GOMA Pro

User Manual

v1.0

Thank you for purchasing GOMA Pro.

GOMA Pro is our most advanced take on the classic attenuverter-mixer concept. It stands for Generator, Offset, Mixer, Attenuverter. A 6HP module made of high-end components for max precision (low tolerance resistors, low noise opamps).

GOMA Pro offers 3 channels to amplify (up to x10 gain!), attenuate or polarize (attenuverter) any signal, from CV, audio to line level sources.

Additionally, each channel can act as a high precision voltage generator (–10V to +10V) to offset another channel or control external parameters.

The 3 channels can be processed separately or summed through cascade mixing, which can extend further than a single module since all the GOMA family (I, II, Pro) can be daisy chained to unlock virtually infinite mixing.

Waranty

BLACK NOISE warrants its products to be free of defects in materials or workmanship and to be conform with the specifications at the time of shipment for a period of two years from the date of purchase. During that period any malfunctioning or damaged units will be repaired, service and calibrated into your workshop.

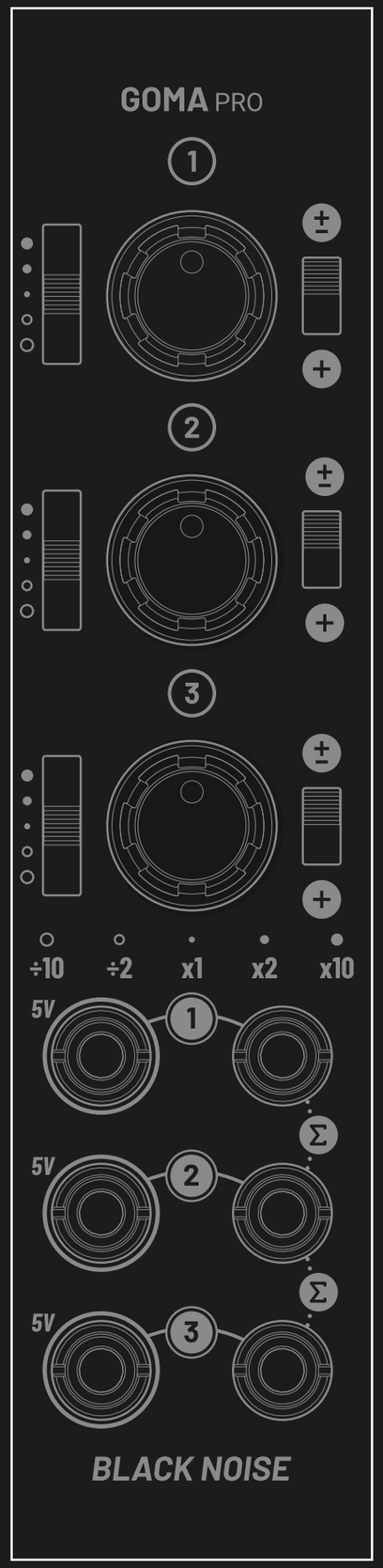
This warranty does not cover any problems resulting from damages during shipping, incorrect installation or power supply, abusive treatment, or any other obvious user-inflicted fault. If your product warranty is passed, it still can be serviced as long as parts are available in our workshop. We reserve the right to charge for labor,parts and transit expenses where applicable.

Before sending your product to our workshop please contact us for RMA and details. Any unsolicited parcel will be rejected and or returned. The postage to our workshop is on the customer. The return of your module is on us. BLACK NOISE cannot take any responsibility for damages caused during transport.

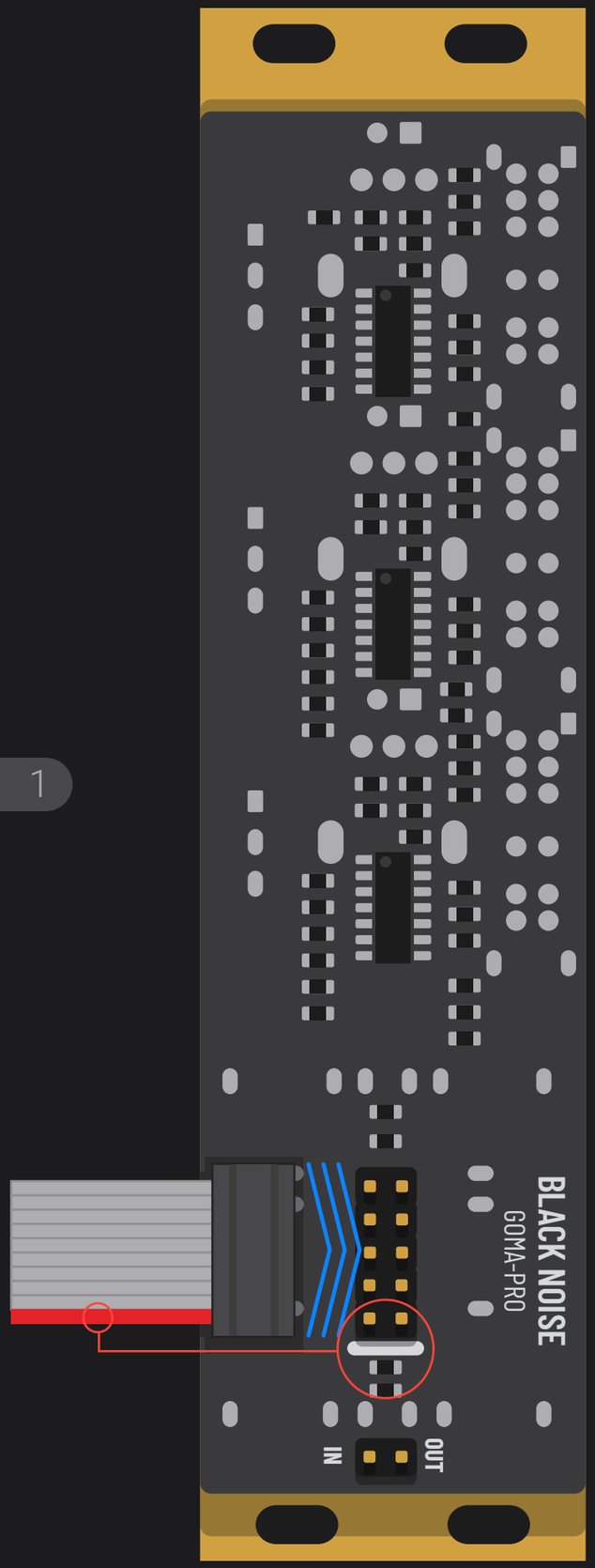
Contact us

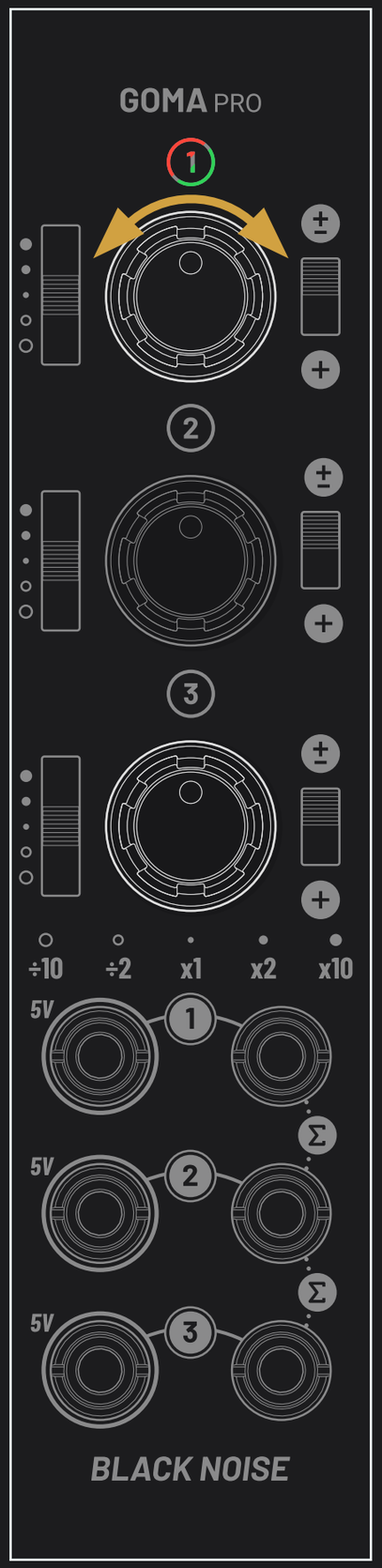
contact@blacknoisemodular.com

Specs		
	Width:	6HP
	Depth:	20mm
	Power :	+12V: 35ma
		-12V: 35ma
		+5V: 0ma



Contents





Starting GOMA Pro

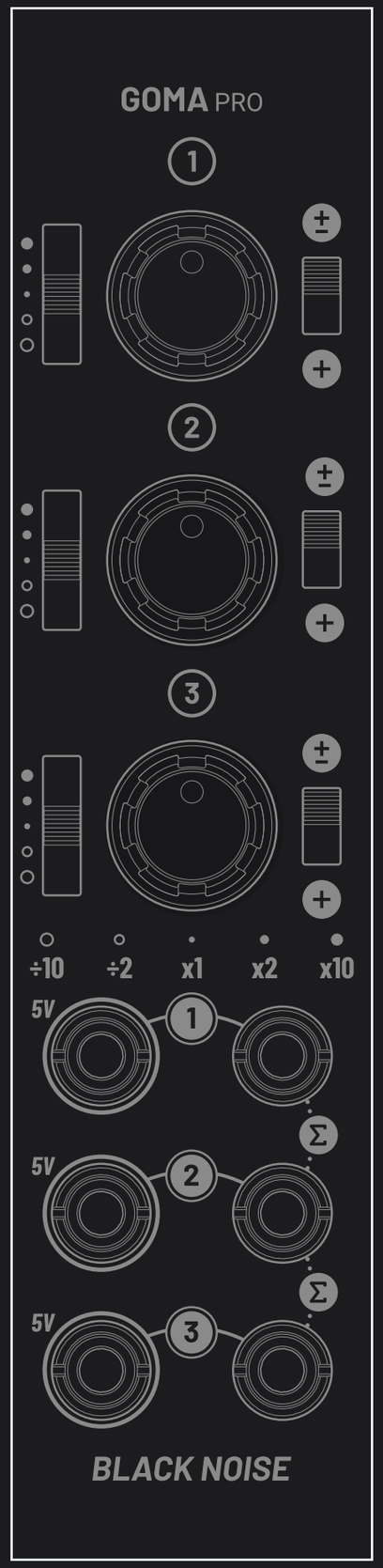
Installation

1. Turn off your eurorack system and pull off the cord.
2. Connect the provided ribbon cable's 16-pin head to you to the system's power bus, making sure the red stripe matches the one indicated on the bus
3. Connect the provided ribbon cable's 10-pin head to the GOMA Pro, making sure the red stripe matches the one indicated on the board. Red stripe down!
4. Place GOMA Pro on the rails of your system.
5. Put your system's power cord back in and turn it on.

Test

1. Move the first knob. the "1" LED should light up according to the knob position.
2. GOMA Pro is ready. Have fun!

If the test procedure described above, comes to fail, don't hesitate to reach out with BLACK NOISE.

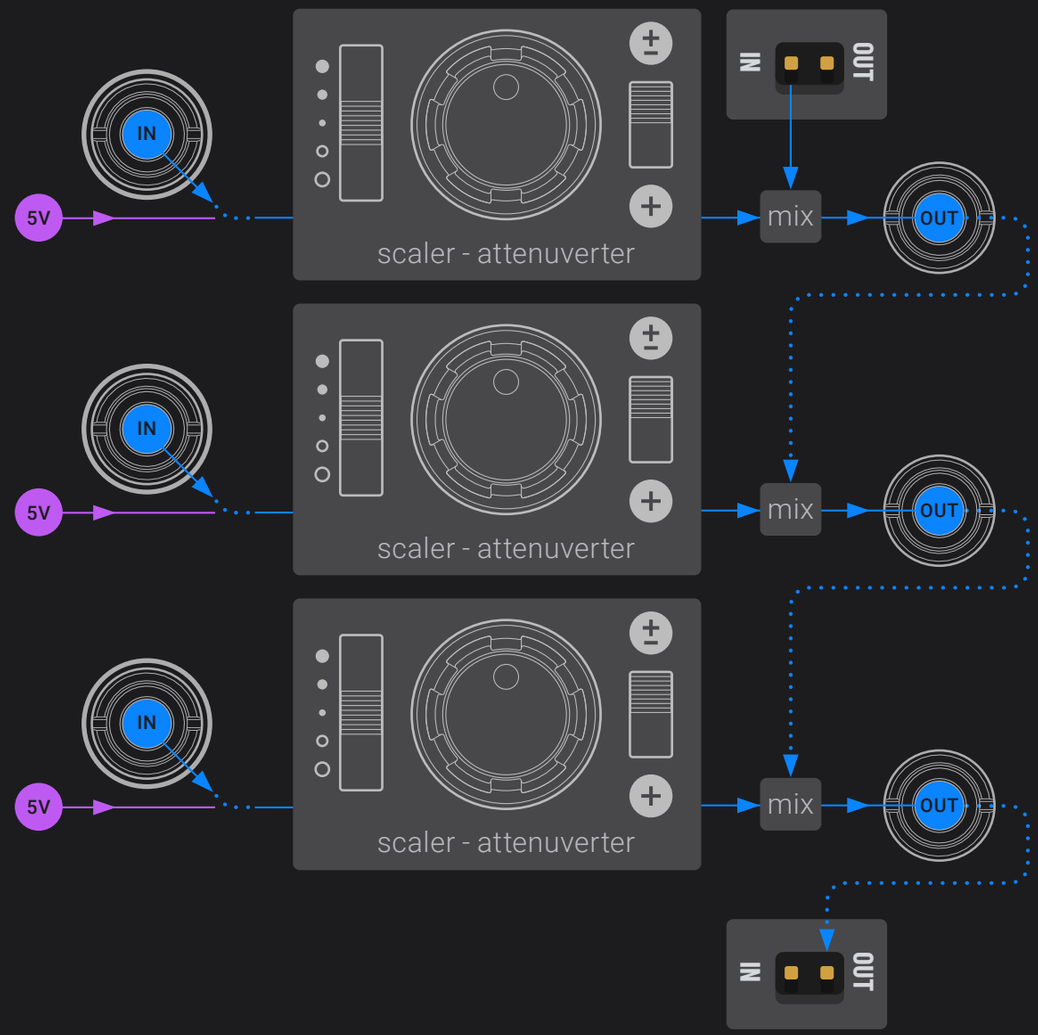


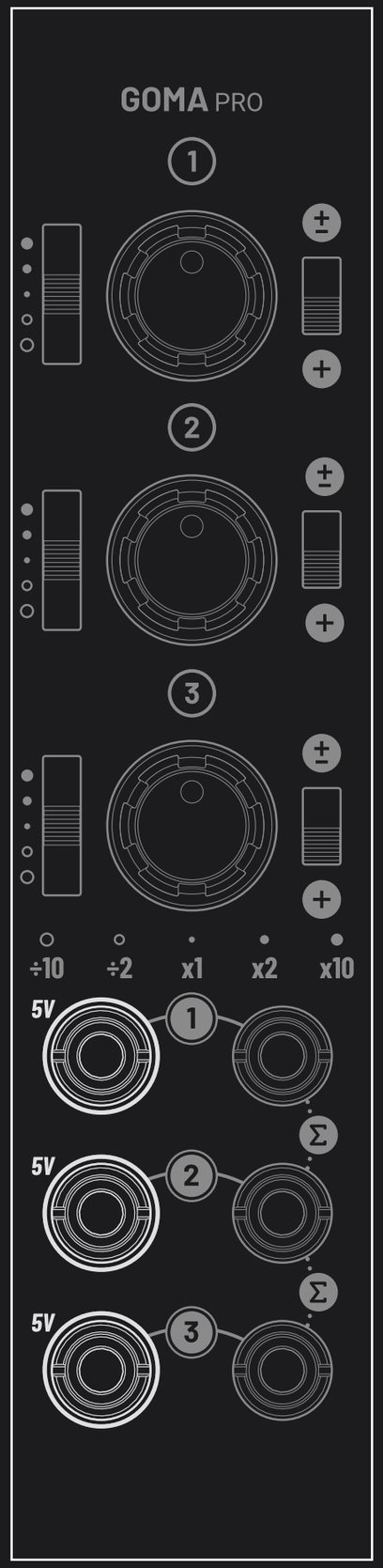
Structure

GOMA Pro offers 3 channels normalized to 5 volts, processed individually by the scalers and the attenuverters.

Their outputs are cascaded for mixing purposes.

Back panel IN and OUT pins enable daisy chaining any modules from the GOMA family together.





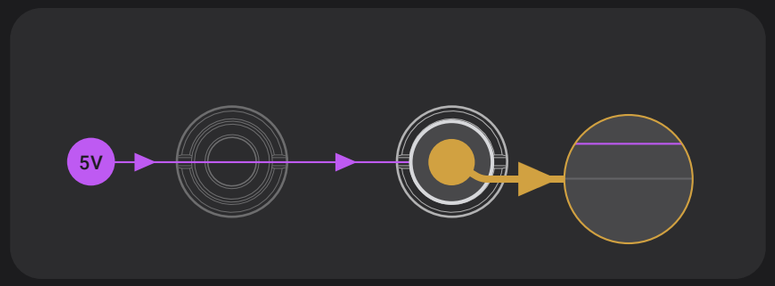
Features

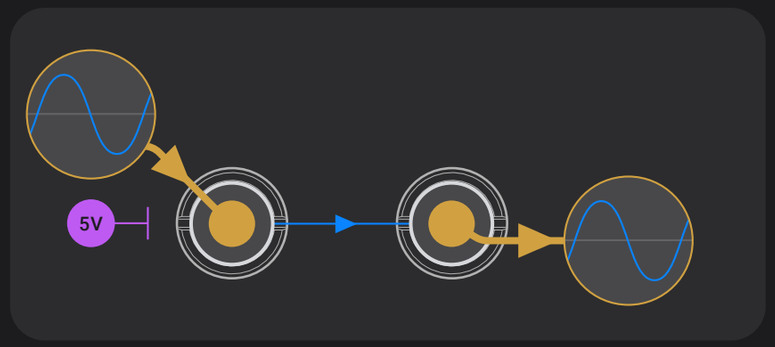
Input normalization: fixed voltage generator

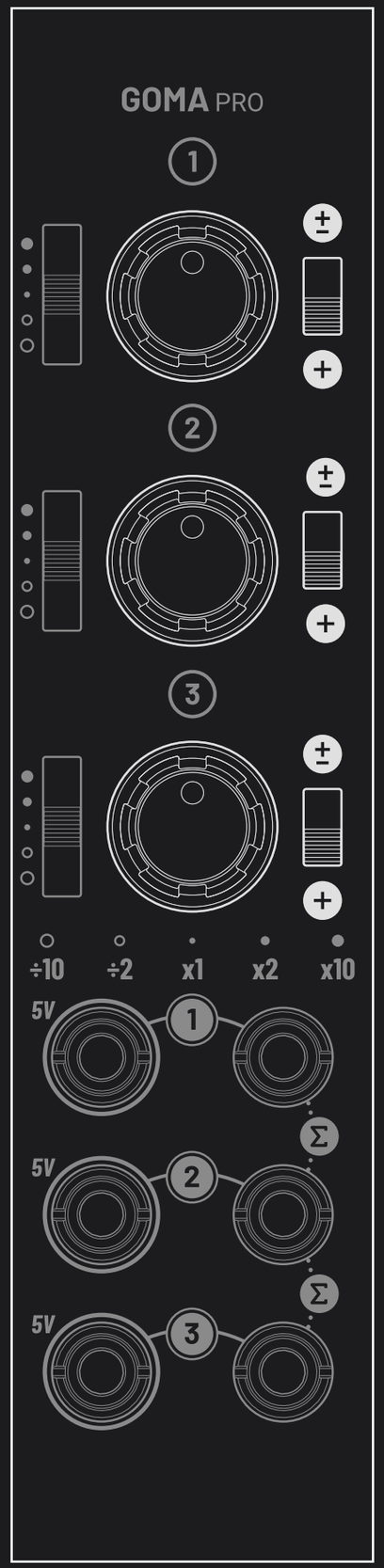
While each channel handles external signals, they are normalized to a high precision 5V internal reference when no input jack is connected.

The fixed voltage is processed by the scaler and the attenuverter to reach any value within the -10V to +10V range. It can be used to offset another channel or to control modulation inputs.

Inserting a jack in the input breaks the 5V connection and taking the jack out restores it, potentially causing unwanted pops when processing audio signals. Set the knob to zero before unplugging.







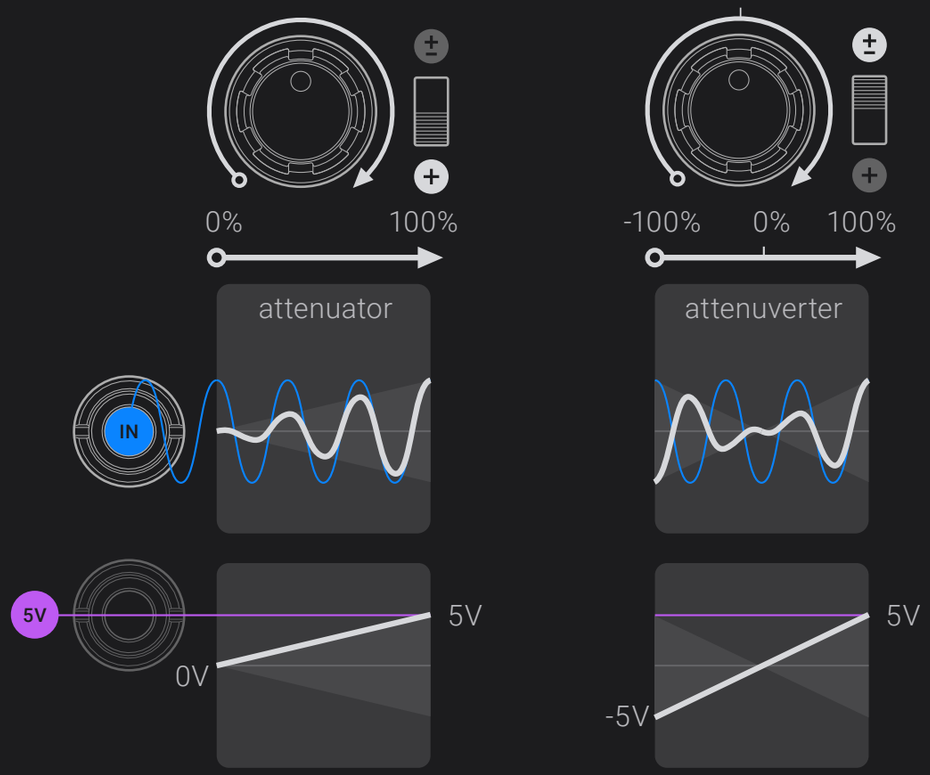
Features

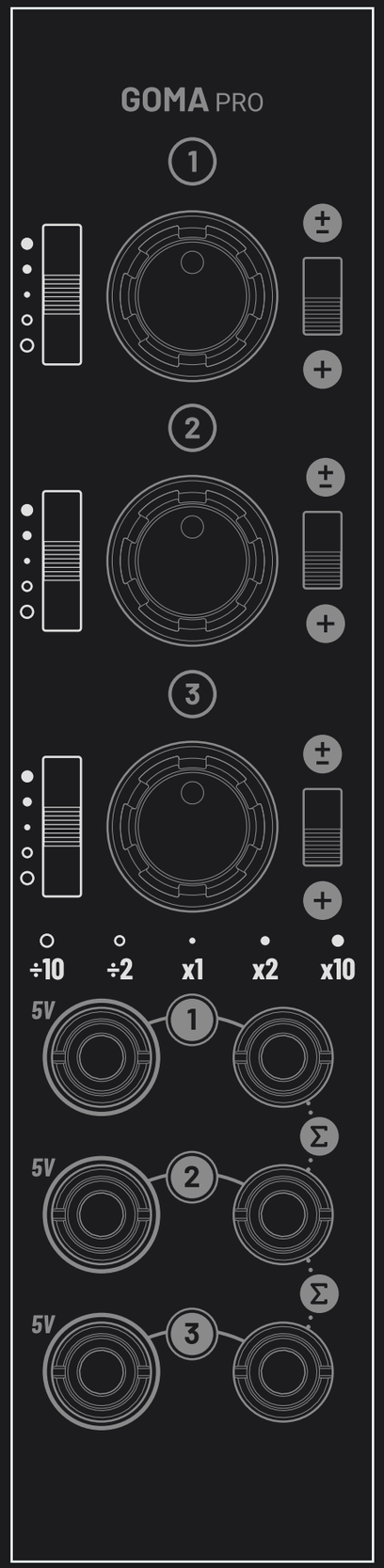
Attenuverter

The 2-position switch set each channel's knob behavior.

- Attenuator, controlling the amplitude (aka "volume") from 0% to 100%.
- Attenuverter (aka polarizer) with 0% at center position. Clockwise direction provides attenuation from 0% to 100%. Counterclockwise offers similar outcome with an inverted version of the signal: positive voltage becomes negative, and vice versa.

This section also processes the 5V internal source to dial any value using the knob.



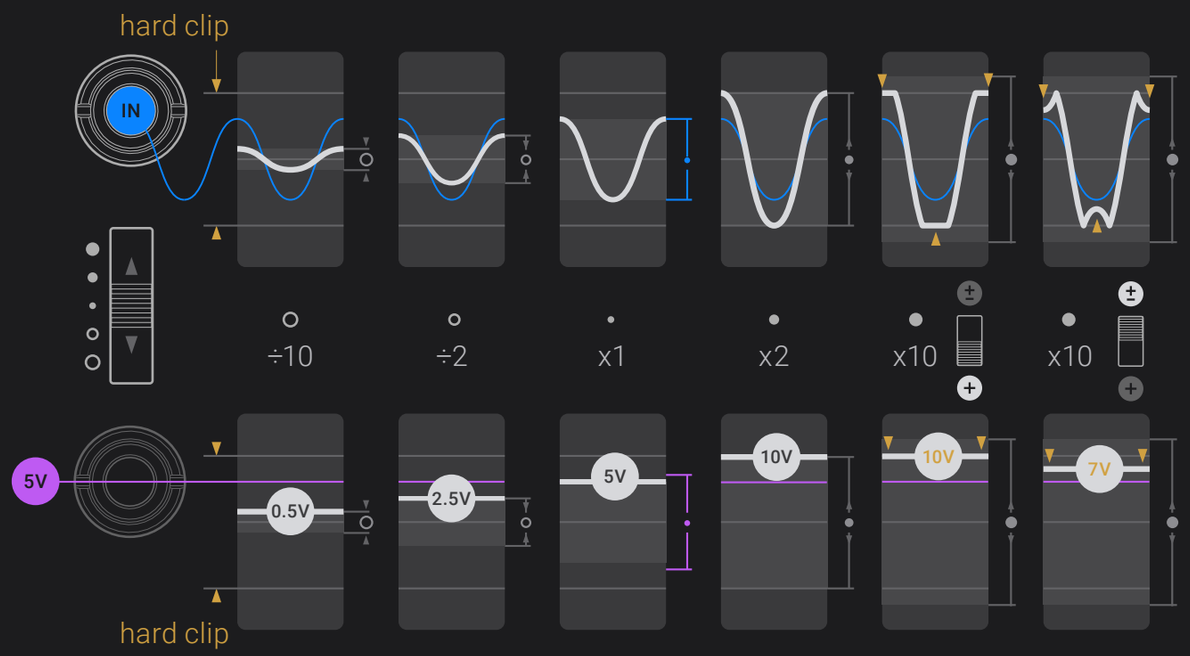


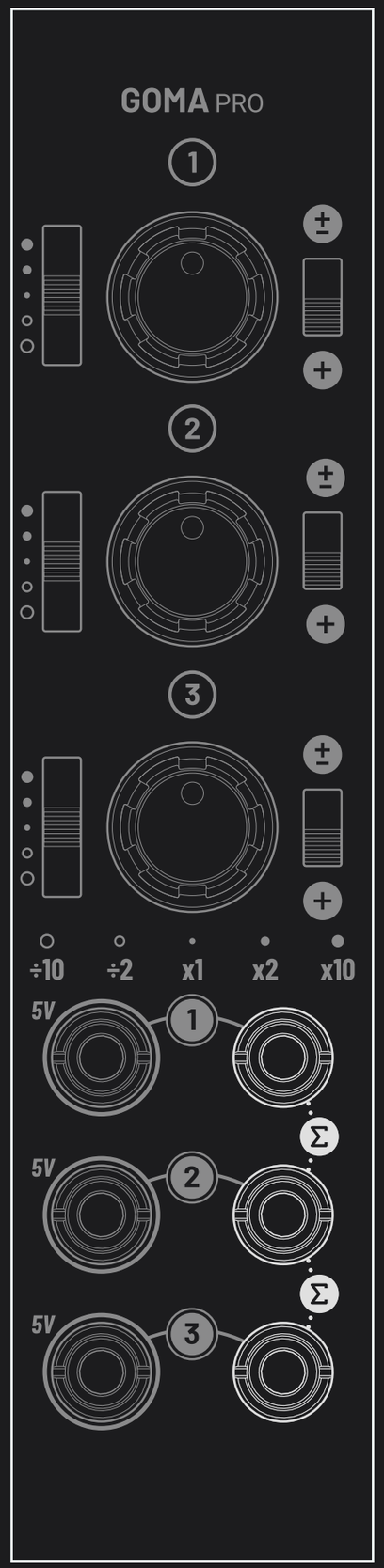
Features

Scaler

GOMA Pro allows to set the attenuverter's range with a 5-position switch featuring symbols explained in the center of the faceplate: two levels of attenuation, precise unity gain and two levels of amplification.

A clipper confines the output to -/+10V, hard clipping the signal in unipolar mode, and reversing it in bipolar mode. This set of features also applies to the 5V internal source, enabling larger or smaller voltage ranges.



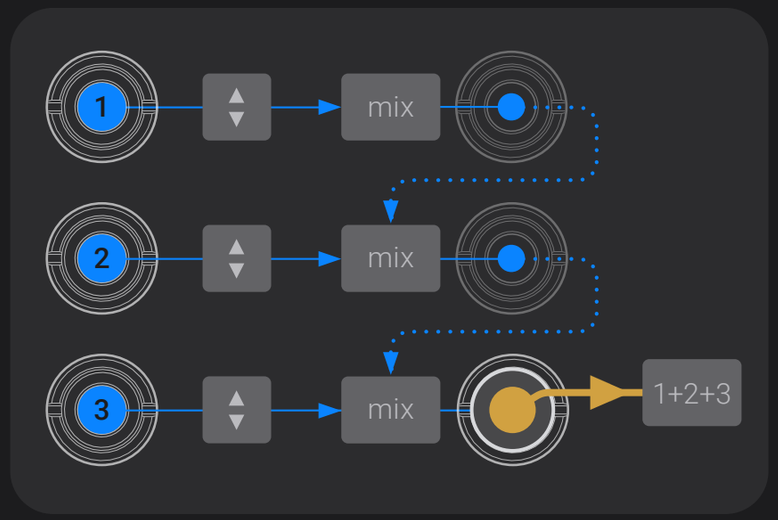


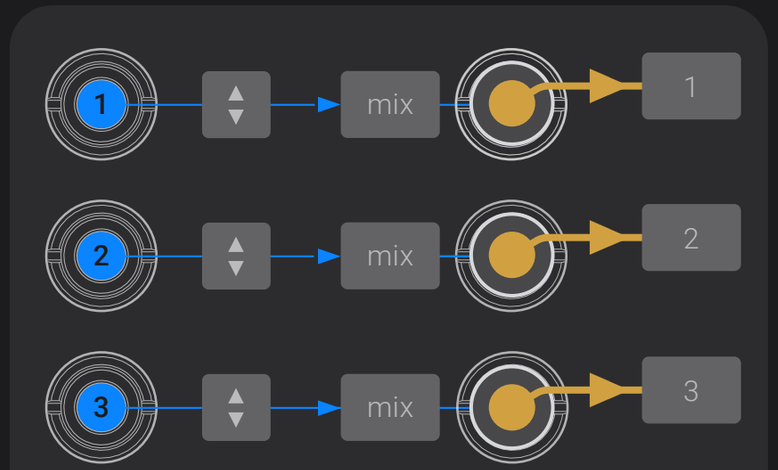
Features

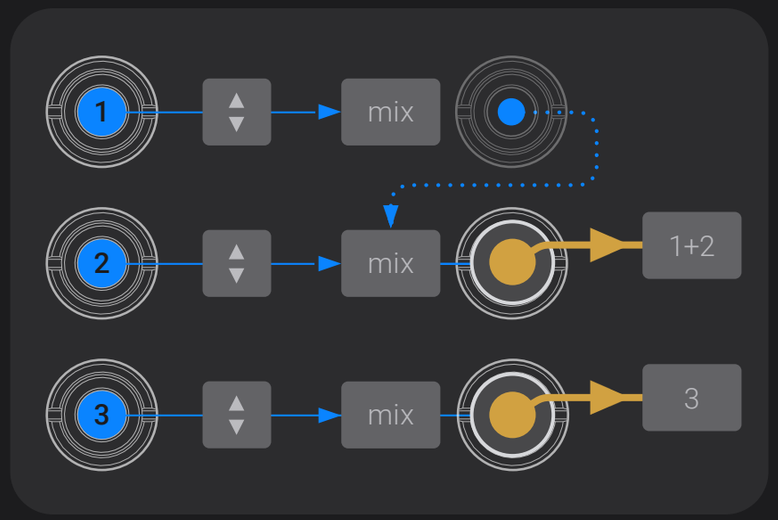
Cascade Mixer

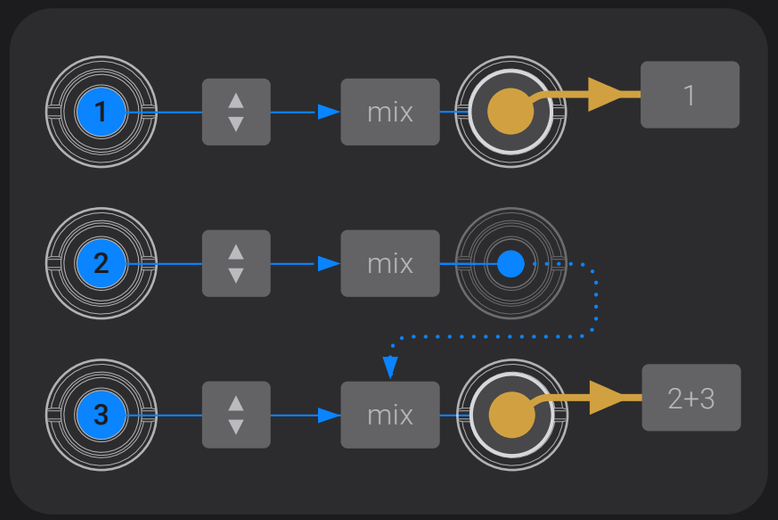
Unpatched outputs are automatically mixed with the next channel's output, every unpatched output forming a link in a flexible mixing chain.

Patching only the last output of the module turns it into a standard mixer.







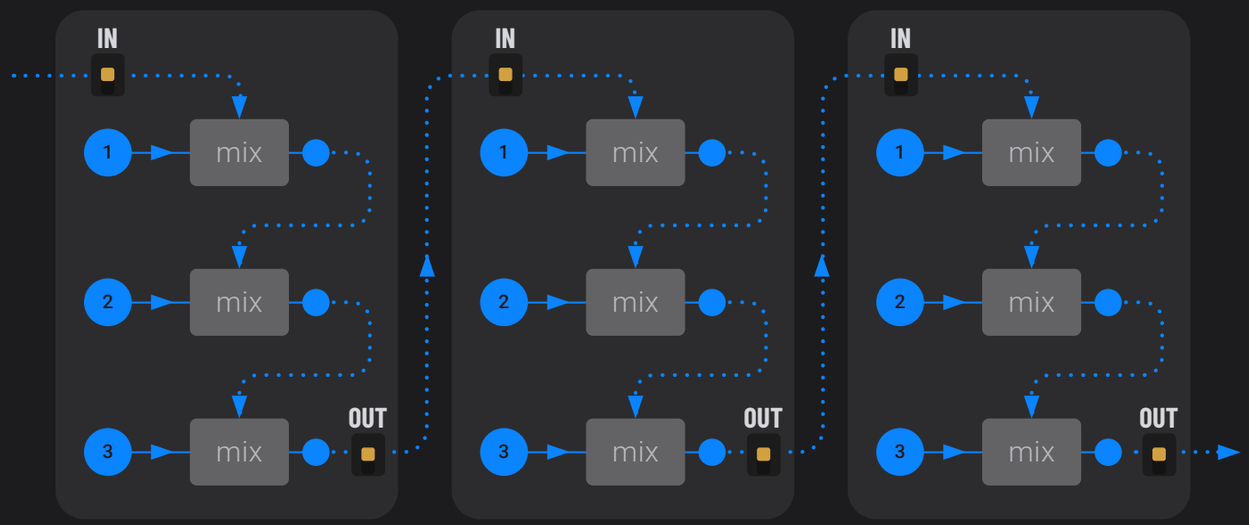


Features

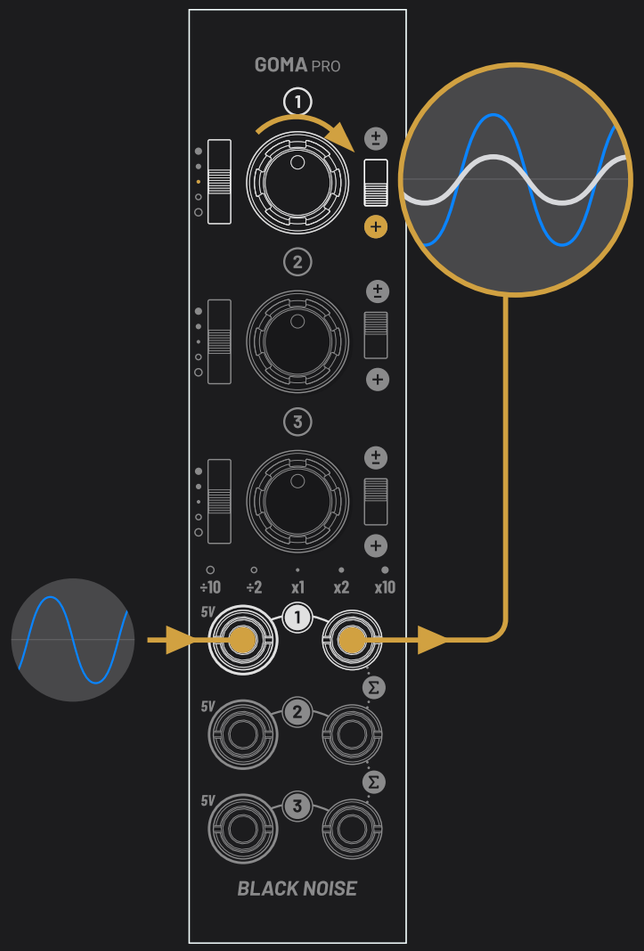
Daisy chain

The cascade mixing system described above can be extended across any modules from the GOMA family, by using the included 1-pin cable to connect the OUT pin from the first module to the IN pin from the next module.

If the last channel of the first module is unpatched, it is mixed with the first channel of the next module's output.



Practical uses

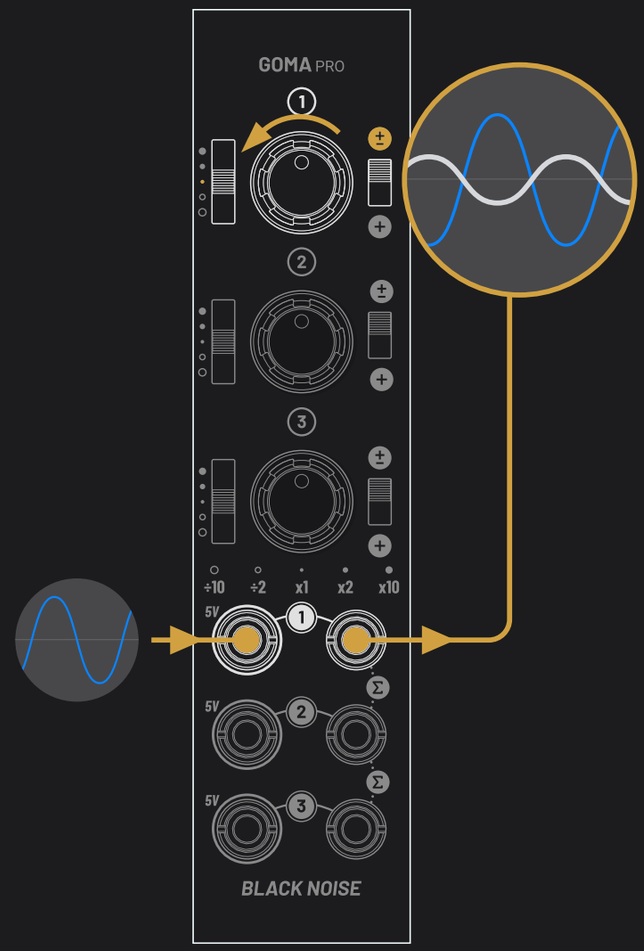


Attenuator

Adjust the gain of an audio signal (volume knob), or set the range of a CV signal before sending it to a modulation input.

Process a signal with the scaler to center position and the polarizer switch to unipolar.

Use the knob to set the desired amplitude.

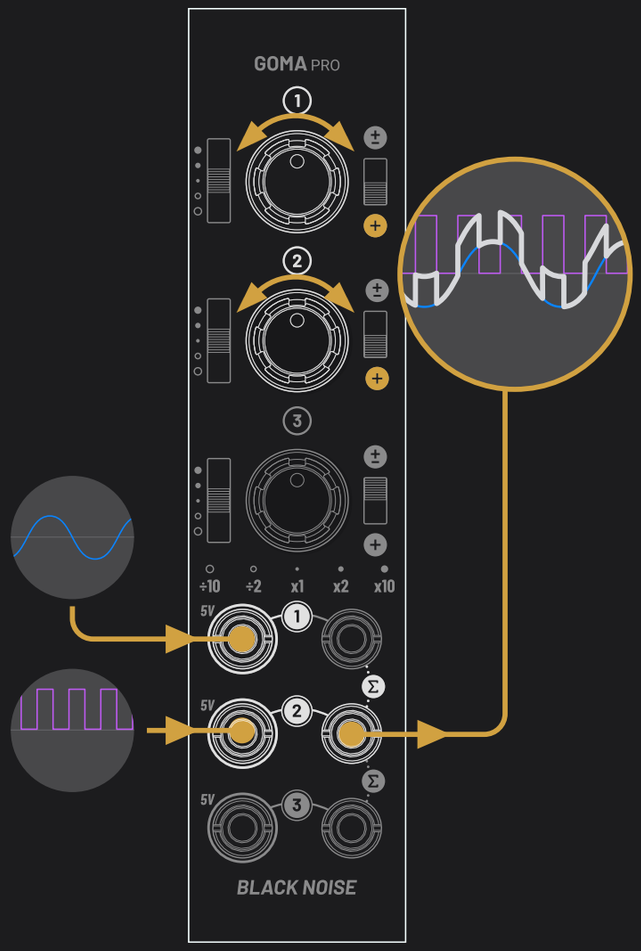


Attenuverter

Turn a LFO ramp waveform upside down, prepare an audio signal for phase effect or invert the direction of an envelope before sending it to a modulation input.

Process a signal with the scaler to center position and the polarizer switch to bipolar.

Use the knob in counter-clockwise direction to set the desired amplitude of the inverted signal.

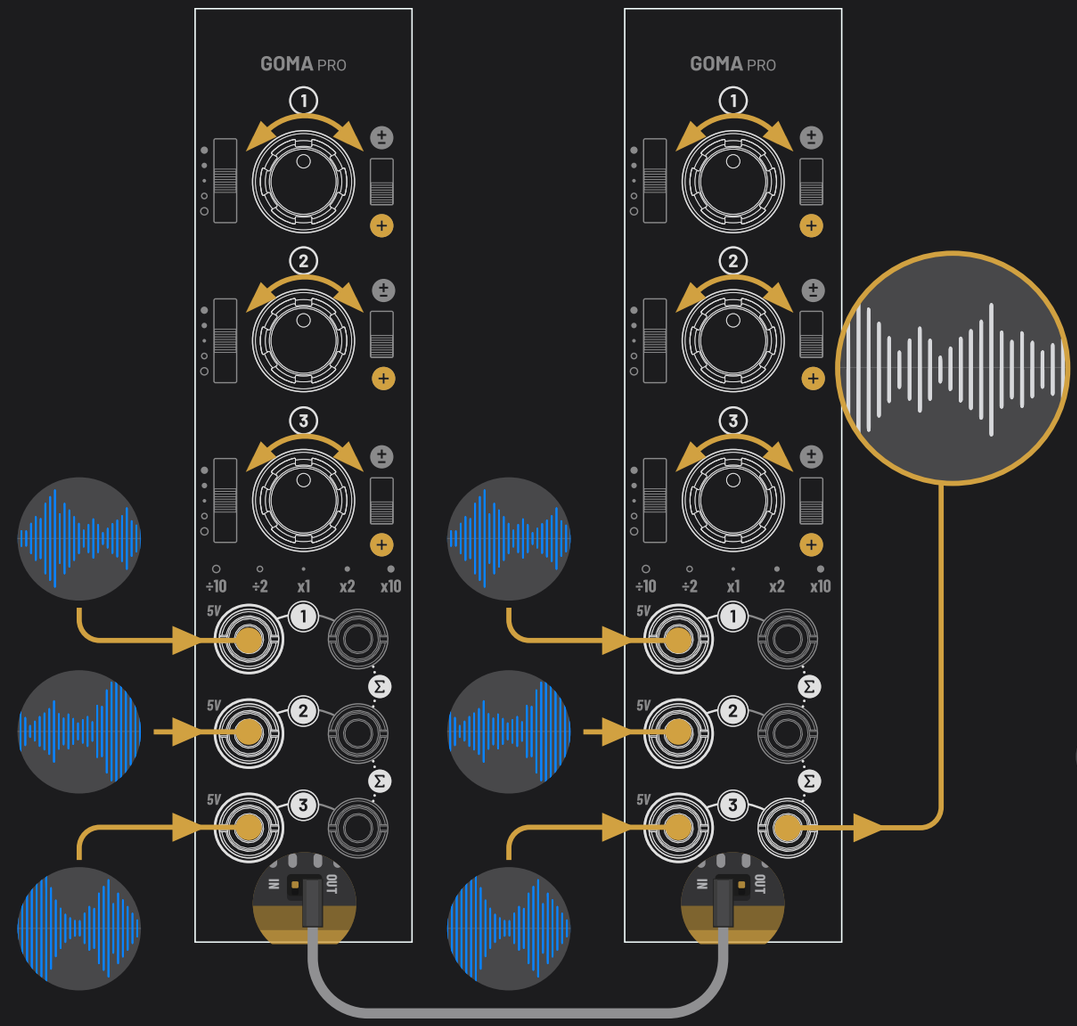


Mixer

Mix audio signals, create complex modulation signal by combining LFO shapes.

Patch two or more inputs. patch the lowest used channel output only and leave all other outputs unpatched.

Use the knobs to adjust the level of each channel in the mix.



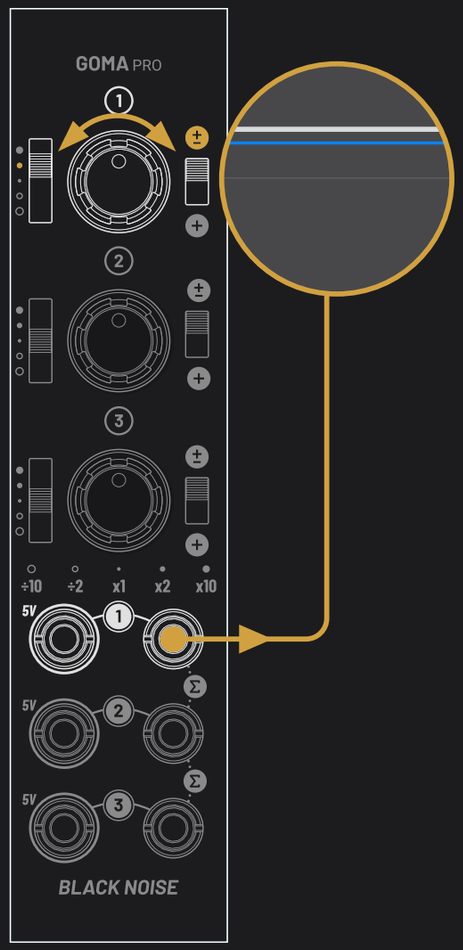
Daisy chain mixer

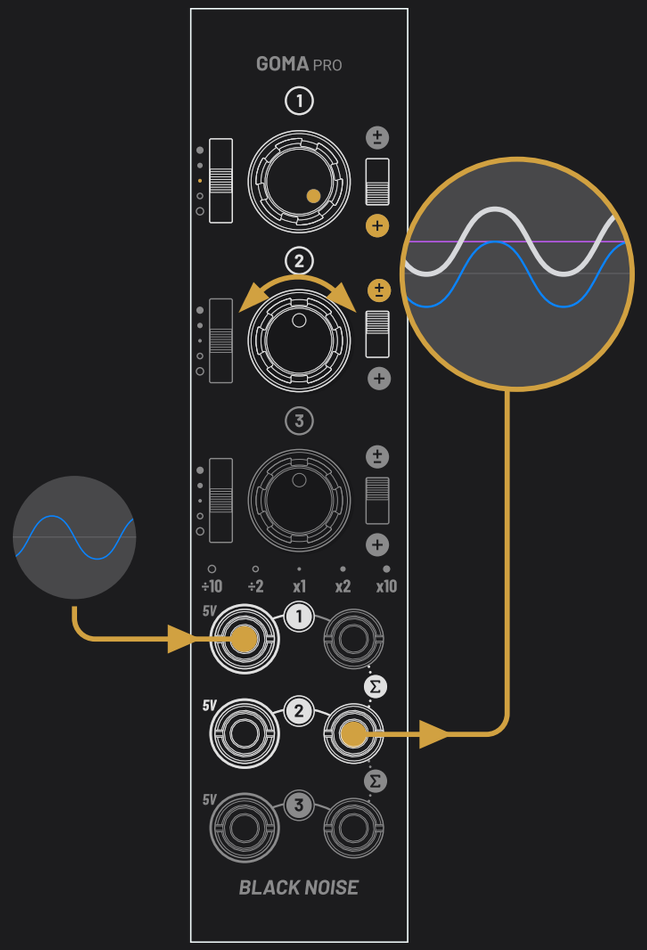
Extend the cascade mixing system through any module from the GOMA family.

Ensure the modules are daisy chained as shown in p7.

Patch any number of inputs. Patch solely the last used channel output in the chain of modules.

Use the knobs to adjust the level of each channel in the mix.





Full range fixed voltage

Set a knob to control any modulation input over a full range from -10V to +10 V.

Use a channel without input connected to enable the 5V normalization.

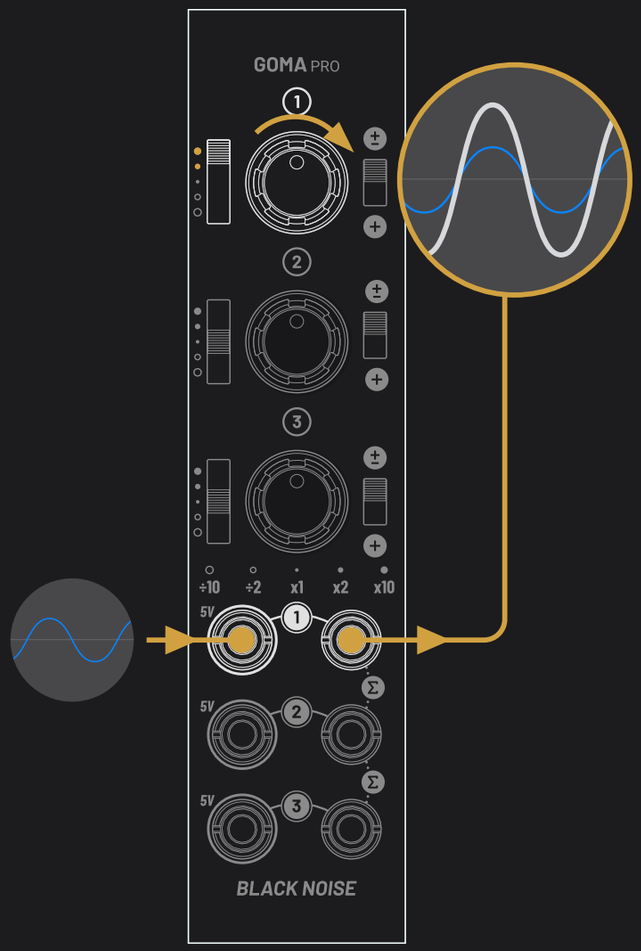
The bipolar switch allows the knob to shift the fixed voltage from -5V to +5 V. The scaler's x2 position doubles this range.

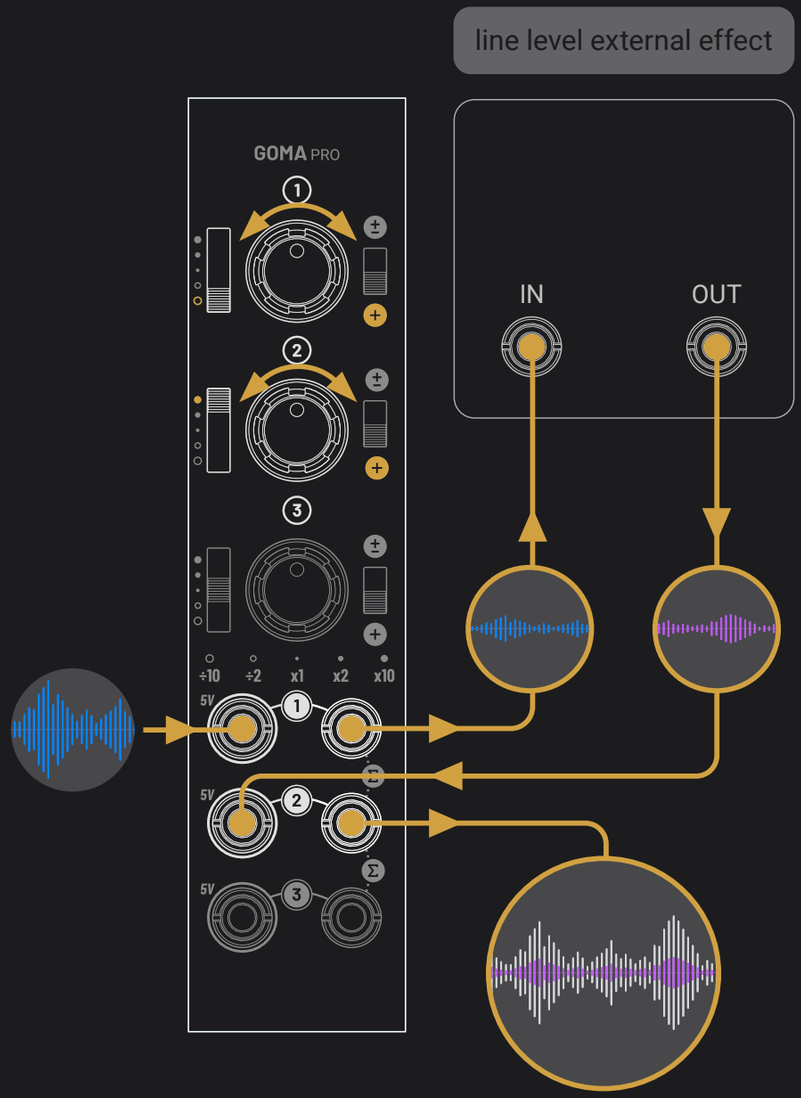
Offset

Bring a unipolar LFO in the bipolar range and vice versa, prepare audio signal for asymmetric wave shaping, transpose a 1V/oct sequence.

Combine an external signal (output unpatched) with an offset (input unpatched).

+5V to bring a bipolar signal in the positive range, -5V to bring a unipolar signal in the bipolar range.





Amplifier

Amplify an Audio signal or prepare a CV signal for a modulation input requiring high amplitude.

Process a signal with the scaler to higher or top position.

Use the knob to set the desired amplitude

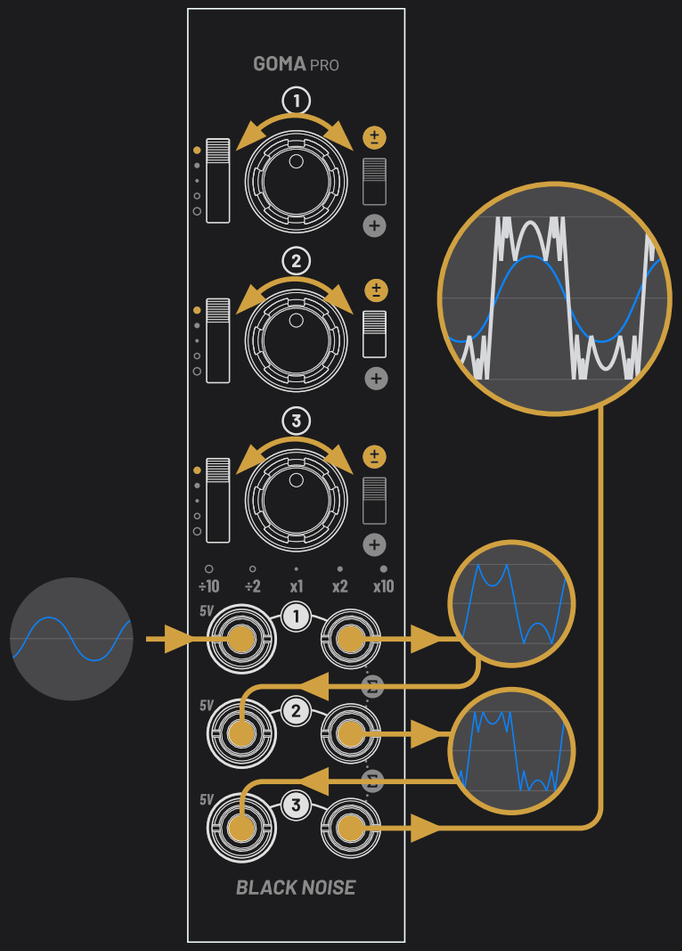
Line level in/out

Eurorack signals (10V peak to peak) are too hot to be processed by external gear expecting line level between 0.5Vpp and 3.5V pp.

The signals should be attenuated for these devices and then re-amplified to come back in eurorack systems.

Patch a signal and set the scaler on the /10 position to reach line level and send it to the external device.

Patch the output of the external device and set the scaler on x10 position to reach back eurorack level.

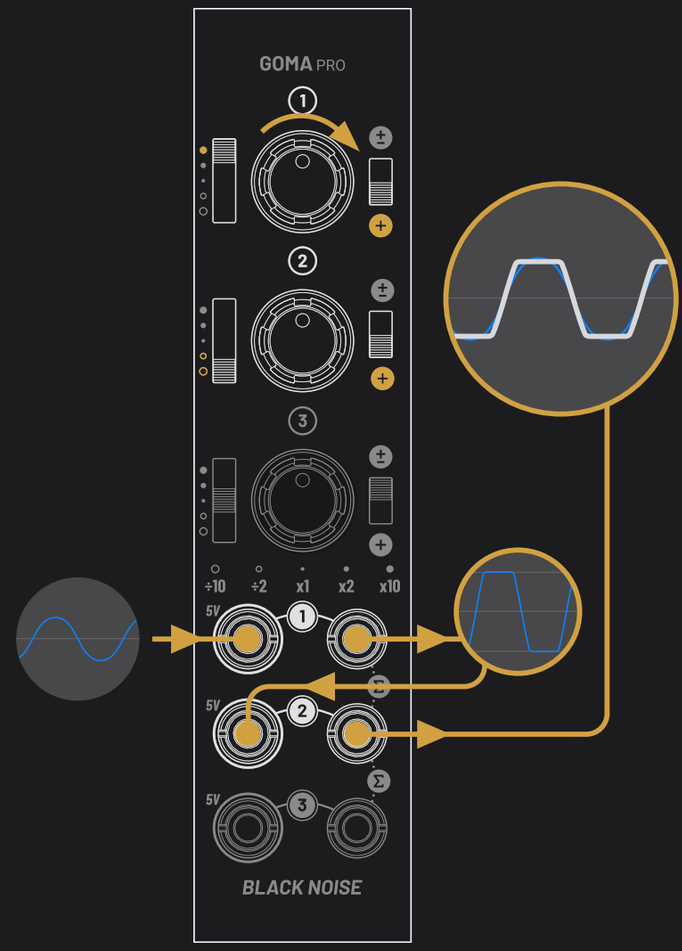


Waveshaper

Multi-fold waveshaper for audio distortion with character.

Set all channels in series (each output in next input), x10 gain, bipolar switch.

Each channel in the chain add a fold to the sound.

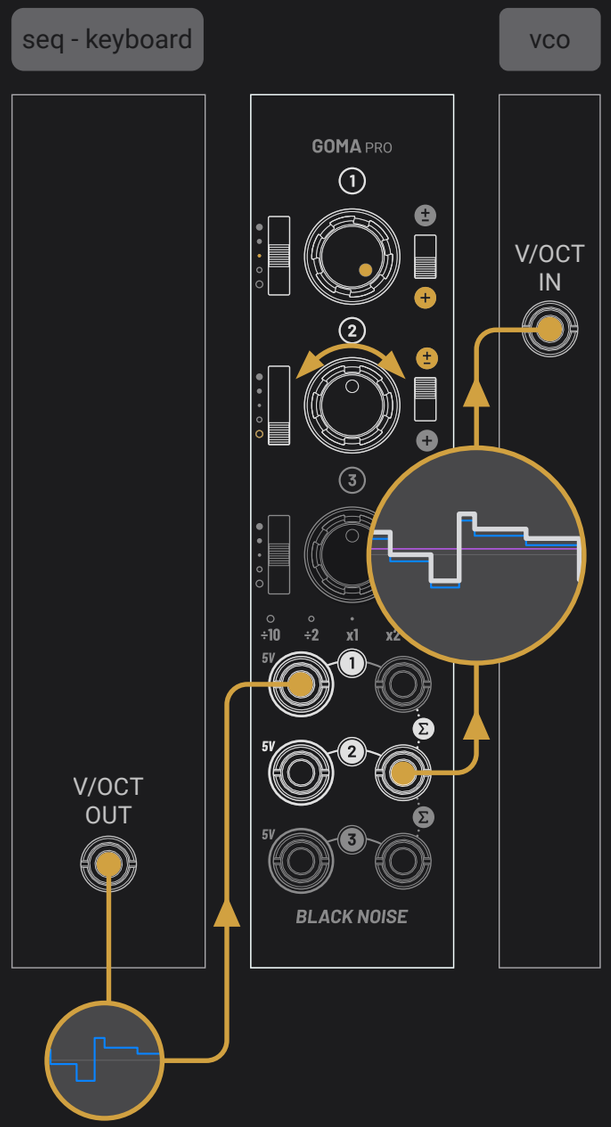


Hard clip distortion

Hard clipping distortion to an audio signal, crop a CV signal to a specific range.

Patch an signal and set the scaler to maximum position, use the knob to set the 10V clipping effect to taste.

Patch the output into a second channel and set the scaler to /2 or /10 position to attenuate the signal into a more adapted range.



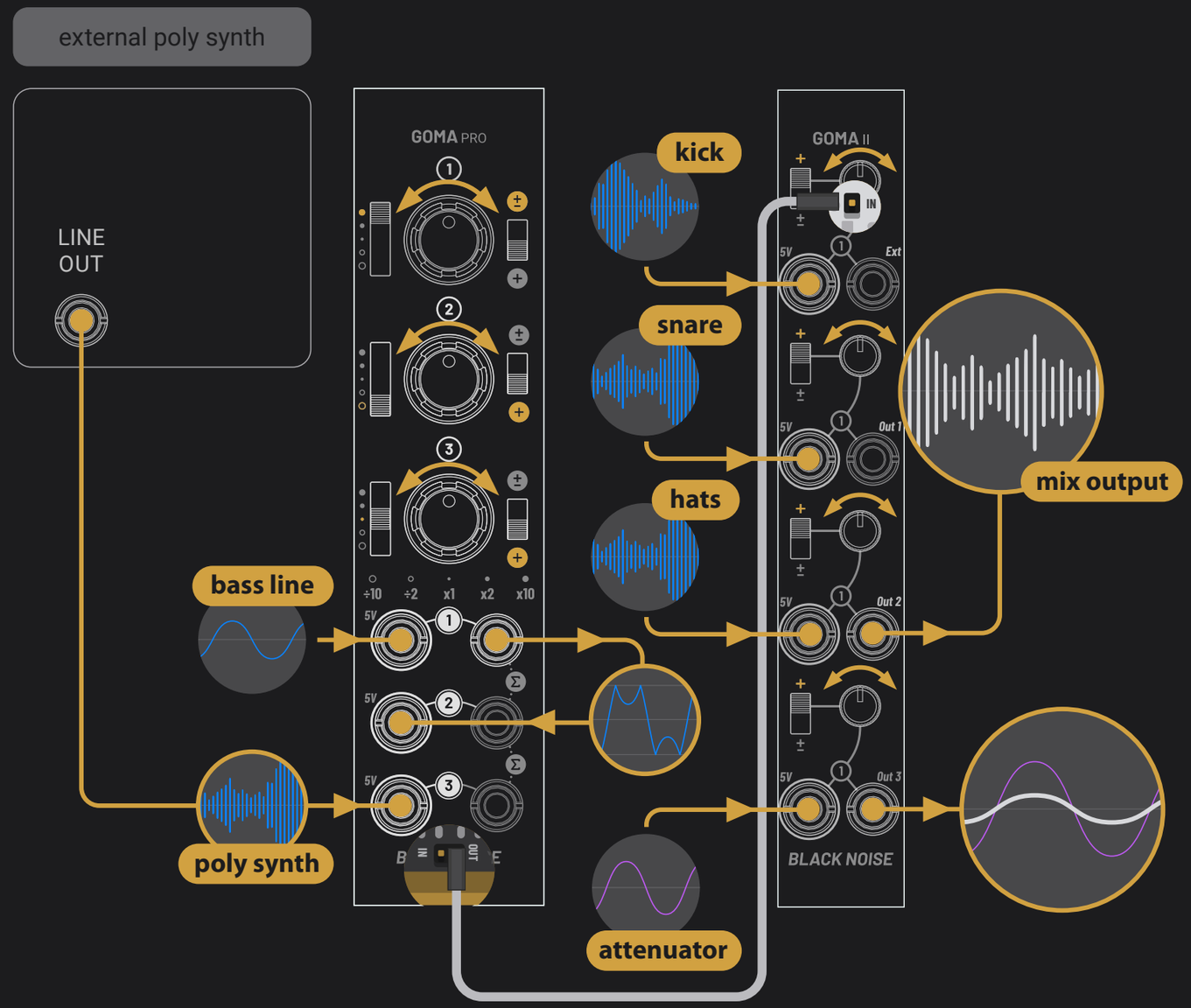
VCO fine tune

Very precise tunning adjustment for a VCO by processing a 1V/oct signal from sequencer or keyboard.

Combine a 1V/oct signal (output unpatched) with an offset channel (input unpatched).

Set the scaler at the lowest position and switch to bipolar for a -/+ 3 semi-tone range.

Use the result to control a VCO.



Multi-function mixer

Take full control of the Goma familly's capabilities in a complex mixer patch

bassline waveshaper, gain to x10, bipolar switch, output to next channel's input to lower the volume and mix with other channels.

Line level synth to eurorack: gain to x10 to bring a synth sound into eurorack range and mix with other channels.

drum tracks as source and last channel for mix.

Any available next channel can be used separately for other purposes