ECHON 6

Owner's manual

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Morphor
Radical Acoustics

Morphor ECHON 6 - Owner's manual
All you need to know to resonate with ECHON 6

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FOREWORD

Thank you for choosing ECHON 6.

By bringing this instrument into your hands, you've joined a story that began long before the first prototype powered on, one rooted in curiosity, collaboration, and a shared belief that technology and art are at their best when they meet in the middle.

Over fifteen years ago, we met while working in industrial R&D. That meeting set the foundation for everything that followed: friendship, experiments, music, and eventually a deep exploration into the expressive world of analogue delay lines, bucket-brigade circuits and exciter systems.

ECHON 6 stands as the culmination of that journey, our legacy of BBD research, hands-on analogue craft, and Eurorack design distilled into a fully-fledged, stand-alone musical instrument.

Belgium has a long and quietly influential tradition of electronic music and instrument making. We are proud to contribute to that lineage with a synthesizer built not only for performance, but for exploration, musicality, and a fresh perspective on sound design.

ECHON 6 invites you to search, to shape, to discover. Its architecture rewards both precision and play, encouraging you to embrace the beautiful imperfections that echo throughout nature, the subtle variations, resonances, and textures that remind us why analogue instruments remain so human.

In a world moving quickly, we wanted to create something that endures. An instrument built with care, with high-quality materials, with sustainability in mind. Something that can be opened, understood, repaired, and, hopefully, passed on. A machine designed for longevity, not obsolescence. A companion for decades of music. You now hold the result of years of work, thousands of decisions, countless experiments, and an unshakable belief that the poetry of music and the language of technology can harmonise into something meaningful.

We are truly grateful, and honoured, that you have chosen to make ECHON 6 part of your creative life. We hope it brings you a lifetime of inspiration, surprises, and sonic journeys.

Enjoy the instrument. Explore boldly.
And welcome to the ECHON 6 community.

Boris, Eli & Matthew

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REGULATORY & SAFETY

The small print

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REGULATORY COMPLIANCE

ECHON 6 has been designed and tested to comply with applicable safety and electromagnetic compatibility (EMC) requirements for the territories listed below.

CAN ICES-003(B)/NMB-003(B)

European Union (CE)

ECHON 6 complies with the relevant EU directives and harmonised standards. An EU Declaration of Conformity is available from the manufacturer on request.

United Kingdom (UKCA)

ECHON 6 complies with the relevant UK regulations. A UK Declaration of Conformity is available from the manufacturer on request.

Australia / New Zealand (RCM)

ECHON 6 complies with applicable ACMA requirements for electromagnetic compatibility and safety.

Canada (ICES-003 / NMB-003)

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

United States (FCC)

FCC compliance statement (Class B):

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and

(2) this device must accept any interference received, including interference that may cause undesired operation.

Disposal and recycling (WEEE)

This symbol indicates that this product must not be disposed of with household waste. Waste electrical and electronic equipment should be collected separately and recycled in accordance with local regulations. For information about returning end-of-life equipment, contact your local recycling authority or the manufacturer. ECHON 6 is marked with the crossed-out wheeled bin symbol in accordance with applicable WEEE requirements.

IMPORTANT SAFETY INFORMATION

Read these instructions. Keep them for future reference. Follow all warnings and instructions marked on the instrument.

POWER AND GROUNDING

- Use only the power supply specified for ECHON 6.
- Do not defeat the safety purpose of the provided power connection. If you are unsure about the power available in your location, consult a qualified electrician.

PLACEMENT AND HEAT

- Keep the instrument away from radiators, heat registers, stoves, or other heat sources (including amplifiers) that produce heat.
- Do not use or leave the instrument in direct sunlight.
- Use the instrument indoors only. Avoid operating in ambient temperatures above 32°C.

WATER AND MOISTURE

- Do not use this instrument near water. Do not expose it to rain or moisture.
- Do not store or use the instrument in humid or damp environments.
- Do not place objects filled with liquids (such as vases, glasses, or bottles) on or near the instrument.

CLEANING

- Unplug the instrument before cleaning. Use a dry or slightly damp cloth only. Do not use liquid cleaners, aerosol cleaners, or solvents.

CABLES AND STRAIN RELIEF

- Route all cables to prevent pinching, kinking, or strain on connectors.

- Disconnect by gripping the plug, not the cable.

HEARING SAFETY

- This instrument can produce high sound pressure levels. To protect your hearing, start with low volume and increase gradually. Use caution when monitoring with headphones.

EXTERNAL EQUIPMENT

- ECHON 6 can output professional line-level signals. When connecting to mixers, audio interfaces, pedals, or powered speakers (especially equipment designed for consumer line level) levels can become very loud very quickly. To protect your hearing and your equipment, turn down the destination device's input gain and monitoring level before making connections, then raise levels gradually. If the input clips or distorts, reduce ECHON 6's output level and/or the destination input gain.

SERVICING

- There are no user-serviceable parts inside. Do not open the instrument.
- Refer servicing to qualified service personnel. Servicing is required when the instrument has been damaged in any way, such as: power supply or plug damage, liquid spilled into the instrument, exposure to rain or moisture, abnormal operation, or the instrument has been dropped.

WARRANTY INFORMATION

ECHON 6 is covered by Morphor's limited warranty for two (2) years from the date of purchase (dated proof of purchase required). This warranty is transferable, provided that a dated proof of purchase can be presented.

This warranty covers defects in materials and workmanship under normal use. This warranty does not cover damage or malfunction caused by misuse, accident, neglect, improper installation, or unauthorised modification. This includes (but is not limited to): use of an incorrect power supply, incorrect mains voltage, liquid ingress, excessive heat or moisture, excessive signal levels, physical damage, or exposure to abnormal electrical conditions (power surges, improper grounding, etc.). Normal service rates apply to non-warranty repairs.

Morphor will, at its discretion, repair or replace the product or affected part. For service, please contact your dealer or Morphor support at support@morphor.io for return instructions/authorisation before sending the instrument. Please always include your serial number. The serial number can be found on the bottom of the unit, on the manual supplied with the instrument, and on the packaging. Unless required by local law, the customer is generally responsible for the cost of shipping the instrument to Morphor for inspection or servicing. If the issue is confirmed to be covered under warranty, Morphor will handle the repair or replacement and will arrange return shipping. (Regional policies may vary.)

Changes and/or modifications to the instrument not expressly approved by Morphor could void the user's authority to operate the equipment and may void warranty coverage.

For safe transport, we strongly recommend using the original packaging. If the original packaging is not available, use packaging that provides equivalent protection. Instruments damaged due to inadequate packaging may not be eligible for warranty coverage.

This warranty is provided in addition to, and does not affect, your statutory consumer rights under applicable local law.

THINGS YOU KNOW

And some tech specs

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WHAT'S IN THE BOX

ECHON 6 ships with everything you need to start playing immediately. We put care into the packaging, keeping it sturdy, practical and as close to mono-material as possible to simplify recycling while still protecting the instrument during transport. The box itself is designed to be reused. It is strong enough to safely store the instrument when not in use and ideal for transporting it between studios, rehearsals or sessions. Inside the box you will find the instrument together with its power supply, documentation and accessories for both desktop use and 19-inch rack mounting. Every item included is there for a reason and reflects our intention to deliver a complete, reliable and long-term musical tool.

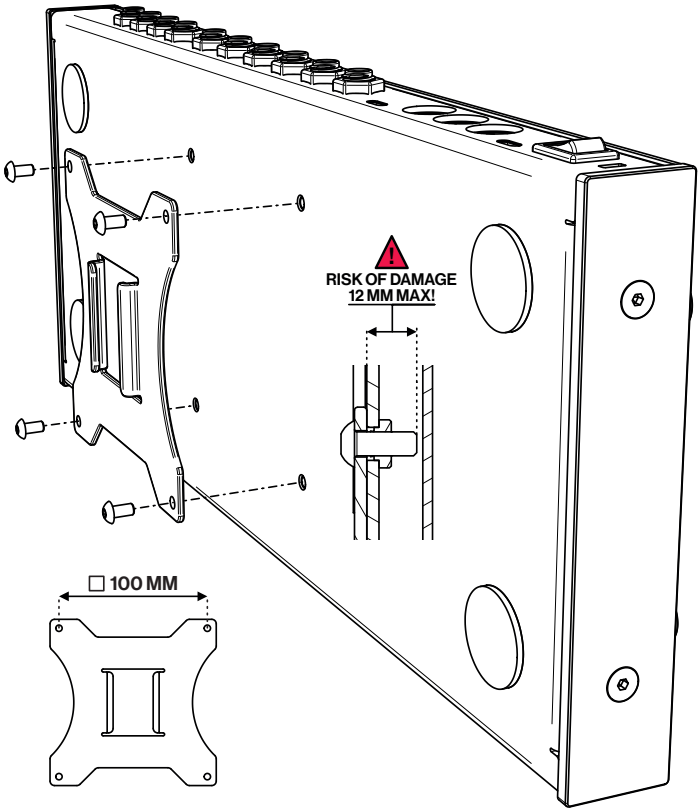
Included in the box:

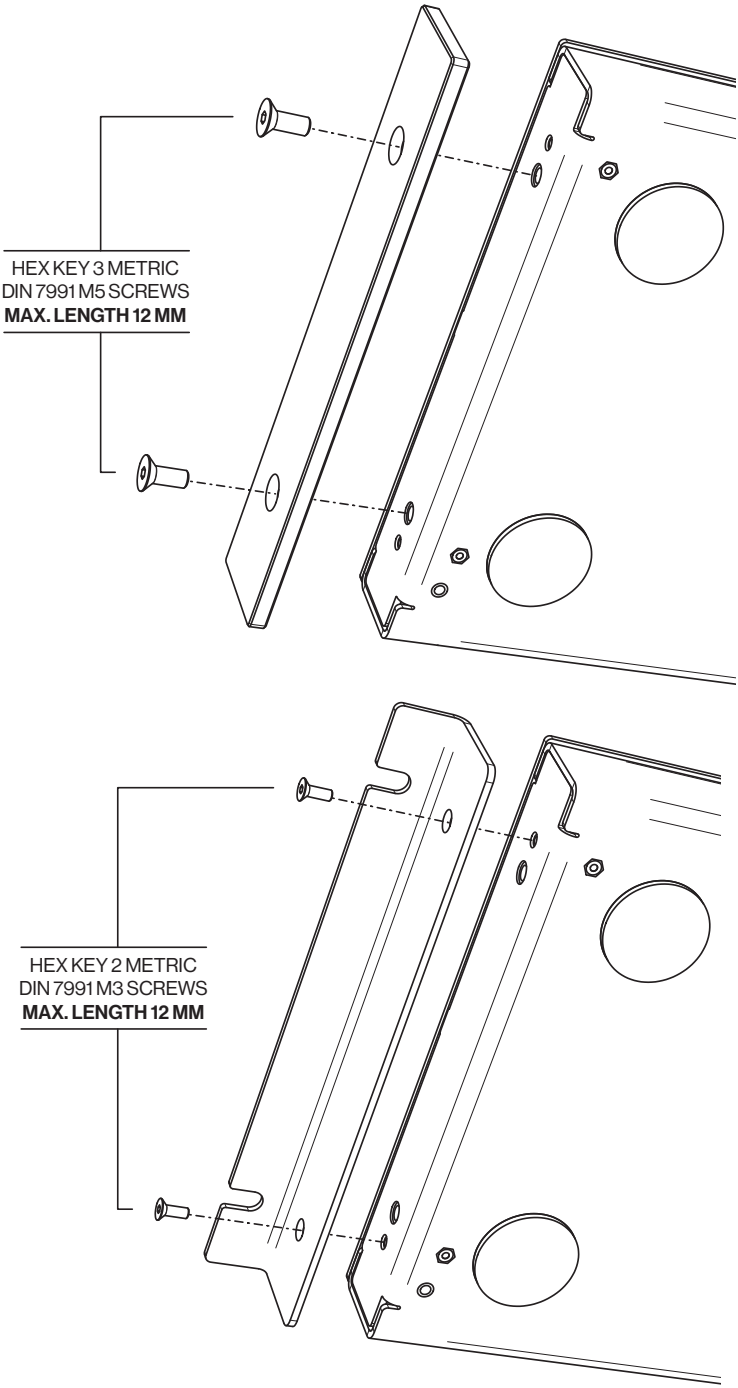
- ECHON 6
- USB-C power supply
- Owner's manual
- Quick start guide
- Two rack ears for 19-inch rack mounting
- Four M3×6 DIN7991 screws for assembling the rack ears
- USB-C cable to connect ECHON 6 to your computer

19” RACK MOUNT AND VESA MOUNT

To install the **19-inch rack ears**, first remove the side panels using a 3 mm hex key. Attach the rack ears to the chassis using the supplied countersunk M3 × 6 screws, and tighten them with a 2 mm hex key. To avoid damaging the instrument and voiding the warranty, never use screws longer than 12 mm.

ECHON 6 also supports a 100 × 100 mm **VESA mount** on the underside of the chassis. Use mounting screws that do not protrude into the housing by more than 12 mm. Longer screws can damage internal components and may void the warranty.




HEX KEY 3 METRIC
DIN 7991 M5 SCREWS
MAX. LENGTH 12 MM
HEX KEY 2 METRIC
DIN 7991 M3 SCREWS
MAX. LENGTH 12 MM

KEY FEATURES

GENERAL

- Feedback system with full analogue audio path
- 6-part multi-timbral architecture
- 6× Full analogue BBD resonators
- 6× True analogue VCO exciters
- 4× LFOs per voice (24 in total)
- 4× Random generators per voice (24 in total)
- Custom voice grouping (up to 6 groups)
- Comprehensive unison control
- Extensive modulation matrix (9 sources × 32 destination parameters)
- Global modulation attenuverters
- 216 user presets (6 × 6 × 6 structure)
- 1× 1/4" mono jack external input
- 2× 1/4" (L/R) TRS balanced main outputs
- 6× 1/4" stereo jack voice outputs
- 1× 1/4" stereo jack headphone output (independent level for pre-master monitoring)
- MIDI DIN In/Out/Thru ports
- MIDI USB-C (class-compliant device, no bus power)
- MIDI fully-remote controllable
- MIDI SysEx support
- Firmware update via USB-C
- 19" rack-mountable (black aluminium rack ears included)
- VESA-mount compatible
- Kensington security slot
- No display — 100% tactile operation

EXCITERS

- Analogue VCO: Sine, triangle, ramp, pulse and square waveforms
- External input: Accepts professional line-level audio source
- Crossfade control: Continuously variable blend between 2 VCO waveforms

and external input (when available)
- Noise generator: Analogue S&H noise circuit (full white noise spectrum)
- Noise mix: Crossfade between waveform and noise source
- Envelope generator: ADSR with onset delay
- Output level: Adjustable exciter output level

RESONATORS

- Input filter: 12 dB/oct low-pass filter (LPF)
- BBD feedback loop filter: 6 dB/oct low-pass filter (LPF)
- BBD type: 1024 stages per voice
- BBD circuit: High-precision control circuitry with pitch compensation
- BBD feedback type: Feedback polarity selector
- Feedback control: Fine adjustable level control
- Panning: Stereo spread control per voice
- Dry/wet mix: Adjustable blend of direct exciter and resonator signal
- Output level: Adjustable resonator output level

MODULATION SOURCES

- Envelope generator: DADSR with, legato and loop modes
- Quad LFO + Random Generator: 4x LFO + random generator per voice, uni-/bipolar, free or MIDI-sync, key reset, single-shot and crossfader
- Aftertouch: Channel or polyphonic aftertouch to add expressivity to any modulation destination per key
- Modwheel: Assignable to any modulation destination
- Velocity: Dynamic response for any modulation depth
- Key follow: Modulation scaling for any modulation across keyboard range

TECHNICAL SPECIFICATIONS

- Main outputs (L/R): 1/4" jack balanced (+4 dBu)
- Direct voice outputs (stereo): 1/4" jack (+4 dBu)
- Audio input (mono): 1/4" jack (+4 dBu)
- Headphone output (stereo): 1/4" jack (independent level)
- Power input: USB-C (9 V ⎓ 3 A)
- Power consumption: 15 W
- Tabletop Dimensions: 53 × 450 × 185 mm
- 19" Rack Dimensions: 4 U (+1 U for cables)
- Weight: 2.3 kg
- SysEx ID: 00h 22h 17h (MIDI manufacturer ID)

INTRODUCING ECHON 6

The first analogue BBD synthesizer

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ECHON 6 INTRODUCED

Each voice in ECHON 6 is built around a Bucket Brigade Device, or BBD, which is a specialised analogue chip designed to create delay by passing the signal through a long chain of tiny capacitors. You can imagine it as a line of people passing buckets of water from one to the next, each transfer happening in step with a running clock. When the clock runs fast, the sound moves quickly and the delay becomes short. When the clock slows down, the sound takes longer to move through the chain and the delay time increases.

A BBD on its own is simply a delay, but once a feedback loop is created, routing part of the delayed signal back into the input, something more interesting happens. The circuit starts to reinforce specific frequencies tied to the delay time and the clock speed. At certain points this reinforcement becomes resonance. The delay line starts to act like a vibrating physical object with a natural pitch. This very physical mechanism forms the foundation of sound designing on ECHON 6.

The behaviour of this resonance depends strongly on the harmonic content entering the BBD. ECHON 6 provides several places where this harmonic structure is shaped. It begins in the Exciter, which acts as a compact subtractive synthesizer. The Exciter can operate on its own, allowing ECHON 6 to function as a straightforward, 6 voice synth with noise, analogue wave shapes, a filter, an envelope generator and ample modulation options. When used in this way the instrument can create clean tones, evolving timbres or rich bursts of harmonics without ever touching the resonator. This is a valuable feature, because it lets you explore traditional subtractive sounds and modulation before stepping into the resonant world.

The Exciter also prepares the kind of signals that real physical bodies respond to. It can generate very short, bright transients similar to the initial pluck of a string or the strike of a drum membrane. It can also create sustained energy, which allows for bowed or blown style behaviour. This combination of short impulses and continuous tones means the Exciter can act like a tap, a bow, a breath or anything in between. The harmonic content produced here determines how the resonator will respond.

Before the signal enters the BBD, it passes through a gentle 12dB/oct low pass filter. This filter adjusts how bright or damped the excitation becomes. A brighter signal produces sharper, more metallic resonance while a more filtered signal creates rounder, more muted behaviour. Inside the feedback loop a second (even gentler 6dB/oct) low pass filter controls how the energy decays. By reducing the build-up of high frequencies it mimics how natural materials absorb brightness over time, allowing smoother decays and natural damping. Together these stages let you, decide how quickly the resonance blooms, how long it sustains and how it fades.

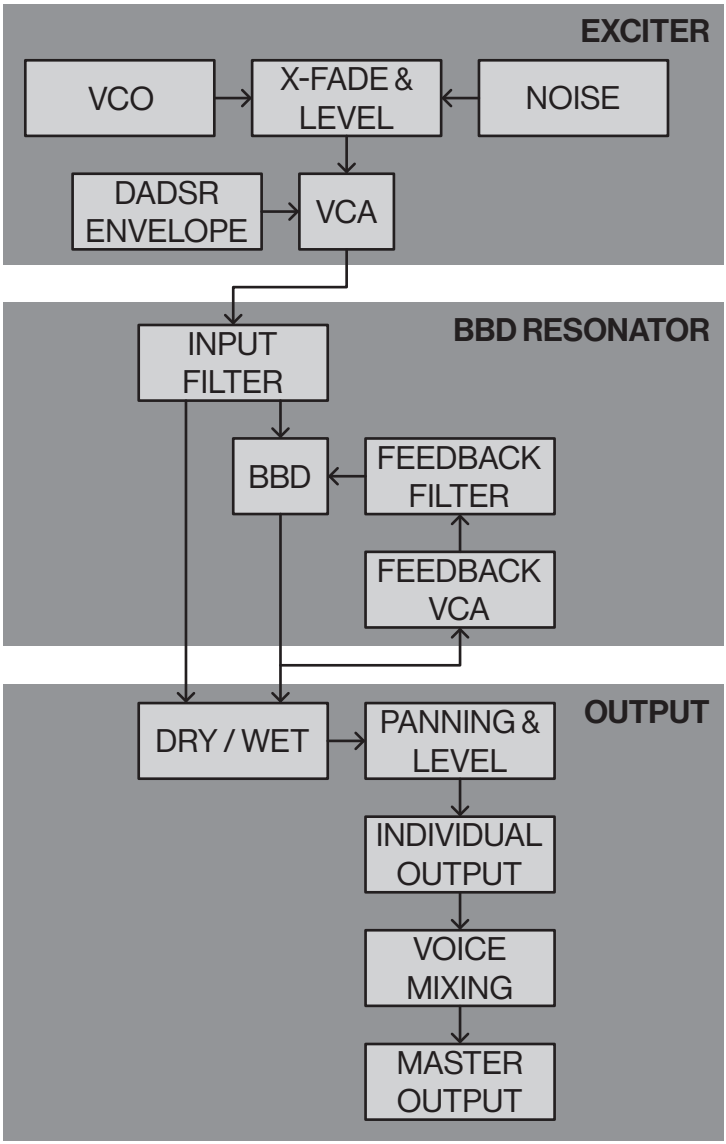
This type of sound design is often referred to as modal synthesis. Although modal synthesis is commonly associated with digital engines using many resonant filters per voice, ECHON 6 takes a different approach. Each voice contains only one analogue resonator. In a strict technical sense this means each voice behaves like a single resonant mode. Digital modal systems often stack dozens of modes inside one voice to create highly detailed material simulations. ECHON 6 does not attempt this. Instead, it offers six voices that each act as their own resonant body. When played individually, each voice produces a clear, focused resonance. When stacked in unison, the six voices combine into a multi mode structure. Slight differences in tuning, modulation and harmonic content allow these six resonances to interact in a way that feels lively and organic.

The result is a system that behaves with the spirit of modal synthesis while remaining firmly analogue. Sounds can shift from percussive plucks to sustained, evolving tones. A short burst into the resonator produces a sharp strike, while a continuous excitation causes the system to hold and transform the tone over time. Because of the analogue nature of the design, each resonance carries small variations that resemble the imperfections of acoustic materials. There is no static model here, only the behaviour that emerges from the interaction between excitation, filtering, delay, feedback and time.

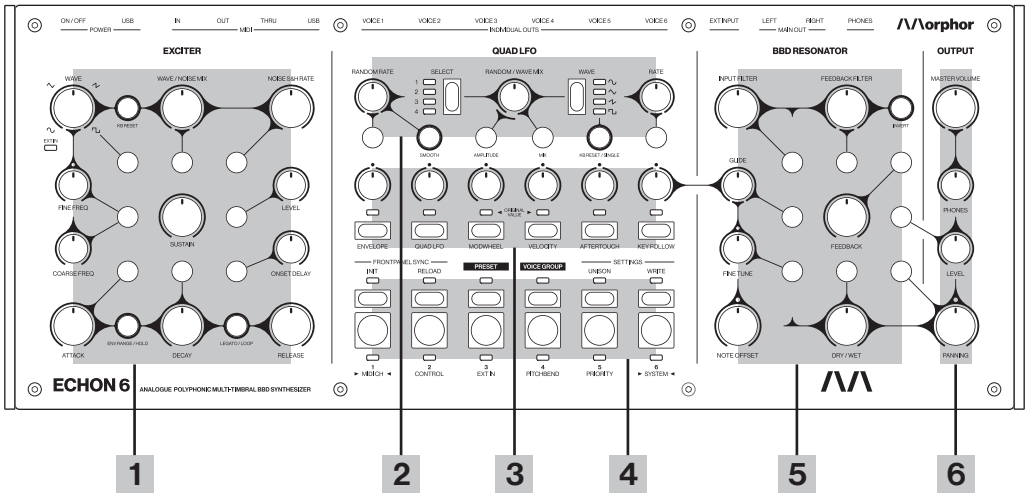
ECHON 6 does not aim to simulate real instruments with mathematical precision. Our goal is to give you an instrument that responds physically, one where resonance is born from real electronic motion rather than from algorithms. With its combination of a capable subtractive exciter, and a genuine analogue resonant delay per voice, it offers a distinctive landscape for exploration. You are

free to treat it like a traditional synthesizer, a resonant body or something entirely new. The architecture invites experimentation and rewards careful listening, allowing the instrument to become whatever you choose to excite into motion.

ECHON 6 is also a six-voice polyphonic instrument with multitimbral capabilities. Its six voices can operate together as a single sound, but they can also be organised into voice groups. Each voice group has its own sound settings, allowing different parts of the instrument to behave as independent timbres within the same preset. Voice groups can be layered to create thicker, richer or more complex sounds, or they can be addressed separately from different MIDI channels so that ECHON 6 functions as several instruments at once. One group might play a bass sound, another chords, while others provide leads, plucks, textures or percussion. This voice-group architecture gives ECHON 6 a flexibility that goes far beyond conventional polyphony.

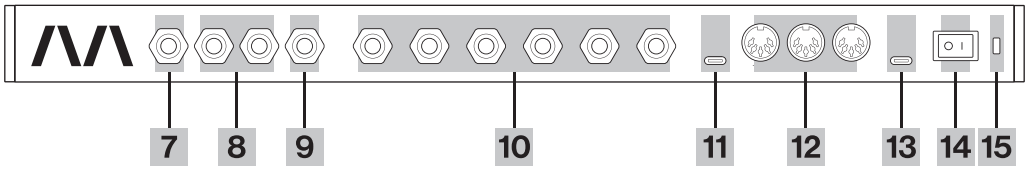

EXCITER
VCO
X-FADE & LEVEL
NOISE
DADSR ENVELOPE
VCA
BBD RESONATOR
INPUT FILTER
BBD
FEEDBACK FILTER
FEEDBACK VCA
OUTPUT
DRY / WET
PANNING & LEVEL
INDIVIDUAL OUTPUT
VOICE MIXING
MASTER OUTPUT

FRONT PANEL OVERVIEW



1. EXCITER SECTION
2. QUAD LFO SECTION
3. MODULATION SECTION
4. CONTROL SECTION
5. BBD RESONATOR SECTION
6. OUTPUT SECTION

BACK PANEL OVERVIEW



7. HEADPHONE OUTPUT
8. LEFT / RIGHT MASTER OUTPUT
9. EXTERNAL INPUT
10. INDIVIDUAL VOICE OUTPUTS
11. USB MIDI IN / OUT
12. DIN MIDI IN / OUT / THRU
13. POWER INLET
14. POWER ON /OFF SWITCH
15. KENSINGTON SECURITY SLOT

SETUP AND BASICS

Getting started

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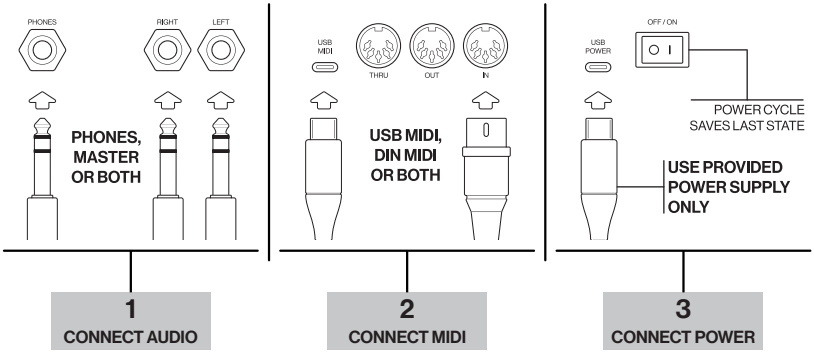
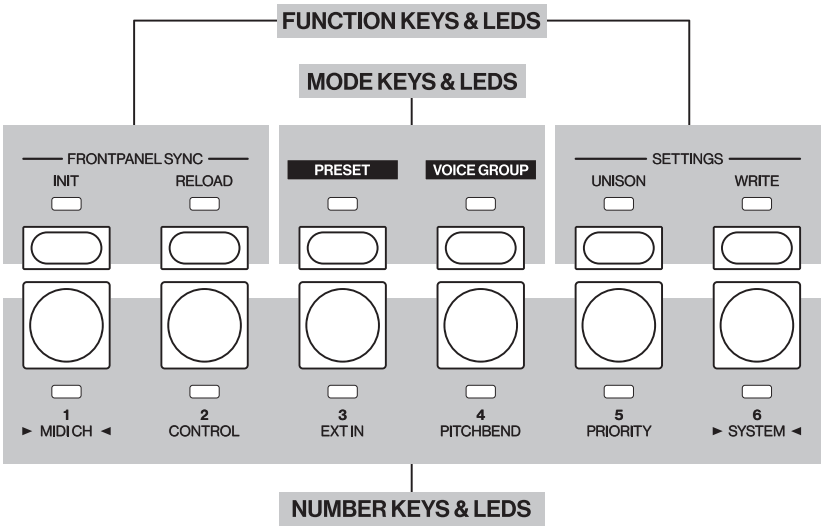
CONNECTING ECHON 6

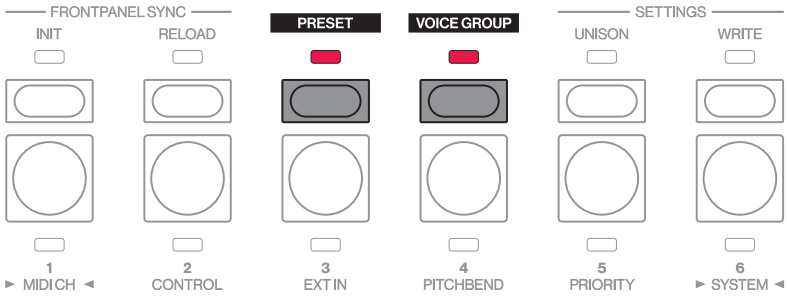


THE CONTROL PANEL



PRESETS AND VOICE GROUPS

ECHON 6 can operate on several levels of complexity, from a simple polyphonic synthesizer to a fully multi timbral instrument. To make this possible it offers two main operational modes: Preset Mode and Voice Group Mode. Although they work closely together, each mode serves a different purpose and understanding the distinction between them is key to navigating the instrument efficiently.



Preset Mode focuses on the complete sound configuration that is stored in memory. A preset can contain up to six independent voice groups, each with its own settings. When you load or save a preset, you are recalling or storing the entire structure of all included voice groups. This is the level at which full instrument setups are managed.

To enter Preset Mode, hit the PRESET key in the Control Section, the PRESET LED will be lit. For the first part of this manual this will be the mode we will be working from.

Voice Group Mode works at a finer level of detail. A voice group is a set of parameters that define one “sound block” inside the instrument. This sound block includes all settings related to that section of the instrument such as the exciter configuration, resonator settings, filters, envelope, modulation settings and routings, external input configuration and MIDI behaviour including note priority and pitch bend range. A voice group may contain one or several of the six available voices, depending on how you structure the instrument for a particular patch.

To enter Voice Group Mode, hit the VOICE GROUP key in the Control Section, the VOICE GROUP LED will be lit.

The relationship between the two modes is simple. A preset contains voice groups and a voice group contains voices. Preset Mode is for managing, recalling and storing entire structures, while Voice Group Mode is for editing and shaping the behaviour of each individual sound block inside that structure.

Preset Mode and Voice Group Mode form the backbone of ECHON 6's architecture. Switching between them allows you to move naturally from shaping an individual sound to organising the full structure of a complex patch. Once you understand their roles, creating polyphonic, layered or multi timbral setups becomes intuitive.

Before we explore multi timbral setups later in the manual, it makes sense to look at how presets are recalled and saved, and how the memory banks are organised. A preset contains the complete set of voice groups that define a sound, and understanding how to load and store these presets will let you explore the factory sounds, tweak them, or build your own from scratch, and navigate the instrument's memory with confidence. The next chapter explains how preset banks work and how you can save and recall your creations.

MEMORY STRUCTURE

PRESET AND GLOBAL MEMORY

ECHON 6 distinguishes between two types of memory: global memory and preset memory. Understanding the difference between these two is essential for navigating the instrument.

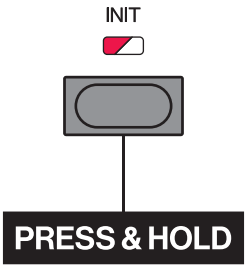
Global memory stores everything related to the behaviour of the instrument as a whole. This includes MIDI channel assignments and all System settings. These settings do not belong to any individual preset and remain constant regardless of which preset you load or save. These settings do not need to be explicitly saved. The instrument automatically stores their last state in global memory and recalls

it on power-up.

Preset memory stores everything related to the sound and the control thereof. This includes all voice groups, all sound parameters and all settings that shape or control the audio or the behaviour of a preset with its voice group(s). The settings of your unsaved preset are stored in the scratch-pad, these settings are automatically loaded on start-up.

ECHON 6's preset memory is organised into six banks, each containing six sub-banks and each sub-bank containing six preset slots. This results in 216 preset locations in total. When you load a preset, you recall the entire sound structure stored in preset memory. When you save a preset, you store the full sonic state of the instrument at that moment, without affecting anything stored in global memory.

INITIALISE PRESET OR VOICE GROUP



A good starting point for sound design on ECHON 6 is the INIT sound. It is an intentionally simple patch: a sustained sinusoidal tone generated by the Exciter, with keyboard tracking across the full range.

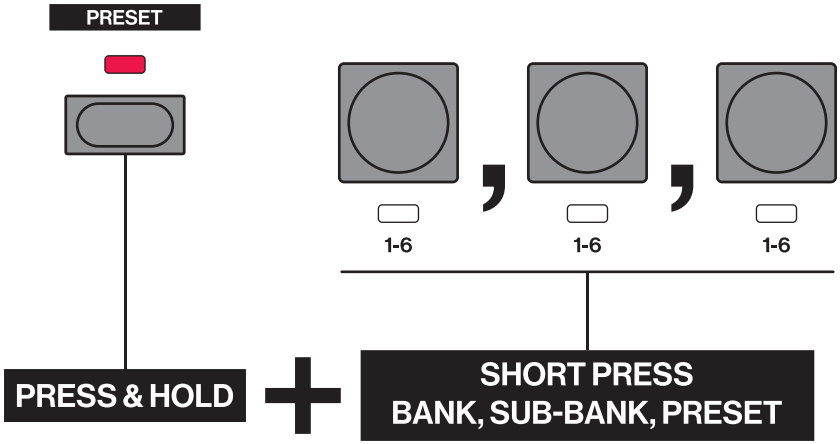
To recall the INIT sound, hold the INIT key. When the INIT LED starts blinking, the INIT sound has been successfully loaded.

What gets initialised depends on the mode you are in. Loading INIT in Preset Mode resets the entire instrument to the complete INIT preset, including the

preset structure. Loading INIT in Voice Group Mode resets only the selected voice group to the INIT sound, while the overall preset structure and any other voice groups remain unchanged. This allows you to reset the part of the instrument you are working on without affecting the rest of the setup.

When you load the INIT preset, the instrument uses a single voice group containing all six voices. In this configuration ECHON 6 behaves like a classic six-voice polyphonic synthesizer, with all voices responding to the same settings. This is the most straightforward way to play the instrument and where most users will begin. More advanced multitimbral and layered configurations are introduced later in the manual.

LOADING A PRESET



There are 216 preset slots, organised in 6 banks, with 6 sub-banks each. Every sub-bank can contain up to 6 presets.

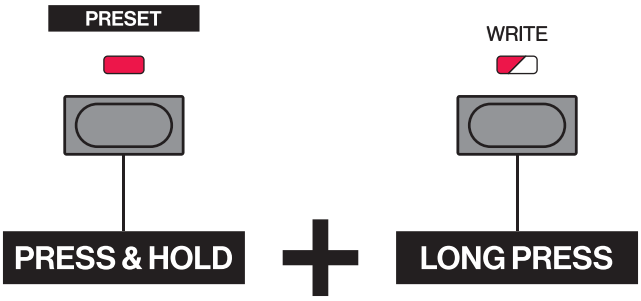
While the PRESET key is held down, the NUMBER LEDs show the currently loaded preset. The LEDs illuminate bank, sub-bank and preset in sequence with a short pause between cycles, allowing you to clearly see which preset is active.

To load a preset, hold the PRESET key and press three NUMBER keys in

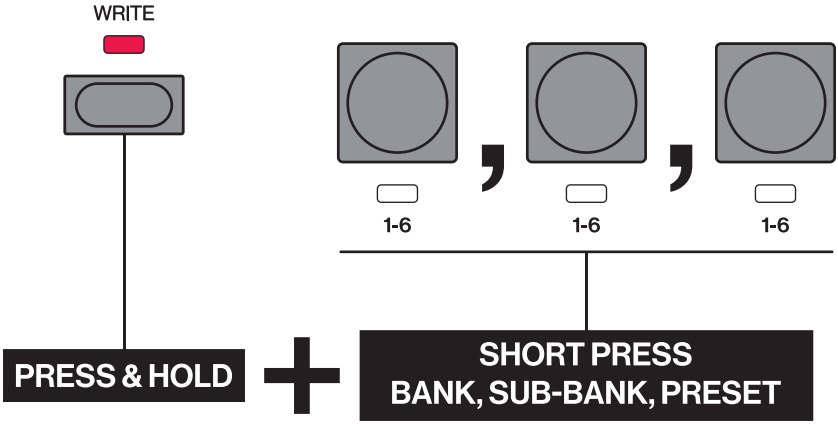
sequence. The first key selects the bank, the second selects the sub-bank and the third selects the preset slot inside that sub-bank.

For example, to load preset 416, which is the sixth preset in the first sub-bank of bank four, hold PRESET and press 4, 1 and then 6. The preset loads immediately.

SAVING A PRESET



There are two saving methods: overwriting the currently active preset or storing it in a new slot within preset memory.



To overwrite the current preset, hold the PRESET key and then hold the WRITE

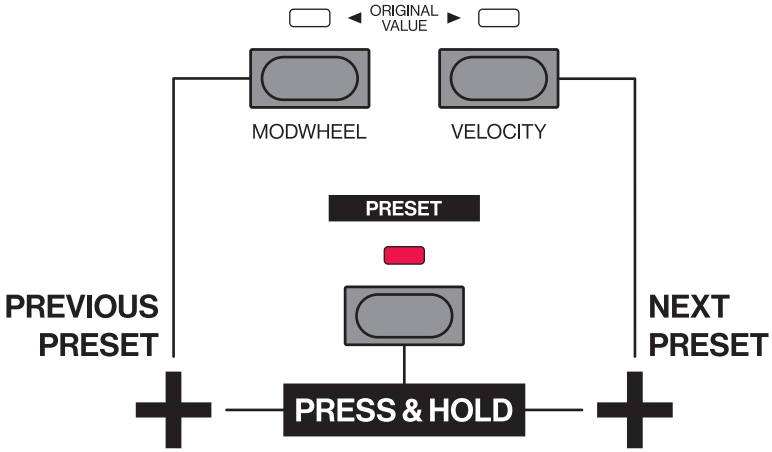
key. When the WRITE LED begins to blink, the preset has been saved and the previous version has been replaced.

To save the preset into a new location, hold WRITE and press the three NUMBER keys representing the target bank, sub-bank and preset slot. As soon as the three keys are entered the preset is saved and becomes active at its new location. For example, holding WRITE and pressing 5, 1 and 2 stores the current preset as 512.

All of this affects only preset memory. MIDI channel assignments and system preferences remain in global memory and are never overwritten by preset operations.

PREVIOUS / NEXT PRESET

To quickly step through the presets, hold PRESET and press MODWHEEL to select the previous preset, or press VELOCITY to select the next preset.



RELOADING A PRESET

During sound design it is often useful to compare your edits with the saved version of a preset. The RELOAD key offers this directly.

In Preset Mode the RELOAD LED lights up whenever unsaved changes have been made. Pressing RELOAD restores all voice groups to the last saved preset-state from preset memory. Pressing RELOAD again returns the instrument to the state it was in before reloading, allowing quick A/B comparison. This behaviour is also highly useful in performance settings, where you might create a manual buildup or evolving sound and then instantly return to the baseline state with a single press of a button.

In Voice Group Mode the RELOAD key works the same way, but only for the currently selected voice group, leaving all other voice groups untouched.

CONCEPTS RELATED TO PRESETS AND SAVING

UPS AND POWER ON/OFF MEMORY

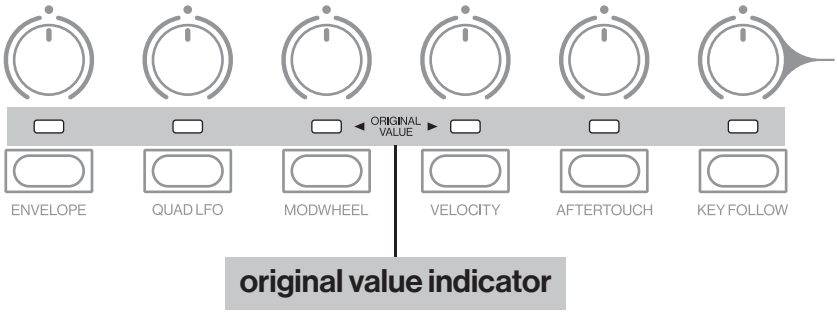
ECHON 6 makes use of a small UPS (Uninterruptible Power Supply). It is used every time ECHON 6 is powered off (manually or unintentionally) and provides just enough power to the system to store the current state of the synth in the scratch-pad of the preset memory. This ensures you never lose any valuable adjustments and that ECHON 6 always powers up just the way you left it when it was turned off.

TRANSFERRING PRESETS

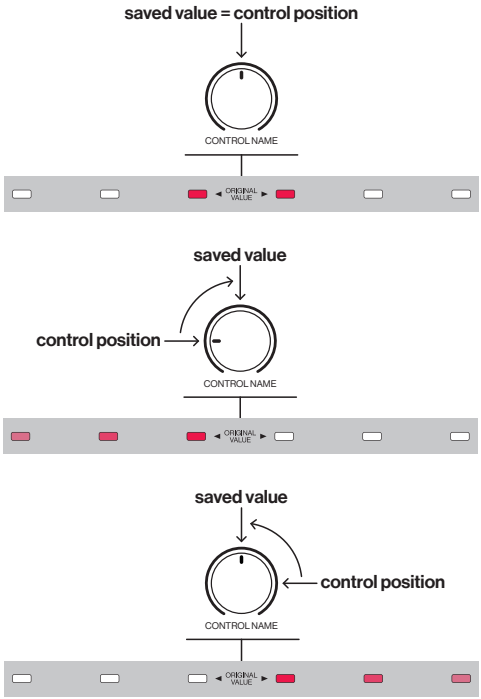
If you are wondering how presets can be transferred, backed up or exchanged between instruments, ECHON 6 fully supports preset import and export over SysEx. There is a dedicated online configurator tool that lets you manage your presets along with all system settings of your unit. Visit configurator.echon6.com in a Chromium based browser and connect ECHON 6 via MIDI over USB-C.

ORIGINAL VALUE INDICATOR

When editing a preset it is often useful to know how far a parameter has moved from its saved value. ECHON 6 provides a clear visual aid for this through its original value indicator. The modulation source LEDs temporarily take on a



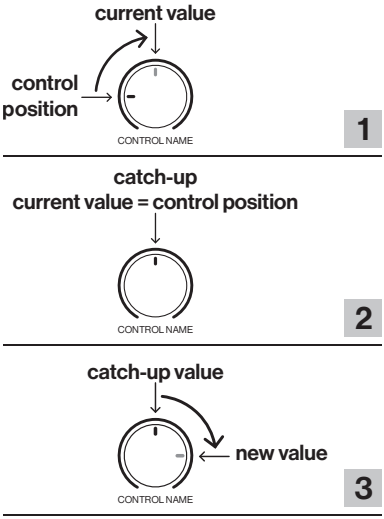
second function whenever you turn a control. Instead of showing modulation routing, they form a LED bar that represents the distance between the current control position and the value stored in the preset.



The behaviour of the LEDs is straightforward. When you adjust a control the LEDs light up outward from the centre. The further the control is from the saved value, the more LEDs illuminate toward either side. The two middle LEDs represent the exact value stored in the preset. When these centre LEDs light up together, the control is aligned with the preset. LEDs to the left mean you need to turn the control to the right to reach the saved value and LEDs to the right mean the opposite.

This visual feedback allows for precise and confident editing. Whether you are refining a preset or comparing, the Original Value Indicator ensures you always know where the true reference point of the sound lies.

CATCH-UP



When changing between presets or voice groups, the controls on the front panel of ECHON 6 don't always represent the actual value of the parameter. The catch-up setting prevents sudden jumps when you start tweaking. Touching a control does not instantly force the parameter to the control's current position. Instead, you move the control until it catches up with the parameter's actual value. Only

once you reach that point does the control “take over,” and further movement changes the parameter normally.

Catch-up is disabled by default and can be enabled through the system settings.

FRONT PANEL SYNC

Press INIT + RELOAD to perform a front panel sync. This forces the internal sound engine to match the current positions of the front panel controls, so the sound immediately reflects what you see. Front Panel Sync is handy when you want to quickly bring a different voice group in line with the panel state , or any time you need to eliminate a mismatch between the stored values and the control positions.

VOICE ARCHITECTURE

Diving deeper

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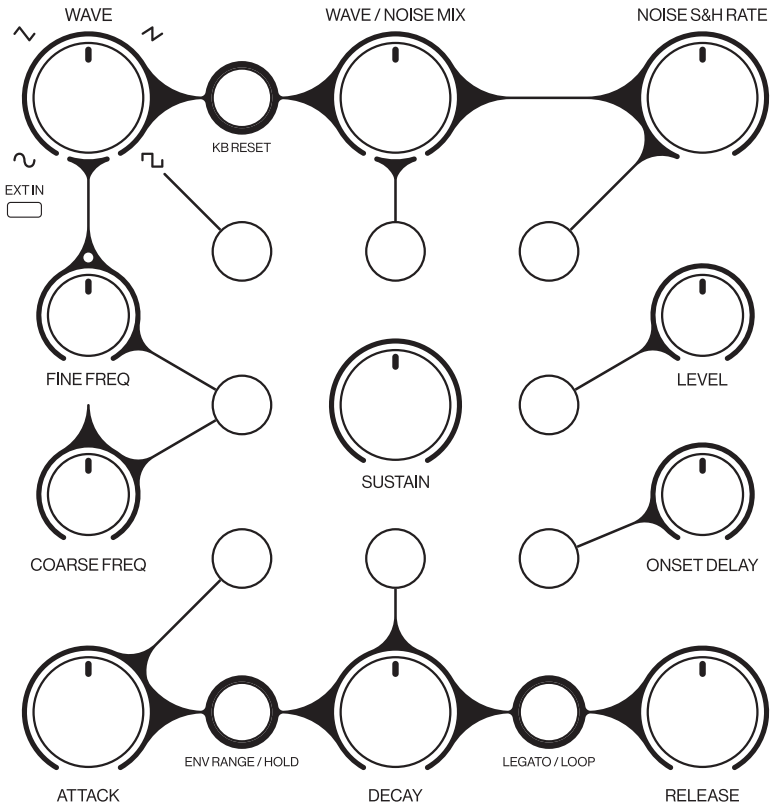
EXCITER SECTION

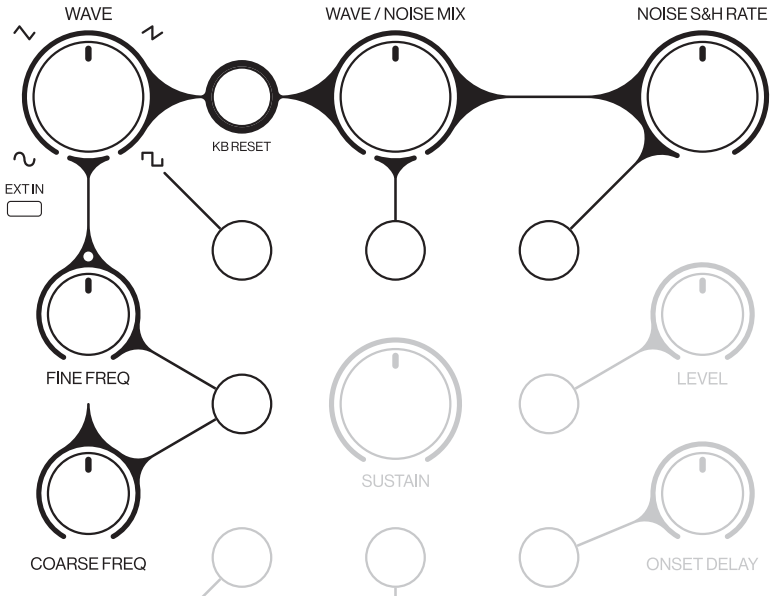


The Exciter section is where the analogue signal path of ECHON 6 begins. In this chapter, each control is described in detail, outlining both its function and the underlying technical behaviour of this stage. The Exciter is responsible for generating the raw sound for each voice and shaping its amplitude over time.

The Exciter comprises two main functional blocks: sound generation and amplitude contour. Sound generation is handled by an analogue VCO, along with analogue noise and sample-and-hold circuits. The amplitude contour is shaped by a DADSR envelope generator feeding a VCA. Together, these elements behave like a compact synthesizer in their own right, forming the foundation of

what is later processed by the Input Filter and the Resonator.

ANALOGUE VCO AND NOISE



WAVE CONTROL

The WAVE control continuously morphs between several basic waveforms. Fully counterclockwise it produces a clean sine wave. Turning the control clockwise gradually adds harmonic content by crossfading through triangle, ramp, a narrow 5 percent pulse and finally a full square wave. Even before the oscillator reaches the Input Filter or Resonator, this feature gives you broad control over the harmonic content, allowing you to choose between pure low-harmonic material or bright, rich excitation signals depending on the sound you are going for.

KB RESET

The VCO includes a KB RESET function. When active, the VCO restarts its phase

at zero every time the voice receives a MIDI note-on message. This creates consistent and reproducible attack transients and can make layered or unison sounds behave more tightly. With KB RESET off, the oscillator runs freely and the phase at note-on is whatever the oscillator happens to be doing at that moment, resulting in more variation and consequently a more organic feel.

COARSE FREQ AND FINE FREQ CONTROLS

The COARSE FREQ and FINE FREQ controls set the base pitch of the VCO. COARSE FREQ spans eight octaves, while FINE FREQ allows tuning of half an octave centred around its mid position, from minus three to plus three semitones.

The two controls are summed to establish the oscillator frequency. In the INIT sound, this pitch is fully modulated by KEY FOLLOW, so the oscillator tracks the keyboard across its entire range. By muting or adjusting the modulation depth of KEY FOLLOW, you can change the tracking behaviour or disconnect it entirely.

It is important to understand that, conceptually, ECHON 6 is built around the resonators, not the oscillator. The resonators are designed to track the keyboard by default, forming the stable, pitch-defining element of each voice. The VCO, by contrast, can track the keyboard, but is not required to do so. This distinction is intentional.

By reducing or removing KEY FOLLOW from the VCO while the resonators continue to track, the exciter and resonator frequencies become independent. This opens up a wide range of behaviours, from subtle beating and shifting spectra to pronounced moiré-like interference patterns and inharmonic textures. In other words, the oscillator does not merely define pitch, but acts as a flexible excitation source whose relationship to the resonator can be tightly coupled, loosely related, or deliberately detached.

The concept of modulation, including KEY FOLLOW, will be explained in detail in the Modulation Matrix section later in the manual. For now, it is useful to know that this separation between exciter and resonator pitch is a core design principle of ECHON 6, rather than an exception.

NOISE S&H RATE CONTROL

The Exciter provides a second sound source in the form of analogue (transistor) noise. The NOISE S&H RATE control determines how this noise is shaped. With the control fully clockwise, the noise is pure white noise. As you turn it counterclockwise, a sample and hold circuit begins to process the noise. The circuit takes rapid snapshots of the random noise voltage and holds each snapshot for a short moment, producing stepped and quantised noise. The lower the setting, the slower the sampling clock becomes and the more broken and segmented the noise will sound.

For most of the range of the control, the NOISE S&H RATE control has the same range as the COARSE FREQ control. This allows you to modulate the sample and hold rate relative to the oscillator pitch, or have the sample-and-hold clock track the keyboard. In the final quarter of the range of the control, the rate increases more steeply to create a smooth transition into continuous white noise.

WAVE / NOISE MIX CONTROL

The WAVE / NOISE MIX control blends the oscillator and the noise source. Fully counterclockwise, the Exciter feeds only the VCO signal into the Input Filter and Resonator. Fully clockwise, it outputs only the quantised or white noise. Any intermediate setting creates a mix of both, allowing you to produce everything from breathy or metallic to wide-spectrum excitation signals for the Resonator.

EXT IN (EXTERNAL INPUT)

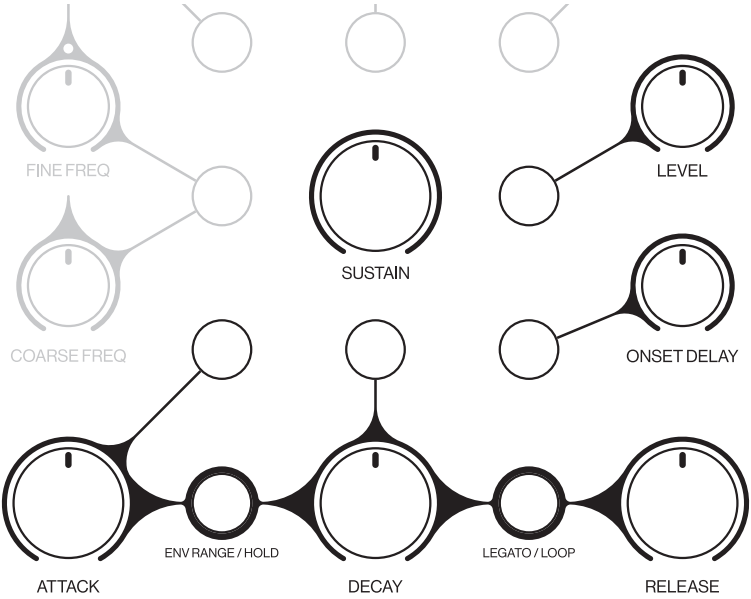
The Exciter offers an external input, allowing you to feed audio from outside the instrument. When an external signal is present, the WAVE control adapts its behaviour. The fully counterclockwise position no longer outputs a pure sine wave but instead outputs the external input. As you turn the WAVE control clockwise, the external signal gradually blends with the internal waveforms that follow in the morphing path. This lets you mix the incoming audio with triangle, ramp, narrow pulse and square waves in any proportion you choose.

The external input can be enabled or disabled independently for each Voice Group, and this state is stored with the preset. From Preset Mode, the EXT IN menu page lets you set this behaviour for all Voice Groups at once. When working in Voice Group Mode, the same menu page applies the setting only to the currently selected voice group.

The EXT IN LED lights up white when the external input is present and enabled on the current voice group. If the incoming signal is driven into saturation, the LED turns red to indicate distortion. This makes it easy to judge input level and gain staging while working with external sources.

In more advanced patches the external input becomes an experimental playground. You can feed one of the individual voice outputs back into the Exciter of any other voice. This opens up a parallel universe of possibilities such as cross feedback, chained resonators, or chaotic structures. Depending on gain levels the results can become intense or unpredictable, so it is wise to begin with lower levels and explore gradually. The system will not be harmed, and this kind of exploratory behaviour is very much encouraged.

ENVELOPE GENERATOR



The envelope controls the amplitude of the wave and noise mixture continuously. You can imagine the envelope as a hand on a volume fader moving between silence and full output. The movement between these values follows the shape of the DADSR envelope generator.

In normal operation, assuming no legato or loop behaviour, each time a voice receives a MIDI note on message the envelope begins a new cycle. The following stages define how the sound begins, evolves and ends.

ONSET DELAY

The ONSET DELAY control defines the time between receiving a MIDI note-on message and entering the attack stage. It ranges from zero to two seconds. While delaying a sound may feel counterintuitive in basic patches, it is exceptionally powerful in multi timbral setups where different voice groups respond to the same MIDI note-on message. By assigning different onset delays

you can create staggered entries and layered articulations, similar to strumming strings, performing a flam on a drum, or creating the kind of rapid buzz-roll timing variations percussionists use to animate a texture. If the note ends (a MIDI note-off message is received) before the onset delay has finished, the envelope stays at zero without entering the attack stage.

ATTACK

The ATTACK stage defines how long the envelope takes to rise from silence to full amplitude. The curve is logarithmic to create a perceptually smooth and natural rise. If the note ends (a MIDI note-off message is received) during the attack stage, the envelope immediately jumps to its release stage.

DECAY

After reaching its peak, the envelope enters the decay stage and falls from maximum level to its sustain level. This drop is exponential to create a natural sounding decay. If the note ends (a MIDI note-off message is received) during the decay stage, the envelope transitions straight to release.

SUSTAIN

The SUSTAIN control sets the level at which the envelope remains while the note is held. Unlike the other stages, Sustain is a level and not a time. The sound is held at this level until a note off message is received.

RELEASE

Once the note ends, the envelope enters its release stage. The level falls exponentially from its current value back to silence. The release time defines how long this fade-out takes.

ENVELOPE RANGE / HOLD

The envelope generator can operate across three different timing ranges which

allow precise control over short percussive shapes as well as long evolving gestures. Pressing the ENV RANGE button cycles through short, medium and long envelopes. The LED brightness increases with the length of the range. These ranges apply to the Attack, Decay and Release stages and provide stage times from approximately 0 to 250 milliseconds in the short range to around 25 seconds in the long range.

A long press on the same button activates HOLD mode and the LED begins to blink. With HOLD enabled, the envelope ignores MIDI note-off messages and remains in the sustain stage indefinitely, ideal for drones or ambient textures.

In PRESET mode the NUMBER LEDs show which voices are active. With HOLD on these LEDs remain lit and each held voice can be toggled on or off with its corresponding NUMBER key. This is a performance feature that allows for better control when using ECHON 6 as a standalone instrument without a keyboard.

If a voice gets stolen during HOLD mode, meaning all six voices are active and a new note is triggered, ECHON 6 assigns one of the active voices according to the selected note priority setting. The envelope response in that moment depends on whether Legato is enabled or not.

LEGATO / LOOP MODES

The LEGATO / LOOP button defines how the envelope behaves when notes overlap or when voices are reassigned. A short press enables LEGATO mode, and the LED lights continuously. A long press enables LOOP mode, and the LED blinks to indicate this. LEGATO can be enabled without being in LOOP mode, however enabling LOOP mode, implies LEGATO is enabled.

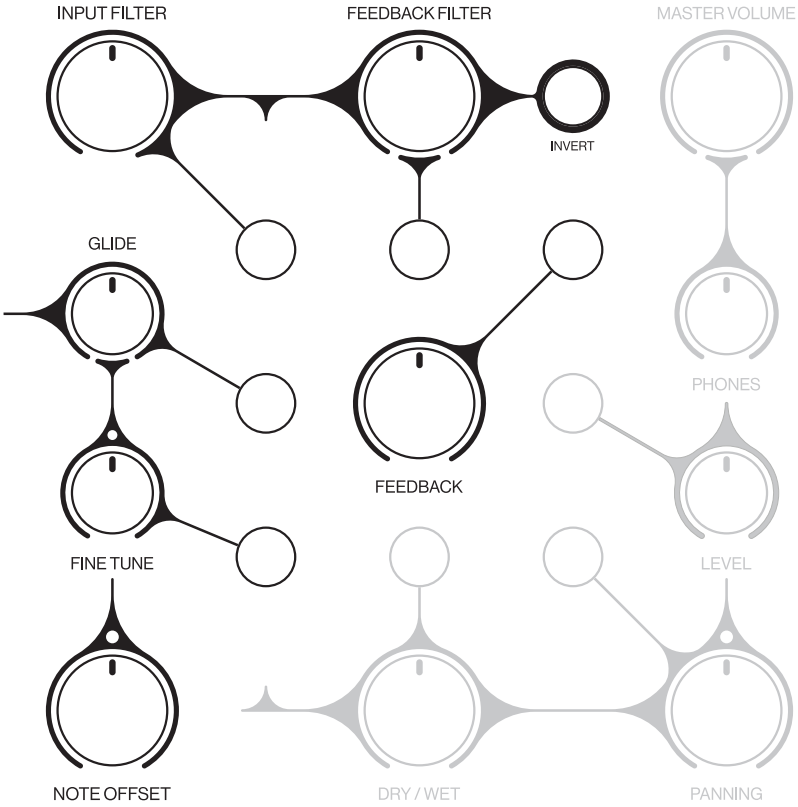
With LEGATO disabled, an envelope always starts from zero. With LEGATO enabled, the behaviour becomes more connected and continuous. If a voice is stolen during LEGATO, its envelope does not restart. Instead, the current envelope continues its trajectory. If a new note arrives while the envelope is still in its release stage, the envelope restarts from its current level rather than from zero. This is ideal for smooth phrasing, pads and connected gestures.

LOOP mode extends this by turning the envelope into a repeating cycle. Instead of running through all stages and stopping, the envelope loops through the onset delay, attack and decay stages for as long as the note is held. The first pass moves from zero to the sustain level. All subsequent passes begin from the sustain level and repeat the cycle. This creates rhythmic pulses, tremolo patterns or evolving repeating shapes.

LEVEL CONTROL

The LEVEL control sets the overall level of the Exciter and affects the loudness and how strongly the Resonator is driven. Lower level settings produce gentler resonances, while higher settings can push the resonator into richer and more saturated responses. With sustained Exciter signals, LEVEL settings above about 3 o'clock can push the BBD into audible distortion. You can choose to use this creatively, or keep LEVEL below 3 o'clock if you want a cleaner response.

BBD RESONATOR SECTION



The BBD resonator section brings together several key components that shape the characteristic resonant behaviour of ECHON 6. The signal first passes through the INPUT FILTER before entering the Bucket Brigade Device (BBD), whose behaviour is defined by the FEEDBACK control, the FEEDBACK FILTER and the INVERT setting, which reverses the polarity of the feedback path. The BBD is driven by a dedicated clock with its own GLIDE, FINE TUNE and NOTE OFFSET controls, allowing precise control over the resonant pitch and its movement. Finally, the DRY/WET control determines how the unprocessed exciter signal blends with the output of the resonator.

In this chapter we'll dive deeper into each of the BBD Resonator controls, positive feedback systems and resonator tuning.

POSITIVE FEEDBACK EXPLAINED

At the heart of this system lies positive feedback. Positive feedback occurs when part of the output of the BBD is routed back into its input. As the loop cycles, specific frequencies begin to reinforce themselves more strongly than others, eventually forming audible resonances. This is the fundamental mechanism behind the ringing, pitched or vibrating qualities that define the resonator of ECHON 6.

Positive feedback exists on a narrow threshold between stability and instability. At lower feedback levels, the resonator behaves gently, adding colour, harmonic emphasis or subtle body to the exciter signal. As the feedback increases, the resonator becomes more active and begins to shape the sound with more force. When the feedback energy exceeds the natural damping in the circuit, the resonator starts to self-oscillate. Depending on the combination of feedback level, filtering, input amplitude and clock frequency, this transition can be smooth and gradual, emerging as a faint tone, or it can rise suddenly into more intense behaviour.

This is part of the beauty and creative potential of positive feedback systems. Even without any input from the Exciter, slight analogue imperfections in the system are fed back into the loop and can cause oscillation. Once oscillation begins, the loop sustains itself and does not naturally fall back into silence until the feedback is reduced or the input conditions change. Resonances can bloom, swell, drift, stabilise or destabilise depending on how you interact with the circuit. A tone may slowly evolve into a beating cluster, or an unstable growl may settle into a precise resonance as the circuit finds equilibrium.

One reason for this movement is group delay: In a positive feedback loop, some frequencies return a little earlier or later than others, because the BBD clocking and the filters slow parts of the signal down by different amounts. These tiny timing differences affect how neatly the loop lines up with itself, which can shift

where the resonator “locks” into a pitch. The result is subtle detuning, beating, and gentle pitch movement one of the physical reasons the resonances of ECHON 6 can feel alive and imperfect in a musical way.

Rather than treating this behaviour as something to avoid, ECHON 6 embraces it as a musical resource. The resonator’s positive feedback path is engineered to offer expressive unpredictability without ever producing anything harmful to your signal chain. Small adjustments to the Input Filter, and Feedback Filter or Polarity inversion can dramatically change the character of the sound.

INPUT FILTER

The output of the Exciter passes directly through the INPUT FILTER, a 12 dB per octave low pass filter with a cutoff frequency ranging from 32.7 hertz at the fully counterclockwise position to 21 kilohertz at the fully clockwise position. The output of the INPUT FILTER is sent simultaneously to the dry path of the DRY WET control and to the input of the BBD. This means that even when the resonator is effectively bypassed by turning the DRY WET control fully counterclockwise, the sound of the Exciter is still completely shaped by the INPUT FILTER.

The INPUT FILTER can be seen as the midpoint of the analogue signal path of ECHON 6. It defines the boundary between the Exciter and the Resonator and plays an important role in determining what harmonic content is available to excite the BBD. Bright signals push the resonator into sharper, more energetic responses, while darker signals lead to softer and more rounded resonances.

FEEDBACK

The FEEDBACK control determines how much of the BBD’s output is routed back into its input. Increasing this control strengthens the loop and makes the resonator more responsive to whatever signal it receives from the Exciter. At low settings, the feedback adds subtle reinforcement, creating gentle resonances, soft acoustic-like body and mild prolongation of the exciter’s tone. As the FEEDBACK level rises, the resonator begins to imprint its own character more

strongly and reacts with greater intensity to changes in the input.

Eventually the feedback loop reaches a point where it accumulates more energy than it loses. When this threshold is crossed, the resonator begins to self-oscillate even without an exciter signal. This is possible because the analogue circuitry naturally contains minute variations, far below what is normally audible. In a high-gain feedback loop these tiny fluctuations are enough to kick the system into motion. The loop amplifies them, reinforces specific frequencies and develops a sustained tone from what would otherwise be silence. This is why ECHON 6 can generate a wide variety of timbres even when the Exciter is muted.

The speed at which this self-oscillation grows is influenced by the BBD clock rate. At higher clock rates the delay time inside the BBD becomes shorter, so the loop circulates more quickly. Each pass loses a bit of energy, so a fast-cycling loop reaches equilibrium and fades more rapidly. At lower clock rates the delay line becomes longer and the loop takes more time to cycle. Because fewer cycles occur per second, less energy is lost overall, which allows the resonance to ring out for a longer time. The result is that higher clock pitches produce tighter, shorter rings, while lower clock pitches produce slower, more sustained resonances.

The FEEDBACK control interacts closely with both the INPUT FILTER and the FEEDBACK FILTER. A brighter input feeds more high-frequency energy into the loop, pushing it toward more energetic behaviour, while a darker input dampens the loop and may require higher feedback levels to reach oscillation. Because of this interplay the FEEDBACK control responds musically rather than mechanically. Small adjustments often produce dramatic changes and the threshold between calm resonance and runaway behaviour becomes an expressive area to explore.

ECHON 6 is designed so that even extreme feedback settings are safe for both the instrument and your audio chain. Whether you prefer subtle resonances, precise tuned feedback or bold, unstable energy, the FEEDBACK control is the heart of the resonator's personality.

FEEDBACK FILTER

The FEEDBACK FILTER is a gentle 6 dB per octave low pass filter designed specifically to behave musically within the positive feedback loop of the resonator. Because it lives inside the loop, every adjustment subtly reshapes how the feedback evolves. Reducing its cutoff removes high harmonics from each pass through the loop, which also reduces the influence of the FEEDBACK control. Although it is a gentle filter on paper, its recursive placement gives it significant influence over the overall sound.

Closing the FEEDBACK FILTER produces a behaviour that goes far beyond a simple reduction in brightness. As the cutoff is lowered, the resonance tends to settle at a lower perceived pitch. This begins with a straightforward physical effect. Each time the sound travels through the loop, the filter trims away a portion of the upper harmonics. The more the cutoff is reduced, the faster those upper frequencies lose energy. After several cycles, the loop contains proportionally more low frequency energy than high. Since the ear derives pitch from the component of the signal that repeats most reliably, the resonator gradually shifts toward these slower, lower components. The pitch falls not because the BBD clock has changed, but because the remaining harmonic content is weighted toward the low end.

There is a second layer to this behaviour. A low pass filter does not simply shape the spectrum. It also introduces a frequency dependent time shift. As the cutoff moves downward, frequencies near that cutoff experience increasing phase delay. This alters the timing of the loop slightly differently for different harmonics. A positive feedback system naturally reinforces the frequency whose timing and phase relationship best fits the round-trip of the loop. When the filter is more closed, this point of stability moves downward. The combination of both effects; The faster decay of high harmonics and the shift in the loop's timing, explains why tightening the FEEDBACK FILTER makes the resonance drift to a lower perceived pitch rather than only making it darker.

INVERT

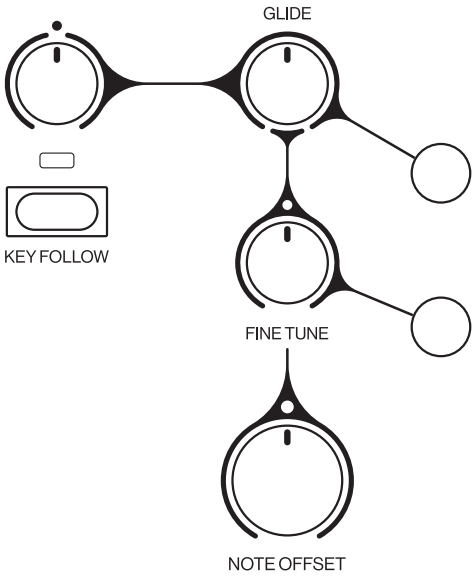
The INVERT control reverses the polarity of the signal inside the feedback loop. Instead of feeding the output of the BBD back into its input with the same polarity, the loop sends back an inverted version of the signal. This small change has a surprisingly large effect on the behaviour of the resonator.

When the feedback is non-inverted, the loop reinforces frequencies whose phase relationship naturally aligns with the round-trip time of the BBD. Inverted feedback shifts that relationship by 180 degrees. As a result, the set of frequencies that reinforce or cancel changes, and the resonator locks onto a different tonal centre and a different pattern of harmonics. Inverted feedback often produces a more hollow, tense or nasal character, while non-inverted feedback tends to sound rounder or more direct. Neither mode is “correct”; they simply represent two stable but distinct resonant personalities.

The effect becomes especially noticeable at higher feedback settings, where the resonator depends more heavily on phase relationships to determine which frequencies survive in the loop. Switching INVERT can shift the perceived pitch, alter the shape of the resonance or move the loop from a dominant harmonic to an overtone.

Exploring both positions of the INVERT setting is highly recommended while designing sounds, as it often reveals unexpected harmonics or alternative resonant modes that are not achievable through filtering or tuning alone.

RESONATOR TUNING



The tuning of the BBD resonator is determined by a dedicated pitch chain that always tracks the keyboard. Unlike the exciter VCO, which follows the keyboard only when KEY FOLLOW modulation is applied, the resonator clock always receives the incoming MIDI note as its fundamental reference. Before this note value is translated into the actual clock frequency that drives the BBD, it passes through three controls that define its pitch behaviour: NOTE OFFSET, FINE TUNE and GLIDE. Together they establish the resonator's tuning and its movement.

The result of this tuning chain is not only used to determine the BBD clock frequency. It also forms the basis of the KEY FOLLOW modulation source available throughout the modulation matrix. KEY FOLLOW represents the fully processed pitch value, including NOTE OFFSET, FINE TUNE and GLIDE. When routed to the exciter VCO, it allows the exciter to follow the keyboard in perfect alignment with the resonator, but KEY FOLLOW is not limited to pitch-related

tasks. It can just as well be used to modulate parameters such as filter cutoff, feedback amount, noise rate or wave-shape, making the tuning behaviour of the resonator a powerful and expressive modulation source within the wider architecture of ECHON 6.

NOTE OFFSET

The first stage of the tuning chain is NOTE OFFSET. This is a quantised control that shifts the received MIDI note value by a bipolar semitone amount ranging from minus twelve to plus twelve semitones. With the control in its central position, the resonator receives the incoming MIDI note unaltered. Turning it left or right transposes the resonator down or up in exact semitone steps before any FINE TUNE is applied. This makes NOTE OFFSET ideal for octave shifts, harmonic transpositions or intervallic resonator setups when layering in Voice Group Mode.

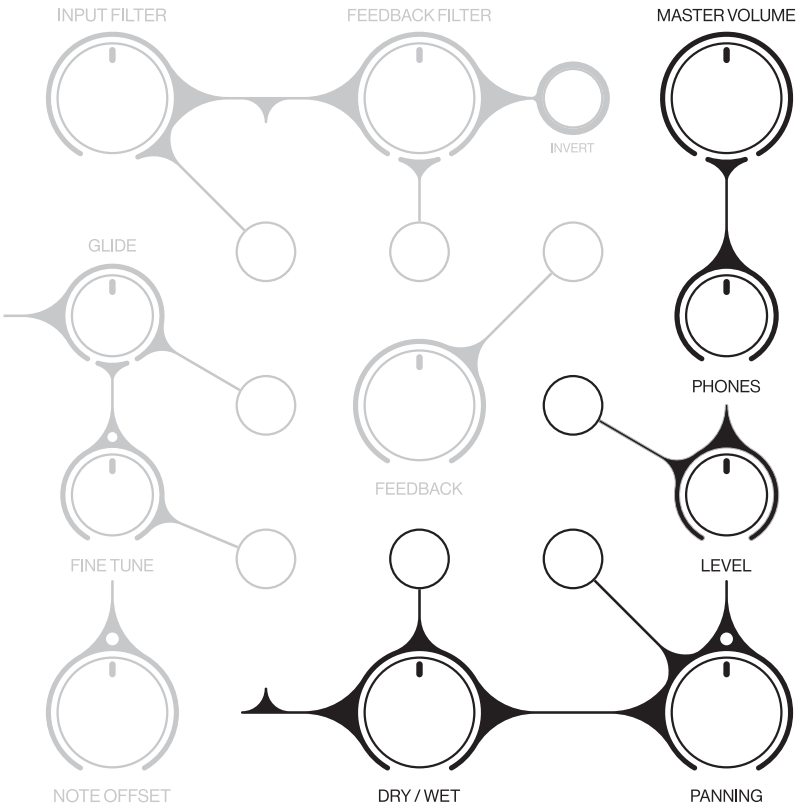
FINE TUNE

After NOTE OFFSET, the pitch is processed through the FINE TUNE stage. This is a continuous control offering a range of minus three to plus three semitones. FINE TUNE is used to dial in precise tuning adjustments, slight de-tunings or perfect pitch matching with external instruments.

GLIDE

The final stage in the tuning chain is GLIDE, which determines how long the resonator takes to move from one pitch to the next. Adjustable from zero to one second, GLIDE enables anything from sharp, instantaneous pitch changes to smooth, expressive slides.

OUTPUT SECTION



DRY WET

The DRY WET control determines how the output of the Exciter and the output of the Resonator are blended before they enter the panner and the final output stage. At its fully counterclockwise position the signal consists entirely of the Exciter passing through the INPUT FILTER. At its fully clockwise position the sound is made entirely of the resonator output. Any position in between allows you to combine the transient clarity and harmonic definition of the Exciter with the tonal shaping and resonant behaviour of the BBD.

This control is central to how you navigate between two sonic worlds: the harmonic content fed into the resonator and the spectral transformation that occurs inside the feedback loop. When designing sounds it is often helpful to switch quickly between a dry signal and a resonated one. This allows you to compare the harmonic material entering the system with what the resonator is doing to it. During performance the DRY WET control becomes an expressive tool for moving between percussive, exciter-driven articulation and resonant behaviour.

The DRY WET control also plays a unique role when the resonator is self-oscillating or close to self-oscillation. In this state there may be little or no input from the Exciter, yet the resonator produces a stable or evolving tone on its own. Because the resonator output passes through DRY WET before reaching the Output stage, the control effectively becomes a VCA for the resonant tone. By modulating DRY WET with the Envelope or a LFO, you can shape the loudness of the self-oscillation just as you would modulate the level of a traditional oscillator through a VCA. This opens up a wide range of performance and sound design techniques. You can create struck or bowed articulations, tremolo-like effects or precise amplitude-shaped resonances that feel like you are playing the resonator directly as an instrument in its own right.

Because DRY WET combines two fundamentally different sound components, its behaviour responds musically to every stage that precedes it. The Exciter provides the attack, the harmonic spectrum and the initial character. The resonator adds body, movement and sustain. Blending the two creates hybrid tones that range from subtle reinforcement to dramatically transformed acoustic-like gestures.

PANNING

Each ECHON 6 voice is generated as a single mono signal, the PANNING control lets you place that voice anywhere from left to right in the stereo field. In other words, you are not changing the source itself, you are choosing where that voice is perceived in the mix.

In Voice Group mode, PANNING becomes a powerful way to position stacked voices in the stereo image. This makes it easy to keep one group centred while placing others wider, creating separation and a clear sense of multiple instruments occupying different locations. When PANNING is used as a modulation destination, sounds can drift, dance, and fade across the stereo field for animated movement and expression. PANNING is applied on the main Left and Right Master outputs. It is also preserved on the Individual Voice outputs, so the panning position and any panning modulation remain intact even when using a single voice output.

LEVEL

The LEVEL control sets the overall output level of the current Voice Group. As with all parameters discussed so far, level settings are recalled with the preset, so each sound returns at its intended loudness when you load it. Use LEVEL to set a voice group's level appropriately within a mix and to match perceived loudness between presets for consistent volume when switching sounds.

LEVEL can also be used as a modulation destination. With slower sources such as an LFO, this creates classic tremolo and dynamic movement. Performance sources such as VELOCITY can be used to make a voice group respond to how you play, automatically adjusting loudness for expressive control, along with many other modulation applications.

PHONES

The PHONES control sets the output level of the headphone jack. The headphone output is designed to deliver a strong signal so it can properly drive a wide range of headphones, from small consumer models to high impedance studio headphones. This level is independent from the Master output level.

Because the headphone output can get loud quickly, start with PHONES turned down, then raise it gradually to a comfortable level. Take care when loading presets, changing routings, or patching external gear, since sudden level changes can be unpleasant and potentially harmful. Protect your hearing. You

only get one pair of ears.

MASTER

The MASTER control sets the overall output level of ECHON 6 on the main Left and Right Master outputs. Use it to match the instrument to the input level of your mixer, audio interface, or speakers. Start with MASTER low and bring it up gradually, especially when switching presets or changing connections, to avoid unexpected loud levels.

MAIN OUT

The main Left and Right outputs of ECHON 6 operate at professional line level (+4 dBu). When connecting to consumer level equipment (typically -10 dBV), take care not to overload the input. If you are unsure what input level your mixer, amplifier, audio interface, or active speakers expect, start with the MASTER control turned down and raise it gradually to a comfortable level.

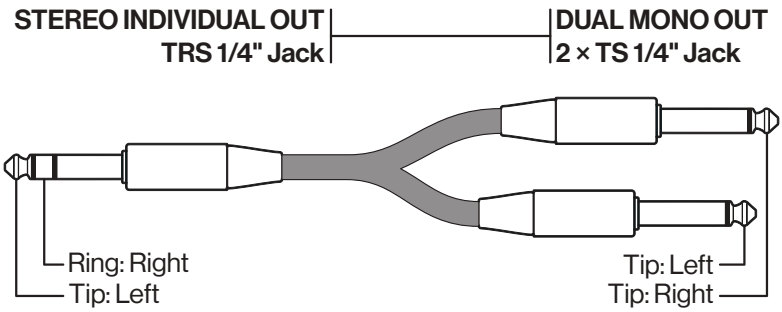
The main outputs can be connected using balanced TRS cables or unbalanced TS cables. If you connect only the Left output, the Right channel is automatically mixed into the Left output, allowing you to use ECHON 6 in mono without losing stereo information. If you want to run the instrument in mono, use the Left output only.

INDIVIDUAL OUTS

The Individual OUTS provide a dedicated output for each of ECHON 6's six voices. This is useful for multitimbral setups, or whenever you want to process specific voices through their own effects chains, route a voice back into the External Input, or explore more experimental patching and feedback configurations.

Each Individual OUT is a TRS jack that carries a stereo signal for that voice. Using a TRS to dual-TS breakout cable (often called an insert cable) gives you separate Left and Right channels, preserving the effect of the PANNING control on that

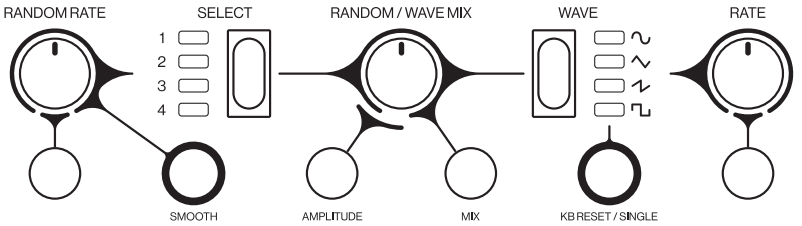
voice. If you connect an Individual OUT with a standard TS cable, only the Left channel gets transmitted.



The Individual OUTS can be used at the same time as the Main outputs. Any voice that is connected to its Individual OUT is removed from the Main output mix. This is intentional, and allows you to process one or more voices separately while keeping the remaining voices in the Main output mix.

The Individual OUTS operate at professional line level (+4 dBu). Use the same precautions as with the main outputs to avoid overloading the inputs of connected equipment.

QUAD LFO SECTION



The Quad LFO section provides each voice with four independent Low Frequency Oscillators, giving ECHON 6 a deep reservoir of cyclical and random modulation.

Each LFO is bipolar and free-running by default. They can easily be set to output unipolar waves, sync to incoming MIDI clock data, sync to keyboard presses or output a single cycle.

An LFO can produce a mix of stepped random values and periodic waveforms. The design mirrors elements of the Exciter's noise and VCO configuration, offering both a quantised random source and a periodic waveform within each unit. With twenty-four LFOs running simultaneously across the instrument (4 LFOs per voice), the Quad LFO section is a major contributor to movement, animation and complexity within a patch.

The Quad LFO section is part of ECHON 6's deep modulation system and without a doubt one of its most powerful and complex modulation sources, this is why we dedicate a separate chapter to it, before diving deeper into the whole of ECHON 6's modulation system.

SELECT KEY

SELECT LFO

The SELECT key determines which of the four LFOs you are currently editing. Each press moves to the next LFO in sequence, cycling through all four. The

LEDs next to the SELECT key indicate which LFO is active and receiving input from the front panel controls. The intensity of this LED refers to the maximum amplitude of the LFO.

Changing the selected LFO does not affect the behaviour of the others. It merely changes which one you are shaping at that moment. This selection system allows you to navigate quickly between the LFOs.

SET MIDI CLOCK SYNC OR FREE-RUNNING

The SELECT key has a secondary function accessed with a long press. Long-press SELECT to toggle the LFO and random between free-running and MIDI clock sync. The current mode is shown by the wave LED: in sync mode it blinks at the tempo received from incoming MIDI clock, while in free-running mode it stays brightly lit. If sync is enabled but no MIDI clock is present, the LED remains dimly lit to indicate that the LFO is waiting for clock. In this state ECHON 6 will either revert to an internal clock at 120 BPM or continue clocking the LFO at the rate of the last received MIDI clock.

WAVE KEY

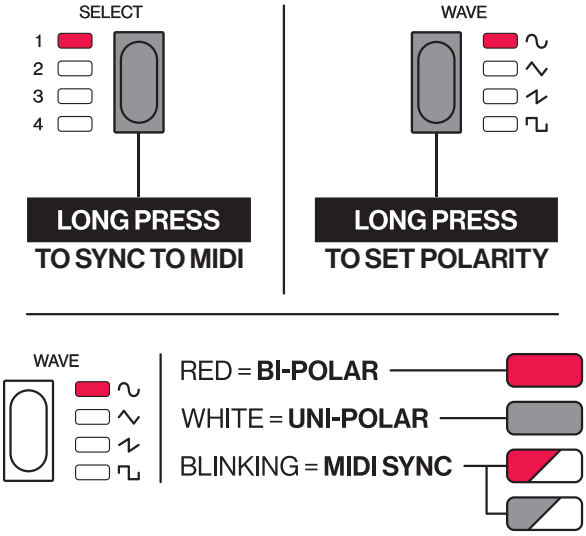
SELECT WAVE FORM

The WAVE key selects the shape of the periodic waveform used by the currently active LFO. Pressing the key cycles through four shapes in sequence: sine, triangle, ramp and square. The LEDs positioned next to the key indicate which shape is active. Unlike the Exciter's oscillator, the LFO waveform is not continuously morphable. You select the desired shape directly. Each waveform carries its own character, from the smoothness of sine to the sharp transitions of square.

SET LFO POLARITY

The WAVE key also has a secondary function accessed with a long press. Long-press WAVE to cycle the periodic waveform and random between bipolar (–1 to

+1) and unipolar (0 to +1) operation. The current mode is indicated by the wave LED: red for bipolar and white for unipolar.



RANDOM RATE CONTROL

The RANDOM RATE control sets the clock rate of the stepped random (sample-and-hold) generator inside the currently selected LFO. At higher settings it outputs rapidly changing S&H values; at lower settings it produces sparse, irregular steps that are ideal for evolving or unstable movement. Turning RANDOM RATE fully counterclockwise stops the S&H clock entirely. In this state, the random generator holds its last value indefinitely, creating a stable, per-voice random offset. With KB Reset enabled, a new random value is generated on each incoming MIDI note-on, effectively producing a fixed random value per note.

SMOOTH BUTTON

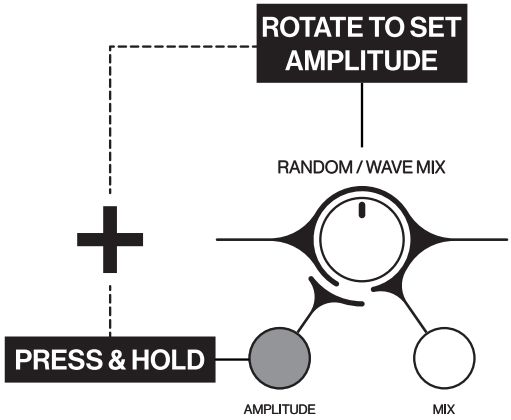
The SMOOTH button applies a glide between successive stepped random values. Without smoothing, the stepped random generator jumps abruptly between values, creating sharp discontinuities. With smoothing engaged, each

step transitions gradually into the next, forming curved movements instead of hard jumps. This can produce more natural, drifting behaviours reminiscent of analogue instability or slow chaotic modulation. Smoothing applies only to the stepped random part of the LFO and does not affect the periodic waveform.

RANDOM / WAVE MIX CONTROL

The RANDOM / WAVE MIX control blends the stepped random generator with the periodic waveform of the selected LFO. Fully counterclockwise the LFO produces only stepped random values. Fully clockwise it produces only the selected waveform. Any position in between combines the two, allowing you to create LFO shapes that mix periodic behaviour with controlled randomness. This can produce subtle instability, organic wobble, unpredictable vibrato, fluttering movements or hybrid patterns that evolve over time.

AMPLITUDE BUTTON



Each LFO has its own amplitude setting, which determines the strength of its output before it reaches any modulation destination. The amplitude is adjusted by holding the AMPLITUDE button and turning the RANDOM / WAVE MIX control. When doing so, the SELECT LED indicates the amplitude amount you have set,

giving clear visual feedback both during adjustment and whenever that LFO is selected. This parameter scales the combined output of the periodic waveform and the stepped random generator equally.

KB RESET / SINGLE BUTTON

The KB RESET / SINGLE button determines how the LFO reacts when its voice receives a new MIDI note-on message. A short press activates keyboard reset, causing the periodic waveform to restart its cycle with every new note. This makes it easy to create consistent attack transients, synchronised motions or per-note rhythmic modulation. A long press places the LFO in Single mode. In this state, the waveform runs through exactly one cycle when a note is played, then stops and waits for the next note-on message. Single mode always implies KB Reset. With KB Reset active, the stepped random generator also picks a new random value at each note-on event, independent of its internal clock. However, Single mode does not affect the random clock itself; the stepped random generator continues running freely unless its clock is manually stopped with the RANDOM RATE control.

RATE CONTROL

The RATE control sets the speed of the periodic waveform in the selected LFO. In free-running mode it sweeps continuously from approximately 20 seconds per cycle up to 50 Hz.

MIDI CLOCK SYNC

When MIDI clock sync is enabled, RANDOM RATE and RATE become quantised and step through 19 musical divisions derived from the incoming MIDI clock:

- 2 bars ..... 8 beats
- 1.5 bars..... 6 beats
- 1.25 bars..... 5 beats
- 1 bar ..... 4 beats
- 1/2 dotted..... 3 beats
- 1/1 triplet (bar triplet) ..... 8/3 beats
- 1/2..... 2 beats
- 1/2 triplet..... 4/3 beats
- 1/4 dotted..... 3/2 beats
- 1/4..... 1 beat = Center position
- 1/4 triplet..... 2/3 beats
- 1/8 dotted..... 3/4 beats
- 1/8 ..... 1/2 beats
- 1/8 triplet..... 1/3 beats
- 1/16 dotted..... 3/8 beats
- 1/16..... 1/4 beats
- 1/16 triplet..... 1/6 beats
- 1/32..... 1/8 beats
- 1/32 triplet..... 1/12 beats

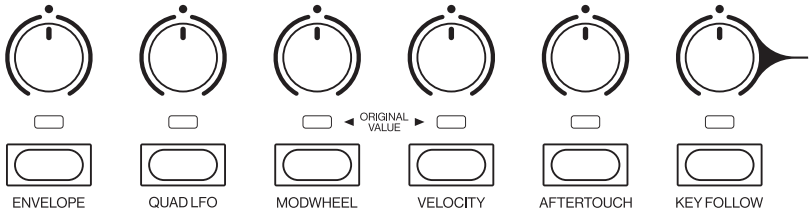
MODULATION MATRIX

Patching sources to destinations

“The modular approach”

/\/\orphor®

MODULATION MATRIX



INTRODUCTION

Modulation is one of the core creative tools of ECHON 6. It turns static patches into evolving sounds and lets you shape timbre, pitch, articulation, and movement. Each voice has access to six modulation sections, providing a total of nine modulation sources (the Quad LFO counts as four). These sources can be routed to 32 parameters per voice (modulation destinations) using a clear, performance-friendly modulation matrix.

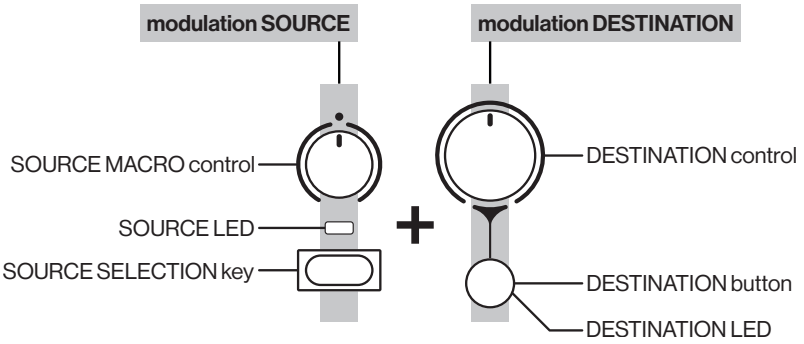
ECHON 6 offers the depth of a modular-style modulation system, but without patch cables. Assignments are always visible on the panel, easy to adjust, and stored with the preset.

This section explains each modulator and the workflow for navigating, assigning, and shaping modulation in ECHON 6. It also introduces more advanced features such as LFO cross-modulation and Source Override, which turns any modulation layer into a global macro control.

MORPHOLOGY OF THE MODULATION MATRIX

The modulation system of ECHON 6 has two sides: modulation sources and modulation destinations. Each modulation source has a dedicated section with a SOURCE MACRO control, a red SOURCE LED, and a SOURCE SELECTION key. The grey SOURCE MACRO acts as an attenuverter for its source, scaling or inverting the modulation before it reaches any destination. Pressing a SOURCE

SELECTION key lights its red LED and shows all destinations that source modulates. ECHON 6 provides six modulation sections: Envelope, Quad LFO, Modwheel, Velocity, Aftertouch, and Key Follow.



The Quad LFO behaves slightly differently from the other modulators. Although it has only one SOURCE MACRO, it counts as four separate modulation sources, one for each of the four LFOs. The Quad LFO SOURCE SELECTION key works together with the LFO SELECT key: the selected LFO determines which LFO SOURCE SELECTION is shown on the destination buttons. The Quad LFO SOURCE MACRO scales or inverts all four LFOs at once, providing a single global control over LFO modulation depth.

On the destination side, every modulatable parameter on the front panel is represented by a pair: a physical control (the black knob that sets the base value of the parameter) and a DESTINATION button. Each DESTINATION button is a round translucent switch with a red and blue LED beneath it, showing the polarity and depth of modulation. There are 32 destination pairs per voice across the instrument, spanning the Exciter, Quad LFO, Resonator, and Output sections. Together, the source side and destination side form a modulation matrix in which any source can modulate any destination, and multiple sources can modulate the same destination simultaneously in different layers. This layout keeps modulation routing visible and easy to manage.

UNDERSTANDING MODULATIONS

SOURCE MACRO ATTENUVERTER

With the exception of the Quad LFO (which can run unipolar or bipolar), all modulation sources in ECHON 6 are unipolar at the source. Their depth (and polarity) is set with the SOURCE MACRO control, which acts as an attenuverter for that source.

- 12 o'clock: ..... fully attenuates the source (no modulation).
- Fully clockwise: ..... passes the source at unity gain (full positive).
- Fully counterclockwise: ..... passes the source at unity gain, inverted (full negative).

The SOURCE MACRO sets the overall strength of a source before it reaches any destinations. Each destination still has its own individual modulation depth, set when you make the assignment.

ASSIGNING A MODULATION

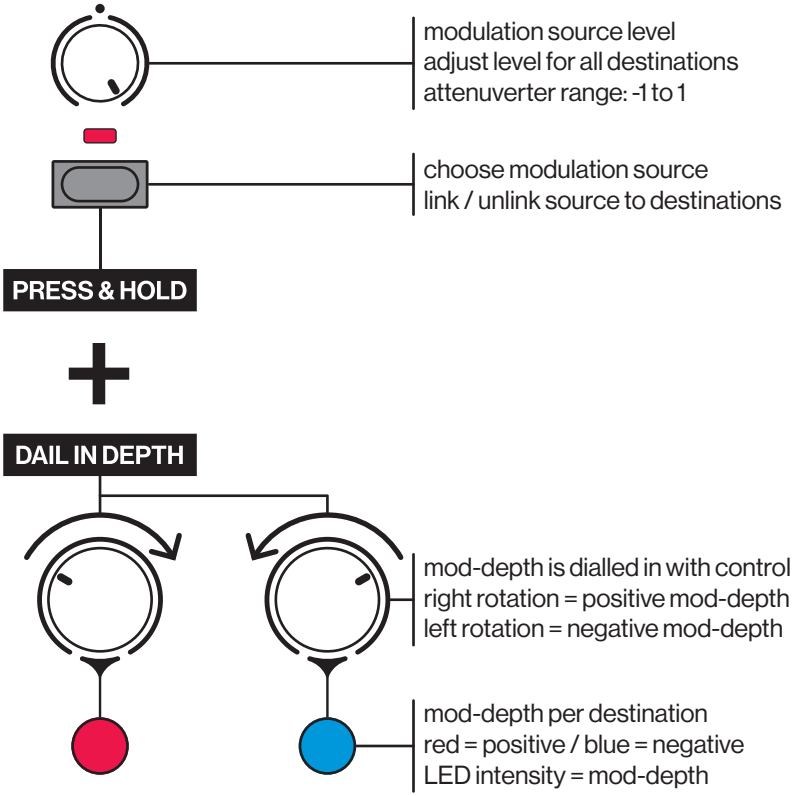
To route a modulation source to a destination:

1. Set the destination parameter to its starting value (the value you want to hear with no modulation). This can still be done afterwards, but is considered good practice, as it will help you asses the effect of the modulation better.
2. Press and hold the SOURCE SELECTION key for the modulation source.

    - While holding the SOURCE SELECTION key, turn the destination control:
    - Turning the control clockwise creates a positive modulation amount and the destination LED turns red.
    - Turning the control counterclockwise creates a negative modulation amount and the destination LED turns blue.

3. Release the SOURCE SELECTION key to confirm.

The amount you turn the destination control while holding the SOURCE SELECTION key becomes the modulation depth at unity gain. The destination LED brightness reflects the assigned depth, the colour reflects its direction or polarity.



HOW MODULATION IS APPLIED

Unipolar sources modulate **from the destination's set value** (the value shown by the control itself).

- With positive (red) depth, the modulation pushes the destination upward

from its set value.

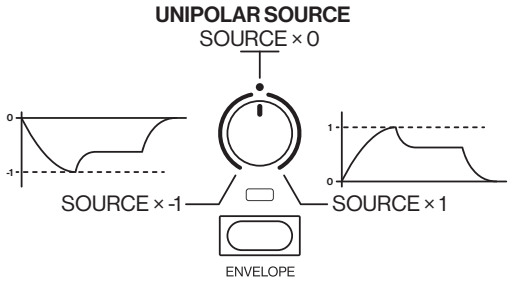
- With negative (blue) depth, the modulation pulls the destination downward from its set value.

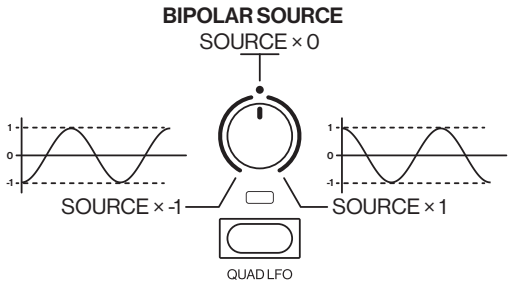
So the destination control always defines the reference point, and the unipolar source moves away from that point in one direction.

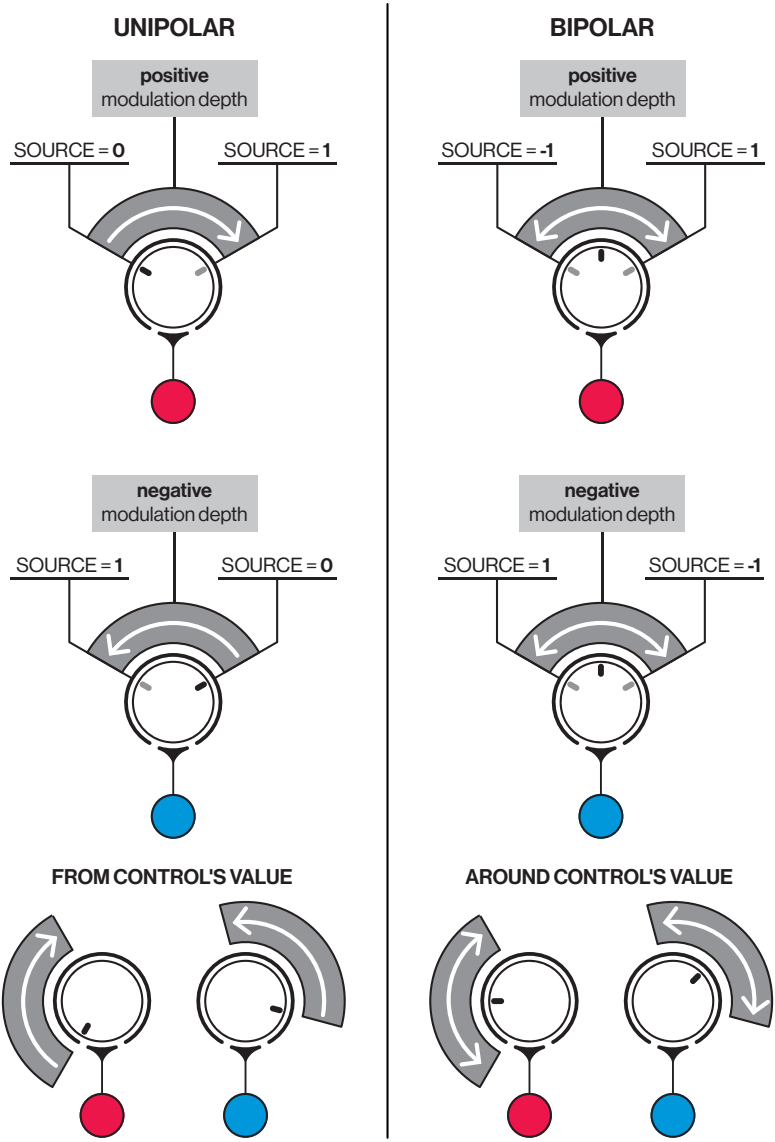
Bipolar sources (bipolar LFOs) modulate **around the destination's set value**.

- With positive (red) depth, the positive half of the LFO cycle moves the destination above the set value, and the negative half moves it below.
- With negative (blue) depth, that behaviour is inverted.

Each parameter's limits are defined by the control. Modulation cannot push a parameter beyond its range. If a modulation would exceed the minimum or maximum of a control, it clips at the end of the range.





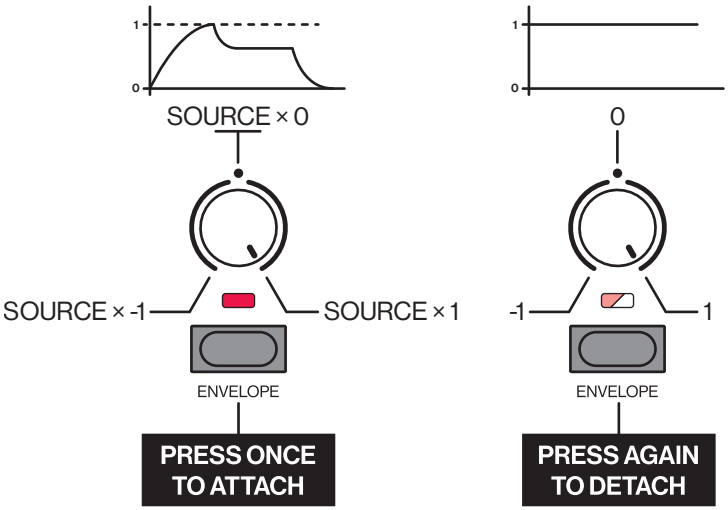

UNIPOLAR
BIPOLAR
positive
modulation depth
SOURCE = 0
SOURCE = 1
positive
modulation depth
SOURCE = -1
SOURCE = 1
negative
modulation depth
SOURCE = 1
SOURCE = 0
negative
modulation depth
SOURCE = 1
SOURCE = -1
FROM CONTROL'S VALUE
AROUND CONTROL'S VALUE

DETACHING MODULATION SOURCES

If you're not using a modulation source in a preset, you can detach it by pressing its SOURCE SELECTION key. When detached, the source no longer follows its usual input (for example mod wheel, velocity, aftertouch, key follow, an envelope, or an LFO). Instead, the SOURCE MACRO replaces that source and becomes a manual attenuverter for all destinations assigned to it.

- Attached to input: ..... brightly lit
- Detached from input: ..... dimly blinking

For example, if you are not using the envelope as a modulation source in a preset, you can detach it by pressing the ENVELOPE SOURCE SELECTION key and use its SOURCE MACRO control's value instead. In detached, just like in attached mode, the SOURCE MACRO is bipolar.



DESTINATION BUTTON

The DESTINATION button lets you manage the modulation assigned to its

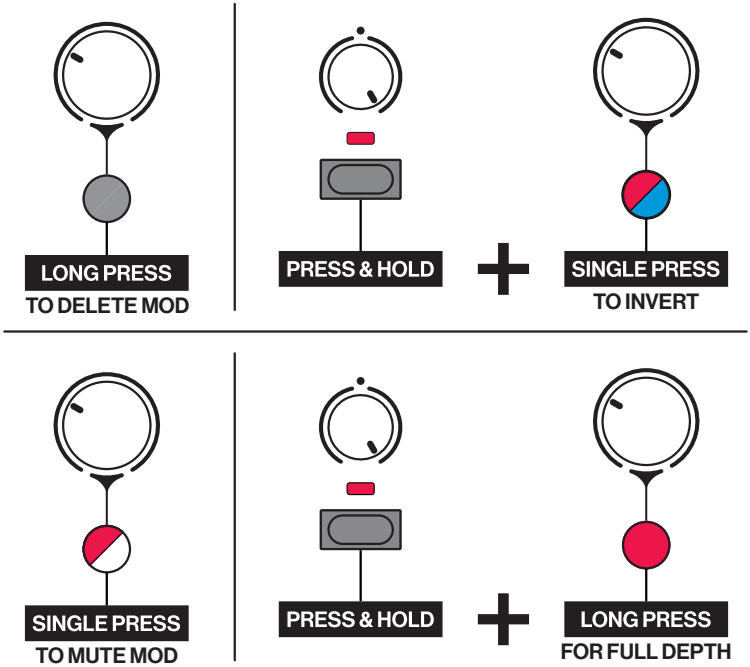
parameter (the parameter linked to that DESTINATION LED).

Mute or un-mute a modulation: Press DESTINATION once to mute or un-mute the modulation on that destination. While muted, the DESTINATION LED blinks.

Delete a modulation: Press and hold DESTINATION to delete the modulation from that destination.

Invert a modulation: If a modulation is active on a destination, you can flip its polarity by holding the SOURCE SELECTION key while pressing DESTINATION button. The DESTINATION LED flips between red (positive) and blue (negative).

Set modulation depth to 100%: To quickly set a modulation to full depth, hold the SOURCE SELECTION key, then press and hold the DESTINATION button. The DESTINATION LED lights red at full brightness (100% depth).



SPECIAL MODULATION DESTINATIONS

Most modulation assignments work the same way: hold a SOURCE SELECTION key and turn the DESTINATION control to set the depth. A few destinations are special cases because the destination parameter is shared between two controls, or because there is no dedicated knob for that destination. Nothing unusual, just a couple of details worth knowing.

FINE FREQ & COARSE FREQ

The Exciter's COARSE FREQ and FINE FREQ knobs both control the same underlying parameter (oscillator frequency), just at different scaling. For modulation purposes they are treated as one destination. You can assign frequency modulation using either knob.

- Use COARSE FREQ when you want wide modulation depth.
- Use FINE FREQ when you want precise modulation depth.

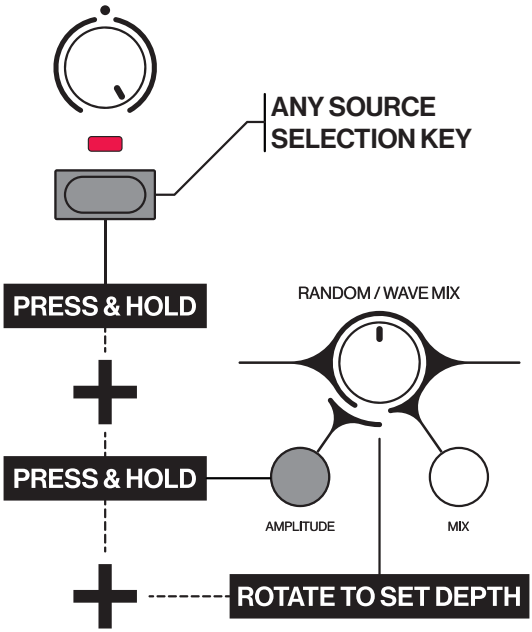
After assigning the modulation, the knob position still sets the "base" frequency the modulation starts from, as usual.

QUAD LFO AMPLITUDE

LFO AMPLITUDE has no dedicated knob. As described in the Quad LFO chapter, LFO amplitude is adjusted by holding AMPLITUDE button while turning the RANDOM / WAVE MIX control.

To modulate an LFO's amplitude, use the same interaction, but add in the modulation combo:

1. Hold the SOURCE SELECTION key you want to use.
2. Press and hold AMPLITUDE (destination).
3. Turn RANDOM / WAVE MIX to set the modulation depth.
4. Release the buttons to confirm.



LFO CROSS MODULATION

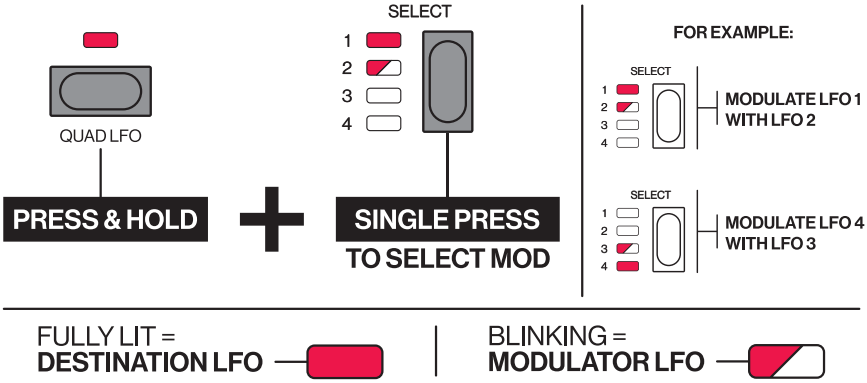
LFOs can modulate each other's parameters (for example, LFO2 modulating the RATE of LFO1). In a cross-mod assignment you define, the destination LFO (the one being modulated) and the source LFO (the one doing the modulating).

Set up the source and destination LFOs:

- Select the destination LFO using SELECT (its SELECT LED stays solid).
- Hold the QUAD LFO SOURCE SELECTION key and use SELECT to choose the source LFO. A second, blinking SELECT LED appears, this blinking LED indicates the source LFO.

When LFO cross-mod is active, the blinking LFO SELECT LED indicates the LFO you've chosen as the modulator (source), while the solid LFO SELECT LED indicates the LFO being modulated (destination). From this point on, any

modulation you create using the QUAD LFO SOURCE SELECTION key will use the blinking LFO as its source across the entire instrument. This applies both to regular destinations elsewhere in the synth, and to modulating the Quad LFO's own parameters: RANDOM RATE, AMPLITUDE, RANDOM / WAVE MIX, and RATE, which will then affect the currently selected (solid) LFO.



MODULATION SOURCES

We've learnt how to setup modulations and that ECHON 6 provides nine modulation sources, on every voice. In this chapter we will go through each of them and explain in detail how they work and describe some of their more common uses.

ENVELOPE

The envelope modulator uses the main per-voice DADSR envelope described earlier in the Exciter Section chapter. Because the envelope is per-voice, each note triggers its own modulation contour. This makes the envelope ideal for shaping parameters that must follow note articulation, such as wave-shape, filter behaviour, feedback amount or DRY/WET.

The envelope always reflects the full DADSR behaviour, including ONSET DELAY, LEGATO and LOOP modes. This means an envelope that loops, or one

triggered legato across several notes, will modulate its destinations in the same shape as it modulates the VCA in the Exciter.

QUAD LFO

The Quad LFO is a key player in the modulation matrix and as such deserves its own in-depth chapter. You can read all about it in the chapter QUAD LFO SECTION .

MODWHEEL

The modwheel is one of the most familiar performance controls in electronic instruments and controllers, and on ECHON 6 its MIDI value serves as a flexible, expressive modulation source. Unlike the internal envelope or LFOs, the modwheel is not generated per voice. It is a global modulation signal received via MIDI, and its behaviour depends entirely on the MIDI channel assignment of the voice groups.

ECHON 6 listens to the modwheel value per MIDI channel. Every voice in a voice group responds to the modwheel on the MIDI channel that group is assigned to. This means, when multiple voice groups share the same MIDI channel, they also share the same modwheel information. Alternatively, when voice groups use different MIDI channels, each group can receive its own independent modwheel data stream.

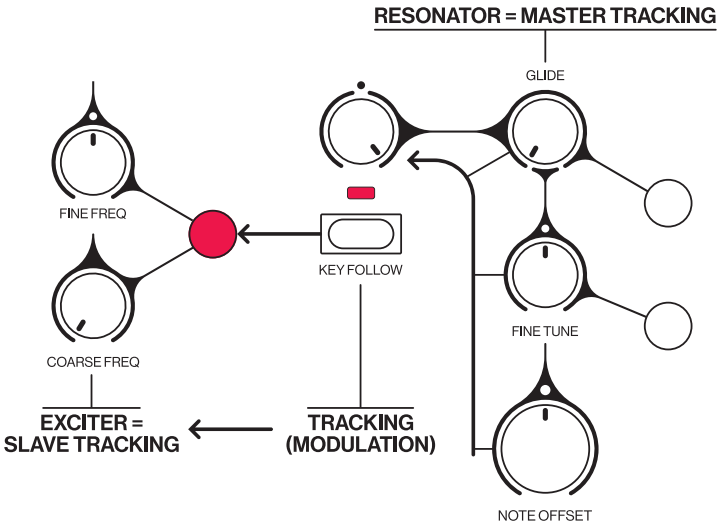
The modwheel data, as defined by the MIDI standard is received by ECHON 6 as MIDI CC 1 and internally converted to a unipolar value from 0 to 1, which is then scaled or inverted by its SOURCE MACRO control before being sent to its destinations.

VELOCITY

Velocity represents the force with which a MIDI note is played and is one of the most natural expressive sources available in ECHON 6. It is a unipolar modulation source ranging from 0 to 1, where 0 corresponds to a MIDI note-off message and

1 to the strongest hit of a key. Unlike fixed envelopes or cyclic LFOs, velocity changes from keystroke to keystroke, making it ideal for shaping articulation, dynamics and playing nuance within each voice.

Velocity excels at controlling amplitude, attack brightness, envelope times or the behaviour of the resonator. It can add emphasis to harder key strikes, making them sharper or more resonant, or it can soften delicate notes by reducing energy fed into the feedback loop.



Different keyboards can feel very different even when they send the same type of MIDI data. This is largely down to the velocity curve: the mapping between how hard you play and the velocity value the controller generates. Some controllers use a fixed curve, while others let you choose from multiple curves to match your playing style. As a result, the same performance can produce different velocity values on different keyboards, and any modulation in ECHON 6 that uses velocity as a source may feel more sensitive, less sensitive, or differently weighted depending on the controller's curve settings.

AFTERTOUCH

Aftertouch is a unipolar modulation source that responds to pressure applied after the initial key press. ECHON 6 responds to both monophonic aftertouch (also known as Channel Pressure) and polyphonic aftertouch, depending on what your controller transmits over MIDI. When using polyphonic aftertouch, each voice can receive and process its own individual pressure value in its modulation matrix. This allows you to open the filter or change the rate of an LFO for each individually held key during a performance, simply by applying more or less pressure. The aftertouch MIDI data is internally converted to a unipolar value from 0 to 1, then scaled or inverted by its SOURCE MACRO before being sent to its destinations.

KEY FOLLOW

We have already briefly touched on key follow in the Resonator Tuning chapter of this manual. Key follow is closely linked to the resonator tuning section, because its internal value is derived from the same pitch chain. It is calculated as the fully processed note value: the incoming MIDI note (and pitch bend) combined with NOTE OFFSET, FINE TUNE and GLIDE parameters. Key follow spans a chromatic range of eight octaves, from MIDI note C0 to C8. A value of C0 corresponds to an internal key follow value of 0, and C8 corresponds to 1. These limits match the useful frequency range of the Exciter VCO, from around 16 hertz to about 4200 hertz. This is why, with the VCO's frequency modulated by key follow at full modulation depth, the VCO tracks the keyboard accurately across the entire range.

As with all modulation sources, key follow can modulate any of the 32 destinations in the modulation matrix. Beyond controlling the frequency of the VCO, it is naturally suited for use with filters. Opening a low pass filter proportionally as pitch increases helps maintain brightness, perceived loudness and energy across the full keyboard range.

In practice, key follow can be used to maintain, extend or deliberately break the balance of a sound across the keyboard. It anchors the instrument's pitch-based

behaviour and provides a direct link between musical input and expressive, dynamically shifting timbre.

Key follow can also be understood in relation to how other performance signals behave across the keyboard. Velocity and aftertouch both operate in what could be called the vertical dimension of playing: they respond to how a note is struck or how pressure is applied after the key is down. Key follow, by contrast, lives entirely in the horizontal dimension. It follows the left-to-right position of the notes you play and translates keyboard placement into a modulation source. This makes it fundamentally different from velocity and aftertouch, and uniquely suited for shaping the way a sound evolves across pitch rather than across touch. Whether used for tuning, filter movement, variations in decay behaviour or any other modulation destination, key follow adds a spatial logic to the instrument, linking the geography of the keyboard to the behaviour of the sound.

MODULATION DESTINATIONS

The following is a list of all 32 possible modulation destinations per voice. Each of these controls have been discussed in depth in earlier sections of this manual. They are structured by their respective sections on the front panel.

EXCITER SECTION MODULATION DESTINATIONS

Exciter VCO:

WAVE
WAVE / NOISE MIX
NOISE S&H RATE
FINE & COARSE FREQ

Exciter envelope:

ONSET DELAY
ATTACK
DECAY

LEVEL

QUAD LFO SECTION MODULATION DESTINATIONS

For LFO 1 through 4:

RANDOM RATE
AMPLITUDE
RANDOM / WAVE MIX
RATE

BBD RESONATOR SECTION MODULATION DESTINATIONS

Resonator sound controls:

INPUT FILTER
FEEDBACK FILTER
FEEDBACK

Resonator pitch controls:

FINE TUNE
GLIDE

OUTPUT SECTION MODULATION DESTINATIONS

DRY / WET
PANNING
LEVEL

PERFORMANCE FEATURES

Polyphony, voicing and keyboard

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PERFORMANCE FEATURES

WORKING WITH MULTI-TIMBRALITY

In the introduction to ECHON 6 you got introduced to the concept of presets, voice groups, and voices. Now that you've explored the sound architecture, modulation matrix, and built patches in the standard six-voice polyphonic mode, it's time to look at multitimbral use.

In this chapter you'll learn how to split ECHON 6 into multiple voice groups, give each group its own sound and settings, and control them independently. We'll cover the setup steps, what changes when voices are divided across groups, and a few practical examples.

The easiest way to introduce multitimbral concepts is to start from an INIT preset. By default, INIT uses a single voice group containing all six voices, so there is no multitimbral structure yet. To begin, make sure you are in Preset Mode, then hold the INIT key until the INIT LED starts blinking.

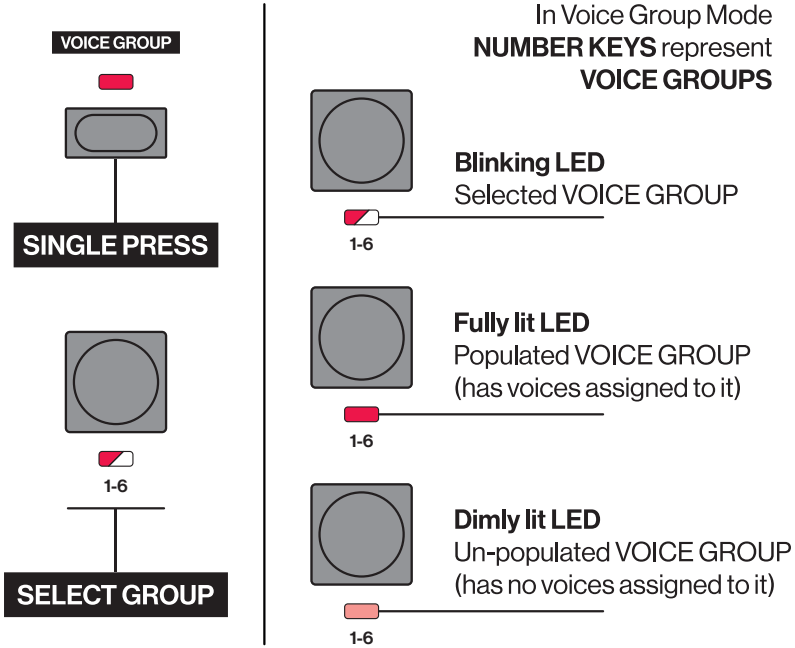
VOICE GROUP MODE

Enter Voice Group Mode by pressing the VOICE GROUP key in the Control section. The NUMBER LEDs now represent the six available voice groups. The blinking LED indicates the currently selected voice group. This is the group whose parameters you are editing from the front panel.

LED brightness indicates whether a voice group has voices assigned to it. Bright LEDs represent voice groups with one or more voices assigned. Dim LEDs represent empty voice groups with no voices assigned. Empty voice groups can still store sound settings, but they will remain silent until voices are allocated to them.

To select a different voice group for editing, press its NUMBER key. The selected voice group LED will start blinking.

With the INIT preset loaded, only Voice Group 1 can be played because all six voices are assigned to it. To create a second voice group, you first need to free some voices so they become available for allocation. This is done in Voice Group Edit Mode.

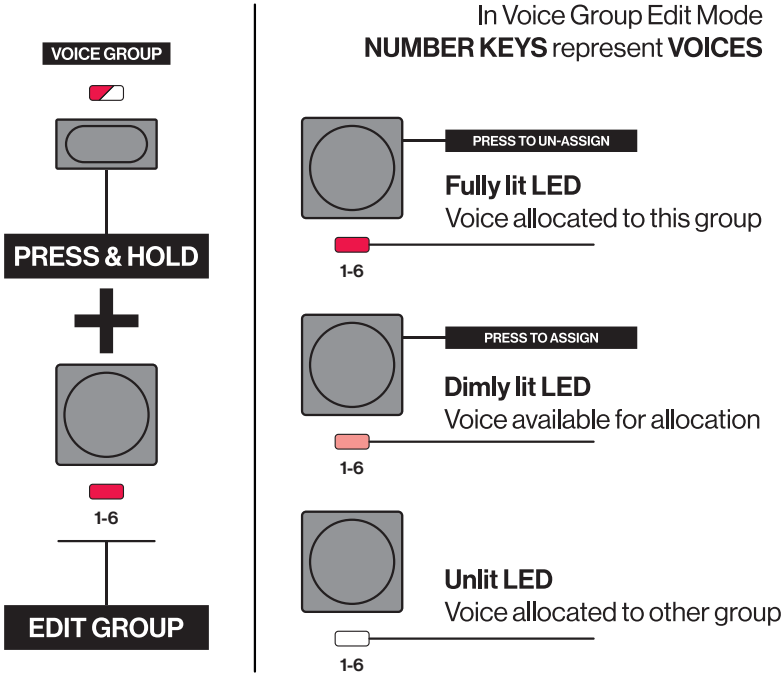


VOICE GROUP EDIT MODE

To enter Voice Group Edit Mode for a specific voice group, press and hold the VOICE GROUP key and then press the NUMBER key of the voice group you want to edit. The VOICE GROUP LED starts blinking to indicate you are now in Voice Group Edit Mode.

In this mode the NUMBER LEDs no longer represent voice groups. They represent the six voices of ECHON 6.

- A bright LED means the voice is assigned to this voice group.
- A dim LED means the voice is unassigned and available for allocation.
- An off LED means the voice is already assigned to a different voice group and is unavailable.



To create a second voice group, first unassign voices 4, 5, and 6 from Voice Group 1 so they become available. While editing Voice Group 1, press NUMBER keys 4, 5, and 6. Their LEDs will dim, indicating they are now unassigned and available for assignment.

Next, edit Voice Group 2. Press and hold the VOICE GROUP key and press NUMBER key 2. NUMBER LEDs 1, 2, and 3 will be off because these voices belong to Voice Group 1 and are unavailable for other Voice Groups. NUMBER LEDs 4, 5, and 6 will be dim because they are available. Press NUMBER keys 4, 5, and 6 to assign them to Voice Group 2. Their LEDs will become bright.

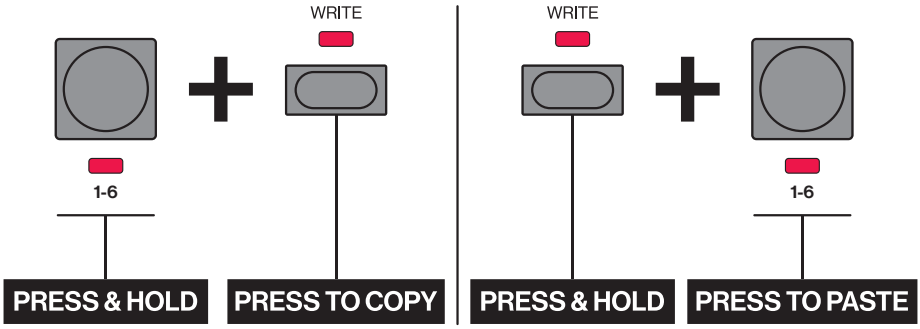
You have now created a second voice group. The preset contains two voice groups, each with three voices assigned. This is the basis of a multitimbral preset.

Press the VOICE GROUP key again to exit Voice Group Edit Mode and return to Voice Group Mode. You can now select which voice group you control from the front panel by pressing their respective NUMBER Key.

COPY / PASTE VOICE GROUP SETTINGS

You can copy / paste the sound of a one voice group to another voice group. From Voice Group Mode, hold the NUMBER key of the voice group you want to copy and hit the WRITE key. This copies the settings of the voice group to the clipboard. To paste the copied voice group hold the WRITE key and hit the NUMBER key of the voice group you want to paste the settings to.

MIDI CHANNELS, POLYPHONY AND UNISON



Now that you have created a multitimbral preset, the next step is to decide how to play the voice groups. You can layer them, play them in sequence, or treat them as separate instruments on different MIDI channels, and much more. Let's have a look at what is possible.

MIDI CHANNELS IN SHORT

ECHON 6 works with one preset MIDI channel (by default MIDI channel 1) and up to six voice group MIDI channels (by default these are MIDI channels 2 - 7). This two-layer MIDI system lets you play ECHON 6 either as one polyphonic instrument via the preset MIDI channel or as a multitimbral synth with independent parts via the voice group MIDI channels.

Different voice groups can share the same MIDI channel, but the preset and the voice groups can never share a MIDI channel.

Deeper insight into the nitty gritty of how this layered MIDI system works can be found in the MIDI implementation chapter at the end of the manual.

SETTING MIDI CHANNELS

Preset MIDI channel:

From Preset Mode press UNISON + WRITE to enter the settings menu. Hit NUMBER key 1 (labeled MIDI CH) to load the MIDI channel UI.

Voice group MIDI channel:

From Voice Group Mode, select the voice group you want to set the MIDI channel for. Press UNISON + WRITE to enter the settings menu. Hit NUMBER key 1 (labeled MIDI CH) to load the MIDI channel UI.

MIDI channel UI:

A MIDI channel is set using the RANDOM / WAVE MIX control. The SELECT and WAVE LEDs are used to display which MIDI channel is selected. These 8 LEDs are used in two layers, MIDI channels 1 - 8 are fully lit, 9 - 16 are dimly lit. The blinking LED corresponds to the selected MIDI channel. Any unlit LED represents a MIDI channel that has already been assigned and is unavailable for assignment.

UNISON

The UNISON key in the Control section of ECHON 6 has different functionality in PRESET mode or VOICE GROUP mode, allowing for complex unison control over the voices inside a voice group as well as the voice groups inside a preset. You can set the preset to play in unison independently from the voice group.

Unison in Preset Mode:

With UNISON enabled, MIDI note information received on the preset MIDI channel will be routed to all voice groups, simultaneously, irrespective of their individual MIDI channels.

With unison disabled ECHON 6 will allocate the note it receives to one voice group at a time according to the preset's note priority setting.

Unison in Voice Group Mode:

Here unison controls how voices inside the same voice group are triggered upon a note-on message.

With unison active in Voice Group Mode, a MIDI note-on message sent to that voice group will trigger all the voices in that group simultaneously. Conversely when unison is inactive on the voice group the notes will be played polyphonically according to the voice allocation algorithm set by the voice group priority setting.

NUMBER KEYPAD AS KEYBOARD CONTROLLER

ECHON 6 can be played from an external keyboard controller or sequencer via MIDI, but it can also be played directly from the front panel using the NUMBER keys as a note source.

In PRESET mode, each NUMBER key triggers its corresponding voice. By default, each key plays:

- Note: ..... Middle C (MIDI note 60)
- Modwheel value:..... 0
- Velocity value:..... 127
- Aftertouch value: 0

These settings can be changed per NUMBER key on the fly. To do so, press and hold the NUMBER key you want to edit, press and hold the SOURCE SELECTION key of the parameter you want to edit (MODWHEEL, VELOCITY, AFTERTOUCH or KEY FOLLOW), with these two buttons held, use the NOTE OFFSET control to dial in the value you like. The voice retriggers as you change the value so you can audition the result. Release the buttons to store the setting.

SETTINGS MENU

A list of all ECHON 6's settings

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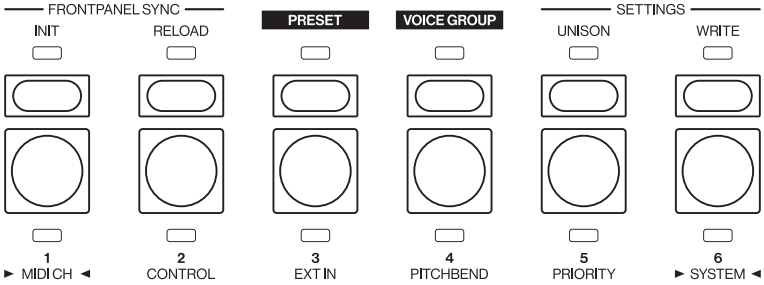
SETTINGS MENU



Press UNISON and WRITE at the same time to open the Settings menu from either Preset Mode or Voice Group Mode. The available settings depend on which mode you're in: Preset Mode gives access to preset-related settings, while Voice Group Mode provides voice-group-specific settings.

The settings page is selected with the NUMBER keys, there are 6 pages. Their names appear underneath the number of the NUMBER key.

- MIDI CH ..... (NUMBER key 1)
- CONTROL ..... (NUMBER key 2)
- EXT IN ..... (NUMBER key 3)
- PITCHBEND ..... (NUMBER key 4)
- PRIORITY ..... (NUMBER key 5)
- SYSTEM ..... (NUMBER key 6)

Settings on pages between two arrows (MIDI CH & SYSTEM) will not be saved in the preset and are saved automatically in global memory, all other settings are saved and recalled with the preset. Non-global settings are reset to default upon loading the INIT preset.

MIDI CH (NUMBER KEY 1)

In Preset Mode this sets the preset MIDI channel. This is a master MIDI channel

that is used for data transmission from and to all voice groups. (More details in the MIDI implementation chart section of this manual).

MIDI notes played on the master channel are sent to all voice groups, irrespective of their individual MIDI channels, depending on the preset UNISON and preset note priority settings.

In Voice Group Mode this sets the MIDI channel for the selected voice group.

SELECTING A MIDI CHANNEL

From the MIDI CH menu page use the RANDOM / WAVE MIX control to choose a MIDI channel. The SELECT and WAVE LEDs display the channel number:

- Channels 1–8 ..... LED fully lit
- Channels 9–16 ..... LED dimly lit
- The blinking LED indicates the currently selected channel.

Channels already used by voice groups are unavailable as the preset MIDI channel (channel LED off in Preset Settings). The preset MIDI channel is unavailable in Voice Group mode (channel LED off).

CHANNEL ASSIGNMENT RULES

The Preset MIDI Channel cannot be assigned to a Voice Group. In Voice Group Settings, its LED is off and it cannot be selected.

Any channel already assigned to a Voice Group cannot be used as the Preset MIDI Channel. In Preset Settings, those LEDs are off and cannot be selected.

CONTROL (NUMBER KEY 2):

IN PRESET MODE

- NUMBER Key 1 ..... CC in on/off

- NUMBER Key 2..... CC out on/off
- NUMBER Key 3..... Not used
- NUMBER Key 4..... Not used
- NUMBER Key 5..... SysEx current preset dump (Long press)
- NUMBER Key 6 ..... SysEx complete dump (Long press)

IN VOICE GROUP MODE

- NUMBER Key 1..... CC in on/off
- NUMBER Key 2..... CC out on/off
- NUMBER Key 3..... Not used
- NUMBER Key 4..... Not used
- NUMBER Key 5..... Not used
- NUMBER Key 6 ..... Not used

EXT IN (NUMBER KEY 3)

IN PRESET MODE

- NUMBER Key 1..... External input on/off for Voice Group 1
- NUMBER Key 2..... External input on/off for Voice Group 2
- NUMBER Key 3..... External input on/off for Voice Group 3
- NUMBER Key 4..... External input on/off for Voice Group 4
- NUMBER Key 5..... External input on/off for Voice Group 5
- NUMBER Key 6..... External input on/off for Voice Group 6

IN VOICE GROUP MODE

- NUMBER Key 1..... External input on/off for selected Voice Group
- NUMBER Key 2..... Not used
- NUMBER Key 3..... Not used
- NUMBER Key 4..... Not used
- NUMBER Key 5..... Not used
- NUMBER Key 6..... Not used

PITCHBEND (NUMBER KEY 4):

When selected in Preset Mode we automatically jump to the currently selected voice group as this setting has no use in Preset Mode.

- NUMBER Key 1..... +/- 1 semitone
- NUMBER Key 2..... +/- 2 semitones
- NUMBER Key 3..... +/- 3 semitones
- NUMBER Key 4..... +/- 5 semitones
- NUMBER Key 5..... +/- 7 semitones
- NUMBER Key 6..... +/- 12 semitones

PRIORITY (KEY 5):

ECHON 6 supports five voice allocation strategies to determine how incoming notes are assigned to available voices. These modes are selectable per voice group or preset and can significantly affect how polyphony and note stealing behave. Note priority can be set independently for both Preset Mode and Voice Group Mode.

IN PRESET MODE

In Preset Mode this defines how voice groups on the same MIDI channel will be triggered when unison is inactive.

- NUMBER Key 1..... First available with stealing
- NUMBER Key 2..... First available without stealing
- NUMBER Key 3..... Round-robin with stealing
- NUMBER Key 4..... Least recently used (oldest)
- NUMBER Key 5..... Reuse same note if playing
- NUMBER Key 6..... Not used

IN VOICE GROUP MODE

In VOICE GROUP mode this defines how voices inside the same voice group are

triggered when unison is off.

- NUMBER Key 1..... First available with stealing
- NUMBER Key 2..... First available without stealing
- NUMBER Key 3..... Round-robin with stealing
- NUMBER Key 4..... Least recently used (oldest)
- NUMBER Key 5..... Reuse same note if playing
- NUMBER Key 6..... Not used

VOICE ALLOCATION MODE DESCRIPTIONS

First available with stealing:

This is the default and most straightforward voice allocation strategy. When a new note is received, the synthesizer looks for the first (lowest voice number) free voice. If no free voices are available, it will steal the least recently used voice.

Best for predictable behaviour with smooth voice recycling, particularly for sustained playing or chords where voice priority isn't explicitly controlled by the user.

First available without stealing:

New notes are assigned to the first free voice. If all voices are already in use, the note is ignored, no voice stealing occurs.

Ideal for avoiding unwanted note cut-offs in live performances or for patch designs where voice stealing would cause artefacts or audible pops.

Round-robin with stealing:

Each new note is assigned to the next voice in a rotating fashion (next voice number), cycling through all voices evenly. If the selected voice is busy, ECHON 6 continues searching. If all voices are busy, the least recently used voice is stolen.

Great for spreading notes evenly across available voices, especially useful for voices with slight variation between them to create a richer sound, as ECHON 6 will cycle through all voices. Also suitable for layered unison sounds where one or more voice groups are not in unison and even load distribution is important.

Least recently used (oldest):

This mode always uses the oldest available voice, the one that was used least recently. If all voices are in use, it steals the oldest one.

Good for emulating classic polyphonic synths (like the Prophet series), where voice priority is influenced by note history. Also useful when you want predictable voice stealing behaviour without using round-robin.

Reuse Same Note (with fallback stealing):

If a note is already being played (same pitch), that same voice is used, even if still sounding. If not, the synthesizer looks for a free voice. If all voices are in use, it steals the least recently used voice.

Useful for legato playing, re-triggering the same note (e.g., monophonic-style glides), or reducing detuning artefacts when the same key is repeatedly pressed.

SYSTEM (NUMBER KEY 6)

System Settings are available from both Preset Mode and Voice Group Mode. They apply globally to ECHON 6 and are not tied to any single preset or voice group.

- NUMBER Key 1: ..... Local control on/off
- NUMBER Key 2: ..... Program change in on/off
- NUMBER Key 3 ..... Program change out on/off
- NUMBER Key 4 ..... Control catch-up on/off
- NUMBER Key 5 ..... LED brightness (cycle through 5 options)
- NUMBER Key 6 ..... Start VCO tuning

LOCAL CONTROL

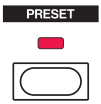
Local Control determines whether ECHON 6's front panel controls and performance inputs are connected directly to its internal sound engine.

- Local Control On (normal operation): playing notes (including from the NUMBER keypad) and adjusting any front panel control immediately affects the sound.
- Local Control Off: front panel controls and the NUMBER keypad no longer affect the internal sound engine directly. ECHON 6 will respond only to incoming MIDI messages.

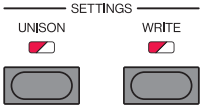
Local Control is mainly used when ECHON 6 is connected to a computer, sequencer, or external MIDI controller that is also routing MIDI back to ECHON 6. Turning Local Control Off prevents "double triggering" (notes being played twice) and avoids MIDI feedback loops when your DAW is echoing MIDI back to the instrument. This is the preferred setting when using ECHON 6 as a controller surface or when MIDI routing is handled externally.

VCO-TUNING

ECHON 6 features an automatic tuning procedure for the Exciter's VCO to ensure accurate pitch across all six voices. To start the tuning process, open the Global Settings menu and press Key 6. This activates the auto-tuning routine for all VCOs. During tuning, the synthesizer is completely unavailable for normal use and produces no sound at any output. This process will take several minutes and will return to preset mode when complete. Do not turn off ECHON 6 while tuning is in progress. Interrupting the procedure can result in incomplete calibration and unstable tuning. If the unit is turned off during tuning, wait at least 20 seconds before powering it up again to allow the internal power backup system to fully reset. For best results, and improved temperature stability during longer sessions, let ECHON 6 warm up for at least 10 minutes after power-on before running the tuning procedure.



1 - Open PRESET settings menu



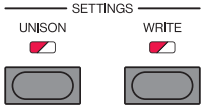
PRESS BOTH

2 - Choose menu page

3 - Set menu item(s)

	1	2	3	4	5	6
1 ► MIDI CH ◄	**Set PRESET MIDI channel using RANDOM / WAVE MIX**					
2 CONTROL	**CC in on/off**	**CC out on/off**			**Dump current preset** (Long press)	**Dump all presets** (Long press)
3 EXT IN	**VG 1 EXT. IN on/off**	**VG 2 EXT. IN on/off**	**VG 3 EXT. IN on/off**	**VG 4 EXT. IN on/off**	**VG 5 EXT. IN on/off**	**VG 6 EXT. IN on/off**
4 PITCHBEND	**+/- 1 st**	**+/- 2 st**	**+/- 3 st**	**+/- 5 st**	**+/- 7 st**	**+/- 12 st**
5 PRIORITY	**First available with stealing**	**First available without stealing**	**Round robin with stealing**	**Least recently used**	**Reuse same note if playing**	
6 ► SYSTEM ◄	**Local control on/off**	**PGM in on/off**	**PGM out on/off**	**Control catch-up on/off**	**LED bright-ness**	**VCO tuning**

1 - Open VOICE GROUP settings menu



PRESS BOTH

2 - Choose menu page

3 - Set menu item(s)

	1	2	3	4	5	6
1 ► MIDI CH ◄	Set VOICE GROUP MIDI channel using RANDOM / WAVE MIX					
2 CONTROL	CC in on/off	CC out on/off				
3 EXT IN	Current VG EXT. IN on/off					
4 PITCHBEND	+/- 1 st	+/- 2 st	+/- 3 st	+/- 5 st	+/- 7 st	+/- 12 st
5 PRIORITY	First available with stealing	First available without stealing	Round robin with stealing	Least recently used	Reuse same note if playing	
6 ► SYSTEM ◄	Local control on/off	PGM in on/off	PGM out on/off	Control catch-up on/off	LED bright-ness	VCO tuning

FACTORY RESET

A factory reset returns ECHON 6 to its original out-of-the-box state. Warning: this operation permanently deletes all current user presets and formats the entire user-memory flash region. It then restores the original embedded factory presets and the original global settings. The currently installed firmware is kept, and calibration data is preserved. To perform a factory reset, hold both KB RESET buttons (one in the Exciter section and one in the QUAD LFO section) plus the SMOOTH button, then power on the unit. During the reset, the SOURCE LEDs act as a progress bar. The FUNCTION LEDs blink to indicate that a factory reset is in progress.

CREDITS

Thank you's and praises

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UNE ODE À NOS TERRES

Belgium is a country that rarely raises its voice, yet somehow its echoes travel far. From the outside it looks modest, but beneath that quiet surface lies a restless undercurrent of invention, artistry and unlikely revolutions. Music here does not arrive with grand statements. It slips through rehearsal room doors, late-night cafés, converted barns, damp basements and tiny studios where imagination and stubborn craft sit shoulder to shoulder.

This is the land of Adolphe Sax, who shaped the breath of modern music with an instrument dreamt up in a Brussels workshop. It is the birthplace of Django Reinhardt, whose two remaining fingers created a guitar style the world still chases. It is where dance halls once throbbed with the mechanical heartbeat of Decap organs, machines built not only to play music but to make entire rooms move. And decades later, when electronic music was still deciding what it wanted to be, Belgian producers stepped in with a peculiar combination of discipline and mischief, inventing Electronic Body Music and slowing records into the hypnotic pulse that became New Beat. What started as experimentation in small clubs soon became global language.

There is a particular flavour to Belgian creativity. A blend of precision and surrealism, melancholy and humour, engineering and instinct. It is not loud. It does not demand attention. But it is relentless in its curiosity. Even in the most obscure corners of the country you find makers and musicians pushing boundaries simply because the idea will not leave them alone. There is this spirit of rebuilding, rethinking, reimagining, turning limitations into pathways rather than walls.

Belgium has always embraced imperfection as part of the beauty of sound. From Django's unexpected technique to the unruly growl of analogue filters and the unpredictable charm of mechanical music machines, there is a comfort here with things that wobble, shimmer and wander. Precision is loved, but never allowed to suffocate character. Technology is respected, but always asked to serve musicality, not the other way around.

This quiet country, small though it may be, has left fingerprints on instruments,

genres and ideas across continents. It has produced inventions that became household names, genres that reshaped dance floors, and artists who altered the way the world listens. And it has done all this without shouting, without spectacle, with a kind of gentle confidence that the work will speak for itself when the time is right.

THANKS TO

We'd like to thank a few people whose help and support made a real difference in getting ECHON 6 out into the world.

Belgian synth maker community
Jeremia Aelbrecht
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Dries Geusens
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Drew Neumann
Karel Pauwels
Fred Philpott
Lieven Stockx
Herman Uytterhaegen †
Lies Van Damme
Kris Vanderheyden
Wim Verheyen
Gaz Willams
Ben Wilson

ABBREVIATIONS

Used in this manual

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ABBREVIATIONS

- BBD: ..... Bucket Brigade Device
- BPM: ..... Beat Per Minute
- c: ..... Cent, 1/100 of a semitone
- DAW: ..... Digital Audio Workstation
- dB: ..... Decibel
- Excl.: ..... Excluding
- Ext in: ..... External input
- Hz: ..... Hertz
- Incl.: ..... Including
- KB: ..... Keyboard
- LED: ..... Light Emitting Diode
- LFO: ..... Low Frequency Oscillator
- MIDI: ..... Musical Instrument Digital Interface
- MIDI CC: ..... MIDI Continuous Controller
- st: ..... Semitone
- TS: ..... Tip-Sleeve jack connector / cable
- TRS: ..... Tip-Ring-Sleeve jack connector / cable
- Sysex: ..... System Exclusive
- VCO: ..... Voltage Controlled Oscillator
- VCA: ..... Voltage Controlled Amplifier

MIDI IMPLEMENTATION

Charts and numbers

/\/\orphor®

MIDI IMPLEMENTATION

ECHON 6 listens to MIDI and decides what to do based on:

- Which channel the message arrives on.
- What type of message it is.

When a MIDI message arrives, ECHON 6 checks:

- Is this the Preset MIDI Channel?
- Or is this a Voice Group MIDI Channel?

That decision determines how the message is routed.

PRESET MIDI CHANNEL

MIDI Notes:

Note On:

- If Unison is ON the note is sent to all voice groups.
- If Unison is OFF the preset's voice priority setting selects one voice group using the current voice allocation mode (round-robin, lowest, etc.).

Note Off:

- Always sent to all voice groups, because any group may have played the note.

Program Change:

Program Change messages load presets. ECHON 6 supports three standard MIDI selection methods:

Full Bank Select Mode (CC0 + CC32 + Program Change)
If both were received before the Program Change:

- CC0 sets the bank (0–5) (strict)
- CC32 sets the sub-bank (0–5) (strict)
- PC sets the preset (0–5) (strict)

This gives full access to all 216 presets.

Bank + Program Mode (CC0 + Program Change)

If only CC0 was received:

- CC0 selects the Bank (0-5)
- Program Change selects preset inside that bank (0-35)
- Program Change values above 35 are ignored.

Program Change Only Mode

If no bank select messages were sent:

- Program Change 0–127 selects presets 0–127 in a deterministic order:
- Program Change 0-127 maps globally across presets
- Only Banks 0-3 are reachable in this mode

Control Change and SysEx:

Global Broadcast Controls

- These affect all voice groups:
- CC1.....Modulation Wheel
- CC120.....All Sounds Off
- CC123.....All Notes Off

Preset Controls

- CC0 ..... Bank Select MSB
- CC32 ..... Bank Select LSB
- CC114 ..... Select active voice group
- CC121 ..... Reset all controllers
- CC122 ..... Local Control On/Off
- CC126 ..... Mono mode (Unison ON)
- CC127 ..... Poly mode (Unison OFF)

Voice-Group Parameter Controls (Received on Preset Channel)

All other CC messages are forwarded only to the currently selected voice group. This allows editing any voice group without changing MIDI channels.

Example workflow:

- Select voice group with CC114
- Adjust parameters using CC messages
- Play normally

Only the selected voice group is affected.

Special CC Functions

These are used for the Control Panel keypad MIDI note configuration:

- CC11 ..... Select NUMBER key (1-6)
- CC12 ..... Set MIDI note for selected key
- CC13 ..... Set velocity for selected key

Special System Messages

These perform system-level functions:

- Tune Request (0xF6).....Starts tuning process
- System Reset (0xFF) .....Reboots the system

Pitch Bend and Aftertouch on Preset Channel

These expressive controls are broadcast to all voice groups:

- Pitch Bend
- Channel Aftertouch
- Polyphonic Aftertouch

This ensures consistent expression across all active voices.

VOICE GROUP MIDI CHANNEL

Each voice group can be given its own MIDI channel. This means every voice group can behave as its own independent synthesizer (poly or mono).

MIDI Notes

- Notes go directly to that voice group
- Preset voice priority algorithm is bypassed
- Only voice group note priority setting is applied.
- Multiple groups can share a channel

Pitch Bend and Aftertouch

Affect only that voice group.

CC Messages

- All CC messages affect only that voice group.
- Each group can have independent:
- Modulations
- Envelope settings

- QuadLFO/Random settings
- Modulation routing
- Resonator settings
- Pitchbend depth
- Voice allocation modeUnison mode
- Ext in usage

UNIVERSAL MIDI MESSAGES

MESSAGE TYPE	PRESET CHANNEL	VOICE GROUP CHANNEL
Note On	Allocated or Unison broadcast	Direct to group
Note Off	Broadcast to all groups	Direct to group
Program Change	Loads preset	Ignored
Pitch Bend	Broadcast to all groups	Group only
Aftertouch	Broadcast to all groups	Group only
CC (parameters)	Sent only to selected voice group	Sent to that group
CC120 / CC123	Global broadcast	Channel broadcast
CC114	Select voice group	Ignored

SYSTEM MESSAGES

MIDI MESSAGE	HEX	DESCRIPTION
SYSEX_START	0xF0	Begins a System Exclusive message for manufacturer-specific data
TUNE_REQUEST	0xF6	Requests that all voices are tuned to the standard pitch
SYSEX_STOP	0xF7	Ends a System Exclusive message
CLOCK	0xF8	MIDI clock (24 ppqn), used for LFO in sync mode
TRANSPORT_START	0xFA	Transport start
TRANSPORT_CONTINUE	0xFB	Transport continue
TRANSPORT_STOP	0xFC	Transport stop
ACTIVE_SENSE	0xFE	Active sensing
SYSTEM_RESET	0xFF	Reset complete system

CHANNEL MESSAGES

MIDI MESSAGE	HEX	ACCEPTED CHANNELS	DESCRIPTION
NOTE_OFF	0x80	Preset + voice groups	Turns off a note on the channel
NOTE_ON	0x90	Preset + voice groups	Starts playing a note with a certain velocity
POLYPHONIC_ AFTERTOUCH	0xA0	Preset + voice groups	Sends pressure information for individual notes
CONTROL_CHANGE	0xB0	Preset + voice groups	Sends control changes on the channel (see supported CC tables)
PROGRAM_CHANGE	0xC0	Preset	Changes (loads) the current preset
CHANNEL_AFTERTOUCH	0xD0	Preset + voice groups	Sends overall pressure information for the channel
PITCH_BEND	0xE0	Preset + voice groups	Adjusts pitch with 14-bit resolution

EXCITER - CONTROL CHANGE (CC) MESSAGES

MIDI CC #	PARAMETER	MODULATABLE	ACCEPTED CHANNELS	VALUES / DESCRIPTION
14	Ext in	No	Voice groups	Off: 0-63, On: 64-127
15	Wave	Yes	Preset + voice groups	0-127
16	KB reset	No	Preset + voice groups	Off: 0-63, On: 64-127
17	Coarse frequency	Yes	Preset + voice groups	0-127
18	Fine frequency	Yes	Preset + voice groups	0-127 (63 = center)
19	Noise S&H rate	Yes	Preset + voice groups	0-127
20	Wave noise mix	Yes	Preset + voice groups	0-127
21	Level	Yes	Preset + voice groups	0-127

ENVELOPE - CONTROL CHANGE (CC) MESSAGES

MIDI CC #	PARAMETER	MODULATABLE	ACCEPTED CHANNELS	VALUES / DESCRIPTION
22	Onset delay	Yes	Preset + voice groups	0-127
23	Attack	Yes	Preset + voice groups	0-127
24	Decay	Yes	Preset + voice groups	0-127
25	Sustain	No	Preset + voice groups	0-127
26	Release	No	Preset + voice groups	0-127
27	Range	No	Preset + voice groups	Short: 0-41, Medium: 42-83, Long: 84-127
28	Hold	No	Preset + voice groups	Off: 0-63, On: 64-127
29	Legato	No	Preset + voice groups	Off: 0-63, On: 64-127
30	Loop	No	Preset + voice groups	Off: 0-63, On: 64-127

RESONATOR CONTROL CHANGE (CC) MESSAGES

MIDI CC #	PARAMETER	MODULATABLE	ACCEPTED CHANNELS	VALUES / DESCRIPTION
31	Input filter	Yes	Preset + voice groups	0-127
40	Feedback filter	Yes	Preset + voice groups	0-127
41	Invert	Yes	Preset + voice groups	0-127
43	Feedback	No	Preset + voice groups	0-127
5	Glide	No	Preset + voice groups	0-127
46	Fine tune	No	Preset + voice groups	Short: 0-41, Medium: 42-83, Long: 84-127
47	Note offset	No	Preset + voice groups	Off: 0-63, On: 64-127

OUTPUT - CONTROL CHANGE (CC) MESSAGES

MIDI CC #	PARAMETER	MODULATABLE	ACCEPTED CHANNELS	VALUES / DESCRIPTION
48	Dry/wet	Yes	Preset + voice groups	0-127
10	Panning	Yes	Preset + voice groups	0-127
7	Level	Yes	Preset + voice groups	0-127

QUAD LFO - CONTROL CHANGE (CC) MESSAGES

MIDI CC #	PARAMETER	MODULATABLE	ACCEPTED CHANNELS	VALUES / DESCRIPTION
49	LFO 1 wave	No	Preset + voice groups	Sine: 0-31, Triangle: 32-63, Ramp: 64-95, Square: 96-127
50	LFO 1 random rate	Yes	Preset + voice groups	0-127
51	LFO 1 amplitude	Yes	Preset + voice groups	0-127
52	LFO 1 smooth	No	Preset + voice groups	Off: 0-63, On: 64-127
53	LFO 1 mix	Yes	Preset + voice groups	0-127
54	LFO 1 KB reset	No	Preset + voice groups	Off: 0-63, On: 64-127
55	LFO 1 single shot	No	Preset + voice groups	Off: 0-63, On: 64-127
56	LFO 1 rate	Yes	Preset + voice groups	0-127
57	LFO 1 polarity	No	Preset + voice groups	Bipolar: 0-63, Unipolar: 64-127
58	LFO 1 clock sync	No	Preset + voice groups	Off: 0-63, On: 64-127
59	LFO 2 wave	Yes	Preset + voice groups	Sine: 0-31, Triangle: 32-63, Ramp: 64-95, Square: 96-127
60	LFO 2 random rate	Yes	Preset + voice groups	0-127
61	LFO 2 amplitude	Yes	Preset + voice groups	0-127

62	LFO 2 smooth	No	Preset + voice groups	Off: 0-63, On: 64-127
63	LFO 2 mix	Yes	Preset + voice groups	0-127
70	LFO 2 KB reset	No	Preset + voice groups	Off: 0-63, On: 64-127
71	LFO 2 single shot	No	Preset + voice groups	Off: 0-63, On: 64-127
72	LFO 2 rate	Yes	Preset + voice groups	0-127
73	LFO 2 polarity	No	Preset + voice groups	Bipolar: 0-63, Unipolar: 64-127
74	LFO 2 clock sync	No	Preset + voice groups	Off: 0-63, On: 64-127
75	LFO 3 wave	Yes	Preset + voice groups	Sine: 0-31, Triangle: 32-63, Ramp: 64-95, Square: 96-127
76	LFO 3 random rate	Yes	Preset + voice groups	0-127
77	LFO 3 amplitude	Yes	Preset + voice groups	0-127
78	LFO 3 smooth	No	Preset + voice groups	Off: 0-63, On: 64-127
79	LFO 3 mix	Yes	Preset + voice groups	0-127
80	LFO 3 KB reset	No	Preset + voice groups	Off: 0-63, On: 64-127
81	LFO 3 single shot	No	Preset + voice groups	Off: 0-63, On: 64-127
82	LFO 3 rate	Yes	Preset + voice groups	0-127
83	LFO 3 polarity	No	Preset + voice groups	Bipolar: 0-63, Unipolar: 64-127
85	LFO 3 clock sync	No	Preset + voice groups	Off: 0-63, On: 64-127
86	LFO 4 wave	Yes	Preset + voice groups	Sine: 0-31, Triangle: 32-63, Ramp: 64-95, Square: 96-127
87	LFO 4 random rate	Yes	Preset + voice groups	0-127
88	LFO 4 amplitude	Yes	Preset + voice groups	0-127
89	LFO 4 smooth	No	Preset + voice groups	Off: 0-63, On: 64-127

90	LFO 3 mix	Yes	Preset + voice groups	0-127
91	LFO 3 KB reset	No	Preset + voice groups	Off: 0-63, On: 64-127
92	LFO 3 single shot	No	Preset + voice groups	Off: 0-63, On: 64-127
93	LFO 3 rate	Yes	Preset + voice groups	0-127
94	LFO 3 polarity	No	Preset + voice groups	Bipolar: 0-63, Unipolar: 64-127
95	LFO 3 clock sync	No	Preset + voice groups	Off: 0-63, On: 64-127

SOURCE MACRO ATTENUVERTER - CONTROL CHANGE (CC) MESSAGES

MIDI CC #	PARAMETER	MODULATABLE	ACCEPTED CHANNELS	VALUES / DESCRIPTION
9	Detach / attach source	No	Preset + voice groups	Envelope Detached: 0–9; Envelope Attached: 10–20; Quad LFO Detached: 21–31; Quad LFO Attached: 32–41; Modwheel Detached: 42–52; Modwheel Attached: 53–63; Velocity Detached: 64–73; Velocity Attached: 74–84; Aftertouch Detached: 85–95; Aftertouch Attached: 96–105; Key Follow Detached: 106–116; Key Follow Attached: 117–127
102	Envelope	No	Preset + voice groups	Negative values : 0-63, No modulation depth : 64, Positive values: 65-127
103	Quad LFO	No	Preset + voice groups	Negative values : 0-63, No modulation depth : 64, Positive values: 65-127
104	Modwheel	No	Preset + voice groups	Negative values : 0-63, No modulation depth : 64, Positive values: 65-127
105	Velocity	No	Preset + voice groups	Negative values : 0-63, No modulation depth : 64, Positive values: 65-127
106	Aftertouch	No	Preset + voice groups	Negative values : 0-63, No modulation depth : 64, Positive values: 65-127
107	Key follow	No	Preset + voice groups	Negative values : 0-63, No modulation depth : 64, Positive values: 65-127
108v	Pitchbend depth	No	Preset + voice groups	±1 semitones: 0-21, ±2 semitones: 22-42, ±3 semitones: 43-63, ±5 semitones: 64-84, ±7 semitones: 85-105, ±12 semitones: 106-127

MODULATION PATH - CONTROL CHANGE (CC) MESSAGES

MIDI CC #	PARAMETER	MODULATABLE	ACCEPTED CHANNELS	VALUES / DESCRIPTION
109	Modulation source select	No	Preset + voice groups	See “Modulation Source Selection Table”
110	Modulation destination select	No	Preset + voice groups	See “Modulation Destination Parameter Selection”
111	Destination depth	No	Preset + voice groups	0-127
112	Destination depth polarity	No	Preset + voice groups	Negative: 0-63. Positive: 64-127
113	Modulation enable	No	Preset + voice groups	Disable: 0-63, Enable: 64-127

OTHER - CONTROL CHANGE (CC) MESSAGES

MIDI CC #	PARAMETER	MODULATABLE	ACCEPTED CHANNELS	VALUES / DESCRIPTION
0	Bank select MSB	No	Preset	0-5: Select 1 of the 6 banks (0,1,2,3,4,5)
1	Modwheel	No	Preset + voice groups	0-127
32	Bank select LSB	No	Preset	0-35: Select combined sub bank and preset number. (e.g. 6-> sub bank 1, preset 0, e.g. 35-> sub bank 5, preset 5)
11	NUMBER key note select	No	Preset	0–20: Key 1; 21-41: Key 2; 42-62: Key 3; 63-83: Key 4; 84-104: Key 5; 105-127: Key 6
12	NUMBER key MIDI note number	No	Preset	12-108
13	NUMBER key velocity value	No	Preset	0-127
2	NUMBER key modwheel value	No	Preset	0-127
3	NUMBER key aftertouch value	No	Preset	0-127
114	Voice group select	No	Preset	0,1,2,3,4,5: Select the voice group if more than 1 voice group has the specified channel.

115	LFO select	No	Preset + voice groups	0–31: LFO1, 32–63: LFO 2, 64–95: LFO 3, 96–127: LFO 4
116	Note priority mode	No	Preset + voice groups	Mode 1: 0-25, Mode 2: 26–51, Mode 3: 52–77, Mode 4: 78–102, Mode 5: 103–127 (see Note Priority Modes)
117	Remove voice from voice group	No	Preset + voice groups	Voice 1-6: 0,1,2,3,4,5; Remove a voice from the selected voice group
118	Add voice to voice group	No	Preset + voice groups	Voice 1-6: 0,1,2,3,4,5; Add a voice to the selected voice group (Voice must be free i.e. not belonging to another voice group)
120	All sounds off	No	Preset + voice groups	0: Immediately silences all voices (i.e. resonator level control set to 0) of all voice groups on the specified channel.
121	Reset all controls	No	Preset + voice groups	Load init settings for all voice groups when on send on Preset channel, loads init voice group settings when send on Voice Group channel
122	Local control	No	Preset	Off: 0, On: 127, All front-panel tweaks no longer change the internal engine directly. CCs can still be send out if CC Out is enabled.
123	All notes off	No	Preset + voice groups	Any value is accepted: All voices receive a "Note Off" for all voices when received on Preset channel. When received on Voice Group channel, all voice groups with that specified channel receive a “Note Off” for their voices.
126	Mono mode on	No	Preset + voice groups	Any value is accepted: Switches to unison mode. (disables Polyphonic mode)
127	Poly mode on	No	Preset + voice groups	Any value is accepted: Switches to polyphonic mode. (disables Unison mode)

MODULATION SOURCE SELECTION TABLE

MODULATION SOURCE SELECTION VALUES	MODULATION SOURCE NAME
0	Envelope
1	Random/LFO 1
2	Random/LFO 2
3	Random/LFO 3
4	Random/LFO 4
5	Modwheel
6	Velocity
7	Aftertouch
8	Key Follow

MODULATION DESTINATION PARAMETER SELECTION TABLE

MODULATION PARAMETER SELECTION VALUES	MODULATION SOURCE NAME
0	Exciter Wave Ext In
1	Exciter Noise S&H Rate
2	Exciter Wave Ext In Noise Mix
3	Exciter Frequency
4	Exciter Level
5	Envelope Onset Delay

6	Envelope Attack
7	Envelope Decay
8	Resonator Input Filter
9	Resonator Feedback Filter
10	Resonator Feedback
11	Resonator Glide
12	Resonator Fine Tune
13	Resonator Dry/Wet
14	Resonator Panning
15	Resonator Level
16	LFO 1 LFO Rate
17	LFO 1 Mix
18	LFO 1 Amplitude
19	LFO 1 Random Rate
20	LFO 2 LFO Rate
21	LFO 2 Mix
22	LFO 2 Amplitude
23	LFO 2 Random Rate
24	LFO 3 LFO Rate
25	LFO 3 Mix
26	LFO 3 Amplitude
27	LFO 3 Random Rate

28	LFO 4 LFO Rate
29	LFO 4 Mix
30	LFO 4 Amplitude
31	LFO 4 Random Rate

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