ARC

Quick guide

Thank you for choosing ARC
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 ARC, 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

ARC is an analog **Dual Function Generator** which features two independent channels and a versatile common section, equipped with advanced functionalities.
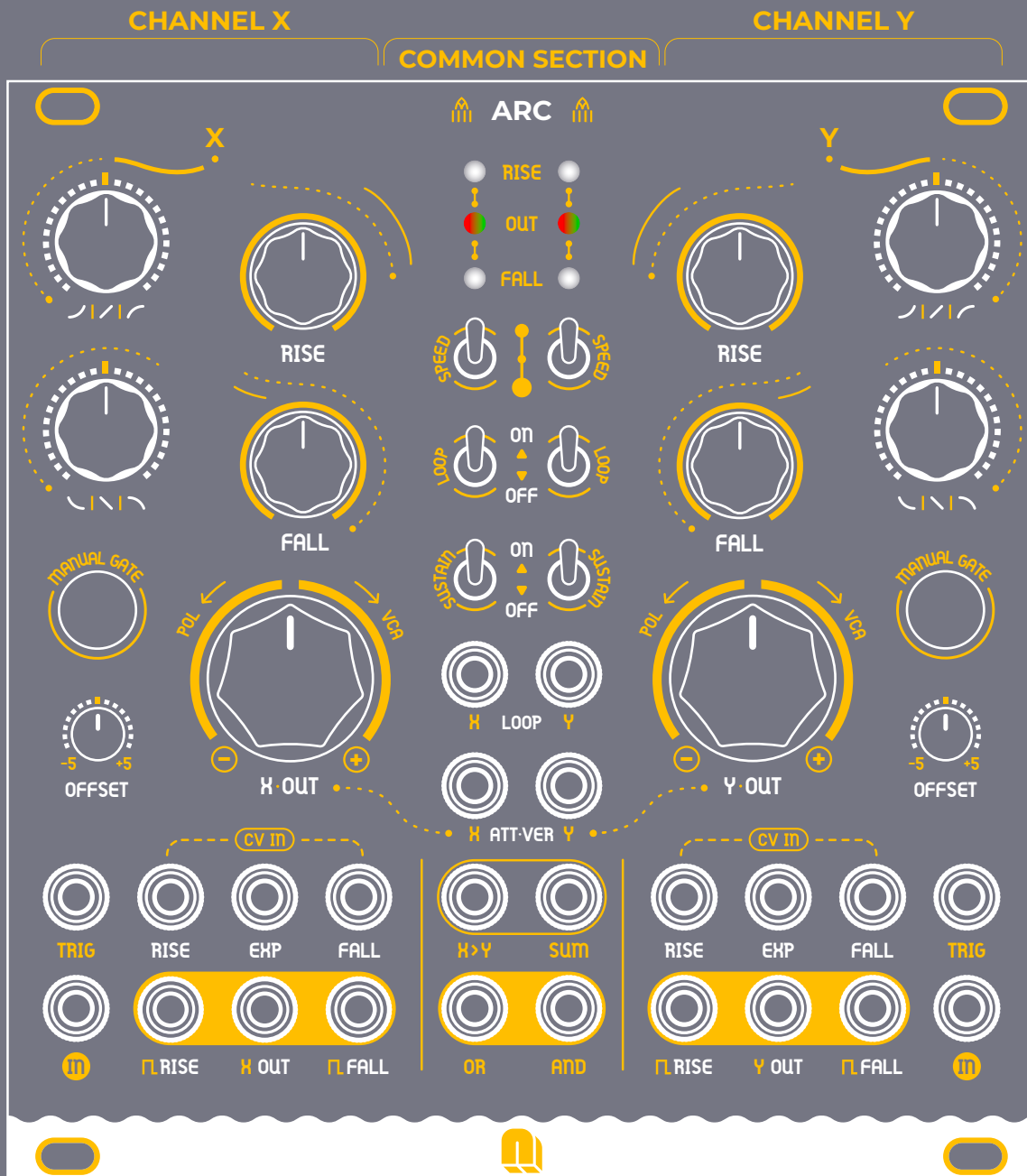
Each channel can be used as:

- **Envelope generator** (AD/ASR)
- **Audio & Low-frequency oscillator** (VCO/LFO)
- **Slew limiter**
- **Waveform Modulator** (VCA/Polarizer)

With dedicated trigger and signal inputs, ARC allows for fine-tuned control over **RISE and FALL** times, adjustable **SHAPES** (linear, logarithmic, or exponential), and a range of additional features including **SUSTAIN** mode, **OFFSET** adjustment, and a built-in **Logic Section**.

Designed to be the heart of your modular setup, ARC allows you to shape and modulate both audio and control signals, offering everything from **smooth transitions** and **complex envelopes** to **precise modulation**, making it the go-to module for those who demand more from their modulation sources.
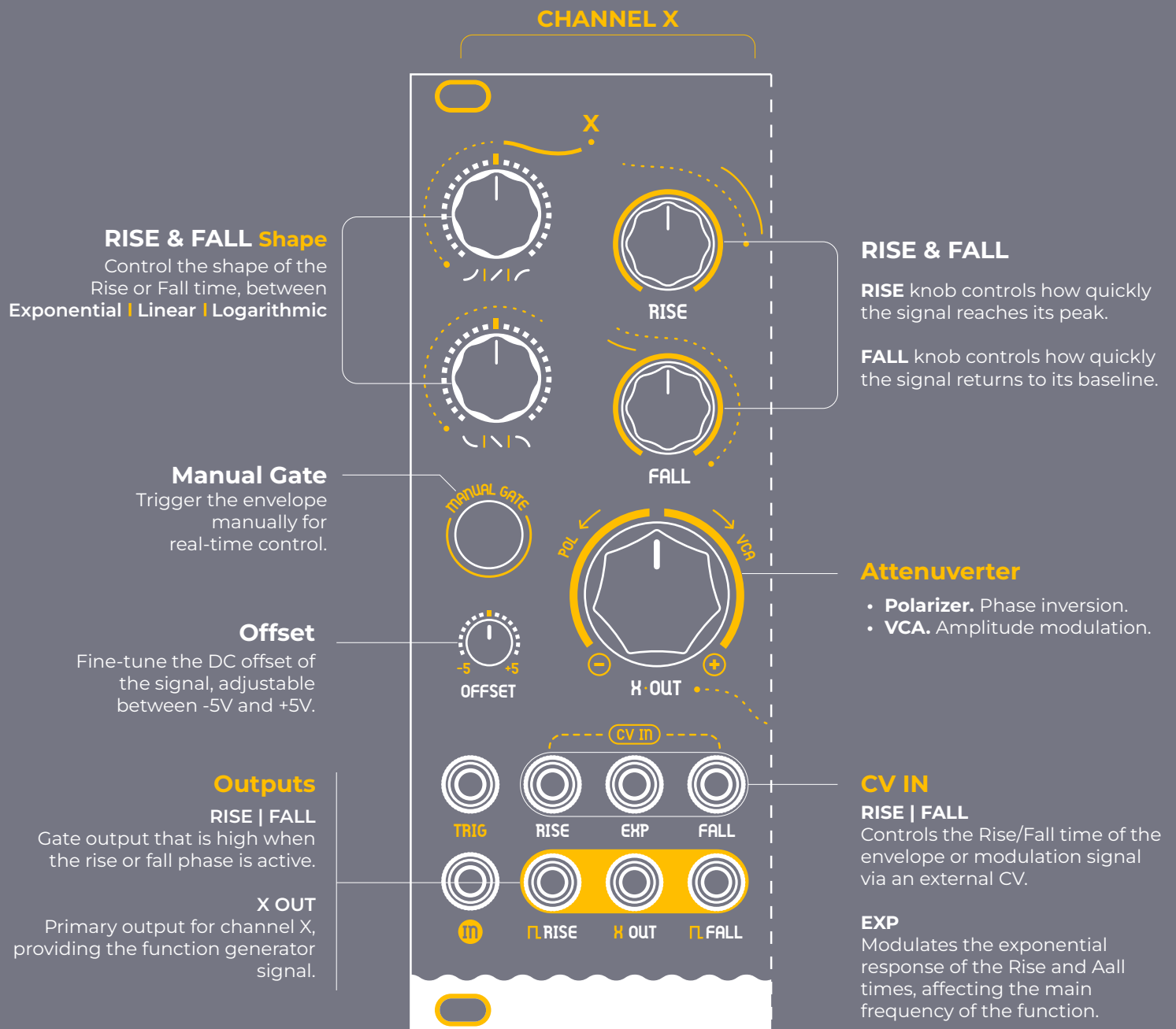
Layout · General view

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

CHANNEL X
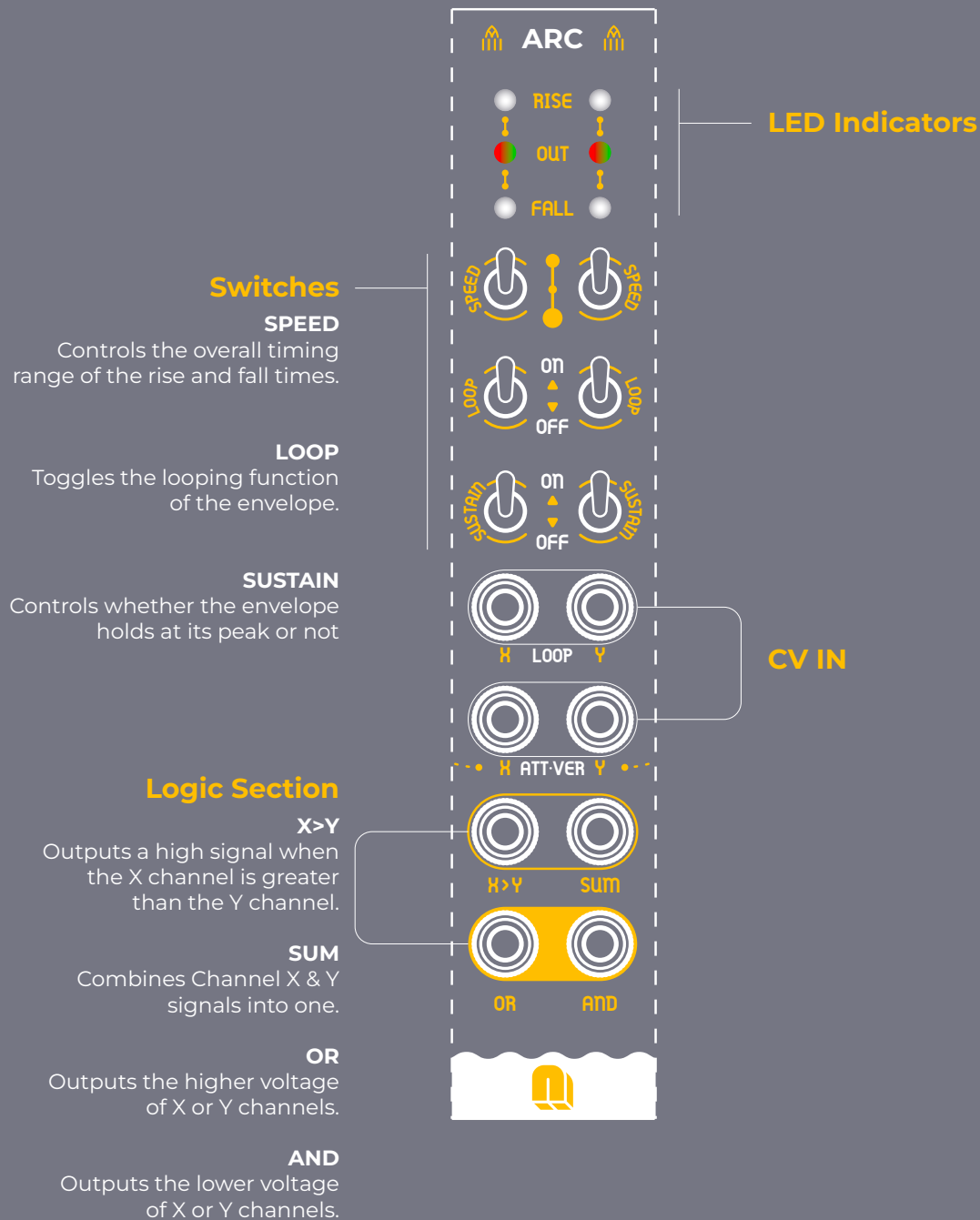
COMMON SECTION

CHANNEL Y

ARC

X

Y

RISE

OUT

FALL

RISE

FALL

SPEED

SPEED

LOOP

LOOP

ON

OFF

SUSTAIN

SUSTAIN

ON

OFF

RISE

FALL

MANUAL GATE

POL

VCA

X

LOOP

Y

MANUAL GATE

POL

VCA

OFFSET

−5   +5

X · OUT

−

+

X   ATT·VER   Y

Y · OUT

−

+

OFFSET

−5   +5

CV IN

TRIG   RISE   EXP   FALL

X>Y   SUM

CV IN

RISE   EXP   FALL   TRIG

IN   ⊓RISE   X OUT   ⊓FALL

OR   AND

⊓RISE   Y OUT   ⊓FALL   IN

ARC

Layout

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

CHANNEL X

RISE & FALL Shape
Control the shape of the
Rise or Fall time, between
Exponential | Linear | Logarithmic

RISE & FALL

RISE knob controls how quickly
the signal reaches its peak.

FALL knob controls how quickly
the signal returns to its baseline.

RISE

FALL

Manual Gate
Trigger the envelope
manually for
real-time control.

MANUAL GATE

Offset
Fine-tune the DC offset of
the signal, adjustable
between -5V and +5V.

-5   +5

OFFSET

POL   VCA

X·OUT

Attenuverter

- **Polarizer.** Phase inversion.
- **VCA.** Amplitude modulation.

CV IN

Outputs

RISE | FALL
Gate output that is high when
the rise or fall phase is active.

X OUT
Primary output for channel X,
providing the function generator
signal.

TRIG   RISE   EXP   FALL

⊓RISE   X OUT   ⊓FALL

CV IN

RISE | FALL
Controls the Rise/Fall time of the
envelope or modulation signal
via an external CV.

EXP
Modulates the exponential
response of the Rise and Aall
times, affecting the main
frequency of the function.

Layout

Common Section
This section includes shared controls from both channels seamlessly.

LED Indicators

ARC

RISE

OUT

FALL

Switches

SPEED
Controls the overall timing range of the rise and fall times.

SPEED SPEED

LOOP
Toggles the looping function of the envelope.

LOOP ON OFF LOOP

SUSTAIN
Controls whether the envelope holds at its peak or not

SUSTAIN ON OFF SUSTAIN

X LOOP Y

CV IN

X ATT·VER Y

Logic Section

X>Y
Outputs a high signal when the X channel is greater than the Y channel.

X>Y SUM

SUM
Combines Channel X & Y signals into one.

OR AND

OR
Outputs the higher voltage of X or Y channels.

AND
Outputs the lower voltage of X or Y channels.

ARC

Layout

Channel Y
Same as Channel X .

CHANNEL Y

Y

RISE

FALL

POL

VCA

MANUAL GATE

Y·OUT

⊖ ⊕

OFFSET

−5 +5

CV IN

RISE   EXP   FALL   TRIG

⊓RISE   Y OUT   ⊓FALL   in

Trigger

Trigger input for the envelope.

Signal Input

Signal input that feeds into the slew limiter

Envelope Generator AR/ASR

Use the **RISE** & **FALL** controls to create simple **AD envelopes** for punchy and percussive sounds.

For **ASR envelopes**, turn on the Sustain switch! The envelope will rise to the peak and hold there while the Gate is active.
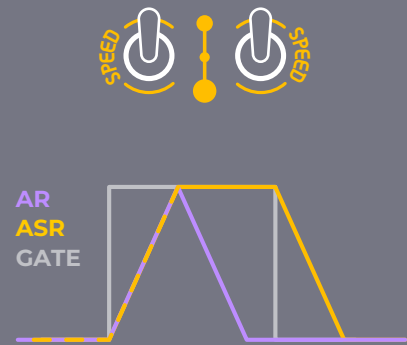
Fig.1 Speed Switch Configuration & Graph for AR/ASR Envelopes

Audio & Low Frequency Oscillator

ARC features **RISE** & **FALL** frequency adjusts and a **SPEED** switch with three positions (slow, mid, fast) to cover all possible needs.

Turn on the **LOOP** switch to convert the function generator into an oscillator. Use the previous controls to match the required frequency.

ARC can generate a huge range of frequencies for producing both **audio-rate** signals for pitched sounds and **ultra slow** waveforms for modulation purposes.
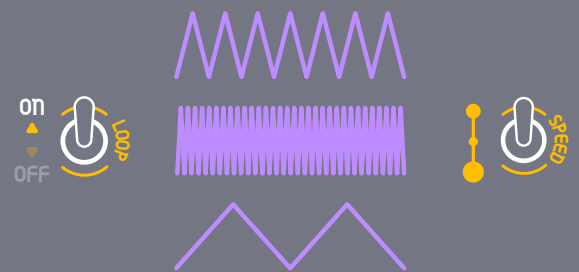
Fig.2 LOOP Switch ON & Graph for Speed Ranges

Slew Limiter & Waveform Modulation

• Slew limiter
Smooth out abrupt changes in CV & audio signals to create filtering and portamento effects .

• Waveform Modulation
Adjust Rise and Fall shapes to create logarithmic, linear, or exponential shapes over your input signal.
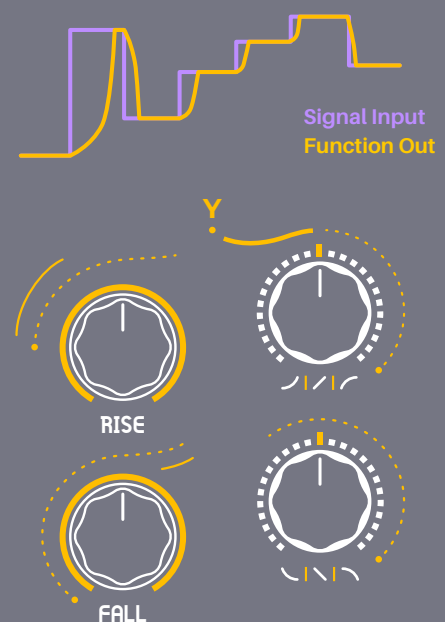
Fig.3 Waveform Modulation Knobs & Graphic representation example

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VCA & Signal Inversion (POL)

The **VCA/POL** adjusts the volume of the signal, acting as a traditional VCA for dynamic level control.

Additionally, the **POL** function modifies the polarity, enabling both positive and negative modulation for more complex sound shaping.

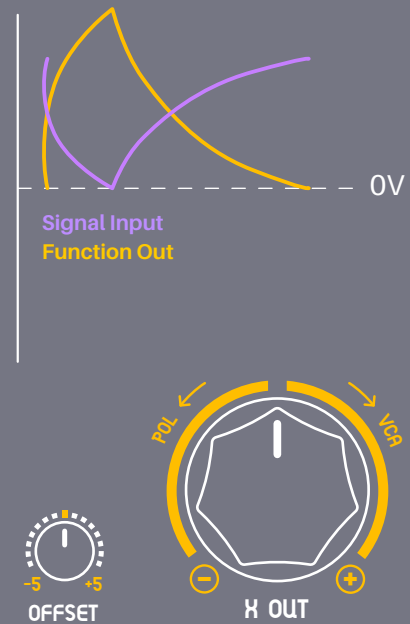The **OFFSET** function can add or subtract a voltage from -5V to 5V to match the required signal range.

Signal Input
Function Out

0V

POL   VCA

−5   +5

OFFSET   X OUT

Fig.4 Detail of X·OUT Attenuverter & Offset Knobs & Graphic Representation example

Logic Section

ARC includes a **X > Y** gate logic output, which compares the two function signals and **outputs a gate** when X is greater than Y.

Additionally, the module provides the **SUM of X and Y** functions, as well as **OR and AND** logic functions.

X>Y   SUM

OR   AND
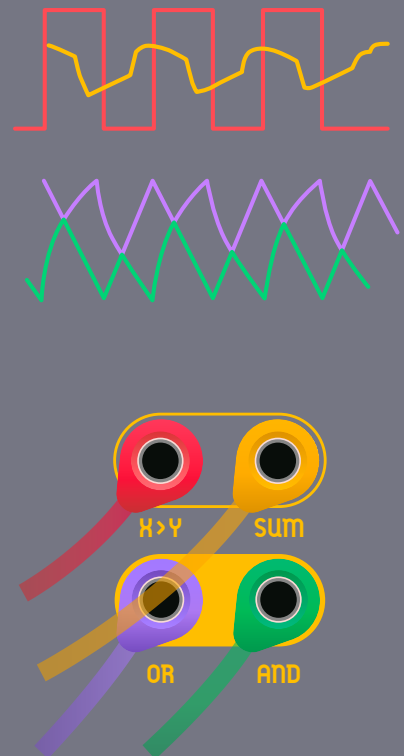
Fig.5 Detail of Logic Outputs and its graphic representaion

Controls / Channel X & Y

• RISE & FALL

RISE: Controls how quickly the signal reaches its peak. Turn clockwise for a slower, smoother rise; counterclockwise for a faster, sharper rise.

FALL: Controls how quickly the signal returns to baseline. Clockwise for a gradual fall; counterclockwise for a quicker drop.

Fig.6 Detail of RISE & FALL Knobs

• RISE & FALL Shape
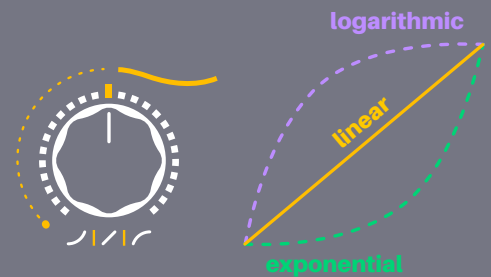Adjusts the curve of the rise and fall times between Exponential, Linear, and Logarithmic.

Fig.7 Detail of RISE Shape Knob &
its graphic representation
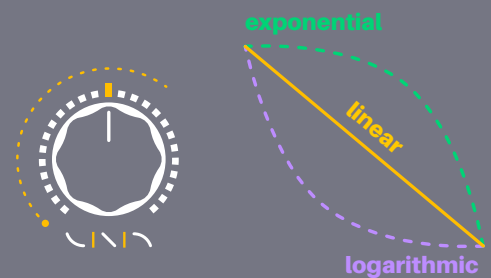
Fig.8 Detail of FALL Shape Knob &
its graphic representation

Controls / Channel X & Y

• Manual Gate

Manually trigger the envelope for real-time activation.

Fig.9 Detail of Manual Gate Button

• Offset

DC Offset Adjustment: Adjusts the signal's baseline voltage between -5V and +5V, aligning it with your needs or ensuring the correct modulation starting point.

Fig.10 Detail of Offset Attenuverter

• Attenuverter

Acts as a polarizer and amplitude controller. It allows you to control the amplitude and invert the phase of the signal.

Fig.11 Detail of POL/VCA Attenuverter

ARC

Controls / Channel X & Y

• Inputs

/IN
This is the signal input that feeds into the slew limiter. It smooths out and shapes incoming signals.

/TRIG
The trigger input for the envelope. When a trigger signal is received, it activates the envelope, initiating the rise and fall phases according to the set controls.

Fig.12 Detail of TRIG & IN Inputs

• CV Inputs

/RISE | FALL
Controls the Rise/Fall time of the envelope or modulation signal via an external CV.

/EXP
Modulates the exponential response of the Rise and Aall times, affecting the main frequency of the function.
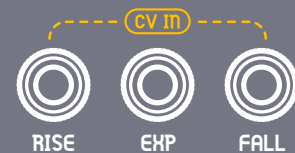
Fig.13 Detail of CV IN Inputs

• Outputs

RISE | FALL
Gate output that is high when the rise or fall phase is active.

X OUT
Primary output for channel X, providing the function generator signal.

Fig.14 Detail of Outputs

Contols / Common Section

• LED Indicators

RISE
This LED lights up during the rise phase of the envelope or function generator, indicating that the signal is increasing toward its peak.

OUT (Bicolor)
This bicolor LED shows the output status of the module.

It typically changes color based on the signal polarity or state, allowing you to quickly assess whether the output is positive, negative, or at zero.

FALL
This LED lights up during the fall phase, showing that the signal is returning to its baseline or completing its cycle.
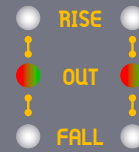
Fig.15 Detail of LED Indicators

• Switches

SPEED
This switch controls the overall timing range of the rise and fall times.

• **MID.** A balanced range for medium-speed transitions.
• **HIGH.** For fast, snappy envelopes, ideal for percussive sounds or quick modulation changes
• **LOW.** For very slow envelopes and modulations.

Fig.16 Detail of Speed Switch

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• Switches

LOOP
Toggles the looping function of the envelope.

• **ON.** The envelope will continuously loop, creating a repeating cycle without the need for external triggering.

• **OFF.** The envelope will function normally, only triggering once per trigger signal.

Fig.17 Detail of Loop Switch

Fig.18 Detail of Sustain Switch

SUSTAIN
Controls whether the envelope holds at its peak.

• **ON.** The envelope will sustain at the peak level as long as the gate or trigger signal is active, only proceeding to the fall phase once the gate is released.

• **OFF.** The envelope will immediately proceed to the fall phase after reaching the peak, without holding.

Contols / Common Section

• CV Inputs

LOOP
Applying a voltage of more than 2V to this input activates the loop mode, causing the function generator to **repeat its cycle continuously**, without needing manual activation or a gate signal.

Fig.19 Detail of Loop & Attenuverter CV Inputs

ATT.VER
This input acts as a CV control for the channel attenuverter, allowing you to dynamically **adjust the amplitude and polarity** of the signal.

0V results in no modulation, maintaining the current amplitude and polarity.
-5V inverts the signal with maximum amplitude.(POL)
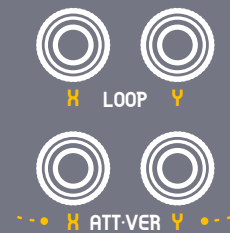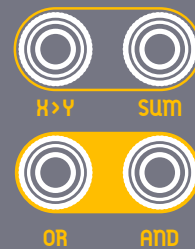**+5V maintains the signal's polarity** with maximum amplitude. (VCA)

Fig.20 Detail of Logic Outputs

• Logic Operations

/X>Y. Outputs a high signal when the X channel is greater than the Y channel, useful for creating complex modulation or conditional triggers.

/SUM. Outputs the sum of the X and Y channels, combining both signals into one.

/OR. Outputs the higher voltage of X or Y channels.

/AND. Outputs the lower voltage of X or Y channels.

ARC

Calibration

ARC is factory calibrated with precision sources. The following procedure is for adjusting inaccuracies in your system:

• **ATT-VER Center Adjust** ① ②

These adjust the center position of the attenuator/offset voltage for Y and X channels. When the potentiometer is centered, the output should be 0V to ensure proper alignment.

• **Rise Shape Adjust** ③ ⑤

These trimmers adjust the rise curve for the Y and X channels. Calibrate them so that when the shape potentiometer is centered, the rise curve is linear.
This ensures a neutral starting point for further adjustments.

• **Fall Shape Adjust** ④ ⑥

These control the fall curve for the Y and X channels. Set them so that the fall curve is linear when the shape potentiometer is in the center, allowing for smooth modifications.

• **V/OCT Tracking Adjust** ⑦ ⑧

These trimmers tune the 1V/Octave tracking for Y and X channels, ensuring accurate response across some octaves range.

ARC
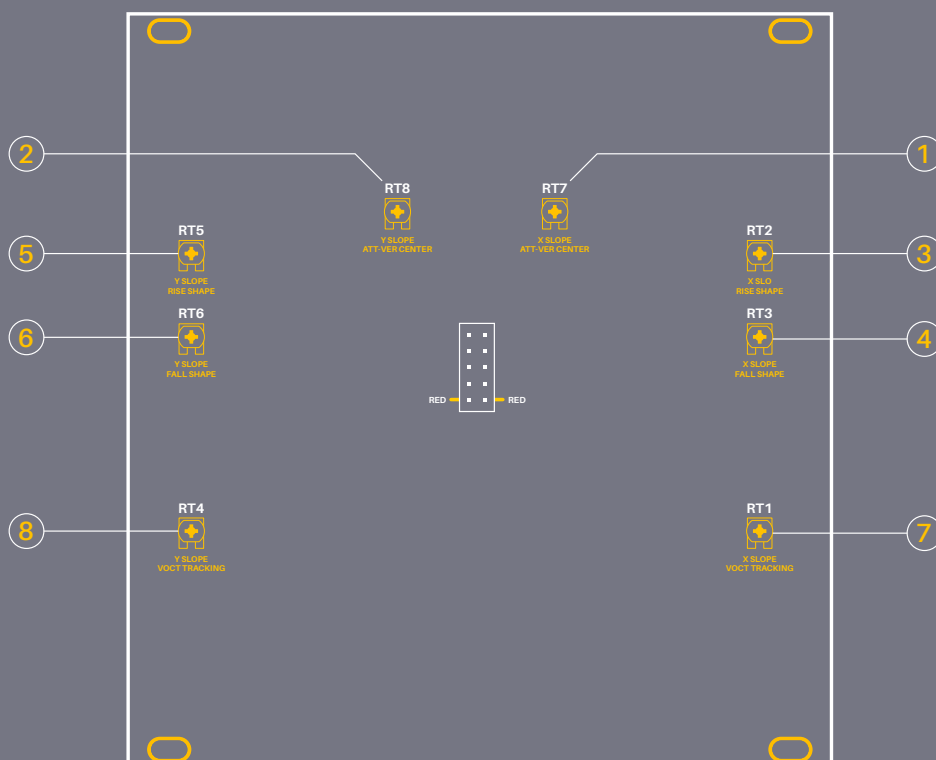
Compliance

This device complies to the **EU guidelines** and is manufactured **RoHS** conforming without use of led, 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 - 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 24HP – 120×128,5mm
Current +12V 150mA / +5V 0mA / -12V 130mA
Input & Output Signals ±10V
Min. time for Attack & Decay 0.5ms
Max. time for Attack & Decay 7 minutes
Impedance Input 10k - Output 10k
Materials PCB and Panel - FR4 1,6mm
Depth 40mm - Skiff friendly

Modules are designed and assembled in València.

Contact

Bravo!
You have learned the basic fundamentals of your ARC Module.

If you have any doubts, please feel free to contact us.
nano-modules.com/contact

ARC