pedal, with the two offsetting each other. Alternatively just the CV input can be used and the module can be used as a CV processor or gate and trigger extractor.

When using both inputs at the same time the voltage range produced by the expression pedal is halved to ensure the output stays within a usable range of +/-5v to 0-10v.

This module will only work with expression pedals with a TRS connection where the tip is producing the variable output and the sleeve is connected to ground.

### Variable Output Level

This scales the Rising or Falling signal before it reaches the Variable Output Offset control.

### Variable Output Offset

Sweeps the output between -5v to +5v and 0v to +10v.

### Variable Output Slope

The switch selects between rising and falling modes.

### Variable Output

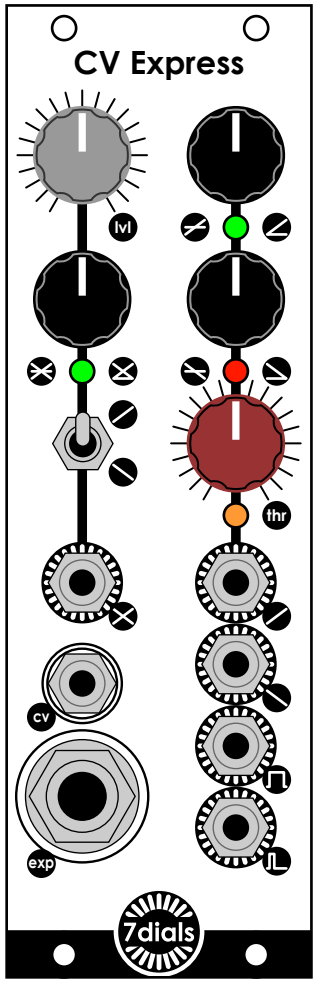
CV Output for the Variable section of the module.

### CV Input

Input for CV signal from modular.
**Please Note** - plugging a CV signal in to be mixed with the Expression Pedal Input automatically halves the range of the Expression Pedal. This is deliberate to keep the output levels within a usable range.

### Expression Pedal Input

Plug your expression pedal in here.
The tip carries the signal, the ring carries about 9 volts and the sleeve is connected to 0 volts.
Connecting anything other than an Expression pedal is done so at the user's risk and we take no liability for any damage caused.




### Rising Output Offset

Sweeps the output between approximately -5v to +5v and 0v to +10v.

### Falling Output Offset

Sweeps the output between approximately +5v to -5v and +10v to 0v.

### Comparator Threshold

When the Expression Pedal or CV input exceeds the threshold set by this control the circuit produces a Gate and Gate On Trigger.
If the module is used with just an Expression Pedal the control has no effect below about 11 o'clock. This is because the control goes into negative voltage ranges to accommodate bipolar CV inputs. Likewise when just using a CV input the control has no effect past about 4 o'clock.

### Rising Output

CV Output for the Rising section of the module.

### Falling Output

CV Output for the Falling section of the module.

### Gate Output

Gate output when the comparator threshold is passed.

### Trigger Output

Gate On Trigger pulse produces when the Gate output goes high.

## Calibration

Calibration of the module is simple and requires only a multimeter and a small flat blade screwdriver. Multimeter probes ending in a crocodile clip would be advantageous as they will free up your hands.

To start with plug your expression pedal into the module. The pedal forms part of the circuit so needs to be attached. Different pedals have different values of resistance and this enables you to calibrate the module to your pedal.

The two calibration points on the board are positioned on the back of the 1/4inch jack.

Attach the black pr to 0V and the red to +CP. Adjust the trimmer (R32) until your multimeter reads 9.1 volts. That should be it. Now have some fun!

Just because you've calibrated the module doesn't mean you can't use other pedals. Pedals with different resistive values will only change the range of module slightly.