



**ALT**

Quick guide

# Thank you for choosing ALT Quad VCA for your Eurorack System.

## Powering up

1. Turn off the power of your modular synthesizer.
2. Double check the power cord polarity. If you plug the module backwards you might damage its electronic circuits.



*If you flip over your ALT Quad VCA, you will find the "RED" mark at the PCB power connector, which must match the colored line on the ribbon cable.*

3. Once you have checked all the connections, you can turn on your modular system.
4. If you notice any anomalies, turn your system off right away and check again your connections.

## Description

ALT is a **Quadruple Voltage-Controlled Amplifier**, which is an electronic device that uses electric power to vary the amplitude of a signal applied to its input terminals, producing a signal proportional to the control voltage at its output.

The amount of amplification provided by an amplifier is measured by its **gain**, which is the ratio of output voltage, current, or power to input. There is no signal processing in a VCA, just overall volume control.

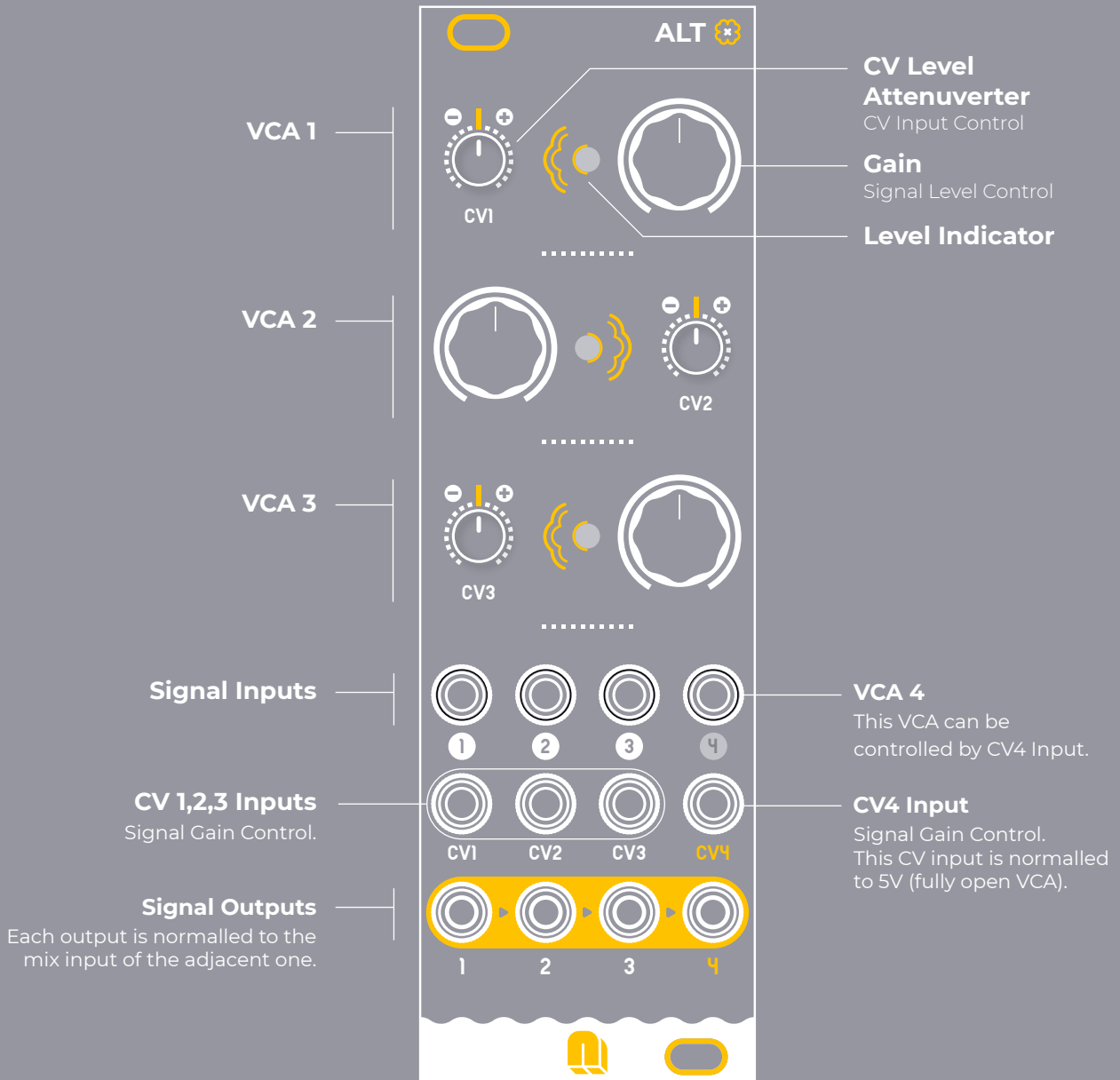
ALT has 4 channels of voltage controlled amplifiers:

- **VCAs 1, 2, 3.** Each one is equipped with a GAIN control, and a CV IN Attenuverter.
- **VCA 4.** GAIN CV IN and the signal normalised to +5V (fully open VCA).

Additionally, the outputs of these channels are cascaded from left to right, allowing ALT to behave as a **four-channel mixer**.

# Layout

This image will clarify the function of each of the elements of the module.



## Controls

ALT has a **linear response**: the amplification is in direct linear proportion to the control voltage input (see Fig. 1).

### • GAIN

This control sets the initial level of amplification. This value is summed to the CV applied at the CV input. The **maximum bias** is 5V which provides a gain of 1. (see Fig. 1)

At **minimum level** with no CV present, there is no signal at the VCA's output. Once the gain control is turned up, amplification occurs (see Fig. 2), even if there is no CV input present.

The gain control shifts the whole VCA response upwards.

### • CV

Amplitude attenuverter. Adjusts the amount and polarity of amplitude modulation from the CV input.

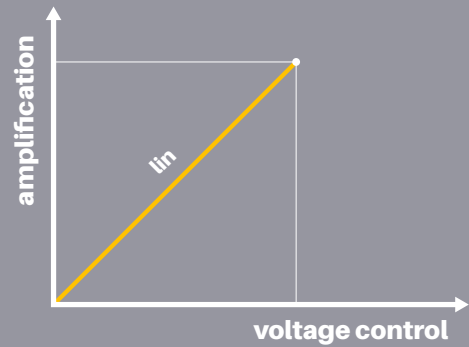


Fig.1 Response curve for ALT

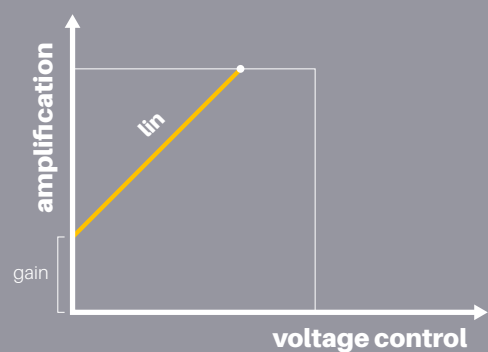


Fig. 2 Effect of GAIN control on VCA response

## Inputs & Outputs

### • Inputs

#### /1 - 4

These are the 4 signal inputs of the amplifiers, which are DC coupled. This means that audio, CV and trigger signals can be fed here.

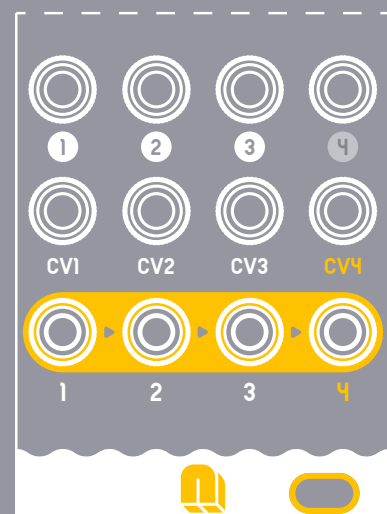
#### /CV 1,2,3

CV inputs for the GAIN of the amplifiers, which can be controlled with its CV attenuverters.

The voltage is summed with the bias control. The VCA is fully open with 5V CV, and clips voltages above this level.

#### /CV 4

This CV input is normalled to internal 5V (fully open VCA) and can be controlled with any external voltage.



## • Outputs

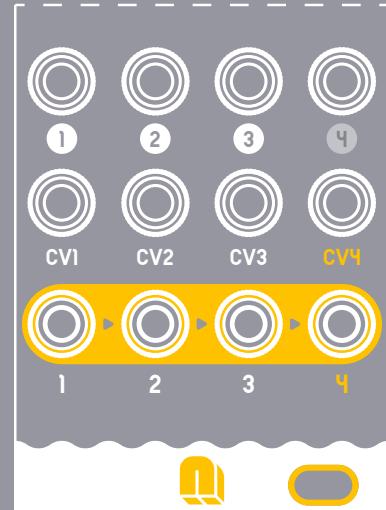
### /1 - 4

These are the 4 signal outputs of each amplifier, which are cascaded from left to right, allowing ALT to behave as a **four-channel mixer** with the ability to extract any channel from the mix.

### ALT as a mixer

When no patch cable is plugged into an output, the signal from this channel is cascaded to the next channel. For example, when no patch cable is patched into output 1, output 2 will contain the sum of channel 2 and channel 1. If nothing is patched into outputs 1, 2 and 3, output 4 will contain the sum of all four channels.

To extract a signal from the mix, plug a patch cable in the output of the desired channel.



## Compliance

This device complies to the **EU guidelines** and is manufactured **RoHS** conforming without use of lead, mercury, cadmium and chrome. Nevertheless, this device is special waste and disposal in household waste is not recommended.

This device meets the requirements of the following standards and directives:

- **EMC: 2014/30/EU**
- **EN 55032.** Electromagnetic compatibility of multimedia equipment.
- **EN 55103-2.** Electromagnetic compatibility - Product family standard for audio, video, audio-visual and entertainment lighting control apparatus for professional use.
- **EN 61000-3-2.** Limits for harmonic current emissions.
- **EN 61000-3-3.** Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems.
- **EN 62311.** Assessment of electronic and electrical equipment related to human exposure restrictions for electromagnetic fields.
- **RoHS2: 2011/65/EU**
- **WEEE: 2012/19/EU**



## Guarantee

This product is covered by **2 years of guarantee** on purchased goods, which begins when you receive your package.

- **This guarantee covers**

Any defect in the manufacturing of this product.  
Replacement or repair, as decided by NANO Modules.

- **This guarantee does not cover**

Any damage or malfunction caused by incorrect use , such as, but not limited to:

- Power cables connected backwards.
- Excessive voltage levels.
- Unauthorized mods.
- Exposure to extreme temperature or moisture levels.

Please contact our customer service - [jorge@nanomodul.es](mailto:jorge@nanomodul.es) - for a return authorization before sending the module. The cost of sending a module back for servicing is paid for by the customer.

## Technical Specifications

**Dimensions** 8HP 40x128,5mm

**Current** 58 mA +12V / 31 mA -12V / 0 mA +5V

**Input & Output** Signals between  $\pm 10V$

**Impedance** Input 47k - Output 1k

**Materials** PCB and Panel - FR4 1,6mm

**Depth** 20mm - Skiff friendly

Modules are designed and assembled in València.

## Contact

### Bravo!

You have learned the basic fundamentals of your ALT Module.

If you have any doubts, please feel free to contact us.

[nanomodul.es/contact](https://nanomodul.es/contact)