

USER MANUAL

KEYSTEP PRO

Controller & Sequencer

ARTURIA
_The sound explorers

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Thank you for purchasing the Arturia KeyStep Pro!

This manual covers the features and operation of Arturia's **KeyStep Pro**. KeyStep Pro is a full-featured standalone keyboard controller complete with four polyphonic sequencers, four arpeggiators, a wide-ranging set of USB, MIDI and CV connections and our Slimkey keyboard that provides maximum playability with a minimal footprint.

KeyStep Pro is designed for the electronic musician looking for a reliable hardware product that will give them fast hands-on control over up to four devices at once. Each device can be played directly through the keyboard or controlled by one of the four sequencers/arpeggiators. Devices can also be controlled through USB, two independent MIDI outputs or four sets of CV and Gate outputs, giving users the ability to control nearly any kind of electronic musical instrument available today.

In this package you will find:

- One KeyStep Pro controller, with a serial number and unlock code on the bottom. You will need this information in order to register your KeyStep Pro.
- One "worldwide" power supply with interchangeable leads
- One USB cable
- The Quick Start Guide for KeyStep Pro

Be sure to register your KeyStep Pro as soon as possible! There is a sticker on the bottom panel that contains the serial number of your unit and an unlock code. These are required during the online registration process. You may want to record these elsewhere or take a photo of the sticker in case it becomes damaged.

Registering your KeyStep Pro provides the following benefits:

- Access to the latest version of the MIDI Control Center software
- Special offers restricted to KeyStep Pro owners

Special Message Section

Specifications Subject to Change:

The information contained in this manual is believed to be correct at the time of printing. However, Arturia reserves the right to change or modify any of the specifications without notice or obligation to update the hardware that has been purchased.

IMPORTANT:

The product and its software, when used in combination with an amplifier, headphones or speakers, may be able to produce sound levels that could cause permanent hearing loss. DO NOT operate for long periods of time at a high level or at a level that is uncomfortable.

If you encounter any hearing loss or ringing in the ears, you should consult an audiologist.

NOTICE:

Service charges incurred due to a lack of knowledge relating to how a function or feature works (when the product is operating as designed) are not covered by the manufacturer's warranty, and are therefore the owner's responsibility. Please study this manual carefully and consult your dealer before requesting service.

Precautions include, but are not limited to, the following:

1. Read and understand all the instructions.
2. Always follow the instructions on the instrument.
3. Before cleaning the instrument, always remove the USB and power cables. When cleaning, use a soft and dry cloth. Do not use gasoline, alcohol, acetone, turpentine or any other organic solutions; do not use a liquid cleaner, spray or cloth that is too wet.
4. Do not use the instrument near water or moisture, such as a bathtub, sink, swimming pool or similar place.
5. Do not place the instrument in an unstable position where it might accidentally fall over.
6. Do not place heavy objects on the instrument. Do not block openings or vents of the instrument; these locations are used for air circulation to prevent the instrument from overheating. Do not place the instrument near a heat vent at any location with poor air circulation.
7. Do not open or insert anything into the instrument that may cause a fire or electrical shock.
8. Do not spill any kind of liquid onto the instrument.
9. Always take the instrument to a qualified service center. You will invalidate your warranty if you open and remove the cover, and improper assembly may cause electrical shock or other malfunctions.
10. Do not use the instrument with thunder and lightning present; otherwise it may cause long distance electrical shock.
11. Do not expose the instrument to hot sunlight.
12. Do not use the instrument when there is a gas leak nearby.
13. Arturia is not responsible for any damage or data loss caused by improper operation of the instrument.

Introduction

Congratulations on your purchase of the Arturia KeyStep Pro!

This fantastic keyboard controller gives you everything you need to quickly and easily control up to four devices (virtual instruments, hardware synthesizers, modular synthesizers or drum machines) at once. Its standalone design means that you can use it with or without a computer and its four powerful sequencers/arpeggiators are sure to spark interesting musical ideas and capture your best performances.

All the essential features of a professional keyboard controller are here, including aftertouch, pitch and modulation touch-strips, and clearly labeled buttons and knobs that are sensibly laid out for fast, intuitive access. The Slimkey keyboard features great-feeling keys that are smaller than standard piano keys but still large enough to allow for maximum playability across multiple octaves. These keys make the product smaller and more portable but—make no mistake—KeyStep Pro is built like a tank so that it can be taken on tour with confidence.

We hope the four polyphonic sequencers will unleash your most interesting musical ideas. The RGB LED indicators above each key give you immediate visual feedback of exactly what each sequencer is doing. You can specify the exact pitch, length, velocity, timing and randomness of a sequence step through touch-sensitive knobs with surrounding indicator LED rings. The dedicated note tie, transposition, overdubbing and hold buttons bring immediacy and power to the sequencers. You can even set independent lengths for each of the four sequencers for amazing polyrhythmic fun! Breath new life in your sequences by playing them in a different key. Transpose them intelligently, they'll remain in key during transpose. Invert them, Shift them forward or backwards in time. Then send it all out on the four Voices to your Modular system.

The arpeggiators have many inspiring modes of operation beyond the basic (up/down) modes. The HOLD function lets you easily create complex arpeggiations with up to 32 notes (!) and the step timing can be manipulated in realtime. Experiment with Arpeggiators like you've never done before! Create and mix the output of three arpeggiators playing simultaneously. Mix arpeggios playing at different speeds. Finally, the scale quantization and chord memory features will make you seem like even more of a musical monster than you already are!

Use the Drum track to create complex polymeter rhythms; rhythms of different lengths playing on 24 channels. Or use the first 8 channels to trigger drum units on your modular system. Use the control tracks of the four sequencers to control filters, envelope stages, reverb times on your external synths.

All of its features are one SHIFT/CLICK away. There's no menu diving. If you need to change settings there's a configuration menu, but it's a set and forget thing. The real stuff that makes your music come to life is always at your fingertips. And what features they are! Four sequencers, that can play huge stacked chords in every step. Advanced step editing; take the chord stored in a step and change only the notes you want to change in that chord.

In addition to the standard MIDI ports, there is a second MIDI port that you use to control more gear or a DMX light controller.

KeyStep Pro has a massive number of uses thanks to its simultaneous USB, MIDI, CV/Gate connections. Each of the its four tracks can output on USB, MIDI or CV/Gate simultaneously. Each track on KeyStep Pro has control voltage (CV) outputs for Pitch, Gate and an extra "modulation" CV output that allows for more creative sound design by letting you control things like controlling velocity, filter cutoff, or any other parameter of your choosing. The first track of KeyStep Pro can be set to function as a drum or "trigger" sequencer with 8 separate CV gate outputs that you can use with analog drum machines or your modular synthesizer.

The powerful synchronization features let you use KeyStep Pro as a master clock source or to have it synchronize itself to incoming USB, MIDI or CV synchronization signals. KeyStep Pro can send and receive clock signals and even has a separate clock reset CV output jack so that your external analog gear always remains firmly synchronized in both tempo *and* phase (loops and sequences always start on the "one" together).

Our MIDI Control Center (MCC) software allows you to dive deep into the KeyStep Pro's features and to reconfigure the product so that it works best for you and your setup. MCC really opens up a lot of options and we have dedicated an entire chapter of this guide so that you can understand all of the powerful options.

The Keystep Pro is a USB MIDI Class Compliant device. What does that mean and why is it important? It means you can connect it to any other MIDI Class Compliant device without having to install drivers. Only when connecting to an iPad you will need a camera connection cable or a USB to lightning cable. Arturia has a great line of iPad synthesizers such as the iMini, the iSem, the iProphet and the iSpark. It's worth checking them out.

Be sure to visit www.arturia.com. That's the place to go for the latest firmware and to download the MIDI Control Center. You'll also find links to our tutorials and FAQs.

KeyStep Pro is easy to use, so you'll probably start experimenting with it right out of the box. However, please be sure to read this manual even if you are an experienced user as we describe many useful tips that will help you get the most out of your purchase. We're sure you will find KeyStep Pro to be a great source of musical inspiration and we hope you'll use it to its fullest potential.

Happy music making!

The Arturia team

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1. WELCOME AND INTRODUCTION

The Keystep Pro is an advanced third-generation controller and sequencing station. It is both compact and versatile, with unique features that will spark your imagination and creativity in a new way. It enables you to connect to all your studio and performance gear and control it in ways you never thought possible.

Controllers have come a long way. The first generation of controllers could transmit MIDI pitch and velocity over the 16 MIDI channels, not much more. The second generation added complex step- and real-time sequencing features and was capable of connecting to your DAW in special ways, allowing you to control multiple parameters of VSTi's (virtual instruments, including synths).

This third-generation controller adds control options for modular systems. The Keystep Pro has four tracks each with CV, velocity/modulation and gate output. You can employ each of these tracks as a melodic sequencer, arpeggiator or drum sequencer. It lets you play, record edit and add to your sequences on the fly, with a clear and easy-to-understand workflow that encourages your creativity. Each pattern can be up to 64 steps long. You can chain up to 16 patterns together for live performances or jamming. The Scenes feature enables you to save and recall configuration states. It's a lifesaver if you need to quickly change from one setup to another. Couple this with the advanced chord options and scale quantisation and you'll begin to understand why it will soon become your favourite controller.

1.1. A fascinating adventure

As soon as you start experimenting with the Keystep Pro, you'll be faced with many questions: How do I make connections? What are the difference between Real-time and Step recording?

The answers to these questions come slowly: you'll find many of the answers in this manual and many others by reading online forums, sharing and comparing user experiences and, most importantly, by diving in and experimenting. Whatever you do, take the time to get to know the Keystep Pro inside out.

To sustain the fascination you feel, learn the functions of the Keystep Pro one by one and test your knowledge continuously. The Keystep Pro is an advanced controller with many levels of understanding. It offers a unique way to experience the reward that comes with being able to create the sounds as you imagine them.

1.2. About reading manuals

Reading manuals can mean much more than familiarizing yourself with an instrument. Yes, it is excellent for learning, but it serves another purpose that is much less understood: creating the basis for inspiration.

Inspiration can flourish when you have many little pieces of knowledge 'online' in your mind, so that you can interconnect and crosslink them; it widens the scope of your creativity. It also helps to look at the current state of your knowledge as something that needs to be maintained and expanded. Reading a manual, again and again, causes a quantum shift in what you absorb from it. You are building a living model of the controller in your brain.

Reading a manual the first time helps you to get acquainted with the parameters of an instrument; what does a knob do and how does it affect the sound of external modules or synths? Second and third readings will give you a better understanding of the structure of the Keystep Pro. Beyond that, reading becomes a source of creative input that inspires you to think of new ways to use this unique controller and sequencing station.

2. INSTALLATION

2.1. Usage Precautions

The Keystep Pro uses an external power adapter. Do not use any power supply or adapter other than the unit provided by Arturia. Arturia accepts no responsibility for damage caused by the use of an unauthorized power supply.

2.2. Warning

Do not place this product in a place or position where anyone might walk on, trip over, or roll anything over power cords or connecting cables. The use of an extension cord is not recommended. However, if you must use one, make sure that the cord can handle the maximum current needed by this product. Please consult a local electrician for more information on your power requirements. This product should be used only with accessories supplied or recommended by Arturia. When used with any such products, please observe all safety markings and instructions that accompany them.

2.3. Register your Instrument

Registering your instrument establishes your legal ownership of it, which entitles you to access the Arturia Technical Support service and to be informed of updates. Additionally, you can subscribe to the Arturia newsletter to be informed of Arturia-related news as well as promotional offers. Connect to your [Arturia account](#), go to the section My Registered Products, then add the Keystep Pro by entering its serial number, as printed on the sticker located under the controller.

2.4. Connecting the KeyStep Pro to the World

Always power-off all audio gear before making any connections. Failing to do so may damage your speakers, the Keystep Pro, or the other audio equipment. After completing all connections, set all volume levels to zero. Power-on the various devices, with your audio amplifier or monitoring system last, then raise the volumes to a comfortable listening level.

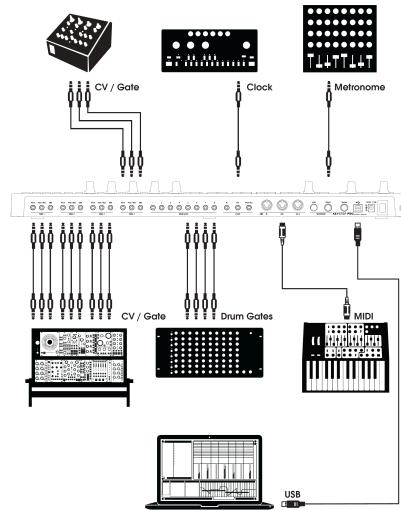
Here is an overview of the Keystep Pro connectors:

Purpose	Connector type
MIDI input (1x)	5-pin DIN connector
MIDI outputs (2x)	5-pin DIN connectors
USB	Standard USB type B
Power	DC input: internal Ø 2.1 mm, external Ø 5.5 mm

3. BASIC OPERATIONS

3.1. Plug and Play

Connect the KeyStep Pro to your computer or an external device as shown in the image below and you're ready to go! Here are a few pointers to make the most of your first session.



3.1.1. Slimkey Keyboard

The Slimkey keyboard is both velocity- and pressure-sensitive (sometimes called aftertouch). You can specify the velocity curve and aftertouch response using the MIDI Control Center and the Utility menu. Refer to [Chapter 9 \[p.118\]](#) for details.



3.1.2. Keyboard MIDI Channel Selection

The KeyStep Pro can transmit notes and other MIDI messages on 16 channels numbered from 1 to 16. Each of the four tracks of the KeyStep Pro transmits on its own channel: Track 1 on MIDI channel 1, and Tracks 2, 3 and 4 on MIDI channels 2, 3 and 4, respectively. Track 1 is a special case because it has both a melodic sequencer and a drum sequencer. When in sequencer mode, Track 1 transmits on MIDI channel 1; when in Drum mode it transmits on MIDI channel 10. Most MIDI devices default to receiving on MIDI channel 1, so connecting an external device and playing notes on Track 1 will usually trigger a response from the external device.



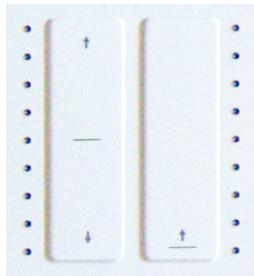
i: If the external device does not respond, that may be because it is set to a MIDI channel that doesn't match the current KeyStep Pro MIDI channel. First check the MIDI channel setting of the external device. If the channels do not match and you want to set the KeyStep Pro to another MIDI channel, you'll have to go into the Utility menu.

In the Utility menu, you can set all the configuration options of the KeyStep Pro, including the MIDI transmit functions. Like most fine-tune functions on the KeyStep Pro, you access it with the SHIFT key. SHIFT functions are printed in blue and can usually be found below buttons. In this case, the Utility function sits under the Project button. - Hold SHIFT + Project (Utility), the Utility menu will light up

- Turn the selection encoder to scroll down to 'MIDI channels' - Now push the selection button, and scroll down to Track 1 output, push once more and select the MIDI channel you want to transmit on - Press SHIFT + Exit repeatedly to exit Utility

3.1.3. Pitch and Mod Touch Strips

The Pitch and Mod touch strips are similar to standard wheels in how they work, except that you slide your finger backward or forward along the strip instead of rotating a wheel.



3.1.3.1. The Pitch Strip

The Pitch strip has a center zone in which slight finger movements produce no change. Moving your finger forward bends the pitch upward, and moving it backward bends the pitch downward. When you lift your finger, the Pitch bend value snaps back to zero.

3.1.3.2. The Mod Strip

The Mod strip works like a mod wheel: from minimum to maximum. Placing your finger at the bottom of the Mod strip (the end closest to you) produces no modulation, and moving your finger all the way up (to the end furthest from you) causes maximum modulation. The Mod strip differs from the Pitch strip in that it does not snap to zero when you lift your finger.

3.1.4. The HOLD Button

The HOLD button enables the Arpeggiator to keep playing after you take your fingers off the keys. But there's another way to use it: while HOLD mode is active, you can keep adding notes to an arpeggio as long as you continue holding down at least one key.

For an in-depth look at the Arpeggiator, refer to [chapter 5 \[p.51\]](#).

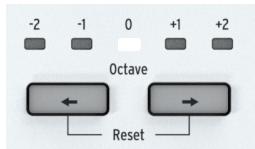
3.1.5. Sustain Pedal

If you have a momentary footswitch, plug it into the Sustain jack socket on the rear panel. If it works the wrong way around, disconnect KeyStep Pro from its power source and then reconnect it. KeyStep Pro will sense the polarity of the pedal, and it should work fine after that.

There are several configuration options for the Sustain pedal in the [The MIDI Control Center \[p.126\]](#).

3.1.6. Octave - / Octave +

Pushing one of the Octave select buttons will transpose the keyboard pitch by as much as two octaves up or down. To reset the keyboard octave shift back to zero, press both buttons simultaneously.



3.2. Record and Play a Sequence

The KeyStep Pro features four (!) sequencers; one on each track. Let's record something on Track 1:



- Press the Track 1 button; it will light up in green
- Select 'Seq' on this track if it isn't selected already
- Now hold the 'Record' button and press the 'Play' button; the step buttons' LEDs now become active and cycle from Step 1 to Step 16 continuously. We are about to create our first sequence pattern. Each track can hold 16 of these patterns.

The sequencer is in loop mode, so press a few keys and they will be added to the loop. The KeyStep Pro sequencers are polyphonic, so pressing a chord instead of a single note will enter it into the loop. Notice that all notes are recorded with the velocity at which you play them.

At this point, you can start to 'play around' with your sequence. When you look carefully, you'll see sequence modifiers printed in blue under the step buttons. - Hold the SHIFT key (the leftmost button on the KeyStep Pro) and press 'Semi Up' or 'Semi Down' and hear how your sequence is transposed up or down in semitones (half steps) on the fly.

There are a few other things to try here: SHIFT + Invert will create a mirror image of your sequence. The last notes will become the first and vice versa. Press SHIFT + Invert once more to restore the natural order of things (-:-).

It does not stop here: you can shift the looping sequence as a whole one step to the left or right. To shift to the right, hold SHIFT and press Nudge>. A note in the first position of the loop will move to the second position; a note in the last position will wrap around to the first position.

You can make adjustments to the tempo in quantized 1 BPM increments by turning the Tempo knob. If you need to make finer adjustments, hold SHIFT and turn the Tempo knob. This will increment and decrement the tempo in 0.01 steps.

3.2.1. Time Division

There's another row of blue shift modifiers printed above the keys of the keyboard. In the centre, right above the 'middle C' key, you'll find a series of time-division options, ranging from 1/4 to 1/32. To change the current time division, hold SHIFT and press the appropriate key on the keyboard. What happens now is that you change the rhythmic relationship of the sequence relative to the tempo: quarter notes (one step per beat), eighth notes (two steps per beat), and so on. Triplet values are also an option (1/4T, 1/8T, etc.); if you're already in 1/8 then press SHIFT+Triplet, you'll get into 1/8 triplet mode.



There's a lot of potential for creative fun here. In [Chapter 5 \[p.51\]](#), we'll show you how to copy the pattern of one sequence to another sequence. Imagine starting with a simple pattern, copying it to the three other sequencers, modifying those copies with Invert, Nudge and Transpose, then running them simultaneously with the first sequence. You get the idea ...

3.3. Using the Arpeggiator

An arpeggio is a chord of which you repeatedly play the individual notes. It's what you hear when you hold a chord on a guitar and pluck the strings from top to bottom or the other way around. A major part of learning to play the guitar is figuring out how to play different fingerpicking/arpeggio styles. The arpeggiators on the KeyStep Pro do all these things for you. Each KeyStep Pro track, except Track 1, has an arpeggiator.



To play an arpeggio, activate a track (try Track 2), press the Arp button then hold down a chord. Now press the 'Play' button and your arpeggio will start. It's rather tiresome to hold keys down, especially if what you really want is to change your arpeggio, or if you want to tweak parameters on your modular system or synth that is connected to the KeyStep Pro. Pressing HOLD lets you lift your fingers off the keys without stopping the arpeggio. What's more, once HOLD is active and if you keep at least one key pressed down, you can add notes to the arpeggio; just press one or more keys and the note(s) and its/their velocity will be added to the arpeggio. You can add up to 16 notes to an arpeggio.



Again, there's a lot to discover here, so try some of these:

- SHIFT + Arp to change the 'strum' pattern of your arpeggio
- SHIFT + Time Division (1/4th, 1/8th, 1/16th, 1/32th)
- SHIFT + Scale. Selecting another scale will instantly change the tonal focus of your arpeggio.

And there's even more: the Gate, Velocity and Randomness encoders! Tweaking the Gate knob will lengthen or shorten the gate time, Velocity will add or subtract (surprise!) velocity, and Randomness will inject random notes into your arpeggio. Press the Play/Pause button again to pause the arpeggio pattern; press it once more to resume playback from where you stopped.

3.4. Scales & Chords

Some of the most interesting features of the KeyStep Pro are its scale and chord options, which we'll cover in more detail in [Chapter 5 \[p.51\]](#), but to get an idea of the impact they have on your sequences and arpeggios, try this neat trick while your sequence or arpeggio is running.

Let's try this in Track 2:

- Activate Track 2 by pressing its button
- Hold SHIFT + (Scale)-minor. The Scale selectors are located just above the keyboard. For example, you activate the minor scale with SHIFT + C4 (the third 'C' from the left.) Try some of the other Scale selectors to hear the different types of scale.



Chord mode is equally fascinating:
- Stop everything that's playing by pressing the 'Stop' button
- Hold SHIFT + Tie/Rest (Chord) and play a chord
- Release all the keys of the chord
- Let go of the SHIFT + Chord buttons
- Play any key on the keyboard

If, for example, you still have the minor scale selected, as explained above, any key you play on the keyboard will generate a minor chord! Can you arpeggiate this chord and thus create an arpeggiated minor chord? Yes, of course you can!

3.5. Creating Splits

You could have an arpeggio play on the lower part of the keyboard and a sequence on the upper part. How? By creating a keyboard split.

- Hold down the two track buttons of the tracks that you want to be part of the split. The track button you press first will be assigned to the upper part of the keyboard, the other one to the lower part. For example, if you want the sequence on Track 1 to play in the upper part, you need to press the Track 1 button first.
- While holding down both track buttons, press an appropriate key on the keyboard to select the split point.



Tip: If at a later moment you want to check where the split point is, press the same two track buttons simultaneously. The KeyStep Pro will display the ranges in the colour of the tracks that are part of the split. Press the split key once more to deactivate the split.

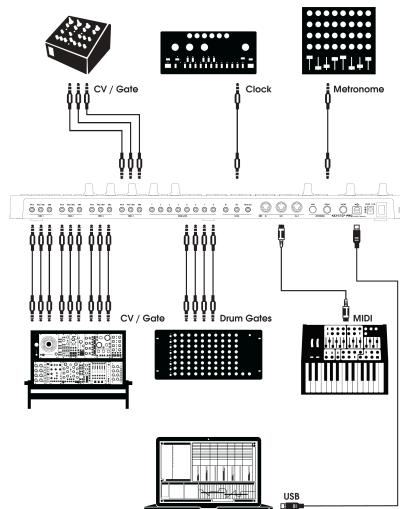
We'll cover all these features in more depth in [Chapter 6 \[p.91\]](#).

4. KEYSTEP PRO OVERVIEW

In this chapter, we'll guide you through the front and back panels and explain the functions of all the knobs and connections on these panels. It's a reference chapter. If you're eager to start exploring your KeyStep Pro and want to dive right in, continue to [Chapter 5 \[p.51\]](#), where you can learn how to use the sequencers and the arpeggiators. This chapter is mainly for reference; you can return here if you need to know more about a specific function, knob, strip, connection or menu.

4.1. Making the Connections

There are countless ways to connect the KeyStep Pro with your music-making gear. It's impossible to cover every scenario in this guide, but here are some typical setups:



CV Gate outputs

4.1.1. ... with a Computer

The KeyStep Pro is a USB class-compliant controller, so at its most basic level it can be connected to any computer with a USB port, through which it receives its DC power supply, and can be used as an input device for various applications. The downloadable MIDI Control Center software lets you choose which MIDI messages will be sent by the mod strip and also enables you to specify global KeyStep Pro parameters.

However, the KeyStep Pro can also be used in standalone mode without a computer connected! In this case, simply use the provided 12V DC power supply adaptor.

WARNING! Although the KeyStep Pro might seem to work OK when you power it up with a powerbank, we strongly advise you NOT to power it this way. The KeyStep Pro needs a lot of current for its LEDs and analog output. Using a defective or partially charged powerbank could damage the KeyStep Pro.

4.1.2. ... with External Devices

As shown above, you can connect the KeyStep Pro to a variety of synths, drum machines and/or Eurorack modules.

- When connecting to a synth, use one of the two MIDI Out ports. If you need to connect to more than two synths, you can daisy chain them: connect the KeyStep Pro to the MIDI In of the first synth and then connect the MIDI Thru of that synth to the MIDI In of the second synth, etc. Daisy chaining allows you to connect as many as 16 synths to one MIDI Out.
- An increasing number of modern synths have both MIDI Ins and Analog Ins, for example the Arturia MiniBrute 2 and MiniBrute 2S. They enable you to use a mix of MIDI and analog connections.
- When connecting to a Drum machine such as the DrumBrute, you have two options: MIDI Out only or a mix of MIDI and Analog Outs. The KeyStep Pro has eight analog drum-trigger outputs (Drum Gates) that you can play with the lower eight keys of the KeyStep Pro keyboard.
- If you have a Eurorack system, you can connect the KeyStep Pro's four Voice outputs to various Eurorack inputs. Please refer to [Chapter 10](#) for examples of how to set up these connections.

4.1.3. ...with an iPad®

Add a camera connection kit and the KeyStep Pro becomes the perfect companion for an iPad. This enables it to be used as a controller for Arturia's iMini, iSem or iProphet applications, for example.

If you have an iPad but don't already own those great virtual instruments, please take a look at them on our website! They are very affordable and live up to Arturia's reputation for accurately modelling the sound of analog synthesizers with warmth and precision.

As you can see, KeyStep Pro can be the controlling hub of some amazing systems!

4.1.4. Analog Connections (CV and Gate)

KeyStep Pro can send control voltages (CV) to modular synthesizers and other non-MIDI devices through its four sets of Pitch, Velo/Mod and Gate connectors on the back panel. Each of the KeyStep Pro's four tracks has its own dedicated set of connectors, allowing you to hook up to and control as many as four devices at the same time!

4.1.4.1. Control Voltages: Pitch, Velo/Mod and Gate

When the sequencers are running or you play a single note or multiple notes on the keyboard, each note is translated immediately into Pitch, Control Voltage (Velocity or Modulation) and Gate signals and sent to the four Voice outputs on the back panel. When you play the keyboard or the sequencers in polyphonic mode, the KeyStep Pro's CV routing options allow you to define how these signals from the four voices will be distributed.



CV Gate outputs

For each note, three independent voltages are sent: Pitch, Velo/Mod and Gate. The Velo/Mod voltage can be either velocity or modulation, depending on what you have selected in the Utility section or in the MIDI Control Center.

Some analog synthesizers have unusual implementations that are not fully compatible with the KeyStep Pro's CV and Gate signals. Before purchasing an analog synth, please refer to its manufacturer's specifications to ensure that the two devices will work together well.

We've designed the KeyStep Pro to be as flexible as possible: the downloadable [MIDI Control Center \[p.126\]](#), which you can install on your computer, allows you to configure the response of the CV/Gate jacks in a number of ways: by default, the transmitted pitch voltage is compatible with the 1.0 V per octave standard, which means that if you play an octave interval on the KeyStep Pro keyboard, the connected synth(s) or Eurorack module(s) should also play an octave interval. In other words, the 'pitch tracking' is correct. However, some synths use a 1.2 V per octave or a Hertz per Volt (Hz/V) standard. To control such beasts, you have to change the corresponding setting in the MIDI Control Center.

Gate signals can also have quite different output ranges (S-Trig, V-Trig 5V or V-trig 10V). These too can be set up in the MIDI Control Center.

The four Voice outputs can be set to transmit either velocity or aftertouch modulation. You can change this in Utility>CV Settings.

By default, the control voltages sent to the Voice outputs match the 1.0 V per octave standard. It's a standard that was defined in the early days of electronic music history. It simply means that a 1.0 Volt increase in signal level makes an oscillator rise one octave in pitch. This is the most commonly used standard. Please refer to the manufacturer's documentation of your external music-making gear if you cannot get external oscillators to track correctly. Changing the CV Pitch output setting may well solve the problem.

For each of the KeyStep Pro's four tracks, the Pitch control voltage (CV) can be set separately in Utility>CV>Track (1-4) to:

- 1.0 Volt/Octave (0-10V)
- 1.2 Volt/Octave
- Hertz per Volt

4.1.5. MIDI Connections

Much of the 'mid-vintage' music hardware from the 1980s and 1990s had MIDI DIN jacks but not CV/Gate connectors or USB ports. KeyStep Pro can be plugged directly into such devices, letting you control them using its powerful sequencers, arpeggiators and other controls (keys, knobs, touch strips, etc.)

4.1.5.1. Connecting to a DAW

The KeyStep Pro is an ideal controller for your DAW because you can use its four Voice outputs to separately control instruments loaded on four tracks of your DAW simultaneously. Below, we give an example of how to set up Ableton if you want to control instruments via four MIDI channels.

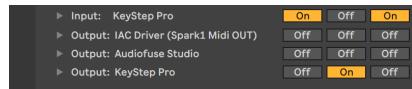
Connect the KeyStep Pro to a USB port on your computer using the supplied USB host cable.

We first have to 'tell' Ableton that we want to use the KeyStep Pro as a controller in Ableton:

- Open 'Preferences' in the 'Live' menu.
- Select 'Link/MIDI'.
- Make sure to set it up as follows:

If you want the KeyStep Pro to be slaved to your session:

- In the MIDI ports section:
 - Enable 'Track' for the input: which enables the midi from the KeyStep Pro to be received by Live.
 - Enable 'Remote' for the input: which will allow the mapping of the control sequencer's encoders via midi learn.
 - Enable 'Sync' for the output: for live to send clock information to your KeyStep Pro.



Finally, make sure that the KeyStep Pro is set to Auto or USB sync source (will define the source of the synchronisation of the KeyStep and can be edited from the Utility > Sync > Source menu)

The KeyStep Pro will then start when launching the playback in Live.

If you want the Keystep pro to be master of the session:

- In the Midi ports section:

- Enable 'Track' as well as "Sync" and "Remote" on the input.

► Input: KeyStep Pro	On	On	On
► Output: IAC Driver (Spark1 Midi OUT)	Off	Off	Off
► Output: Audiofuse Studio	Off	Off	Off
► Output: KeyStep Pro	Off	Off	Off

- Don't forget to also enable the external sync next to the BPM display of your session:



From there, pressing play on the KeyStep Pro will launch playback in Live.

We're done; Ableton is now able to correctly interpret the (MIDI) control signals arriving from the KeyStep Pro and we're now ready to make some noise!

- Open Ableton and select 'New live set' to create an empty set.
- Delete the two default audio tracks by selecting them and clicking 'delete' in the 'Edit' menu.
- Select 'Insert MIDI track' from the 'Create' menu and repeat this one more time to create two empty MIDI tracks. As an alternative, you can right-click in the empty track space and insert two MIDI tracks.
- Drag a sound from Category>Sounds to Track 1. Repeat this for Tracks 2 to 4.

You should now have four MIDI tracks, each with its own virtual instrument loaded. There's nothing to hear yet because we haven't made the connection from the KeyStep Pro to Ableton. Let's do that now:

- Focus on Ableton track 1 and click on the downward arrow in the 'All ins' dropdown menu listed below 'MIDI From'.
- Select KeyStep Pro from the listed options.
- Select channel 1 if it is not already selected.
- In the monitor menu directly below, select 'in'.

We've now instructed Ableton to listen to what's happening on MIDI channel 1. If your KeyStep Pro is in its default state, Track 1 will transmit on MIDI channel 1.

Select Track 1 on the KeyStepPro and play a note on the keyboard. You should now hear the virtual instrument you dragged to Ableton track 1.

We'll repeat these steps for Ableton track 2:

- Again select KeyStep Pro as the MIDI source.
- Select MIDI channel 2 as the channel that this track should listen to and playback.
- Select 'in' to monitor directly what is coming in on this channel.

Repeat this for KeyStep Pro Tracks 3 and 4 and select MIDI channel as input for Ableton track 3 and MIDI channel 4 as the input to Ableton track 4.

Your screen should now look like this:



In this setup, the four KeyStep Pro tracks will play on the four corresponding Ableton tracks.

To play a drum track in Ableton:

- Drag a drum set into an Ableton track.
- Set the track to MIDI channel 10.
- On Track 1 of the KeyStep Pro, press the Drum button.



By default, the KeyStep Pro's drum track (only available on Track 1) will always transmit on MIDI channel 10.

Because you've set the Ableton drum track to listen on MIDI channel 10, the two will match.

Your screen should now look like this:



4.1.5.2. Tutorial 1: Using MIDI to Control Arturia's MINI V VST synth

In this tutorial, we will use the KeyStep Pro to control the filter cut-off frequency of Arturia's MINI V VST synth. The MINI V is part of Arturia's V Collection, a great series of software emulations of classic hardware synths.



Even if you don't own the MINI V, you can still follow this tutorial. Just download the Demo version from <https://www.arturia.com/support/downloads&manuals>. Although this tutorial features the MINI V, it can be used to learn how to control any knob on any VST synth from Arturia's V Collection that you want to set up to receive MIDI.

- Connect the KeyStep Pro's USB Out to your computer's USB In. Load either the standalone or the DAW-based VST version of the MINI V.
- In the MIDI V user interface, open the Arturia system menu in the top left and select 'Midi Settings'. Under 'MIDI Devices', select the Arturia KeyStep Pro.



ⓘ 'MIDI Devices' is only visible when a KeyStep Pro is connected to your computer via USB.

- Next, click on the MIDI symbol in the top right of the Main Menu. The knobs on the MINI V will now be highlighted in red or purple.
- Click on the Cutoff Frequency knob in the Filter section of the MINI V. Tweak the Filter knob on the KeyStep Pro. The Cutoff Frequency knob of the MINI V should now respond to your knob movements.

4.1.6. Clock In/Out

The Clock input and output connectors on the back panel allow the KeyStep Pro to synchronize with many different clock formats: a single pulse per step, two pulses per step, 24 pulses per quarter note (ppqn), and 48 ppqn.



These options enable you to connect and stay synchronized with almost every conceivable piece of music technology.

4.1.6.1. Clock In/Out Rates

The downloadable MIDI Control Center can also be used to configure the KeyStep Pro to send and receive one of the following clock signals via the Clock In and Clock Out connectors.

4.1.6.2. Clock In/Out Connectors

Over the past few decades, several types of connectors have been used for musical synchronization purposes. Here's a table that indicates the best kinds to use when connecting older devices to KeyStep Pro:

Connector type	Signal(s) sent
1/8" mono (TS) [1]	Clock pulse only [1]
1/8" stereo (TRS) [2]	Clock pulse and start/stop [2]
1/8" stereo (TRS) plus DIN sync adapter [2]	Clock pulse and start/stop [2]

You can use a 3.5 mm jack to 5-pin DIN adapters to connect to devices which utilize DIN sync messages. Check the owner's manual for your device if you are not sure which sort of sync capabilities it has.

1. If Sync is set to an external source and a TS connector is used, the sequencer needs to be armed before it can start when receiving a clock signal. You must press the Play button to arm the sequencer. For example:
 2. If the Play button has been pressed but no clock signal has been received, the unit will wait for a clock signal and only start when it receives one.
 - If clock signals are being received but Play is not active, the unit will start as soon as you press the Play button.
 - If Sync is set to an external source and a TRS connector is used, the Keystep Pro will follow the master and will:
 - Play on receiving a high-state signal and clock,
 - Pause on receiving a high-state signal and no clock, or
 - Stop on receiving a low-state signal, with or without clock.

4.1.7. Master or Slave

KeyStep Pro can be the clock master for an entire MIDI rig, or it can just as happily serve as a slave to several clock sources. Clock In and Clock Out can synchronize with older clock types such as 2, 24 or 48 ppqn (pulses per quarter note), or even a single pulse per step.

Whether the KeyStep Pro will send or receive MIDI Clock signals and send or receive Transport Signals (Start-Stop-Continue) will depend on the corresponding settings in Utility>MIDI Settings.



ⓘ While the unit is playing a sequence, the Sync settings cannot be changed.

4.1.7.1. KeyStep Pro as Master

To use the KeyStep Pro as clock master, in Utility>MIDI Setting>Clock send must be on. This is the default setting.

You can set the Master sync options in Utility>Sync>Output. To access the utility menu, hold down SHIFT and press the Project button.

Category	Parameter	Description	Utility	MCC
*Sync *				
	Output: 1 PP16, 2 PPQ8, 1 PPQ, 1PP2Q, 1 PPQ4Q, Korg, 24PPQ, 48PPQ	Allows KeyStep Pro to sync with various clock types	x	x

In this menu, you select how the KeyStep Pro will control the tempo of external modules or synths.

- The transport section will control the internal sequencers.
- MIDI clock messages are sent to MIDI Out 1, MIDI Out 2, USB Out and Clock Out.
- The sequence tempo can be set using the Tempo encoder and the Tap Tempo/Metronome button.

4.1.7.2. KeyStep Pro as Slave

The KeyStep Pro can function as a slave to an external clock source. To use the KeyStep Pro as a slave, in Utility>MIDI Setting>Clock receive must be on. This is the default setting.

You can set the Slave sync options in Utility>Sync>Input. To access the utility menu, hold down SHIFT and press the Project button.

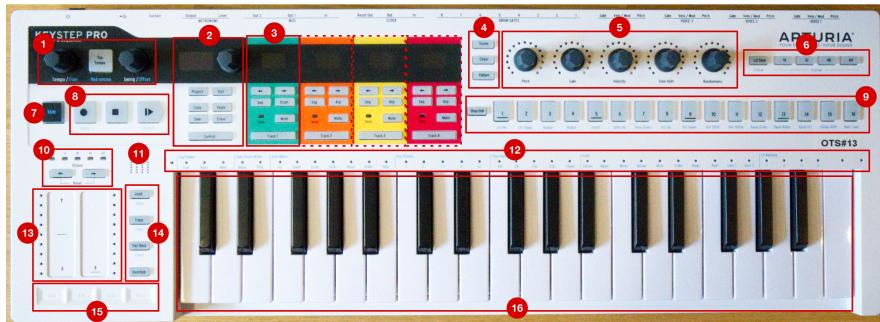
Category	Parameter	Description	Utility	MCC
*Sync *				
	Input: Internal, USB, MIDI, 1 PP16, 2 PPQ, 24PPQ, 48PPQ, Auto	Defines tempo source of KeyStep Pro	x	x

In this menu, you select how the KeyStep Pro will follow the tempo of external modules or synths.

When the KeyStep Pro is in Slave mode:

- The Tempo controls will not control the internal sequencer while the external clock source is running.
- The KeyStep Pro transport section will perform as usual: you can stop, start and pause the internal sequences, and you can record patterns.
- When the external clock source is not running, the KeyStep Pro will function according to its internal clock at the last set tempo.
- The KeyStep Pro will pass the synchronization messages it receives from the external clock source to USB Out, MIDI Out 1, MIDI Out 2 and Clock Out.

4.2. Front Panel Overview



1. Tempo Section
2. Control Section
3. Track Sections (4x)
4. Scene/Chain/Pattern Buttons
5. Main encoders (5x)
6. Sequence Length Section
7. SHIFT button
8. Transport Controls
9. Step Buttons
10. Keyboard Transpose Section
11. Built-in Metronome Speaker
12. Keyboard LEDs and SHIFT Functions
13. Pitch / Mod touch strips
14. Keyboard and Sequencer buttons
15. Looper
16. Keyboard

4.2.1. Tempo Section

Here you can find the tempo-related controls of KeyStep Pro. When KeyStep Pro is internally synchronized, your settings here will affect the internal sequencers/arpeggiators and any external equipment connected to KeyStep Pro.



The Tempo/Fine knob sets the tempo from 30-240 beats per minute (BPM). As you turn this knob, the BPM value is automatically rounded off to the nearest whole number and shown on the KeyStep Pro's OLED display. Holding down SHIFT while turning this knob gives you finer BPM control by switching off the whole-number rounding.

The Tap Tempo/Metronome button lets you set the tempo by tapping on this button in time with the beat you want or are hearing.

To enable or disable KeyStep Pro's built-in Metronome, hold down SHIFT while pressing the Tap Tempo/Metronome button.

Turning the Swing/Offset knob lets you adjust the amount of swing or 'shuffle' feel in your sequences. It affects either the entire project (all four tracks at once) or only the selected sequencer/arpeggiator, leaving the others unchanged. Holding down the SHIFT button while turning the Swing/Offset knob lets you adjust the timing offset for a track



ⓘ If the KeyStep Pro is externally synchronized, the master tempo will be determined by an external clock source and the Tempo/Fine knob and the Tap Tempo button will be ignored.

Swing introduces a shuffle feel to the active sequence or arpeggio. If you've listened to a variety of musical genres (it's unlikely that you haven't) you have heard swing. It's when musicians play just before or just after the beat. This is very often heard in jazz and Latin American music. It evokes a feeling of freedom, of not being forced into a fixed, grid-like rhythm. It is particularly effective when you mix 'straight' notes with 'swung' notes.

25 different settings are available, ranging from fully counter-clockwise (no swing, or 50%) through increasing amounts of swing (51-74%) to fully clockwise (maximum swing, or 75%).

What the Swing setting does is shift the timing of the notes in a sequence, making the first note of a pair longer and the second note shorter. Assuming the time division is set to 1/8, here's what will happen: with Swing set to 50%, each note gets equal time, resulting in a 'straight 1/8th note' feel.

As the Swing value is increased above 50% the first 1/8th note is held longer and the second is played later and shorter. You'll notice that the sequence starts to 'shuffle' a bit and hopefully sounds less mechanical to your ear.

The maximum Swing setting is 75%, at which point the 1/8th notes sound more like a 1/16th-note figure than 'shuffled' 1/8th notes.



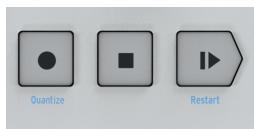
ⓘ Each sequence can have its own Swing setting.

The Swing/Offset knob has a secondary function: to set a track offset. Holding down SHIFT and tweaking Swing/Offset will apply an offset to the selected track.

Turning or pressing the Swing/Offset knob will display the global and current track offset values.

4.2.2. Transport Section

The three Transport buttons control the sequencers, the arpeggiators and any external MIDI devices by using MIDI Machine Control (MMC). If your DAW does not respond to MMC commands, the Transport buttons can be configured to send other MIDI messages . Please refer to the [MIDI Control Center \[p.126\]](#) to make changes if needed.



⚠️ In sequencer mode, all three Transport buttons are active. In arpeggiator mode, only Play/Pause and Stop are active.

4.2.2.1. All Notes Off

The Stop button has an additional function. If for some reason you end up with a stuck note playing, just press the Stop button quickly three times in a row. The KeyStep Pro will then send an All Notes Off command via MIDI.

4.2.3. Built-in Metronome Speaker

The Metronome speaker plays the output of KeyStep Pro's built-in metronome. The Metronome Level knob on the back panel sets the speaker volume. The metronome can be switched on or off by holding down SHIFT while pressing the Tap Tempo button.

Read [Chapter 7 \[p.105\]](#) to learn more about the Metronome and synchronization in general.

4.2.4. SHIFT Button

The SHIFT button gives access to secondary functions, all of which are printed in blue on the front panel. Most of them are printed above the keys of the keyboard or below the step buttons.



All of these functions are accessed by holding down the SHIFT button and pressing another button that has blue text below it or a key of the keyboard that has blue text above it. For a detailed overview of the SHIFT functions, refer to the SHIFT function overview later in this chapter.

4.2.5. Control Section

In the control section, you'll find Project options, pattern edit options and the Utility menu.



4.2.5.1. Utility Menu

The KeyStep Pro has many internal settings that you may want to adjust. The Utility menu is where you set and change most of the global settings for the KeyStep Pro. 'Global' means that these setting are shared by all projects. They will be saved as soon as you exit the Utility menu, which you access by holding down SHIFT and pressing the Project/Utility button. The Utility menu will open in the OLED display. To navigate in the Utility menu turn the Control section encoder and click it to enter a submenu. To back up in a submenu press the Exit button. To leave the Utility menu, press the Exit button repeatedly. You don't have to save the changes you make here; they are automatically saved whenever you exit the Utility menu.

4.2.5.2. Exit/Undo

Undo is a SHIFT function closely related to the other edit functions such as copy/paste and erase. If you make a mistake during editing, it's good to know that you can undo the last change you made. If undo is possible, the Exit/Undo button blinks. Pressing SHIFT + Exit will undo the mistake.

4.2.5.3. Project Button

KeyStep Pro sequences are organized into Projects. In a Project, you save all your sequence and drum patterns. Each of the four tracks can store 16 sequences, which can be copied from one track to another. The Erase button enables you to delete entire projects (as well as patterns, scenes, steps and notes). The patterns in a project can be chained. This is a handy feature that will help you to prepare for a performance. Please refer to [Chapter 6 \[p.91\]](#) for an in-depth overview of these functions.

4.2.5.4. Control Mode

The Control button changes the function of the five main encoders. Instead of controlling pitch, gate, velocity, etc. and the corresponding control voltages (CV) sent to the analog outputs, in Control Mode they send MIDI control change (CC#) messages, enabling you to control parameters of external hardware synths or Eurorack modules and, for example, virtual instruments on your computer.

You enter Control Mode by pressing the Control button. When Control Mode is selected, the five main encoders send CC# values. For an in-depth explanation of what CC# values are and what you can use them for, please refer to [Chapter 8](#). The CC# messages to be sent can be edited using the OLED display in Utility>Controller and in the downloadable MIDI Control Center.

4.2.6. Track Sections (4x)

The KeyStep Pro has four separate tracks, each of which has its own dedicated set of buttons to give you instant control over important features.



The track controls are identical except for one button: Track 1 has a Drum button for the drum sequencer, but Tracks 2, 3 and 4 each have an Arp button for the arpeggiators. The track controls function as follows:

4.2.6.1. Track Selector

The Track Selector buttons (Track 1, Track 2, Track 3 or Track 4) let you select the currently active track. The buttons of the active track light up, and the various controls of the KeyStep Pro (keyboard, encoder knobs, step buttons, etc.) will only affect the currently selected track.

As you work with the KeyStep Pro, you will notice that there is a consistent colour-coding across the entire front panel. For example, Track 1 is green and when it is selected, all of the Step Buttons and Keyboard LEDs will light up in green. Track 2 is orange and selecting it will cause the Step Buttons and Keyboard LEDs to light up in orange. These colour cues help you to know what you are editing and to avoid accidentally changing parameters on the wrong track.

4.2.6.2. Mute Button

The Mute button engages or disengages the track mute function. When this button is illuminated, its associated track is muted and does not transmit any data. In other words, devices connected via MIDI, CV or USB will not receive any signals when mute is engaged.



Holding down SHIFT while pressing the Mute button will engage or disengage Solo mode. This feature is similar to the 'solo' button found on many mixing boards. When Solo mode is engaged, the Mute button lights up in blue and you will *only* hear the soloed track (or tracks). Note that the Mute button will only mute the sequences and arpeggios that are running, possibly including a drum sequence on Track 1. You can still have a muted channel active and play its sounds on the keyboard.



The Mute and Solo functions can be useful in both composing and performing contexts. For example, while composing or mixing you may need to solo a certain track to focus on it without distraction; in a performance context, you may want to mute and unmute sections to build up or breakdown a song.

4.2.6.3. Note LED

This LED lights up whenever a track's sequencer or arpeggiator is playing and/or whenever you are playing notes on the keyboard. This handy feature instantly lets you know what is happening on all four of your tracks without you having to select a track and look at its Step Buttons or Keyboard LEDs.

4.2.6.4. Sequencer and Arpeggiator Buttons

The KeyStep Pro has four tracks, each with its own independent sequencer or arpeggiator.

	Sequencer	Arpeggiator	Drum trigger (gates) sequencer
Track 1	Yes	No	Yes
Track 2	Yes	Yes	No
Track 3	Yes	Yes	No
Track 4	Yes	Yes	No

Each track has a pair of buttons labelled Seq and Arp (or Seq and Drum on Track 1). These buttons let you set the functions for their associated track. The currently selected option is lit up, and only one mode (Seq or Arp) can be active at any time.

4.2.6.5. Sequencer

The Sequencer lets you record 16 different sequences, each with up to 64 steps. You can create these sequences by playing them on the keyboard or by entering note events directly (complete with pitch, gate length, velocity and other parameters) using the Step buttons. These sequences can then be played, transposed and modified in many creative ways.

The Sequencer is covered in detail in [Chapter 5 \[p.51\]](#) of this guide.

4.2.6.6. Arpeggiator

The arpeggiator generates notes based on the keys of the keyboard that you have pressed or are now pressing and plays them back according to the Arp Mode setting. This is a fun and interesting way to create new patterns and melodies or to improvise on existing chords.

The Arpeggiator is covered in detail in [Chapter 5 \[p.51\]](#) of this guide.

4.2.6.7. Drum Trigger Sequencer

This is a special drum or 'trigger' sequencer that sends signals to the Drum Gates outputs on the back panel of the KeyStep Pro. The Drum sequencer has eight gate outputs (labelled 'Drum Gates 1-8'). You can use these outputs to trigger connected drum machines or synthesizer modules with (or 'trigger') signals.

The Drum Gate sequencer is covered in detail in [Chapter 5 \[p.51\]](#) of this guide.

4.2.7. Arrangement Section

Patterns are the basic elements for creating chains. A chain is a pre-programmed series of patterns that you construct for a performance; it's an automated way of selecting patterns.



ⓘ A pattern chain can contain up to 16 patterns.

Scenes are snapshots of an interesting combination of active elements: for example, an arpeggio running on Track 1 plus sequences running on Tracks 2 and 3 with nudged and/or inverted patterns. Anything worth saving can be stored in a scene.

Please refer to [Chapter 6 \[p.91\]](#) for detailed information on patterns, chains and scenes.

4.2.8. The Step Edit Button

The Step Edit button enables you to edit an individual step of a sequence. By pressing the Step Edit button you active Step Edit mode.



In Step Edit mode you can use the five main encoders to edit the Pitch, Gate, Velocity, Time Shift and/or Randomness of the note or notes in the active step. There's much to discover and learn about how this seemingly simple button works. Please refer to [Chapter 5 \[p.51\]](#) for details.

4.2.9. Step Buttons

These 16 buttons let you activate or deactivate steps in a sequence and program specific steps. They provide visual feedback (active steps are lit up in the colour of the selected track) and an indication of the currently playing step (which is lit up in white). This is an intuitive way of programming steps that will be very familiar to anyone who has worked with an old-school drum machine.



On the KeyStep Pro, these 16 Step buttons can do many other things that just active or deactivate steps. For example, holding down the Lst Step (Last Step) button while pressing one of the Step buttons lets you set the sequence's length. Holding down the SHIFT button lets you do several different things, including clearing patterns, nudging notes backward or forward and quantizing sequences. These various SHIFT functions are covered in detail in [Chapter 5 \[p.51\]](#) of this guide.

One of the most distinctive features of these Step buttons is that they are colour-coded to match the track that is currently selected. So when Track 1 is active the Step buttons light up in green; for Track 2 they become orange, and so on. This colour-coding is consistently followed across the entire front panel and lets you know what track you are currently editing in the KeyStep Pro.

4.2.10. The Main Encoders (5x)

The five main encoders (above Step buttons 2 to 10) are key to changing the parameters of your patterns. They are somewhat different to standard encoders. Turn them slowly and you'll notice that they have a slight 'detent': you'll feel a small click or series of clicks whenever you move one.



Each of the five main encoders is surrounded by 15 red LEDs, each of which has eight levels of brightness from dim red to bright red. If we take the Gate encoder as an example: first turn it all the way counter-clockwise, then turn it slowly to the right. The LED in the first position will slowly increase in brightness and after eight clicks the second LED will light up dimly and the dim-to-bright cycle will repeat. All in all, this gives you 128 distinct positions for each of these encoders!



i: The encoders are touch-sensitive: the moment you touch them, their current value will be displayed in the OLED screen.

4.2.10.1. The Pitch Encoder

In Step Edit mode, the Pitch encoder will step through the pitches chromatically, or if you have selected a scale by holding down the SHIFT button and pressing the appropriate Scale key it will only step through the notes that belong to the scale you've selected.

4.2.10.2. The Gate Encoder

In Step Edit mode the Gate encoder enables you to set the gate length of the selected step. Simply stated, the gate length is the ON time or duration of a note. It's a great feature: imagine how a fast 12-step piano sequence sounds when steps 3, 6, 9 and 11 are sustained, while the other steps are all short. This is something that only a very skilled pianist can accomplish. In Arpeggio (Arp) mode, the Gate encoder functions as a global encoder that simultaneously affects all gates in the currently activated arpeggio.

4.2.10.3. The Velocity Encoder

Velocity means the strength or force with which you hit a key. In the MIDI specification, velocity values range from 0-127, where notes with a velocity of 0 to 50 or so are soft, velocities of about 50 to 100 are medium, and a velocity above 100 is loud. In Utility>MIDI Settings>Velocity Curve and the downloadable MIDI Control Center you can choose a suitable velocity scaling.

In Arpeggio (Arp) mode, the Velocity encoder functions as a global encoder that simultaneously affects all velocities in your arpeggio.

4.2.10.4. The Time Shift Encoder

This encoder enables you to shift a selected note backward or forward in time relative to the centre of that step. The range is -49% to +50% of a step. In the case of two adjacent steps in a sequence, if you shift the first forward and the second backward they will seem to almost merge. In Arpeggio (Arp) mode, the Time Shift encoder shifts the entire arpeggio that is playing in the current track backward or forward in time. Of course, you'll only notice this if you have two arpeggios running simultaneously on two tracks, both on Hold.

4.2.10.5. The Randomness Encoder

In Step Edit mode, the Randomness encoder lets you choose, for each note, the probability that it will trigger, from 0% to 100%. If there is more than one note stored in the selected step, each note will trigger randomly according to the current Randomness setting.

In Arpeggio (Arp) mode, the Randomness encoder does something quite different: it introduces random notes into your arpeggio.

4.2.10.6. Setting a Track's Default Parameters

To set the parameters for a specific track, select the track using the Track 1, 2, 3 or 4 button and then turn the main encoders without holding down any Step buttons. This combination of five encoder positions will become the default parameters for that track.

4.2.10.7. Setting an individual step

To set parameters for a specific step, first choose the track you would like to edit using the Track 1, 2, 3 or 4 button, then hold down a Step button while adjusting one or more of the main encoders. Doing this will set specific values for that step that are different to the default parameters (as described above).

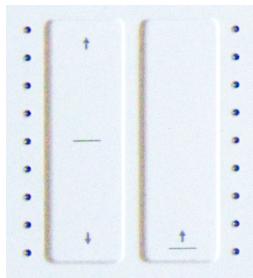
4.2.11. Keyboard Section

In this sub-section, we'll have a look at everything to the left of and directly above the keyboard; the lower half of the KeyStep Pro. The Keyboard has 37 velocity-sensitive keys that generate aftertouch signals. 'Velocity-sensitive' means that each key detects the force/speed with which you press it. The magnitude of aftertouch depends on how hard you press a key down after it has reached the bottom of its travel.



4.2.11.1. Pitchbend / Mod Touch Strips

These innovative touch-sensitive vertical strips take the place of the standard 'wheels' you usually find on a MIDI controller and are used to add expressivity to your performance. Each strip has a corresponding ladder of nine red LEDs to indicate the position of the control. Like most traditional wheel controllers, the Pitch touch strip is 'spring-loaded', meaning that it returns to its center value immediately when released, whereas the Mod touch strip retains its current value when released.



The KeyStep Pro will remember the last position of the Mod strip of the currently selected track when you switch to another track. In a sense, you therefore have four modulation strips, one for each track!

The Pitchbend Strip

Pitch-bending is a technique whereby you bend the pitch of the currently playing note upward or downward.

The Pitchbend strip is where you perform all your pitch-bending tricks. The middle of the strip, indicated by a horizontal black stripe, is the neutral point; if you touch the strip there nothing will happen. If you move your finger up (away from you) or down (toward you), you will hear the pitch of the currently playing note go up and down. So far it's not much different to bending with a wheel. Unlike a wheel, however, you can place your finger directly on any other point of the strip. The pitch will then jump instantly to that value!

Tip: To the left of the Pitchbend strip you'll see nine red LEDs. They will help you to create more accurate pitchbends.

By default, the bend range is set to 24 semitones (half steps): 12 from the center up and 12 from the center down. In Utility>CV Settings>Pitch Bend Range, you can set the range for the Pitch CV outs from +/- 1 to +/- 24 semitones.

Tapping the Pitchbend strip at two different points in succession enables you to alternate quickly between two pitches. This playing technique is only possible on pitchbend strips and makes a pitch wheel look primitive! Whenever you lift your finger off the strip, the pitch will jump back to the zero centre value. Another advantage of this strip is that it is ideal for applying natural-sounding vibrato to a note by wiggling your finger on the strip.

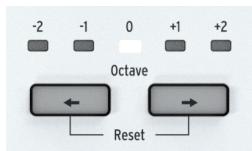
Tip: Musical traditions other than western classical music have much richer expressive possibilities when it comes to pitch-bending. Try listening to some Indian music. Maybe you'll come to appreciate the complex and very musical pitch-bending techniques used by singers and by performers on instruments like the sarod and the sitar.

The Mod Strip

This innovative modulation control takes the place of the standard mod wheel. It transmits the standard MIDI CC# modulation value. To learn more about CC# values, please refer to [Chapter 10](#).

4.2.11.2. The Octave Buttons

Use the Octave arrow buttons (above the touch strips) to transpose the output of the keyboard up or down by octaves. The range is two octaves up and three octaves down from the default mid-point.



Knowing this can help you to remember where you are pitch-wise on a poorly-lit stage. The keyboard itself is three octaves but the whole pitch range is seven octaves, which should facilitate all but the most extreme musical adventures.



i: To quickly reset the octave to the default mid-point, hold down both Octave arrow buttons simultaneously.

4.2.11.3. The Hold Button

The Hold button has an important function when an arpeggio is playing. When Hold is active you can lift your fingers from the keyboard and the arpeggio will continue to play. Hold also enables you to add more notes (up to 16) to an arpeggio while it is running.



4.2.11.4. The Trans (Transpose) Button

The Transpose function lets you shift up or shift down the pitch of running sequences/patterns and arpeggios. To transpose, hold down the Trans button and play a note on the keyboard. Notes below middle C will cause a downward transposition; notes above middle C will cause an upward transposition.

4.2.11.5. The Tie/Rest/Chord Button

When creating a sequence, this button is used to enter rests or to tie two notes together. However, when in Step Edit mode, if you press Tie/Rest the current step will be cleared. If the sequencer is running in Step Edit mode, holding down Tie/Rest is a quick way to clear the contents of a series of steps.

Holding down SHIFT while pressing the Tie/Rest/Chord button switches Chord mode on or off. This is covered in [Chapter 5 \[p.51\]](#).

4.2.11.6. The Overdub Button

The Overdub button plays an important role in Step Edit mode when you are editing the content of a specific step. While overdub is ON, any notes you play on the keyboard will be added to the existing notes of that step. When overdub is OFF, any new notes you play will replace the existing notes in the step. You can always tell whether you're in add or replace mode: if you are in Quick Edit or Step Edit mode, when the LED above a key blinks the existing notes of the step will be replaced.

4.2.12. The Looper

The horizontal Looper Touch Strip (under the Pitchbend and Mod vertical touch strips) enables you to alter the playback of a Project in real-time. It will generate longer or shorter loops depending on where you touch the Looper Touch Strip and when you do it.



The Looper loops all tracks simultaneously. This includes CC# values that you may have stored in the Control track.

4.2.12.1. Loop Length

The length of the loop is determined by where you place your finger on the Looper Touch Strip, 1/4 being the longest loop and 1/32 being the shortest. Changing the placement of your finger changes the size of the loop.

4.2.12.2. Loop Start Point

The start point of the loop depends on when you touch the Looper strip during playback. You can jump to a different loop position by holding your finger on the strip and then pressing one of the Step buttons. With the Looper, you can loop a range of steps in a sequence. The length of the loop is determined by the indentation you press: 1/4, 1/8, 1/16 or 1/32.

4.2.13. Keyboard

The KeyStep Pro's 37-note slim-key keyboard features great-feeling keys that are narrower than standard piano keys but still large enough to allow for maximum playability across three octaves. The keys are both velocity and aftertouch sensitive to give your performance maximum expressivity.

4.2.13.1. Keyboard LEDs

Each key of the KeyStep Pro has a corresponding multi-colour LED located directly above it. These LEDs blink to provide visual feedback on what the four sequencers/arpeggiators are playing. The colour of each LED changes to match the selected track (Track 1 is green, Track 2 is orange, Track 3 is yellow and Track 4 is red).



Also, the two little triangles on either side of the keyboard light up if there is activity outside the range covered by the keyboard. This may happen when an octave transposition shifts a sequence or arpeggio outside the visible keyboard range.

4.2.13.2. Keyboard SHIFT Functions

The KeyStep Pro has many secondary or 'shift' functions that can be accessed by holding down the SHIFT button and pressing one of the keys on the keyboard. The blue text above each key indicates the SHIFT function associated with that key.

The row of LEDs above the keyboard will give a lot of information about what is going on: - When you hold down the SHIFT button, the current ON/OFF state of the SHIFT functions will be shown. - When you turn the Pitch encoder in Step Edit mode, it will show which note(s) you are editing.

4.2.14. SHIFT Functions

Many of the KeyStep Pro's most interesting functions can be accessed with the SHIFT button. It's the leftmost button on the front panel and it's black. The blue SHIFT text reveals its crafty secret: it is linked to all KeyStep Pro functions that are printed in blue on the front panel. Take a good look and you'll find many of them: in the Transport section, to the left of the keyboard, above the keys of the keyboard (except the highest C), below the 16 step buttons, and in the Sequence Extend section. That's 63 SHIFT functions in total!

4.2.14.1. Keyboard Shift Functions

In itself, the SHIFT button has a very helpful feature: if you hold it down, the currently active keyboard SHIFT functions will be displayed by lit-up LEDs. From left to right above the keyboard these are:

- Seq Pattern mode
- Seq/Drum mode (Mono or Poly)
- Arp Pattern and Arp Octave
- Time Division
- Scale
- CV routing

The HOLD/Clear Button

The HOLD/Clear button enables you to hold arpeggios, so that they continue to play until you release it. You can hold arpeggios on several tracks simultaneously. SHIFT + HOLD/Clear will release all currently held arpeggios.



The Trans/Clear Button

By holding down the Trans (Transpose) button and pressing a key on the keyboard you can transpose the running sequence to another key signature. The Transpose button is a toggle button. Once you have applied a transposition to a sequence, the transpose button will 'remember' that transpose action. If you press it once more you return to the original untransposed sequence. Thus you always have an untransposed and a transposed version of the sequence at hand, and you can toggle between them!

Transposition is linked to the currently selected track. In a live situation you can, for example, transpose Track 1, then select Track 2 and apply a transposition there as well. Holding down SHIFT and pressing Trans/Clear will clear all active transpositions simultaneously.

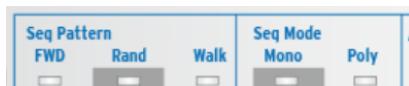
The Tie/Rest/Chord button

Holding down SHIFT and pressing the Tie/Rest/Chord button puts the KeyStep Pro into Chord mode. It will wait for you to play a block or legato chord. As soon as you lift your fingers off the keyboard, the chord (actually its stacked intervals) is stored in memory. If you now press a key on the keyboard, that key will become the root of the stored chord. In other words, Chord mode will use the stored stack of intervals to build the chord on this new root note. Please refer to [Chapter 5 \[p.51\]](#) for details.

Seq (Sequence) Pattern

To activate this shift function, hold down the SHIFT button and press the appropriate key (C, C# or D in the lower octave).

This shift function enables you to change the way the notes stored in the step buttons will play. Fwd (Forward) is the default mode. Rand (Random) plays the steps in random order. In Walk mode, the sequencer digitally ‘throws a dice’ to decide whether to go forward or backward at the end of each step: there’s a 50% chance it will play the next step, a 25% chance it will play the current step and a 25% chance it will play the previous step. Please refer to [Chapter 5 \[p.51\]](#) for details.



Seq/Drum Mode

To activate this shift function, hold down the SHIFT button and press the appropriate key (D# or E in the lower octave).

In Sequencer mode, each step can store a maximum of 16 notes. The mode you select here, Mono (monophonic) or Poly (polyphonic), will determine whether all notes stored in the step will play or just one: the lowest note of the stored chord.

In Drum mode, switching between Mono and Poly has a different effect. In Poly mode, each of the 24 drum tracks can have a different length. In Mono mode, they share the same length. Please refer to [Chapter 5 \[p.51\]](#) for details.

Arp (Arpeggio) Pattern

To activate this shift function, hold down the SHIFT button and press the appropriate key (F, F#, G, G#, A, Bb or B in the lower octave).

The KeyStep Pro can transform any chord you are holding down on the keyboard into an arpeggio. It can arpeggiate your chord in seven ways: up, down, exclusive pendulum, inclusive pendulum, random, in the order you played them or polyphonically.



There’s a lot to be learned about this function, so we have devoted a [whole chapter \[p.51\]](#) to the wondrous secrets of arpeggiation and specifically to the KeyStep Pro’s unique arpeggiation features.

Arp Octave

To activate this shift function, hold down the SHIFT button and press the appropriate key (C, C#, D, D# or E in the middle octave).

By default, the arpeggiator will play the notes you are holding down and stay within the limits of one octave. The Arp Octave -1, 0, +1, +2 and +3 buttons will extend the notes beyond that range. If you change the octave range, the arpeggiator will also play notes in the octaves above and below the chord you are playing. Press SHIFT + an Arp Octave key to change the range.

Time Division

To activate this shift function, hold down the SHIFT button and press the appropriate key (F, F#, G, G# or A in the middle octave).

Time Division can be applied to both the arpeggiators and the sequencers. Much of the fun of arpeggios is that they can run at various speeds. If you mix them with sequences and change speed it will have a great overall effect. The KeyStep Pro features three arpeggiators that can run simultaneously and at different speeds!



By default, an arpeggiator will run in 1/16th straight-note speed, but there are four straight-note speeds to choose from: 1/4, 1/8, 1/16 and 1/32. Each of these speeds can also run in triplet mode, so actually when you consider straight notes and triplets there are eight speed options. You can have one arpeggiator running in 1/16th straight-note speed and another in 1/8th triplets speed. There are lots of creative options to explore!

The sequencers (including the drum sequencer) can also run at these different speeds. You could, for example, run copies of the same pattern in different tracks at different speeds. There's unlimited potential for discoveries here.

Each pattern can have its own time division, which is stored with the pattern. This allows you to create chains of the same pattern in different time divisions.



When you change to another pattern while in Arp mode, the time division will not change.

Scale

To activate this shift function, hold down the SHIFT button and press the appropriate key (Bb in the middle octave to G in the upper octave).

This SHIFT function enables you to change the scale of an arpeggio or a sequence on the fly. You can choose from six different scales (major, minor, dorian, mixolydian, harmonic minor or blues). When you select a scale by pressing SHIFT + a Scale key, everything in the currently selected track - the notes you are playing on the KeyStep Pro's keyboard, the active track's sequence and the active track's arpeggio - will play in that scale. This is a pattern setting that is stored with the pattern when you save it.

The KeyStep Pro comes with six predefined scales, but you can also create your own custom scale and store it as User 1 or User 2. Please refer to [Chapter 5](#) for additional information.

Scale Root & User Scales

Holding down SHIFT and pressing the Root key (F in the upper octave) gives you the option to select another root note for the currently playing sequence.

Holding down SHIFT and pressing the User 1 or the User 2 key (F# or G in the upper octave) enables you to store pre-defined scale roots.

For the major, minor, dorian, mixolydian, harmonic minor and blues scales, you can select a new root note by holding down SHIFT and pressing the Root key then selecting a new root in the lower octave of the keyboard. Pressing a key in the lower octave will update the Root note. This can be repeated multiple times while holding down the Root key. The currently active root note will be shown by its LED being lit up in blue.

Please refer to [Chapter 5](#) for an in-depth explanation of root notes and user scales.

CV Routing

To activate this shift function, hold down the SHIFT button and press the appropriate key (G#, A, Bb or B in the upper octave).

All sequencers and arpeggiators can send their output signals to the four Voice outputs on the KeyStep Pro's back panel. By default, the output of Track 1 will be sent to Voice 1, the output of Track 2 to Voice 2, etc. There may be situations where you want more control of the tracks' routings. That's what CV routing is all about. For example, you can route the output of Track 1 to all four Voice outputs, or you can route the output of Track 1 to Voices 1 and 2 and the output of Track 2 to Voices 3 and 4.

For each track, you can define any combination of voices. If a voice is already used by another track, it will be dimly lit. If it is already active for the current track it will be brightly lit. If you select a voice that is already being used by another track, you will overwrite the previously assigned voice. When Track 1 is in Drum mode, CV outputs that were assigned to Track 1 will be freed up.



CV routing is an important skill to master when you [use a modular system \[p.138\]](#) with your KeyStep Pro.

4.2.14.2. Step Button SHIFT Functions



Clr Ptn (Clear Pattern)

For the currently active pattern, this function clears all steps, resets the sequence length to the default 16 steps and restores all other default settings: 1/16th straight-note speed, Forward seq mode, Poly mode, Chromatic scale. Clearing a Drum pattern clears all 24 drum tracks simultaneously.

Clr Steps (Clear Steps)

For the currently active pattern, Clr Steps clears all steps but keeps everything else unchanged. When applied to a Drum sequence it will clear only the selected drum track.

< Nudge

< Nudge shifts the currently active pattern to the left. All steps on all pages of the Pattern will shift to the left. It works both with sequencer patterns and drum patterns. In Drum mode it will only affect the currently selected drum track.

Nudge >

Nudge > shifts the currently active pattern to the right. All steps on all pages of the Pattern will shift to the right. It works both with sequencer patterns and drum patterns. In Drum mode it will only affect the currently selected drum track.

Invert

Invert inverts all notes currently present in the steps. The last notes in the pattern will become the first and the first the last. Invert acts on the currently active step groups.

Semi Down

This function is for intelligent semitone (half step) downward transposition of the current sequence. It's intelligent because the transpose function takes the current scale setting into account.

Semi Up

This function is for intelligent semitone (half step) upward transposition of the current sequence. Again, it's intelligent because the transpose function takes the current scale setting into account.

Oct (Octave) Down

Transposes the current pattern one octave downward.

Oct (Octave) Up

Transposes the current pattern one octave upward.

Qnt (Quantize) 50%

Sets recording quantization to 50%. When in Drum mode, it will only quantize the currently selected drum track. Please refer to [the sequencer section \[p.51\]](#) for details.

Qnt (Quantize) 100%

Sets recording quantization to 100%. When in Drum mode it will only quantize the currently selected drum track. Please refer to [the sequencer section \[p.51\]](#) for details.

Rand (Randomize) Order

Randomizes the order of the steps in the current pattern.

Rand (Randomize) Notes

Randomizes the notes (pitch values) in the current pattern.

Global BPM

Pressing SHIFT + Global BPM enables you to switch between the Global tempo set in the MIDI Control Center and the current Project Tempo. A Project Tempo is stored with a Project when you save it. When lit up (in blue) the Global tempo is active. When unlit, the Project Tempo is active.

Wait Load (Wait to Load)

This is where you 'tell' the KeyStep Pro how it should continue to the next pattern. For Patterns, the wait-to-load options can be set directly using the SHIFT button: hold down SHIFT and press Wait Load to switch instant change on or off. Whether the change will occur at the end of the current bar or at the end of the current pattern is determined by settings made in Utility or the MIDI Control Center.

It is also possible to change the wait-to-load behavior of Scenes and Projects. Should the KeyStep Pro wait for 1 bar, 2 bars or 4 bars before switching to the next Scene or Project? Changing Scene and Project behavior is done in Utility>Launch Quantize or in the MIDI Control Center. Please refer to [Chapter 6 \[p.91\]](#) for details.

4.2.15. The Sequence Extend Section

These five buttons and their associated SHIFT functions enable you to view and set the step groups of your pattern in great detail.

To start with, you can set the length of a pattern or sequence by holding down the Lst Step button and pressing one of the step group buttons (16, 32, 48 or 64). The maximum length is 64 steps. This works whether you are recording in Step mode or Real-time mode.



Within a page, you can further refine the pattern length by holding down the Lst Step button and pressing a step button.

Pressing SHIFT + Lst Step / Follow lets you follow the actively playing step while the sequence is playing.

In Drum mode, when Poly is activated, the individual drum tracks can have different lengths.

4.3. Back Panel Overview



1. Analog Voice outputs (4x)
2. Drum Gates outputs (8x)
3. Clock In/Out/Reset Out
4. MIDI In/Out 1/Out 2
5. Metronome Level knob and Metronome Output
6. Sustain Pedal input
7. USB, 12V DC / 1.O A power input, and ON/OFF switch
8. Kensington Lock

4.3.1. Pitch, Velo/Mod & Gate Outputs

For each of the four Voices, these outputs send analog control voltages (CV) and gate/trigger signals to external devices, for example Arturia's popular analog synthesizers (MiniBrute/SE, MicroBrute/SE, MatrixBrute) or a Eurorack modular system.



The Pitch CV output is mostly used to control the pitch of an external voltage-controlled oscillator (VCO).

The Velo/Mod CV output can be routed to a destination such as the cutoff frequency of a voltage-controlled filter (VCF) or the amplitude/gain of a voltage-controlled amplifier (VCA). By default, it is mapped to the keyboard velocity, but this can be changed to aftertouch or another voltage source in the Utility menu or the [MIDI Control Center \[p.126\]](#).

The Gate output sends gate (trigger) signals with a length determined by the Gate encoder. A long gate will cause the sustain stage of an envelope generator (EG) to remain high for a long period of time. It has selectable output ranges, so that you can adjust the output levels to accommodate different gate standards.

The KeyStep Pro has four tracks, each with its own sequencer or arpeggiator. These tracks are linked to the four Voice outputs on the back panel. Each voice has its own Pitch, Velo/Mod and Gate outputs (labelled Voice 1 to Voice 4). This powerful collection of features means that you can control up to four completely separate synthesizer voices at the same time using only your KeyStep Pro! In addition, the KeyStep Pro has powerful voice-routing options.

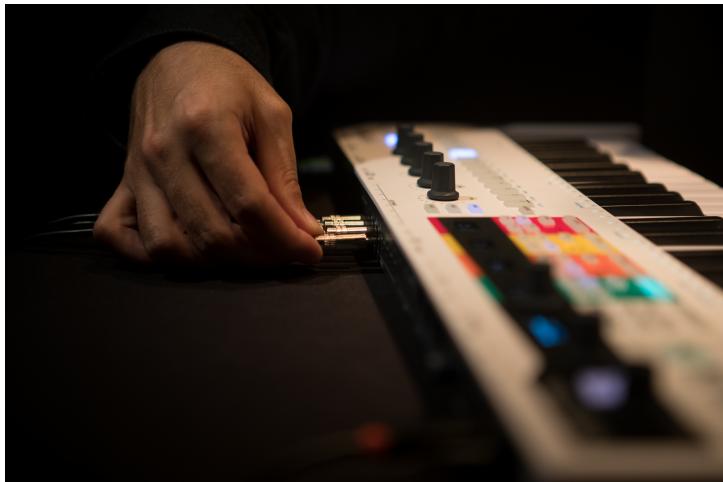


Arturia's MIDI Control Center software and the Utility menu allow you to configure the type of electrical signals that are generated and sent to each output. See [Chapter 9 \[p.118\]](#) for more information about this topic.

For more in-depth information about the CV/Gate functions, refer to [Chapter 10: Keystep Pro and your modular system \[p.138\]](#).

4.3.2. Drum Gates

The KeyStep Pro's Track 1 can be configured to work as an eight-output drum-trigger sequencer by pressing the Drum button on the top panel. These are the individual gate outputs for that sequencer.



This mode is described in detail in [Chapter 5 \[p.51\]](#) of this guide.



: These gate signals are not limited to triggering drum sounds. You can connect these outputs to any input that accepts a trigger or gate signal, including an ADSR envelope generator or an LFO reset. Experiment, and we're sure you'll find some delightful rhythmic uses!

4.3.3. Clock Section

These three jacks (In, Out, Reset Out) allow you to interface with modular synthesizers and pre-MIDI technology that was capable of clock synchronization (such as early drum machines produced by Korg and Roland).



The KeyStep Pro is capable of both sending and receiving synchronization signals. It also has a Reset Out, allowing external sequencers with a reset input to re-start from the beginning of a sequence whenever a KeyStep Pro sequence is restarted.

Please see [Chapter 7 \[p.105\]](#) for information about clocking and synchronization.

4.3.4. MIDI Section

Three full-sized 5-pin DIN connectors let you send and receive MIDI data to/from external MIDI-compatible devices. The KeyStep Pro includes one MIDI input and two independent MIDI outputs to provide maximum flexibility when working with external hardware.



The KeyStep Pro can send not only MIDI note-related data but also MIDI synchronization signals, so that your external tempo-dependent devices (such as sequencers, arpeggiators, etc.) remain in sync.



When working with a host computer, these connectors can also be used to send MIDI data from your music software to your connected hardware.

4.3.5. Metronome Section

KeyStep Pro has a convenient built-in metronome, making it easy to build up empty sequences from scratch without having to use an external rhythmic reference (such as a metronome or drum machine) as a 'click track'. The internal speaker (located on the front panel) produces clearly audible metronome ticks, so you don't need to use external speakers.



The **Level** knob sets the output level of the metronome. This knob is retractable to prevent accidental changes to the metronome volume. Press the knob to stow it away and press it again to bring it back out for adjustment.

The **Output** jack lets you send the metronome signal to a mixer or headphone distribution amplifier, so that multiple performers can play to the same metronome.



i: The Level knob only affects the internal speaker's loudness level. It does not affect the signal sent from the Output jack.

4.3.6. Sustain Pedal Input

Connect an optional sustain pedal to this input. It is best to connect the pedal before switching on the KeyStep Pro, so that it can correctly sense the pedal's polarity. Be sure to keep your foot off the pedal when switching on the KeyStep Pro or its operation may be reversed. If this happens, switch the KeyStep Pro off and start again.

4.3.7. USB and Power Section

The KeyStep Pro is a standalone product and can be used by itself without a host computer. To do this, simply connect the included 12 V power supply adaptor to the KeyStep Pro and switch it on. To make life easier for international travellers, the 'universal' power supply adaptor (12V DC, 1.0 A, centre positive) includes interchangeable leads, enabling you to use the KeyStep Pro in most countries of Planet Earth.



The USB connector provides a data connection to your computer or tablet for those occasions when you want to use the KeyStep Pro with a host device. When working this way, simply connect the KeyStep Pro to your host device with the supplied USB cable and switch it on.



"WARNING! Although the KeyStep Pro might seem to work OK when you power it up with a powerbank, we strongly advise you NOT to power it this way. The KeyStep Pro needs a lot of current for its LEDs and analog output. Using a defective or partially charged powerbank could damage the KeyStep Pro."

4.3.8. Kensington Lock Port

The KeyStep Pro is highly portable and easy to carry, but it should be carried away only when you want it to be, and not by a thief!



We've included a Kensington lock slot on the far right edge of the back panel so you can secure it to the surface of your choice.

5. MAKING TRACKS

In this chapter, we'll have a look at the process of creating (drum) sequences and arpeggios. What's the use of having tracks if you have nothing to fill them with?

5.1. Sequencer / Arpeggiator (or Drum) Tracks

The KeyStep Pro has four Tracks, each with its own independent sequencer or arpeggiator.

	Sequencer	Arpeggiator	Drum Sequencer
Track 1	Yes	No	Yes
Track 2	Yes	Yes	No
Track 3	Yes	Yes	No
Track 4	Yes	Yes	No

Each track has a pair of buttons labelled Seq and Arp (or Seq and Drum on Track 1). These buttons let you set the functionality for their associated track. The currently selected option is lit up and only one mode can be active at any time.

5.2. The Three Arpeggiators

One of the unique features of the KeyStep Pro is that it has three arpeggiators. What makes it even more unique is that these arpeggiators can run in different scales and time signatures simultaneously!

5.2.1. What is an Arpeggiator?

An arpeggiator breaks up a chord into individual notes: hold down a chord on the keyboard, press the Play button and the arpeggiator will play them one by one at equal time intervals. You can keep adding notes to the arpeggio; simply holding down more keys will add them to the arpeggio. If you happen to have 16 fingers you can use all of them to create a maximum-length arpeggio. A better way to extend arpeggios is to make use of the HOLD key. We'll explain this in the next sub-section.

To activate the arpeggiator, select a track with an arpeggiator (Track 2, 3 or 4) and press the Arp button. It lights up in white to show that Arpeggio mode is currently active on that track. Now hold a chord and press Play to start your arpeggio.

5.2.2. HOLD and the Arpeggiator

The KeyStep Pro gives you some control over the Patterns that are generated:

- The arpeggiator picks notes within the available octaves as defined by the Arp Octave function. To change the arpeggio range, hold down SHIFT and press one of the Arp Octave keys (-1, 0, +1, +2 or +3).

When you find a particularly interesting Pattern, press the HOLD button and refrain from touching the keyboard; whatever keys you held down on the keyboard will remain active, even after you lift your fingers. The arpeggio will continue playing, and you'll have an extra hand to tweak knobs. As long as you keep at least one note depressed, you can extend an arpeggio to a maximum length of 16 notes.

After lifting your fingers from the keyboard, when you play a new chord, this will start a new arpeggio that will replace the arpeggio that was just playing.



! This feature offers some interesting creative options: if you have set an arpeggio to play in the order you press the keys of the chord (by using the SHIFT + Order key), you can repeatedly play the notes of same chord in different orders, thus emphasizing different notes in the chord. If you play with your attention focused on the velocity of the notes in the chord you can make this effect even more pronounced. ! Another thing to try is to combine an arpeggio held in Poly mode with an arpeggio in Exclu (exclusive pendulum) or Inclu (inclusive pendulum) mode. The polyphonic arpeggiation will repeat all notes in the arpeggio simultaneously, thus forming a block-chord background for the second arpeggio.

5.2.3. Editing an Arpeggio

While an arpeggio is playing you can edit Gate length, Velocity, Time Shift and Randomness with those main encoders. Editing Time Shift only makes sense when you have two or more arpeggios running simultaneously. Actually, it makes a *lot* of sense: instant Steve Reich/Terry Riley! Randomness will add an additional element of surprise by applying random pitch changes to your arpeggio. Used sparingly when multiple arpeggios are running will add even more depth. Note that the edits you make will affect the currently active arpeggio only.

Press SHIFT+ Hold/Clear to clear the arpeggio.



! The HOLD state is not saved with the Pattern. ! HOLD does not work with external MIDI. If you need to hold one or more external MIDI notes, send the KeyStep Pro a Sustain message using a sustain pedal.

5.2.4. Arpeggiator Features

The KeyStep Pro's arpeggiators have many features not found on other arpeggiators. To start with, there are three arpeggiators (on Tracks 2, 3 and 4). Imagine the creative options at your disposal when you have three arpeggiators in HOLD playing simultaneously and you are able to transpose each of them individually within its predefined scale – and each arpeggio is running in a different scale!

When HOLD is active, the arpeggiator will run indefinitely and you can focus on making changes to the selected arpeggio.

With the exception of Pitch, all main encoders can be used to edit the arpeggio. These edits are global for that arpeggio: you cannot change parameters of individual notes within the arpeggio. You can, however, make these global edits: change the Gate time, Velocity, Time Shift and Randomness. To hear the effect of Time Shift you need to have two arpeggios on HOLD running simultaneously. Randomness will apply random pitch changes to the arpeggio.

5.2.4.1. Arp Pattern Directions

Just above the keys, from F to B in the lower octave, you'll find a series of blue Arp Pattern labels: Up, Down, Exclu, Inclu, Rand, Order and Poly. These are used to select how the arpeggiator will play the notes of the chord you're currently holding down on the keyboard. To activate one of these functions, hold down the SHIFT button and press the appropriate key.



- 'Up' will play the notes of your chord from left to right or bottom to top (pitchwise), depending on your point of view. The order in which you press the keys does not matter. The arpeggiator will always play the individual notes from left to right.
- 'Down' plays the notes of your chord from right to left or top to bottom (pitchwise).
- 'Exclu' plays the chord notes in pendulum motion without repeating the bottom and top endnotes.
- 'Inclu' plays the chord notes in pendulum motion, including repeat of the two endnotes.



J: Exclu and Inclu both play your chord notes in pendulum motion; that is, up and down, then up and down again repeatedly. The difference is what happens at the extreme ends of the arpeggio. Let's say you have a four-note chord. In 'Exclu' mode it will be arpeggiated as 1,2,3,4,3,2,1,2 In 'Inclu' your arpeggio will be played as 1,2,3,4,4,3,2,1,2

- 'Random' will play the notes of your chord in ever-changing random order.
- 'Order' will play the notes of your chord in exactly the same order as you played them. You can use this to good effect by repeatedly playing the same chord but changing the order in which your fingers touch the keyboard.
- 'Poly' will repeat the entire chord as a block chord – all notes at the same time – instead of arpeggiating its notes in series. The octave of the repeated notes will depend on the selected Arp Octave parameter and will basically transpose the whole chord into a different octave then return to the current octave.

5.2.4.2. Arp Octaves (Running a Multi-Octave Arpeggio)

By default, the arpeggiator will play the notes you hold down and stay within the limits of that octave. Holding down SHIFT and pressing one of the Arp Octave keys will extend the notes beyond that range. When you change the octave range, the arpeggiator will also play notes in the octave(s) below or above the chord you play.

Octave range settings:

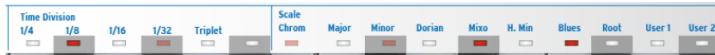
Octave	Function
-1	held down notes plus the same notes repeated one octave below
0	only notes held down on the keyboard are played
+1	held down notes plus the same notes repeated one octave above
+2	held down notes plus the same notes repeated two octaves above
+3	held down notes plus the same notes repeated three octaves above

The arpeggiator has another freaky feature that becomes apparent when you press the Octave Down or Octave Up arrow button (under the SHIFT button) while an arpeggio is playing. On most arpeggiators, pressing an octave down/up button will transpose all currently held notes in the arpeggio one octave down or up. Uniquely, the KeyStep Pro's arpeggiator will preserve the pitch of your arpeggio. If you shift the octave down or up, the new notes you play will be added to the existing arpeggio in the new octave range!

When a Scale function is activated (by holding down SHIFT and pressing one of the Scale keys), this can have a peculiar effect on your arpeggio: any 'outside notes' you play that don't belong to the currently selected scale will be forced (quantized) into it, causing duplicate notes. If, for example, you've set Scale to C major and you play a block or legato chord including an E and an Eb (which is foreign to the C major scale) the arpeggio will play the E twice in swift succession, which causes a ratcheting effect.

5.2.4.3. Time Division

The Tempo knob determines the speed of your arpeggio(s). Tempo changes are displayed as BPM (beats per minute) in the OLED display. The default rate is 120.0 bpm.



By default, the arpeggiator will sync to the internal clock. The Time Division tells you with what rate the arpeggiator is currently synced to the clock. For example, if you select 1/4 (quarter notes), the arpeggiator plays four notes per bar/measure.



ⓘ This way of syncing is the same for arpeggios and sequences.

The available time divisions are listed below:

- 1/4 note
- 1/4 note triplet
- 1/8 note
- 1/8 note triplet
- 1/16 note
- 1/16 note triplet
- 1/32 note
- 1/32 note triplet

At this point, you are probably wondering how to create the triplet values in the above list. It's simple: to create 1/8 triplets, hold down SHIFT and press the 1/8 key (F# in the middle octave) plus the triplet key (A in the middle octave).



ⓘ 1/4 corresponds to a standard metronome tick.

5.2.4.4. Scale and Root

While an arpeggio is running, you can alter its scale and root on the fly. Please refer to the to the [Scales \[p.85\]](#) section later in this chapter for more information.

5.2.4.5. Chord Mode

The KeyStep Pro can memorize a chord. You can then play an entire chord simply by pressing a single key on the keyboard. The chord will transpose automatically as you play different notes.

It's a feature that adds a new dimension to the concept of an arpeggio. Chord mode enables you to create blindingly fast and intricate polyphonic scale-quantized arpeggios; you'll hear arpeggios as you've never heard them before – maybe not even in your wildest dreams!



CAUTION: The following procedure will erase the previous chord and replace it with a new one.

Here's how to memorize a chord:

- Hold down the SHIFT button and press the Tie/Rest/Chord button. Don't let go!
- Play up to 16 notes on the keyboard. These will become your chord.
- When you are done, lift all your fingers off the keyboard and then release the SHIFT and Tie/Rest/Chord buttons.

Now the Chord button will flash once per second, showing that the KeyStep Pro is in Chord mode. The next single key you press will play the chord you created; in other words, it will be the new root note of that chord.

Now you're ready to play complex arpeggiated chords: - Select an arpeggio pattern by holding down SHIFT and pressing one of the Arp Pattern keys. - Memorize a chord, as you have just learned to. - Press the Play button,

Other fun things to try:

Select another Time Division to hear your arpeggiated chord at different speeds.

Select another Scale to quantize the notes in your arpeggio to a predefined (or user) scale.



!: Unless you have huge hands that can span half the keyboard, it's a good idea to press HOLD before attempting the above tips.

Here are a few more handy things to know about this feature:

- For all the Chord mode functions described above, you can use a sustain pedal instead of the HOLD button. (The pedal will not flash, of course – but that would be cool.)
- To enter or exit Chord mode, hold down the SHIFT button and then tap the Tie/Rest/Chord button.



CAUTION: Neither the memorized chord nor your arpeggio are saved when the KeyStep Pro is powered down.

5.2.5. Making the Most of the Arpeggiators

5.2.5.1. Mixing Arpeggios

Mixing arpeggios is one of the most fun creative experiences you can have with the KeyStep Pro. Here's how to do it:

- Activate Track 2 and press Arp to select Arpeggio mode.
- Select the minor scale (or any other scale you like) by pressing SHIFT + the appropriate Scale key.
- Hold down a chord on the keyboard and press HOLD.
- Press Play to start the arpeggio.

Repeat this on Tracks 3 and 4.

If all is well, you now have three arpeggios playing simultaneously!

Select one of the arpeggiating tracks and start experimenting with Semi Down, Semi Up, Oct Down and Oct Up (by holding down SHIFT and pressing the appropriate step button).

By pressing Mute you can silence one of the Arpeggios momentarily.

The real magic happens when you change the Time Division of one or two of the arpeggios with SHIFT + Time Division. This will only change the Time Division of the active arpeggio; the others will keep running at their own pace(s)!



! An external delay is the arpeggiator's best friend.

5.2.5.2. Spicing up your Arpeggios

Use the Pitchbend touch strip to change the pitch of your arpeggio.



♪ In the MIDI Control Center you can set the pitch bend range in semitones (half steps). ! One of the most overlooked applications of an arpeggiator is just playing one note instead of a chord. When you set the Arpeggio to medium speed, you can create interesting rhythms by sporadically lifting and pressing a finger on a key. You can take this idea further to create Hocketus. Hocketus is the name of a technique where you repeat one note over and over, never changing its pitch, though you do change other parameters of the note: for example, its timbre (LFO→Filter Cutoff), the Attack, Sustain and Decay stages of the note's amplitude or filter envelope, and its velocity or aftertouch (pressure).

5.3. The Four Sequencers

The KeyStep Pro has four sequencers, each of which can hold 16 patterns/sequences. And as each sequence can be up to 64 steps in length, you have 4096 steps to fill! Your actual sequences can be much longer because you can chain sequences together: for example, play sequence A three times, followed by sequence B two times and ending with sequence C once. Don't forget that the sequencers are polyphonic, capable of stacking up to 16 notes per step.

The KeyStep Pro thus enables you to create and play up to 64 unique sequences wherever you go. And in spite of its small footprint, there are lots of ways to modify your sequences during a performance. We'll cover those later in this chapter.

Sequences can be stored in Projects. A Project is a collection of sequences that you create for a specific event, such as a recording session or a performance.

5.3.1. Exploring the Sequencers

A sequencer will play a series of notes, stored in steps. Per note, each step can store a pitch value, a velocity value, a gate time, a time shift and a randomness value. These values will be transmitted over MIDI (via the USB or 5-pin DIN connectors). They will also be sent to the Voice outputs corresponding to the tracks; for example, for controlling a modular system.

Once stored, the steps are referred to as a Pattern. Patterns can be modified, copied and chained together.

The 64 steps are grouped into four pages: page 1 holds steps 1-16, page 2 holds 17-32, page 3 holds 33-48 and page 4 holds 49 to 64.

5.3.1.1. Using the Transport Buttons

You control the sequencers with the three Transport buttons; Record/Quantize, Stop, and Play/Pause/Restart.

Each button has an additional function when creating a sequence:

- SHIFT + PLAY will restart a sequence.
- SHIFT + Record/Quantize will toggle between quantized and unquantized recording mode.
- Pressing Stop repeatedly will clear any stuck notes.

5.3.1.2. Setting the Sequence Length

You set the length of a sequence by holding Lst Step (Last Step) and pressing one of the page buttons (16, 32, 48 or 64). To select a length in the middle of a page, first select the appropriate page and then the last step within it, with Lst Step + a step button.



SHIFT + Lst Step/Follow enables you to follow the sequence through the pages while it's running.

You can copy the steps in a page and paste them to other pages. For example, if you want to copy the steps in page 1 and paste them to page 2:

- Hold Copy and press Page button 16
- Hold Paste and press Page button 32

At this stage you can paste what's in the copy buffer again and again: for example, to paste the steps now in the buffer into pages 48 and 64, hold Paste + 48 and Paste + 64 . This will fill these pages even if you have set sequence length to 16. To view and play these new pages, lengthen the sequence by re-setting Lst Step.

In a similar way you can copy a number of steps and paste them to another page. When pasting, if some of your steps do not fit on the current page, they will continue onto the next page. Please refer to [Copy steps \[p.69\]](#) later in this chapter.

Note: There is a difference between making a pattern longer and extending it. When you extend a Pattern with SHIFT + Page button you copy its content to another page. If, for example, your Pattern is 16 steps long and you Hold SHIFT and press 32, the first 16 steps will be copied to the second 16 steps (16 to 32).

To summarize: to set a new pattern length use Lst Step + Page button, to Extend a pattern use SHIFT + Page button.

5.3.1.3. Mono and Poly

In Mono mode, a sequencer will play only one note per step. In Poly mode, a sequence can play up to 16 notes per step. To switch this mode, hold down SHIFT and press the Mono key (D# in the lower octave) or the Poly key (E in the lower octave).

You can use this SHIFT function in a performance by switching a polyphonic sequence to monophonic. However, only the lowest note of the chord will survive. You can, of course, do this the other way around by starting in Mono mode and suddenly introducing chords after switching to Poly mode. Of course, you have to play those notes yourself. The KeyStep Pro is an amazing piece of kit, but it cannot read your musical mind!

In Drum mode, Mono mode means that all 24 tracks share the same length. In Poly mode, each track can have its own separate length.



When Poly is active, Last Stp operations (copy, extend) only affect the currently selected track.

5.3.1.4. Seq Patterns (Directions)

How do you change the playing direction of the sequence? Hold down SHIFT and press one of the Seq Pattern keys (C, C# or D in the lower octave).

A sequence that repeatedly runs from beginning to end tends to bore listeners quickly. Fortunately, the Keystep Pro sequencers can step in three different ways: Fwd (forward), Rand (random) and Walk.

- Forward is self-explanatory.
- In Random mode, the steps are played in ever-changing random order.
- In walk mode, it's as if the sequencer 'throws a dice' at the end of each step: there's a 50% chance it will play the next step, a 25% chance it will play the current step again and a 25% chance it will play the previous step.



It's called Walk mode after the way monks would walk during medieval pilgrimages; two steps forward, one step back. This is the walk of a rather uncertain monk.

One question remains: how do you know whether the sequence will play the last step when you're in Random or Walk mode? This is sometimes important to know; for instance, when at the end of a sequence you want to start another sequence with the Wait Load (Wait to Load) function activated. It's the number of steps – defined by Lst Step – that determines this.

5.3.1.5. Scales, Chords and the Sequencer

The KeyStep Pro gives you a lot of control over the tonality of your sequence. Once you've programmed a sequence, you can change its root note and the scale it plays in.

To define a new root note for your sequence, hold down SHIFT and press the Root key (F in the upper octave), then press a key in the lower octave of the keyboard. The LED above the currently active root note will light up.



You will only hear a pitch change when your sequence is already running in a scale other than chromatic.

An alternative way to define a root note is to hold down SHIFT and press the User 1 or User 2 key (F# or G in the upper octave). You can assign a root note to one or both of these keys in the same way as explained above. The advantage of this method is that in a performance situation you can define two different root notes in advance and then select them on the fly with SHIFT + User 1 or SHIFT + User 2.

5.3.2. Recording

5.3.2.1. Quick Record

Quick Record mode is the easiest way to create sequence or drum tracks. Quick recording works whether the sequencer is running or not.



♪ The KeyStep Pro is in Quick Record mode when both the Record and the Step Edit buttons are off.

In Quick Record mode, the 16 step buttons turn into simple on/off controls for each step. To record something into a step just hold down the corresponding step button and play a note or a chord. As soon as you lift your fingers off the keys, whatever you just played is stored in that step. If you change your mind and want to store something else in that step, hold down the step button again and play a new note or chord. This will overwrite the currently stored note(s).



! There's a secret to know here: the notes you record into a step will use the current setting of the main encoders. Change the encoder settings to add notes with different values.

At this point, you can add notes to what's already stored in the step by pressing the Overdub button. It will light up in red to show that Overdub is active. Hold down the appropriate step button and press the notes on the keyboard that you want to add to the chord.

To hear the result of your step programming so far, press Play to start the sequencer.

The keyboard is still available for playing on top of the running sequence. You can play it to solo over the currently playing sequence or press HOLD and add some notes that will sustain indefinitely like a drone or bourdon.

By holding the Trans (Transpose) button and pressing a key on the keyboard you can transpose the running sequence to another key. It's an intelligent transpose: it takes into account the scale that is currently active, so no 'outside notes' will play. Selecting another scale will instantly change the tonal focus of your sequence. To try this form of transposition, also called scale-quantized transposition, hold down the SHIFT button and select one of the Scale keys (Bb to E in the upper octave) or User 1 or User 2 (F# or G in the upper octave) if you have pre-defined user scales.

There are two other SHIFT functions available to experiment with your sequence:

SHIFT + Time Division (1/4th, 1/8th, 1/16th, 1/32th).

SHIFT + Mono, which plays only the lowest note of the currently stored chord (the fundamental) in each step. Pressing SHIFT + POLY will restore the chords to their former glory.

You can now fine-tune the individual steps in your sequence using the Gate, Velocity and Randomness encoders. To change the parameters of an individual step hold the step and tweak Gate, Velocity or Randomness.

- Gate will shorten or lengthen the gate time.
- Velocity will subtract or add (surprise!) velocity.
- Randomness will silence random notes in your sequence. Turning the Randomness encoder counter-clockwise will reduce the probability that a note will be triggered. In the fully clockwise position, the note will always be triggered.

Press the Play/Pause/Restart button again to pause the sequence; press it once more to resume playback from where you stopped.



J: To turn off stuck notes (notes that continue to play after stopping the sequencer) press the STOP button once more.

To start something new, press Clr Ptn (Clear Pattern) and create a new sequence. This will clear all parameters of the Pattern.



J: The previous Pattern – the one you erased – is still in memory. Hold down SHIFT and press Exit/Undo to restore it. The Exit/Undo button will blink whenever there is something present in the undo buffer.

5.3.2.2. Step Record

In Step Record mode, the KeyStep Pro can record and playback music data. Originally popular in the 1960s and '70s, step sequencers have become popular again due to the increased interest in modular synthesizers.

A step sequencer is usually *monophonic*, meaning that it will output only one note at a time. The KeyStep Pro sequencer, however, is capable of stacking up to 16 notes per sequence step.

Step Record mode is the preferred way to quickly record sequences. Unlike Quick Record (described above), where you have to manually select the steps you want to fill, in Step Record mode you use the keys of the keyboard to step through the Pattern, advancing automatically to the next step when you lift your finger from the keyboard. Press RECORD to activate Step Record mode. The KeyStep Pro will jump to the first step of the Pattern and wait for you to enter a note or notes. Start playing and notice how the steps fill. At the end of the Pattern, the KeyStep Pro will loop back to the beginning and overwrite the notes you played before.

Step Record has one other feature: you can backup in the sequence. To give an example: you've pressed Record and have filled six steps by entering chords and lifting your fingers from keyboard to advance a step. You can now backup in the sequence by pressing step four and restart recording from there. When overdub is on the new notes you play will replace the notes you've recorded in steps 4, 5 and 6.

5.3.2.3. Realtime Record

Holding down Record and pressing Play puts KeyStep Pro into Realtime Record mode.

Realtime recording will give a more fluent, natural feel to your sequence. In Realtime Record mode, the sequencer will run at the speed you have set with the Tempo knob or the Tap Tempo knob, and it will store whatever note or notes you are playing at each moment into the currently active step. That makes it somewhat harder to predict in which step your key-presses will be stored.



! In Realtime Record mode, if you hold down SHIFT and press Record/Quantize, what you play will be automatically quantized according to the current Time Division setting (see next sub-section). !: When recording in Realtime Record mode, choosing a longer sequence length gives you more space. To set the sequence to 64 steps, hold down Lst Step and press the 64 button.

There's a small problem with Realtime Record mode: it's difficult to know when you have start playing, because you can't hear where the first step is. The solution is to turn on the Metronome with SHIFT + Metronome. When you now press Play, the Metronome starts ticking, with the first step accented by a higher pitch. You can set the desired metronome level (volume) with the retractable knob next to the Metronome output on the back panel of the KeyStep Pro. To change the Time Division of the Metronome hold Tap Tempo and press one of the Time Division keys on the keyboard.



! If the accent is not pronounced enough, make the first step louder by changing the metronome settings in the Utility menu (Shift>Utility>Metronome) or in the MIDI Control Center.

The sequencer is now looping; the notes of any keys you press will be added to the loop. The KeyStep Pro sequencers are polyphonic, so if you play a block chord instead of a single note, all the notes of the chord will be entered into the currently active step of the loop. Of course, if you want to hear all these notes, you must be in Poly mode.

Notice that all notes are recorded with the velocity at which you play them. Whether played notes are *added* to the existing sequence or *replace* existing notes depends on the status of the Overdub button to the left of the keyboard. It lights up when Overdub is ON.

How do you edit the individual notes and/or chords you've recorded in realtime? It's simple: press the Step Edit button (to the left of the step 1 button) and if you need [advanced editing \[p.66\]](#) options, like moving selected notes in a chord you can also activate Overdub.

About Quantized Recording

To activate quantization, hold down SHIFT and press Record/Quantize.

When recording in Realtime Record mode using the keys or incoming MIDI, there's an important concept you need to know about: the notes will be quantized according to the Time Division you have selected.

For example, if 1/16 is the current Time Division setting, then the recorded notes will be quantized forward or backwards to the nearest sixteenth note. As the Pattern loops, you can replace certain notes by playing new ones within their time range.



i: You will hear the effect of quantization very clearly if you first set Tempo to 30.00 BPM and Time Division to 1/4 (with SHIFT + 1/4). Now record a Pattern in realtime with lots of very quick notes. Now press SHIFT + Qnt 50% (step button 10) to hear how the notes start to cluster around the beats. Pressing SHIFT + Qnt 100% (step button 11) makes the clustering even stronger, so that notes almost turn into chords.

Hold down SHIFT and press REC/Quantize to deactivate quantization.

5.3.3. Editing Steps

We've already explained the basics of step-editing in [Chapter 3 \[p.7\]](#), but there's much more to learn and discover.

In several ways, the KeyStep Pro sequencer is more advanced than a traditional step sequencer. One advanced feature is that it lets you transpose the sequence simply by playing keys on the keyboard. Most early step sequencers could not do this; instead, the pitch of each note was set with a knob or slider. More importantly, the KeyStep Pro sequencer lets you edit all parameters of the note or notes stored in a step.

5.3.3.1. Step Edit Mode

Enter Step Edit mode by pressing the Step Edit button, which is probably one of the most important buttons on the KeyStep Pro. You use it to edit the steps of the currently selected sequence individually.

In Step Edit mode, the keyboard turns into a traditional step editor. When a step is active (its button is blinking), you can edit all of its parameters: for example, turning the Pitch encoder will lower or raise the pitch of the note or notes stored in that step; turning the Gate encoder will shorten or lengthen the gate time of the note or notes stored in that step.



i: If you have a chord stored in the current step, all its pitches will move up or down by the same amount and all its gate times will be shortened or lengthened by the same amount.



5.3.3.2. Step Edit Button OFF (Quick Edit Mode)

When the Step Edit button is OFF, you can simply turn steps on or off by pressing their step buttons. That might seem trivial, but it can make a big difference to the feel of your sequence.

When your sequence is running, the KeyStep Pro will light up the buttons of the steps that are ON in your sequence. You can do several things now:

- Hold down the Trans (Transpose) button and press a key on the keyboard to transpose your sequence up or down.
- Press SHIFT + Invert (step button 5) to create a mirror image of your sequence, and press SHIFT + Invert once more to restore the natural order of things (-:-)
- Nudge the looping sequence as a whole to the left or right (backward or forward in time). To nudge to the left, hold down SHIFT and press < Nudge (step button 3); to nudge to the right, hold down SHIFT and press Nudge > (step button 4). The note or notes in the first step of the loop will move to the second step; the note or notes in the last step will wrap around to the first step.

There are a few other interesting options we haven't explored. By holding down a step button, you can edit three parameters – Gate, Velocity and Randomness – of the note or notes stored in that step by turning the appropriate encoders. You can even do this selectively by activating [Advanced Edit mode \[p.66\]](#) with Overdub. For example, to lengthen the gate time of only two notes of a four-note chord, select them by pressing the appropriate keys and turn the Gate encoder to the right. How cool is that?

5.3.3.3. Step Edit Button ON

When Step Edit is ON, selecting a step will make its button blink: three of that step's parameters – Gate, Velocity and Randomness – can now be edited by turning the appropriate encoders.

When the sequencer is stopped and Step Edit is ON, pressing a step button selects that step. You can now do the same things as in Quick Edit mode, but there's no need to hold down a step button:

- Play a note or a chord (a stack of notes) to store in that step, or if the step already contains a note or a chord, change it using the keyboard. The note or chord you press will replace the existing note(s).
- Edit that step's parameters with the Gate, Velocity and Randomness encoders.

5.3.4. Advanced editing

To edit chords that you have recorded in a step, press the Overdub button. This gives you access to a number of advanced edit options specifically designed for chords. With Overdub ON you can select notes from the chord stored in the current step and edit the parameters of these selected notes only.

You can access advanced editing in Quick Edit mode, in Step Edit Mode and Step Recording mode.

To enter Advanced Edit mode, press Overdub (if it is not already active) and select the step you want to edit.

The LEDs above the notes stored in that step will blink. Press the notes of the chord you want to edit. Their LEDs will stop blinking and light up continuously. Now any edits you make with the encoders will only affect the selected notes. You can move the selected notes up or down the keyboard with the Pitch encoder. Notice how only the selected notes move; the unselected notes of the chord remain in place. The same applies to the Gate and Velocity edits you make: they will only be applied to the currently selected notes.

Another remarkable option you have now is to add a timing offset to individual notes stored in a step! Just select a note or notes of the chord stored in that step and shift them forward or backwards in time with the Time Shift encoder. Why is this important?

When playing chords live, a musician will never press all the keys of the chord at exactly the same time; there will always be slight time differences between when the different notes of a chords start. One musician tends to strike a chord with the index finger first; another with the middle finger first. You might call this the musician's 'signature'. Another use for this Time Shift feature is to emulate strumming or finger-picking a guitar chord. Used in tandem with copying/pasting steps as explained in the next paragraph, you can create very intricate sequences.



♪ In Overdub mode you can add notes to a chord until the maximum of 16 notes-per-step is reached. New notes you add when Overdub is ON will automatically be selected for advanced editing.

Press OVERDUB once more to exit Advanced Edit mode.

5.3.5. Working with Patterns

5.3.5.1. Using the Main Encoders



When in Seq mode, the five main encoders can be used to edit the parameters of the current track.

Gate

The Gate parameter is used to adjust the length (ON time) of a note. Possible values are from 0.06 step (very short) to 64 steps (very long). These values can be set independently for each step in a Pattern. By default, the Gate time is set to 0.5 step for each note.

Velocity

If a step in the Pattern is too loud or soft, you can edit its velocity using the Velocity encoder. Just select the step in question by pressing the appropriate step button, then turn the Velocity encoder to change its value to a new value in the range 0-127.

The default velocity is 100.

Time Shift

The Time Shift encoder can be used to shift the timing of steps backward or forward in relation to the beat grid. This can help add a more 'human' feel to your patterns. The range is -49 to +50, where 50 is half of the Time Division value.

Randomness

The Randomness encoder can be used to randomly mute note events in your sequence. In other words, it can be used to create automatic variety in the sequence. Per step, you can set the probability that it will play in the sequence. If you set different values for each step, every repeat will be unique.



! There's another simple way to create variety in your patterns, especially if they are 32 steps or longer. It's called the Step Skip feature: hold down a step button and then press the sequence page buttons (16, 32, 48 and/or 64) in which you do not want the KeyStep Pro to play this step. For example, if you have four identical patterns in the four pages, hold down steps 8 and 16 then press 32 and 64. The 8th and 16th steps will not play in those pages. This works in all note sequences and drum patterns.

5.3.5.2. Using the Default Encoder Settings

We've already hinted at this in a previous paragraph: whenever you add a note or notes to a (drum)sequence, the KeyStep Pro will read the current values of the Gate and Velocity encoders and insert the new note or notes with those values. This feature has an enormous creative potential that you will come to appreciate when you get to know your KeyStep Pro better. It's a feature that enables you to create intricate gate and velocity patterns. How? Here's an example to create an accented feel:

- Set the Gate encoder to 0.5 and the Velocity encoder to 100.
- Activate steps in the sequence where you want accents by pressing their step buttons.
- Now turn the Velocity encoder down to 50 and the Gate encoder down to 0.2
- Enter several other steps with these values.

Play the sequence and notice how the steps with the lower velocity values sound softer, less pronounced.

This is just the beginning. By carefully exploring the effects of long and short gate times combined with high and low velocities, you can make many musical discoveries and explore unknown territory!

The effect of this feature is not limited to monophonic steps: by selectively changing the individual gate times of the notes in a chord, you can let some notes of the chord sustain for several seconds while others fade away quickly.

5.3.5.3. Saving Your Edits

It's important to understand how the KeyStep Pro handles your Pattern edits. Whenever you are working on a Pattern, it is held in working memory. If you switched off the KeyStep Pro during the edit process and restarted it, your project would be empty and all your hard work would be lost. To store it permanently in internal memory, you need to save it. It's easy to check which patterns need to be saved: just press **SAVE + Pattern**. The step buttons corresponding to all modified and unsaved Patterns will light up in red.

To save a single Pattern:

- Hold down **SAVE** and press **Pattern**. Previously saved Patterns will blink in blue; Patterns with unsaved edits will blink in red.
- Press the red-lit step button of the Pattern you want to save.

If there is more than one Pattern with unsaved changes: - Hold down **SAVE** and press **Pattern**. Previously saved Patterns will blink in blue; Patterns with unsaved edits will blink in red. - Keep the **SAVE** button held down and press the red-lit step buttons of all the Patterns you want to save. - Press **EXIT** to exit the **SAVE** process.

A shortcut for saving unsaved Patterns is to hold down **SAVE** and press the **Track** button of the active track to save all its Patterns in one operation.



i: As you may already have guessed, a quick way to check whether the Patterns you are working on contain unsaved changes is to hold down the **SAVE** button. The step buttons of Patterns that contain unsaved changes will light up in red.

5.3.6. Copy, Paste & Erase (Steps)

Copy and paste operations are the core of the creative process. Music of almost any genre consists of basic patterns and variations of them. In this section, we'll discuss copying and pasting of steps. To learn how to copy/paste at Pattern level, refer to Chapter 6 (#What-is-a-Project).

5.3.6.1. Copy Steps

Each step in your Pattern holds a lot of data on Pitch, Gate, Velocity, Time Shift and Randomness. It also holds data on whether this step should be played or skipped in each of the four pages of the Pattern. When you copy a step to a new location, all of this data is copied with it. The same is true when you nudge a step backward or forward in time.

To copy a step, hold down the Copy button and press one or more step buttons to select it/them. The step or steps you have selected for copying will light up in blue. The OLED display will show the message: "Step(s) Copied".



J: If you copy a range of steps that includes one or more steps with data and one or more empty steps, when you paste them their precise configuration is retained; in other words, the empty steps are pasted along with the steps that contain data and their *relative* positions are unchanged. Destination steps with data will always be overwritten, even by pasted empty steps!

5.3.6.2. Paste Steps

Once you've performed a copy operation, you can repeatedly paste the selected step or steps that you copied.

Holding down Paste and pressing a step button will paste the step or steps you selected during copy at that location, either in the current Pattern or in another Pattern, including a Pattern on another track. If you copied multiple adjacent steps, they will be pasted in the same order, starting from that location. If you copied multiple non-adjacent steps, they will be pasted with the gap(s) between them retained. In other words, the step or steps in between them in the destination pattern will not be overwritten.

You can even paste across the boundaries of a page: if the steps you are pasting do not fit on the current page, the steps that do not fit will extend into the next page. For example, if you paste 12 steps to the last position of page 1 (step 16), 11 of those steps will be pasted into steps 17-27 of page 2.

The OLED display will show the message: "Step(s) Pasted"

If Track 1 is in Drum mode, and steps were copied from one drum track, they can be pasted onto another Drum track. However, it is not possible to paste from Drum to Seq or from Seq to Drum.



J: You can repeat paste as many times as you want, as long as you do not perform a new copy operation. If you do, the old contents of the copy buffer will be overwritten.

5.3.6.3. Erase Steps

In Quick Erase mode, you simply hold down the Erase button and press the step buttons of the steps you want to erase.



♪: Erasing steps is immediate: there is no message asking you whether you really want to erase. On step level this makes sense, as the consequences of an accidental erase are not too serious.

5.3.7. Copy, & Paste (Pages)

The KeyStep Pro has four 'pages' of steps: page 1 (steps 1-16); page 2 (steps 17-32); page 3 (steps 33-48); page 4 (steps 49-64). These correspond to the four long buttons to the right of the Lst Step button, under the Arturia brand name.

You can copy all the steps in one page and paste them to other pages. This works regardless of whether Step Edit is ON or OFF. For example, if you want to copy the steps on page 1 and paste them to page 2:

- Hold down Copy and press the 16 button (not the step 16 button). It will blink three times.
- Now hold down Paste and press the 32 button. It will blink three times to indicate that the content was successfully pasted.

Of course, you can also paste these steps into pages 3 and 4, which will fill with steps even if you previously set the sequence length to 16. To view and play all these new 'page extends', lengthen the sequence by holding down Lst Step and pressing the 64 button.



♪: If Track 1 is in Drum mode and steps of one drum track have been copied, they can be pasted onto any other Drum track. However it is not possible to paste from Drum to Seq or from Seq to Drum.

Paste always overwrites the existing data in the destination steps. You can paste outside the current sequence length, but to view and play the out-of-range results, you must extend the sequence by holding down Lst Step and pressing the 32, 48 or 64 button.

If you keep holding down the Paste button, you can repeat a paste on multiple pages.

5.4. The Drum Sequencer

The Drum sequencer on Track 1 is a special case. It has 24 parallel tracks, but unlike the other sequencer tracks, each drum track can only trigger one specific drum or percussion sound.

Also, programming a Drum Pattern is different to programming a melodic sequence. In sequencer Quick Edit mode, you hold down a step button and then select the notes you want to include in that step by pressing keys on the keyboard. The Drum sequencer works the other way around: you hold down a key on the keyboard that triggers a certain drum sound and then select the step or steps in which that sound will be triggered.

Why then do we have poly(phonic) and mono(phonic) options for a drum track? In Poly mode, each of the 24 tracks can be different in length. For example, Track 1 could be 8 beats long; Track 7, 9 beats long and Track 12, 16 beats long. You guessed it: when patterns of different lengths run in parallel, some very interesting polyrhythmic effects can be created. That's what Poly means for a Drum Pattern.

In Mono mode, however, all 24 Drum tracks have the same length.



I: Knowing this, you can do some very weird and wonderful things, like creating several tracks with unequal lengths. Run them until they reach complete chaos, then suddenly switch to Mono mode and have them all line-up!

5.4.1. Drum vs. Seq Comparison

Seq1/Seq2/Seq3/Seq4 and Drum on Track 1 may seem similar, but the Drum sequencer is different in many ways:

- Drum mode can record trigger patterns for up to 24 different drum sounds.
- Each of the 24 drum sounds has its own track. When a track is selected, the step buttons display the Pattern events for that drum. This is similar to the classic workflow of early drum machines.
- The lower eight keys of the keyboard send gate on/off signals in realtime to the Drum Gates 1-8 outputs on the back panel, as well as any Drum sequencer events previously entered by those keys. Pressing one of the lower eight keys will select the corresponding Drum track and generate a trigger. In Drum mode, the higher keys have no effect. The output from all 24 drum tracks is also sent over MIDI (Out 1, Out 2 and USB).
- in Drum mode, the Pitch encoder has no effect. The other encoders can be used to edit gate time and velocity, to shift the timing of drum triggers backward or forward in relation to the beat grid, and to add randomness of trigger probability to each drum step.
- The step-mode SHIFT functions can add many interesting changes to your Drum sequence:
 - Invert will reverse the steps of the currently selected Drum instrument track.
 - Nudge left and nudge right will shift the position of all steps of the currently selected Drum instrument track one step to the left or the right.
 - Rand Order (Random Order) will mess up the order of the steps in your drum track.
- The Drum sequencer has a polymeter feature (described in the next section) that allows each drum track within a Drum Pattern to have its own length.

 To select a Drum track/sound without generating a trigger, hold down the Track 1 Drum button and press the appropriate key.  In Drum mode, the Overdub button is always inactive; you cannot overdub on a Drum track.

5.4.1.1. Polymeter

As explained in the Overview chapter, the Drum sequencer can operate in Poly or Mono mode. In Poly mode, each Drum track can have its own length. This feature enables you to create complex polymeter rhythms (polyrhythms).

5.4.1.2. Exploring Polymeter

Here's an example:

What if you wanted a Pattern with this crazy mixture of loops, each in a different time signature:

Instrument:	Drum track 1	Drum tr. 2	Drum tr. 3	Drum tr. 4	Drum tr. 5
Time signature	3/16	1/4	5/16	3/8	4/4

Track 5 is the longest, so we'll use that as the timing reference.

Drum track 2 recycles every quarter-note beat (1, 2, 3 and 4), while Drum track 5 recycles every four beats (that is, only on beat 1).

Drum track 1 recycles every 3 sixteenth notes; Drum track 3 recycles every 5 sixteenth notes; Drum track 4 recycles every 6 sixteenth notes. Therefore, it will take a long time before they all recycle at the same moment, as they did in the beginning. In fact, it will be 360 bars of 4/4 time before the first bar is heard again!

5.4.2. Gates and Triggers

The keyboard, the sequencers (including the Drum sequencer) and the arpeggiators create gates and triggers. Gates and triggers are needed to start envelope generators (EGs) in external synths or Eurorack modules. By itself, an envelope generator does nothing; it needs a gate or trigger to start.

It is essential to understand that gates and triggers are two different things. A trigger is a very short pulse that can be used to synchronize (sync) modules with each other or, as in the KeyStep Pro, to start envelopes. A gate is usually longer: anywhere from a few milliseconds to several seconds.

The KeyStep Pro keyboard is the primary source of gates. When your finger touches a key on the keyboard and holds it down for a moment, you generate a gate. The gate goes into the ON state when you press the key down; it goes into the OFF state when you release the key by lifting your finger off it. When transmitted via MIDI (Out 1, Out 2 and USB) or via one of the four Voice Gate outputs, this gate signal starts an envelope cycle and the first stage of the envelope, the attack, begins. The duration of this increase in level depends on the attack setting (A) of the envelope generator. The envelope then continues through the decay stage, the duration of which depends on the decay setting (D), to the sustain stage, which has a constant level (S). It remains in the sustain stage until you lift your finger off the key. Then the final stage of the envelope begins: the release, during which the level decreases to zero. The duration of this decrease depends on the release setting (R) of the envelope generator.

It is important to realise that the KeyStep Pro does not generate ADSR envelopes, nor can it control their parameters (A, D, S and R). The KeyStep Pro only generates gates and triggers.

5.4.3. Creating Drum Patterns

For this section, you need to have your KeyStep Pro in Drum mode. To do that, press the Drum button on Track 1.

5.4.3.1. Drum Quick Edit Mode

Quick Edit is the fastest way to create and experiment with rhythmic patterns.

Here's how it works:

- Select Track 1 and put it into Drum mode.
- Press a key on the keyboard that corresponds to the drum sound you want to use for this track, then press the step buttons for the steps you want to trigger this sound.
- Repeat this procedure with other keys/sounds.
- Press play to hear your Drum Pattern.

If you watch carefully, you'll see the LEDs above the keys (Drum tracks) you have programmed light up. While the Pattern is playing, whenever a trigger occurs on a Drum track the corresponding LED will flash momentarily.

If a key (Drum track) is selected for editing, its LED will be permanently lit to indicate that, if you press step buttons, steps will be added to the current track. Any new steps you add will use the current settings of the encoders: Gate, Velocity, Time Shift and Randomness. You can use this feature to create accents:

- Set Velocity to medium (12 o'clock position) and press step buttons 1 and 8.
- Set Velocity to maximum and press step buttons 4 and 12.

Now press Play and hear how steps 4 and 12 are accented.

To change the parameters of a step, hold down the corresponding step button and change the encoder settings.



When Drum mode is selected, the Drum sequencer is in Mono mode by default.

5.4.3.2. Realtime Recording of a Pattern

To record a Pattern, press the Record button then press the Play button to start the Pattern. If the Pattern is already playing, just press the Record button. When the KeyStep Pro is running with both Play and Record lit up, it is in Record mode. If it isn't running, check the sync settings in the Utility menu by pressing SHIFT + Project, scrolling down to Sync, pressing the selection encoder and checking the Input parameter. It's best to set this to 'auto'.

Now play one or more keys. Whatever you play will be captured and added to the current Pattern. You can toggle individual events ON/OFF with the step buttons.

You can also record the input from an external MIDI/USB source, but the only steps that will be recorded are those that correspond to the current Drum note mapping. For more information, see the Drum Map section of the [MIDI Control Center \[p.126\]](#).

The active quantization setting will have a direct effect on your recording. When recording with active quantization in a low time-division (1/4 or 1/8) the beats will be 'forced' together. Turn quantization OFF by pressing SHIFT + Record/Quantize to preserve the irregular feel of your playing style or the external input.

5.4.3.3. Selecting and Editing a Drum Track

To select an individual Drum track/sound for editing, simply tap a key when in Drum mode on Track 1. The LED above that key lights up continuously to indicate that this Drum track/sound has been selected.

To select a Drum track/sound without generating a trigger and hearing a sound, hold down the Track 1 Drum button and press the appropriate key.

At this point, step buttons will light up to display the active steps (existing trigger events) in the selected Drum track of this Pattern. You can now use the step buttons to toggle steps ON/OFF. If you want to edit the parameters of an individual step, hold down the Step Edit button and press the appropriate step button, then use the main encoders to change that step's Gate, Velocity, Time Shift and Randomness parameters.



i: In Drum Edit mode, you cannot simultaneously change the parameters of multiple steps.

When using the Drum sequencer with a DAW, it may happen that the tracks of the Drum sequencer do not match the sounds of the drum or percussion patch currently loaded in the drum track of the DAW. For example, the DAW drums may be mapped from C3 upward. If you play C2 on the KeyStep Pro keyboard, there will be no sound because there's nothing to trigger. You can solve this either by remapping the sounds in the drum or percussion patch in your DAW (consult the manual of the DAW or virtual instrument to discover how to do this) or by selecting another chromatic low note in the KeyStep Pro using Utility>DrumMap>Config>Chromatic Low Note or in the MIDI Control Center.

If you want to fix this at a deeper level, you can create your own custom Drum mapping in Utility>DrumMap>Config>Custom. This Utility setting enables you to map each key on the KeyStep Pro to a specific drum (MIDI note number) in your DAW. The MIDI Control Center has a similar feature if you prefer to work from there.

Last but not least: the lowest eight keys on your keyboard – for Drum tracks 1-8 – are mapped to the Drum Gate outputs on the back panel of the KeyStep Pro. These Drum Gates are intended to trigger modules in an external (Eurorack) modular system. Please refer to [Chapter 10 \[p.138\]](#) for more details on how to do this.

5.4.3.4. Muting Drums

Muting and unmuting drum tracks/sounds is a craft that takes time to master. When used skilfully, it's a great way to introduce build-up tension in a drum or percussion performance. You can start with a Pattern with several drum tracks muted and then gradually unmute them one by one when you need the extra drive they provide. The KeyStep Pro offers two ways to mute drum tracks/sounds: Quick Mute and Drum Mute mode.

Quick Mute

Quick mutes are temporary; they are useful when you have a Drum Pattern running and want to mute one or more drum tracks/sounds that are too much for your ears at that moment or are preventing you from focusing on what you want to edit. To mute one or more drum tracks/sounds while creating your Pattern or during a performance:

- Enter Drum mode if you are not already in it by pressing the Track 1 Drum button.
- Hold down the Track 1 Mute button.
- Press the key or keys corresponding to the drum track(s)/sound(s) you want to silence. The key LED(s) will light up in red continuously to indicate where the mutes are.

Quick mutes are remembered for all Patterns on that Drum track. For example, if you mute the bass drum on C1 in Pattern 1, it will also be muted in Patterns 2 to 32 when they play. In other words, drum muting is global for all 24 tracks. To unmute, hold down the Track 1 Mute button and press the key(s) for the Drum track(s)/sound(s) you want to hear.



i: When one or more Drum tracks are muted, the Mute button will flash. When the entire Drum sequencer is muted, the Mute button will be lit continuously.

Drum Mute Mode

You can also mute drums by entering Drum Mute mode.

- Hold down the Track 1 Mute button and press Drum.

Both the Mute and the Drum button will now flash. As long as you are in this mode, all you have to do is press the key of a drum track to mute or unmute it.

To unmute all muted tracks, hold down SHIFT and press Drum.



i: To solo the Drum sequencer, hold down SHIFT and press the Mute button.

5.4.3.5. Using the Main Encoders

In Drum mode, the five main encoders can be used to edit the parameters of the current Drum track.

Gate

The Gate time parameter is used to adjust the length of notes. Possible values are from 1/64th of a step (short) to 64 steps (long). These values can be set independently for each step in a Pattern.

By default, the Gate time is set to half a step length for each event.

Velocity

If a Drum event (trigger) in the current Pattern is too loud or quiet, you can edit its velocity using this encoder. First select the drum track/sound in question by pressing the corresponding key of the keyboard, then press the step button for that step in the Pattern. Turning the encoder will choose a new value in the range 1-127.

The default velocity is 100.



i: Drum velocity values are transmitted via MIDI (Out 1, Out 2, USB) but are not sent to the Drum Gate outputs; they only transmit gates.

Time Shift

The Time Shift encoder can be used to shift the timing of Drum events (triggers) backward or forward in relation to the beat grid. This can help to add a 'humanised' feel to your drum patterns. The range is -49 to +50, or half of the current Time Division value.

Randomness

Use the Randomness encoder to randomly mute Drum events in your sequence. Turning this encoder counter-clockwise reduces the probability that an event in a step will cause a trigger to be generated. In the fully clockwise position, all events will always cause triggers.

5.4.3.6. Drum Step-Edit Mode

Step-Editing a Drum Pattern

One important function of the step buttons is to activate or deactivate each step in the Pattern. When a step button is lit, a note will play at the velocity you played on the key or set using the Velocity encoder and will keep playing for as long as you want it to (the Gate time). To silence a Drum event, simply press its step button to deactivate it.

Extending a Drum Pattern

To set a new length for the Drum Pattern hold down Lst Step and press either the 32 button (page 2), the 48 button (page 3) or the 64 button (page 4). To select a page just press its button.



To extend a Drum Pattern hold SHIFT and press a Page button. If, for example, your Pattern is 16 steps long and you Hold SHIFT and press 32, the first 16 steps will be copied to the second 16 steps (16 to 32).

To summarize: to set a new pattern length use Lst Step + Page button, to Extend a pattern use SHIFT + Page button.

When working with Drum patterns longer than 16 steps there is an important feature you need to know. To follow the sequence through the other page(s), hold down SHIFT and press Lst Step/Follow. This toggles the KeyStep Pro in/out of Pattern Follow mode.

When Pattern Follow mode is active during playback, the buttons of the current page and the current step light up to indicate the current position in sequence: first the 16 button (page 1: steps 1-16), then the 32 button (page 2: steps 17-32), then the 48 button (page 3: steps 33-48), then the 64 button (page 4: steps 49-64), then back to the beginning and so on.

When Pattern Follow mode is active, the Lst Step button is lit.



ⓘ It is possible to extend a Pattern that is shorter than the maximum length of 64 steps by copying and pasting existing data beyond its last step (see above). ⓘ The playback of the Pattern itself is not affected when Pattern Follow mode is disabled. This only affects what you are seeing, which should make it easier to edit particular sections of the Pattern. ⓘ There's a helpful button colour scheme behind the Sequence Extend system. If, for example, your Drum Pattern is playing in page 2, the 32 button will light up in green. (If you were on Track 2, it would light up in orange).

Set Pattern Length

The default length of a Pattern is 16 steps, but you can extend this length up to a maximum of 64 steps, as described above.

If you'd like your Pattern to be shorter than 16 steps, simply hold down the Lst Step button then press the step button of the desired last step. If you'd like your Pattern to be longer than 16 steps but not cover the whole page length, first select the desired page by pressing the 32, 48 or 64 button, then press the step button of the step within that page that you want to be the last step of the Pattern.

For example, if you want to create a Pattern with a length of 34 steps: - Hold down Lst Step and then press the 48 button. - Keep holding down Lst Step and press the step 2 button.

Editing Extended Step Ranges

If you want to focus on steps 17-32 (page 2) while editing, here's what to do:

- Disable Pattern Follow mode by holding down SHIFT and pressing Lst Step/Follow.
- Press the 32 (page 2) button.

Now the step buttons will only show the status of steps 17-32. If you want, you can play the Pattern while editing; it will play all 32 steps, but the step buttons will keep showing the status of steps 17-32.

Simply edit the steps as desired using the step buttons and the main encoders: Gate, Velocity, Time Shift and Randomness. When you're finished, if you like, you can re-enter Pattern Follow mode with SHIFT + Lst Step/Follow.

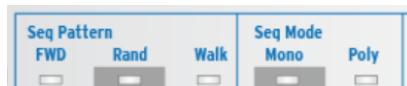
5.4.3.7. Drum Mode Shift Key Functions

When the Track 1 Drum sequencer is selected, the lowest 24 keys of the keyboard send note data over MIDI, including gate length and velocity.

The keys also have secondary functions, which are accessed by holding down SHIFT and pressing one of the keys. These combinations allow you to specify the following Pattern parameters:

Playback Mode

The lowest three keys are used with the SHIFT button to select the playback mode (that is, the direction of play).



Here's what each option does:

- **Forward:** plays Pattern beats 1, 2, 3, 4 | 1, 2, 3, 4, etc.
- **Random:** plays random beats from the Pattern.
- **Walk:** plays the steps using the Drunkard's Walk Algorithm: when the sequencer is on a given step, there's a 50% chance it will play the next step, a 25% chance it will play the same step again and a 25% chance it will play the previous step.

The default setting is Forward.

Time Division

This setting can be a quick way to halve or double the playback rate of your drum Pattern. Triplet options are also available.



i: When the KeyStep Pro clock is set to 1 pulse per step, changing Drum Time Division is only available when the KeyStep Pro is stopped.

To set Time Division, hold down the SHIFT button then press the key that corresponds to the timing you want:

- Quarter notes (1/4)
- Eighth notes (1/8)
- Sixteenth notes (1/16)
- Thirty-second notes (1/32)

To switch any of these Time Divisions into their triplet values, hold down SHIFT then press the Triplet key.

The default setting is 1/16.

5.4.3.8. Saving a Drum Pattern

Saving a Drum Pattern is the same procedure as saving sequencer patterns on Tracks 2-4:

To save one Drum Pattern:

- Hold down SAVE and press Pattern. Saved steps will blink in blue; steps with unsaved edits will blink in red.
- Press the red-lit step button of the Drum Pattern you want to save.

If there is more than one Drum Pattern with unsaved changes:

- Hold down SAVE and press Pattern. Saved steps will blink in blue; steps with unsaved edits will blink in red.
- Keep the SAVE button held down and press the red-lit step buttons of all the Drum Patterns you want to save.
- Press EXIT to exit the SAVE process.

A shortcut for saving all unsaved Drum Patterns is to press SAVE + Track 1.

i: As you may have guessed, a quick way to check whether the Patterns you're working on contain unsaved changes is to hold down the SAVE button. Patterns that contain unsaved changes will light up in red.

5.4.3.9. Copying a Drum Pattern

When working in the Drum sequencer, you can copy a Drum Pattern from one location to another, even if you have made no edits. To do this, simply follow the procedure described above in [Saving a Drum Pattern \[p.80\]](#) but select a new destination number instead of the original number by pressing the appropriate step button.

5.4.3.10. Clearing a Drum Pattern

To clear the events (triggers) stored in the current Drum track, hold down SHIFT and press Clr Steps. To clear the entire Pattern and reset all of its settings (track lengths, Time Division, etc.) to their defaults, hold down SHIFT and press Clr Ptn.

5.4.3.11. Making the Most of Drum Mode

Many of the special SHIFT functions you would normally apply to a melodic and/or harmonic sequence can also be applied to Drum sequences, with surprising results.

Try some these:

SHIFT + Invert will create a mirror image of the events (triggers) in the current Drum track. The last notes will become the first and vice versa. Press SHIFT + Invert once more to restore the natural order of things (-:-).



♪: SHIFT + Invert will only invert the currently selected Drum track.

It does not stop there: you can shift the currently selected looping Drum sequence to the left or right. To shift to the right hold down SHIFT and press Nudge>. An event (trigger) in the first position of the loop will move to the second position; an event (trigger) in the last position will wrap around to the first position.



♪: Remember to save the Pattern after making edits! ♪: The project-level swing percentage is not saved with Scenes, Sequences or Patterns, but it is saved with each Project. !: To explore uncharted territory, set the drum MIDI channel number to something other than 10 and thus use the 24 Drum tracks to trigger fixed MIDI notes rhythmically. !: As explained in the sequencer section above, there's a simple way to create variety in your patterns, especially if your patterns are 32 steps or longer. It's called the Step Skip feature: hold down a step button then press the buttons (16, 32, 48 or 64) of pages in which you do not want the KeyStep Pro to play that step. For example, if you have identical Patterns in each of the four pages, hold down step buttons 8 and 16, and press the 32 and 64 buttons. The 8th and 16th steps will not play in those step ranges. This works for all Drum Patterns.

5.4.4. Rhythmic Examples

5.4.4.1. An African Rhythm

The example below is a West African rhythm called Djaa Siuri. The first two voices/rhythms, Drum 1 and Drum 2, are usually played on djembes. The third voice/rhythm is often played on a sangban, a medium-sized dunum drum.

To program this rhythm into the KeyStep Pro, you might want to read 'S' as a drum hit with maximum velocity and 's' as a drum hit with medium velocity. The same applies to 'T' and 't'.

S = right-hand slap

s = left-hand slap

T = right-hand resonant tone

t = left-hand resonant tone

x = sangban hit

1	2	3	4	5	6	7	8	measure
s-t	S--	s-t	S--	s-t	S--	s-t	S--	Drum 1
s-s	SiT	s-s	SiT	s-s	SiT	s-s	SiT	Drum 2
x-x	-x-	xx-	x-x	x-x	-x-	xx-	x-x	sangban

5.4.4.2. An Arabic Rhythm

The example below is a very simple traditional Arabic rhythm called Maqsum. It is usually played on a darbouka: a goblet drum made of clay and a riq; a high-pitched tambourine. It has a swing feeling to it because the riq leaves the first eighth note in the second beat empty:

measure 1	measure 2	Instrument
xTxT	xxTx	riq
Dxxx	Dxxx	darbuka

To program this rhythm into the KeyStep Pro:

- Select Drum mode on Track 1.
- Select/load a drum kit on your DAW (MIDI) or external synth.
- Play the keys of the lowest octave on the KeyStep Pro to familiarize yourself with the drum sounds triggered by each key.
- Now, we want to make an 8-step rhythm. To create that, hold down '1st Step' and press the step 8 button.
- Found a bass drum sound? Hold down the key that triggers it and active the steps on which you want to hear it. To try the above rhythm, select steps 1 and 5.
- Now find a high-pitched drum sound that can play the riq part.
- Hold down the key that triggers it and select steps 2, 4 and 7.
- Press 'Play' to hear your rhythm.

To check whether a particular Drum Track is active in your rhythm, hold down its key. If that Drum Track has steps that are active (ON), their buttons will light up. Steps that are OFF will remain unlit.

To deactivate a step, press the appropriate step button.

Things to try:

SHIFT + Rand Order (step 12 button)

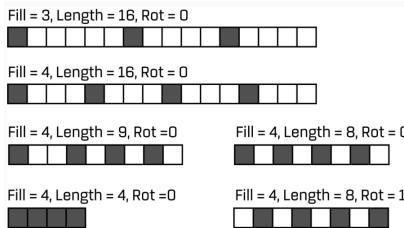
SHIFT + Random or Walk (C# or D key under Seq Pattern)

SHIFT + Time Division: 1/4, 1/8, 1/16 or 1/32, or their triplet variants (F, F#, G, G# or A keys of middle octave)

5.4.4.3. Euclidean Rhythms

There are times when you notice that you're stuck in the same routine when creating rhythms: for example, every sequence you create is 16 steps long with every fourth step active. It has become your default setting and you find it difficult to appreciate anything that sounds different. If that is the case, you may want to explore Euclidean rhythms.

An Euclidian rhythm is built using three parameters: length (step length), density (step fill) and rotation of the sequence. The simplest example is a sequence of 16 steps with four beats. When you distribute these beats evenly over the sixteen steps, the result is the rhythm most often heard in western music: four 4-step bars, each with a note on the first step of the bar. But there's an alternative: by combining different step lengths and step fills, a great number of original rhythms can be created. The diagram below shows a few examples:



Many of these patterns are common in African and South American music. For an in-depth explanation of Euclidian rhythms and their use in various music cultures, please refer to:

(<http://cgm.cs.mcgill.ca/~godfried/publications/banff.pdf>)

The next phase is to explore advanced rhythms by applying Pattern rotation, randomness and swing. Euclidean Patterns are notated in the format E(X, Y), where X is the number of active steps in the Pattern and Y is the length of the Pattern. For example: E(4, 7) = [x · x · x · x] is a famous Bulgarian dance rhythm. E(2, 5) = [x · x · · ·] is a rhythm found in Greece, Namibia, Rwanda and Central Africa.

Setting Pattern Rotation

By shifting a Pattern one position to the right with the KeyStep Pro's nudge function (SHIFT + NUDGE>) you can change the overall character of the rhythm. If you start the above rhythm on the second step, as in [x · · x · ·], it suddenly becomes a rhythm often found in Central Africa, Bulgaria, Turkey, Turkestan and Norway. Each additional NUDGE> will generate another unique rhythm.

5.5. Special Features

The KeyStep Pro has various special features that you can use to add spice and variation to your sequences:

5.5.1. Scales

Scales express emotion in music. A single melodic line can evoke many emotions, but when you add chord notes from the scale to that melodic line, the feeling will become much stronger. When you add notes of a major scale, the result sounds forceful and happy, whereas adding notes of a minor scale can make the same melodic line seem sad. At least, that might be your response if you were born in a culture dominated by western music. In other cultures, the response to major and minor scales may be different.

A standard (chromatic) scale consists of twelve notes: C-C#-D-D#-E-F-F#-G-G#-A-A#-B. Every scale is a selection from these twelve notes.

Most common scales use only seven notes, except for the pentatonic scale, which uses five notes. By leaving out certain notes, each scale evokes a very specific emotional effect.

The most widely used scale in western music is the C major or C Ionian scale: play the white keys on a piano ascending from C to C' and what you hear is the C major scale. Of the twelve notes of the chromatic scale, C major uses: C D E F G A B (C). Leaving out certain notes creates gaps. Some of these gaps, known in musical terminology as *intervals*, are whole-tone gaps; the others are semitone gaps. The interval from C to D is a whole tone; from E to F a semitone.

C Major Intervals

A musical staff in G clef shows the notes C, D, E, F, G, A, B, C. Below the staff, the intervals are labeled as t-t-st - t-t-t-st, indicating a whole tone, a semitone, a whole tone, a whole tone, a semitone, and a whole tone.

C major has a specific series of intervals: tone, tone, semitone, tone, tone, tone, semitone. This is known as the Ionian mode.

However, if you play the white keys on the keyboard ascending from D to D', you get a different series of intervals: tone, semitone, tone, tone, tone, semitone, tone. This is known as the Dorian mode.

C Major Scale- Root D

A musical staff in G clef shows the notes D, E, F, G, A, B, C, D. The note D is highlighted in blue and labeled "Root D". Below the staff, the intervals are labeled as t-st - t-t-t-st - t, indicating a semitone, a whole tone, a whole tone, a whole tone, a semitone, and a whole tone.

If you now start on C and play a scale using this new series of intervals, you play a C Dorian scale.

C Dorian Scale



When you play a scale only on white keys, ascending from the 5th step of the C major scale, G to G', you get another series of intervals: tone, tone, semitone, tone, tone, semitone, tone. This is known as the Mixolydian mode.

Creating different scales in this way, each with its own special emotional feeling, is an age-old trick. Scales created this way are sometimes referred to as 'church modes', which were largely unused for centuries but rediscovered by jazz musicians in the 1950s and 1960s. They are now widely used in western music.

5.5.1.1. Selecting Scales

In the KeyStep Pro, if you select a scale using the SHIFT + Scale key feature, everything in the currently selected track – what you play on the keyboard, the track sequence and the track arpeggio – will play in that scale. It's a Track setting.



: You can use this feature to your advantage by creating Tracks with different Scale and Root settings. By muting and unmuting tracks, you can drastically alter the tonal effect of your performance.

The Scale option works as a filter, selecting eight notes from the chromatic scale. For each scale, it's a different set of notes. In technical terminology, it *quantizes* the default chromatic scale (C, Db, D, Eb, E, F, Gb, G, Ab, A, Bb, B) to either the:

- Major scale (C, D, E, F, G, A, B)
- Minor scale (C, D, Eb, F, G, Ab, Bb, B)
- Dorian mode (C, D, Eb, F, G, A, Bb)
- Mixolydian mode (C, D, E, F, G, A, Bb)
- Harmonic Minor scale (C, D, E, F, G, Ab, B)
- Blues scale (C, Eb, F, Gb, G, Bb)

To hear (and see) the effect of selecting a scale on your KeyStep Pro, switch it ON if it isn't on already (do you ever switch it off?) and select a preset on your external synth with a fairly simple sound.

Press SHIFT + Scale key B to select the Major scale. When you now play the white keys you'll hear the major scale. The odd thing is that the black keys also play the major scale! The black key that normally plays C# now plays C natural. All black keys are 'stripped' of their normal pitch and have been lowered a semitone to fit in the C major scale. Whatever chord you play on the keyboard, it will always be a chord of the major scale!

Let's explore these scales. Press play to activate the Arpeggiator and, starting from C, hold down the first, third and fifth steps of the major scale; you're now playing a C major chord. Press SHIFT + a Scale key to select other scales. You'll hear the third step changing when you select the Minor scale, the Dorian mode or the Blues scale



: A nifty trick is to start an arpeggio or sequence in a certain scale, then select another scale with the SHIFT + Scale key option. You'll hear your arpeggio or sequence change scale on the fly. Remember, the KeyStep Pro has three arpeggiators, on Tracks 2-3. ! You can also use the Pitchbend strip to change the pitch of your arpeggio.

When Scale mode is active, this can have a peculiar effect on your arpeggio or sequence: because all notes will be forced to play in the currently selected scale, there may be duplicate notes. For example, if you've set the scale to C major and you hold down an E and an Eb, because the Eb is 'foreign' to the C major scale, the Arpeggiator will play E twice, which causes a ratcheting effect.

5.5.1.2. The Scale Root

SHIFT + Root (F in the upper octave) allows you to select another root note for the currently playing sequence. Also, User 1 and User 2 (F# and G in the upper octave) can be used to store custom scales.

For Major, Minor, Dorian, Mixolydian, Harmonic Minor and Blues scales, you can select a new root note by pressing SHIFT and holding down the Root key then selecting a new root in the first octave of the keyboard. As long as you keep holding down the Root key, pressing a key will update the root note. The currently active root note will be shown with its LED lit up continuously in blue.

Starting a scale on a different note will drastically change the mood or feeling. For example, if we play the notes that make up the C major scale not from C to C' but from D to D', the intervals will now be heard in a different order.

- C major starting on C: tone, tone, semitone, tone, tone, tone, semitone (T-T-s-T-T-T-s).
- C major starting on D: tone, semitone, tone, tone, tone, semitone, tone (T-s-T-T-T-T-s-T = Dorian mode).

When you take this second series of intervals and start on, say, G as the root note, you get:

- G, A, Bb, C, D, E, F, G' (known as G Dorian)

It's an age-old principle that was widely used in ancient music and medieval church music. It was rediscovered by jazz musicians in the 1950s and 1960s. And when the western world opened up to other music cultures, especially in the 1980s and 1990s, musicians explored the exotic-sounding scales of Indian ragas and Arabic maqams, which used some scales that were quite different to the standard major and minor scales that had been used for centuries in western classical music.

Changing the root note is a form of 'intelligent' transpose – intelligent because the interval structure of the scale remains intact. This, as opposed to normal or 'dumb' transpose, which simply lowers or raises all the pitches by the same interval.



: If you want to know more about this fascinating subject, search "music theory" on a search engine or YouTube.

5.5.1.3. User Scales

From the Arturia factory, the KeyStep Pro comes complete with six predefined scales, but you can create your own custom scales and store them as User 1 or User 2.

In the example below, we'll add Bhairavi, a well-known and popular scale in Indian music. Bhairavi has lowered second, third, sixth and seventh steps. So, based on C, it plays as C, Db, Eb, F, G, Ab, Bb (C').

To create this scale, we have to eliminate notes that are not part of it. This is how you do it:

Hold down SHIFT and press Scale>User 1 (F# in the upper octave of the keyboard)

Now focus on the 12 keys in the lower octave of the keyboard. The LEDs above all those keys have lit up, meaning that all keys will play. We need to change this so that only the keys of the Bhairavi scale will play. Therefore, we have to eliminate D, E, F#, A and B. Press those keys to deactivate them.

By setting a new Root for the scale, you make the series of intervals start at a new position on the keyboard. The intervals of Bhairavi are: 1/2, 1, 1, 1, 1/2, 1 or s-T-T-T-s-T.

If we set the root of Bhairavi to Db (which is, in fact, how it is often played on Indian harmoniums, sitars, sarods, etc.) the scale will be transposed to Db, D, E, F#, G#, A, B (Db).



♪ If you haven't yet made any changes to the User 1 and User 2 scales, they will both be chromatic.

5.5.2. Chord Mode

The KeyStep Pro can memorize a chord. You can then play that chord just by pressing a single key on the keyboard. The chord will transpose automatically as you press different keys.

Chord mode lets you experiment with chord transpositions in new ways. It's a unique new KeyStep Pro feature. Initiate Chord mode by holding down SHIFT then pressing the Tie/Rest/Chord button. Now, as soon as you play a chord of up to sixteen notes on the keyboard, the KeyStep Pro will remember its interval structure and allow you to play it with just one key. It will also intelligently take account of the current Root note and adapt to the current Scale.

Chords are derived from scales. The most common three-note chords consist of the first, the third and the fifth of a scale. The most common four-note chords consist of the first, the third, the fifth and the seventh of a scale. The first note of a chord is the Root. The third note in a scale determines the 'feel' of a chord: if it is three semitones above the Root, the chord is minor; if it is four semitones above the Root, the chord is major. When you add more notes to a chord, you are essentially fine-tuning or further shaping the minor or major feel.

When you initiate Chord mode and play some notes on the keyboard, the KeyStep Pro will analyse the interval structure of the chord you play. When next you play a single note on the keyboard, it will reconstruct that interval structure based on the note you play. If it was a minor seventh chord (for example, Cmin7), it will create a minor seventh chord based on the key you press.

It's a feature that gives new meaning to the word 'arpeggio'. Chord mode enables you to create blindingly fast and intricate polyphonic scale-quantized arpeggios.

5.5.2.1. Memorizing a Chord

Memorizing a chord is very easy: just hold down a chord, then hold down SHIFT and quickly press the Tie/Rest/Chord button. After this, as long as you keep holding down either SHIFT or Tie/Rest/Chord, you can add notes to the chord. When you let go of both Tie/Rest/Chord and SHIFT, the KeyStep Pro will switch into Chord mode and the Tie/Rest/Chord button will flash once per second. The next single key you press will play the chord you created in the currently active scale.

The lowest note you entered will be the centre key for transposition. Pressing any key above that will transpose the chord up; pressing any key below it will transpose the chord downward.

Here are a few more things to know about this feature:

- You can use a sustain pedal instead of the Tie/Rest/Chord button for all Chord mode functions. (The pedal will not flash, of course, but that would be cool!)
- Chord mode is a keyboard and Arpeggiator feature; it doesn't work when playing a sequence. If Chord mode is active and you record a sequence hoping that the sequence will play the chords, you'll be cruelly disappointed. However, you can have a sequence playing and play the keyboard in Chord mode on top of it.
- Chord mode can be initiated on all tracks when playing the keys, except on Track 1 when Drum mode is selected.
- You can memorize one chord per track.

Another extraordinary thing about Chord mode is that you can hold down several keys and each key will be the starting point of a chord! This will work until you have exhausted the maximum number of voices.

For example, initiate Chord mode and memorise a major chord (C, E, G) with the Scale setting Chromatic.

When you press C3, the notes C3, E3, G3 will play. Now if you stay in Chord mode and also hold down F3, it will add F3, A3, C4 to the chord.

To exit Chord mode, hold down the SHIFT button and press Tie/Rest/Chord. The last chord you memorized will still be there. Pressing SHIFT + Tie/Rest/Chord again will reenable Chord mode with your memorized chord intact.



⚠: Chord memory is not saved when the KeyStep Pro is switched OFF.

5.5.3. Using Sync

Of all the skills you can master in electronic music, sync is one of the most important. Sync is when two or more units (synths, drum machines, effects, oscillators, filters, voices) have their rhythms synchronised to each other. Sync is also how we humans connect to the flow of music. If you want to capture the attention of your listeners, you must understand how to make captivating synced patterns.

The KeyStep Pro can sync to your DAW or external synth in various ways. Changing the Time Division allows you to sync proportionally: at double speed, at half-speed, or even slower than that.

The KeyStep Pro can also sync to your modular system. The CLOCK In jack on the back panel accepts clock signals that will sync the KeyStep Pro to the clock of your Eurorack system, be it a sequencer and LFO or a dedicated clock module. But there's more: a very interesting option is to connect a burst module to CLOCK In. A burst module generates a flurry of clock signals that can speed up and slow down. When connected to CLOCK In, it will simultaneously speed up or slow down all (drum) sequences and arpeggios running on your Keystep Pro!

6. WHAT IS A PROJECT?

A Project enables you to store and recall 16 Patterns per sequencer, as well as the state of each sequencer. When you do a save, everything in the Project is stored: Seq/Drum mode for Track 1, Seq/Arp mode for Tracks 2, 3 and 4; solo or mute state of each track; Scenes, Chains, output mappings and current time divisions.

The edit options are flexible: in addition to Project SAVE, you can copy one Project to another or erase a Project. For each of these operations, a screen message asks you to confirm the action. The instructions below show the confirmation screens. The necessary buttons for managing Projects are found in the Control section of the front panel.

6.1. Managing Projects

After using your KeyStep Pro for a while, you'll probably have a large number of sequences. You may be working on a musical arrangement or performance and want to create and safeguard a selection of your sequences for that purpose. KeyStep Pro Projects are designed for that kind of situation.

The internal memory of the KeyStep Pro holds a total of 16 Projects. You could think of a Project as a single song (although it could be an entire performance). Each Project contains:

- 16 Patterns for each of the four sequencers (Seq1, Seq2, Seq3, Seq4 and Drum), including all the swing, randomness and probability settings for each Pattern.
- A Control Mode preset (that is, a controller map), with independent settings for each assignable control.
- 16 Scenes.
- Project-level settings for tempo, swing, randomness and probability.

Please refer to [Chapter 7 \[p.105\]](#) for information about other parameters that affect the way Projects respond when you switch from one Project to the next.



! Before switching to another Project, it's important to save the sequencer Patterns you've just been working on. If you forget to save them, they will be lost forever. To save all Patterns in a track, hold down SAVE and press the appropriate track button (Track 1 to Track 4). To save all Patterns in the current Project, hold down SAVE and press Project.

6.1.1. Loading a Project

To create a new Project, hold down the Project button and choose an empty Project by selecting one of the 16 step buttons.

To load an existing Project, hold down the Project button and press the step button that corresponds to the number of the Project you want to load.



! Be sure you have saved your current Project to another number before loading an existing Project!

An alternative way to load a Project is to hold down the Project button and turn the selection encoder. Select the desired Project number and press the encoder to load it.



! Don't hesitate too long, otherwise the operation will be cancelled.

Projects can be loaded even while the sequencers are running.



i: The [MIDI Control Center \[p.126\]](#) has a parameter that allows you to specify whether the new Project should be loaded instantly or wait until after the (drum) sequencer reaches the end of its current Pattern. See the [Wait to Load Project \[p.102\]](#) section to learn about this feature.

6.1.2. Saving a Project



i: When you follow the instructions below you will overwrite the selected Project and all its Patterns. Before you save your Project, make sure that is what you want to do! If you don't want to overwrite the selected Project, be sure to find out which memory location is empty and store your Project there instead.

To save a Project:

- Hold down the SAVE button, then
- Press the Project button.

The Screen will now ask you to confirm that you want to save the current Project. If that's OK, press the encoder to confirm your decision or press the Exit button to cancel.

To recall this Project later, follow the procedure described in the [Loading a Project \[p.91\]](#) section above.

After pressing the SAVE button (in the Control section), to perform the actual save operation, press the selection encoder (to the right of the OLED display above the Control Section). A warning screen will then appear, asking you whether you really want to save. Press the selection encoder a second time to make the save.



i: Saving a project will save all edited Patterns. It's a quick way to make certain you save all your changes.

6.1.3. Copying a Project

You can also copy a Project from one location to another, whether you have just edited it or not. You can only copy the currently loaded Project to a chosen destination Project.

To copy one Project to another, hold down the Copy button and press the Project button.

Pressing the Copy button will change the screen to show the currently loaded Project as well as the destination Project. The destination Project number will always be the current Project number +1. Press the selection encoder to confirm the copy operation. A warning message will ask if you really want to perform the copy. If so, press the selection encoder again to confirm, or hold down SHIFT and press Exit/Undo to cancel the copy operation.



Warning! If Project 16 is current and you want to save it, it will be stored to Project 1, overwriting all existing data in Project 1 in the process. **J**: PASTE has no function at Project level.

6.1.4. Erasing a Project

You can, of course, erase the current project. Erase will clear all Patterns in all sequencers/arpeggiators including all their associated settings. However, erasing the current project will leave all the MIDI/CV routings and setting in place. Only the pitches, steps, velocities, etc. will be removed.

To erase the currently selected Project, hold down the Erase button and press the Project button.

A warning message will ask if you really want to erase this project. Confirm and erase the current Project by pressing the selection encoder, or choose a different Project to Erase by turning the encoder and selecting another number.



i: Again, if you change your mind during the erase process, press Exit/Undo to stop the process and return to the currently selected Project.

6.2. All about Tracks

The currently selected track is where you can create melodic sequences, drum sequences and arpeggios. A track can hold up to 16 Patterns that you can edit and arrange to your heart's content. You can duplicate a Pattern to another Pattern in the same track or to an empty Pattern in another track.

There are two kinds of tracks: the standard track that holds (drum) sequences and arpeggios, and the control track, which you will probably use less often but which offers fascinating options for control of external synthesizers and Eurorack modules.

The control track lets you use the five main encoders (surrounded by 15 LEDs) as CC# encoders to create CC# sequences. In every other aspect, it behaves like a normal track.

Track 1 can be either in Drum or Seq mode. Tracks 2, 3 and 4 can either be in Arp or Seq mode.



i: When you save the current situation of the tracks in a Scene, your track selection will be saved with it.

6.2.1. Selecting a Track

To select a track, press one of the Track buttons. The button of the selected track will light up. As soon as you start to play notes, the LEDs above the keyboard will light up in the colour of the current track.

6.2.2. Muting a Track

Mute a track by pressing its Mute button, which will turn red. You can mute multiple tracks simultaneously. When a track is muted and selected, the keyboard can be used to play notes on that track's MIDI channel.

6.2.3. Soloing a Track

The Mute button has a second option: to solo a track, hold down SHIFT and press its Mute button. The Mute button now turns blue. Solo is exclusive: only one track can be soloed at a time.

The Solo function is intelligent: when you deactivate it by pressing it once more it will return to the state it was in before you pressed it. If you pressed it from mute state, it will return to mute; if the track was active when you pressed it, it will return to active state.

Pressing this button again (with or without SHIFT held down) exits Solo mode and goes back to mutes if there were any – except for the current track, whose Mute button becomes unlit. Solo takes priority over mute.

6.2.4. Creating Splits

By splitting the keyboard into two parts you can play a sound on the lower part of the keyboard that is different from the sound you play on the upper part. Splits are a handy feature if you want to solo with your right hand over an accompaniment (for example, chords or a bass line) you play with the left.

To create a split, hold down a first Track button and then another Track button. While holding down both Track buttons, press a key to define the split point (the lowest note of the upper part). The first Track button that you held down becomes the upper part and the second becomes the lower part. The LEDs above the keyboard will tell you which is which by displaying the colour of the tracks that make up the split.

The default split point is the keyboard's second C from the left. The upper part includes all MIDI notes including and above the split point. Even when there is already an active split, you can still hold down two Track buttons to set another split point.

To deactivate the split, press the two appropriate Track buttons simultaneously. On release, the split will be deactivated.

While the split is active, you can still switch focus between the two tracks by pressing one of the two Track buttons. Transpose, Octave, pitch bends, SHIFT functions (SHIFT + key), steps and the parameter changes you make with the main encoders all apply to the track in focus.

The Track button of the track that is in focus blinks and the step buttons will light up in the colour of the track in focus. The states of the Overdub and Hold buttons are maintained.

In Seq mode, the keyboard is always used for playing or transposing.



J: You can select another track (that is, a third track that is not involved in the split), but doing this will temporarily exit split mode. Note that the split is still 'memorized' in the background though not displayed while neither of the two split tracks is selected. J: Transpose ignores the split point. Holding down Trans and pressing a key transposes the currently selected track.

6.3. Patterns

A Pattern contains the note information for a given track. There are 16 Patterns per track within a project.

6.3.1. Selecting a Pattern

There are two ways to select a Pattern. You can press the left or right arrow buttons in a track to navigate between Patterns, or you can select a Pattern directly by holding down the Pattern button and pressing one of the 16 step buttons.

When a Pattern is selected (as opposed to a Chain), the Pattern button will be lit.

6.3.2. Managing Patterns

When loading a Pattern, you load it from internal memory to working memory. All changes you make, such as Nudge and Randomize, will be performed on this temporary copy in working memory. At any moment you can see which Patterns are still in their unaltered state and which you have changed. Hold down SAVE and the step buttons of Patterns that contain unsaved changes will light up in red, whereas unaltered ones will light up in blue.

Why is this important?

The KeyStep Pro is very much an improvisation tool, so when you load a Pattern you have many tools available to create variations of that current Pattern. When you are making changes, some will turn out OK but others will be undesirable or even disastrous. In a situation like that, you want to be able to switch back to the original state of the Pattern and undo your failed experiment. To reload the original version of your Pattern, hold down SHIFT and press SAVE. The OLED screen will display "Pattern reloaded".

To save one or more of the Patterns held in working memory, hold down SAVE and press the step button(s) of the Pattern(s) you wish to save. This is a great feature that enables you to save sequences selectively.



I: A shortcut for saving all unsaved Patterns in the currently active track is to hold down SAVE and press the appropriate Track button.

6.3.3. Copy, Paste & Erase Sequencer Patterns

In the previous chapter we explained how to copy steps within a Pattern. In this section we'll explain how to copy and paste one Pattern to another in the same track, or to a Pattern in another track.

Holding down Copy and pressing Pattern starts Pattern Copy mode. You know you're in Pattern Copy mode when the Copy and Pattern buttons blink.

To copy one Pattern:

- Hold down Copy and press Pattern. Saved Patterns will blink in blue; Patterns with unsaved edits will blink in red.
- The OLED screen displays "Select Pattern to Copy, Press Exit to Cancel" inviting you to select a Pattern or cancel.
- Hit the step of the Pattern you want to copy.
- Hold down Paste and press the button of the step where you want to save the Pattern

If you want to copy a Pattern to more than one location:

- Hold down Copy and press Pattern. Saved Patterns will blink in blue, Patterns with unsaved changes in red.

The OLED Screen displays "Select Pattern to Copy, Press Exit to Cancel".

- Press the step button of the Pattern you want to copy.

The step buttons display the current state of the Patterns:

- Blue for a Pattern that has been saved
- Red for a Pattern with unsaved changes
- Unlit for an empty Pattern

Pressing a step button activates/completes the Copy operation and stores the Pattern data in the copy buffer.

Now hold down Paste and press Pattern. Again the step buttons will light up to display the current status of the Patterns:

- Blue for a Pattern that has been saved
- Red for a Pattern with unsaved changes
- Unlit for an empty Pattern

Keep holding down Paste and press the step button(s) of the destination(s) to which you want to copy the Pattern. The content of the copy buffer will be pasted into the Patterns you select. Press the Exit button to exit the Paste process.

6.3.4. Copy, Paste & Erase of Drum Patterns

Copying drum Patterns is identical to copying sequencer Patterns.

- Hold down Copy and press Pattern. Previously saved Patterns will blink in blue, Patterns with unsaved changes in red.
- The OLED screen displays "Select Pattern to Copy, Press Exit to Cancel".
- Press the step button of the Pattern you want to copy.
- Hold down Paste and press the step button of the destination to which you want to copy the Pattern.

If you want to copy a Pattern to more than one location:

- Hold down Copy and press Pattern. Previously saved Patterns will blink in blue, Patterns with unsaved changes in red.
- The OLED Screen displays "Select Pattern to Copy, Press Exit to Cancel".
- Keep the Copy button held down and press the step button of the Pattern you want to copy.

The step buttons display the current state of the Patterns:

- Blue for a Pattern that is saved
- Red for a Pattern with unsaved changes
- Unlit for an empty Pattern

Pressing a step activates/completes the Copy operation and stores the Pattern data in the copy buffer.

Now hold down Paste and press pattern. Again the steps will light up and display the current status of the steps:

- Blue for a Pattern that is saved
- Red for a Pattern with unsaved modifications
- Unlit for an empty Pattern

Keep the Paste button held down and press the step button(s) of the destination(s) to which you want to copy the Pattern. The content of the copy buffer will be pasted into the Patterns you selected. Press the Exit button to exit the Paste process.

6.3.5. Erasing Patterns

Holding down Erase and pressing Pattern starts Pattern Erase mode. The Erase and Pattern buttons blink.

The OLED screen displays "Select Pattern to Erase".

As with copy and paste operations, the step buttons display the current state of the Patterns:

- Blue for a Pattern that is saved
- Red for a Pattern with unsaved modifications
- Unlit for an empty Pattern

Keep the Erase button held down and press the step button(s) of the Pattern(s) you want to erase. To exit Erase mode press EXIT.

6.3.6. Undo

Of course, there's always the risk that you erase something unintentionally. Fortunately, the KeyStep Pro has an undo function. It can't save you all the time, but when available, usually after a critical erase, the Exit button blinks.

To undo a Paste or Erase operation, hold down SHIFT and press Exit/Undo.

Undo is also useful to undo the last recording you made. Undo will restore the KeyStep Pro to the state it was in before recording started.



i: Undo will only undo Paste and Erase operations; it will not undo randomizing notes in a Pattern or any of the other SHIFT functions.

6.4. Arranging

A Project is much more than a collection of saved sequencer Patterns. It has two additional aspects: Chains and Scenes. The Scenes functionality enables you to store and recall snapshots of a situation. In a Scene you store everything that is currently playing: not only the state of the current Project but also the Patterns and Chains running in each track. A Chain is a linked series of Patterns that you can create to play in a fixed order.

Arranging already starts within a sequence; for example, if you create a 16-step sequence on the first page of a Pattern and copy that sequence to page 2 (steps 17-32), page 3 (steps 33-48) and page 4 (steps 49-64). More about this in the [Top-Down \[p.103\]](#) and [Bottom-UP \[p.104\]](#) sections later in this chapter.

6.4.1. Chains

A Chain is a linked series of Patterns that will play one after the other in a fixed order. Chain mode effectively automates the selection of Patterns, so that during a performance or a recording session you don't have to manually switch from one Pattern to another. Each track can have its own Chain, and each Chain can consist of up to 16 Patterns.

When a Chain is selected (as opposed to a Pattern), the Chain button will be lit.

6.4.1.1. Creating a Chain

To create a Chain, hold down the Chain button (to the left of the Pitch encoder) and press step buttons in the order in which you want to store Patterns in the Chain. The step buttons will blink in the order they were entered. Keep an eye on the OLED screen; it will display how many Patterns are currently stored in the Chain. When you press Play, the Chain you programmed in each track will take care of changing Patterns for you.



CAUTION: When you create a new Chain in one of the tracks, the existing one in that track is replaced.

6.4.1.2. Mastering Chains

Chain-making is the essential skill you need to master to create interesting arrangements.

When creating a song or a large-scale composition, you'll probably arrive at a moment where you have created several sequences in each track. You probably don't want all of them to play simultaneously, but you may want to start off with a sequence in Track 1 and repeat it two times, after which a sequence in Track 2 will join in and play two times while a *different* sequence is playing in Track 1.

Something like this:

Track 1	Track 2	Track 3	Track 4
first sequence			
first sequence			
second sequence	first sequence		
second sequence	first sequence		
	second sequence	first sequence	
	second sequence	second sequence	first sequence
			second sequence

How do you create a song structure like that?

The trick is to use an empty or 'dummy' Pattern to create silence in the Chain. For example, just leave Pattern 16 of each track empty for that purpose. Fill Patterns 1 and 2 with sequences, which are unique on each track.

Creating the Chain for Track 1 is easy. Hold down the Chain button and twice press Pattern + step 1 (which holds the first sequence), then twice press Pattern + step 2 (which holds the second sequence), then press Pattern + step 16 (the dummy) three times to fill the remaining empty parts of the Chain.

When creating the Chain for Track 2, we start with the dummy pattern twice:

Select Track 2. To enter two dummy patterns, hold down Chain and press Pattern + step 16 twice, then twice press Pattern + step 1, then twice press Pattern + Step 2, then press Pattern + step 16 once to complete the Chain with a dummy.

You've got the basic idea, we hope. Continue until you've programmed all four chains. This is the result, with the pattern numbers for the respective tracks shown in square brackets:

Track 1	Track 2	Track 3	Track 4
first sequence [1]	dummy [16]	dummy [16]	dummy [16]
first sequence [1]	dummy [16]	dummy [16]	dummy [16]
second sequence [2]	first sequence [1]	dummy [16]	dummy [16]
second sequence [2]	second sequence [2]	dummy [16]	dummy [16]
dummy [16]	first sequence [1]	first sequence [1]	dummy [16]
dummy [16]	second sequence [2]	second sequence [2]	first sequence [1]
dummy [16]	dummy [16]	dummy [16]	second sequence [2]

Make certain to save this to a Scene: (SAVE + SCENE + Step). Because it took some effort and you don't want to lose your masterpiece, also save the current Project (SAVE + PROJECT) and press the selection encoder to confirm the save.

6.4.1.3. Saving Chains

If you want to preserve your Chain for posterity, don't forget to save it before powering off the KeyStep Pro. You save the Chains you've created for each track by saving the current project by pressing SAVE + Project and confirming my pressing the selection encoder.

6.4.2. Scenes

A Scene is a kind of 'snapshot' of the Patterns and Chains that are current in each of the four tracks. 16 Scenes can be stored within a project and then loaded at any time.

- A Scene also contains the mode for each track (Drum/Seq/Arp).
- A Scene contains the mute status of each track.
- When a Scene is loaded, it activates the track that was selected when you saved the Scene.

Maybe 'snapshot' isn't the right word, because it makes you think it's just what is happening at a given moment (like frozen motion). Actually, a Scene holds all the Chains that are current – not just the Chains of the active sequencer/track, but all Chains of all sequencers/tracks. Not only Chains are stored to a Scene: if one or more arpeggios are running in a hold state when you save the Scene, it/they too will become part of the stored Scene.

Loading and starting a Scene is the beginning of a dynamic musical event. Each of the 16 Projects can hold 16 Scenes. That makes a total of 256 Scenes for you to store and load. That's a massive amount of dynamism!

6.4.2.1. How to Make a Scene

Saving a Scene

Hold down SAVE and press the Scene button to enter Scene Save mode. The 16 steps will blink, waiting for you to select a destination. The step buttons of empty Scenes will blink once in blue; scenes that have content will keep blinking in blue.

Pressing a step button now will save the Patterns and Chains (if any) that are current on each of the four tracks. You can keep the Save button held down and save to multiple Scene destinations by pressing multiple step buttons.

If, at the moment when a Scene is loaded, a track is in a different mode than that stored in the Chain, loading the Chain will switch to the mode saved in the Scene.

Scenes are automatically saved within a Project whenever you save one. Press Exit to cancel saving.

Scenes can be copied and pasted, and erased, in the same way as Patterns. (See above in this chapter.)

Selecting and Loading a Scene

To select a Scene, hold down the Scene button and press one of the 16 step buttons. Empty Scenes will be unlit, and loading them has no effect. Scenes with previously-stored content will light up in blue.



♪: The [Wait to Load Pattern \[p.44\]](#) setting also determines when the next Scene will load.

Erasing a Scene

To enter Scene Erase mode, hold down Erase and press the Scene button. The 16 step buttons will blink, waiting for you to erase a Scene. Empty Scenes will only blink once; scenes that have content will blink in blue.

Pressing a step button now will erase all the Patterns and/or Chains that were stored in that Scene. If you want you to erase several Scenes, keep the Erase button held down and press the appropriate step buttons. Once erased, the selected step(s) will blink once in blue then turn off.

Press the Exit button to exit Erase mode.

Switching Scenes

You can set Scene Launch Quantize in the Utility menu (SHIFT + Project). The options are 1 beat, ½ bar, 1 bar, 2 bar, 4 bar. This setting determines the precise point in time at which a Scene, once loaded, will start playing.



♪: Scenes are saved in the KeyStep Pro's internal memory, so if you power down the KeyStep Pro OFF and then switch it back ON, your saved Scenes will still be there.

All Patterns of all sequencers – but not the arpeggios – will reset when a new Scene is loaded.

6.4.3. Wait to Load

The KeyStep Pro can play Patterns and Chains (if any) in a Project and Scenes. With so many 'play options' in your controller, you need a way to specify when to switch from one Scene to another, or from one Project to another. Do you want to switch Scenes the very moment you select and load a new Scene, or should the current Scene play to its end first? Same with Patterns: do you want them to play in full before switching, or to switch when a new Pattern is selected?

You can perform the magic you need with the 'Wait Load' button (step 16). To activate Wait Load, hold down SHIFT and press 16/Wait Load. The KeyStep Pro will check the Utility settings to see whether switching should be instant or delayed until a Pattern/Project/Scene ends.



When Wait to Load is active, the step 16 button is lit up in blue.

You can set the Wait to Load options with Launch Quantize in the Utility menu or in the MIDI Control Center.

For Patterns, the Wait to Load option can be set directly with the SHIFT button: Hold down SHIFT and press 16/Wait Load to toggle instant switching on or off. In Utility>Launch Quantize or in the MIDI Control Center you can set what will happen when Wait Load is active: the switch can either be at the end of the current bar or at the end of the current Pattern.

6.4.4. Step Skip

Another interesting feature is Step Skip: hold down a step button and then press the 16, 32, 48 and/or 64 button(s) to select whether or not a step will play.

This feature works as follows:

By default, all four page buttons (16, 32, 48 and 64) are lit. Suppose you have created a sequence with three copies of the first 16 steps, so all 64 steps have content. If you do not want the 5th step to play in pages 2 and 4, hold down the step 5 button and press 32 and 64.

Another example: if only 16 and 48 (pages 1 and 3) are lit when you are holding down step 1, and the sequence is 1 bar long, then step 1 will play in the 1st and 3rd bars but not in the 2nd and 4th bars.

It is possible to deactivate all four iterations of a note, in which case it will be shown by a dimmed LED. This is a good way to 'silence' a note without losing its content.)



This also works in Step Edit mode.

6.4.5. Top-Down

There are two ways you can start composing and song-writing on the KeyStep Pro. The first is the top-down approach. It's similar to a writer who sketches a storyline for a book. He/She will start by writing a series of scenes that make up the story.

The writer will then start 'fleshing out' the Scenes with characters, places and plots until every detail of the story has unfolded.

Composing/writing songs on the KeyStep Pro can be similar. You start by designing Scenes:

Scene 1:

- track/voice 1: drum, 2 Chains, 3 Patterns
- track/voice 2: sequencer, 4 Chains, 5 Patterns
- track/voice 3: arpeggio on hold

Scene 2:

- track/voice 2: sequencer, 4 Chains, 5 Patterns
- track/voice 3: sequencer, 6 Chains, 8 Patterns
- track/voice 4: arpeggio on hold

Scene 3:

- track/voice 1: drum, 2 Chains, 4 Patterns
- track/voice 2: sequencer, 2 Chains, 7 Patterns
- track/voice 3: sequencer, 4 Chains, 9 Patterns
- track/voice 4: arpeggio on hold

This is also the moment when you make the other top-level decisions about tempo, scale and drum mode:

Scene 1:

- Tempo: 140 BPM; scale: minor; drum mode: mono

Scene 2:

- Tempo: 80 BPM; scale: dorian.

Scene 3:

- Tempo: 160 BPM; swing: 60%; scale: harmonic minor; drum mode: poly

To prepare even further, you could set up these configurations at the start of your composing session and save them in Scenes.

After completing this basic structure, you'll start to create the Patterns that will be the details of the composition. By the look of it, this is already becoming an *opus magnum*, a large-scale work!

6.4.6. Bottom-Up

The second approach is more bottom-up and improvisational. You'll start by creating Patterns, improvising as you go, and then developing more and more Patterns by mangling, inverting and/or transposing a number of basic Patterns with themes that you like.

Next, you'll want to organize these Patterns into Chains, feeling your way through combinations of Patterns, making decisions about how to chain them for the musical feelings and developments you're after.

In the final stage, you decide which tracks/voices will play and save your choices in a Scene. You repeat this until you have three or more Scenes.

6.4.7. Top-Down or Bottom-up?

Both approaches have their own merits, and it's probably a good idea to give both a try to see what fits your style of composing or improvising.

6.4.8. Other things to try

Create very short Patterns of only two notes, but vary velocity and gate length in each Pattern.

Keep the number 12 in mind when making decisions about Pattern lengths, because it can be divided in so many ways;

- 2+2+2+2+2
- 3+3+3+3
- 4+4+4
- 6+6

and mixtures of these numbers:

- 2+3+2+3+2
- 4+2+6

and many others. By combining Patterns of these lengths it is easy to keep your Patterns more or less in sync. Of course, if sync is not what you're after, throw in a few odd numbers. The number 9 has interesting permutations:

- 3+3+3
- 4+5 or 5+4
- 3+2+2+2 or 2+2+3+2

Whatever you do, enjoy it!

7. TIMING

This chapter is all about timing. How do you sync your external gear to the KeyStep Pro? Or, the other way around, how do you sync the KeyStep Pro's sequencers and arpeggiators to an external sequencer or a DAW? Hopefully, you'll find all the answers here.

7.1. Tempo

Using the Tempo encoder you can set the tempo from 30 to 240 BPM (beats per minute).



You can set the decimal value of the tempo by holding down SHIFT and turning the Tempo encoder.

The KeyStep Pro can switch between two tempos: Global Tempo and Project Tempo. The Global Tempo can be set using SHIFT + step 15/Global BPM. By default, a new empty Project will always be in the standard Project Tempo of 120 BPM. In a Project, if you change the Tempo setting and save the Project, the new Tempo setting will be stored with the Project. When you reload the Project, it will have the saved Project tempo.

You can override the Project tempo at any moment by holding down SHIFT and pressing step 15/Global BPM. When that button is lit (in blue) the Global Tempo is active; when unlit, the Project Tempo is active.

7.1.1. Making it Swing

To set a Swing amount, turn the Swing/Offset encoder. If you've listened to music before (it's unlikely you haven't) you have heard swing. It's when musicians play just before or after the beat. This is often used in jazz and South American music. It evokes an emotion of freedom, of not being forced into a fixed rhythm. It is particularly effective when you mix 'straight' notes with 'swung' notes. The KeyStep Pro's swing range goes from 50% to 75%. By default, it is 50%.

Swing has an important second function: you can use it to add an offset to the swing amount of the current track. For example, Track 1 could use 53% swing and Track 2, 57%. The effect is very subtle, but it can help make a track stand out.

To add Swing Offset to a track:

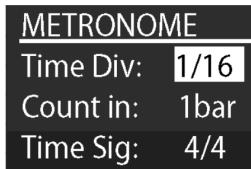
- Select the track by pressing Track 1, Track 2, Track 3 or Track 4.
- Hold down SHIFT and turn the Swing encoder clockwise. The OLED display will show the offset amount. An amount of 50% equals no offset; an amount of 75% equals maximum offset.

7.1.2. Metronome

The Keystep Pro has a metronome function that enables you to hear the beat in tempo as well as count-ins before realtime recording. By default, the Metronome is off. To turn it on, hold down SHIFT and press the Tap Tempo/Metronome button. The retractable Level knob on the back panel of the KeyStep Pro enables you to change the volume of the built-in piezoelectric speaker (above the Hold/Clear button).

There are three ways to change the Metronome settings:

For a quick edit of Time Division, hold down Tap Tempo/Metronome and press one of the Time Division keys (F to G# in the middle octave of the keyboard). While that button is held down, LEDs above those keys will show the current Time Division. Additionally pressing the A key selects the Triplet variant of the previously set Time Division.



For a more detailed edit of the Metronome setting, enter the Utility menu by holding down SHIFT and pressing the Project/Utility button. Scroll down to 'Metronome'. The settings you'll find there are more extensive and enable you to set:

- Output medium of the Metronome (line, speaker + line, speaker)
- Count-in (off, 1 bar, 2 bars)
- Time Division (1/4, 1/4 triplet/ 1/8, 1/8 triplet, 1/16, 1/16 triplet, 1/32, 1/32 triplet)
- Time Signature (1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16)

Combining these last two settings enables you to create a wide variety of beat settings: for example, 2/4, 3/4, 4/4, 7/8, 9/16). The Metronome will always put an accent on the first beat of each measure.

On the back panel, next to the Metronome Level knob, you'll see an output jack. You can use this output to send an audible click to other devices, such as a mixing desk. The output is at standard mixer line level.

The third option for changing the Metronome settings is in the downloadable MIDI Control Center. The settings you'll find there are the same as in the KeyStep Pro's Utility menu.

7.1.3. Tap tempo

You can set the tempo by tapping on the Tap Tempo button repeatedly. Two taps are already enough for the Metronome to set the tempo. With more taps, the tempo approximation will improve.

SHIFT + Tap Tempo toggles the Metronome ON/OFF.

7.2. Sync

When you connect your Keystep Pro to an external device such as a synthesizer, a Eurorack modular system or a computer running a DAW, you'll need a way to synchronise that external device to the KeyStep Pro. That is where Sync comes in.

The KeyStep Pro can send sync signals via USB, MIDI Out 1, MIDI Out 2 or Clock Out to external devices. It can also receive sync signals from external devices via USB, MIDI In or Clock In.

SHIFT>Utility>SYNC opens the Sync menu. There you can view and set the sync options:

Sync		Values	Description
Input	Source	[Internal, USB, MIDI, Clock, Auto (d)]	Defines tempo and sync source
	Clock Rate	[1PP16, 2PPQ, 24PPQ (d), 48PPQ]	Allows you to choose from different analog clock-rate types
Output		[1PP16, 2PPQ, 1PPQ, 1PP2Q, 1PPQ4Q, 2PPQ, 24PPQ (d), 48PPQ]	

These settings allow you to specify synchronization and tempo input/output. By changing these settings, you also determine which type of clocking signal will be transmitted via the output connectors and recognized by the Clock input.

Auto Mode works as follows:

- If no clock signal is received, you can set the tempo and press Play. The KeyStep Pro will then behave as in Internal mode.
- If Clock / MIDI Transport Control (MTC) is received, the external clock takes priority over the internal clock. The resulting tempo is calculated based on the external clock. When the external clock stops, the sequencers/arpeggiators stop.
- If a MIDI Stop message is received, all running sequencers/arpeggiators will stop.

Category	Parameter	Description	Utility	MCC
Sync Output	[1PP16, 1PP8, 1PPQ, 1PP2Q, 1PPQ4Q, 2PPQ, 24PPQ, 48PPQ]	allows you to adjust the Tempo setting to other PPQ standards	x	x

The Sync menu enables you to set the clock type for the analog output clock:

- 1PP16 = 1 pulse per 16th beat (clocked)
- 1PP8 = 1 pulse per 8th beat (1 pulse every two 1/16th beats)
- 1PPQ = 1 pulse per quarter beat
- 1PP2Q = 1 pulse per 2 quarter beats
- 1PP4Q = 1 pulse per 4 quarter beats,
- 2PPQ = 2 pulses per quarter beat
- 24PPQ = 24 pulses per quarter beat
- 48PPQ = 48 pulses per quarter beat

7.2.1. Sequencer Sync

The Sync option is the key to unlocking the creative power of the sequencers. By default, Sync is ON.

When Sync is active (set to AUTO) the KeyStep Pro's tempo will lock to the nearest multiple of the tempo of the incoming clock signal.

By default, Sync is active and the Sequencer Rate is set to 1/16.

7.3. Sync/Clock and Reset Outputs

In the Sync menu, you can select whether the clock and/or transport signals will be sent via each of the following outputs:

- USB
- MIDI Out 1
- MIDI Out 2
- Clock Out

The Reset Output (Reset Out) sends a [4ms 5V high] signal whenever you press STOP or after a sequence reset with SHIFT + PLAY.



The ON cycle of the Clock output (Clock Out) is +5V, which should be enough to trigger even the most unresponsive Eurorack modules.

7.3.1. Stop, Start & Continue

Other settings in the Utility menu determine how the Keystep Pro will send and respond to the Stop, Start & Continue commands if receives. To learn more about this, please refer to Chapter 9 [p.118].

8. CONTROL MODE

8.1. What is Control Mode?

When the KeyStep Pro is in Control mode, every encoder and step button on the right half of the unit can transmit specific MIDI data to external devices that are connected to MIDI Out 1 or Out 2 (5-pin DIN). This same data will be sent to your computer via USB.

To activate Control mode, hold down the Control button. The control Track can be used to create Patterns of special control data for controlling parameters of external devices such as hardware synths, Eurorack modular systems, or software virtual instruments loaded in tracks of your DAW. The track button will blink slowly to remind you that you are in Control mode.

In Control mode, a few features are disabled or work differently:

- Selecting a different track will exit Control mode.
- You save a Control Track the same way you do normal tracks.
- The Mute button has no effect.

8.1.1. What are CC# values?

When you draw notes in the MIDI editor of your DAW, you create MIDI data. With each note you add, you create a note-on message, a gate message, a note-off message and a velocity value, etc., all associated with a particular MIDI note number. The velocity value imitates how hard a key is struck on a MIDI keyboard. When you connect an external synth such as the Arturia MatrixBrute or MicroFreak to your DAW and press 'play', the DAW starts sending a stream of digital MIDI messages to the synth. The MatrixBrute or MicroFreak interprets these messages and plays your DAW sequence the way you intended it to sound. Note number and velocity values (like most values in MIDI) are in the range 0-127.

There's another kind of MIDI data that allows you to control parameters on external synths, modular systems and virtual instruments loaded in DAW tracks. These Control Change (CC) messages are different from, and independent of, the note-related MIDI messages. They are referred to as CC# messages: strings of numerical data that are specifically designed to control parameters on an external MIDI-compatible hardware or software device; for example, a hardware synth, a Eurorack modular system or a software modular system such as VCV Rack.

MIDI CC# messages have existed for over 40 years and, despite their enormous potential, they are not widely used.

When the KeyStep Pro is in Control mode and you turn one of the five main encoders, a CC# message will be transmitted. The default CC# messages that will be transmitted are:

Encoder	CC#
1 - Pitch	74
2 - Gate	75
3 - Velocity	76
4 - Time Shift	77
5 - Randomness	78

The problem with CC# messages is that you may have no way of knowing whether they are being transmitted, unlike notes that will either sound or not. Fortunately, there are two ways to understand what is going on. Whenever you turn an encoder, its value will be displayed in the OLED screen. For details of what is going on, check Utility>Controller>Knob (1-5).

Secondly, there is an option in the downloadable MIDI Control Center that enables you to check what's going on:

- Open the MIDI Control Center.
- Select 'MIDI console' in the View menu.
- Activate Control mode in the KeyStep Pro.

If you now turn the main encoders, you will see their CC# messages (changing values) displayed in the console window.



I: If you're a lucky owner of the Arturia Pigments software synth, you could map four of these encoders to Pigment's four macro knobs.

8.1.2. CC# Patterns

A Pattern in the KeyStep Pro's Control Track runs in parallel with the normal Track Patterns (sequences).

Is it possible to create 'empty' tracks containing control data only? Yes, it is. You could, for example, assign one of the four tracks to 'play' control data exclusively and use it to control parameters on an external synth, modular system or virtual instrument.

Each of the 16 Patterns in a Project can be used to stored control data in a CC# Pattern.

To load a CC# Pattern hold down the Pattern button and press one of the 16 step buttons.

Chaining Patterns is a way to create a linked series of CC# Patterns. You do this in exactly the same way that you chain sequencer Patterns.

Save CC# Patterns using SAVE + Pattern, just like saving normal sequencer Patterns.

In Control mode, everything is handled just like when working with normal sequencer Patterns and tracks, except that there is no display of Pattern number and the Mute button has no effect.

8.2. Control Mode as DAW Automation

Without a doubt, Control mode is one of the most exciting features of the KeyStep Pro. If you've already used a DAW such as Ableton, Cubase, Logic or Reaper you will be familiar with automation lanes. In the KeyStep Pro, a track in Control mode is the equivalent of a DAW automation lane.

In the KeyStep Pro, a normal sequencer Pattern is used to store notes (pitches) and velocities (the force or speed with which you hit individual keys). In Control mode, however, a CC# Pattern is used to store encoder positions. It gets played back as a 'ghost' sequence in parallel with the sequences of notes stored in normal Patterns. A CC# Pattern can control external encoder/knob positions by transmitting MIDI CC# messages with values that external synths and modular systems, or virtual instruments loaded in your DAW, can recognise and respond to correctly.

8.2.1. Using CC# Patterns to Store and Playback CC Values

With a track of the KeyStep Pro in Control mode, the Patterns you create will act as DAW automation lanes. You can store CC# values in them that will control parameters on external MIDI devices.

If you know the CC# of a synth's knob, you can use that CC# to control that parameter. In the Utility menu, simply define one of the main encoders to send that CC# out to the synth and then fill the steps in the CC# Pattern with CC values to control the movements of the synth's knob.

CC# messages are thus the MIDI equivalent of turning knobs. The MicroFreak, currently one of the most popular Arturia Synthesizers, has very sonically interesting CC# control options: turn the Analog Filter Cutoff knob on the MicroFreak and its cutoff frequency will change. Sending a sequence of MIDI CC 23 messages with varying values to the MicroFreak will have the same effect: sending CC 23 with a value of 0 closes the analog filter completely; sending CC 23 with a value of 127 opens it fully. The MicroFreak has a total of 20 different CC#'s that are available to control its parameters.

8.2.2. Recording Control Changes in Step Edit Mode:

To record control changes (modulation) in Step Edit mode:

- Make sure the Track on which you want to record a CC# Pattern is in Control mode.
- Press Pattern + a step button to select the Pattern into which you want to record CC# data.
- Ensure Play is off and turn on step recording by pressing the Step Edit button.
- Press a step button to select the step to which you want to add CC# data.
- Now turn the encoder to the position you want to record. While turning the encoder, nothing will be recorded, but you can monitor the changing value on the OLED display. The display will indicate the number of the step to which you can add data, the current CC number and its value. When the encoder is in the position that you want to record, release it. The KeyStep Pro will take a 'snapshot' of the encoder position and store it in that step.
- Continue to do this until you've filled every step with a CC# value.



i: If the step being edited has no existing data for that CC number, turning the encoder will create it.
Turning the encoder fully counter-clockwise reaches 0, then turning it further counter-clockwise turns it off for this step. There's a dead zone before deactivation so that it is easy to reach 0 without turning the encoder off. To turn it off, you have to turn it to what would normally be '-5'.

You may have guessed by now that there are two ways to fill CC# Patterns with data: either you can fill the successive steps with 'snapshots' of the positions of one encoder and then go back to the first step and continue with another encoder, or you can fill a step with 'snapshots' of all the encoder positions simultaneously and then continue to the next step until all steps are full. Both methods have their pros and cons.

To erase the CC# data in a step, turn the appropriate encoder fully counter-clockwise until it reaches 0 then continue to turn it counter-clockwise beyond 0, thus turning off the encoder for that step.



i: Sequence functions such as Last Step, Extend, Step/Page Copy & Paste, Clear Pattern and Clear Steps all behave as in normal mode. A CC# track is always in 1/16th resolution (Time Division).

8.2.2.1. Matching MIDI Channels

Before attempting to use MIDI CC# messages to control an external device such as a synth, the MIDI channel on which the KeyStep Pro transmits must match the MIDI channel on which the external device receives. If the receiving synth is set to receive on all 16 MIDI channels simultaneously, you have nothing to worry about. However, if your KeyStep Pro is connected to several synths (and a DAW) and you want to be able to send different control messages to each synth (and the DAW), you'll have to assign a different MIDI channel to each device and adjust channels on the KeyStep Pro to match them.

If you are the proud owner of a MicroFreak, you can try the following example. Let's say we've configured the MicroFreak to receive on MIDI channel 2 with Utility>MIDI>Input>2 and activated Control mode on the KeyStep Pro to perform our control magic.

If you don't own a MicroFreak you're missing out on something special, but you can learn from this example anyhow the general workflow is the same for other synths.

We'll select a MicroFreak parameter with a very drastic effect, so it immediately becomes clear whether the control is working or not. We'll use a CC# to keep changing the Oscillator Type on the MicroFreak!

By default, the MicroFreak receives on all 16 channels, so we can send CC# messages from any KeyStep Pro encoder. By default, Control mode transmits on MIDI channel 1.

We will assign CC 9 to Encoder 1 (Pitch). CC 9 changes Oscillator Type on the MicroFreak.

- Hold down SHIFT and press Project/Utility to open the Utility menu.
- Scroll down to 'Controller' and press the encoder to select this submenu.
- Select knob 1 and continue to select CC.
- Select CC# value 9.

If you now turn the Pitch encoder, the MicroFreak Oscillator Type will change. We can use the steps in any of the current track's Patterns to control Oscillator Type on the MicroFreak.

Remember how a step takes the current value of an encoder when you activate it? You can use this to program a series of Oscillator Type changes.

- Activate Control mode if it is not already active.
- Select a Pattern on Track 1.
- Press Step Edit to activate Step Edit mode.
- Turn the Pitch encoder fully counter-clockwise.
- Press step buttons 1, 3, 5 and 7 to store 'O' values in those steps.
- Set the Pitch encoder to its mid-position (12 o'clock).
- Press the step 2 button.
- Repeat this for steps 4 and 6, remembering to set the encoder in its mid-position.

Play the sequence. You should now hear the MicroFreak alternating between oscillator types.



An option in the MIDI Control Center enables you to set a control range for each of the main encoders. You could use this feature to limit the range of the Pitch encoder (encoder 1) to 50-100 and thus only select specific oscillator types. To set this range, click on 'Device Settings' in the MIDI Control Center and change the min. and max. values listed under Controller> Knob 1.

8.2.3. Controlling Parameters in a DAW

With CC# messages you can also control parameters of plugins, including virtual instruments, loaded in your DAW. All plugins of the Arturia V Collection series have a MIDI learn feature that enables you to link knobs on the KeyStep Pro front panel to knobs in the plugin. Imagine all the new sonic options you have when using the KeyStep Pro's encoders to simultaneously control the filters of the CZ V, the DX7 V and the Buchla Easel V, for example.

Please refer to the documentation that comes with your DAW and the V Collection for detailed descriptions of how to do this.



i: CC# messages transmitted over MIDI can also be used to control parameters on a modular system, but to make that possible you need to have a module that knows how to convert CC# values to analog voltages.

The controller assignments can be set in Utility>Controller and in the [MIDI Control Center](#) [p.126].

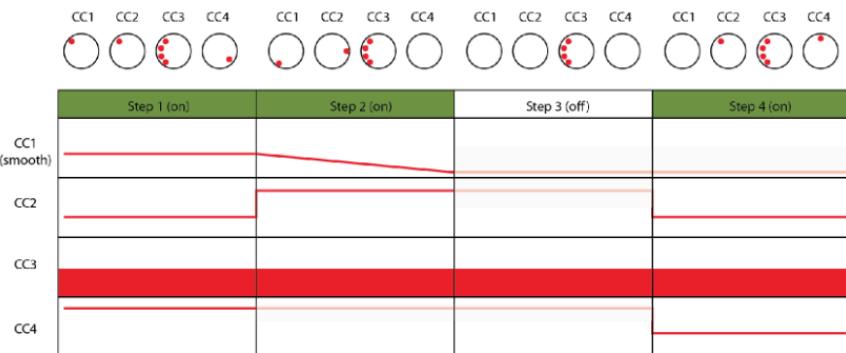
8.2.4. More about CC# Patterns

The CC# values can be sequenced as we've seen above. However, they can also be used in a more general way to set parameters in an external synth. If you send a certain CC# value in the first step of a Pattern and there are no other values programmed in that Pattern, this initial value will be held during the sequence. This feature gives you the creative option of sending a new configuration to the external synth, module or virtual instrument at the start of each Pattern!



Patterns can be chained. CC# Patterns are no exception. If you have three similar Patterns chained, you could store CC# values in the first step of each Pattern. For example, in the first Pattern, you store a CC# value that sets a filter half-opened; in the second Pattern you store a CC# value that opens the filter a bit further; in the third Pattern you store a CC# value that fully opens the filter.

Here's a diagram with four CC#'s and four steps:



If you use the steps of Patterns to send different CC# values in each step, there is a feature you can use to great effect: the looper, the horizontal control strip located under the two vertical touch strips. The looper also works in Control mode. If you loop part of a sequence, you will also loop the CC# values in that part of the sequence.



There is one important difference between a normal track and a track in Control mode: a normal track can be muted, but a control track cannot. It will always transmit CC# messages as long as it is playing.

8.2.5. Visual Feedback

If a step in a Pattern has any recorded CC# data in it, its step button will be lit. Otherwise, it will be unlit.

If there is recorded CC# data corresponding to a main encoder, its LED ring will have only one LED lit (or one LED lit and one adjacent LED dimmed) to indicate the current value of that CC#. If the sequencer is running, by 'moving', the LED ring will show the value changing.

If there is no recorded CC# data corresponding to a main encoder, its LED ring will have all LEDs lit up to indicate the previously registered value of the CC# (plus one dimmed LED at the end of the ring, if applicable).

8.2.6. Realtime Recording of CC# values

Above in this chapter, we looked at recording CC# values in Step Edit mode. Control values can also be recorded and played back in realtime mode.

Realtime recording of CC# values is no different to recording notes and their parameters: select the Control Track and press Record and Play. You stop recording by either pressing Stop or Record. If you do not stop recording manually, it will stop automatically when the last step of the Pattern is reached.

Again, it's important to understand that Control mode is different to normal mode: if you're in Control mode and press SHIFT+ Clr Steps, all CC# values stored in the steps will be erased, but the notes and note-related parameter values will be retained. The opposite is also true. Pressing SHIFT+ Clr Steps in normal mode only erases notes and note-related parameter values in the steps, not CC# data. Knowing this aspect, you can use it to your advantage by recording notes over existing CC# values or vice versa.

Unlike recording notes, which are only stored in the current step if there is an open gate (note in ON state), CC# values are recorded continuously: for example, if you record a CC# value in step 1, this value will be retained to the last step of the Pattern. (You do not need to record the same CC# value in each following step). If you touch/turn other encoders, their CC# values will be superimposed on the existing CC# data.

If you touch/turn an encoder a second time during a following recording loop, its CC# data will overwrite the existing data for that CC number. However, it will leave the data of other CC numbers unchanged.

When the end of the loop is reached, the Record button is automatically deactivated.

8.2.7. Erasing CC# Values

To Erase all previously recorded data for a certain CC number, hold down ERASE and turn the corresponding encoder fully counter-clockwise beyond the 0 point.

8.2.8. The Live Track

Being able to program automation in CC# Patterns is a great feature, but what if you want to directly control an external synthesizer or modular system in a live situation using the CC# values of the main encoders? Or what if you want to create and modify a Pattern already containing CC# data? It's easy: the track that is currently active when you press the Control button becomes the 'Live Track'. The track button will blink slowly to remind you that you are in Control mode. When in Control mode, you can use CC# messages in realtime to control any MIDI-compatible hardware or software devices connected to this track via USB, MIDI Out 1 or MIDI Out 2.

To exit Control mode, press the Track button of the Live Track again. All normal SHIFT functions are now at your disposal again.



ⓘ The Overdub button has no effect while Control mode is active.

8.3. Front Panel Functions

In Control mode, most of the performance controls in the left half of the KeyStep Pro's front panel control the same functions as they do in normal mode, unless configured otherwise using MIDI Control Center. There are some slight variations, though, which we'll point out as we go through the performance controls:

8.3.1. The Tempo/Fine Encoder

The Tempo/Fine encoder works the same in all modes. Its functions are described in the [KeyStep Pro Overview Chapter. \[p.14\]](#)

8.3.2. Tap Tempo/Metronome Button

The Tap Tempo/Metronome button works the same in all modes:

- Hold down SHIFT and press Tap Tempo/Metronome to toggle the Metronome ON/OFF.
- Tap the Tap Tempo/Metronome button several times to set the tempo.

In [MIDI Control Center \[p.126\]](#) you can specify the number of taps it will take to set the tempo.

8.3.3. The Swing/Offset Encoder

In Control mode, the Swing encoder controls the swing percentage of the entire Project. In other words, the Swing percentage is applied to all tracks equally. For a description of the Swing feature, see the Swing section of [Chapter 6 \[p.91\]](#).

8.3.4. Transport Section

The buttons of the Transport Section work the same way in Control mode as they do in the other modes, unless set up otherwise using the MIDI Control Center.

9. KEYSTEP PRO CONFIGURATION

The KeyStep Pro has many settings that you may want to adjust, and please don't hesitate to do so. It's not like the temperature setting on a fridge that you set once and then forget about. Changes to these settings can make a lot of difference. The right settings will help you to develop a personal synthesis style.

For example, you're playing drums on the keyboard and it doesn't sound right because it doesn't match the way you are used to mapping your drums in your DAW. By changing the Drum mapping in the Utility menu you can explore alternative options. Go to Utility>Drum Map>Config.

Does selecting another velocity curve make my sequences snappier? Go to Utility>MIDI Settings>Velocity curve.

Will changing the knob acceleration give me a better control experience? Go to Utility>MIDI Settings>Knob Acceleration.

The answer to many of your configuration questions can be found in the Utility menu of the KeyStep Pro or the KeyStep Pro Device Settings in the MIDI Control Center. In the KeyStep Pro Utility menu, you can adjust settings specifically for a project. These settings are also available in the MIDI Control Center.

9.1. The Utility Menu

To access the Utility menu, hold down SHIFT and press the Project/Utility button.

The Utility menu is where you set and change most of the KeyStep Pro's global settings. 'Global' means that these settings are shared across all Projects. They are saved automatically as soon as you exit the Utility menu.

The Utility menu is shown in the OLED display. To navigate in the menu, turn the selection encoder (located to the right of the menu) and click it to enter a submenu. To back up in a submenu press 'Exit'. Keep pressing 'Exit' to leave the Utility menu.

9.1.1. MIDI Channels

MIDI Channels	Track	Values	Description
	Track 1 Input	[1-16, OFF, 1 (d)]	Input channel of Track 1
	Track 2 Input	[1-16, OFF, 2 (d)]	Input channel of Track 2
	Track 3 Input	[1-16, OFF, 3 (d)]	Input channel of Track 3
	Track 4 Input	[1-16, OFF, 4 (d)]	Input channel of Track 4
	Drum Input	[1-16, OFF, 10 (d)]	Input channel of the Drum sequencer on Track 1
	Track 1 Output	[1-16, OFF 1 (d)]	Output channel of Track 1
	Track 2 Output	[1-16, OFF 2 (d)]	Output channel of Track 2
	Track 3 Output	[1-16, OFF 3 (d)]	Output channel of Track 3
	Track 4 Output	[1-16, OFF 4 (d)]	Output channel of Track 4
	Drum Output	[1-16, OFF, 10 (d)]	Output channel of the Drum sequencer on Track 1

In the Utility menu, you set the MIDI channels on which the four tracks will send and receive MIDI signals. The Tracks default to their track number (MIDI channel 1-4); the Drum channel defaults to MIDI channel 10.

9.1.2. Sync

Sync		Values	Description
Input	Source	[Internal, USB, MIDI, Clock, Auto (d)]	Defines tempo and sync source
	Clock Rate	[1 PP16, 2 PPQ, 24PPQ (d), 48PPQ]	Allows you to choose from the different analog clock rate types
Output		[1 PP16, 2 PPQ8, 1 PPQ, 1PP2Q, 1 PPQ4Q, 2PPQ, 24PPQ (d), 48PPQ]	

These settings allow you to specify the inputs for receiving synchronization and tempo signals, as well as the input and output clock rates. By changing these settings, you determine which type of clocking signal will be transmitted via the output connectors and which type will be recognized by the sync/clock inputs.

Auto Mode works as follows:

- If no clock signal is received, you can set the tempo and press Play. The KeyStep Pro will then behave as in Internal mode.
- If Clock / MIDI Transport Control (MTC) is received, the external clock takes priority over the internal clock. The resulting tempo is calculated based on the external clock. When the external clock stops, the sequencers/arpeggiators stop.
- If a MIDI Stop message is received, all running sequencers/arpeggiators will stop.

The Sync Output submenu enables you to set the clock type for the analog output clock:

- 1PP16 = 1 pulse per 16th beat (clocked)
- 1PP8 = 1 pulse per 8th beat (1 pulse every two 1/16th beats)
- 1PPQ = 1 pulse per quarter beat
- 1PP2Q = 1 pulse per 2 quarter beats
- 1PP4Q = 1 pulse per 4 quarter beats
- 2PPQ = 2 pulses per quarter beat
- 24PPQ = 24 pulses per quarter beat
- 48PPQ = 48 pulses per quarter beat

9.1.3. Metronome

Metronome		Values	Description
	Output	Line, Speaker (d), Line Line/Speaker	Selects the output of the metronome signal
	Count-in	OFF, 1 bar (d), 2 bars	Selects count-in duration when starting Record
	Time division	1/4, 1/4 Triplets 1/8, 1/8 Triplets, 1/16 (d), 1/16 Triplets, 1/32, 1/32 Triplets	Set number of beats in a measure
	Time signature	1-16, default 4	Sets the number of beats that make up a measure/bar

To use the Metronome, activate it with SHIFT + Tap Tempo/Metronome. The default time signature is 4/4. For example, to set the time signature to 5/8, set Time division to 8 and Time signature to 5.

9.1.4. Launch Quantize

Launch Quantize		Values	Description
	Project	[OFF, 1 bar (d), 2 bars, 4 bars]	Set the moment the KeyStep Pro switches to another Project after you select a new Project
	Scene	[1 beat, 1 bar (d), 2 bars, 4 bars]	Set the moment the KeyStep Pro switches to another Scene after you select a new Scene
	Pattern	[OFF, at end (d), 1 bar]	Set the moment the KeyStep Pro switches to another Pattern after you select a new Pattern

In this menu, you 'tell' the KeyStep Pro how it should continue to the next Pattern, Chain or Scene. Should it wait for 1 bar, 2 bars or 4 bar to make the switch? This is useful in live performance settings where you may not want to interrupt the flow of the music between Projects.

If Sequencer and Drum Patterns are of unequal length, the KeyStep Pro will wait until the end of the Drum Pattern before loading the next Project Scene or Pattern.

9.1.5. MIDI Settings

MIDI settings		Values	Description
	Knob acceleration	[Slow, Medium, Fast]	Sets the amount of acceleration applied to the encoders.
	Aftertouch curve	[Linear, Exponential, Logarithmic]	Sets the keyboard response curve for Aftertouch
	Velocity curve	[Linear, Exponential, Logarithmic]	Sets the keyboard response curve for Velocity
	Transport send	[OFF, MMC, Realtime, Both]	Set whether the KeyStep Pro sends Transport signals
	Transport receive	[OFF, MMC, Realtime, Both]	Set whether the KeyStep Pro receives Transport signals
	Clock send	[OFF, ON]	Enable/Disable clock send
	Clock receive	[OFF, ON]	Enable/Disable clock receive

9.1.5.1. Knob Acceleration

There are four response curves for the encoders:

- **Slow (Off):** The encoders transmit every value. It takes many turns of an encoder to move from minimum to maximum. Use this when greater precision is desired.
- **Medium:** When turned quickly, the encoders will skip a few values. It takes fewer turns of an encoder to move from minimum to maximum.
- **Fast:** When turned quickly, the encoders will skip a few more values. It may take as few as one-and-a-half turns of an encoder to move from minimum to maximum.

9.1.5.2. Aftertouch Curve

Linear, Exponential and Logarithmic describe the mathematical shape of the pressure-voltage curve that determines the amplitude of the voltage transmitted while you exert pressure on a key you are holding at the bottom of its vertical travel.

In Linear mode, the voltage is directly proportional to the pressure. In Exponential mode, the voltage initially increases rapidly as the pressure increases, but the *rate* of increase gradually decreases as the pressure increases further. In Logarithmic mode, the converse is true: the voltage initially increases slowly as the pressure increases, but the *rate* of increase accelerates as the pressure increases further. When applied to control envelope shapes, voltage-controlled filters (VCFs) and voltage-controlled amplifiers (VCAs), the different curves give a very different responsiveness to aftertouch (also known as channel pressure).

9.1.5.3. Velocity Curve

By changing the velocity-voltage curve, you determine the way a sound characteristic such as volume, tone or timbre responds to the speed or force with which you press a key. See Aftertouch Curve above for the characteristics of each curve.

9.1.5.4. Transport Send

This setting allows you to set whether and how the KeyStep Pro will transmit transport commands such as Stop, Rec and Play. It can either be OFF, MCC (meaning that the KeyStep Pro will use the setting currently stored in the MIDI Control Center) or use the current realtime setting.

9.1.5.5. Transport Receive

This setting allows you to set whether and how the KeyStep Pro will respond to transport commands it receives over MIDI. It can either be OFF, MCC (meaning that the KeyStep Pro will use the setting currently stored in the MIDI Control Center) or use the current realtime setting.

9.1.5.6. Clock Send

Set whether the KeyStep Pro will transmit clock signals to external MIDI devices.

9.1.5.7. Clock Receive

Set whether the KeyStep Pro will receive clock signals from external MIDI devices.

9.1.6. CV Settings

CV settings		Values	Description
Voice 1....4			
	Pitch Format	[1V/Oct (d) 1.2V/Oct Hz/V]	Defines the voltage level the KeyStep Pro will output at the CV Pitch Out. 1V/Oct (Eurorack and others), Hz/V or 1.2V/Oct (Buchla)
	Base Note	[C-2 (d) to G8]	Sets at which MIDI note the Pitch out outputs OV
	Gate Format	[V Trig 5V (d), V Trig 10V, S-Trig]	Defines the gate voltage level the KeyStep Pro will output at Gate Out
	Mod Type	[Velo (d), Pressure]	Determines which parameter will be sent to the Velo / Mod outputs
	Mod Max Voltage	1-10 Volt	Sets a maximum limit to the voltage output of the Mod type
	Pitch bend range	(1-24) semitones	Set a maximum pitch-bend range in semitones. Default = 2

This is where you select the electrical behaviour for each sequencer.

Drum Gates		Values	Description
	Gate 1..8 format	[V-Trig 5V (d), V-Trig 12V, S-Trig]	Sets the trigger standard of the Drum Gates, V-Trig 5V being the default.

This is where you set the output voltage level of the Drum Gates. Different brands of synths and drum synths may require different voltages to trigger them properly.

9.1.7. Controller

Controller		Values	Description
	Global MIDI Channel	[1(d)-16]	
Knob 1....5			
	CC	[0-127]	
	Port	[USB, MIDI 1, MIDI 2, All(d)]	
	Channel	[1-16, Global(d)]	
	Mode	[Absolute(d), Relative1, Relative2, Relative3]	
	Min	[0(d)-127]	
	Max	[0-127(d)]	

These parameters enable you to set up the KeyStep Pro as a controller.

'Global MIDI Channel' sets the default MIDI channel on which the KeyStep Pro will transmit.

The Knob (encoder) settings define the functionality of the five main encoders. Each encoder can have a different profile. For example, Encoder 1 (Pitch) could transmit CC 9 on MIDI channel 5 via MIDI Out 2 over the full range of 0-127, while Encoder 2 (Gate) could transmit CC 19 on MIDI channel 6 via MIDI Out 1 with the range set to a minimum of 50 and a maximum of 80.

9.1.8. Looper Touch Strip

Looper Touch Strip		Values	Description
	MIDI Send/Receive	[OFF (d), Send, Receive, Both]	
	MIDI CC	[1-127], 9 (d)	

This menu item enables you to set the values the Looper will receive and transmit when touched.

9.1.8.1. MIDI Send/Receive

Use this menu to specify whether the KeyStep Pro's Looper Touch Strip will send MIDI and react to incoming MIDI messages. The range of transmitted and recognized values is detailed below in [Using the Looper Touch Strip with a DAW \[p.136\]](#).

9.1.8.2. MIDI CC

Use the value field to select the MIDI CC number that the Looper Touch Strip will use to transmit and receive.

9.1.8.3. Using the Looper Touch Strip with a DAW

When the MIDI Send/Receive parameter is enabled, the activity on the can be recorded into a DAW. By default, MIDI CC 9 values will be sent, but you can select a different MIDI CC# as described above.

The Looper Touch Strip will send only the following values:

Looper Touch Strip Region	MIDI CC value
1/4	25
1/8	50
1/16	75
1/32	100
release value	0

However, if you draw a controller curve for the Looper Touch Strip in your DAW, the KeyStep Pro will respond to the values in the following way:

MIDI CC value received	Looper Touch Strip region selected
1-25	1/4
26-50	1/8
51-75	1/16
76-100	1/32

9.1.9. Drum Map

Drum Map		Values	Description
	Mode	Chromatic, Custom	
	Config	Chromatic Low note (1-103)	
		Custom note 1..24 (36-127)	

There are four options for the MIDI note assignments of the keys in Drum mode:

In the Mode menu, you can select whether you want to map your Drum Track notes in the standard chromatic way or to create a custom mapping.

Config>Chromatic enables you to set the Chromatic Low note: which note the lowest key will trigger when Track 1 is in Drum mode. All keys above that lowest key will be mapped relative to this note.

Config>Custom Notes: Enables you to link each of the 24 Drum keys on the keyboard to a MIDI note number in the range 0 to 127. The default mapping starts at MIDI note 36.

Note: MIDI notes that are already used by another note are not displayed when navigating the list.

9.1.10. Miscellaneous

Misc		Values	Description
	Vegas Mode	[5min (d), 10min, never]	Sets the start time of the VEGAS LED pattern.
	Screen Saver	[2min (d), 10min, 30min]	Sets the start time for the screen saver.
	Reset Factory	Confirm [Yes,No]	Restores factory settings
	Firmware version		Displays current firmware version

9.2. MIDI Control Center

The manual for the MIDI Control Center has general descriptions of the features that are common to all Arturia products. To learn how to access the manual, click this link: [Where to find the manual \[p.127\]](#).

This chapter only covers the MIDI Control Center features that are unique to the KeyStep Pro.

9.2.1. MIDI Control Center Basics

The MIDI Control Center is a software application that allows you to configure the MIDI settings of your KeyStep Pro. It works with most of Arturia's hardware devices, so if you have an earlier version of the software you'll want to download the latest version. It will work with those products as well.

9.2.1.1. System Requirements

PC: 2 GB RAM; CPU 2 GHz (Windows 7 or higher)

Mac: 2 GB RAM; CPU 2 GHz (OS X 10.8 or higher)

9.2.1.2. Installation and Location

After downloading the appropriate MIDI Control Center installer for your computer from the Arturia website, double-click on the file. Then all you have to do is start the installer and follow the instructions. The install process should be trouble-free.

The installer places the MIDI Control Center shortcut icon with the other Arturia applications you have. In Windows, check the Start menu. In Mac OS X, you'll find it inside the Applications/Arturia folder.

9.2.1.3. Connection

Connect the KeyStep Pro to your computer using the included USB cable. It will go through its startup cycle and be ready when the display shows "Project 1".

Now launch the MIDI Control Center. KeyStep Pro will be in the list of connected devices.

Potential Issues: Windows OS

The MIDI driver for the KeyStep Pro is not 'multi-client'. That's a technical term that simply means this: If a DAW application is already active on your computer, the MIDI Control Center will launch but the KeyStep Pro won't be detected properly. To use the MIDI Control Center to alter the parameters of your KeyStep Pro you will need to exit the DAW application.

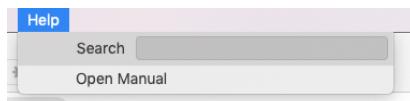
Potential Issues: Mac OS X

If the cable between your Mac and the KeyStep Pro is connected properly and the Mac is having trouble detecting the unit, your Mac is experiencing what is known as a 'USB port enumeration issue'. Here is one potential solution.

1. Launch the Audio MIDI Setup utility. The fastest way to do this is usually to hold the Command key, press the space bar, and type in the letters AMS.
2. If you do not see the MIDI Studio window, hold the Command key and press 2.
3. Turn the unit off or disconnect its USB cable. You should see the related device icon turn grey.
4. Select the greyed-out KeyStep Pro image and delete it.
5. The KeyStep Pro might also be labelled 'MIDI Device' or something else, so you may need to delete all MIDI Device images and restart any connected devices. First, you must disconnect any units or turn them off, or else you will not be able to delete the icons.
6. Restart the KeyStep Pro. It should reappear in the MIDI Studio window.

9.2.1.4. Where to Find the Manual

There is a built-in help file for the MIDI Control Center, accessible from its Help menu, as shown below:



It's a good introduction to the MIDI Control Center, describing each section of the software window and defining important terms you will need to know while using the MIDI Control Center, such as 'Project Browser' and 'Template'.

Note: Once installed, the MIDI control Center will update itself automatically. If for some reason you don't want that to happen, disable this option in the FILE menu.

The next section of this chapter explains how to use the MIDI Control Center software to configure the KeyStep Pro presets so they match your system and enhance your workflow.

9.2.2. Device Projects

9.2.2.1. Project List

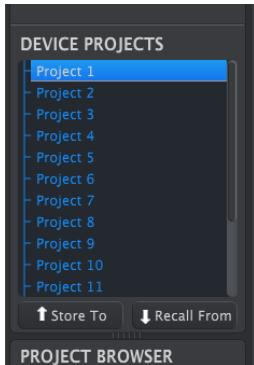
The left side of the MIDI Control Center window shows a list containing Projects 1-16. When one of the Projects is selected from the list, the MIDI Control Center can recall that Project from the internal memory of the KeyStep Pro and place it into the User Project area in the Project Browser window. See the [Store To/Recall From \[p.130\]](#) section for instructions about this.

To see a larger number of the Projects in the Device Projects list, move your mouse pointer to the edge of the Device Projects window until it turns into a double arrow pointer, then click and drag the window resizing button.

9.3. Project Browser

The Project Browser shows a list of all the Projects that have been archived using the MIDI Control Center. These are divided into two main groups of Templates: Factory and User.

The User Templates are the ones you have recalled from the KeyStep Pro using the MIDI Control Center. See [Store To/Recall From \[p.130\]](#) to learn how to do this.



A Template in the MIDI Control Center is the same thing as a Project inside your KeyStep Pro: it contains the Project-level settings, the Control mode settings (including the 16 Scenes), and the Patterns from all four sequencers.



User Templates: click +/- to expand or collapse Project view

9.3.1. Building a Project Library

You can build a limitless library of Projects in the User Templates area. Simply drag one of the Projects to the Project Browser window and it will be transferred from the KeyStep Pro automatically. Then you can give it a new name if you like.

9.3.2. Revise a Template

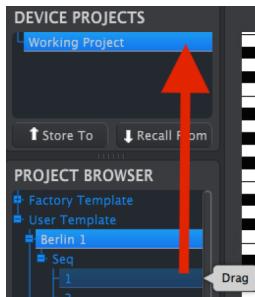
If you'd like to modify a Template you can drag it from the Project Browser and drop it on one of the Projects in the Device Projects area. This will send the selected Project directly into the KeyStep Pro internal memory at that Project location.



! This process will **overwrite** the selected Project in the KeyStep Pro internal memory. Be sure to save what you were doing before you transfer the file!

9.3.3. Revise a Pattern

If you'd like to modify a Pattern inside an archived Template, you can drag that Pattern from the Project Browser and drop it onto one of the Projects in the Device Projects window. This will send the selected Pattern directly into the KeyStep Pro.



! When the MIDI Control Center sends a Pattern to KeyStep Pro **it will overwrite the Pattern** in that memory location. Be sure this is what you want to do before you transfer one of these files!

9.4. Store To/Recall From

These two buttons enable you to send and recall projects to and from the KeyStep Pro.



CAUTION: The Store To/Recall From transfers cannot be performed while the KeyStep Pro is running.

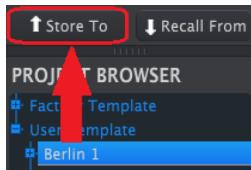
9.4.1. Storing a Project to the KeyStep Pro

The upper left-hand section of the MIDI Control Center has a button called 'Store To'. Right above that is a list that allows you to specify which of the 16 Projects in the KeyStep Pro internal memory will receive the User Project you have selected.



CAUTION: If you follow the procedure below, you will overwrite the current Project that resides inside the KeyStep Pro. Be sure this is what you want to do! If not, please store it to another location inside the KeyStep Pro.

For this example, we'll assume that Project Berlin1 is available:

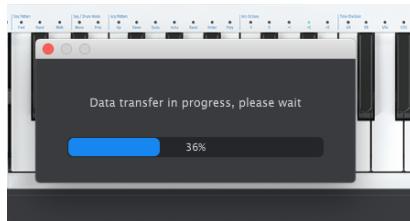


1. First, select 'Project Berlin1' in the list as shown above.
2. Select the User Project you would like to store into the KeyStep Pro.
3. Click the Store To button at the bottom of that section.

That's all there is to it! The settings and sequences of the User Project have been stored as Project Berlin1 in the KeyStep Pro. Now you can load that Project whenever you want by holding down the Project/Utility button and pressing the step 2 button.

9.4.2. Recall a Project from the KeyStep Pro

It is possible to make whole Projects in the KeyStep Pro without a computer attached. It is, however, good practice to back them up from time to time. Just grab any one of the internal Projects or Patterns directly from the internal memory and store it as a Template in the Project Browser window of the MIDI Control Center.



For example, if you want to back up Project #1 from the internal memory, simply select it in the Device Projects window and click Recall From. Project #1 will show up in the Project Browser with a time/date stamp as a name. You can rename it if you like.

9.4.3. Template Utilities

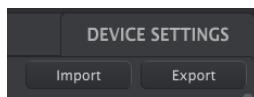
Important features such as Save, Save As, Delete, Import, and Export are described in the MIDI Control Center manual, which you will find in the software Help menu. Look in that document for the section titled Template Utilities.

9.5. Device Settings

The right side of the MIDI Control Center window contains essential parameters that you can use to optimize the KeyStep Pro for your setup and your working style. You will need to scroll down to see them all.

Device settings can be saved and recalled. It is a handy feature that enables you to quickly change the configuration of your KeyStep Pro. Several applications come to mind:

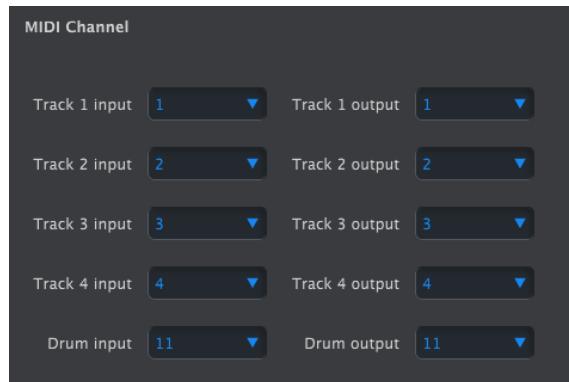
- Redirect the output of each of the Tracks to synths connected to different MIDI channels
- In a mixed setup, change the CV/Gate setting to switch between Eurorack standard and the Buchla CV standard.
- Quickly load an alternate set of CC# values for the encoders to enable you to control a different set of parameters on external synths and set predefined control ranges



The settings you see here are the same as those in the KeyStep Pro's Utility menu. These settings are linked to a Project. Each Project can have its own configuration settings.

For an overview of what these settings do, please refer to the [Utility Menu section \[p.118\]](#).

9.5.1. Midi Channel



In this menu, you set the channels on which the four tracks of the KeyStep Pro will send and receive MIDI signals. The four tracks default to their track number (MIDI channels 1-4); the Drum channel defaults to MIDI channel 10.

9.5.2. Sync



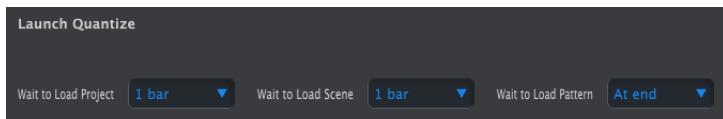
These settings allow you to specify the inputs for receiving synchronization and tempo signals, as well as the input and output clock rates. By changing these settings, you determine which type of clocking signal will be transmitted via the output connectors and which type will be recognized by the sync/clock inputs.

9.5.3. Metronome



To activate the Metronome, hold down SHIFT and press Tap Tempo/Metronome. The default time signature is 4/4. For example, to set the time signature to 5/8 set Time Division to 8 and Time Signature to 5.

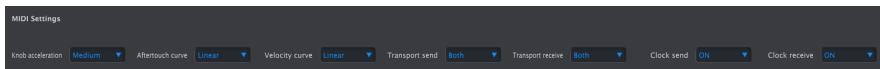
9.5.4. Launch Quantize



In this menu, you 'tell' the KeyStep Pro how it should continue to the next Pattern, Chain or Scene. Should it wait for 1 bar, 2 bars or 4 bar to make the switch? This is useful in live performance settings where you may not want to interrupt the flow of the music between Projects.

If the Sequencer and Drum Patterns are of unequal length, the KeyStep Pro will wait until the end of the Drum Pattern before loading the next Project Scene or Pattern.

9.5.5. MIDI Settings



9.5.5.1. Knob Acceleration

There are four response curves for the encoders:

- **Slow (Off):** The encoders transmit every value. It takes many turns of an encoder to move from minimum to maximum. Use this when greater precision is desired.
- **Medium:** When turned quickly, the encoders will skip a few values. It takes few turns of an encoder to move from minimum to maximum.
- **Fast:** When turned quickly, the encoders will skip a few more values. It may take as few as one-and-a-half turns of an encoder to move from minimum to maximum.

9.5.5.2. Aftertouch Curve

Linear, Exponential and Logarithmic describe the mathematical shape of the pressure-voltage curve that determines the amplitude of the voltage transmitted while you exert pressure on a key you are holding at the bottom of its vertical travel..

In Linear mode, the voltage is directly proportional to the pressure. In Exponential mode, the voltage initially increases rapidly as the pressure increases, but the *rate of increase* gradually decreases as the pressure increases further. In Logarithmic mode, the converse is true: the voltage initially increases slowly as the pressure increases, but the *rate of increase* accelerates as the pressure increases further.

9.5.5.3. Velocity Curve

By changing the velocity-voltage curve, you determine the way a sound characteristic such as volume, tone or timbre responds to the speed or force with which you press a key. See Aftertouch Curve above for the characteristics of each curve.

9.5.5.4. Transport Send

This setting allows you to set whether and how the KeyStep Pro will transmit transport commands such as Stop, Rec and Play. It can either be OFF, MCC (meaning that the KeyStep Pro will use the setting currently stored in the MIDI Control Center) or use the current realtime setting.

9.5.5.5. Transport Receive

This setting allows you to set whether and how the KeyStep Pro will respond to transport commands it receives over MIDI. It can either be OFF, MCC (meaning that the KeyStep Pro will use the setting currently stored in the MIDI Control Center) or use the current realtime setting.

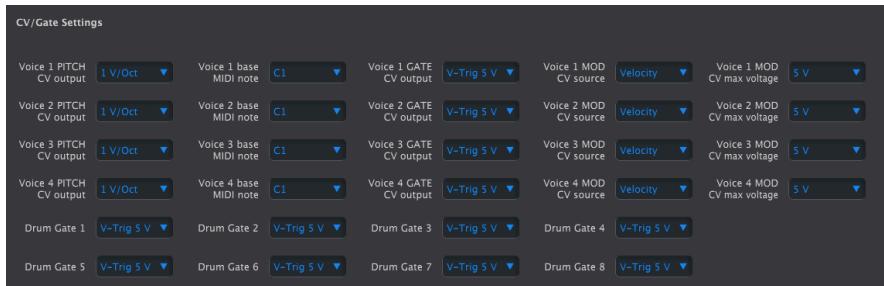
9.5.5.6. Clock Send

Set whether the KeyStep Pro will transmit clock signals to external MIDI devices.

9.5.5.7. Clock Receive

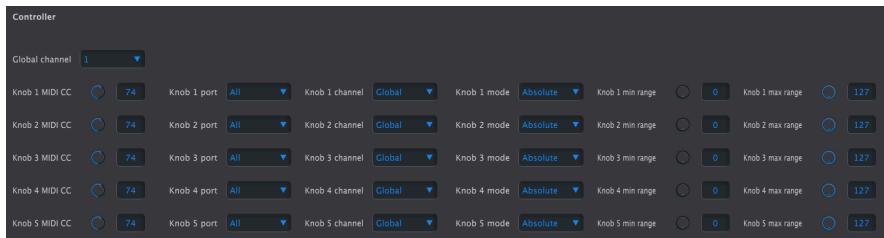
Set whether the KeyStep Pro will receive clock signals from external MIDI devices.

9.5.6. CV Gate Settings



This is where you select the electrical behaviour for each sequencer.

9.5.7. Controller

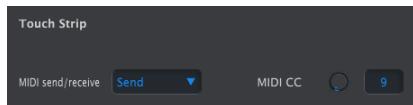


These parameters enable you to set up the KeyStep Pro as a controller.

'Global MIDI channel' sets the default MIDI channel on which the KeyStep Pro will transmit.

The Knob (encoder) settings define the functions of the five main encoders. Each encoder can have a different profile. For example, Encoder 1 (Pitch) could transmit CC 9 on MIDI channel 5 via MIDI Out 2 over the full range of 0-127, while Encoder 2 (Gate) could transmit CC 19 on MIDI channel 6 via MIDI Out 1 with the range set to a minimum of 50 and a maximum of 80.

9.5.8. Touch Strip



This menu item enables you to set the values the Looper will transmit when touched

9.5.8.1. MIDI Send/Receive

Use this menu to specify whether the KeyStep Pro's Looper Touch Strip will send MIDI and react to incoming MIDI messages. The range of transmitted and recognized values is detailed below in [Using the Looper Touch Strip with a DAW \[p.136\]](#).

9.5.8.2. MIDI CC

Use the value field to select the MIDI CC number that the Touch Strip/Looper will use to transmit and receive.

9.5.8.3. Using the Touch Strip with a DAW

When the MIDI Send/Receive parameter is enabled, the activity on the can be recorded into a DAW. By default, MIDI CC 9 values will be sent, but you can select a different MIDI CC# as described above.

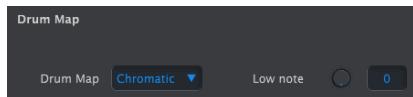
The Looper Touch Strip will send only the following values:

Looper Touch Strip Region	MIDI CC value
1/4	25
1/8	50
1/16	75
1/32	100
release value	0

However, if you draw a controller curve for the Looper Touch Strip in your DAW, the KeyStep Pro will respond to the values in the following way:

MIDI CC value received	Looper Touch Strip region selected
1-25	1/4
26-50	1/8
51-75	1/16
76-100	1/32

9.5.9. Drum Map



There are four options for the MIDI note assignments of the keys in Drum mode:

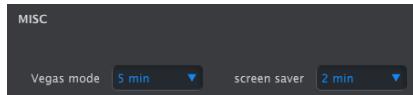
In the Mode menu, you can select whether you want to map your Drum Track keys in the standard chromatic way or to create a custom mapping.

Config>Chromatic enables you to set the Chromatic Low note: which note the lowest key will trigger when Track 1 is in Drum mode. All keys above that lowest key will be mapped relative to this note.

Config>Custom Notes: Enables you to link the 24 Drum keys on the keyboard to a MIDI note number in the range 0 to 127. The default mapping starts at MIDI note 36.

Note: MIDI notes that are already used by another note are not displayed when navigating the list.

9.5.10. Misc



Misc	Values	Description
Vegas Mode	[5min (d), 10min, never]	Sets the start time of the VEGAS LED pattern.
Screen Saver	[2min (d), 10min, 30min]	Sets the start time for the screen saver.
Reset Factory	Confirm [Yes,No]	Restores the factory settings
Firmware version		Displays current Firmware version

10. KEYSTEP PRO AND YOUR MODULAR SYSTEM

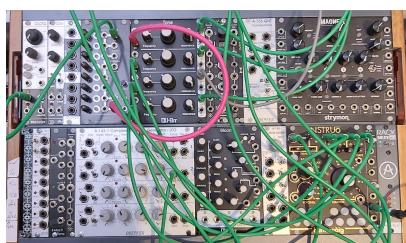
In 1996 Dieter Doepfer created a case based on the 19-inch rack format that was (and still is) a common format to house effects units and other studio gear. He also set the standard for the power supply and the bus boards into which you plug your modules. It was to become the standard of what we now know as Eurorack.

After a slow start, his Eurorack format quickly gained momentum: the modules were relatively inexpensive and very compact. In the following years, the number of available modules grew exponentially. This phenomenal growth is easy to understand: as a musician and/or sound designer you can now create your own customised – and endlessly customisable – modular instrument.

Modular systems have gained a tremendous popularity in recent years. It's easy to understand why: they give you a very direct hands-on experience of sculpting sound. Literally hands-on, because you need to make real connections using patch cables and tweak real knobs. By doing this physically, somehow the connection you have with the sound that emerges and unfolds is more immediate. It enables you to create a unique individual sound. Whether your music style is EDM or complex ambient music, you'll find plenty of suitable and fascinating Eurorack modules.

The KeyStep Pro is a marvellous Eurorack controller because of its rich four-track sequencer and arpeggio architecture, its four analog Voice outputs, its eight Drum Gate outputs and its sync/clock connections. The analog Voice and Drum Gate output signal levels perfectly match your Eurorack gear. Furthermore, because the Voice outputs can be configured in various ways, you can create highly complex and original signal paths and craft music that no one has ever heard before!

Due to its compact size, the KeyStep Pro is also an ideal controller companion for your RackBrute when you are travelling and/or performing. The Pitch, Velocity and Gate signals of all the internal sequencers and arpeggiators, as well as the Drum Track, are available for controlling your Eurorack modules. The eight Drum Gates can be connected to one of the many available Eurorack drum modules, or you can use the Drum Gate signals to trigger various combinations of melodic, harmonic and/or noise synthesis modules.



Another interesting use of the KeyStep Pro is as the master clock of your Eurorack modular or RackBrute system. To make this possible, the KeyStep Pro has a Clock Output. A smart solution is to connect the KeyStep Pro's Clock Out to a clock divider, which will divide the tempo in half or smaller fractions. You can then use these timing signals to start events on each beat, every two beats or on each bar, for example.

The Clock Input allows you to slave the KeyStep Pro to a clock module in your Eurorack modular or RackBrute system. It will accept Start/Stop/Continue message from Eurorack sequencers. The Launch Quantize option in the Utility menu allows you to synchronise the starting of sequencer Patterns, Scenes and Projects.

Over the past decade, Arturia has spearheaded the revival of the analog synthesizer with some very advanced products: the MicroBrute, the MiniBrute, the DrumBrute and the magnificent flagship monosynth, the MatrixBrute.

With each new product generation, Arturia has added interface options that made it easier to connect its range of hardware products to a Eurorack modular system. In recent years, the BeatStep Pro has become the controller of choice for many musicians in the modular world because of its rich feature set, including Pitch, Velocity and Gate outputs that you can use to control external oscillators. In addition, it has eight Drum Gate outputs that you can use to trigger Eurorack drum modules.

In many areas, though, the KeyStep Pro is more advanced than the BeatStep Pro, so we at Arturia hope that the KeyStep Pro will become the controller of choice for keyboard-oriented musicians and composers.

The RackBrute connects to the MiniBrute 2 and MiniBrute 2S but can also be used as a standalone unit. As such, you can use it with all Arturia controllers – including the KeyStep Pro – that feature Pitch, Velocity and Gate outputs.

10.1. The Modular Adventure

As soon as you start filling your Eurorack case with modules, you'll be faced with an endless stream of questions: What kind of modules do I really need? Why are certain modules so popular? Do I go for a standard setup with analog oscillators, or is it better to go digital? Do I prefer West Coast or East Coast synthesis or a combination of those two types?

The answers to these questions come slowly but surely: by reading online forums, comparing user experiences and most importantly, by diving in and experimenting. And if you're not happy with the choices you make, there's a thriving second-hand market for used Eurorack modules, where you can sell your modules if they don't deliver what you expect and buy others that interest you.

Whatever you do, take the time to get to know the modules you currently own inside out. This will help you to avoid a situation where you sit in front of your system tweaking knobs randomly, without understanding what's happening but hoping that something magical will happen. This is a guaranteed recipe for rapidly losing interest.

To sustain the fascination you feel, learn the functions of a module one by one and test your knowledge continuously. It's the only way to experience the reward that comes with being able to create the sounds as you imagine them in your musical mind.

10.2. Hardware or Software?

Eurorack gear can be pretty expensive, and it's tempting to spend loads of money on gear you may rarely use. No wonder some people refer to Eurorack as "Eurocrack"! Fortunately, there's a low-cost virtual alternative: VCV Rack (<https://vcvrack.com>), which is a free software alternative to Eurorack hardware. It enables you to experiment with a wide variety of modules. Many Eurorack hardware modules also exist in the form of a VCV Rack module (known as a 'plugin' in VCV Rack terminology). As you get deeper into VCV Rack, you'll discover that there's an ever-increasing range of new modules/plugins, and that many of them are free, whereas others have to be purchased (though their prices are far lower than equivalent Eurorack hardware modules). In the examples below we'll use VCV Rack modules as a hardware alternative.

10.3. Using MIDI to Control Modules in VCV Rack

In the example below, we'll use a KeyStep Pro arpeggiator to control an oscillator in VCV Rack, a free virtual modular system that you can download from <https://vcvrack.com> and install on your computer.

- Connect the USB output on your KeyStep Pro to a USB port on your computer.
- Open VCV Rack. The first time the program launches, it opens a simple demo patch, which is perfect for our example.
- In the first position (top left), you'll see a MIDI-CV module. We'll use this module to get MIDI Note Numbers from the KeyStep Pro, and we'll use them to control the pitch of a VCV Rack voltage-controlled oscillator (VCO). We'll use the corresponding Velocity values to control the ADSR envelope generator module.
- In the upper menu of the MIDI-CV module, select "Computer keyboard" and change the value to "Core MIDI" or "Windows MIDI", as appropriate). Then, in the middle menu, Click on "(No device)" and change it to "Arturia KeyStep Pro". We've now set up the MIDI-CV module to receive pitch and velocity values from the KeyStep Pro.
- Now, in the middle menu of the Audio-8 output module, click on "(No device)" and change it to the computer audio output (i.e. internal soundcard or external audio interface).



Now, when pressing a key on the KeyStep Pro you should hear sound from VCV Rack through your speakers or headphones. Congratulations! You can now use the KeyStep Pro keyboard, the arpeggiators and the sequencers to control oscillator(s) and envelope generator(s) in VCV Rack.

10.3.1. KeyStep Control Mode and VCV Rack

As we've seen previously in Chapter 8 - Control mode, MIDI CC# (control change) messages can be used to control/modulate parameters of external synths and modular systems. These MIDI CC# messages differ from note-related MIDI messages (for example, Note ON and Note OFF). CC# messages are specifically designed to control/modulate parameters on an external MIDI device such as a hardware synth, a hardware modular system, a software virtual instrument loaded in a DAW, or a software modular system such as VCV Rack.

10.3.1.1. Sending CC# messages from the KeyStep Pro

To send CC# messages to external devices, the KeyStep Pro has to be in Control mode.

The moment you press the Control button, the five main encoders take on a different role: they transmit CC# messages over MIDI (via USB, MIDI Out 1 and/or MIDI Out 2).

Here's an overview of the KeyStep Pro's default MIDI CC#'s:

Encoder/Strip Parameter	CC#
Pitch	74
Gate	75
Velocity	76
Time Shift	77
Randomness	78
Pitch Bend	0
Modulation	1
Looper Touch Strip	9

In this example, we'll configure the KeyStep Pro's encoders to control the ADSR envelope generator in the VCV Rack demo patch. This procedure assumes that you already have the KeyStep Pro and VCV Rack connected as at the end of the previous example.

Our goal now is to get the KeyStep Pro to control the ADSR envelope generator in VCV Rack.

- In VCV Rack, right click anywhere in empty space in the rack. The 'Module Select' window will open. Type "MIDI" in the grey search box at the top left and select the MIDI-CC module. This module gets added to the patch.
- In the MIDI-CC module, click in the middle menu on "(no device)" and select "Arturia KeyStep Pro".
- You now have a 4x4 table of 16 CC#'s (numbered from 0 to 15) – the *connection field* – available to assign parameters from the KeyStep Pro to parameters of VCV Rack modules. Below the connection field, you'll see 16 patch points (outputs) that relate to the entries in the connection field.
- Click on the "0", the first entry in the connection field, and the zero will turn into two faint dashes.
- Move the Pitch encoder on the KeyStep Pro, and the MIDI-CC module will now display "74" as the first entry of the connection field. This is the default CC# (Control Change number) of the Pitch encoder.
- Repeat this to make the Gate encoder (CC 75) the second entry of the connection field, the Velocity encoder (CC 76) the third entry, and the Time Shift encoder (CC 77) as the fourth entry.

Now connect by click and drag:

- The first patch point on the MIDI-CC module to the CV input of the Attack (ATT) of the ADSR,
- The second patch point to the CV input of the Decay (DEC) of the ADSR,
- The third patch point to the CV input of the Sustain (SUS) of the ADSR, and
- The fourth patch point to the CV input of the Release (REL) of the ADSR.

That's it: you have successfully assigned four encoders to the ADSR module of VCV Rack!

From now on, whatever encoder changes you make on the KeyStep Pro will be mirrored in VCV Rack. To hear the effect, on the KeyStep Pro press the Arp button, play a chord and tweak the main encoders at will.

You may have guessed by now that the MIDI-CC module of VCV Rack is a very useful tool for figuring out which CC# messages are currently being sent by the encoders. Just click on one of the 16 entries in the connection field and then move an encoder on the KeyStep Pro. Its CC# (Control Change number) will be displayed by the MIDI-CC module.

The CC#'s in the table above are default values. If, for any reason, you need the encoders to transmit other CC#'s because you want to control parameters of a synth or module that will only respond to certain CC#'s, go, for example, to Utility>Controller>Knob1>CC to change the CC# that Encoder 1 (Pitch) transmits. Of course, the same applies to the other encoders.



♪ These CC#'s can also be changed in the MIDI Control Center.

Sending CC#'s works both ways: you can use the MIDI output of VCV Rack, a sequencer or any specific module in your modular system to control parameters on your KeyStep Pro. To control the KeyStep Pro from your modular system, you need a module such as the Befaco VCMC to translate the analog Control Voltage (CV) signals of your modular system into MIDI CC# format.



♪ As with Note and Velocity values, the CC# messages lie in the range 0-127

10.4. CV/Gate Functions

KeyStep Pro is equipped with some of the best connective technology that the music hardware business has produced in the last six decades: CV/Gate connectors, Clock, MIDI and USB are all present on its compact rear panel.

Connection diagrams for each of these interfaces are available in [Making the Connections \[p.14\]](#).

In this chapter, we'll focus on the features of the KeyStep Pro CV/Gate circuitry. Refer to the [MIDI Control Center \[p.126\]](#) chapter for in-depth coverage of the MIDI features available.

10.5. Voices 1-4: Pitch, Velocity and Gate

When one of the four sequencers is selected, the notes you play on the keyboard are translated immediately into Control Voltage (CV) and Gate signals and sent to the four Voice output connectors on the back panel. Three independent control voltages are sent for each note: Pitch, Velocity/Aftertouch and Gate open/close.

Of course, the sequencers also record what you play, so then you can use the main encoders to edit the pitch, velocity and gate time (duration) of each note. When sequences are played back, they send these signals to any attached devices through the CV/Gate connectors.

10.6. Routing Signals

For each Track, you can decide to which Voice output(s) its CV/Gate signals will be routed. By default, Track 1 will use Voice 1, Track 2 Voice 2, Track 3 Voice 3 and Track 4 Voice 4.

Hold down SHIFT and press one or a combination of the CV Routing keys (G#, A, A#, B in the upper octave). This will route the current Track to those Voices. You can repeat this action for the other three Tracks. Switching to a Track will activate the Voice outputs you've assigned to it.



CAUTION: When you try to assign a Voice to a Track and it is already assigned to another Track, this will overwrite the existing routing with the new routing you are making.

While routing CV signals, watching the LEDs can be helpful. Voices already assigned to the current Track will be indicated with brightly lit LEDs. To cancel that assignment, hit the corresponding key. The LEDs of Voices assigned to other Tracks will be dimly lit.

10.6.0.1. Voice Allocation

What happens if you send two almost simultaneous notes to a Voice output when the voltage-controlled oscillator (VCO) connected to it is monophonic, meaning that it can only sound one note at a time? Unlike male humans who tend to get confused when having to do two things simultaneously, the Voice output circuitry knows exactly what to do: the *last* note you played will have priority. Every new note you play will 'kill' the previous one. If you play two notes almost simultaneously, the note of the last key you press will be heard. Even if you play more than two keys, it's always the last key you'll hear.

How does this work when you're playing a sequence (Pattern) and have more than one note stored in a step? The Voice output will solve this by playing only the *lowest* note of the chord stored in the step.

The KeyStep Pro has another trick up its sleeve: let's say you have a sequence (Pattern) playing in Track 1 with a 4-note chord in each step and you assign the output of Track 1 to Voices 1 to 4. What will happen? The KeyStep Pro will silently applaud your brilliant idea while calmly distributing the notes in your step over the four Voice outputs!

If you have more than four notes in a step, the KeyStep Pro will 'steal' voices to solve that problem; with five notes in a chord, the lowest note of the chord will be dropped, sacrificed to play the fifth note. With six notes in a chord, the lowest two will be dropped ... you get the idea.

Typically, the Pitch (CV) output is connected to a voltage-controlled oscillator (VCO), the Gate output is connected to some trigger input or the gate input of a voltage-controlled amplifier (VCA), and the Velocity output is connected to a CV input of a VCA or a voltage-controlled filter (VCF) or both (through a patch bay or a CV splitter). These typical routings will produce the most predictable results, but you can creatively route these signals to any parameter that will accept them.

10.6.1. Shift Magic

All of the keyboard SHIFT functions will work their magic on the CV outputs: for example, < Nudge and Nudge > will nudge your sequence Pattern to the left or the right; Semi Down and Semi Up will transpose your sequence Pattern within the current scale.

The keyboard SHIFT functions will also work on the CV outputs! You can change Seq Pattern direction, change the Time Division, Scale and Root Note and set a custom User 1 or User 2 scale.

CV Routing

For the modular environment, the last four SHIFT functions – CV Routing – are the most important ones. They enable you to set up the routing of the CV signals to the Voice outputs. By default, the output of Track 1 will be sent to Voice 1, the output of Track 2 to Voice 2, etc.

To define CV routings, hold down SHIFT and press one of the CV Routing keys (1-4). You can send the output of a track to one or more Voices. If you want to send the output of Track 1 to Voices 1 and 2, hold down SHIFT and press CV Routing keys 1 and 2. In a similar way, you can deactivate an active routing by pressing the routing keys once more. This will free up this routing for another track. The active CV Voices will be shown by the LED colours of the tracks to which they are assigned.

The Voices assigned to the currently selected Track will be brightly lit. Those of other tracks will be dimly lit. If you select a CV Voice that is used by another track, it will remove its assignment from the previous track.

10.6.2. CV/Gate Signals: DAW Configuration

The KeyStep Pro can be used as a MIDI to CV converter. Send note-related data from the MIDI tracks of your DAW to the KeyStep Pro via USB or MIDI In. If the MIDI channels match (that is, if they are set to 1, 2, 3 or 4), the MIDI data will appear in analog form as control voltages at the CV/Gate outputs of Voices 1 to 4.

There are two things to keep in mind when you try this:

- All CV/Gate jacks are monophonic, so if the selected MIDI track on the DAW contains polyphonic data, playback could be extremely unpredictable. It's best to send only one note at a time.
- CV/Gate jacks can send only basic CV signals: Pitch, Velocity/Aftertouch and Gate open/closed (equivalent to MIDI Note ON/OFF). The KeyStep Pro encoders aren't able to control synthesizer parameters through the CV/Gate output jacks. You can, however, control external synths with MIDI over USB or via MIDI Out 1 and/or Out 2. The encoders send CC# messages as you turn them. What is more, in Control mode every sequencer can send the CC# messages stored in its tracks.

10.6.3. CV/Gate Specifications

Some analog synthesizers have unusual implementations that are not fully compatible with the KeyStep Pro CV/Gate signals. Please refer to their manufacturer's specifications before making a purchase so that you can be sure the two devices will work together well.

We've designed the KeyStep Pro to be as flexible as possible: the [MIDI Control Center \[p.126\]](#) allows you to configure the CV/Gate Voice output jacks in a number of ways. You can also change these settings in the Utility menu (Utility>CV>Voice).

These are the electrical signals that can be sent by the KeyStep Pro CV/Gate Voice output jacks:

- Control Voltage (Pitch) has two options:
 - 1 Volt/Octave (0-10V) (Standard Eurorack format)
 - 0 Volt MIDI note range: 0-127 (Volt/octave)
 - 1.2 Volt/Octave (0-10V) (Buchla Format)
 - 0 Volt MIDI note range: 0-127 (Volt/octave)
 - Hertz per Volt
 - 1 Volt MIDI note range: 0-127 (Hz/Volt)
- Gate output has two options:
 - V-trigger (positive or 'voltage'), trigger voltage is between 10 V and 12 V
 - V-trigger (positive or 'voltage'), trigger voltage is between 4 V and 5 V
 - S-trigger (negative, or short)

In addition, you can set Modulation Type, Modulation Range and Pitch Bend range. For an overview of these settings, please refer to [Chapter 9 \[p.118\]](#)

The [MIDI Control Center \[p.126\]](#) and the Utility menu allow each of these settings to be configured independently for each of the four voices.

10.7. Drum Gates

When Drum mode is selected on Track 1, the notes you play on the lowest eight keys of the keyboard (corresponding to Drum sequencer tracks 1-8) are translated immediately into Gate signals, which are sent to the eight Drum Gate output connectors on the back panel. Two voltages are sent for each note: one for Gate open and one for Gate close. Of course, velocity/aftertouch signals are not sent to the Drum Gate outputs.

The Drum sequencer can record what you play on the lower two octaves of the keyboard, and then you can use the Gate encoder to change the gate time (duration) of each note. When the sequence plays back, it will send the Gate open/close signals for the lowest eight notes to attached analog devices through the Drum Gate output jacks.

However, the keys cannot 'play' the Drum Gate outputs while the KeyStep Pro is in Control mode. In Control mode, however, you can run the sequencers, and they will 'play' connected external analog devices, but only for the lowest eight notes. At the same time, if you wish, you can play connected MIDI devices from your DAW.

10.7.1. Which Keys Do I Use?

The lowest eight keys of the keyboard are mapped to the eight Drum channels that correspond to the Drum Gate numbers on the rear panel. These are the only keys you can play if you want to send trigger signals to an external device such as an analog drum machine or an analog synth.

10.7.2. Can my DAW send Drum Gate Signals?

It's possible to send triggers from up to eight MIDI tracks on your DAW indirectly via the KeyStep Pro's USB or MIDI In to the Drum Gate jacks. There's a MIDI note number assignment for each Drum Gate, and you can set those values in the Utility menu (Utility>Drum Map) or using the [MIDI Control Center \[p.126\]](#).

When the MIDI channels match the note numbers (that is, when they are set to 1-8), the Drum Gates will be triggered.



As with Note and Velocity values, the CC# messages lie in the range 0-127: The Drum Gate jacks can send only one type of signal: gate open/close (equivalent to MIDI Note On/OFF). So even though the Drum pattern holds Velocity/Aftertouch data for all 24 keys that correspond to the 24 Drum tracks, that data cannot be sent to the Drum Gates. Why not? Because it is digital data, not analog signals.

10.7.3. How Should I Route the Signals?

Typically, a Drum Gate output would be connected to a gate/retrigger input of an ADSR envelope generator used to modulate the amplitude of a voltage-controlled amplifier (VCA) and/or the filter cutoff frequency of a voltage-controlled filter (VCF). But you can send those signals to any inputs that will accept them.

For example, they can be used to trigger a synthesizer such as one from our MiniBrute or MicroBrute series, or even the magnificent MatrixBrute.

10.7.4. Drum Gate Specifications

Different drum modules and other analog devices with Gate inputs have different requirements for the type of analog signal they will recognize.

Fortunately, we've designed the KeyStep Pro Drum Gate outputs to operate as either a V-trigger or an S-trigger. These settings will work with the vast majority of analog devices you will encounter on Planet Earth.



Before connecting any device to the KeyStep Pro, please refer to its manufacturer's specifications to figure out whether and how they will work together properly.

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