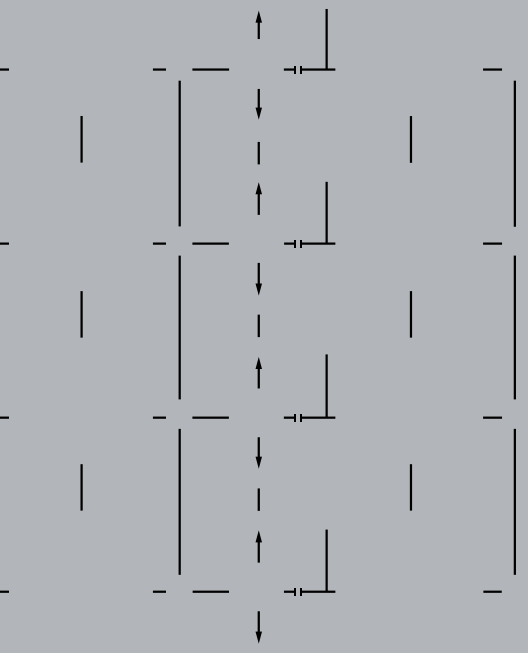
MODMIX

EXPERIMENTAL CV-CONTROLLED
MIXING CONSOLE WITH
ROUTING & MODULATION



USER'S MANUAL

VERSION 1.0

FEBRUARY 2024

FINEGEAR

INTRODUCTION

Welcome to the Modmix User's Manual!

If you own this experimental mixing console - no-input synth - feedback effect processor, then you must be one who is partial to the yet unexplored frontiers of sound, gear and music.

Modmix will be your map with a clear and simple grid, and will allow you to explore - and lose yourself - down some self-generating rabbit holes.

This document describes Modmix, Finegear's CV-controlled mixing console with routing and modulation, as follows:

First, it describes the main features of the console, with 4 CV-controllable channels and as many effect sends, stereo returns and feedback routing controls.

Second, power and audio connections are described.

Next, Modmix's modulation section of two low frequency oscillators and two envelope followers, is detailed;

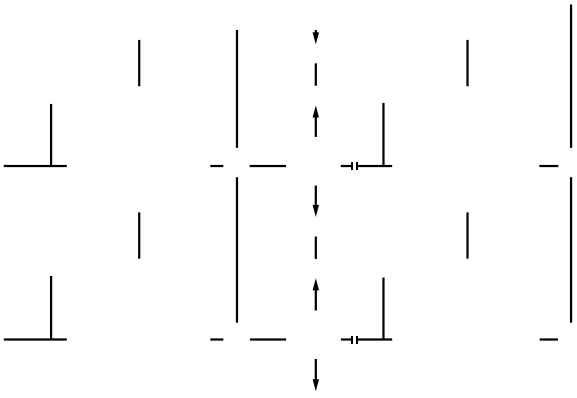
Finally, chaining multiple consoles is described.

A general signal path and further technical specifications can be found at the end, including instructions for future firmware updates.

All along the way, you will find tips and information to help you grasp control of this unusual machine.

Enjoy the ride!

Cristian



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GENERAL OVERVIEW

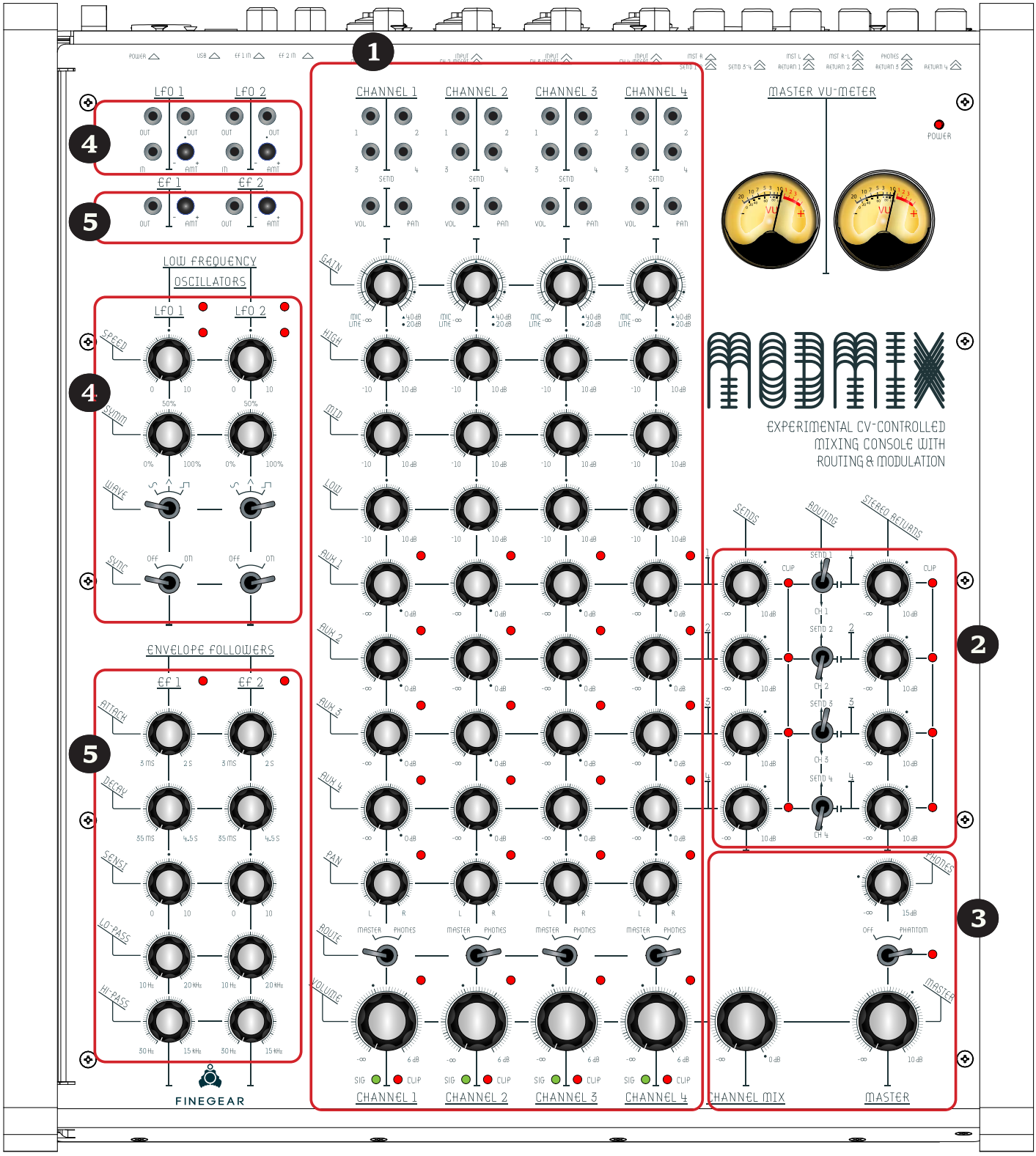
1 — 4-CHANNEL MIXER

2 — SENDS, STEREO RETURNS & FEEDBACK CONTROLS

3 — OUTPUT CONTROLS

4 — LFO MODULATION CONTROLS

5 — ENVELOPE FOLLOWER MODULATION CONTROLS



MIXING CONSOLE

CHANNELS

❶ — PREAMP GAIN

This input gain knob is used to trim or amplify the incoming signal.
Range:

- Line input: -∞ to 20 dB;
- Microphone input: -∞ to 40 dB.

❷ — EQUALIZER

This is a 3-band-equalizer with a very simple and transparent circuit.
Frequency ranges:

- High: 60 Hz;
- Mid: 300 Hz -1.9 kHz;
- Low: 12 kHz.

Adding to the ±10 dB gain range, this amounts to a very pleasant sounding equalizer.

❸ — AUX SENDS 1-4

These knobs are used to send more or less of the channel's signal to one of the four effect send buses (called 1, 2, 3 and 4). The signal is taken after the volume knob, i.e. post-fader (also see "Signal flow diagram" on page 11). Aux send levels can also be controlled by their corresponding CV input at the top of each channel (see below, ❽).
Range: -∞ to 0 dB.

❹ — PANNING

The Pan knob controls the panoramic (left/right) position of the channel's signal.

- Middle: the signal is sent equally to the left and the right channel;
- Left (L): the signal is sent only to the left channel;
- Right (R): the signal is sent only to the right channel.

Panning can also be controlled by its corresponding CV input at the top of each channel (see below, ❽).

❺ — ROUTE MST/PHONES

This switch mutes the signal before the volume knob (meaning that the aux sends are implicitly muted too). It then reroutes the signal to the phones output.

ⓘ There are jumpers inside the unit to change this behavior and only route the signal to the phones output, without also muting the channel. Please contact us before modding your unit during the warranty period.

❻ — VOLUME

This knob controls the level of the signal passing through the channel. The channel volume can also be controlled by its corresponding CV input at the top of each channel (see below, ❽).
Range: -∞ to 6 dB.

❼ — SIGNAL LEDS

These LEDs allow you to monitor your signal. The green SIG LED turns on if any signal above -20 dB is present. The red CLIP LED turns on if the signal goes above 0 dB.

❽ — CV CONTROL & LEDS

For each channel, these CV-inputs for 3.5mm jacks control the aux-sends (❸), panning (❹), and volume (❻). Bi-color LEDs indicate the parameter being controlled: green means positive voltage, while red is negative.

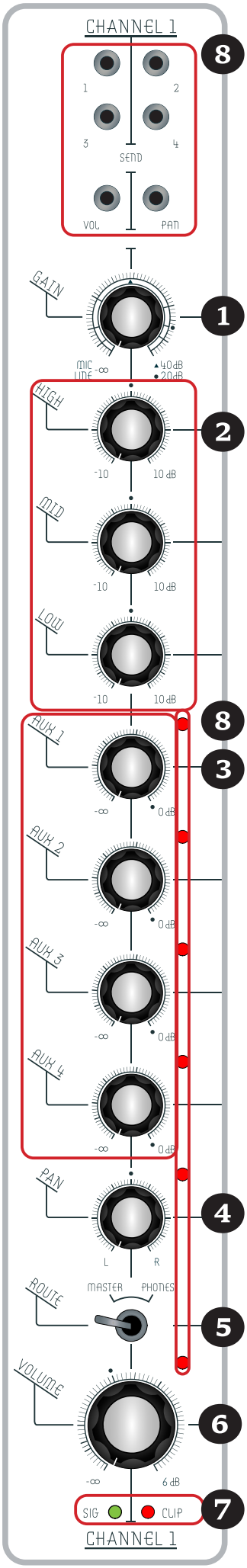


FIGURE 1: CHANNEL 1 CONTROLS & INDICATOR LEDS.

MIXING CONSOLE

AUX SENDS

❶ — EFFECT SENDS 1-4

These knobs control the gain of effect send buses' gains.
Range: -∞ to 10 dB.

❷ — CLIPPING LEDS

If one of the signals sent to the effect send outputs is clipping, the respective red LED will turn on.

ⓘ In this case, lower either the general effect send gain (❶) or one of the individual channel's send levels, or one of the channels' volume knobs (see page 5, items ❸ and ❻).

FEEDBACK ROUTING

❸ — ROUTING

These switches route each send bus signal to its corresponding channel:

- Send 1 is routed to Channel 1;
- Send 2 is routed to Channel 2;
- Send 3 is routed to Channel 3;
- Send 4 is routed to Channel 4.

ⓘ Use these switches to apply no-input mixer techniques, and turn the mixer (or a part of it) into a synth or feedback effect processor.

STEREO RETURNS

❹ — RETURNS 1-4

These knobs control the gain for the stereo returns' inputs. These inputs can be the external effects' return signals or other audio sources, so these stereo returns can be used as up to four extra stereo inputs.
Range: -∞ to 10 dB.

❺ — CLIPPING LEDS

If one of the effect return signals is clipping before being mixed to the master bus, the respective red LED will turn on.

ⓘ If this occurs, lower the general effect return gain (❹) or alter the settings of the effect so as to avoid clipping.

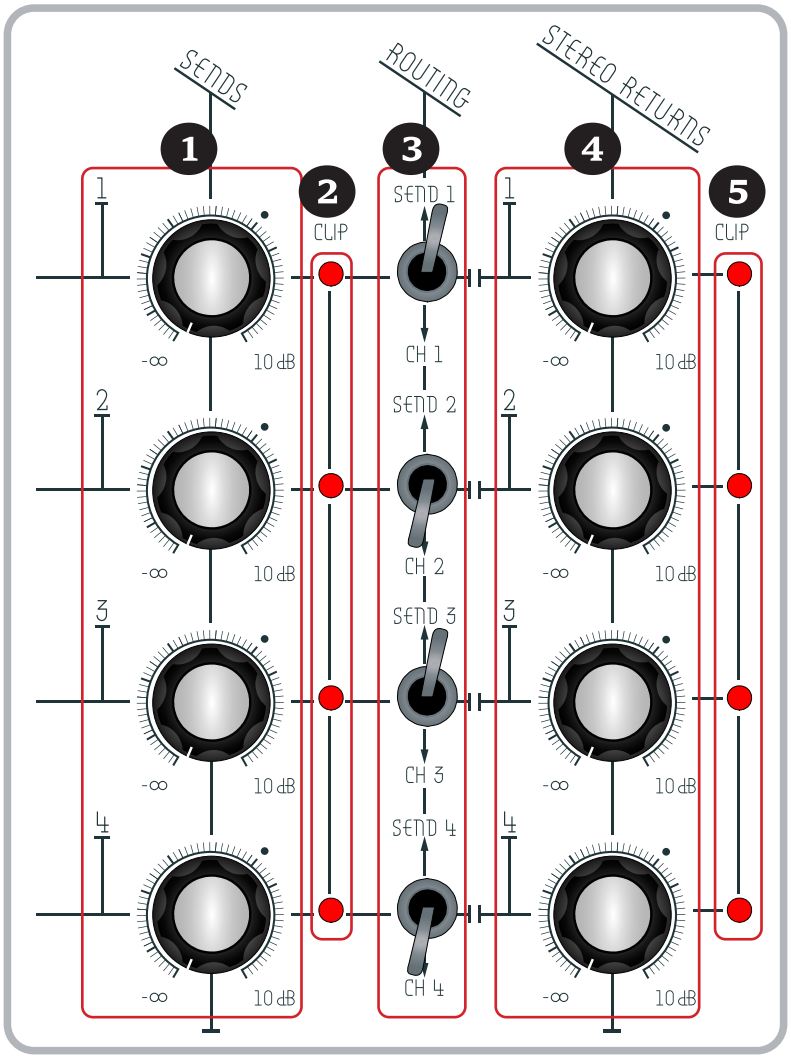


FIGURE 1: AUX-SENDS, FEEDBACK & STEREO RETURNS CONTROLS, WITH THEIR RESPECTIVE INDICATOR LEDS.

WARNING! When generating feedback, the signals get very hot. When connecting the sends' outputs to external audio effects, be careful not to fry the effects, as some don't have over-voltage input protection and can get damaged.

MIXING CONSOLE

OUTPUT

1 — CHANNEL MIX

This knob controls the level of the mixed signal coming from each individual channel.
It is mainly used to lower the level of the channel mix. This is particularly useful in feedback situations, when the signal gets very hot.
Range: -∞ to 0dB.

2 — MASTER OUTPUT LEVEL

This knob controls the master output level, i.e. channel mix and returns.
Range: -∞ to 10 dB.

WARNING! To avoid damaging your speakers, *always* turn the Master knob all the way down to a minimum (-∞) *before* turning the unit on or off.

3 — PHONES

This knob controls the headphones amplifier's gain.
Range: -∞ to 15 dB.

PHANTOM

4 — PHANTOM

Use this switch to toggle the 48V phantom power for microphone inputs.

VU-METERS

5 — MASTER VU-METER

These analog vu-Meters monitor the master output level.

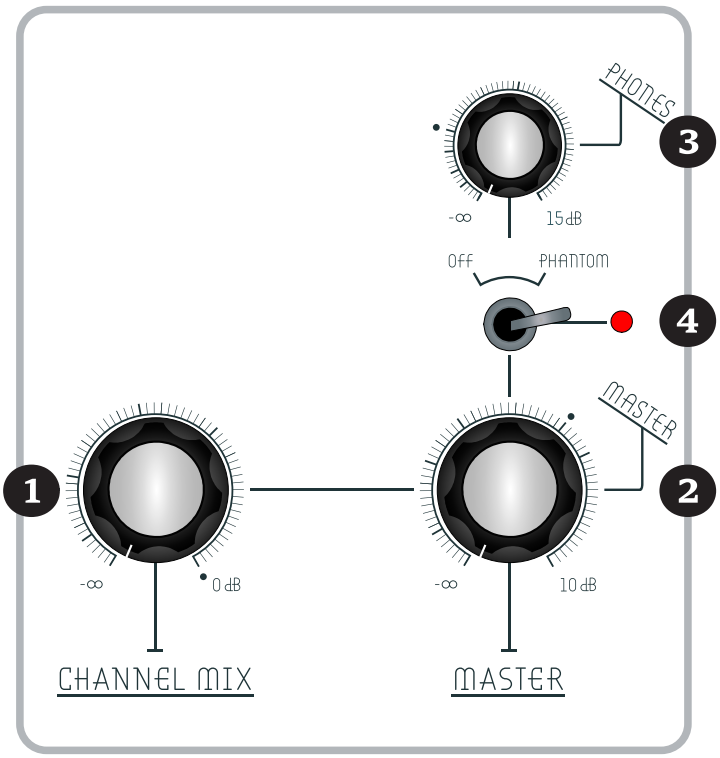


FIGURE 1: OUTPUT CONTROLS

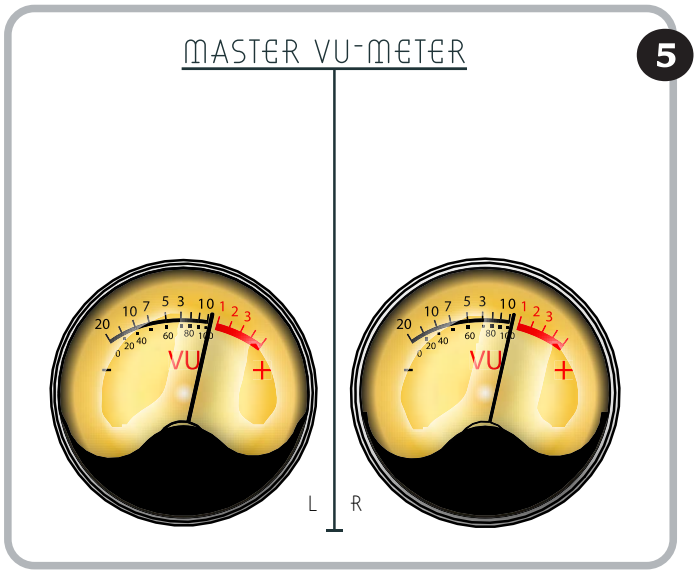


FIGURE 2: ANALOG VU-METER

MIXING CONSOLE

CONNECTIONS

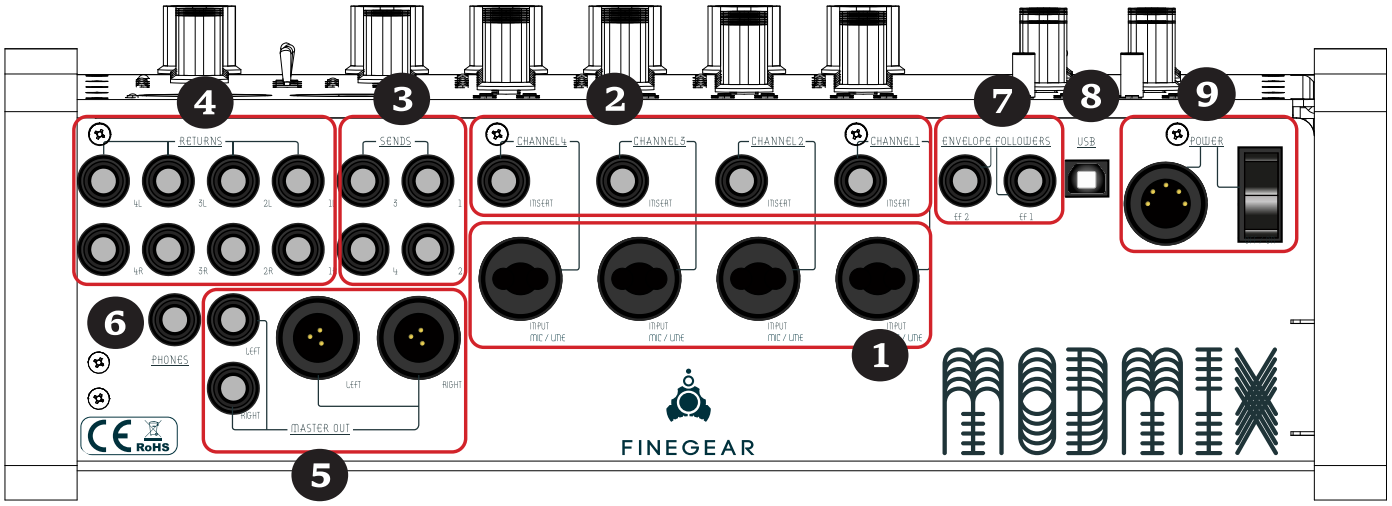


FIGURE 1: MODMIX INPUT AND OUTPUT CONNECTIONS

Modmix's 4 channels accept a variety of connections to instruments, microphones and external effects. There are 4 effect send outputs and as many stereo returns inputs.

❶—INPUTS

This is where each channel gets its signal, connect an instrument or microphone here. These inputs accept either XLR or ¼'' jack connectors. Unbalanced jacks can also be connected.

❷—INSERTS

Use these ¼" jacks to insert an external effect in the channel's signal path. The insert point is post-EQ and the signals are: Send=Tip, Return=Ring (also see "Signal flow diagram" on page 11).

❸—EFFECT SENDS BALANCED OUTPUTS

Effect sends buses are output through these balanced jacks. These outputs should be connected to the inputs from one or more external effects.

❹—EFFECT RETURNS BALANCED STEREO INPUTS

The output signal from the external effects (❸) is returned into the mixing console through these balanced input jacks. They can also be used as stereo inputs, if needed.

❺—MASTER STEREO BALANCED OUTPUTS

These are individual (left and right), balanced outputs for the master buses, in XLR and ¼" jack versions.

❻—PHONES OUTPUT

Headphone amplifier output jack.

❼—EF 1 & 2 INPUTS

Inputs for each of the two envelope followers. If no cables are connected to these jacks, Envelope Follower 1's pre-patched input will be the signal coming from Channel 1. Envelope Follower 2 will receive the signal from Channel 2.

❽—USB

Usb-A input (provided cable).

❾—POWER

Power supply connectors (power supply provided) & switch.

CV MODULATION

LOW FREQUENCY OSCILLATORS

❶—LFO SPEED

This knob sets the speed of the LFO. Alternatively, in MIDI sync mode (❹), it sets the tempo division, ranging from Tempo × 32 to Tempo ÷ 32.

❷—LFO SYMMETRY

Sets the symmetry of the waveform.

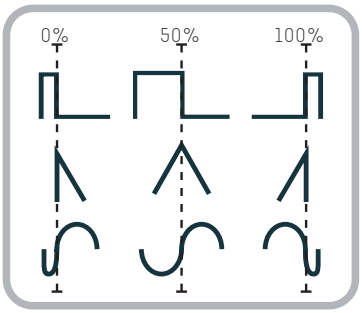


FIGURE 3: LFO SYMMETRY WAVEFORM SHAPES

❸—LFO WAVEFORM

Selects the output waveform between sine, triangle and square.

❹—LFO SYNC

This switch toggles syncing the LFO to the USB MIDI input in the back of the unit (see page 8).

❺—LFO AMOUNT

This knob with a mid-detent sets a bipolar amount for the LFO and the inverted LFO outputs:

- Middle: the amount is zero;
- Right: the amount is positive;
- Left: the amount is inverted/negative.

The LED underneath the knob indicates the LFO's actual output value present at the LFO output mini jack, as attenuated/inverted by the Amount (AMT - ❺) knob.

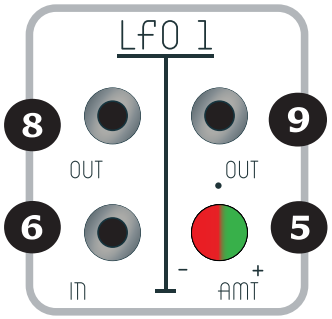


FIGURE 2: LFO CV-CONTROLS

❻—SPEED CV INPUT

Input for modulating the speed of the LFO using a CV 3.5 mm jack.

❼—SPEED CV INDICATOR

Bi-colour LED providing visual feedback of the LFO Speed CV input's (❻) value. Green means positive voltage, while red is negative.

❽—LFO OUTPUT

Outputs the LFO CV.

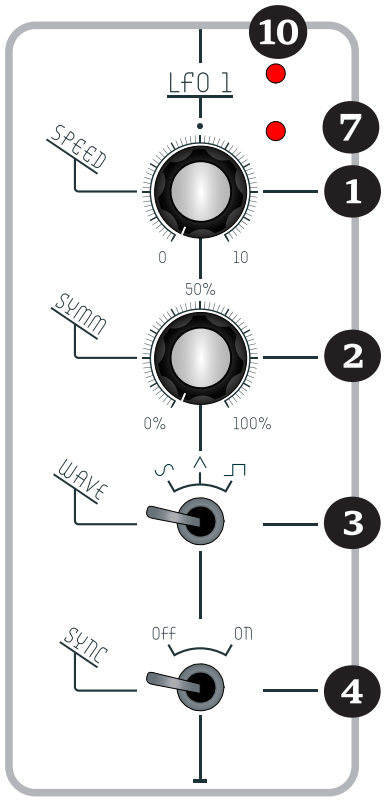


FIGURE 1: LFO MAIN CONTROLS

❾—INVERTED LFO OUTPUT

Outputs the inverted LFO CV.

❿—LFO OUTPUT INDICATOR

Bi-colour LED providing visual feedback of the LFO's output value. Indicates bi-polar CV values: green means positive voltage, while red is negative.

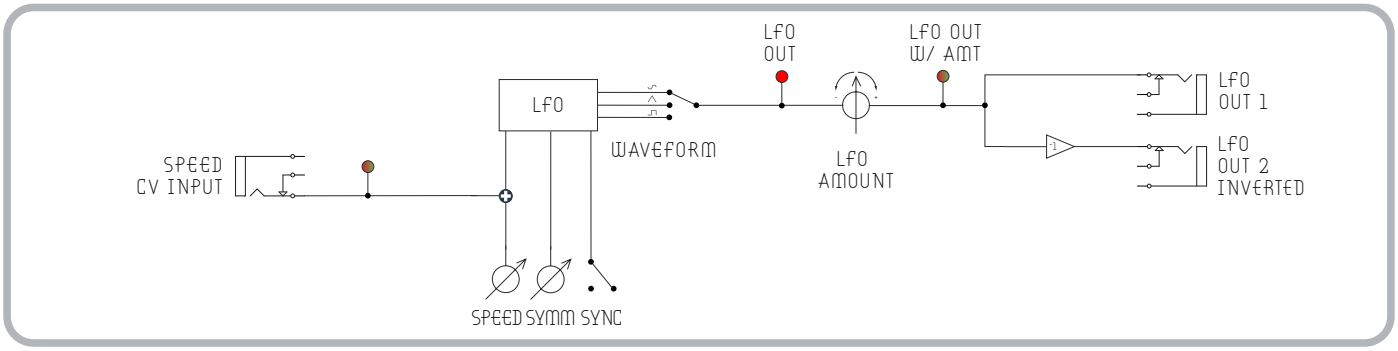


FIGURE 4: LFO SIGNAL FLOW

CV MODULATION

ENVELOPE FOLLOWERS

❶ — SENSITIVITY

Sets the envelope follower's sensitivity to the input signal.

❷ — ATTACK

Sets the attack time of the envelope follower.
Range: 3 milliseconds - 2 seconds.

❸ — DECAY

Sets the decay time of the envelope follower.
Range: 35 milliseconds - 4.5 seconds.

❹ — HI-PASS

Sets the cutoff frequency for the Hi-Pass filter found at the input of the envelope follower.
Range: 30 Hz - 15 kHz.

❺ — LO-PASS

Sets the cutoff frequency for the Lo-Pass filter found at the input of the envelope follower, after the Hi-Pass.
Range: 10 Hz - 20 kHz.

❻ — EF OUTPUT AMOUNT

This knob has a mid-detent and sets a bipolar voltage amount for the EF and inverted EF outputs:

- Middle: the amount is zero,
- Right: the amount is positive
- Left: the amount is inverted/negative.

ⓘ Negative amounts can be used to create "pumping" effects on some channels' signals.

The LED underneath the knob indicates the EF's actual output value present at the EF output minijack, as attenuated/inverted by the Amount (AMT-❻) knob. The LED indicates bi-polar CV values: green means positive voltage, while red is negative.

❼ — EF CV OUTPUT

Outputs the envelope follower CV.

❽ — EF OUTPUT INDICATOR

Bi-colour LED providing visual feedback of the EF's output value. It indicates bi-polar CV values: green means positive voltage, while red is negative.

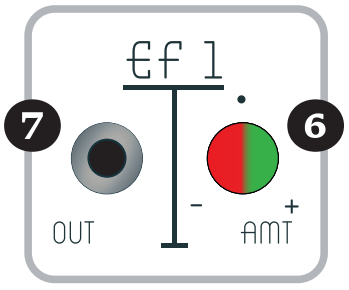


FIGURE 2: ENVELOPE FOLLOWER CV-CONTROLS

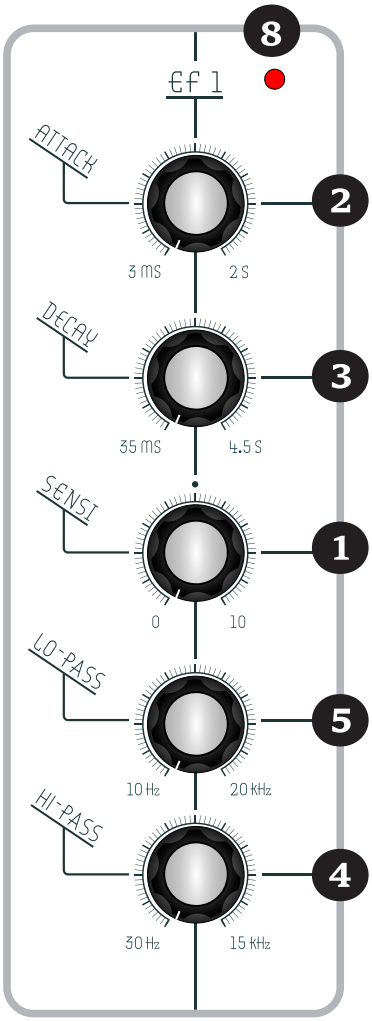


FIGURE 1: ENVELOPE FOLLOWER MAIN CONTROLS

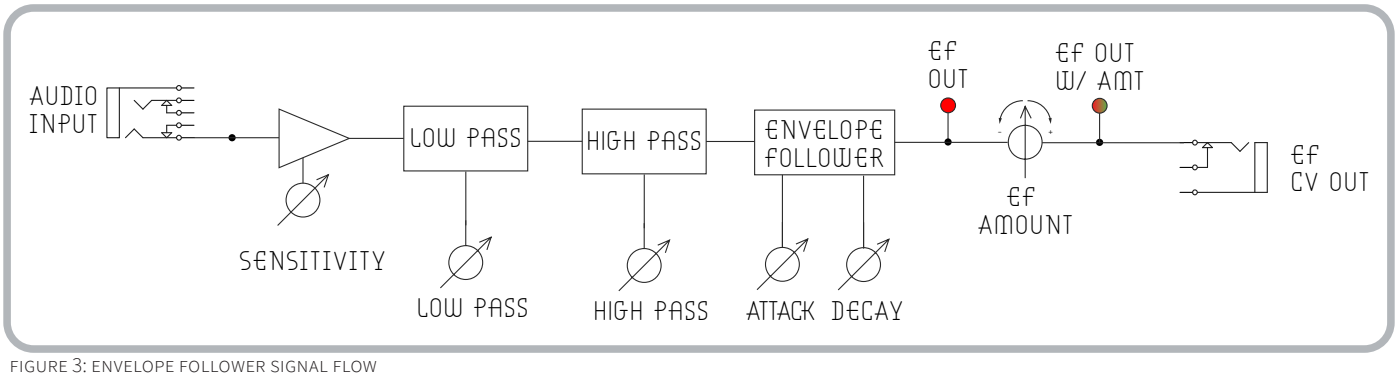
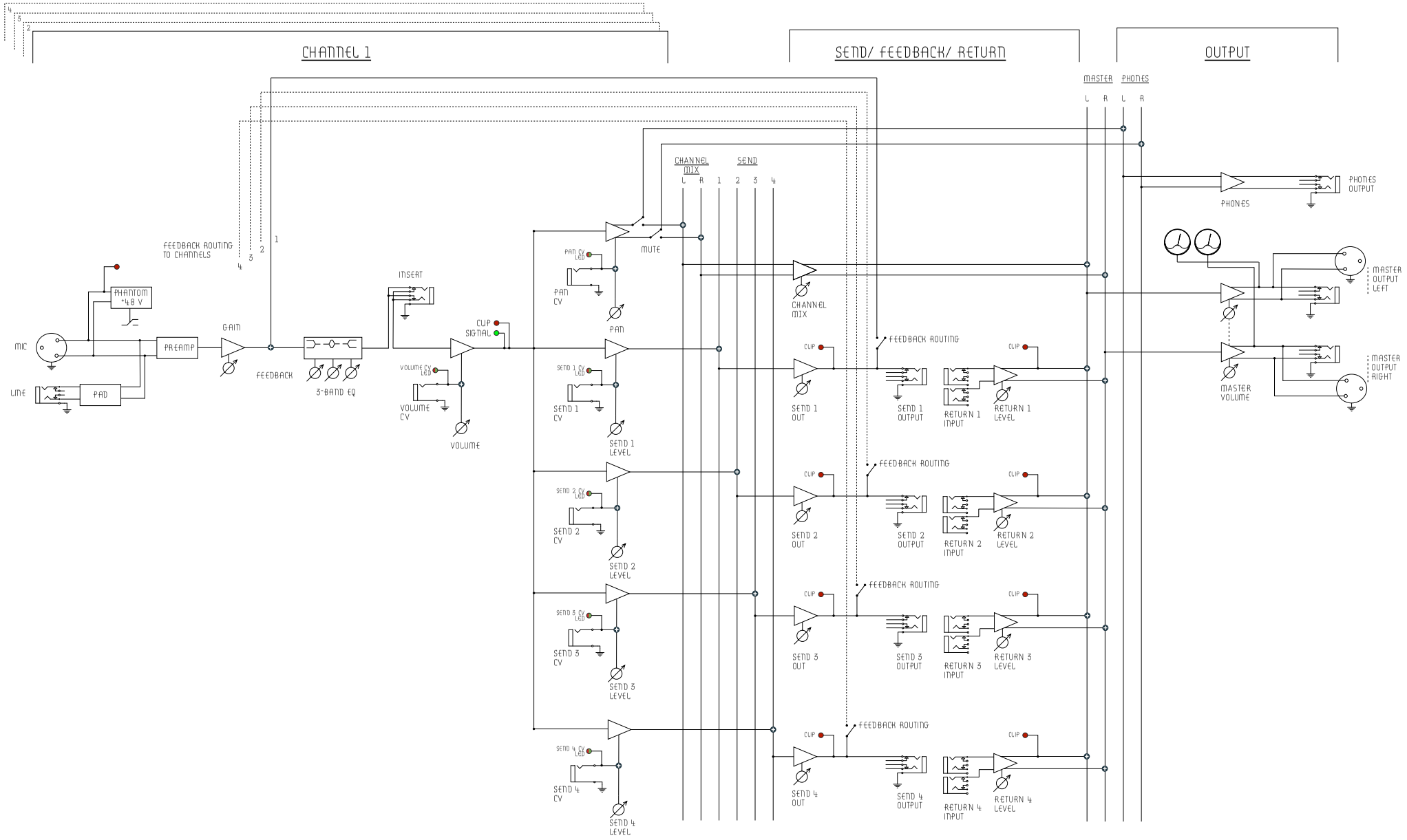


FIGURE 3: ENVELOPE FOLLOWER SIGNAL FLOW

SIGNAL FLOW DIAGRAM



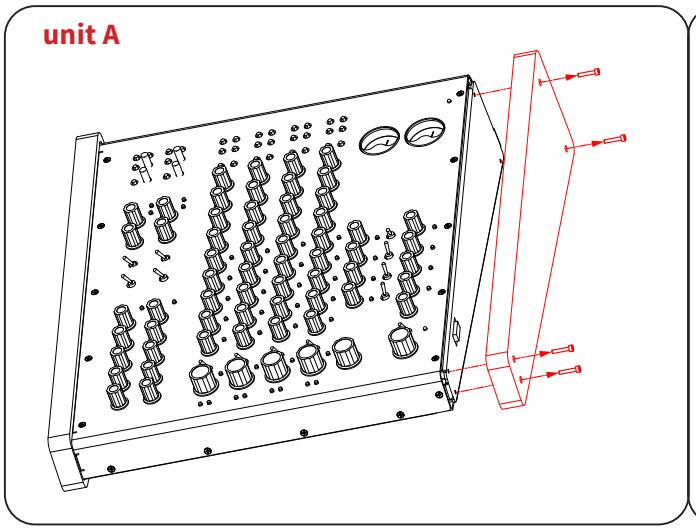
CHAINING UNITS

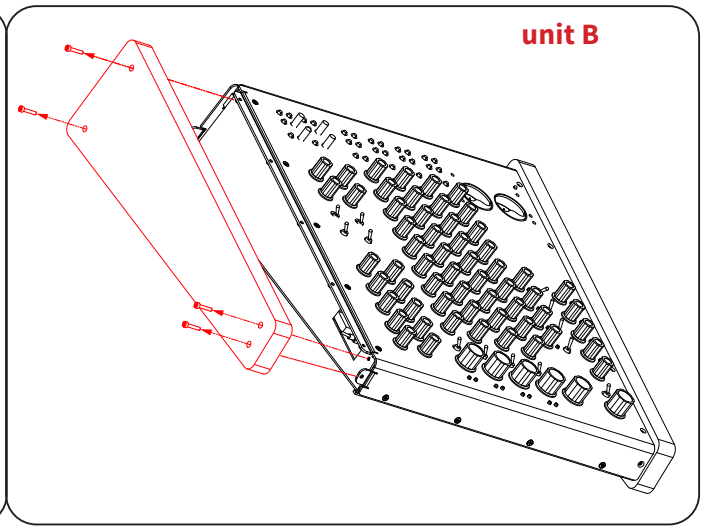
STEPS

TOOLS

1.S2 3.0 Hex screwdriver head (alternatively: T10 star head)
2.PH1 cross screwdriver head

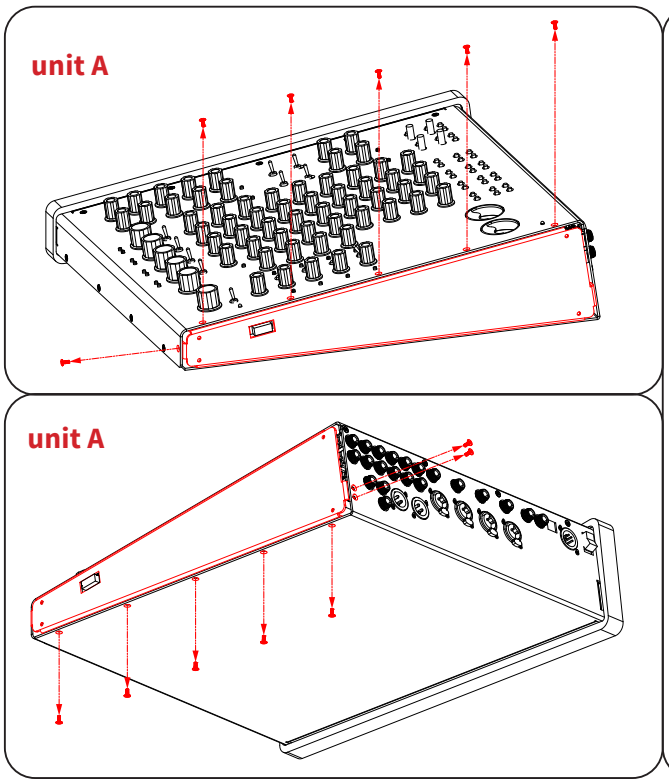
ATTENTION! Each unit must be powered by its own power supply. The units do not share their power supply with other units connected to them.

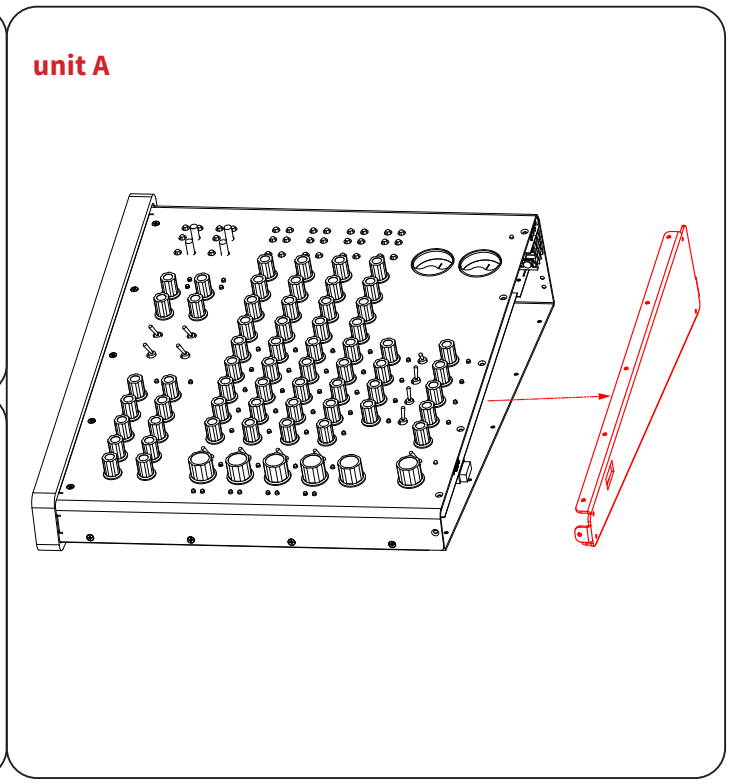




1 Unscrew and remove the right wooden side from unit A (4 hex screws).

2 Unscrew and remove the left wooden side from unit B (4 hex screws).

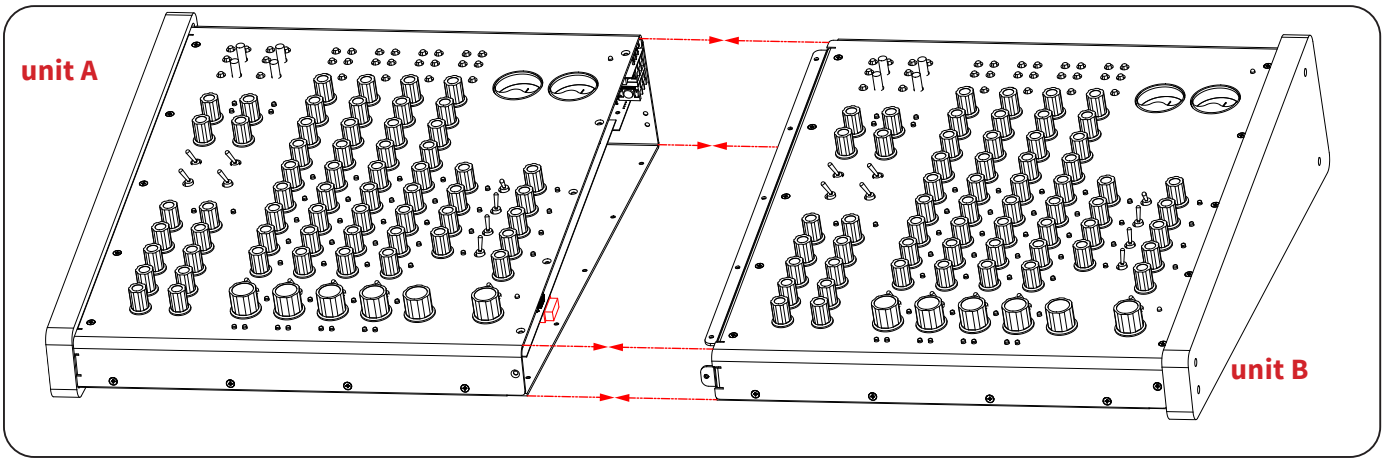




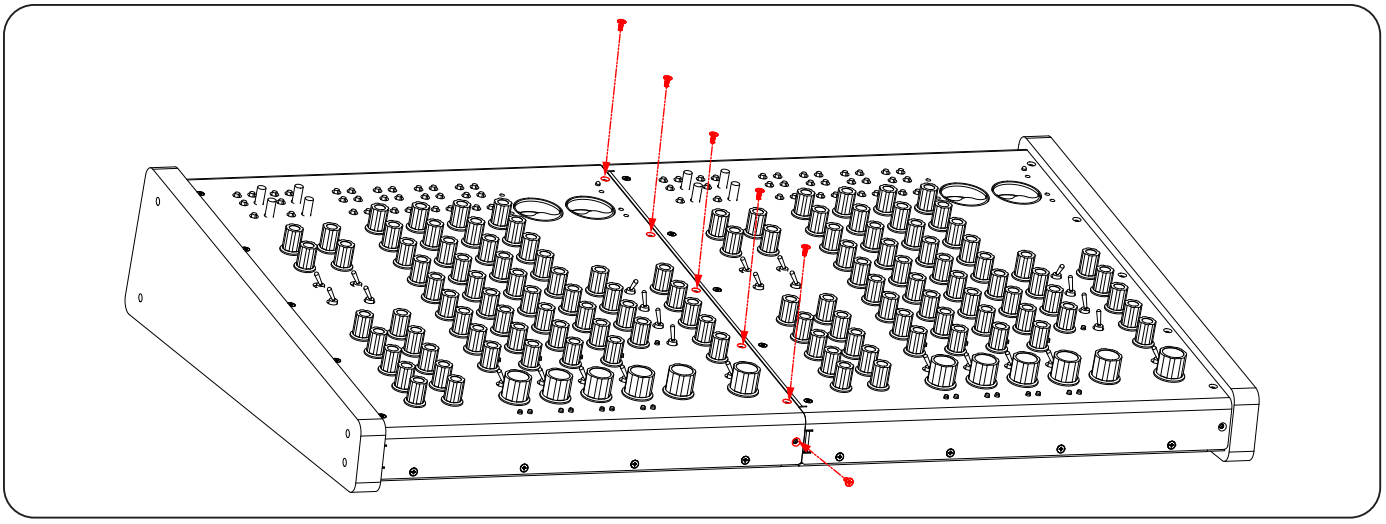
3 Carefully unscrew and remove the right metal side from unit A.
Top side: 5 screws; Front: 1 screw; Rear: 2 screws; Bottom: 5 screws.

CHAINING UNITS

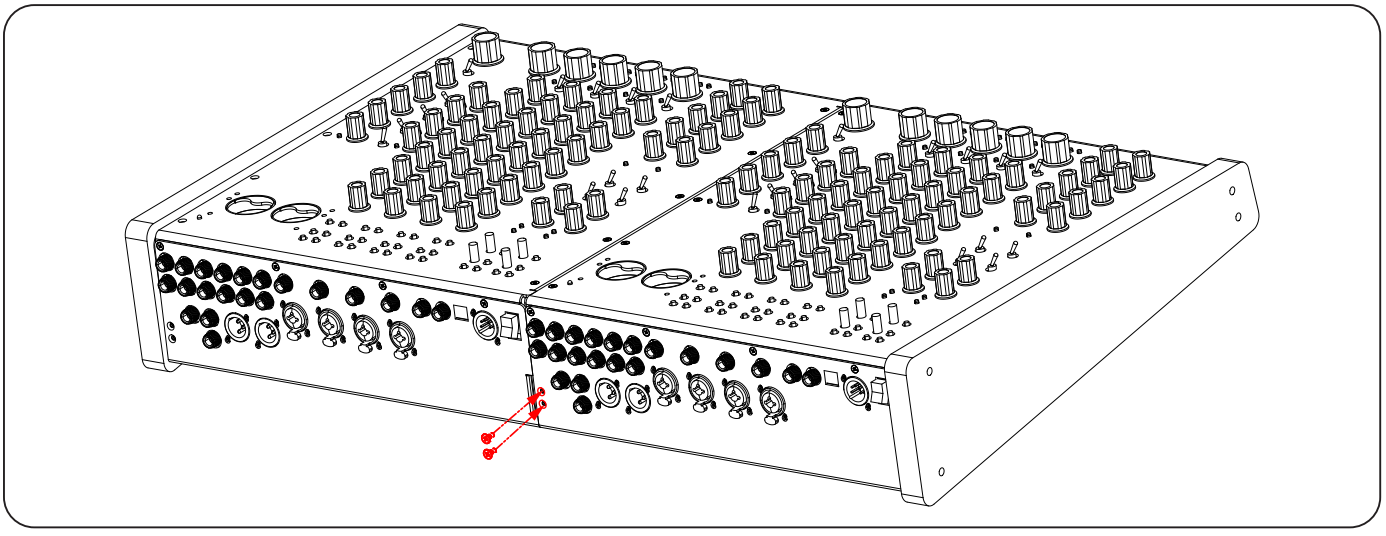
STEPS CONTINUED



4 Place unit A on the left and unit B to the right. Connect them and ensure the pin-connectors on both sides are locked.



5 Fasten the units together. First, screw in the 5 screws on the top. Next, the screw on the front.



6 Finally, fasten in the 2 screws on the rear side of the mixer. Done!

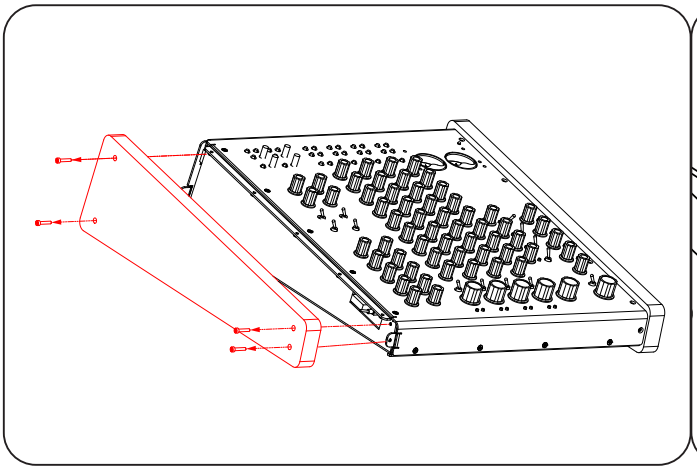
MAINTENANCE

FIRMWARE UPDATE

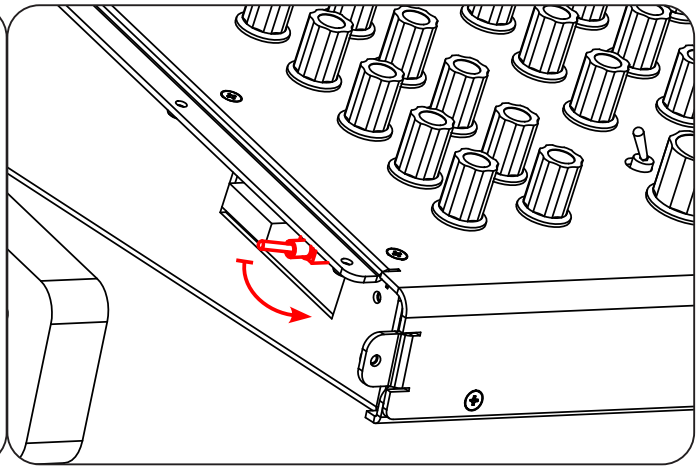
STEPS

TOOLS

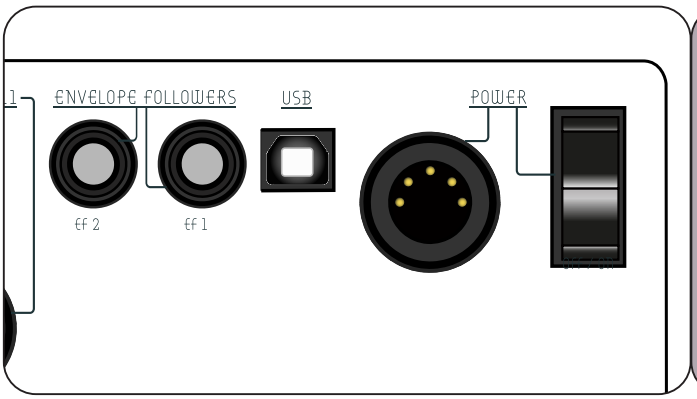
1.S2 3.0 hex screwdriver head (alternatively: T10 star head)
2.USB cable
3.Computer



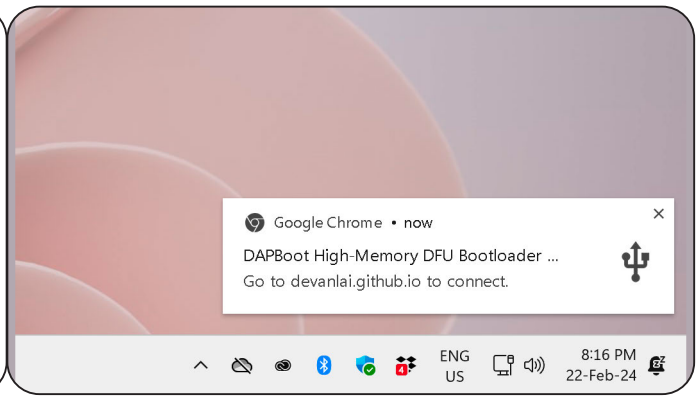
1 Unscrew and remove the left wooden side (4 hex screws);



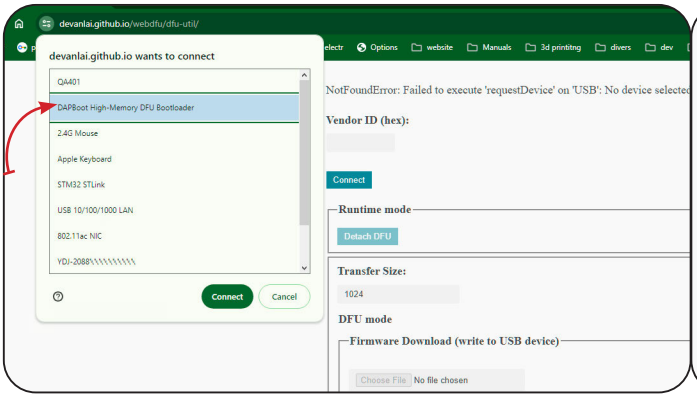
2 Locate the Firmware update switch;
3 Turn the switch lever towards yourself;



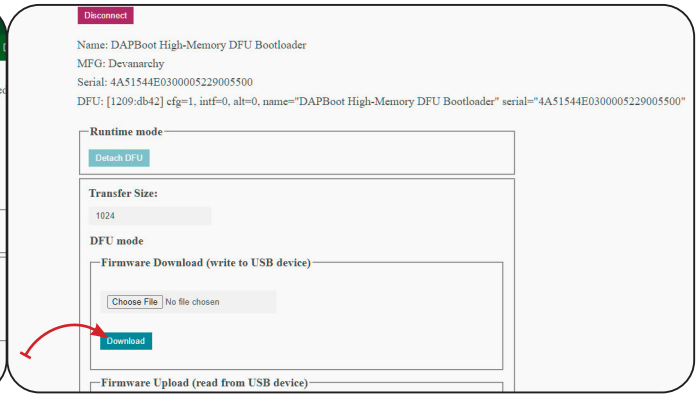
4 Turn the device on;
5 Connect USB cable to computer;



6 Windows users: click on the message box in the lower right corner of the screen;



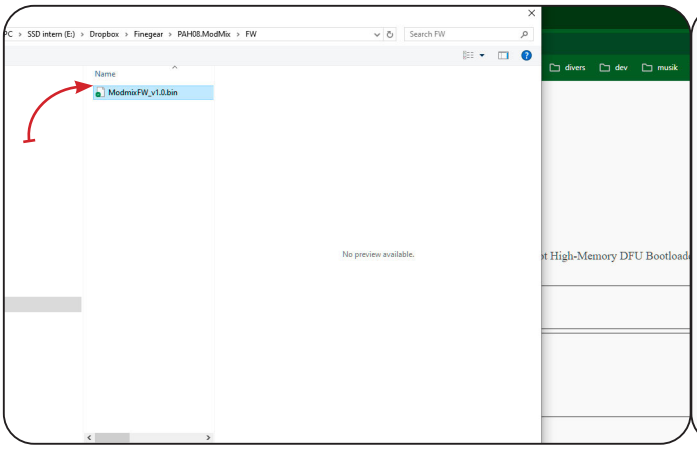
7 Connect to the DAPBoot High-Memory DFU Bootloader;

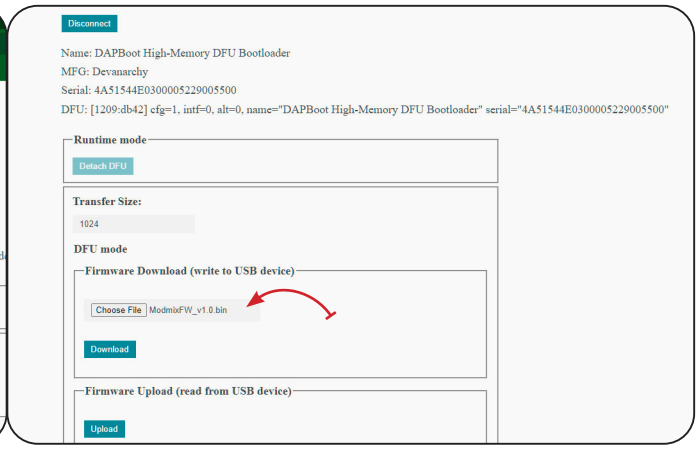


8 Click Choose file;

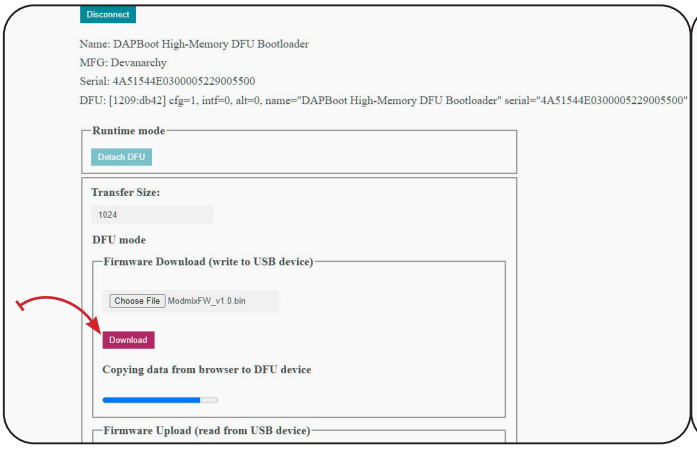
MAINTENANCE

FIRMWARE UPDATE - STEPS CONTINUED

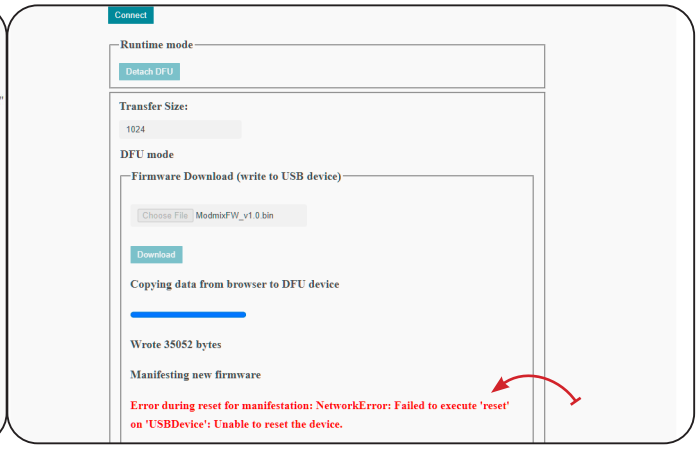




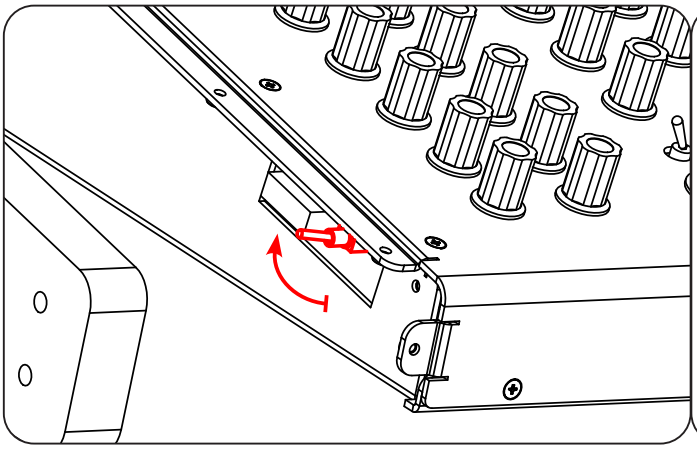
9 Select the ModmixFW_vX.X.bin file;



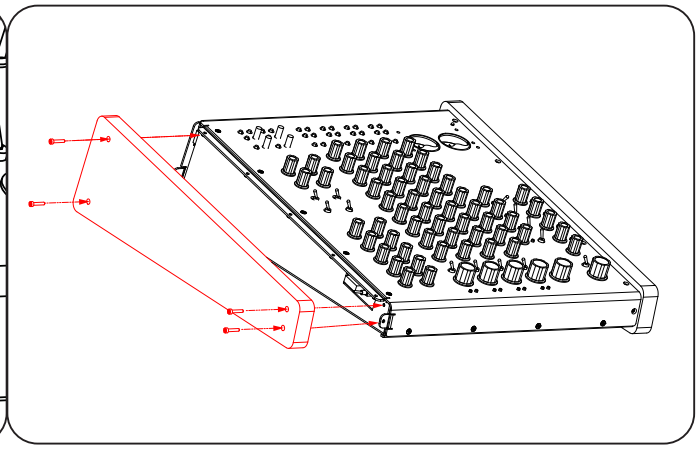
10 Click Download;



11 Ignore error message;
12 Turn the device off;
13 Disconnect the USB cable;



14 Return the firmware update switch back to its original position, away from yourself;
15 Turn the device on. The LFO LEDs must turn on, showing that the LFOs are working.



16 Screw the Left wooden side back in (4 hex screws).

Done!

MAINTENANCE

GENERAL CARE

- Keep away from direct sources of heat or water.
- Avoid placing on soft surfaces; the unit heats up.
- Use a soft microfiber cloth or a brush to remove dust.
- Avoid applying stickers on the faceplate.
- Use diluted alcohol on a micro-fiber cloth to remove stains.
- The wooden sides are made of walnut, finished with wax. If you find the coating has degraded, you can a apply a thin layer of wax (hair styling wax will do) with a soft cloth or directly with your fingers.

TECHNICAL SPECIFICATIONS

MIXING CONSOLE

Current draw:
≈1 A for each rail (+12 V, -12 V)

Impedance:
Input:
- unbalanced: 10 kΩ;
- balanced: 20kΩ

Effects send out:
- unbalanced: 40 Ω;
- balanced: 80 Ω

Effects return:
- unbalanced: 22 kΩ;
- balanced: 44 kΩ

Output:
- unbalanced: 40 Ω;
- balanced: 80 Ω

Phones: 20 Ω

SNR: -95 dB

Crosstalk: -80 dB

Input amp gain:
Microphone: -∞ to 40 dB
Line: -∞ to 20 dB

Aux Send gains: -∞ to 10 dB

EQ:
High (60 Hz): ±10 dB;
Mid (300 Hz -1.9 kHz): ±10 dB
Low (12 kHz): ±10 dB.

Volume amp gain: -∞ to 6 dB

Frequency response:
Master amp gain: -∞ to 10 dB
Phones amp gain: -∞ to 15 dB
Stereo returns amp gain: -∞ to 10 dB

Dimensions: 43 x 38 x 12 cm
Weight: 5 kg

POWER SUPPLY

Supply:
Voltage input: 220/110 V
Voltage output: 12 V, -12 V, 48 V
Maximum current draw: 1 A on each rail (+12 V, -12 V)

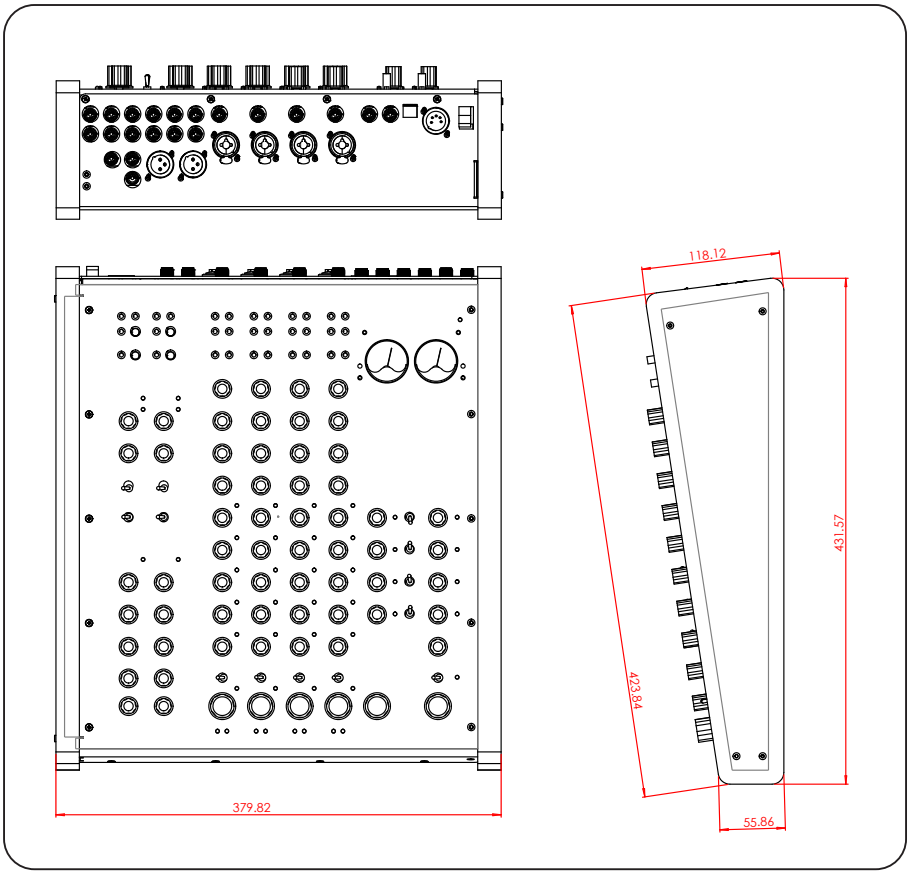


FIG. 1 MODMIX DIMENSIONS (MM)

MODMIX

USER'S MANUAL

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