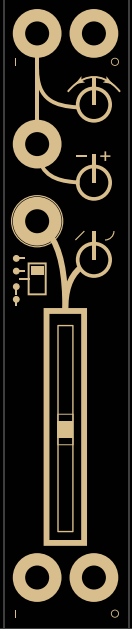
INSTRUō | SPECIALIST SYNTHESIZERS



vincâ

Dual VCA

User Manual

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Description

We've all heard the phrase, "You can never have enough VCAs."
We know it and we totally get it.
With the Instruō **v^{in}câ**, this truly is the case.

v^{in}câ is a two channel voltage controlled amplifier with both parallel and series routing capabilities. Each VCA has a different architecture allowing them to offer unique functionality that both contrasts and compliments one another.

The top VCA has Input Bias and Input Attenuverter controls over its four-quadrant multiplication capabilities.

The bottom VCA has an amplitude control that also acts as a CV attenuator when control voltage is applied. The bottom VCA includes a Shape control that morphs between linear and exponential response curves.

Each channel can be used independently (in parallel) or can be cascaded (in series), by flipping the Mode Switch.

Chain one **v^{in}câ** to another (and another, and another!) to add mixing and routing schemes dispersed throughout your entire system.

Features

- Two channel VCA with separate functionality per channel
- Input bias and attenuverter
- Linear and exponential response curves
- Parallel and series configuration
- Infinitely chainable to additional **v^{in}câ** modules

Installation

1. Confirm that the Eurorack synthesizer system is powered off.
2. Locate 4 HP of space in your Eurorack synthesizer case.
3. Connect the 10 pin side of the IDC power cable to the 2x5 pin header on the back of the module, confirming that the red stripe on the power cable is connected to -12V.
4. Connect the 16 pin side of the IDC power cable to the 2x8 pin header on your Eurorack power supply, confirming that the red stripe on the power cable is connected to -12V.
5. Mount the Instruō **v^{in}câ** in your Eurorack synthesizer case.
6. Power your Eurorack synthesizer system on.

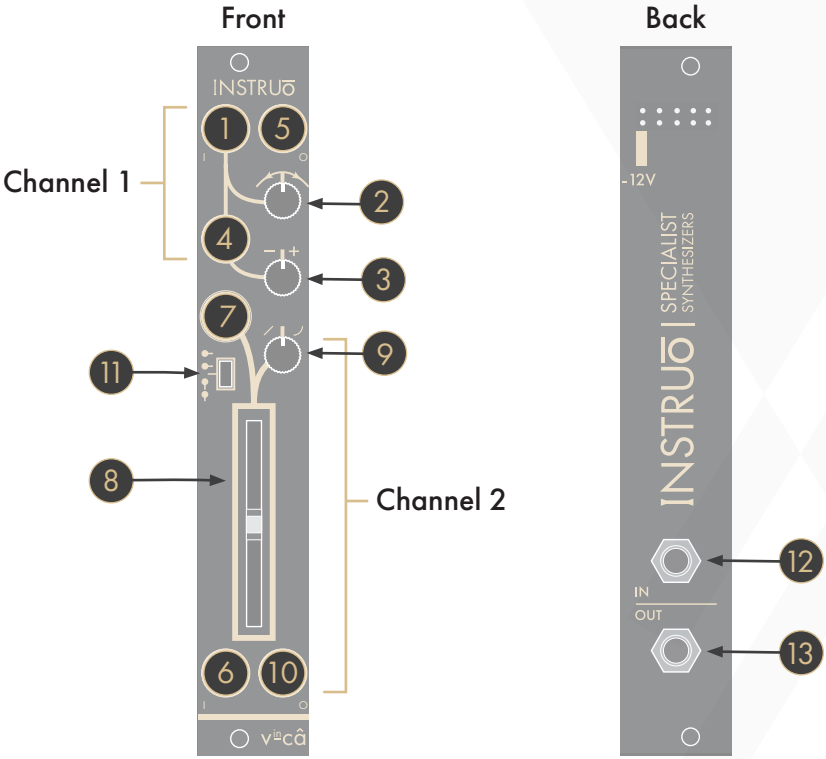
Note:

This module has reverse polarity protection.
Inverted installation of the power cable will not damage the module.

Specifications

- Width: 4HP
- Depth: 35mm
- +12V: 30mA
- -12V: 25mA

v^{in}câ | ˈvɪŋkə | noun (horticulture) genus of small flowering plants commonly known as the periwinkle



Key

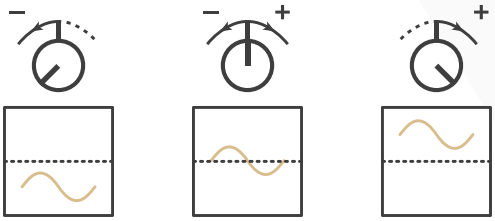
1. Input 1A
2. Input Bias
3. Input Attenuverter
4. Input 1B
5. Output 1
6. Input 2
7. CV Input
8. Amplitude/CV Attenuverter
9. Shape
10. Output 2
11. Mode Switch
12. Input Back Jack
13. Output Back Jack

Channel One

Input 1a: DC coupled input for channel 1.

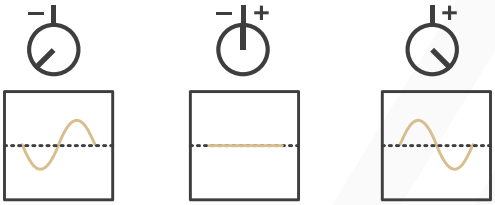
- This input will accept both audio and control voltage signals.
- Channel 1 functions as a four quadrant multiplier. Signals at **Input 1a** will multiply with signals at **Input 1b**.

Input Bias: The **Input Bias** will offset signals present at **Input 1a.**



- Turning the knob anticlockwise will sum a negative DC offset with the signal present at **Input 1a.**
- Turning the knob clockwise will sum a positive DC offset with the signal present at **Input 1a.**

Input Attenuverter: The **Input Attenuverter** scales and inverts the signal present at **Input 1a.**



- If there is no control voltage patched at **Input 1b**, it receives a normalled +5V reference signal. The scaled and/or inverted signal from **Input 1a** sums with the **Bias** and multiplies with this unity gain reference signal.

- Setting the knob to the center position will attenuate the signal at **Input 1a.**
- Turning the knob anticlockwise will scale the inversion of the signal at **Input 1a.**
- Turning the knob clockwise will scale, but not invert, the signal at **Input 1a.**

Input 1b: DC coupled input for channel 1.

- This input will accept both audio and control voltage signals.
- Channel 1 functions as a four quadrant multiplier. Signals at **Input 1a** will multiply with signals at **Input 1b**.

Output 1: Channel 1 output.

- This output is normalled to the module's series/parallel routing.
- When patched, the output signal will not proceed farther within the internal routing.

Channel Two

Input 2: DC coupled input for channel 2.

- This input will accept both audio and CV signals.

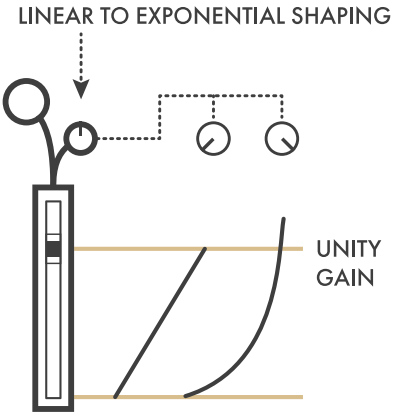
CV Input: DC coupled control voltage input for channel 2.

- This input will accept both audio and control voltage signals.
- Incoming signals are half wave rectified at the **CV Input.** Any negative portions of external signals will be cropped to 0V.

Amplitude/CV Attenuator: The **Amplitude/CV Attenuator** is a dual-purpose fader for Channel 2.

- The fader controls the amplitude of the signal present at **Input 2**. When no control voltage signal is connected, the **CV Input** receives a normalled +5V reference voltage.
- Unity gain is set when the fader is set to approximately two thirds of its maximum range. Any fader position above that will add gain to the signal.
- When control voltage is applied, the fader becomes an attenuator for the signal present at the **CV Input** of channel 2.
- Unity gain of the incoming control voltage signal is set when the fader is at approximately two thirds of its maximum range.

Shape: This control sets the response curve of channel 2.



Turning the knob anticlockwise will set the response curve to linear.

Turnining the knob clockwise will set the response curve towards exponential.

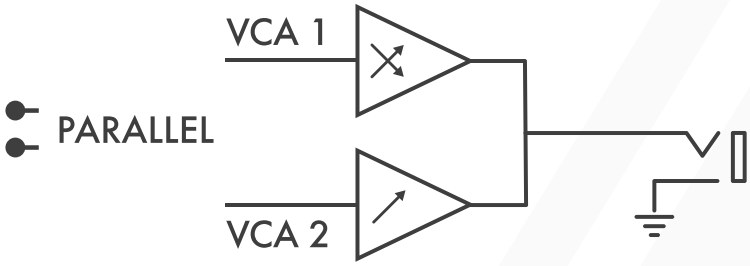
Turning the knob towards exponential will increase the available gain range beyond the fader's unity gain position.

Output 2: Channel 2 output.

Mode Switch: The **Mode Switch** designates the internal routing of the normalisation from the **Output** of Channel 1.



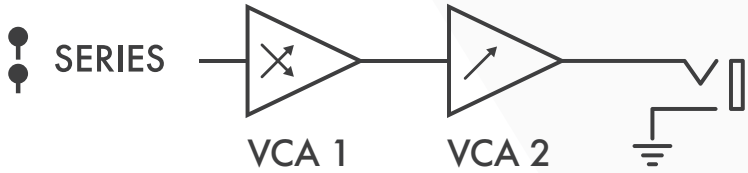
If the switch is set to the top position, the internal routing is set to **Parallel**. Both channels can sum at the **Output** of Channel 2.



Channel 1 will only sum at the **Output** of Channel 2 if the **Output** of Channel 1 is unused and unpatched.

If the **Output** of Channel 1 is used, the summing normal will be broken and both channels will function completely independent.

If the switch is set to the bottom position, the internal routing is set to **Series**, where the output of Channel 1 will cascade and normal to the input of Channel 2.

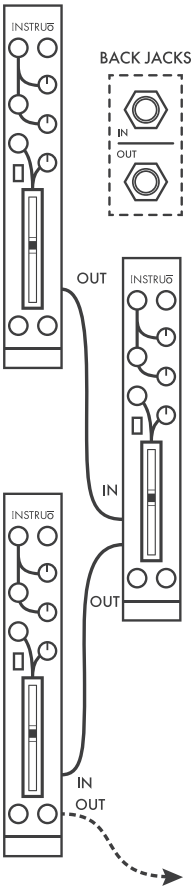


- Channel 1 will only cascade to Channel 2 if the **Output** of Channel 1 and the **Input** of Channel 2 are unused and unpatched.
- This configuration allows for scaling, inverting and biasing of a signal through Channel 1 with master amplitude control via Channel 2.
- This unity gain position remains constant regardless of the **Shape** response curve position.

Linking v[in]câs

Multiple **v[in]câs** can be linked together via **Back Jacks** on the back side of the module.

1. Determine primary and secondary VCA's
2. Patch the **Output Back Jack** of the primary VCA to the **Input Back Jack** of the secondary VCA using the supplied right angled patch cable.
3. Continue this for as many **v[in]câs** as you wish to link.
4. When in this configuration, all features will function normally, but with increased mixing capabilities.



When multiple **v[in]câs** are linked, the last **v[in]câ** in the chain can produce a mix of all the signals produced at all modules' Channel 2 **Outputs.**

Patching from a Channel 2 **Output** will break the normalisation to the **Back Jack** routing. If this occurs before the last **v[in]câ** in the chain, the chain will be broken.

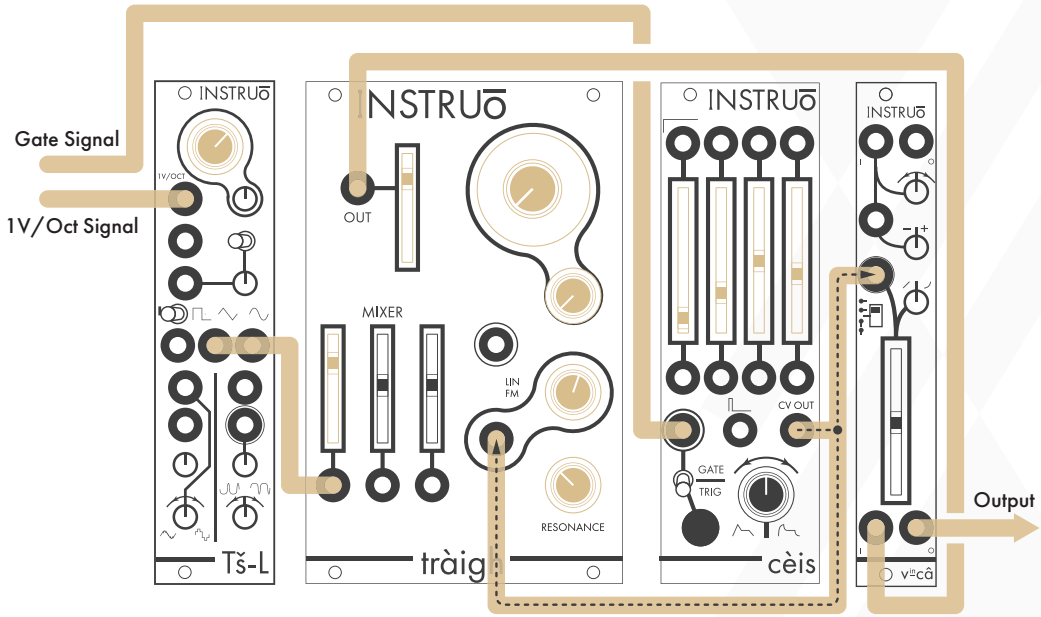
This allows for groupings of **v[in]câs** within a large chain to be isolated.

The cascading summed signals won't proceed farther down the **v[in]câ** chain.

Patch Examples

East Coast Synth Voice:

Summary: The sequencer or keyboard sends voltages to oscillator while simultaneously triggering the envelope generator. The CV output of the envelope generator opens the filter and **v^{in}câ**, allowing the oscillator's signal to pass through. More traditional East Coast patches would incorporate separate envelope generators for the filter and **v^{in}câ**.



Audio Path:

- Connect the desired waveform of an oscillator to the audio input of a filter.
- Connect the audio output of the filter to **Input 2** of **v^{in}câ**.
- Monitor **Output 2** of **v^{in}câ**.
- Set the fundamental frequency of the oscillator to a desired position.
- Set the cutoff frequency of the filter to a desired position.

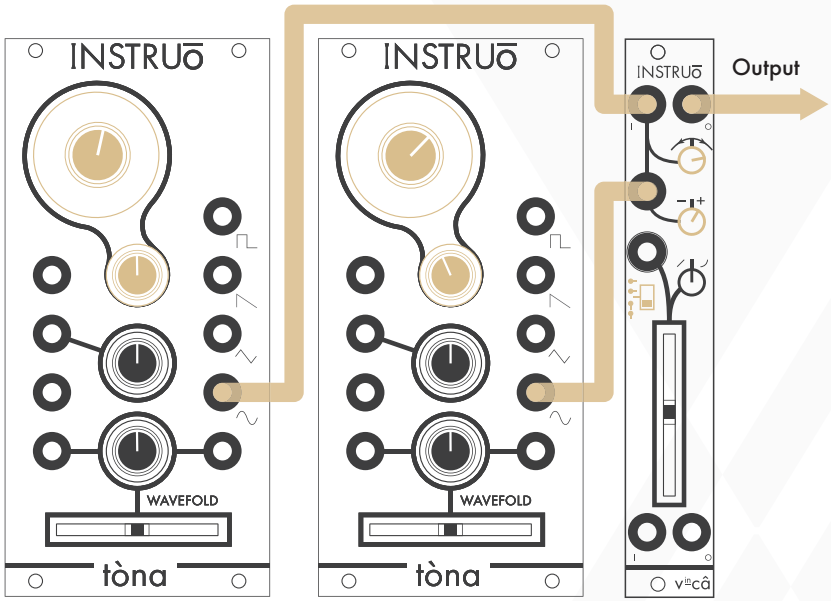
- Set the resonance of the filter to a desired position.
- Set the **Shape** knob to linear.
- Monitor the output of the VCA.

Control Path:

- Connect the 1V/Oct output of a sequencer or keyboard to the 1V/Oct input of the oscillator.
- Connect the gate output of the sequencer or keyboard to the trigger input of an envelope.
- Connect the CV output of the envelope to a multiple.
- Connect one copy of the envelope CV signal to the cutoff frequency CV input of the filter and set the corresponding CV attenuator to a desired position.
- Connect a second copy of the envelope CV signal to the **CV Input** of **vᶦⁿcâ** and set the **Amplitude/CV Attenuator** of **vᶦⁿcâ** to a desired position.
- Set the envelope stages to a desired position.

Ring Modulation:

Summary: Both sine waveforms multiply at Channel 1 of **v^{in}câ**.

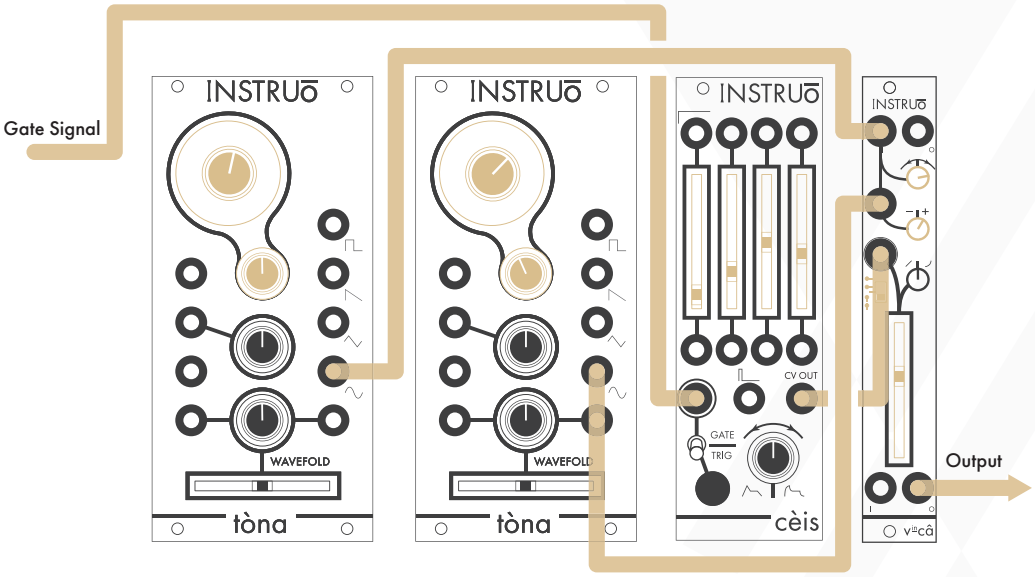


Audio Path:

- Connect the sine waveform of an oscillator to **Input 1A** of **v^{in}câ** .
- Connect the sine waveform of a secondary oscillator to **Input 1B** of **v^{in}câ**.
- Set the **Mode Switch** to **Series**.
- Monitor **Output 1** of **v^{in}câ**.
- Set the fundamental frequency of the primary oscillator to a desired position.
- Set the fundamental frequency of the secondary oscillator to a desired position.
- Set the **Input Attenuator** to a desired position.
- Set the **Input Bias** knob to a desired position.

Gated Ring Modulation:

Summary: Both sine waveforms multiply at Channel 1 of **v^{in}câ**. The trigger, gate, or clock signal triggers the envelope generator. The CV output of the envelope generator opens **v^{in}câ**, allowing the multiplied signal to pass through.



Audio Path:

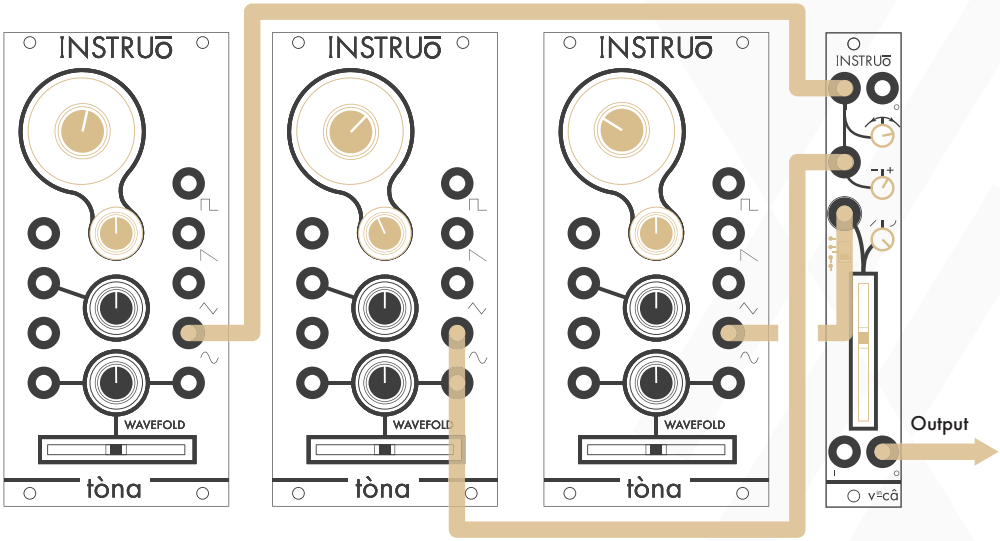
- Connect the sine waveform of an oscillator to **Input 1A** of **v^{in}câ**.
- Connect the sine waveform of a secondary oscillator to **Input 1B** of **v^{in}câ**.
- Set the **Mode Switch** to **Series**.
- Monitor **Output 2** of **v^{in}câ**.
- Set the fundamental frequency of the primary oscillator to a desired position.
- Set the fundamental frequency of the secondary oscillator to a desired position.
- Set the **Input Attenuator** to a desired position.
- Set the **Shape** knob to a desired position.

Control Path:

- Connect a trigger, gate, or clock signal to the trigger input of an envelope.
- Connect the CV output of the envelope to the **CV Input** of **vᵢₙcâ** and set the **Amplitude/CV Attenuator** of the **vᵢₙcâ** to a desired position.
- Set the envelope stages to a desired position.

Multiplication Modulation:

Summary: The sine waveforms of the first and second oscillator are multiplied at Channel 1 of **v^{in}câ**. The multiplied signal then gets multiplied with the sine waveform of the third oscillator at Channel 2. The product of the multiplied signals is then output by Channel 2 and can then be routed to other **v^{in}câ** modules via **Back Jacks** for further multiplication, or used as a final VCA.



Audio Path:

- Connect the sine waveform of an oscillator to **Input 1A** of **v^{in}câ**.
- Connect the sine waveform of a secondary oscillator to **Input 1B** of **v^{in}câ**.
- Connect the sine waveform of a third oscillator to the **CV Input**.
- Set the **Mode Switch** to **Series**.
- Monitor **Output 2** of **v^{in}câ**.
- Set the fundamental frequency of the primary oscillator to a desired position.

- Set the fundamental frequency of the secondary oscillator to a desired position.
- Set the fundamental frequency of the third oscillator to a desired position.
- Set the **Input Attenuator** to a desired position.
- Sed the **Input Bias** knob to a desired position.
- Set the **Shape** knob to a desired position.
- Set the **Amplitude/CV Attenuator** to a desired position.

Manual Author: Collin Russell
Manual Design: Dominic D'Sylva

CE This device meets the requirements of the following standards: EN55032, EN55103-2, EN61000-3-2, EN61000-3-3, EN62311.