CLAVE

Euclidean drum machine. 8 touch pads, one encoder and 3 knobs.

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Getting started

CLAVE plays eight drum channels, each with its own euclidean pattern. You pick a channel with its pad and shape it with the encoder and the knobs.

Quick start

1. Press **play**: the pattern starts.
2. Turn up the **master knob** (overall volume).
3. Touch a **pad** (1–8) to choose the channel you want to edit.
4. Turn the **encoder** to change the number of hits (K).
5. **pitch knob** = tuning · **level knob** = volume of that channel.

The 8 channels

1	Kick
2	Snare
3	Closed hi-hat
4	Low tom
5	Conga
6	Cowbell
7	Maracas / shaker
8	Clap

Each pad selects its channel and its LED shows the channel colour. The pad of the channel you are editing stays lit, at half brightness if that channel is muted. The pitch knob has a centre zone that snaps to the sample's original tuning; its LED tells you when you are there. Sequence length is global (1–16, 16 by default).

Controls

Every control does one thing on its own and another while you hold a modifier. Read across the row: the control, then what it does alone and under each of the three modifiers.

Control	On its own	+ shift	+ tempo	+ mute
play	Play / stop	Record automation (short) / clear it (2 s)	–	–
tempo	Tap the tempo in quarter notes	Double tempo (2x)	–	–
encoder	Hits K, or the cursor in linear mode	Accents: how many	BPM, fine adjust	Effect amount (wet)
swEnc + encoder	Rotate the pattern	Rotate the accents	–	Effect mode (16)
swEnc 2 s + encoder	Sequence length (1–16)	–	–	–
swEnc (press)	–	Accent the step under the cursor, linear mode only	–	–
pitch knob	Tuning	Accent amount, see "Accents"	Channel probability	LP filter cutoff
level knob	Volume (velocity)	Pan	–	LP filter resonance
pad 1–8	Choose the active channel	–	–	Mute that channel
preset	Load (short) / save (2 s)	Kit selection mode	–	–
master knob	Overall volume	–	–	–

A dash means the combination does nothing. The pitch and level knobs always act on the **active channel**, the one you picked with a pad.

Patterns

Each channel spreads its hits evenly over the sequence (euclidean mode), or plays the steps you place by hand (linear mode).

Probability

tempo + pitch knob: 16 = every hit plays · 0 = none · in between = random hit by hit, changing every lap without altering the euclidean pattern.

Sequence length

Hold **swEnc 2 s**: the ring turns amber; turn to choose 1–16 and press swEnc to exit.

Linear mode

shift + mute: place the steps by hand. The encoder moves the cursor and swEnc turns the step under the cursor on or off. It works per channel, so you can have some channels euclidean and others linear in the same song.

Accents in linear mode

In euclidean mode accents spread themselves out, like the hits. In linear mode you draw them: hold shift and press the encoder on the step you want to accent. If that step was off it turns on – an accent without a hit makes no sound.

Changing mode erases nothing

Going from euclidean to linear you inherit the hits and accents exactly as they were playing. Going back to euclidean, the channel keeps playing what you drew: the formula only takes over again when you ask it to spread things out, that is when you add or remove hits, rotate, or change the number of accents.

Accents

shift + **encoder** sets how many accents the channel has, and **shift** + **swEnc** + **encoder** rotates them. To have no accents at all, set the number of accents to 0.

Accent amount

shift + **pitch knob** sets the accent amount (0–12) for the active channel, and what it does depends on the channel:

Channels	What an accent does	The knob controls
1 kick · 2 snare · 3 hi-hat · 7 shaker · 8 clap	Accented hits play at full volume	How much the **non-accented** hits drop: from –3 dB (left) to –12 dB (right)
4 tom · 5 conga · 6 cowbell	Accented hits play at full volume **and higher in pitch**	How many semitones the accent goes up (0–12)

Presets

96 slots in 6 banks of 16. Three factory banks – euclidean (green), hip hop (orange) and latin (yellow) – and **three of your own**: blue, purple and cyan, **48 slots** you can save to. The factory banks live in the firmware: they can't be overwritten and they never take up your saving space.

Loading and saving

preset short loads, **preset** held 2 s saves. When loading and saving, **used** slots are lit and **empty** ones are dark. While saving, shift + swEnc empties the slot.

Your presets are kept in their own area of memory (256 KB), so all 48 fit with room to spare. If a save ever fails, the ring flashes **red**.

What a preset stores

For the 8 channels: pattern (K, rotation, accents), pitch, velocity, pan, linear mode, double tempo and probability; plus the sequence length and the automation.

Not stored in the preset, because they are global: the kit, the effect and the mute state.

Preset tempo

Every preset stores its own tempo, but only imposes it if you load it while the machine is **stopped**: loading a preset then is choosing the tempo you are about to start with. While playing, the BPM you already have wins, so changing preset live never breaks the pulse, and stop/play doesn't move it either. Factory presets carry no tempo of their own and respect yours.

Backing up presets to your computer

The *Backup presets* page of the webflasher can read every preset you saved, download them as a `.txt` file and **load them back into CLAVE**, each one into the slot it came from. Slots that are not in the file are left alone. The machine must be stopped. Older backup files (firmware 3.0) can't be loaded back: they don't contain the whole preset.

Drum kits

There are **9 kits**: 5 factory ones (green on the ring) and 4 user ones (purple, only if they have content). The chosen kit is remembered at power-up.

Choosing a kit

shift + preset	Enter and leave kit selection mode
encoder	Browse the available kits (ring)
swEnc	Load the highlighted kit and exit

Uploading your own kits

From the *Upload Sound Kits* page of the webflasher you can preview 8 samples (one per channel) and save them to a user slot (1–4). They stay in the machine when you turn it off.

How to prepare your samples

- Mono WAV, 44.1 kHz, 16 or 24 bit. Whatever you upload ends up mono, 44.1 kHz, 16 bit.
- Up to **3 s per sound** and about **14 s in total** for the 8 sounds of the kit. Shorter is better.
- No silence at the start, so the hit doesn't arrive late.
- Normalize close to 0 dB: the page doesn't change the volume.
- A short fade-out at the end is **added by the machine**, so a sample that ends abruptly or gets cut at 3 s won't click.
- The output is stereo: each channel has its own pan.

Effects

16 modes. Cycle through them with mute + swEnc + encoder (one LED lights up in the colour of the effect) and set the amount (wet) with mute + encoder. Only one effect is active at a time and it is global: it is not saved in the preset.

Delay and reverb — 8 modes

All of them light the LED in magenta:

Room	reverb only (short)
Hall	reverb only (long)
Delay 1/8	delay only
Delay 1/4	delay only
Dub	dark delay + reverb
Slap+Room	slap + short reverb
1/4+Hall	delay + long reverb
Ambient	delay + wide reverb

The amount rises gradually (1 click ≈ 0.2%, half bar ≈ 16%, full bar 65%), so the small settings are usable on a drum machine, where a little goes a long way.

Processing effects — 8 modes

Each one has its own LED colour:

orange	SP404	Warm saturation / compression
red	Distortion	Aggressive clipping
cyan	Bitcrush	Fewer bits and lower sample rate (lo-fi)
green	Comb	Resonant comb filter, tuned to the tempo
blue	Short flanger	Narrow sweep, synced to the tempo
purple	Fast flanger	Wide, fast sweep, synced
yellow	Marked tremolo	Rhythmic gate in eighth notes: it silences the slice
pink	Stutter	Beat repeat in sixteenths: it records a slice and repeats it

They work on the signal coming in: if the overall volume is low, turn the master knob up to hear them properly.

Stutter and marked tremolo are opposites over the same pulse. The stutter records a slice of the master – the figure of the current tempo – and repeats it: during the slice it captures, the signal passes through live, and the following ones play back what it just recorded, so the effect is always made of what you have just played. Its amount sets how many slices go in a group (2 to 8), and the group re-syncs at the start of every bar. The tremolo does the opposite: instead of repeating the slice it **silences** it, and there the amount is the depth – at the minimum nothing is attenuated, at the maximum the silent half-eighth is total.

Filter and compressor

Resonant LP filter: mute + pitch knob (cutoff) and mute + level knob (resonance). It affects the whole mix, before the effects. **Master compressor:** always on internally.

Automation

Records 2 bars of pitch (per channel) and of the filter, looping.

Recording and clearing

shift + play short	Start recording (the channel LED blinks)
play	Leave recording – the automation keeps playing
play again	Stop
shift + play 2 s	Clear the lane you are looking at
shift + play + encoder click	Clear everything

While you record one channel, the automation of the others keeps playing. The filter is only recorded if you move it. Probability is not automated: it is a fixed value per channel.

Clearing works on what you are seeing. With no modifier it clears the pitch of the active channel; while you hold mute and look at the filter or at the effect, it clears that lane. The whole ring blinks in the colour of what was cleared. To wipe every lane at once – the pitch of all eight channels, the filter and the effects – hold shift and play and click the encoder: the ring blinks red, longer. When you clear the effects lane the amount goes back to the **last value you set by hand**, not to the one the automation left or to zero.

Connections and sync

> ⚠ **Only connect sync in with CLAVE powered on**, and if the clock comes from a passive multiple use a buffered one (or a dedicated output on your clock): CLAVE's input can load the signal and disturb the other modules.

Jacks and ports

Audio	1 × 3.5 mm stereo jack (output)
Clock sync	2 jacks: in and out
USB-C	2 ports: power, and data / MIDI
Power	5 V over USB-C

Clock input

CLAVE works out the resolution on its own: 1, 2, 4 or 24 pulses per quarter note (PPQN). For 1, 2 and 4 PPQN it picks the one that puts the tempo between 80 and 160 BPM. If your tempo is outside that range (170 BPM would read as 85, for example), **tap TEMPO in quarter notes** with the clock connected: CLAVE picks the resolution that matches your tap and remembers it.

It follows the tempo even while stopped, and when you press **play** it starts on the next pulse, in time. If the master changes BPM, CLAVE follows within one or two pulses; the more PPQN your clock sends, the tighter the tracking.

Clock output

2 PPQN (one pulse every two steps), 50% square wave, steady tempo. Low while stopped; 3.3 V logic. Two CLAVEs chain directly: sync out of one into sync in of the other.

MIDI clock over USB

CLAVE also follows external **MIDI clock** over USB (24 PPQN); while USB clock is present the jack input is ignored.

While connected to the computer

When one of the webflasher pages is connected to CLAVE and the machine is stopped, the ring breathes slowly in **orange**: that means "connected". While presets or samples are loading, the ring fills up like a **progress bar**, and a **green flash** means it finished. Press play and the ring goes back to showing the sequence, so you can try a kit while still connected.

MIDI

CLAVE speaks USB MIDI both ways over the data port: it can **drive** a DAW or another machine with its patterns, and it can **be played** from a pad controller or a keyboard.

CLAVE as a sequencer

Every hit that sounds goes out as a note on **channel 10**. The eight channels are notes **36 to 43**, in their own order:

Note	Channel	Note	Channel
36	1 Kick	40	5 Conga
37	2 Snare	41	6 Cowbell
38	3 Closed hi-hat	42	7 Maracas
39	4 Low tom	43	8 Clap

They are consecutive on purpose: in a drum rack they fall as a 2×4 block in the resting view, with nothing to scroll.

The **accent travels as velocity**: an accented hit sends 127, a normal one between 90 and 32 depending on where you leave the accent amount. That holds for all eight channels, including the three where the machine plays the accent as a jump in pitch. A muted channel sends nothing, and nothing is left hanging when you stop.

What crosses and what does not. Everything that decides *whether* and *when* a hit sounds goes to MIDI: the pattern, the rotation, probability, mute, swing, the accent and the transport. Everything that decides *how* it sounds stays in the machine: pitch, kit, reverb, delay, filter, volumes and pan. As a controller CLAVE is an eight-track euclidean sequencer with dynamics, and the instrument is at the other end.

The knobs as CC

The 18 controls send CC, so you map them once with MIDI learn and save it as a template:

Control	CC
Level, channels 1–8	20–27
Master filter: cutoff / resonance	30 / 31
Pitch, channels 1–8	40–47

CLAVE's knobs are not one per channel: there is one pitch knob and one level knob, and they act on the **active channel**. So the CC number depends on the layer you have selected – move the pitch knob with the kick selected and it goes out on the kick's CC; step into the snare and the same knob goes out on its own. They are sent only when the value changes, and only while the knob is actually moving. In Ableton the input needs both **Track** and **Remote** switched on.

Note that the knobs keep acting on CLAVE's own sound, so moving a CC also moves what the machine plays.

Playing CLAVE by hand

A pad controller or a keyboard plugged into the **data port** can play the eight voices: notes 36 to 43 again, on any MIDI channel, so there is nothing to configure on the controller. It sounds with the sequencer stopped and also on top of the pattern. The velocity of the pad scales the level of that channel, so the level you set is the ceiling and a soft hit sounds soft. A muted channel still sounds when you play it by hand – the mute belongs to the sequencer, not to your finger.

For this, CLAVE has to start up with the controller already connected: plug it into the data port, power CLAVE from the other USB-C port, and then switch it on. The ring flashes **green** once the controller is ready. One device at a time, and while it is connected the webflasher pages are not available.

Power-up combos

Hold the buttons **while you plug in the USB** (or while you reset). The light of the mode comes on as soon as the machine sees the combination, even if you are still holding it. To leave and carry on booting, **click the encoder** (swEnc); if you don't touch anything it leaves on its own after 30 s. Every setting is stored: it survives power-off.

All the combos

shift + play	Download mode, to install firmware from the browser (this one enters on its own)
swEnc	Reverse the encoder direction (release it, then click again to carry on)
shift + tempo	LED brightness: turn the encoder and leave with a click
preset + play	Colour-blind palette
mute + play	Left-handed mode
play + tempo	Start-up preset: random or the last one used

Brightness

The ring, the indicators and the pads dim together. Useful for playing in the dark or for recording video. The maximum is 50%, because the LEDs are what draws the most current and above that the touch sensor can lose power. Colours stay readable all the way down to the minimum.

Colour-blind mode

Swaps the colours of the eight channels for a palette that can be told apart with any kind of colour blindness, and keeps the two that could still be confused as far apart as possible on the ring. An accent stops being a complementary colour and becomes the same colour, brighter.

Start-up preset

By default CLAVE powers up with a **random factory preset**, so you don't always hear the same rhythm – nothing is lost, your own presets are still in their slots. Hold **play** + **tempo** while plugging in to switch to **the last preset you used**, and hold it again to go back to random.

Left-handed mode

Bars are drawn from the top towards the right. By default they start at the bottom and climb up the left side, because your right hand covers the right side of the ring when you turn the encoder.

Buttons and LEDs

What each light on the panel is telling you.

Buttons

play	play / stop
preset	load / save
tempo	tap tempo
mute	mute and effects
shift	modifier
swEnc	encoder switch

The 16-LED ring

The steps of the active channel, in its colour. Accents use a different colour and empty steps stay dark. The white playback cursor only appears while playing; stopped, you see the real state of every step. In linear mode a dot also marks where the encoder cursor is.

Bars and the mute view

The **bars** – effect, filter, probability, tempo, accents, length – start at the bottom and climb up the left side, so your hand doesn't cover what you are adjusting. The **mute view** uses that same left half: one LED per channel, lit if it sounds.

The 4 indicators

Original pitch · sequence mode of the channel · reserved · automation (blinks while recording, steady while playing back; in the preset and kit views it shows the bank).

The 8 pad LEDs

In the mute view they show which channel sounds. Outside it, they mark the channel you are editing.

Updating the firmware

Connect the machine over USB and open the webflasher in desktop **Chrome**, **Edge** or **Brave** (it does not work in Firefox or Safari): clave.oficinadesonido.org. Kits and presets are uploaded from there too.

Installing

To put the machine in download mode, hold **shift** + **play** while you plug the USB cable in. The version a page installs is shown next to its Install button.

Keep your presets and kits

Before installing, the browser asks whether to erase the device and shows an **Erase device** checkbox. Leave it **unchecked**: the installer then writes only the firmware and your presets and saved kits stay in place. If you tick it, everything is wiped.

What changed since 3.0

If you are coming from the first public firmware:

- **Accents** work on every channel. Before, the amount knob did nothing on channels 1, 2, 7 and 8, and on the hi-hat it swapped the accent for a fixed 808 sound.
- **Presets** have their own memory. Up to 3.4 they shared the settings memory and filled it up after about 25, and the ones past that were lost on the next restart.
- **Reverb and delay amount**: a full bar is about 25% of what it used to be, and it rises gradually. The processing effects are unchanged.
- **Clock input** detects 1, 2, 4 or 24 PPQN on its own and follows tempo changes.
- **Brightness** tops out at 50%, so the touch sensor doesn't lose power.
- **Samples** get an automatic fade-out, and the webflasher shows progress on the ring.
- **Pitch knob:** it no longer drifts on its own at the edge of the snap zone, and leaving the zone moves by one semitone instead of two.
- **Filter and effects:** the master filter runs on the mix before the effects, so filter + reverb no longer breaks up.
- **Kick and toms:** no more click when a sound retriggers while its tail is still ringing.

Firmware, sound kits and preset backups:
clave.oficinadesonido.org

Desktop Chrome, Edge or Brave. Hold **shift + play** while you plug in the USB cable to enter download mode. Installing firmware keeps your presets and kits.

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