CYCLE INSTRUMENTS

TETRACHORDS

MANUAL

UPDATED 12/2/24

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Acknowledgements

Reading This Guide

Each section in this guide begins with an overview, illustrating and briefly describing the relevant controls, followed by a more detailed description.

The hope is that the overview sections will be sufficient for players who prefer to learn with minimal guidance whilst extra detail is available for those who want it.

Before you start

Important!

The Tetrachords is not a stand-alone instrument.

It plays very well with other instruments and can function as a studio's connective hub. However, it has certain requirements without which it cannot function.

It requires a standard Eurorack power supply, takes 36hp of rack space and requires instruments to connect to. The Tetrachords outputs MIDI notes and 4 channels of CV but on its own does not generate sounds.

Getting Started

This section contains a basic first patch using CV and MIDI.

You can find hands on demonstrations of these first patches in the video manual hosted on the Cycle Instruments Youtube channel.

FIRST PATCH CV

https://youtu.be/NavFps74XkE?feature=shared

SECOND PATCH CV

https://youtu.be/iJqqkaIob7A?feature=shared

FIRST PATCH MIDI

https://youtu.be/J0rhGO2Brgs?feature=shared

SECOND PATCH MIDI

https://youtu.be/UsNp41eZb_o?feature=shared

It is reccomended to check out these videos as they are a quick way of learning the basics of the module.

The Tetrachords has some key combos and menus that require a small amount of learning.

To assist in learning these, there is a Tips and Menus booklet available.

Tips and Menus Booklet

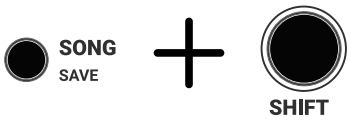
https://cycleinstruments.com/resources/

1st Patch CV

❶ **INITIALISE THE SONG**

Press and hold the SONG button and then press either the RESET or SHIFT button to initialise the patch.

OR



❷ **CONNECT AND EXPERIMENT!**

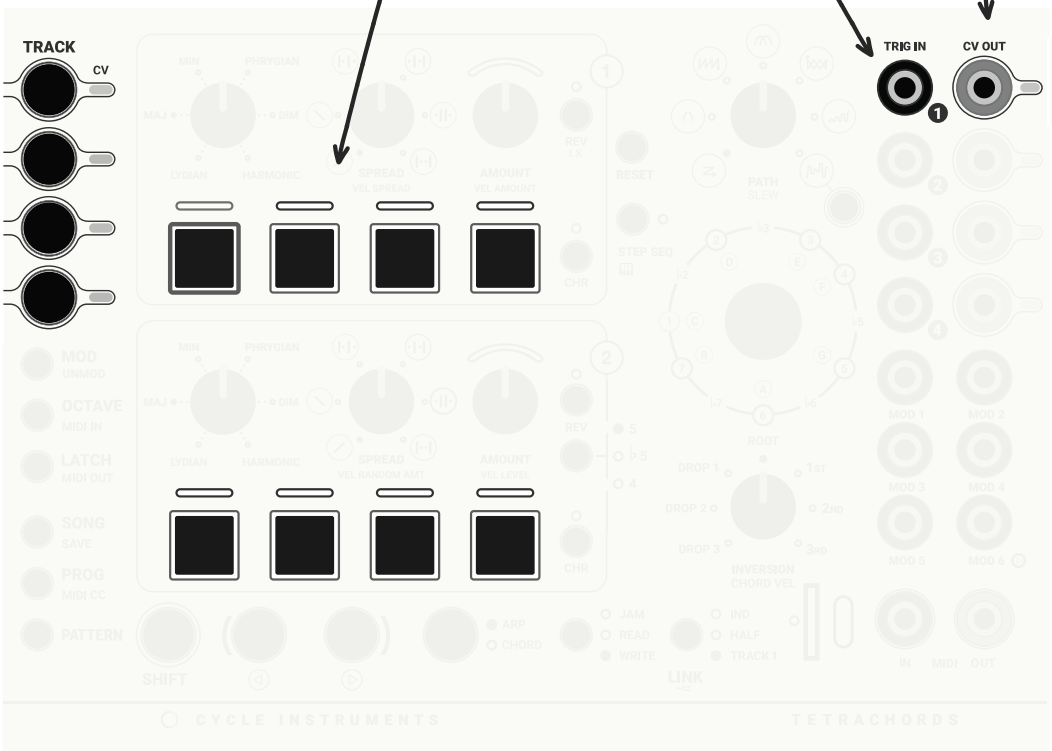
Connect the patch below and play with each of the knobs to get a sense of what they do.

TRACK 1
Select track 1

RGB BUTTONS
Input notes using the 8 RGB buttons

TRIG IN 1
Connect a Trigger or Gate signal

CV OUT 1
Connect to the V/oct Input of an Ocillator

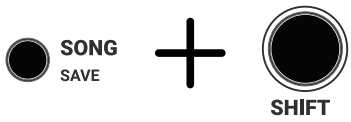


1st Patch MIDI

❶ **INITIALISE THE SONG**

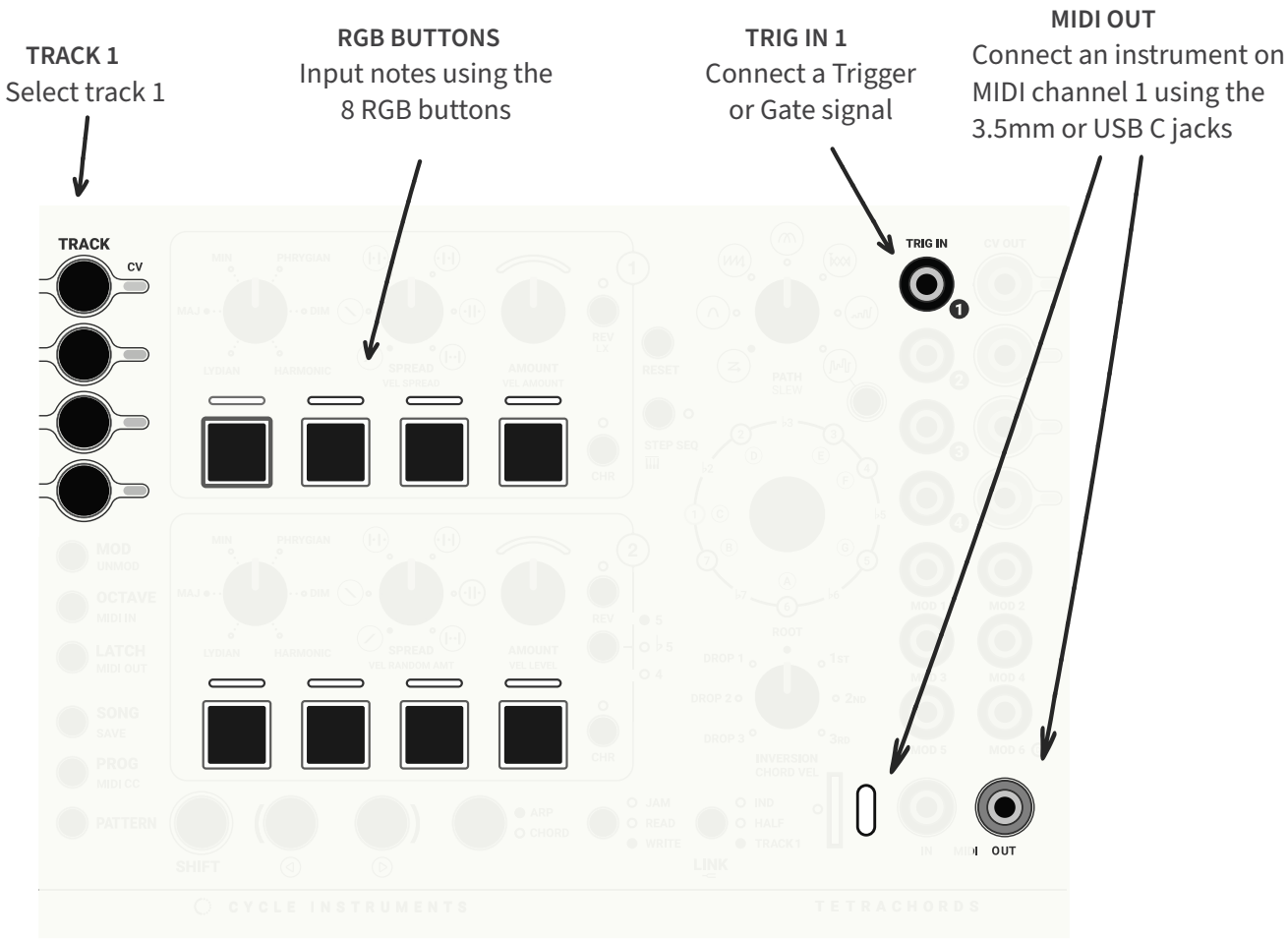
Press and hold the SONG button and then press either the RESET or SHIFT button to initialise the patch.

OR

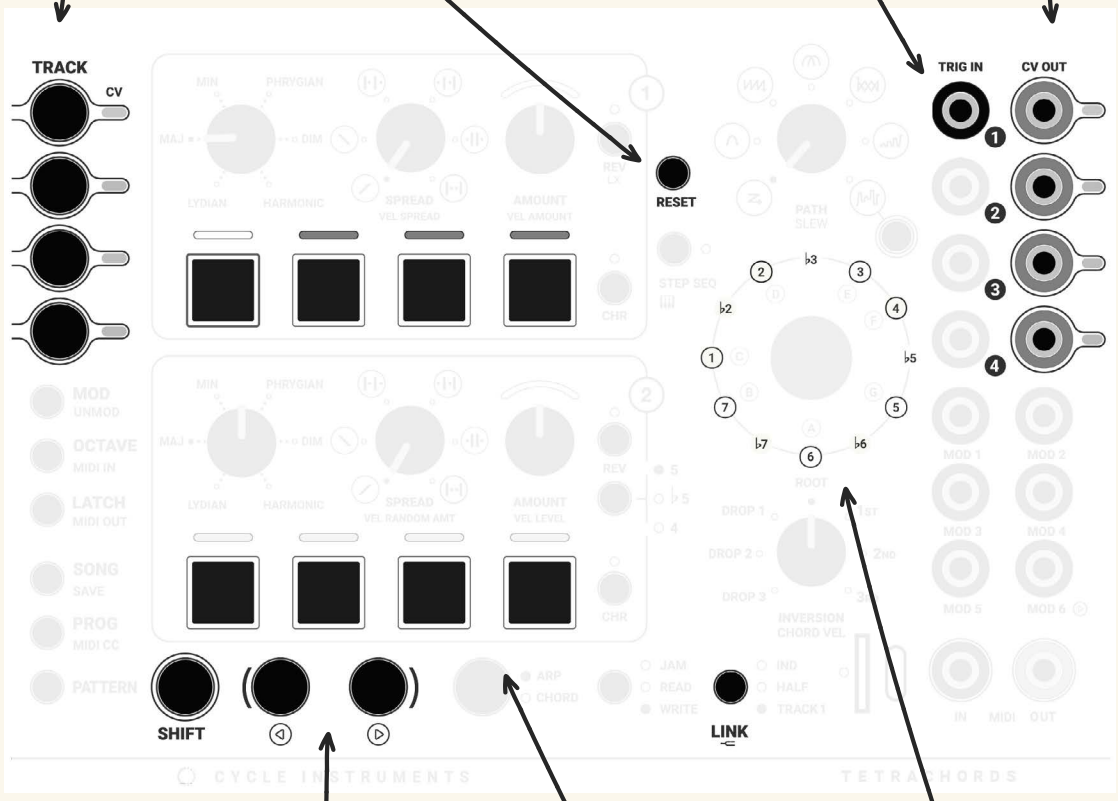


❷ **CONNECT AND EXPERIMENT!**

Connect the patch below and play with each of the knobs to get a sense of what they do.



Tuning Mode



TRACK BUTTONS
Select CV for calibration

RESET
Abort calibration

TRIG IN 1
Tuner/calibration input

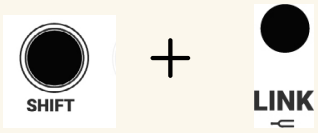
CV OUTS 1 - 4
Output 2v

LEFT (OR RIGHT) BUTTON
Begin calibration

RGB BUTTONS
Load/Select calibration setting.

LED RING
Tuner display/ calibration progress indicator

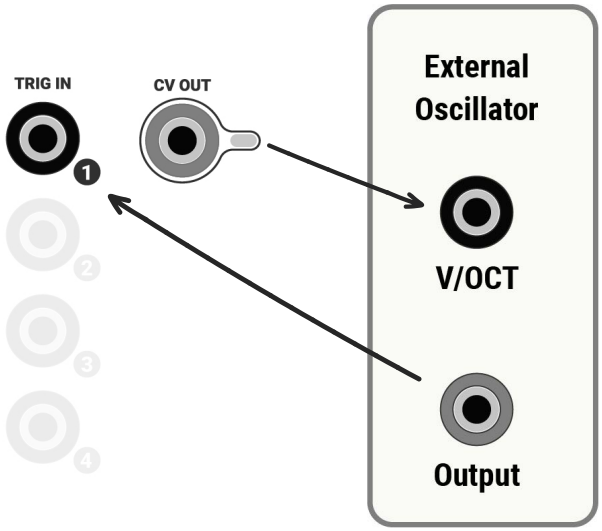
Pressing SHIFT + LINK / ⊂ places the Tetrachords in TUNING MODE.



Tuner

The Tetrachords features a basic tuner, designed to help keep CV controlled oscillators in tune with MIDI instruments and with each other.

To use the tuner, first connect any of the Tetrachords CV OUTS to an oscillator's v/octave input.



Then connect an oscillator output to TRIG IN 1.

NOTE: regardless of which CV OUT is used for tuning, the external oscillator must be connected to TRIG IN 1.

Press and hold SHIFT and then press the LINK / ⊂ button.

SHIFT can be released at this point.

(cont.)

Whilst the LINK / ⊂ button is held, two things happen.

❶ All four of the CV OUTS output 2 volts.

Note: the Tetrachords associates 2 volts with middle C *aka* 261.6Hz *aka* MIDI note 60.

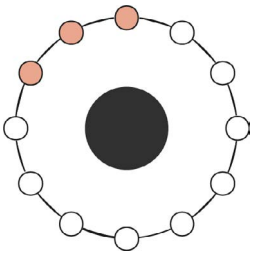
❷ The LED ring indicates the tuning of the oscillator connected to TRIG IN 1.

The LED ring tuning display mimics common instrument tuners. See details on the following page.

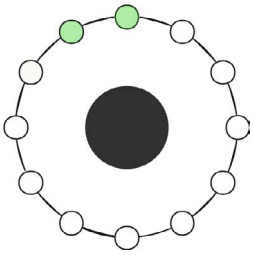
(cont.)

LED RING TUNER DISPLAY

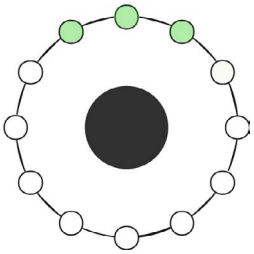
Low
(less than
261.6Hz)



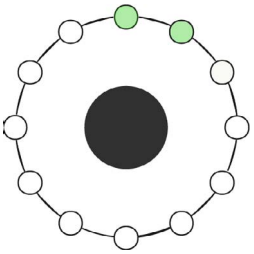
Slightly low
(slightly less
than 261.6Hz)



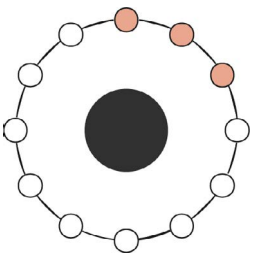
'In Tune'
261.6Hz



Slightly high
(slightly greater
than 261.6Hz)



High
(greater than
261.6Hz)



(cont.)

Troubleshooting tuning

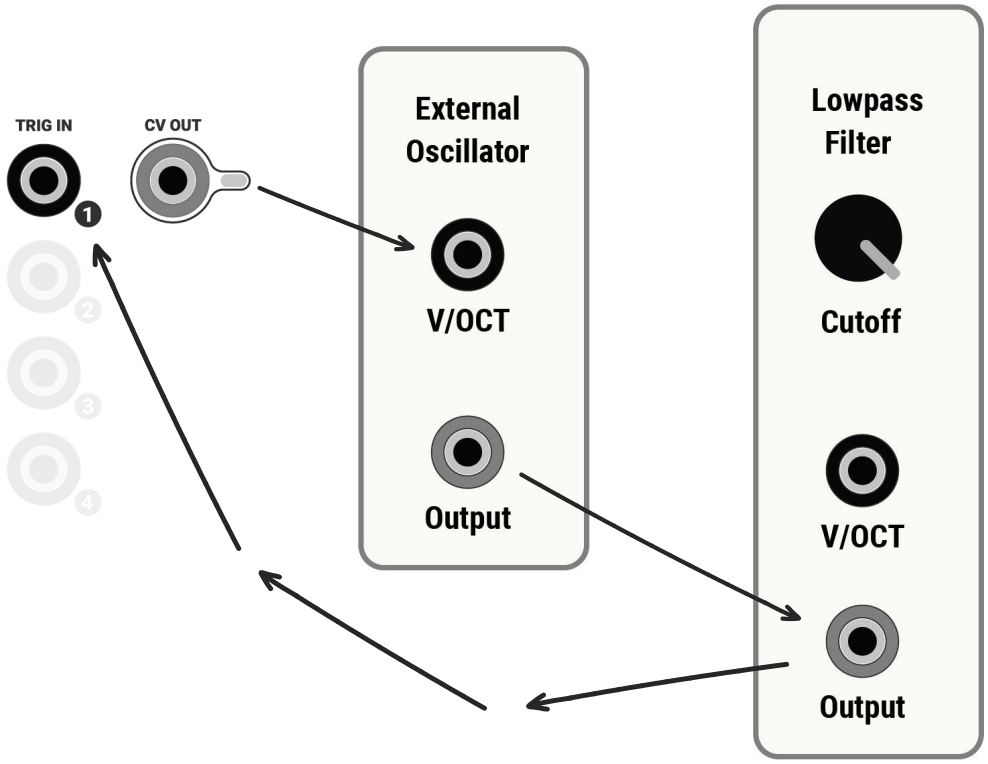
❶ The Tetrachords tuner works best with simple waveforms. Where possible use a square wave.

Otherwise basic waveforms such as saw, triangle and sine waves can work well.

The tuner may not work with more complex waveforms, though by all means try.

❷ Some oscillators generate ultrasonic noise which, though inaudible to humans, may confuse the Tetrachords tuner.

If the tuner appears not to work with an oscillator, try inserting a fully open low pass filter between the oscillator output and TRIG IN 1 of the Tetrachords.



Calibration

The Tetrachords is capable of calibrating its CV OUTS to individual oscillators.

This can significantly improve how in-tune oscillators will play when sequenced by the Tetrachords, especially for sequences with a wide pitch range.

The calibration process currently takes between 1 to 2 minutes.

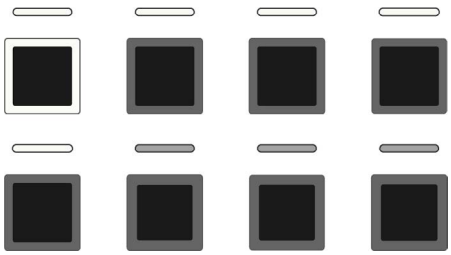
Once calibration is complete, the calibration data is stored on the SD card and can be recalled instantly or even loaded by default if specified in the *CONFIG.TXT* file.

ACTIVE CALIBRATION

One of the track buttons will be illuminated with the current track colour, indicating which calibration setting is active for the current CV OUT.

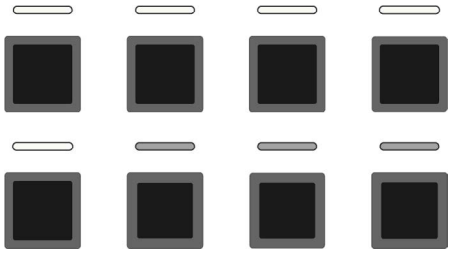
There are 8 possible custom calibration settings, corresponding to the 8 RGB buttons.

Here RGB button 1 is illuminated, indicating that calibration setting 1 is active.



(cont.)

Note that no illuminated buttons indicates the FACTORY, 1V/Octave setting.

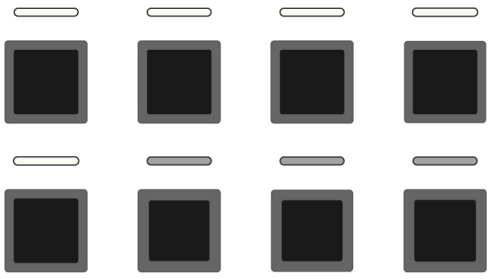


LOADING CALIBRATIONS

The RGB buttons can be used to load saved calibrations from a compatible micro SD card.

The white LED pills indicate where calibrations have been saved.

Here LED pills 1 - 5 are illuminated, indicating that calibrations have been saved in slots 1 - 5.



Pressing buttons 1 - 5 will load the corresponding saved calibration setting.

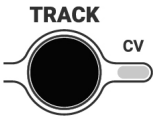
(cont.)

SAVING CALIBRATIONS

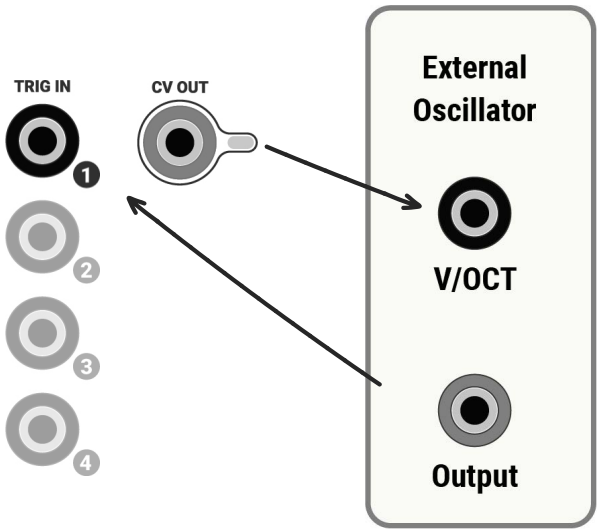
Save a calibration via the following steps.

Note: saving a calibration requires that a compatible micro SD card be inserted in the module.

1. Press the track button corresponding to the CV OUT you wish to use for the calibration e.g. press TRACK 1 if calibrating CV OUT 1



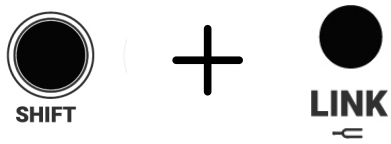
2. Connect the selected CV OUT to an oscillator's v/octave input.



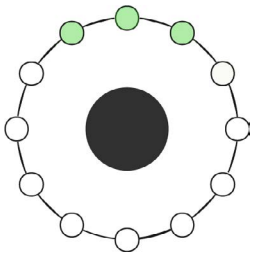
3. Connect the oscillator's output to TRIG IN 1.

(cont.)

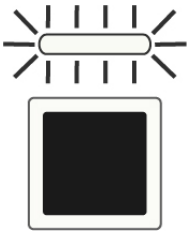
4. Press and hold SHIFT and then press LINK / ⊂ to enter Tuning Mode



5. Tune the oscillator to middle C. The LED ring indicates when the oscillator is in tune.



6. Press one of RGB buttons 1 - 8 to select where the calibration is to be saved.



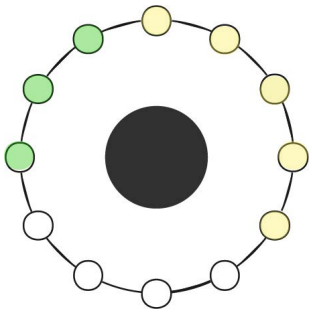
The LED pill above the button will flash, indicating the slot where the calibration is to be saved.

(cont.)

7 Press the RIGHT button to start the calibration routine and save the calibration data to the selected slot.

Calibration takes 1 to 2 minutes.

The LED RING displays the progress of the calibration process.



- calibration complete
- calibration in progress

Abort Calibration

Press the RESET button at any time to abort the calibration process and return to regular operation.

No changes to calibration files or settings will be made if calibration is aborted.

8 When calibration is complete, exit Tuning Mode by pressing the LINK / ⊂ button.

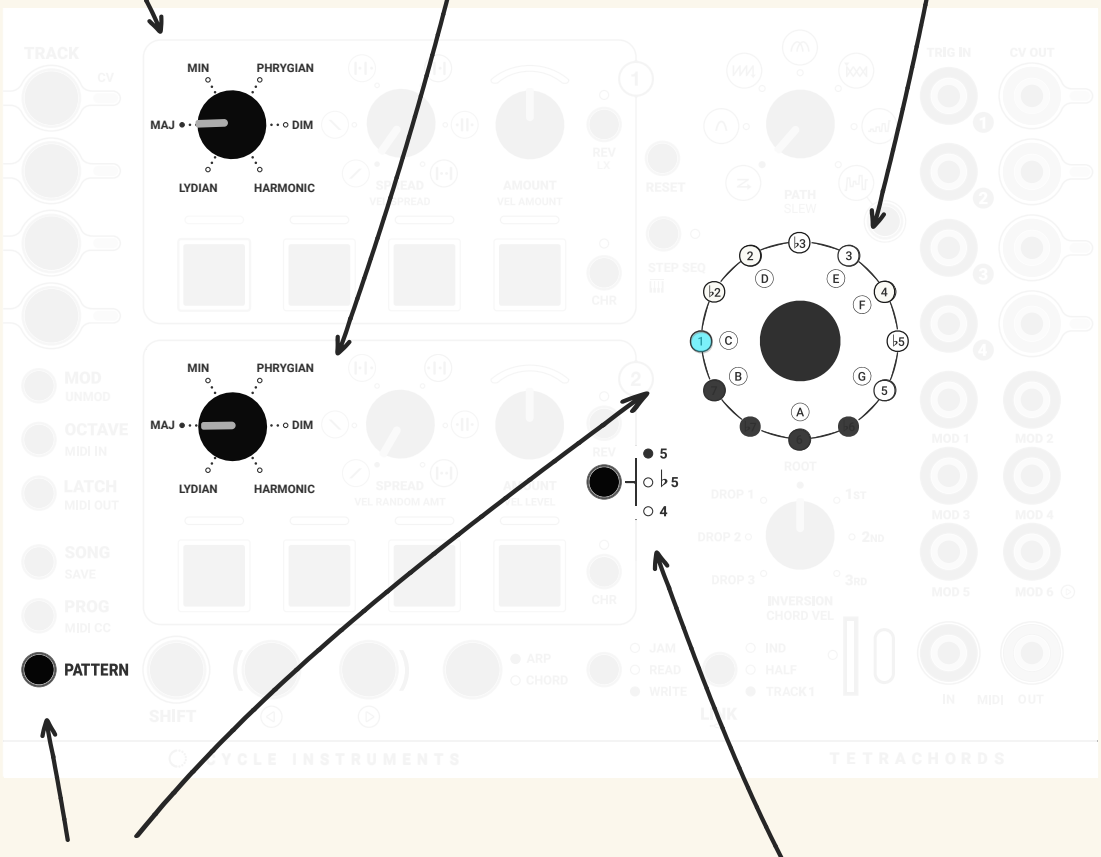
Scales - Overview

These five controls affect the current musical scale settings.

TETRACHORD 1 KNOB
Sets the pattern for scale notes 1 to 4

TETRACHORD 2 KNOB
Sets the pattern for scale notes 5 to 8

ROTARY ENCODER (TURN)
Sets the *mode* of the scale.



PATTERN (HOLD) + ROTARY ENCODER (TURN)
Sets the *root note* of the scale.

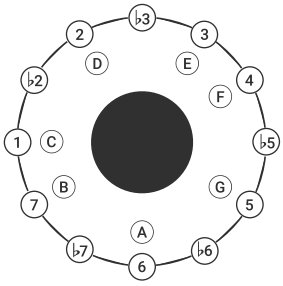
5 ♭5 4 BUTTON
Sets the interval between Tetrachord 1 & Tetrachord 2

Scales 1 - Display

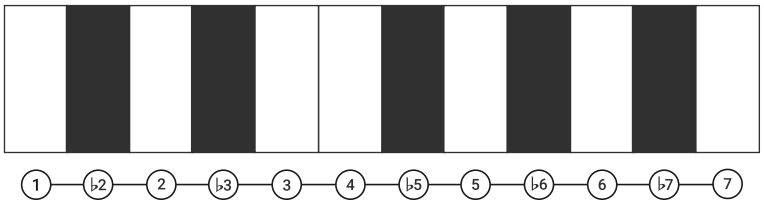
LED RING

In standard operation, the LED ring displays the scale setting for the current track.

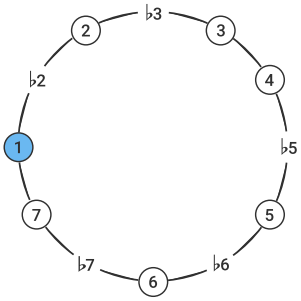
The LED ring consists of 12 LEDs, each representing a note in the Western chromatic scale.



By default, LED 1 represents the note C.



Notes active in the current scale are illuminated and notes outside the current scale are not.



Here the LED ring displays a major scale, with notes 1, 2, 3, 4, 5, 6 & 7 active.

Scales 2 - Root Note

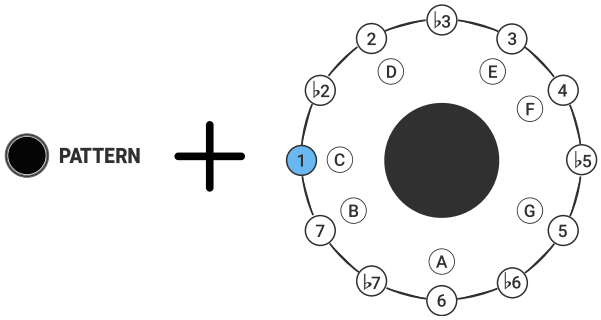
Musical scales have a first name and a second name e.g. *C major* has first name *C* and second name *major*, *B minor* has first name *B* and second name *minor*.

The technical term for a scale's first name is *root note*.

To adjust the root note on the Tetrachords, HOLD PATTERN, then turn the ROTARY ENCODER.

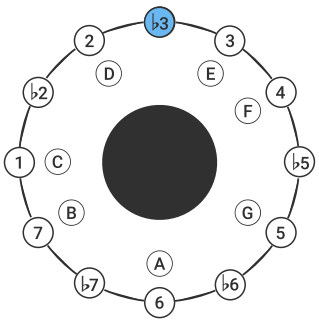
There are 12 root note options, visually represented by the 12 LEDs surrounding the ROTARY ENCODER. Each LED represents one of the 12 notes of the Western chromatic scale.

When PATTERN is held, the current root note is indicated by the lit LED. See the example below, which shows the default setting, root note C.



To change the root note, while holding PATTERN turn the ROTARY ENCODER.

LEDs that don't have a note name label represent accidentals i.e. the black notes on a piano. See the example below, which shows the root note set to D♯/E♭.

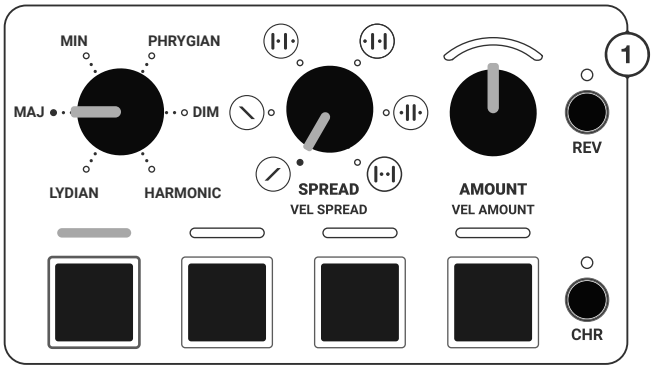


Scales 3 - Tetrachords

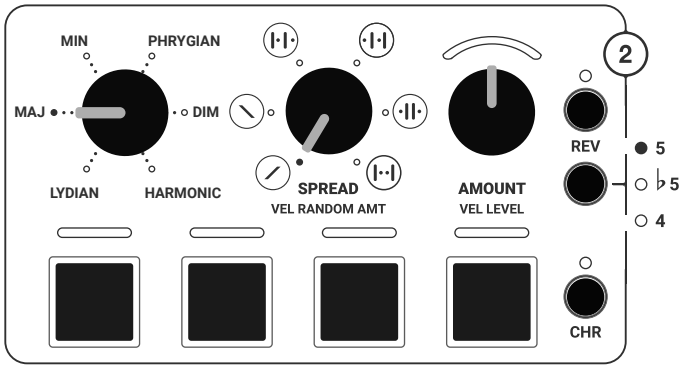
A musical scale can be divided into two, four note halves, called *tetrachords*.

This idea inspired the layout of the Tetrachords with the centre of the module being divided into two sections.

The **TETRACHORD 1** section, for controlling scale notes 1 - 4...



... and the **TETRACHORD 2** section, for controlling scale notes 5 - 8.



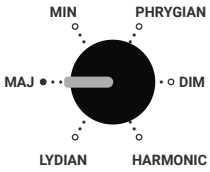
Scales 4 - Note Patterns

As mentioned previously, musical scales have a first name and a second name, with their first name being the root note.

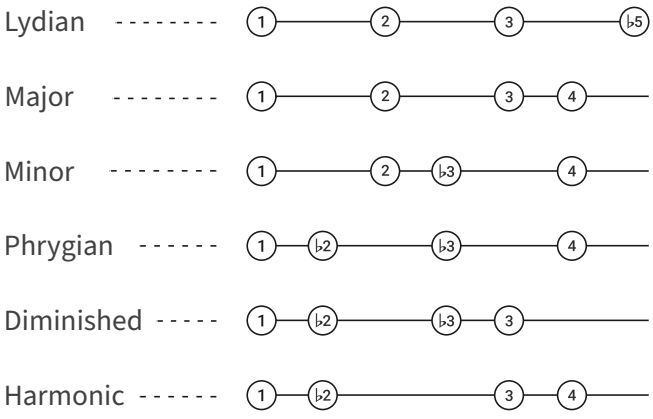
Their second name is derived from the characteristic pattern of *intervals*, aka musical distances, between each note.

Three of the panel controls on the Tetrachords module define the pattern of intervals for a scale.

The first half of the scale is set by the **TETRACHORD 1 KNOB.**



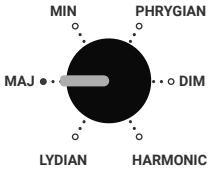
This knob sets the first four scale notes to one of 6 possible *tetrachord* patterns.

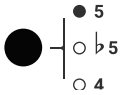


Note: the first note of tetrachord 1 ***is always note 1.***

(cont.)

The second half of the scale is set by the **TETRACHORD 2 KNOB** and the **5 ♭5 4 BUTTON**.

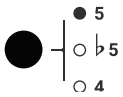


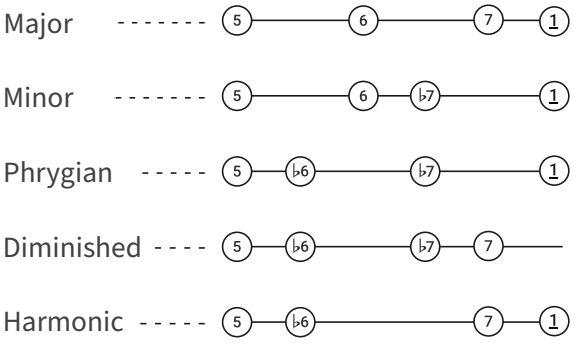


Similar to the **TETRACHORD 1 KNOB**, The **TETRACHORD 2 KNOB** sets scale notes 5 - 8 to one of 6 possible *tetrachord* patterns.

The **5 ♭5 4 BUTTON** sets the interval between *Tetrachord 1* & *Tetrachord 2* i.e. the first note of *Tetrachord 2*

By combining these two controls, the second half of the scale can be set 17 ways. Illustrated below:



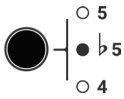


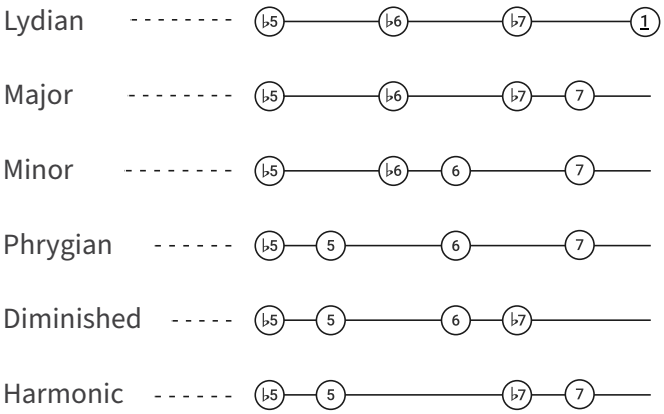
An underscore indicates a note which is an octave higher, i.e. 1 is an octave above 1.

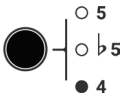
Observe that in some of the above examples, note 1 follows note 7.

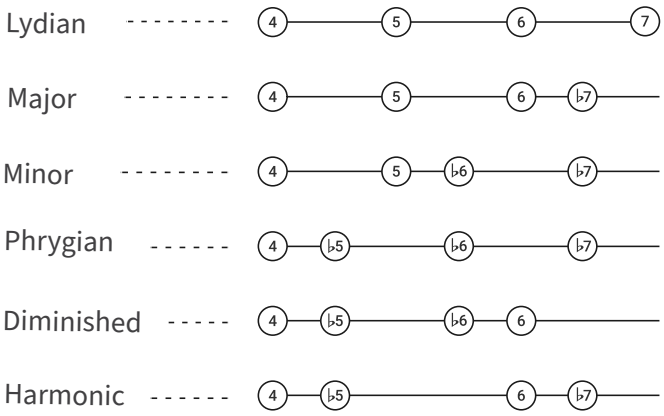
This is a feature of musical scales, after their final note, they begin again on their first note (though one octave higher).

(cont.)









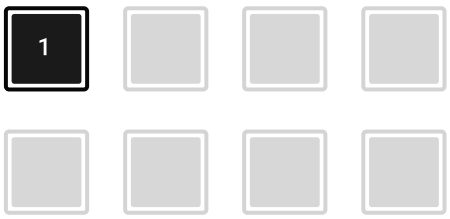
Note: The Tetrachord 1 Lydian setting has no effect when **5 ♭5 4** *is set to* **4**.

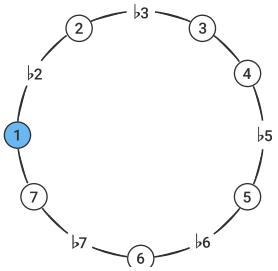
The Tetrachord 2 Lydian setting has no effect when **5 ♭5 4** *is set to* **5**.

Scales 5 - Rotary Encoder / Scale Shift

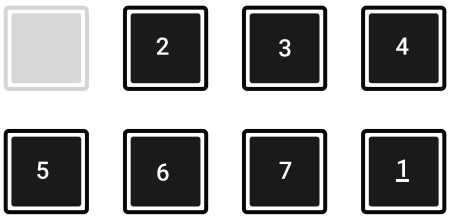
On initialisation, note 1 of the LED ring assumes the current track's colour.

This indicates that RGB button 1 corresponds to scale note 1.

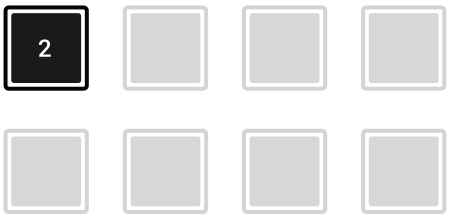


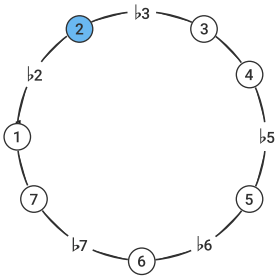


Subsequent RGB buttons correspond to subsequent scale notes.

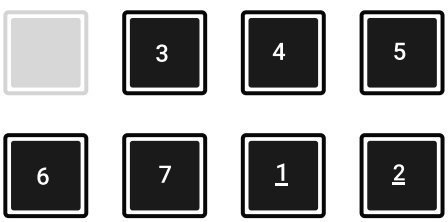


If the Rotary Encoder is turned one step clock-wise, note 2 of the LED ring is coloured, indicating that RGB button 1 now corresponds to scale note 2.





Again, subsequent RGB buttons correspond to subsequent scale notes.



(cont.)

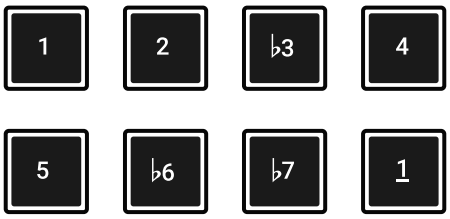
Turning the encoder has the effect of shifting any active notes one step up or down the scale.

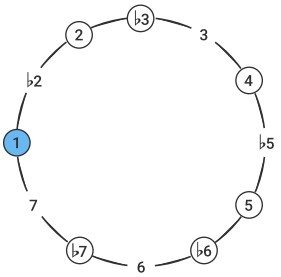
Note that turning the encoder does not change what notes make up the scale.

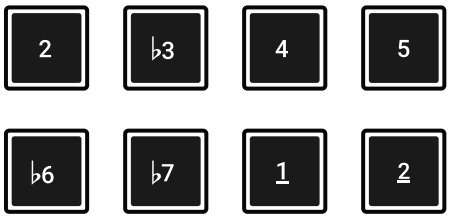
There are as many encoder settings as there are notes in any given scale.

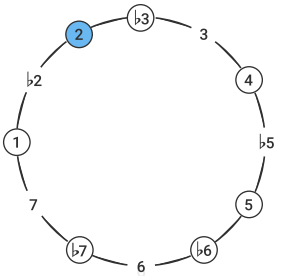
As an example, the seven possible encoder settings for the natural minor scale are illustrated below.

Theoretical note: these settings correspond to what are known as the 7 modes of the natural minor scale.

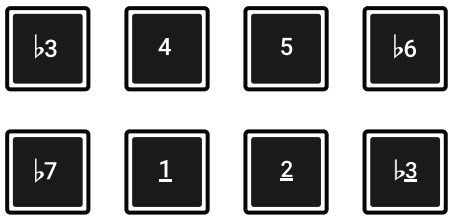


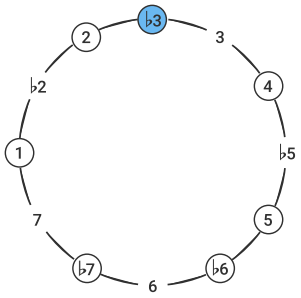


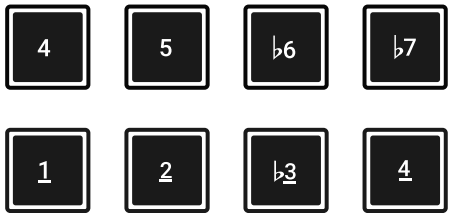


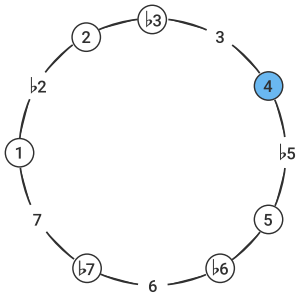


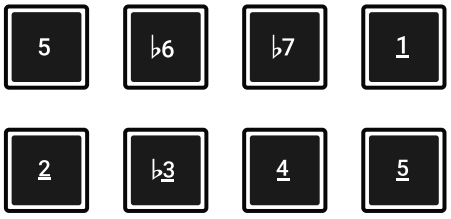
(cont.)

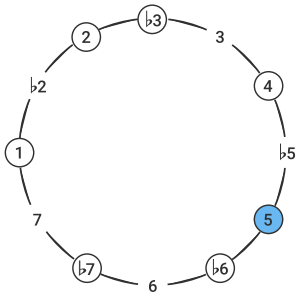

♭3
4
5
♭6
♭7
1
2
♭3

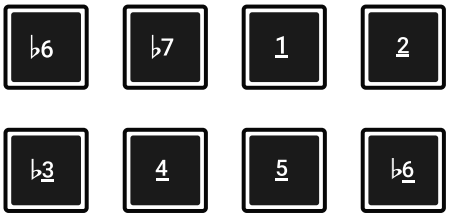

♭3
3
2
♭2
4
1
♭5
7
5
♭7
♭6
6

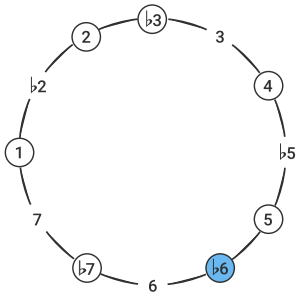

4
5
♭6
♭7
1
2
♭3
4


♭3
3
2
♭2
4
1
♭5
7
5
♭7
♭6
6

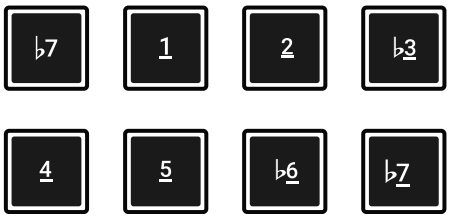

5
♭6
♭7
1
2
♭3
4
5

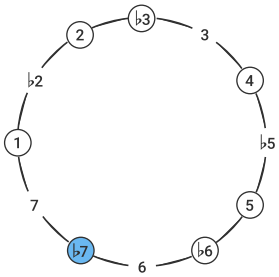

♭3
3
2
♭2
4
1
♭5
7
5
♭7
♭6
6


♭6
♭7
1
2
♭3
4
5
♭6

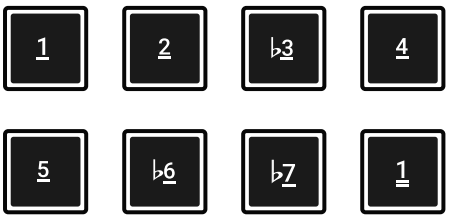

♭3
3
2
♭2
4
1
♭5
7
5
♭7
♭6
6

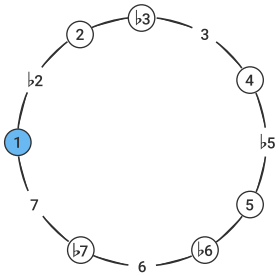
(cont.)



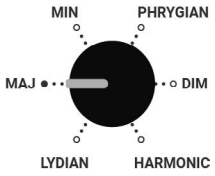
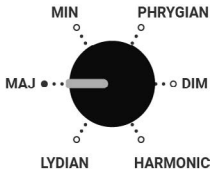
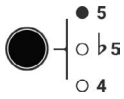
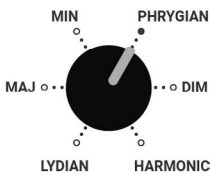
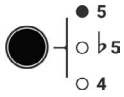
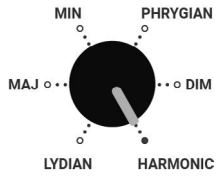
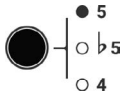
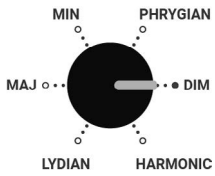
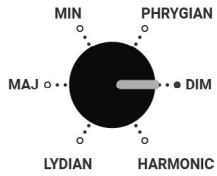
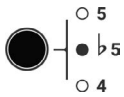
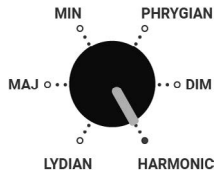
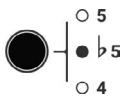
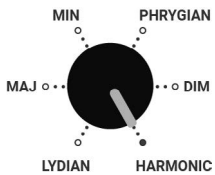
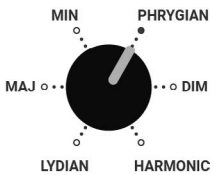
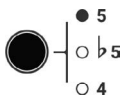


Turning the encoder clock-wise after the 7th setting results in a return to the original setting, though with all notes shifted 1 octave higher.

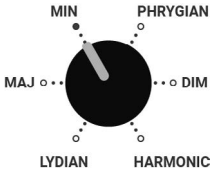
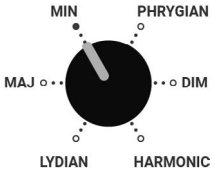
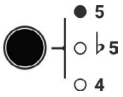
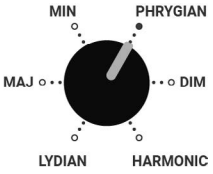
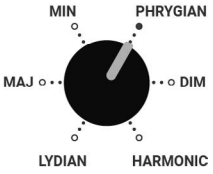
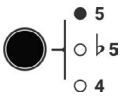
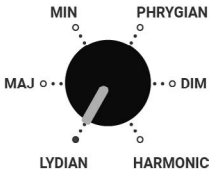
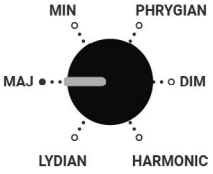
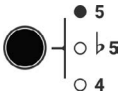
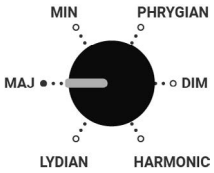
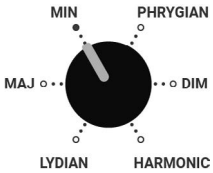
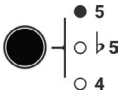
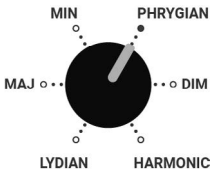
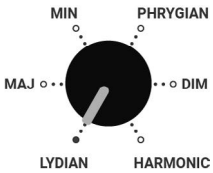
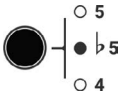
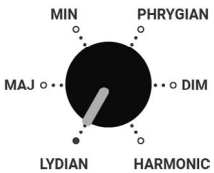
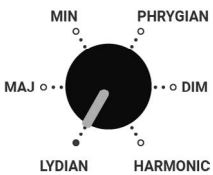
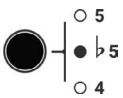




Scales 6 - Scale recipes

SCALE	TETRACHORD 1	TETRACHORD 2	5 ♭5 4
Major			
Natural Minor			
Harmonic Minor			
Half-Whole Diminished			
Blues (ish)			
Phrygian Dominant			

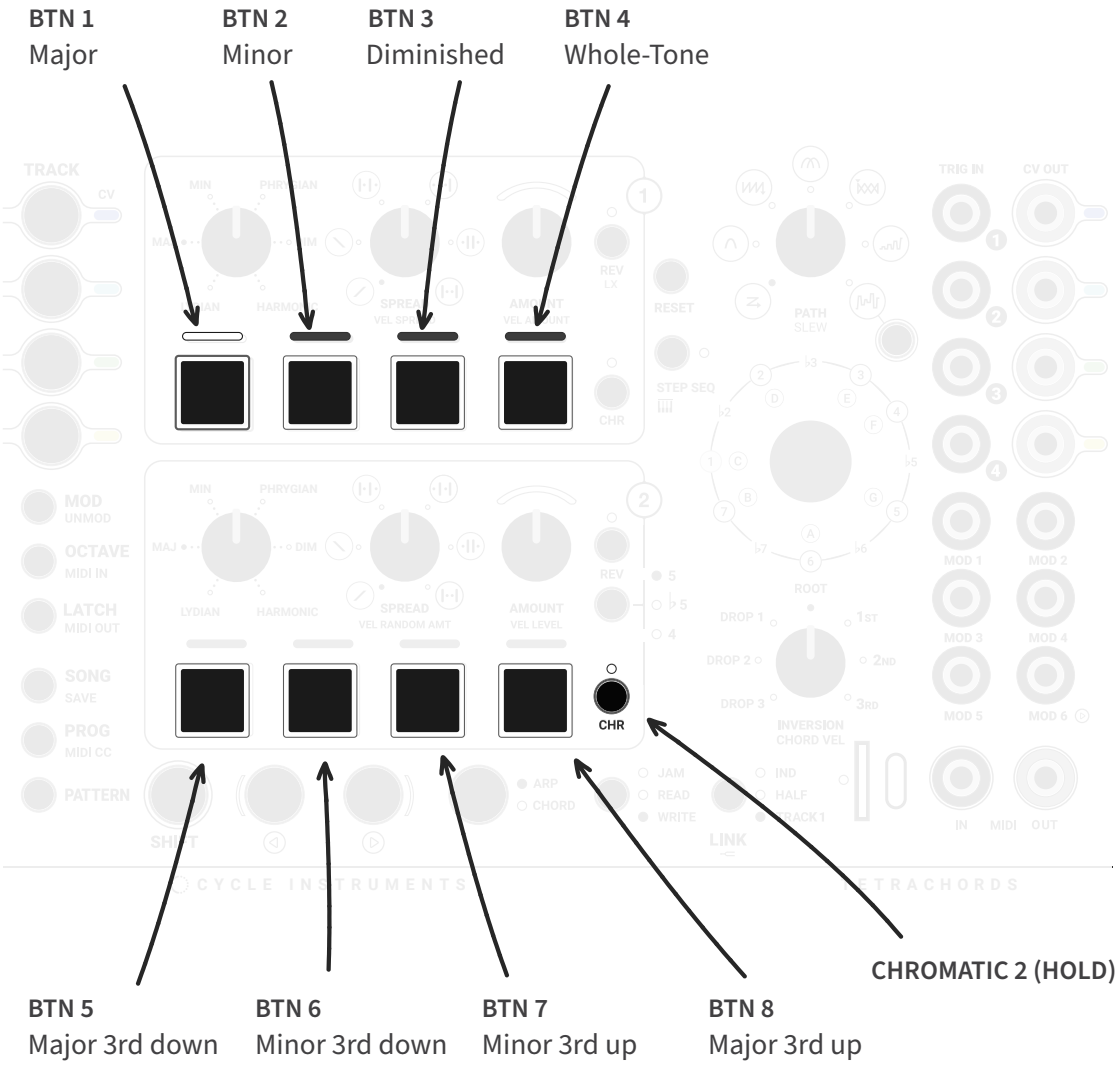
(cont.)

SCALE	TETRACHORD 1	TETRACHORD 2	5 ♭5 4
Dorian Mode			
Phrygian mode			
Lydian Mode			
Myxolydian Mode			
Locrian Mode			
Whole Tone			

Scales 7 - Pivot Modulation

With the CHROMATIC 2 button pressed and held, the RGB buttons can be used to quickly change the scale and tonal center of a PATTERN.

RGB BUTTONS 1 - 4
Change the current scale, making whatever note corresponded to RGB button 1, *note 1* of the new scale.



RGB BUTTONS 5-8
Modulate the tonal center up or down a third and change the scale according to which of RGB buttons 1-4 is active.

(cont.)

PIVOT MODULATIONS are a quick way to generate common, slightly ‘left-of-center’ harmonic changes.

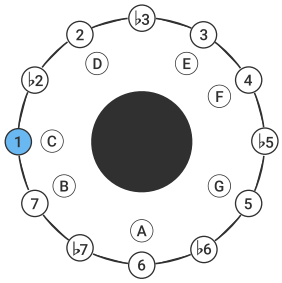
If the changes generated by turning the ENCODER sound too predictable, PIVOT MODULATIONS are worth trying.

The recommended way to learn to use PIVOT MODULATIONS is to experiment.

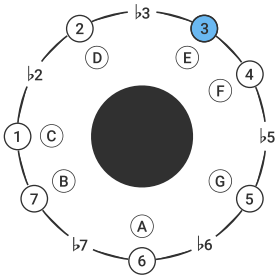
1. Make a sequence using multiple tracks. Ideally with at least a few different notes so you can hear the changes.
2. Press and hold the CHROMATIC 2 button.
3. Experiment by pressing the RGB buttons

HOW PIVOT MODULATIONS WORK

As a starting point, consider a PATTERN with *root note* C, set to *musical mode 3.*

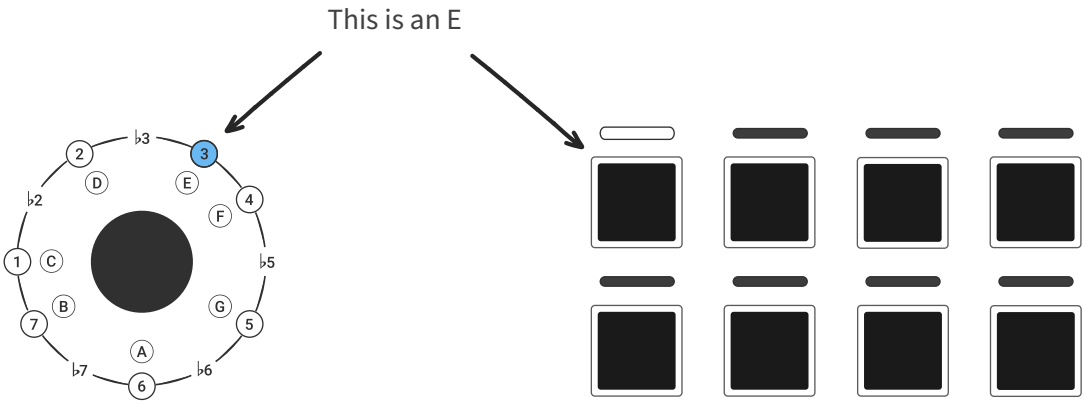


Root Note C



Musical Mode 3

When the *root note* is a C, note 3 in the LED RING is an E. This note corresonds with RGB button 1.



(cont.)

HOW PIVOT MODULATIONS WORK - BUTTONS 1 - 4

When the CHROMATIC 2 button is pressed and held, RGB BUTTONS 1-4 do three things simultaneously

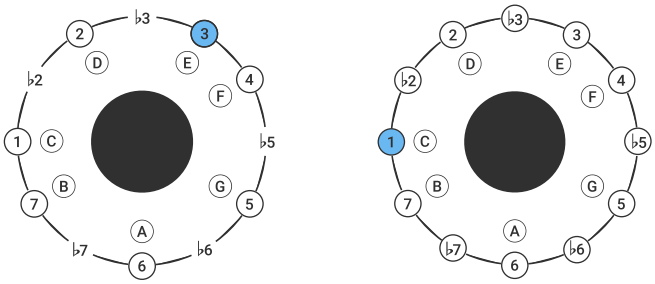
1. Change the scale. RGB BUTTONS 1 to 4 respectevily set the scale to *major*, *minor*, *diminished* or *whole-tone*
2. Set the *root note*.to whatever note correspended to RGB BUTTON 1 e.g. E in the scenario outlined on the previous page.
3. Set the *musical mode* to *musical mode 1*.

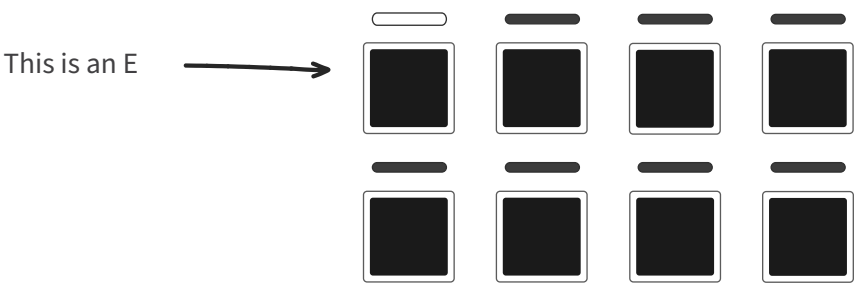
Below, and on the next page is a before and after comparison of applying PIVOT MODULATION using RGB BUTTONS 1 to 4.

Note that after these PIVOTS, RGB BUTTON 1 plays the same note.

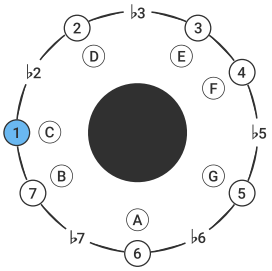
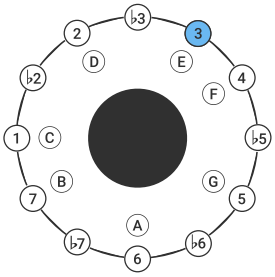
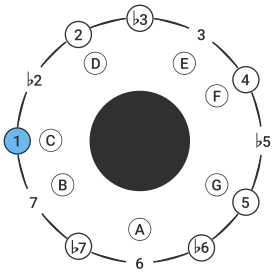
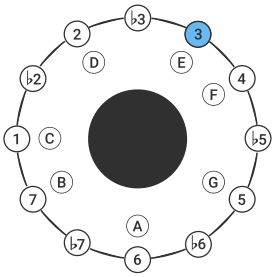
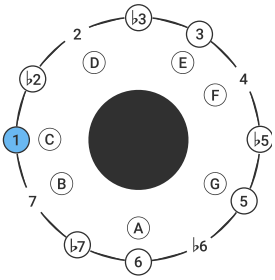
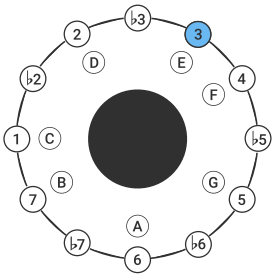
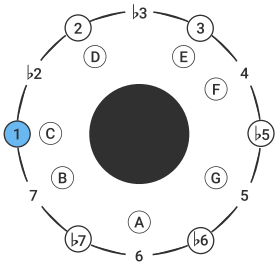
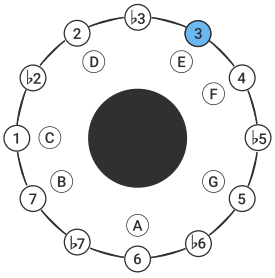
BEFORE

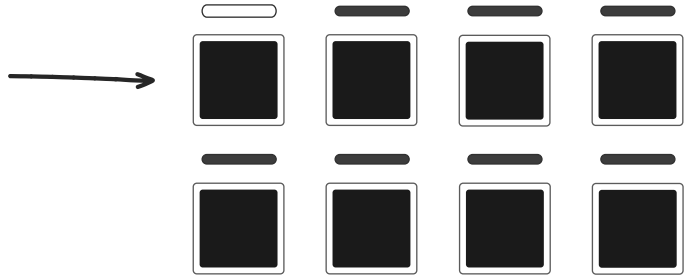
MUSICAL MODE 3 ROOT NOTE C





AFTER

BUTTON PRESSED	MUSICAL MODE 1	ROOT NOTE E
RGB BUTTON 1 | *major*		
RGB BUTTON 2 | *minor*		
RGB BUTTON 3 | *diminished*		
RGB BUTTON 4 | *whole-tone*		

This is still an E 

(cont.)

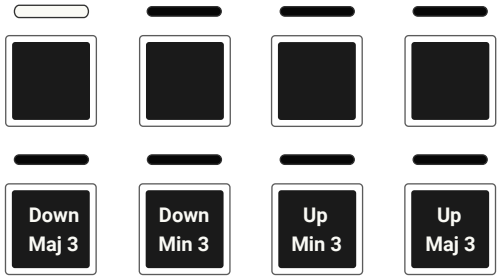
HOW PIVOT MODULATIONS WORK - BUTTONS 5 - 8

RGB BUTTONS 5 to 8 implement a variation on the same idea.

❶ The scale changes to *major*, *minor*, *diminished* or *whole-tone.* This is determined by whichever of RGB BUTTONS 1-4 was most recently pressed, and defaults to *major* if no RGB BUTTONS have been pressed.

Notice that when RGB BUTTONS 1 - 4 are pressed, their corresponding LED PILLs flash, indicating the scale change that will occur, should RGB BUTTONS 5 - 8 be pressed.

❷ The *root note* changes, as illustrated below.



❸ Set the *musical mode* to *musical mode 1*. This works the same as for buttons 1 - 4.

Patterns - Overview

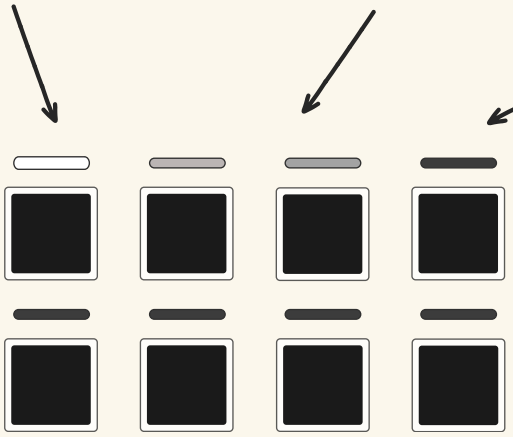
A PROGRESSION is made up of up to 8 PATTERNS.

During normal operation, the white LED pills display the state of all the PATTERNS in the current PROGRESSION.

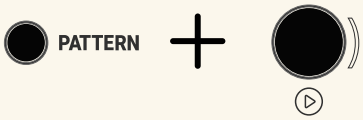
A bright white pill indicates the currently *playing* PATTERN.

A dim white pill indicates an *active* PATTERN.

A dark pill indicates an *inactive* PATTERN.



Hold PATTERN then press the RIGHT button to copy the current PATTERN to the next PATTERN slot.



The LEFT and RIGHT buttons navigate between *active* patterns.

Hold PATTERN then press an RGB button to select a PATTERN.

Sending a trigger to MOD 6 switches to the next active PATTERN. This is equivalent to pressing the RIGHT button.

Patterns - Display

A PROGRESSION is made up of up to 8 PATTERNS.

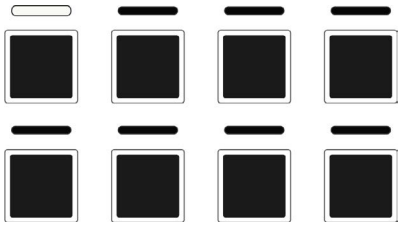
During normal operation, the white LED pills display the state of these PATTERNS

A bright white pill indicates the currently *playing* PATTERN

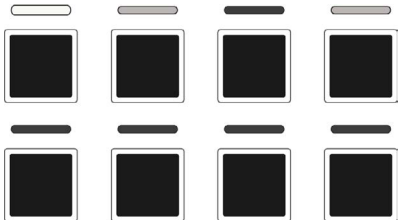
A dim white pill indicates an *active* PATTERN which is not playing.

A dark pill indicates an *inactive* PATTERN.

By default, PATTERN 1 is playing and is the only *active* PATTERN.



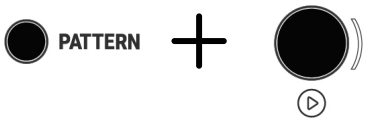
In the example below, PATTERN 1 is *playing* and PATTERNS 2 & 4 are *active*.



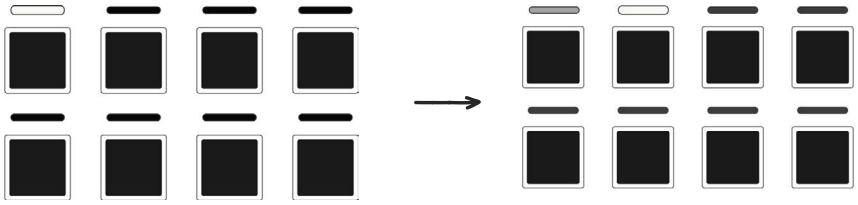
Patterns - Copying

There are 2 ways to copy a PATTERN.

1. Press and hold the PATTERN button and then press the RIGHT ARROW button to copy the playing PATTERN to the next PATTERN slot.

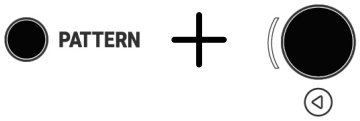


For example, if PATTERN 1 is playing, pressing PATTERN + RIGHT button copies PATTERN 1 to PATTERN 2.



Note that PATTERN 2 is now playing.

2. Press and hold the PATTERN button and then press the LEFT ARROW button to copy the *playing* PATTERN to the previous PATTERN.



Patterns - Navigation

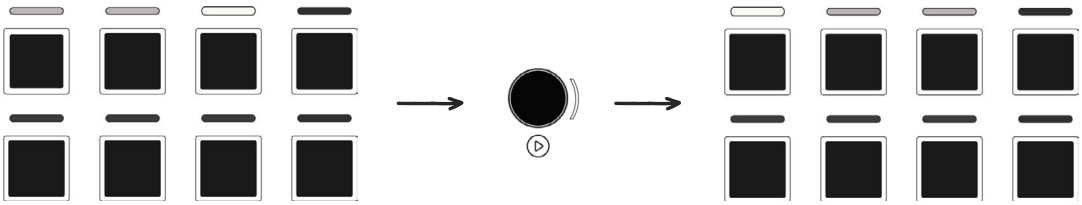
PATTERN SWITCHING METHOD 1 - ARROW BUTTONS

The LEFT or RIGHT ARROW buttons switch between PATTERNS.

Pressing the RIGHT ARROW makes the next *active* PATTERN become the playing PATTERN.

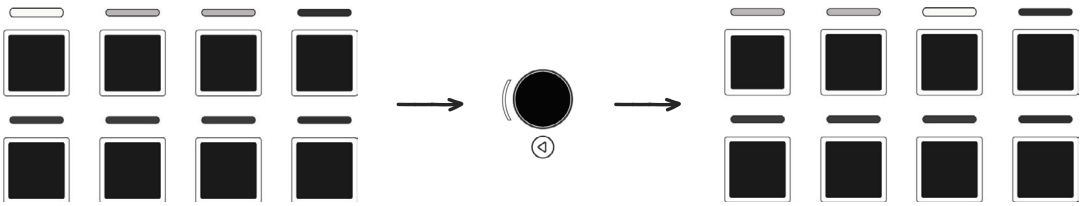
Pressing the LEFT ARROW makes the previous *active* PATTERN become the playing PATTERN.

PATTERN switching is cyclical, if the last *active* PATTERN is playing and the RIGHT ARROW button is pressed...



... the first *active* PATTERN becomes the playing PATTERN.

Conversely, if the first *active* PATTERN is the *control* PATTERN and the LEFT ARROW button is pressed...



... the last *active* PATTERN becomes the playing PATTERN.

(cont.)

PATTERN SWITCHING METHOD 2 - CV

By default, sending a trigger to MOD 6 switches play to the next active PATTERN.

This is equivalent to pressing the RIGHT ARROW button.

For a comprehensive rundown of using MOD's see the CV MODULATION section.

PATTERN SWITCHING METHOD 3 - RGB BUTTONS

Hold PATTERN then press an RGB button to switch directly to the corresponding PATTERN.

The following settings are stored within each PATTERN

Path settings
Scale settings
Octave settings
Spread settings
Inversion settings
Arp/Chord settings
Chromatic settings
Reverse settings
Active note settings i.e. which notes play
Custom pattern settings
MIDI CC settings
MIDI velocity settings
LFO settings

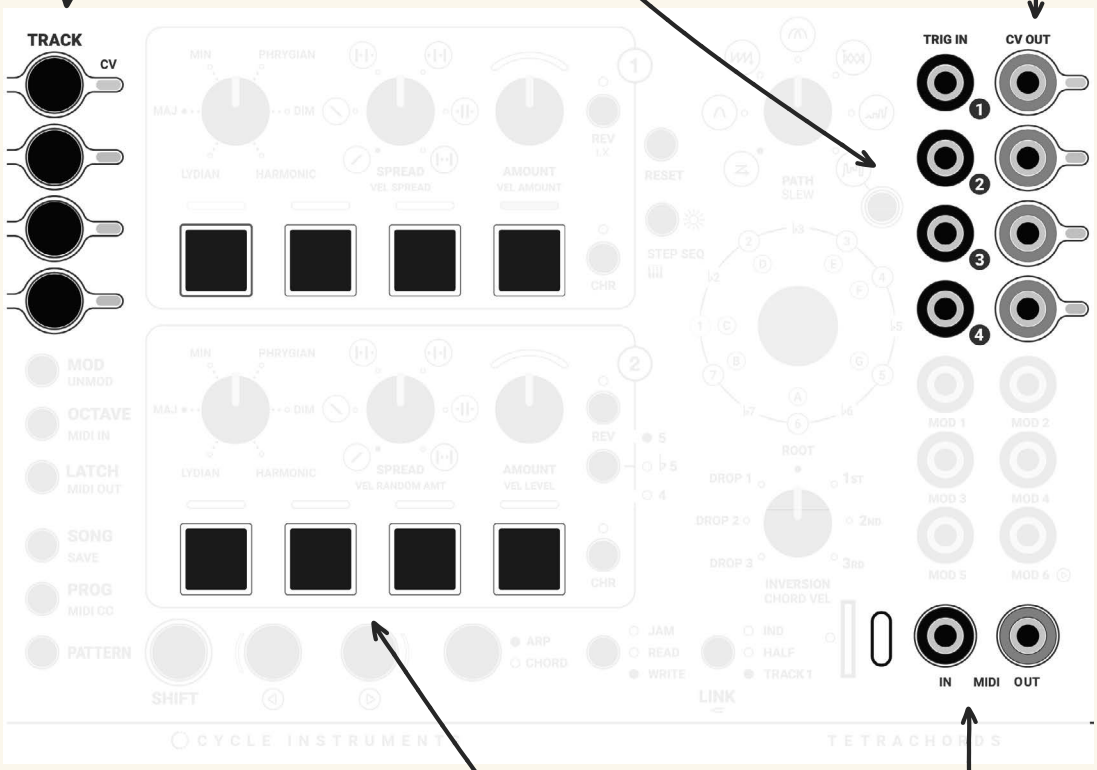
Tracks

The Tetrachords features 4 polyphonic tracks with fixed CV inputs, assignable MIDI inputs and assignable CV and MIDI outputs.

TRIG INS
Assigned to tracks 1-4 respectively.

CV OUTS
Assigned by default to tracks 1-4 respectively

TRACK BUTTONS
Select the active track.



MIDI INPUTS & OUTPUTS

RGB NOTE BUTTONS
Press to activate notes.

Active notes assume the colour of the current track.

Tracks - Triggering

Notes on the Tetrachords can be triggered by an external CV or MIDI connection.

MIDI input connections are made by USB or by the MIDI IN jack.

The MIDI IN jack works with both Type A (Korg) and Type B (Arturia) MIDI jack connectors.

Trig In connections 1 - 4 are used to trigger tracks 1 - 4 respectively.

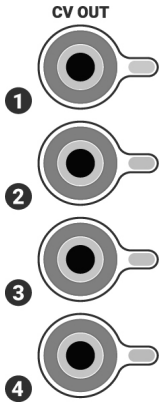
By default, a MIDI note on channels 1-4 will trigger tracks 1-4 repectively.

See the MIDI INPUT section for a comprehensive run down of how the Tetrachords handles incoming MIDI.

Tracks - Outputs

The Tetrachords sends note information via its CV, i2C and MIDI outputs.

By default, tracks 1 - 4 send one-volt per octave CV signals to CV OUTs 1 - 4 respectively.



MIDI output connections are made by USB or by the MIDI OUT jack.

The MIDI OUT jack works with Type A (Korg) MIDI jack connectors by default.

A switch is located on the bottom PCB of the Tetrachords to switch the MIDI OUT to Type B.

By default, tracks 1 - 4 send MIDI note messages on channels 1 - 4 respectively.

The Tetrachords MIDI functionality is highly configurable. See the MIDI OUTPUT section for a comprehensive run down of how the Tetrachords handles outgoing MIDI.

Link

The LINK feature is inspired by some of the ways musicians interact when playing polyphonic music.

Using the LINK feature, a player can specify two things.

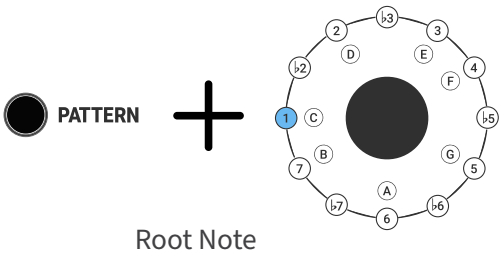
1. Whether or not TRACKS will always play the same scale as each other.

2. Whether or not TRACKS will always play the same PATTERN as each other.

WHAT IT MEANS FOR TRACKS TO 'PLAY THE SAME SCALE'

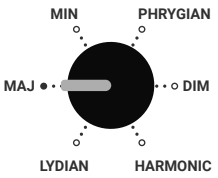
On the Tetrachords, TRACKS having the same scale settings, means that the following 5 settings will be identical.

1



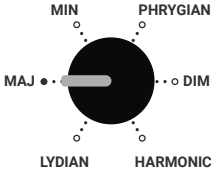
Root Note
(PATTERN + ENCODER)

2



Tetrachord 1

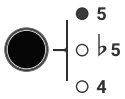
3



Tetrachord 2

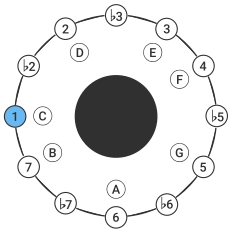
(cont.)

4



5 - ♭5 - 4

5



Musical Mode aka Scale Shift
(ENCODER)

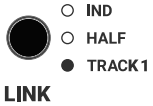
WHAT IT MEANS FOR TRACKS TO 'PLAY THE SAME PATTERN'

Having the same PATTERN settings means that the TRACK in question will have the same number of active PATTERNS as TRACK 1 does, and will be playing the same PATTERN that TRACK 1 is.

This is analagous to musicians agreeing to always change chords together at the same time.

LINK SETTINGS

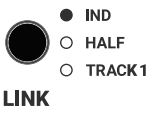
There are 3 possible LINK settings, which can be set with the LINK BUTTON.



1. IND aka Independent
2. HALF aka half-linked to TRACK 1
3. TRACK 1

NOTE: it isn't possible to change the LINK setting of TRACK 1 which, by definition, is always linked to itself.

(cont.)

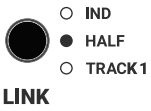


TRACKS set to **INDEPENDENT** can have different scale and PATTERN settings to TRACK 1 and any of the other tracks.

A TRACK set to IND is analagous to a musician who is free to choose any notes and play independently of their bandmates.

Possible use cases for this setting include:

1. Playing a riff or bassline that doesn't change whilst other linked TRACKS play a sequence of chords.
2. Exploring more adventurous ideas where harmonic sequences of different lengths and/or tonalities play alongside each other.



TRACKS set to **HALF-INDEPENDENT** can have independent scale settings to TRACK 1, but always have the same PATTERN settings.

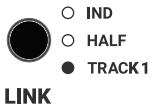
Changes made to the PATTERN settings, on any TRACK with LINK set to HALF, will carry over to every other TRACK with LINK set to HALF or TRACK 1.

A TRACK set to HALF is analagous to a musician who is free to choose any notes or scales but always changes chords at the same time as their bandmates.

Possible use cases for this setting include:

1. Incorporating scales that use notes outside the primary key of a progression.
2. Experimenting with polytonality by stacking progressions in different keys.
3. Starting with a sequence created with the TRACK 1 LINK setting then using the ENCODER to make it sound a little less locked-in and predictable.

(cont.)



TRACKS set to **TRACK 1** have the same scale and PATTERN settings as TRACK 1.

Changes made to scale settings, on any TRACK with LINK set to TRACK 1, will carry over to every other TRACK with the same setting.

Changes made to the PATTERN settings, on any TRACK with LINK set to TRACK 1, will carry over to every other TRACK with LINK set to TRACK 1 or HALF.

This is analagous to musicians agreeing to always use notes from the same scale and to always change chords together at the same time.

Octaves

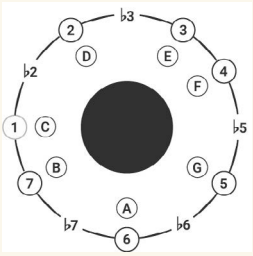
The octave setting affects all notes played by the track.

When the Octave button is pressed, the LEDs above the RGB note buttons display the current track's octave setting.

The default setting is octave 4, as illustrated below.

Pressing an RGB note button, whilst the octave button is pressed, changes the octave setting for the current track.

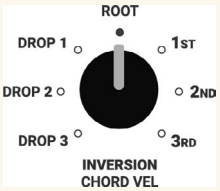
Turning the rotary encoder, whilst the octave button is pressed, also changes the track octave setting.



A clockwise turn increments the octave setting, an anti-clockwise setting decrements it.

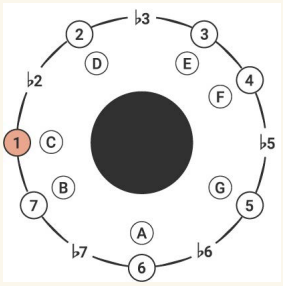
Inversions - Overview

The inversion knob selectively shifts notes in the scale up or down by 1 octave.



Pressing and holding the shift button and then turning the rotary encoder clockwise causes the lowest active notes to be raised by one octave.

Continuously turning the encoder clockwise results in notes cascading upwards until they reach their upper limit.



Similarly, pressing shift and turning the encoder counter-clockwise causes the highest active notes to be lowered one octave.

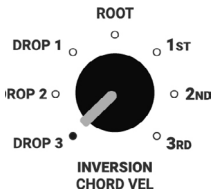
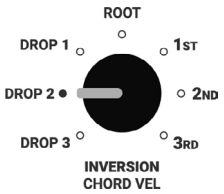
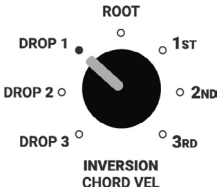
Continuously turning the encoder counter-clockwise results in notes cascading downwards until they reach their lower limit

Inversion knob

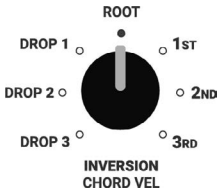
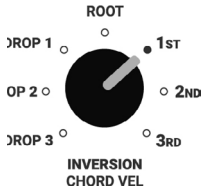
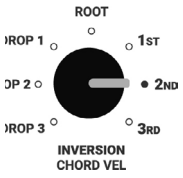
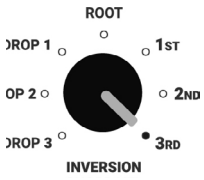
The inversion knob selectively shifts notes up or down by 1 octave.

Unlike the SPREAD and AMOUNT control sections, which affect only one tetrachord, the INVERSION knob affects the entire scale.

A detailed description of each inversion setting is given below.

SETTING		TETRACHORD 1	TETRACHORD 2
DROP 3		Notes 3 and 4 are lowered by 1 octave.	
DROP 2		Notes 5 and 6 are lowered by 1 octave.	
DROP 1		Notes 7 and 8 are lowered by 1 octave.	

(cont.)

SETTING		TETRACHORD 1	TETRACHORD 2
ROOT		The neutral setting. No notes are affected.	
1st		Notes 1 and 2 are raised by 1 octave.	
2nd		Notes 1, 2, 3 and 4 are raised by 1 octave.	
3rd		Notes 1, 2, 3, 4, 5 and 6 are raised by 1 octave.	

THEORETICAL DISCLAIMER

(safe to ignore for everyone - possibly interesting to those familiar with inversions and associated terminology)

The Tetrachords implementation of inversions does not align 100% with established practice.

This is for pragmatic reasons, to make the INVERSION knob more useful and fun.

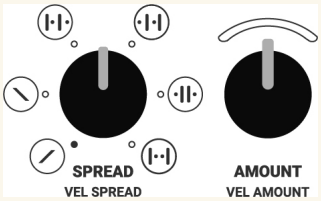
The way it works is the INVERSION knob handles notes in pairs. any octave shift performed on the 1st of the scale gets performed on the 2nd also. Similarly shifting the 3rd shifts the 4th, shifting the 5th shifts the 6th and shifting the 7th shifts the 8th.

The result of this is that when playing 3 or 4 note chords based on 3rds, inversions work as anyone who is familiar with standard terminology would expect.

When playing with 9ths, 11ths 13th etc. inversions are handled in a non-standard manner idiosyncratic to the Tetrachords.

Spread - Overview

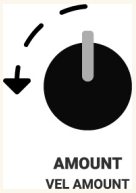
Each tetrachord section has two spread controls, SPREAD and AMOUNT.



The SPREAD knob selects which notes will be shifted up or down by the AMOUNT KNOB.

The AMOUNT knob has no effect at the 12 o'clock position indicated by the dimming of the LEDs above the knob.

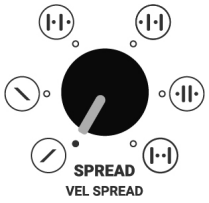
When turned clockwise, the AMOUNT knob shifts selected notes up by 1 to 3 octaves.



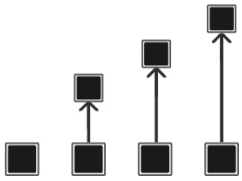
When turned counter-clockwise, the AMOUNT knob shifts selected notes down by 1 to 3 octaves.

Spread - Detail

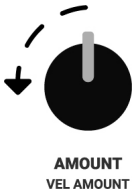
SETTING 1

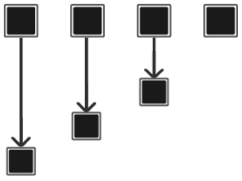


In this setting, notes at the beginning of the tetrachord will always be lower than those at the end.



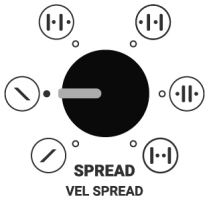
Turning the AMOUNT knob clockwise raises notes by 1 to 3 octaves.



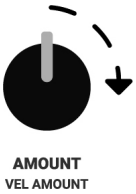


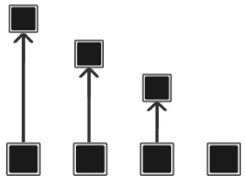
Turning the AMOUNT knob counter-clockwise lowers notes by 1 to 3 octaves.

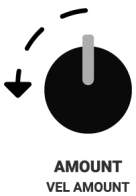
SETTING 2

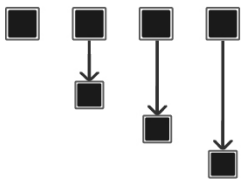


In this setting, notes at the beginning of the tetrachord will always be higher than those at the end.









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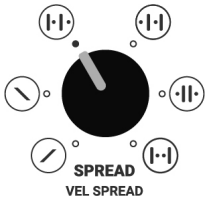
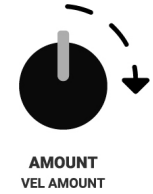
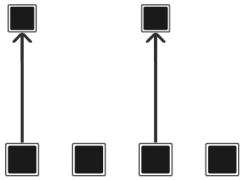
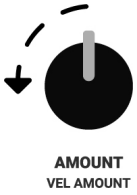
SETTING 3

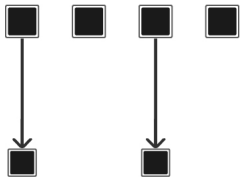


In this setting, the amount knob affects only the 1st and 3rd notes of the tetrachord.

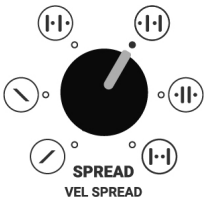




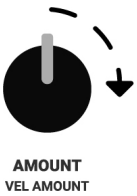


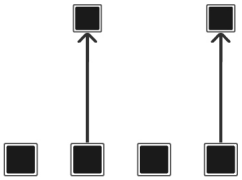


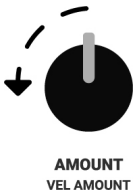
SETTING 4

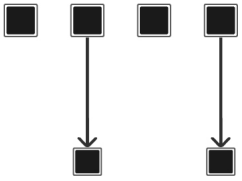


In this setting, the amount knob affects only the 2nd and 4th notes of the tetrachord.









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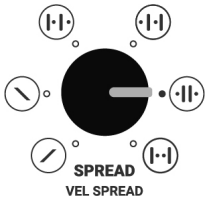
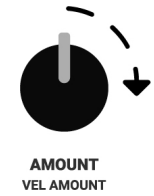
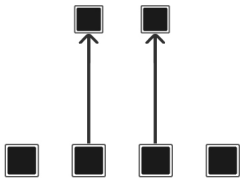
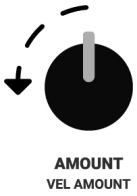
SETTING 5

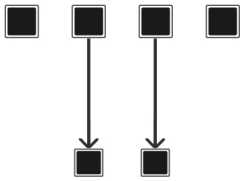


In this setting, the amount knob affects only the middle notes of the tetrachord.

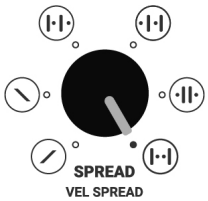




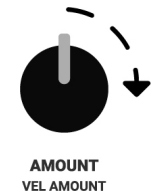


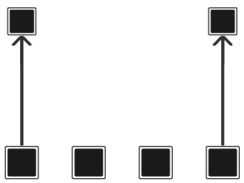


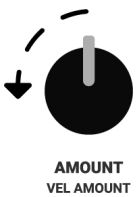
SETTING 6

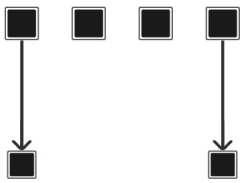


In this section, the amount knob affects only the outer notes of the tetrachord.



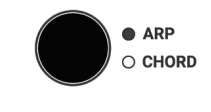






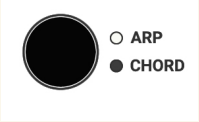
Arp / Chord

When the Arp / Chord button is set to ARP, notes in the current pattern are played one at a time.



The order of the notes is determined by the PATH knob.

When the Arp / Chord button is set to CHORD, all notes in the current pattern are played simultaneously.



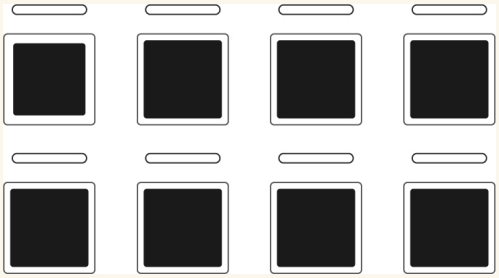
Note that, depending on how many notes are active and how the chromatic buttons are set, a pattern can contain as many as 13 notes.

The Tetrachords module can easily transmit 13 note chords via MIDI, however it is limited to a maximum of 4 simultaneous notes via CV.

For more details on CV polyphony, see the CV OUT section of this guide.

Path - Overview

Pressing an RGB note button, results in a note being added to, or removed from, the current pattern.



The order in which a pattern's notes play is determined by the position of the PATH knob.

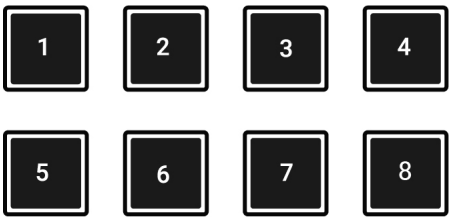
Path - Description

The order in which a pattern's notes play is determined by the position of the PATH knob.

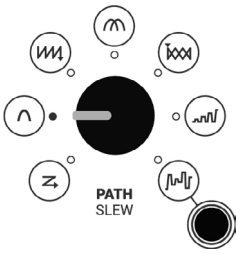
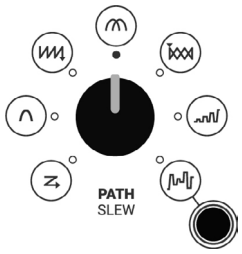
The various path settings are described on the following pages.

In the descriptions, note order refers to order in which the RGB note buttons are triggered.

The buttons are referred to by number as illustrated below.



(cont.)

	NOTE ORDER	PATH KNOB
PATH 1	1 - 2 - 3 - 4 5 - 6 - 7 - 8	
PATH 2	1 - 2 - 3 - 4 5 - 6 - 7 - 8 8 - 7 - 6 - 5 4 - 3 - 2 - 1	
PATH 3	1 - 5 - 2 - 6 3 - 7 - 4 - 8	
PATH 4	1 - 3 - 2 - 4 5 - 7 - 6 - 8	
PATH 5	1 - 5 - 2 - 7 4 - 8 - 3 - 6	

(cont.)

	NOTE ORDER	PATH KNOB
PATH 6	**1** **1 - 2** **1 - 3** **1 - 4** **1 - 5** **1 - 6** **1 - 7** **1 - 8**	

This pattern adapts dynamically in response to which notes are active.

PATH 7 **RANDOM**

A random combination of active notes.

By default, the RANDOM path is a 5-note loop, consisting of some random combination of the currently active notes.

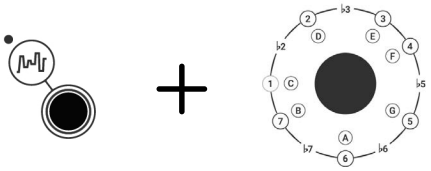
In the default loop, active notes may be repeated or omitted.

Press the random button once to re-randomise the pattern.

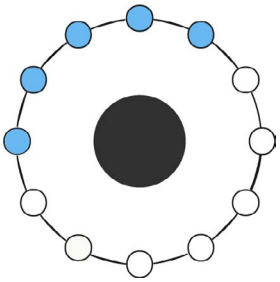
(cont.)

RANDOM - ASSIGNABLE LENGTH, WITH REPEATS

Press and hold the RANDOM button and turning the ROTARY ENCODER to configure the RANDOM PATH.



The LED ring displays the length of the random loop.

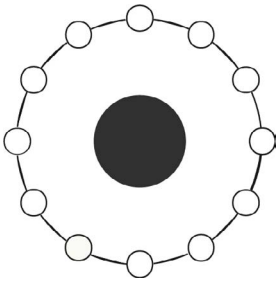


Turning the encoder changes the loop length

In this default mode, where notes can be omitted or repeated, the loop length can be from 1 - 12 notes.

RANDOM - ALL ACTIVE NOTES, NO REPEATS

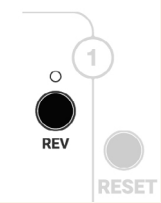
Turning the encoder anti-clockwise, as if to set the length to zero, results in a random note loop in which all active notes appear at least once.



In this case, the length of the loop is equal to the number of active notes.

Reverse

Each tetrachord section features a reverse button, labelled REV.

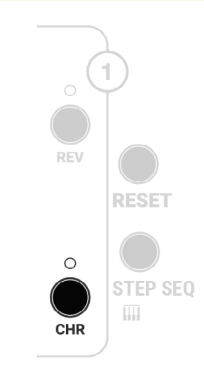


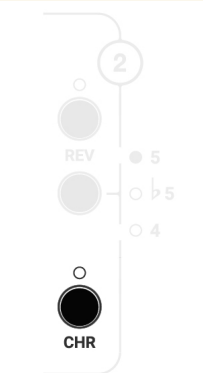
The reverse button reverses the order in which any active notes in the corresponding tetrachord are played.

The LED above the button illuminates when reverse is engaged.

Chromatic - Overview

Each tetrachord section features a chromatic button, labelled CHR





The chromatic button adds non-scale notes to the current pattern.

The LED above the button illuminates when the chromatic button is engaged.

The chromatic button affects a pattern differently depending on the how many notes are active in the corresponding tetrachord.

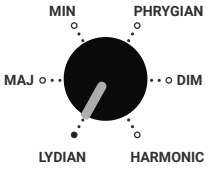
The way this works is detailed on the following pages.

Chromatic Button

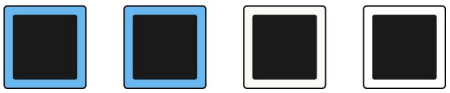
When two notes are active, and the chromatic button is engaged, any notes in between the two active notes will play.

For example:

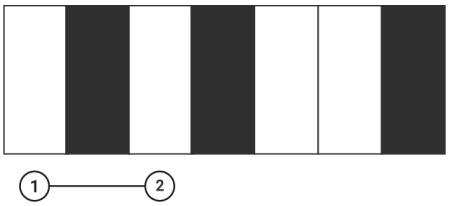
1. Set Tetrachord 1 to Lydian



2. Activate notes 1 & 2

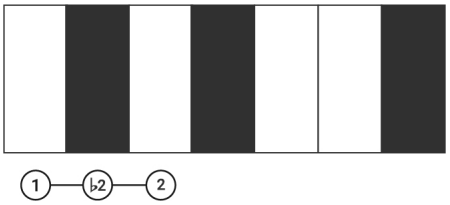


Scale notes 1 & 2 are now part of the current sequence.



3. Press the chromatic button

The ♭2 note i.e. the note between scale notes 1 & 2, is now part of the sequence also.



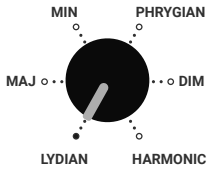
(cont.)

When three notes are active the chromatic button causes, any two notes in between the first two active notes to play.

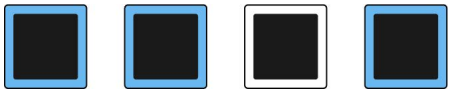
The chromatic button has no effect on the third active note.

For example:

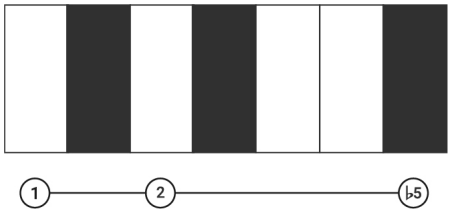
1. Set Tetrachord 1 to Lydian



2. Activate notes 1, 2 & 4

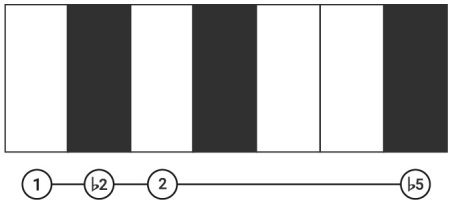


Scale notes 1, 2 & ♭5 are now part of the current sequence.



3. Press the chromatic button

The ♭2 note i.e. the note between scale notes 1 & 2, is now part of the sequence also.



(cont.)

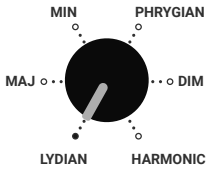
When four notes are active and the chromatic button is engaged:

Any notes between the first two active notes become part of the sequence.

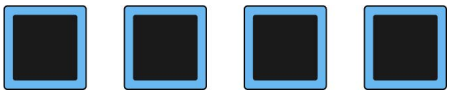
Any notes between the last two active notes become part of the sequence.

For example:

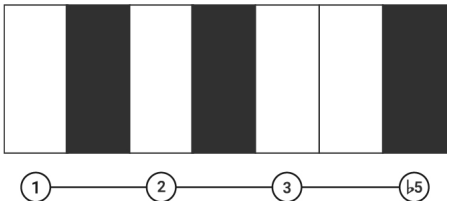
1. Set Tetrachord 1 to Lydian



2. Activate notes 1, 2, 3 & 4



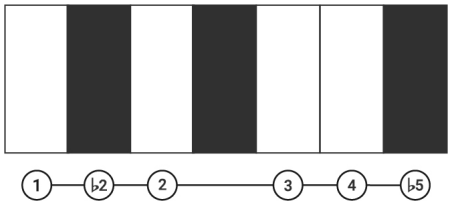
Scale notes 1, 2, 3 & ♭5 are now part of the current sequence.



3. Press the chromatic button

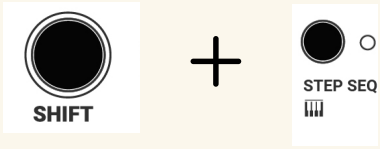
The ♭2 note i.e. the note between scale notes 1 & 2, is now part of the sequence.

The 4 note i.e. the note between scale notes 3 & ♭5, is now part of the sequence.



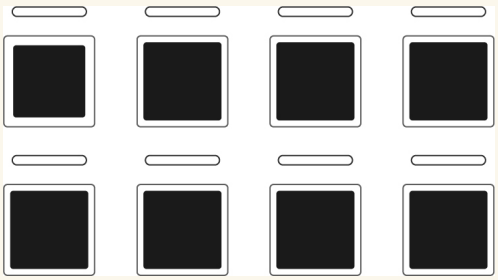
Keyboard Mode

Pressing and holding SHIFT, then pressing the STEP SEQ button places the RGB buttons into KEYBOARD MODE.



The STEP SEQ button LED will flash, indicating that KEYBOARD MODE has been engaged.

In KEYBOARD MODE, the RGB buttons can be triggered manually by pressing them.



To exit KEYBOARD MODE, press the STEP SEQ button again (with or without the SHIFT button).

Step Sequencer - Overview

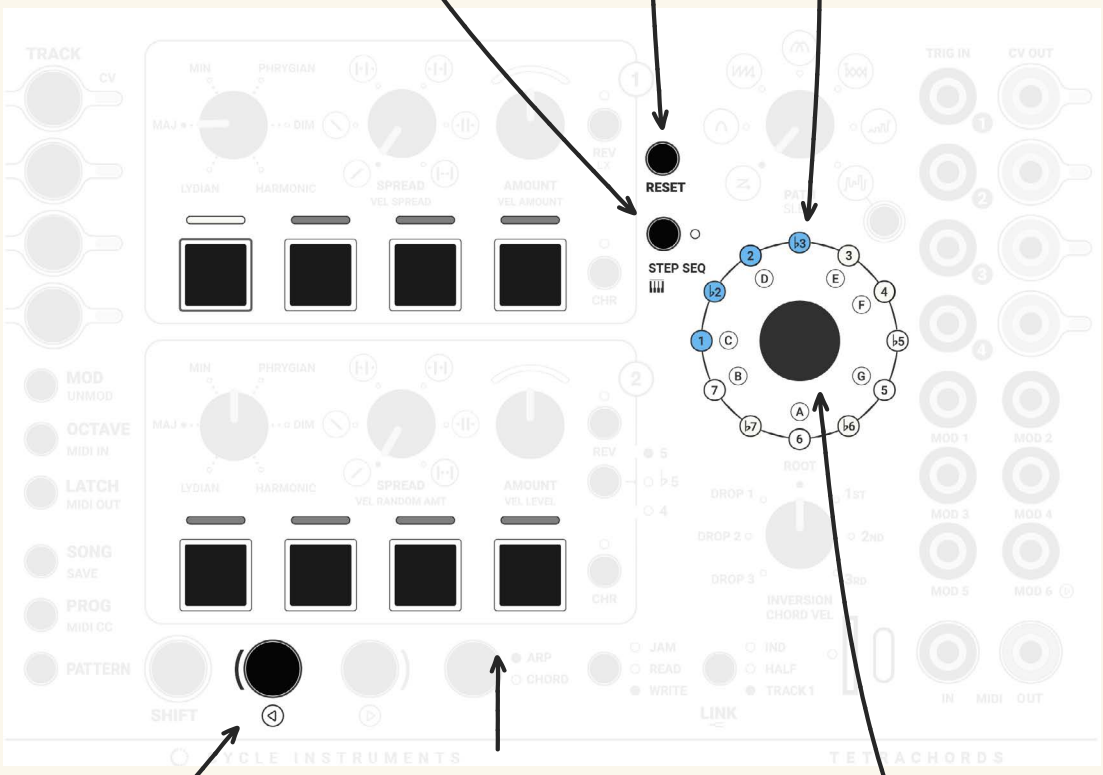
The STEP SEQUENCER allows for user programmable sequences of up to 32 notes.

RESET BUTTON
Press when the STEP SEQ button is held to clear all notes from a sequence.

STEP SEQ BUTTON (PRESS)
Toggles between the STEP SEQUENCER and regular playback as described in the PATH KNOB section of this guide.

LED RING
When the STEP SEQ button is held, the LED ring indicates notes active in the current sequence.

STEP SEQ BUTTON (PRESS & HOLD)
Press and hold to edit the current sequence.



Left Button
Deletes notes from the sequence pattern when the STEP SEQ button is held.

RGB Buttons
Used to add notes to the sequence when the step sequencer is active.

Pressing an RGB button whilst the STEP SEQ button is held clears the current sequence and starts a new one.

ROTARY ENCODER
When the STEP SEQ button is held, turning the encoder shifts the point at which notes will be added to or removed from the sequence.

Step Sequencer - Description

The STEP SEQUENCER can be used to program a bespoke sequence of up to 32 notes. It works similarly to classic step-time sequencers such as found on the Roland SH-101.

In regular Tetrachords operation, the order of notes is determined by the PATH knob, which selects one of the 6 pre-defined note patterns, or a randomised pattern.

With the STEP SEQUENCER enabled, the order of notes and the length of the pattern is determined by the player.

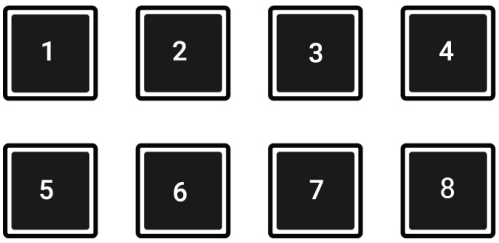
TOGGLE STEP SEQUENCER

Press the STEP SEQ button to toggle between step sequencer playback and regular, PATH knob controlled playback.

The white LED beside the STEP SEQ button is illuminated when the step sequencer is active.

ADD NOTES TO A SEQUENCE

When the step sequencer is active, pressing an RGB button adds a note to the sequence.



The order of the notes is determined by the order in which the buttons are pressed.

For example, pressing buttons 1, 1, 4, 3, 4, 1 generates the corresponding note order.

1 - 1 - 4 - 3 - 4 - 1

(cont.)

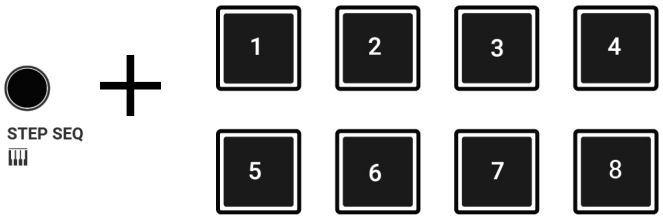
Step Sequencer

CLEAR ALL NOTES

Press and hold the STEP SEQ button then press the RESET button to clear all notes from the sequence.

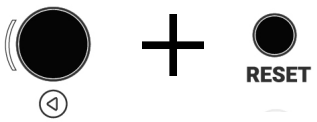
CLEAR ALL NOTES AND START A NEW SEQUENCE

Press and hold the STEP SEQ button then press any RGB button to clear the current sequence and start a new one.



DELETE THE MOST RECENT NOTE

Press and hold the STEP SEQ button then press the BACK button to clear a single note from the custom path.



STEP SEQUENCER LED RING DISPLAY

When the STEP SEQ button is pressed, the RGB LED ring and the white LED PILLS display the seqeunce length

(cont.)

Reset

RESET is an implementation of the classic sequencer reset function.

Pressing RESET when in ARP or STEP SEQ mode causes a PATTERN to start again from the first note.

The RESET button is also used as a utility function for Initialising and clearing.

Go to the Utility Buttons section for a full rundown of how RESET is used as a utility function.

Jam / Read / Write

JAM/READ/WRITE is a feature that specifies what changes, are stored in a PATTERN, and how notes play back as PATTERNS change.

When in WRITE mode, all changes to the current PATTERN are stored. So, if you make changes, then navigate away from the PATTERN and then navigate back, the changes you made persist.

WRITE mode is the default setting.

When in READ mode, all changes to the current PATTERN are *not* stored. So, if you make changes, then navigate away from the PATTERN and then navigate back, the PATTERN will be in its original state.

The idea of READ mode is to provide the freedom to experiment wildly, whilst still being able to return to a familiar state.

When in JAM mode, the SPREAD, SPREAD AMOUNT and ACTIVE NOTE settings persist when changing PATTERNS.

The idea of JAM mode is to make it more likely that notes will stay in the same octave register when changing PATTERNS. This can make it easier to stay, ‘in the moment’, when jamming on PATTERN changes.

JAM MODE - POSSIBLE APPROACH

A good way to approach JAM mode is to create a sequence of PATTERNS with both AMOUNT knobs set to the middle (so they have no effect).

Use the INVERSION and OCTAVE settings to make the sequence flow nicely.

Then jam as the patterns change, using the RGB BUTTONS and the SPREAD and AMOUNT knobs

CV Out - Track settings

Adjusting a track's CV OUT settings is a two step process.

1. Press SHIFT + any of the TRACK/CV buttons (SHIFT can be released at this point).

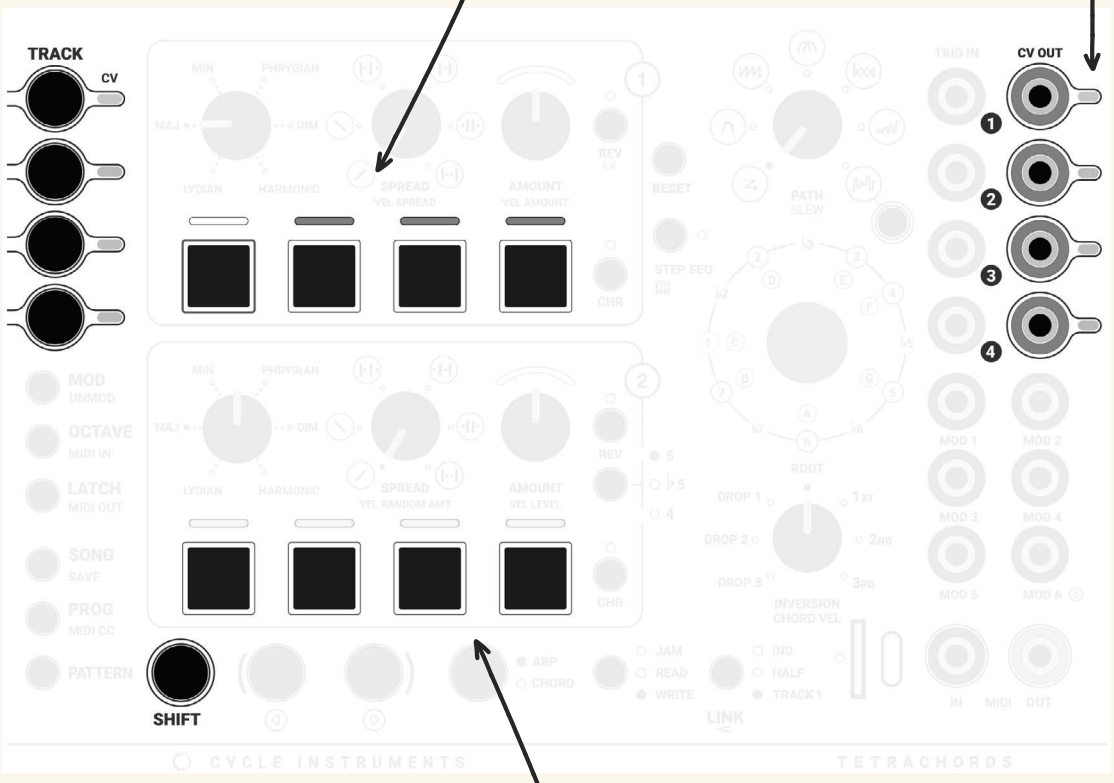
2. Use the RGB buttons to assign CV outputs to the selected track.

CV PITCH OUT

Buttons 1 to 4 assign CV OUT 1 to 4, in V/OCT mode, to the selected track.

CV OUT LEDS

The CV OUT LED colour indicates which CV OUT is assigned to a Track.



CV GATE/VELOCITY OUT

Buttons 5 to 8 assign CV OUT 1 to 4, in Gate Mode, to the selected track. The assigned outputs send a gate signal, scaled according to the MIDI velocity value of the current note.

CV Out - Polyphonic example

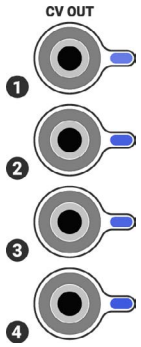
❶ Press SHIFT + TRACK/CV button 1.

SHIFT can be released at this point.

❷ Press RGB buttons 1, 2, 3 & 4.

CV OUTS 1 to 4 are now assigned to TRACK 1. They will transmit note/voltage signals.

This is indicated by CV OUT LEDS 1 to 4 which are now blue, the colour of TRACK 1



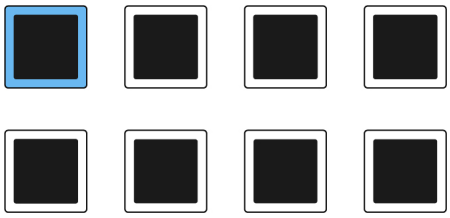
When TRACK 1 is playing and the ARP CHORD button is set to ARP, all 4 CV OUTS transmit the same note/voltage.

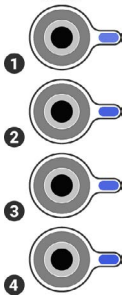
When TRACK 1 is playing and the ARP CHORD button is set to CHORD, the 4 CV OUTS can transmit up to 4 different notes/voltages.

The way it works depends on how many notes are active.

(cont.)

When 1 note is active, all 4 CV OUTS transmit the same note/ voltage.





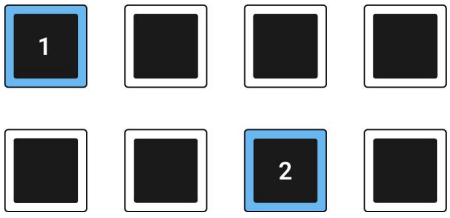
RGB Button 1 note

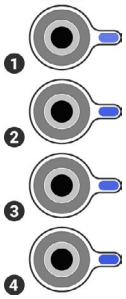
RGB Button 1 note

RGB Button 1 note

RGB Button 1 note

When 2 notes are active, CV OUTS 1 & 3 transmit the 1st note/voltage and CV OUTS 2 & 4 transmit the 2nd.





RGB Button 1 note

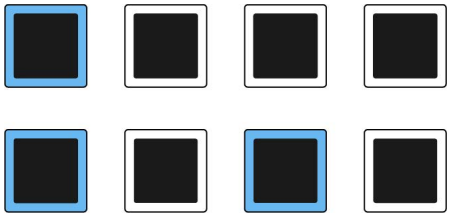
RGB Button 7 note

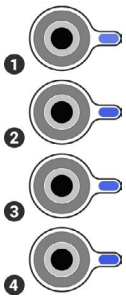
RGB Button 1 note

RGB Button 7 note

When 3 notes are active, CV OUTS 1, 2 & 3 transmit the active notes/ voltages.

CV OUT 4 duplicates note 1.





RGB Button 1 note

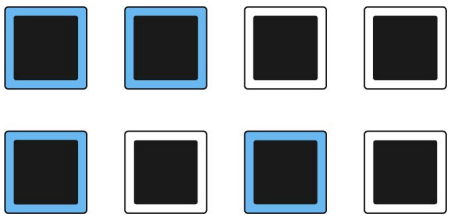
RGB Button 5 note

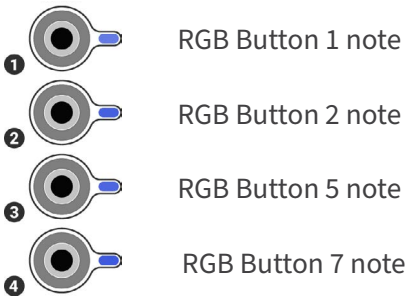
RGB Button 7 note

RGB Button 1 note

(cont.)

When 4 note are active the 4 CV OUTS
each transmit one of the active notes

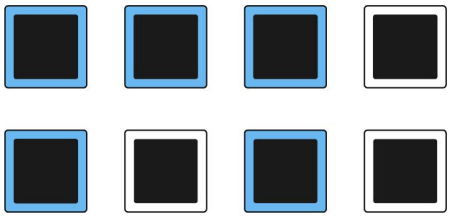


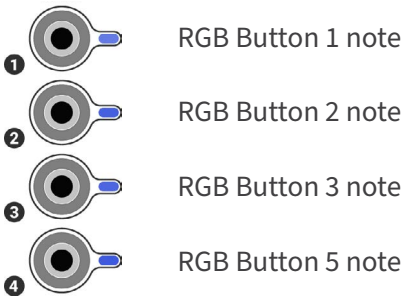


When more than 4 notes are active, the
first 4 active notes (in button order), are
transmitted on CV outs 1 to 4 respectively.

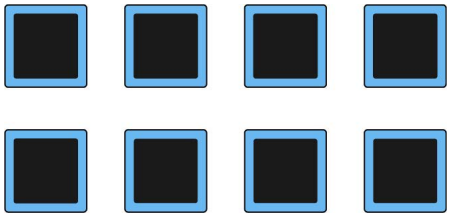
Extra notes are omitted.

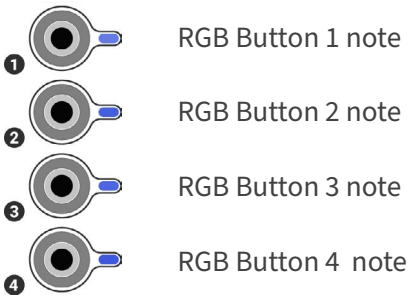
E.g. when 5 notes are active, the
5th note is omitted.





E.g. when all notes are active,
notes 5, 6, 7 & 8 are omitted.





CV Out - Gate out Example

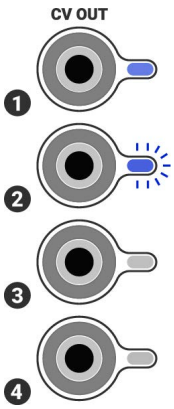
❶ Press SHIFT + TRACK/CV button 1.

SHIFT can be released at this point.

❷ Press RGB buttons 1 & 6

CV OUTS 1 is now assigned to TRACK 1. It will transmit note/voltage signals.

This is indicated by CV OUT LED 1, which shines blue, the colour of track 1.



CV OUT 2 is also assigned to TRACK 1. It will transmit gate signals when notes are triggered.

CV OUT LED 2 flashes blue, the colour of track 1. The flashing indicates that CV OUT 2 is transmitting gate signals.

The generated gate signal will be in the range 0 to 8 volts.

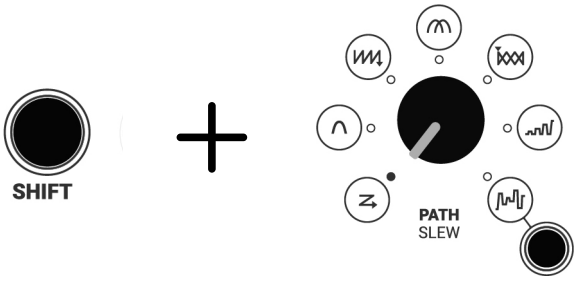
The amplitude is proportional to the MIDI velocity of the note that is triggered i.e. maximum velocity corresponds to 8 volts, minimum to 0 volts.

For details of how to manipulate note velocity, refer to the MIDI Velocity section of this guide.

For details of how the gate output responds to the CV input, refer to the Trig Input Response appendix.

CV Out - Slew

Pressing and holding the shift button, then turning the PATH knob sets the amount of SLEW applied to the CV output.



With SLEW turned fully anti-clockwise, the transition between CV notes is as fast as possible, less than 1 millisecond.

This is the default setting.

Turning SLEW clockwise increases the transition time between CV notes.

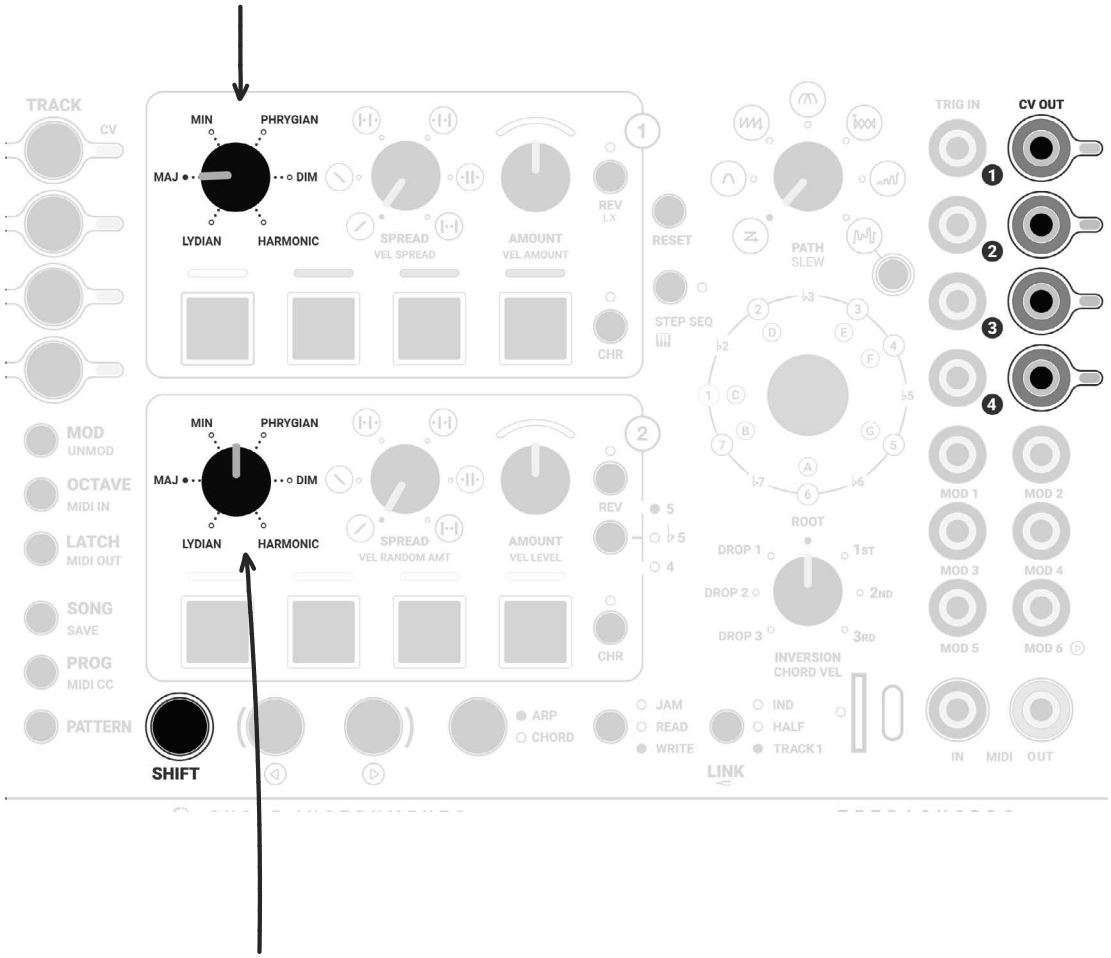
When turned fully clockwise, the transition between CV notes is as slow as possible, approximately 5.5 seconds.

Note that the transition time is independent of the distance between sequenced notes.

CV Out LFO

CURRENT TRACK LFO

SHIFT + TETRACHORD 1 KNOB
Sets the LFO rate for all CV OUTS assigned to the current track.



SHIFT + TETRACHORD 2 KNOB
Sets the LFO depth for all CV OUTS assigned to the current track.

Note: the controls described above can be used to synchronize the LFOS of all CV outputs assigned to a track.

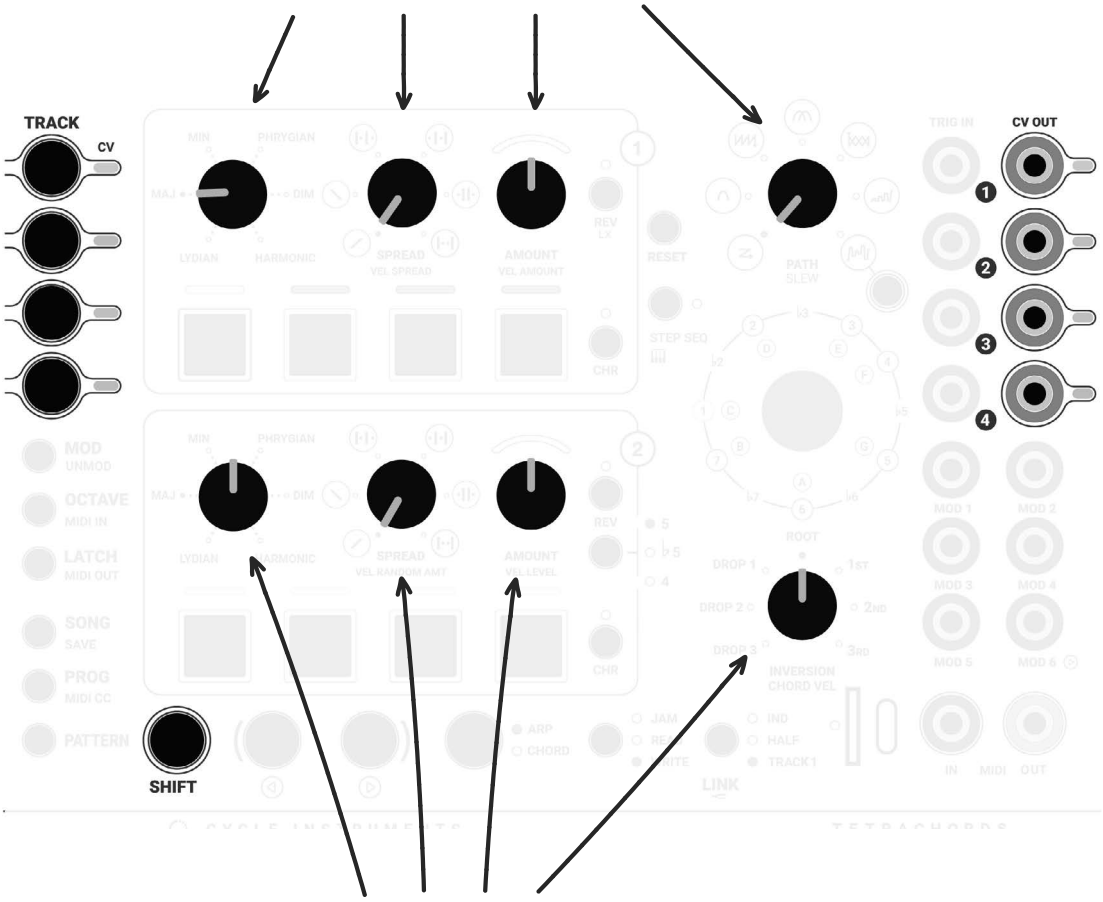
Edit all CV LFOs

1. Press SHIFT + any of the TRACK/CV buttons.

   SHIFT can be released at this point.

2. Use the knobs to adjust LFO settings for all CV OUTS.

KNOBS 1 to 4
Set the LFO rate for CV OUTS
1 to 4 respectively.



KNOBS 5 to 8
Set the LFO amount for CV OUTS
1 to 4 respectively.

The controls described above can be used to independently set the LFOS of all CV outputs assigned to a track.

MIDI INPUT - Overview

Tracks respond to MIDI in two modes, Quantising mode and Simple Triggers mode.

Assigning a Tracks MIDI IN channel and mode is a two step process.

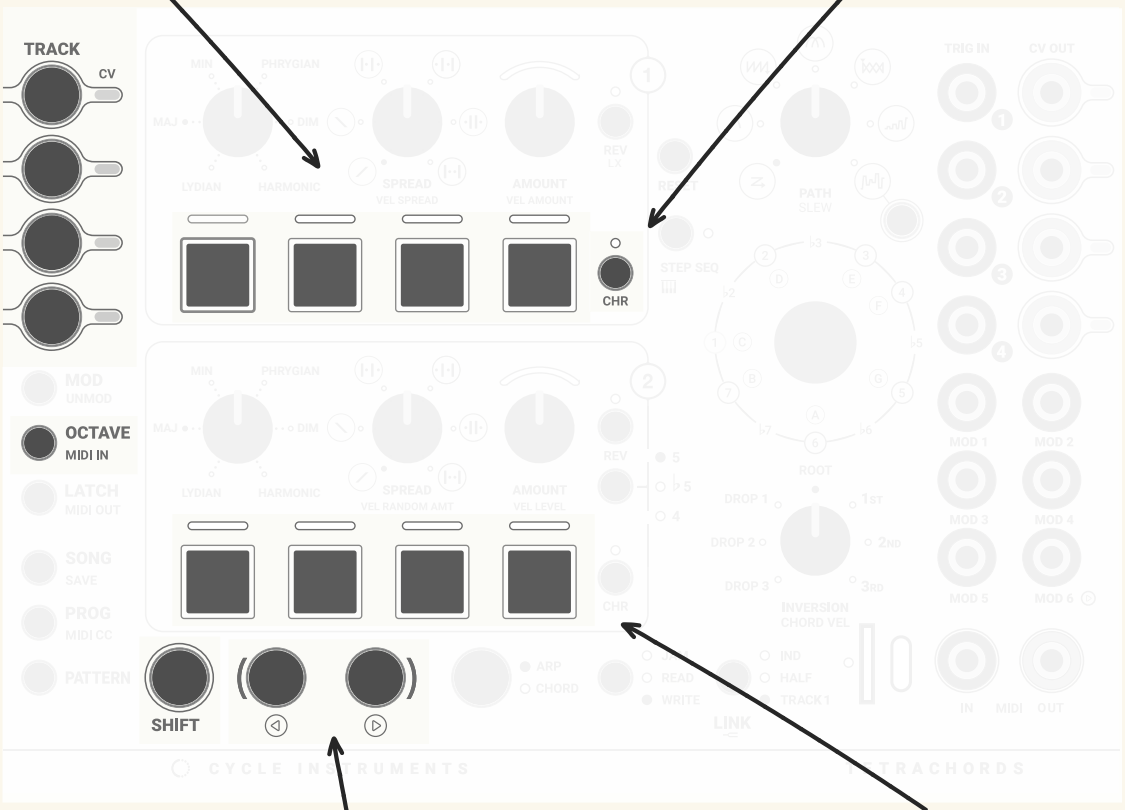
1. Press SHIFT + OCTAVE / MIDI IN (SHIFT can be released).

2. Use RGB buttons to assign MIDI IN channels in one of two modes on the selected track.

RGB Buttons 1-4
Assign MIDI IN channel in Quantising mode

Pills 1-4
Indicates currently selected MIDI channels page

CHR Button
Indicates if incoming MIDI is quantised to the current scale or not



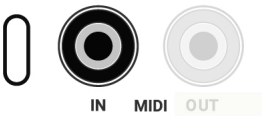
Tracks 1-4
Select which track you are currently editing

Left/Right buttons
Move between MIDI channels 1-16 in 4 pages shown on the Pills

RGB Buttons 5-8
Assign MIDI IN channel in Simple Triggers mode

MIDI INPUT - Connections

The Tetrachords accepts MIDI input via 3.5mm stereo jack and USB C.



The Tetrachords is configured as a class compliant USB C device. This means there is no need to install drivers but it will only pair with a USB host.

The 3.5mm stereo jack accepts both type A and type B connectors.

MIDI INPUT - Tracks

By default tracks 1-4 respond to incoming MIDI messages on channels 1-4 respectively.

By default Tracks 1-4 are set to respond in Simple Trigger mode.

The default MIDI IN Track assigments can be changed using the config.txt file and online configuration editor.

See the Config Text File section for a full rundown on how to configure the default MIDI IN assignments.

SIMPLE TRIGGER MODE

In Simple Trigger mode incoming MIDI notes trigger the selected Track.

By default tracks 1-4 respond in Simple Trigger mode on MIDI channels 1-4 respectively.

Simple Trigger mode mirros the functionality of the Trig input of each track but instead of using analogue trig and gate signals it uses the incoming MIDI notes.

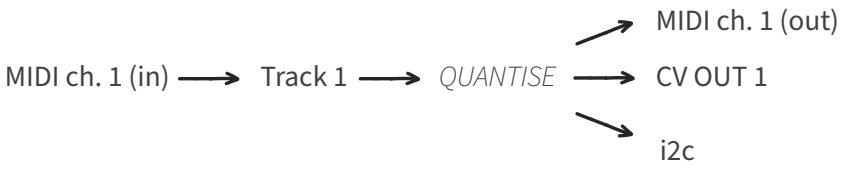
(cont.)

QUANTISATION MODE

In Quantisation mode Incoming note messages are quantised to conform to the scale settings of the current track.

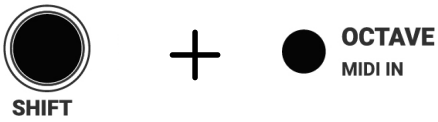
The quantised notes are then transmitted to any outputs that have been assigned to the track in question.

For example,



To turn off quantisation, so the Tetrachords functions as a MIDI through and MIDI to CV/I2C box:

Press and hold the SHIFT button then press and hold OCTAVE/MIDI IN.



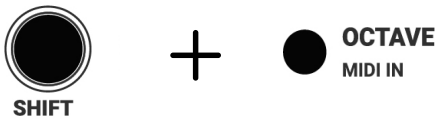
SHIFT can be released at this stage.

Press the top CHROMATIC button to toggle quantisation.

The top CHROMATIC LED fully illuminates, indicating that chromatic MIDI notes will be passed through, unquantised.

TRACK MIDI IN CHANNEL CONFIGURATION

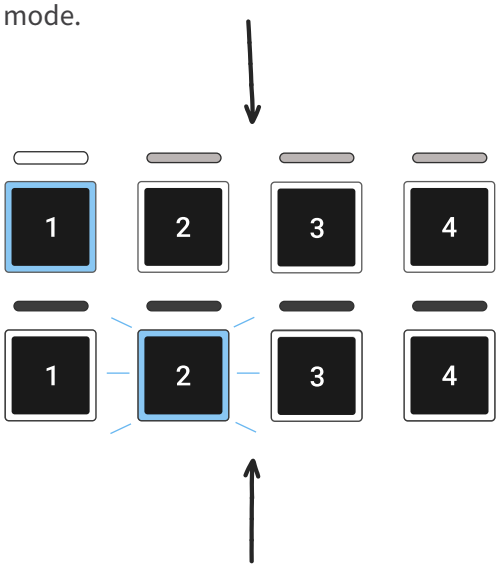
Press and hold the SHIFT button then press and hold OCTAVE/MIDI IN.



SHIFT can be released at this stage.

Whist holding OCTAVE/MIDI IN, it is possible to configure the current Track's MIDI INPUT channel and mode.

The top row of RGB buttons correspond to MIDI IN channels 1-4 in Quantisation mode.



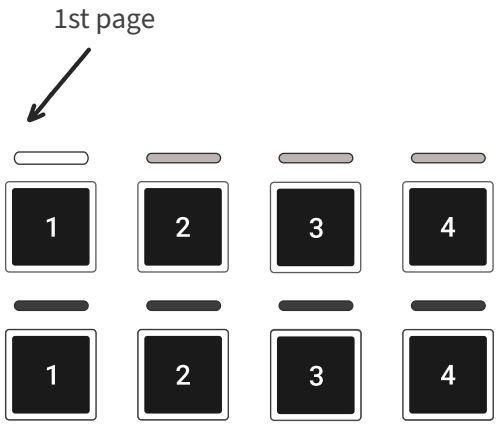
The bottom row of RGB buttons correspond to MIDI IN channels 1-4 in Simple Trigger mode.

Pressing an RGB button toggles the corresponding MIDI channel as an input for the current track.

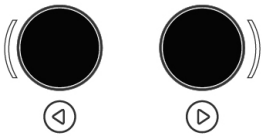
Up to 16 MIDI channels can be assigned to each track. The 16 MIDI channels are arranged in 4 banks of 4.

The LED pills 1 - 4 are illuminated, indicating there are four accessible pages of settings. i.e. 4 groups of 4 channels.

The brighter pill indicates the active page:



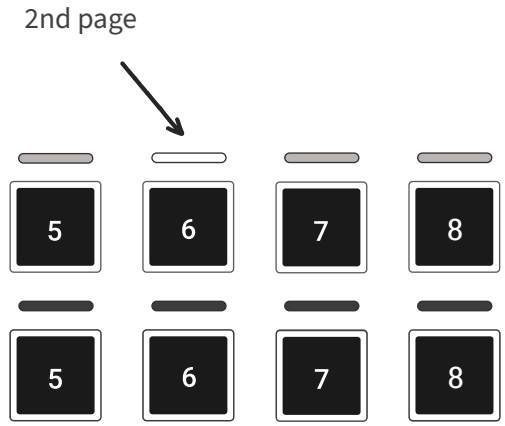
The LEFT and RIGHT buttons navigate between pages.



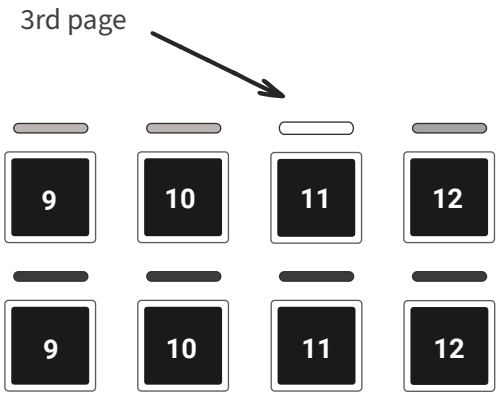
Press the RIGHT button to move to the next page

(cont.)

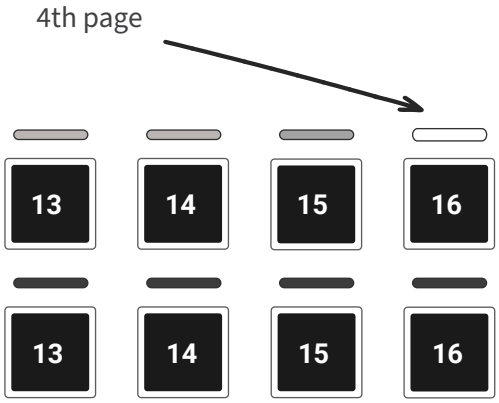
The RGB buttons now allow configuration of MIDI channels 5-8.



MIDI channels 9-12.



MIDI channels 13-16.



(cont.)

MIDI TO CV - MULTIPLE NOTES

When a TRACK receives a single MIDI note, that note is output to all CV OUTS that have been assigned to that TRACK.

When a TRACK receives multiple MIDI notes simulataneously, those notes are distributed between the assigned CV OUTs.

Example:

1. Assign CV OUTS 1 to 4 to TRACK 1 (page 81.)
2. Connect a MIDI keyboard to the Tetrachords and set it to output on MIDI channel 1.
3. Press and release a single note on the MIDI keyboard.

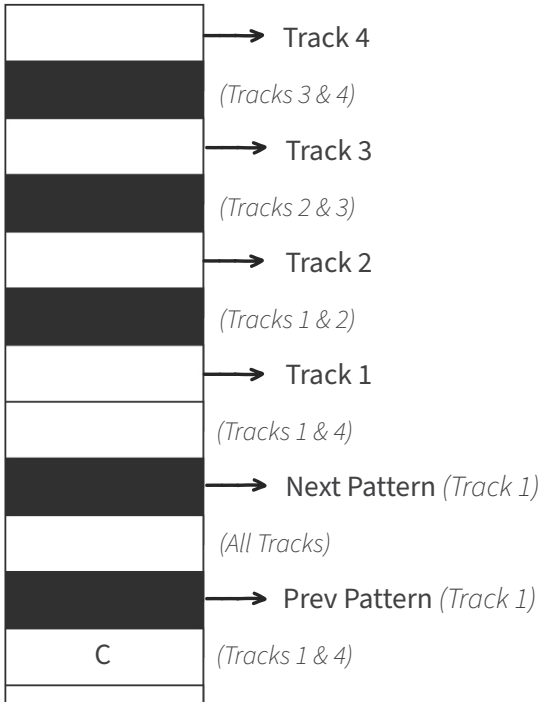
   All 4 CV OUTS will transmit a pitch corresponding to that single note.

4. Press and hold four notes on the keyboard.

   Pitches corresponding to the four notes will be distributed between CV OUTS 1 - 4.

MIDI INPUT - All-Tracks Trigger Channel

By default MIDI channel 5 is the *All-Track Trigger* channel.



Notes F, G, A & B, in any octave, trigger TRACKS 1, 2, 3 & 4 respectively.

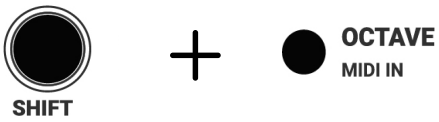
In-between notes trigger multiple TRACKS as illustrated above.

Additionally, notes C# and D# cause TRACK 1, and any linked TRACKS, to progress to the previous or next PATTERN.

(cont.)

ALL TRACKS MIDI CHANNEL CONFIGURATION

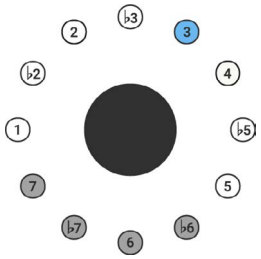
Press and hold the SHIFT button then press and hold OCTAVE/MIDI IN.



SHIFT can be released at this stage.

The first 8 LED ring LEDs now correspond to MIDI channels 1-8.

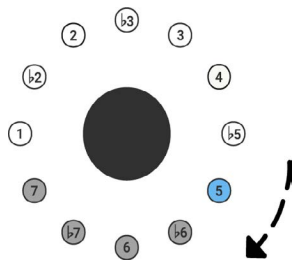
Turning the encoder selects the all-track trigger channel.



The selected channel is illuminated with the current track colour.

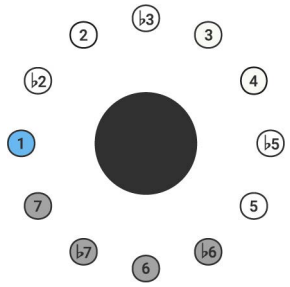
A single channel 1 - 16 can be selected.

To select channels 9-16, turn the encoder clockwise, past the 8th setting.



(cont.)

The LED ring now displays channels 9-16.



Here, MIDI channel 9 is selected.

MIDI Output - Overview

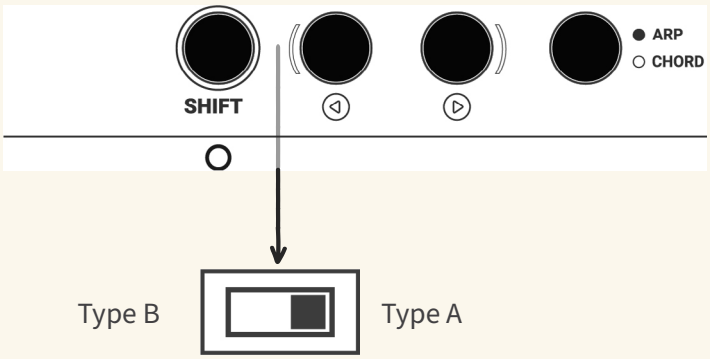
By default, Tracks 1 to 4 output MIDI on channels 1 to 4 respectively.

MIDI is output via the 3.5mm stereo jack and USB C.

The Tetrachords is configured as a class compliant USB C device. This means there is no need to install drivers however, it will only pair with a USB host.

The 3.5mm stereo output jack can work with either type A or type B connectors.

Select Type A or Type B using the switch located on the bottom PCB board, underneath the SHIFT and LEFT buttons.



CAUTION

Care is required when handling the under-side of a module.

Make sure the power is off.

Avoid touching electrical components, other than switches.

Take basic precautions to minimise the risk of static discharge, e.g. don't wear woolly jumpers or other clothes prone to static.

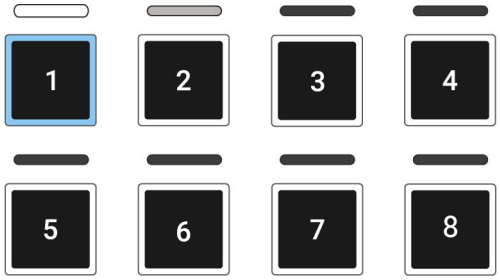
MIDI Output - Channel Configuration

To configure the MIDI output channels for the current TRACK, press and hold the SHIFT button then press and hold LATCH/ MIDI OUT .

SHIFT can be released at this stage.

The RGB buttons now correspond to MIDI channels 1-8.

Pressing each button enables or disables the corresponding channel as an output for the current track.



Enabled channels are illuminated with the current track colour.

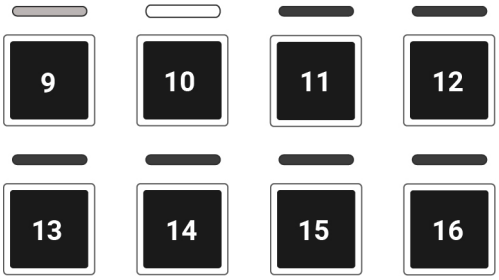
Notes generated by the current track will output to every enabled MIDI channel.

Up to 16 output channels can be set per track.

(cont.)

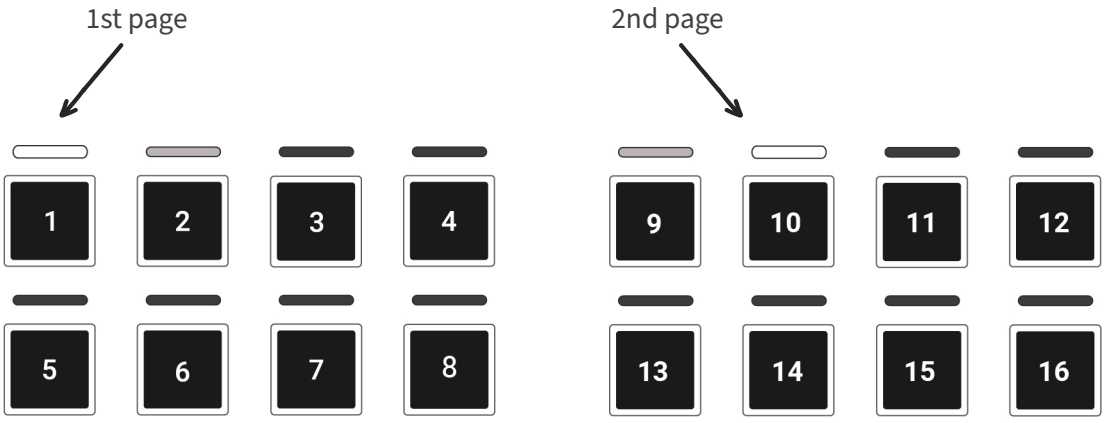
To access channels 9-16, press the RIGHT button.

The RGB buttons now allow configuration of MIDI channels 9-16.

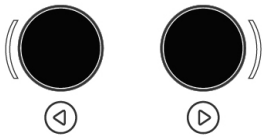


LED pills 1 & 2 are illuminated, indicating there are two accessible pages of settings. i.e. two groups of 8 channels.

The brighter pill indicates the active page:

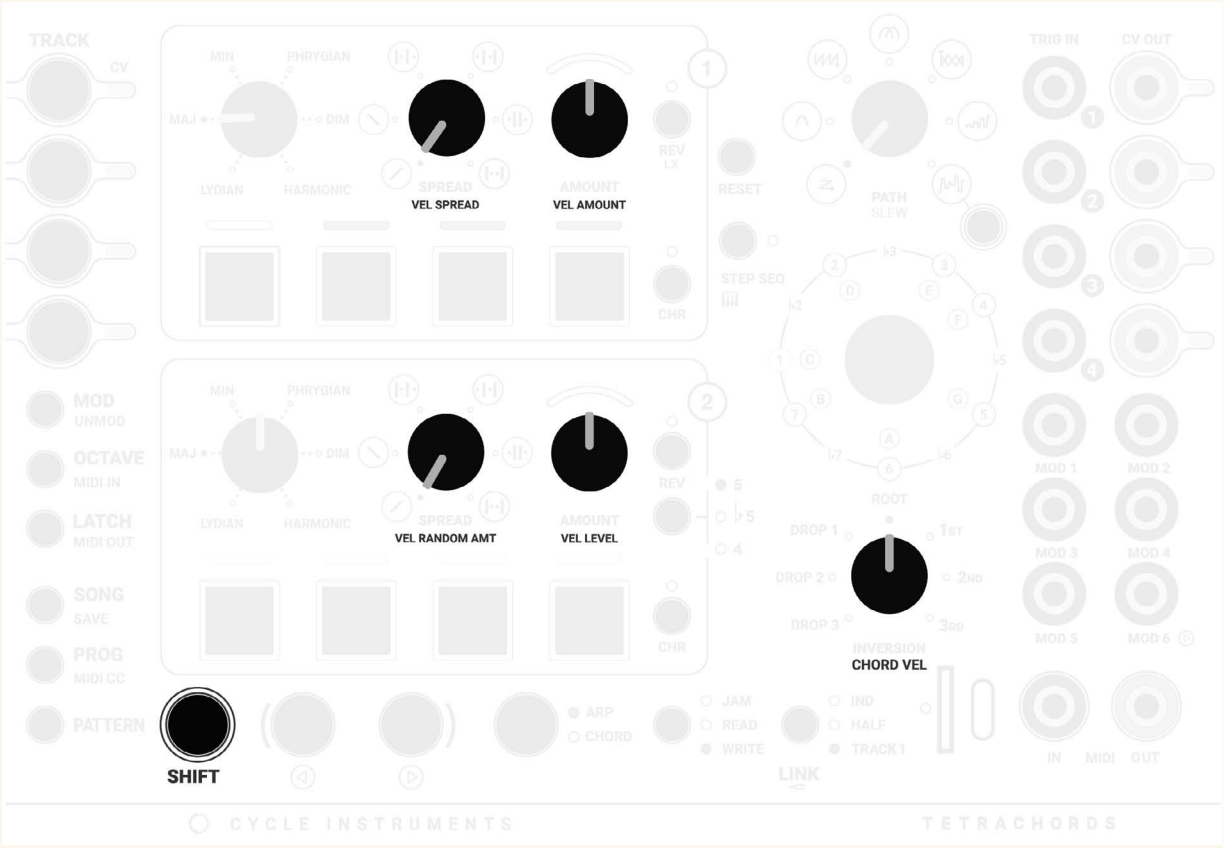


The LEFT and RIGHT buttons navigate between pages.



MIDI Velocity - Overview

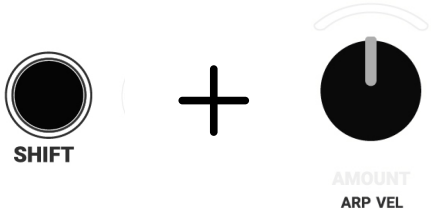
When the SHIFT button is pressed and held, the five knobs below manipulate MIDI velocity values of sequenced notes.



MIDI Velocity

ARP VEL

Press SHIFT and turn the Tetrachord 2 AMOUNT / ARP VEL knob.



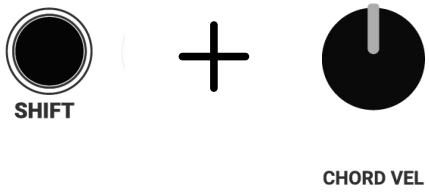
This sets the MIDI velocity for notes played when the ARP CHORD button is set to ARP.

The maximum MIDI velocity value is 127.

ARP VEL is set to 90 by default.

CHORD VEL

Press SHIFT and turn the INVERSION / CHORD VEL knob.



This sets the MIDI velocity for notes played when the ARP CHORD button is set to CHORD.

CHORD VEL is set to 75 by default.

(cont.)

VEL RANDOM

VEL RANDOM, short for velocity random, is the secondary function of the Tetrachord 1 AMOUNT knob.

This adds a random component to the MIDI velocity of notes in the current pattern.

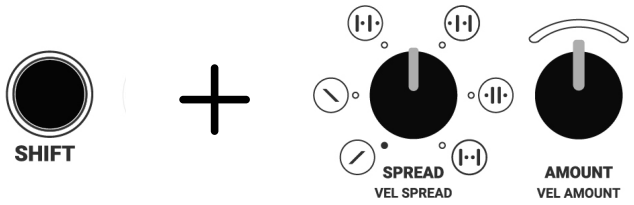
The VEL RANDOM setting effects all notes, regardless of the ARP CHORD button setting.

VEL RANDOM is set to 15% by default.

(cont.)

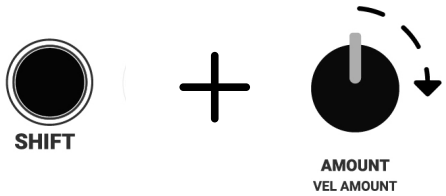
MIDI Velocity Spread

There are two velocity spread controls, VEL SPREAD and VEL AMOUNT, accessed by pressing shift and turning the Tetrachord 1 SPREAD and AMOUNT knobs respectively.

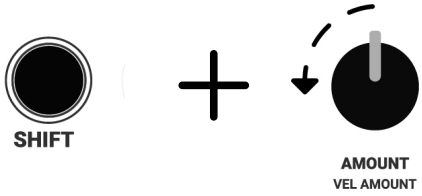


The VEL SPREAD knob selects which notes will have their velocity increased or decreased by the VEL AMOUNT setting.

The VEL AMOUNT knob has no effect at the 12 o'clock position.

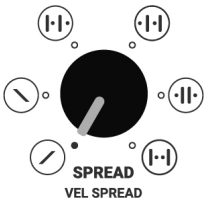


When turned clockwise, the VEL AMOUNT knob increases the velocity of selected notes.

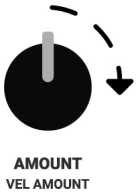


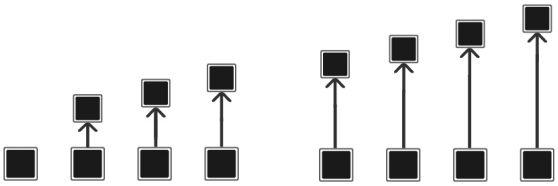
When turned counter-clockwise, the VEL AMOUNT knob decreases the velocity of selected notes.

SETTING 1

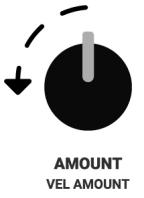


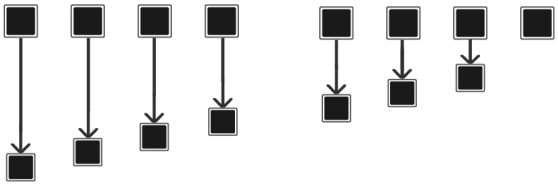
In this setting, notes at the beginning of the pattern will always be softer than those at the end.



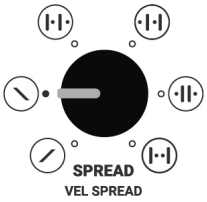


(Buttons 1 - 4) *(Buttons 5 - 8)*

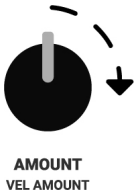


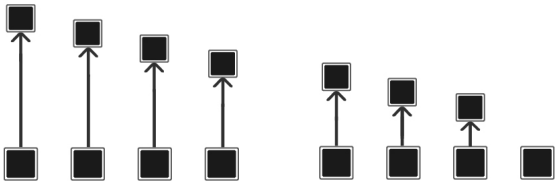


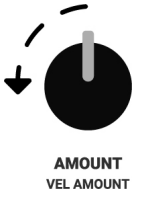
SETTING 2

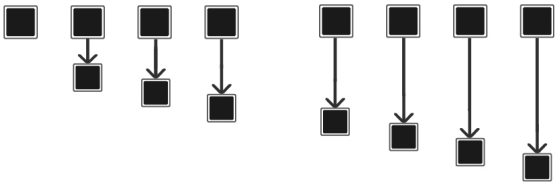


In this setting, notes at the beginning of the pattern will always be louder than those at the end.



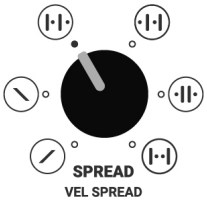




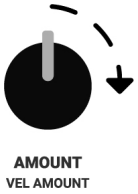


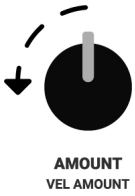
(cont.)

SETTING 3

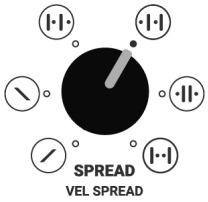


In this setting, the amount knob affects only the odd notes of the pattern.

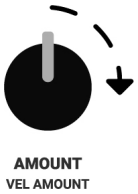


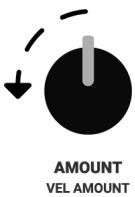


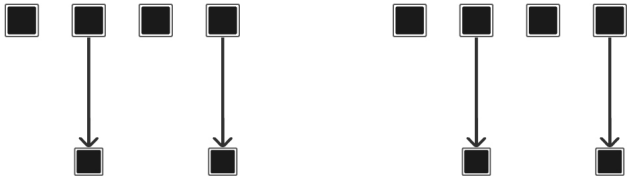
SETTING 4



In this setting, the amount knob affects only the even notes of the pattern.

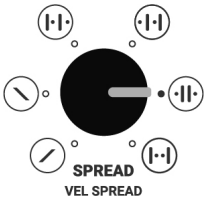




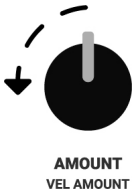


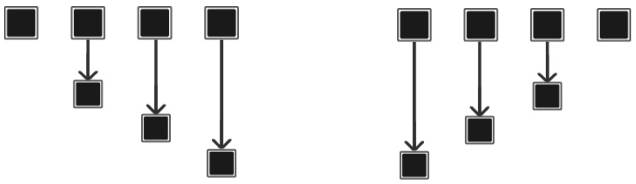
(cont.)

SETTING 5

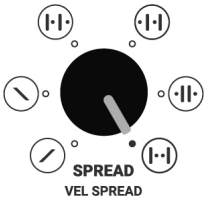


In this setting, the amount knob affects only the middle notes of the pattern.

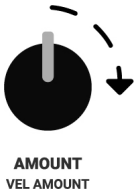


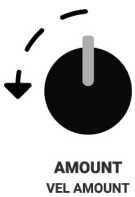


SETTING 6



In this section, the amount knob affects only the outer notes of the pattern.





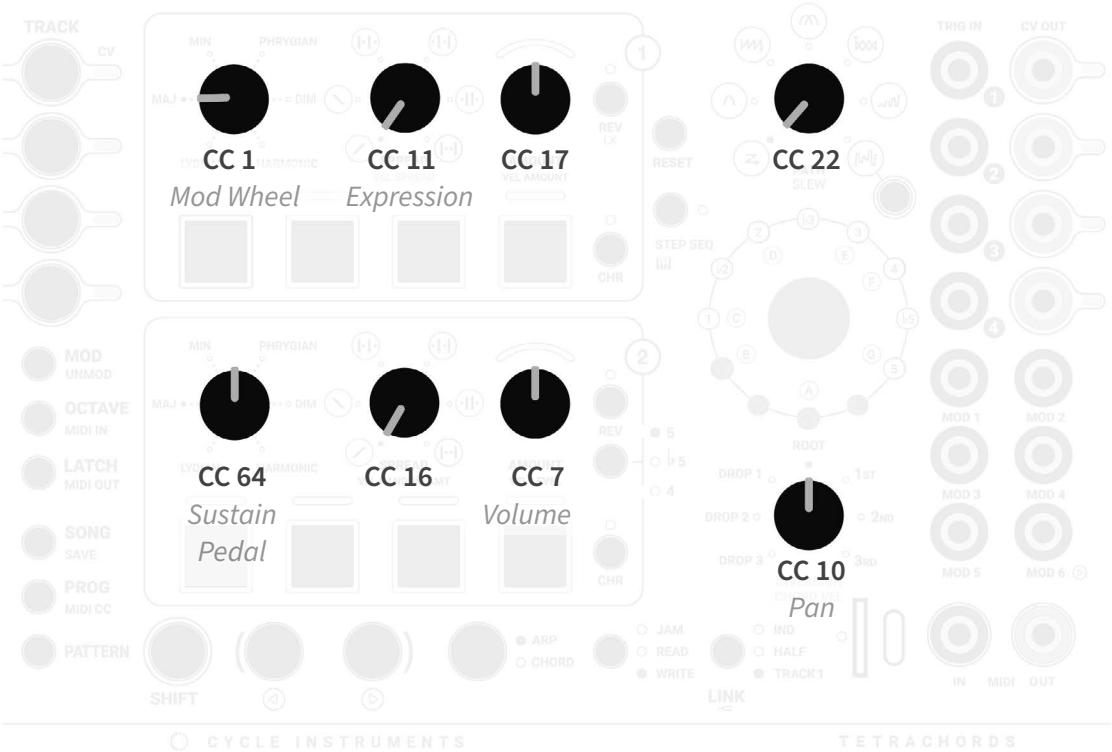
MIDI CC

Pressing and holding SHIFT, then pressing the PROG/MIDI CC button puts the Tetrachords in *MIDI CC MODE*.

Turning any of the 8 knobs generates MIDI CC messages.

Each knob has a dedicated MIDI CC number and transmits values from 0-127.

The default CC numbers are listed below. These can be updated in the *CONFIG.TXT* file stored in the SD card.



As per the Illustration, some CC numbers correspond to standard functions e.g. CC 1 typically corresponds to the mod wheel.

CC numbers 16, 17 and 22 have no standard use and may be freely assigned.

(cont.)

MIDI CC - Example Patch

MIDI CC functionality is best explained with an example.

The example below demonstrates how to configure the Tetrachords to send messages on channel 1, MIDI CC 22.

1. Initialise the Tetrachords .

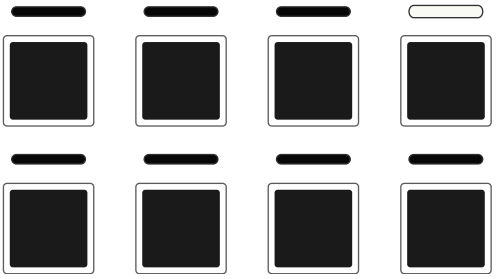
2. Press SHIFT then press and hold PROG/MIDI CC to put the Tetrachords in *MIDI CC MODE*.

SHIFT can be released at this point.

3. Turn the PATH KNOB.

As the PATH KNOB is turned, the Tetrachords streams MIDI CC messsages on MIDI CC 22.

Simultaneously, the 4th white LED PILL illuminates, indicating that MIDI CC on the 4th knob i.e. PATH, is active.



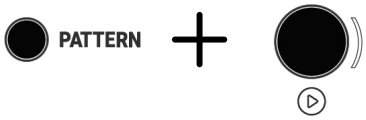
(cont.)

Turn the PATH KNOB fully counter-clockwise.

The MIDI CC setting is stored in the current Tetrachords PATTERN, number 1.

4. Release PROG/MIDI CC

5. Hold PATTERN then press the RIGHT button to copy the current PATTERN to the next PATTERN slot.



6. Press and hold SHIFT then press PROG/MIDI CC

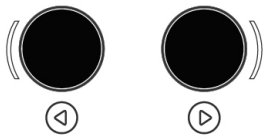
   SHIFT can be released at this point.

7. Turn the PATH knob fully clockwise.

This new setting is saved to the current PATTERN, number two.

(cont.)

9 Navigate between PATTERNS using the LEFT and RIGHT buttons.



As the PATTERN changes, the stored MIDI CC value is sent to any connected MIDI devices.

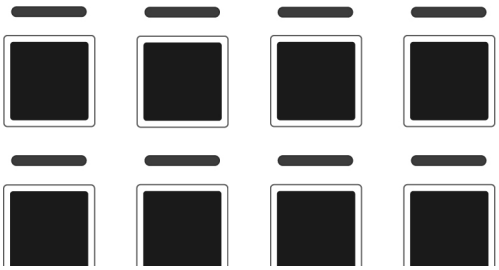
In the given example, when switching to PATTERN 1, will result in a minimum, i.e. 0, being sent on MIDI CC 22, channel 1.

Switching to PATTERN 2, will result in a maximum value, i.e. 127, being sent on MIDI CC 22, channel 1.

10 Press and hold SHIFT then press PROG/MIDI CC
SHIFT can be released at this point.

11 Press the 4th RGB BUTTON. This toggles MIDI CC OUTPUT for the 4th knob.

The 4th white LED pill goes dark indicating that MIDI CC on the 4th knob i.e. PATH, is inactive.



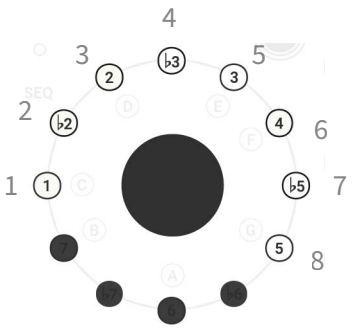
12 Release PROG/MIDI CC

MIDI CC messages will no longer be generated as patterns change.

MIDI CC - Rotary Encoder

The encoder works differently from the knobs. Rather than outputting a full range of values from 0-127, it outputs 8 specific values.

The default values are illustrated below.



CC 32

The following example outlines use of ROTARY ENCODER in *MIDI CC MODE*.

1. Initialise the Tetrachords.

2. Press SHIFT then press and hold PROG/MIDI CC to put the Tetrachords in *MIDI CC MODE*.

   SHIFT can be released at this point.

3. Press the ENCODER BUTTON.

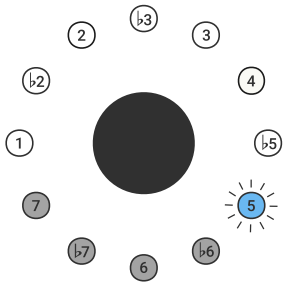
   When the BUTTON is pressed, the Tetrachords transmits a value of 1 on MIDI CC 32.

   Simultaneously, the NOTE 1 LED will assume the colour of the current TRACK, indicating the ENCODER is active in *MIDI CC MODE*.

(cont.)

3 Turn the ENCODER

As the ENCODER is turned, the Tetrachords streams MIDI CC messsages corresponding to the selected NOTE LEDS



E.g. here the ENCODER will send a value sending a value of 8 over MIDI CC 32.

4 Release PROG/MIDI CC

Once activated, MIDI CC values programmed by the ENCODER work similarly to those programmed by KNOBS.

MIDI CC values are stored with each PATTERN.

The stored values are sent whenever a PATTERN changes.

The LED RING indicates when a MIDI CC value is active.

The ENCODER BUTTON toggles whether the ENCODER is active or inactive in MIDI CC mode.

CV Modulation - Overview

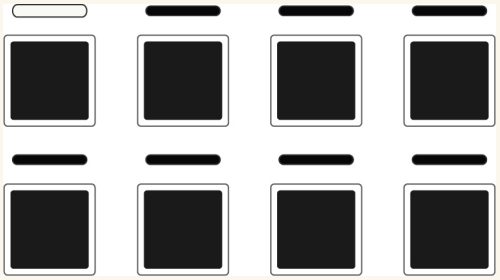
Almost any of the Tetrachords' settings may be precisely controlled via CV.

Below is a quick example. The pages that follow explain the process in full and provide further examples.

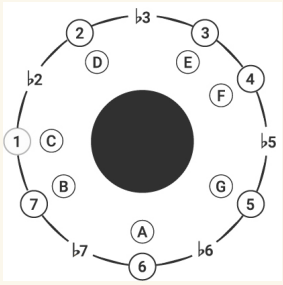
1. Plug a CV source into MOD 1.

2. Press the MOD button.

3. If the white LED pill above RGB button 1 isn't brightly lit, press RGB button 1.



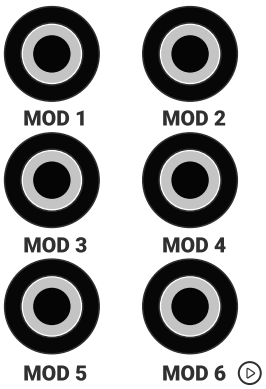
4. Press or turn whatever is to be modulated e.g. turn the rotary encoder.



5. Release the MOD button and observe the modulation.

CV Modulation

The 6 MOD inputs can be used to control any (almost) of the Tetrachords' settings via CV.



Each input can be assigned to modulate multiple settings.

Set up works as follows:

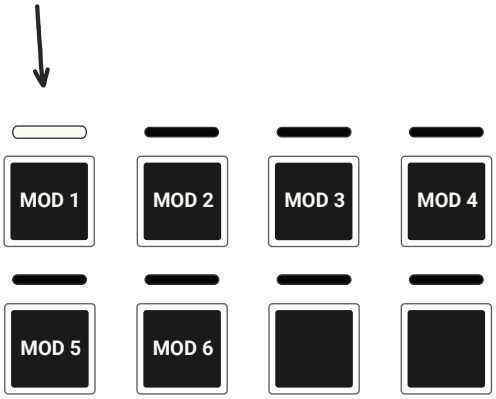
1. Press the MOD button.

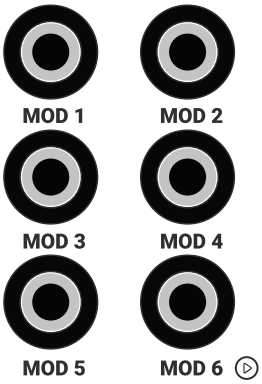
> ***NOTE***
>
> *When the MOD button is pressed, LEDs will flash to indicate any parameter that is being modulated by the currently selected mod (see next step for mod selection).*
>
> *E.g. if ARP/CHORD has been set up for CV modulation, the ARP and CHORD LEDs will flash briefly.*
>
>
>

(cont.)

2 SELECT MOD INPUT

A bright white LED pill indicates the currently selected modulation source.



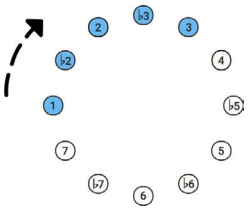


Use the RGB buttons to change the selected mod source as desired.

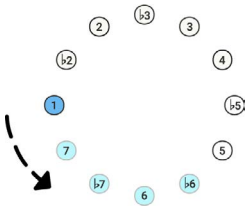
LEDs flash to indicate any parameter assigned to the newly selected MOD.

The LED RING displays the value of any CV signal received by the selected mod.

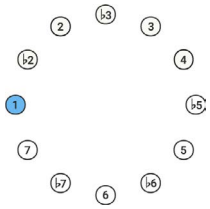
Positive CV



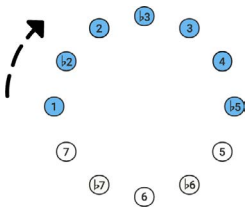
Negative CV



0V



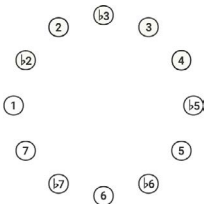
Max CV +5V



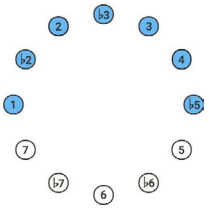
(cont.)

If the CV input response is set to TRIGGER (see below), the upper LEDS will light briefly in response to an incoming pulse.

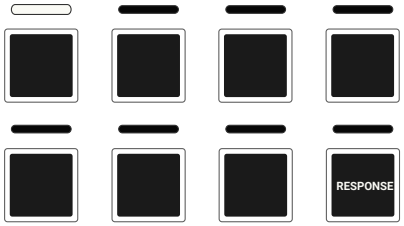
NO TRIGGER



TRIGGER

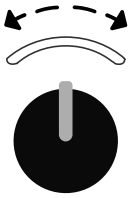


3 **SELECT MOD RESPONSE**



MODs can be configured to respond in 3 ways, indicated by the AMOUNT 2 LED.

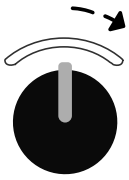
BIPOLAR (-5v to 5v)



AMOUNT

The AMOUNT 2 LED oscillates to indicate the bipolar setting.

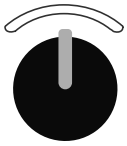
UNIPOLAR (0v to 5v)



AMOUNT

The AMOUNT 2 LED pulses right to indicate the unipolar setting.

TRIGGER



AMOUNT

The AMOUNT 2 LED blinks to indicate the trigger setting.

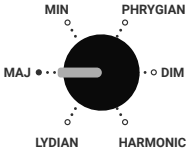
In trigger mode, an incoming trigger causes the targeted control to cycle through its possible settings.

By default, MOD 1 - MOD 5 are set to bi-polar response and MOD 6 is set to trigger.

(cont.)

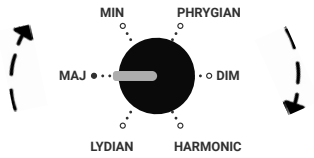
4 **SELECT MOD TARGET**

Select the modulation target by pressing or turning the control associated with that target.

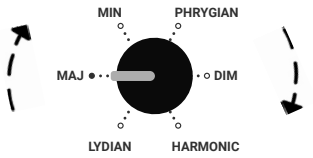


Example: Press and hold MOD, then turn the TETRACHORD 1 knob.

TETRACHORD 1 is now controlled by the incoming CV according to the response setting:



BIPOLAR



UNIPOLAR

LYDIAN → MAJ → MIN → PHRYGIAN → DIM → HARMONIC → LYDIAN

TRIGGER

MODS and Manual Control

In bipolar and unipolar mode, CV modulation completely takes over any control it is assigned to i.e. manually turning a knob or pressing a button won't have any affect.

In trigger mode, modulated controls work as normal.

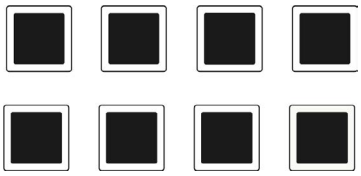
Use MOD 5 & MOD 6 for Triggers

All mods can respond to trigger inputs, however, MOD 5 & MOD 6 have been designed to be more responsive and so are the best choice for time-sensitive trigger modulations.

(cont.)

5 **FINE TUNE MOD RESPONSE**

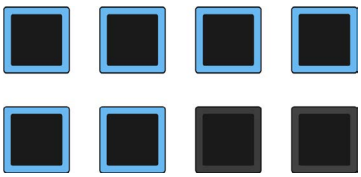
Once the mod target has been selected, the RGB buttons may be used to fine tune the mod response.



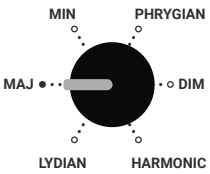
And the LINK or JAM/READ/WRITE buttons may be used to invert the mod response.

FINE TUNING MOD RESPONSE

If TETRACHORD 1 is selected as the mod target, RGB buttons 1 to 6 illuminate.



As do all 6 LEDs surrounding the TETRACHORD 1 KNOB.

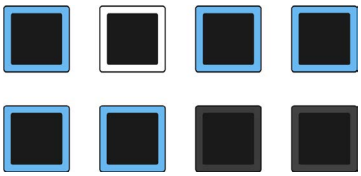


In this way the display indicates that the incoming CV may set the TETRACHORD 1 control to any of its 6 possible values.

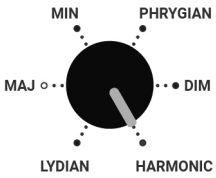
(cont.)

Pressing RGB button 2 at this point disables the 2nd setting.

Incoming CV can no longer set TETRACHORD 1 to MAJ.



RGB button 2 is white.



The MAJ LED is off.

Disabling MODS

At this point, de-selecting all of the RGB buttons disables modulation of the selected control.

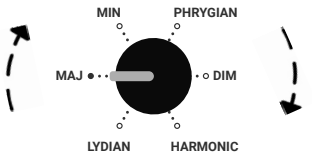
The RESET button works as a short cut for this.

See the UNMOD section for a full rundown on how to disable MOD's .

(cont.)

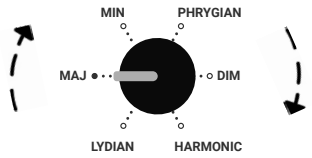
6 INVERTING MOD RESPONSE

By default, increasing the incoming CV corresponds to turning a knob clockwise.



-5v 5v

BIPOLAR

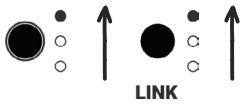


0v 5v

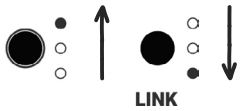
UNIPOLAR

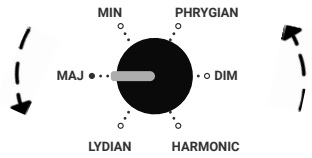
Or in TRIGGER mode, an incoming pulse increments the setting clockwise.

When the MOD button is held, the LINK and JAM/READ/WRITE LEDs strobe in parallel to indicate this.



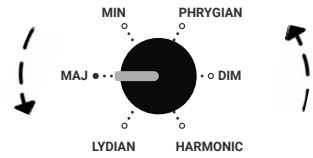
With the MOD button held, pressing LINK or JAM/READ/WRITE, inverts the LED display and mod response..





5v -5v

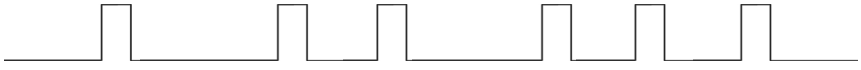
BIPOLAR



5v 0v

UNIPOLAR

LYDIAN → HARMONIC → DIM → PHRYGIAN → MIN → MAJ → LYDIAN



TRIGGER

Disabling Mods

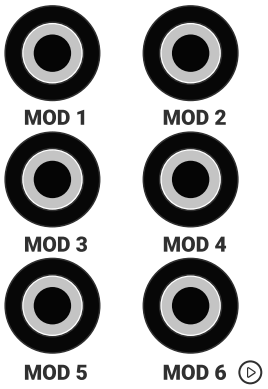
There are two ways to disable CV Mods

1. Press SHIFT then MOD/UNMOD

Then manipulate the control for which you wish to disable modulation e.g. turn the PATH knob to disable PATH modulation. will be deleted from the pattern using this method.

Using this method the Mod settings are deleted from the current Pattern.

2. Remove the cable from the physical MOD input.



Removing the cable temporarily disables any modulations associated with that MOD input.

The MOD settings aren't deleted when the cable is removed. Modulation resumes if the cable is plugged back in.

CV Modulation Example 1

Target: *Musical Mode*

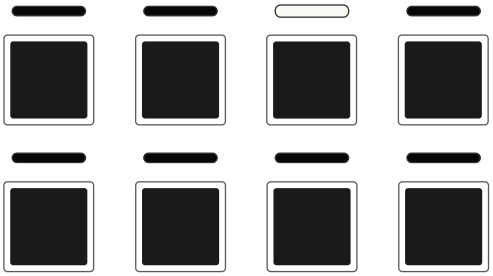
Physical input: *Mod 3*

Type of input: *0 to 5v*

Targeted Settings: *Mode 1* | *Mode 2* | *Mode 4* | *Mode 6*

1. Press and hold the MOD button.

2. Press RGB BUTTON 3 to select MOD 3 as the physical input



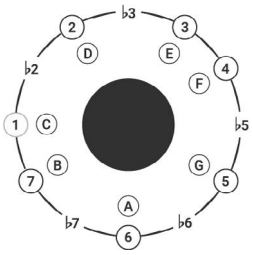
3. Use RGB BUTTON 8 to select unipolar (0 to 5v) input.

UNIPOLAR (0v to 5v)

The AMOUNT 2 LED pulses right to indicate the unipolar setting.

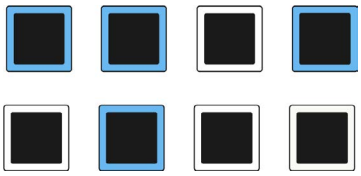
(cont.)

4 Turn the rotary encoder to set *Musical Mode* as the mod target.



5 At this point, RGB buttons 1 to 8 will illuminate, indicating that the incoming CV modulation may set the MUSICAL MODE control to any of its 8 possible values.

Press RGB buttons 3, 5, 7 & 8 to exclude the corresponding values from CV control.



Incoming CV can now set the MUSICAL MODE value to modes 1, 2, 4 or 6.

Note that the buttons act as a toggle.

For example, pressing RGB BUTTON 5 again will make mode 5 accessible to CV modulation.

6 Release the MOD button.

CV Modulation Example 2

Target: *MIDI Out*

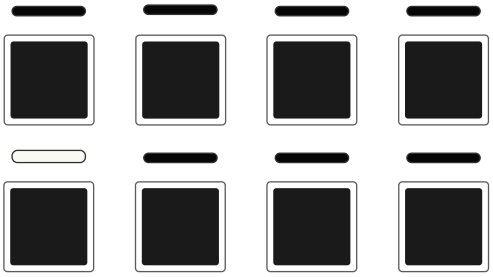
Physical input: *Mod 5*

Type of input: *Trigger*

Targeted Settings: *Channel 1* | *Channel 2* | *Channel 9*

1. Starting with an initialised SONG, press and hold the MOD button.

2. Press RGB BUTTON 5 to select MOD 5 as the physical input

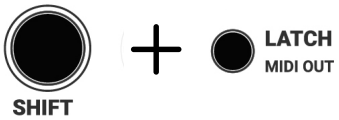


3. Use RGB BUTTON 8 to select trigger input.

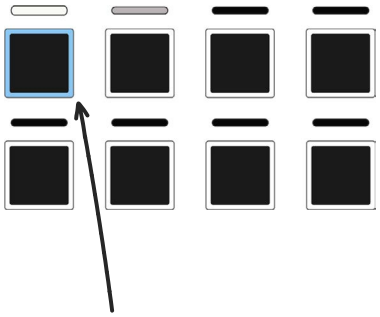
The AMOUNT 2 LED blinks to indicate the trigger setting.

(cont.)

4. Press and hold SHIFT then press LATCH/ MIDI OUT



At this point, the 1st white LED pill is illuminated indicating that RGB buttons 1-8 correspond to MIDI channels 1 - 8.



RGB button 1 is illuminated, indicating that MIDI channel 1 is active.

MIDI MOD DEFAULTS

Mods are initialised differently for MIDI IN and MIDI OUT than for other modulations setups.

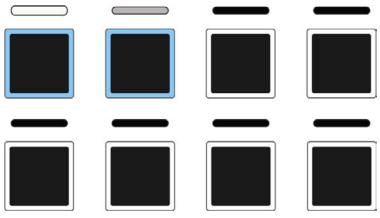
No modulation is activated by default and the player activates channels as part of the setup process.

MIDI MOD SETUP NAVIGATION

Navigating the setup is different because the are 16 possible values i.e. there are more values than RGB buttons.

These 16 values are spread between two 'pages' which can be navigated using the LEFT and RIGHT buttons.

5. Press RGB button 2 to enable CV control of MIDI channel 2.

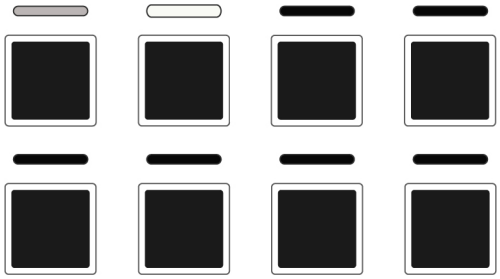


Incoming triggers now cycle the active MIDI OUT channel between MIDI channel 1 and 2.

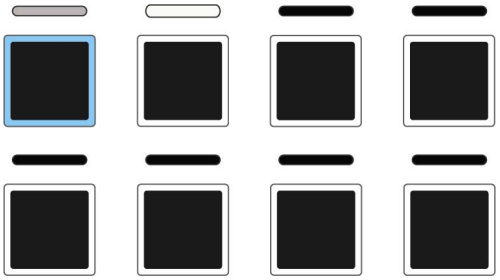
(cont.)

Press the RIGHT button to access the second page of MIDI channels.

RGB buttons 1 - 8 now correspond to MIDI channesl 9 - 16.



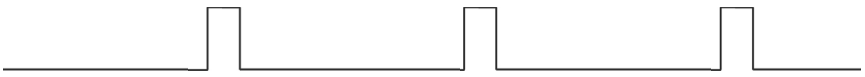
Press RGB button 1 to enable CV control of MIDI channel 9.



6 Release the MOD button.

Incoming triggers now cycle the active MIDI OUT channel.

MIDI CHANNEL 1 → MIDI CHANNEL 2 → MIDI CHANNEL 9 → MIDI CHANNEL 1



TRIGGER

CV Modulation Example 3

Target: *Rev 1*

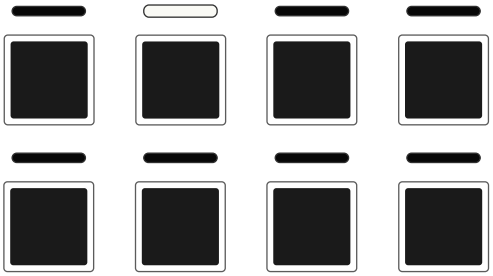
Physical input: *Mod 2*

Type of input: *0 to 5v*

Targeted Settings: *Rev 1 on/off*

1. Press and hold the MOD button.

2. Press RGB BUTTON 2 to select MOD 2 as the physical input



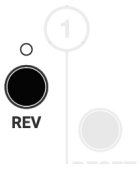
3. Use RGB BUTTON 8 to select unipolar (0 to 5v) input.

UNIPOLAR (0v to 5v)

The AMOUNT 2 LED pulses right to indicate the unipolar setting.

(cont.)

4. Press the REV 1 BUTTON



5. At this point, RGB button 1 illuminates, indicating the incoming CV can set REV 1 on or off.

6. Release the MOD button.

CV Modulation Example 4

Target: *Vel Level*

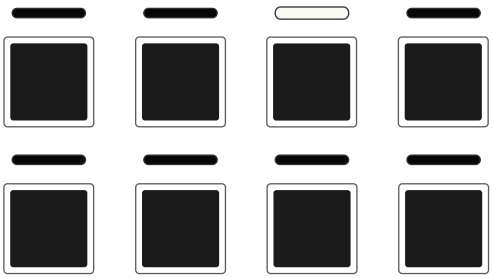
Physical input: *Mod 3*

Type of input: *-5 to 5v*

Targeted Settings: *MIDI velocity 50% to 87.5%*

1. Press and hold the MOD button.

2. Press RGB BUTTON 3 to select MOD 3 as the physical input

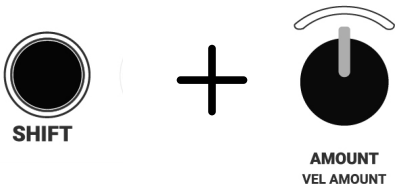


3. Use RGB BUTTON 8 to select bipolar (-5v to 5v) input.

BIPOLAR (-5v to 5v)

The AMOUNT 2 LED oscillates to indicate the bipolar setting.

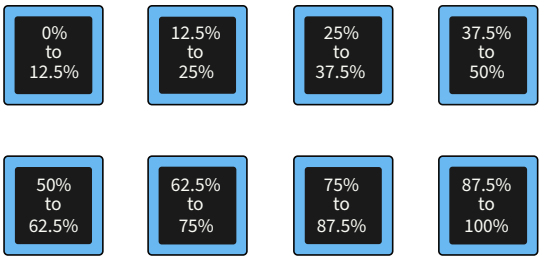
4. Press and hold SHIFT then turn the AMOUNT/VEL AMOUNT knob



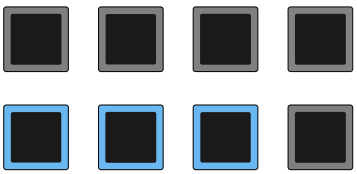
(cont.)

5 At this point, RGB buttons 1 to 8 will illuminate, indicating that the incoming CV modulation may set the MIDI VELOCITY over its entire range, from 0 to 127.

Each RGB button represents 12.5% of the overall range.



Press RGB buttons 1, 2, 3, 4 & 8 to exclude the lowest 50% and highest 12.5% of values from CV control.



Incoming CV can now set the MIDI velocity level to between 50% and 87.5% of the MIDI velocity range.

6 Release the MOD button.

CV Modulation Example 5

Target: *Next Pattern*

Physical input: *Mod 6*

Type of input: *Trigger*

Targeted Settings: *Next Pattern*

1. Next PATTERN modulation is enabled by default.

   When a CV trigger is received on MOD 6, the next PATTERN, if there is one, will play.

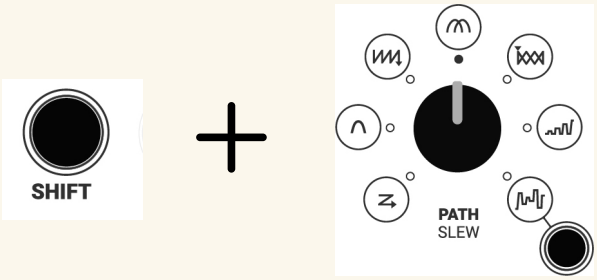
(cont.)

Shift Button

Many of the Tetrachords controls have primary and secondary functions.

Secondary functions are accessed using the SHIFT button.

For example, pressing and holding the SHIFT button, then turning the PATH knob sets the amount of slew applied to the CV output.



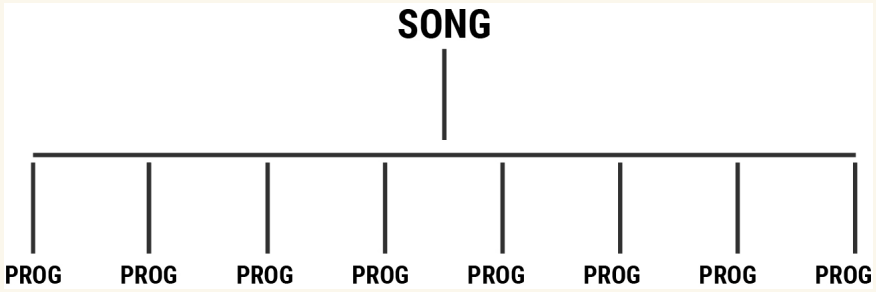
Note that the primary function PATH is labelled more prominently than the secondary SLEW.

Where any control has two labels. The less prominent label describes the SHIFT function.

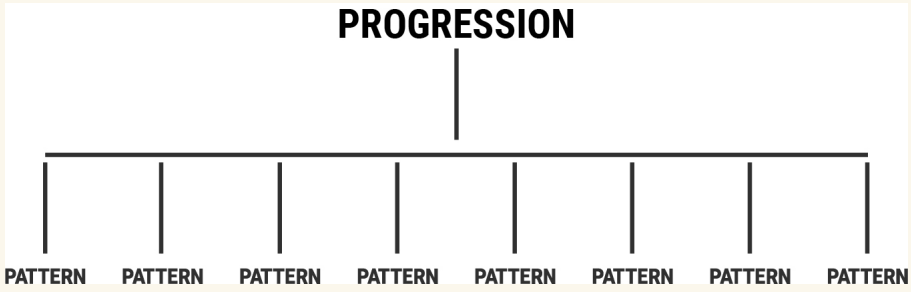
Songs & Progressions - Overview

A SONG is the highest-level Tetrachords structure.

A SONG consists of 8 PROGRESSIONS, labelled PROG on the faceplate.



Each PROGRESSION can contain up to 8 PATTERNS



Songs

LOADING A SAVED SONG

Press and hold SONG then press one of the RGB buttons to load the corresponding song from the SD card.

WARNING - loading a new song causes any unsaved work to be lost from the current song.

SAVING A SONG

There are two ways to save a SONG

1. Press SHIFT then press and hold SONG/SAVE then press one of the RGB buttons to save the current SONG to the corresponding slot.

2. Double click SONG/SAVE to save the current SONG to the current SONG slot.

NOTE - to see which SONG slot is currently selected, press and hold SONG/SAVE. The white LED pills will indicate the current SONG slot.

INITIALISING A SONG

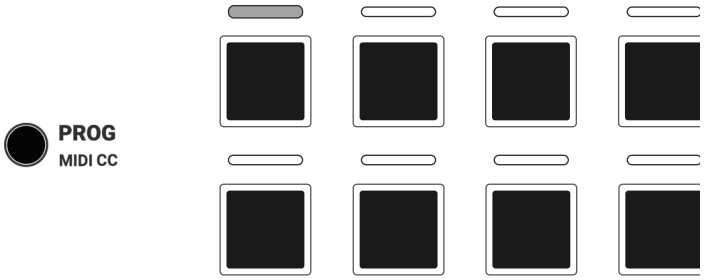
Hold SONG then press the RESET to clear/initialise the current SONG and all PROGRESSIONS within it.

Progressions

A SONG consists of 8 PROGRESSIONS.

DISPLAY

When the PROG button is pressed the bright LED pill indicates the currently active PROGRESSION.



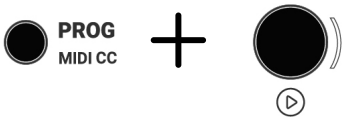
PROGRESSION 1 is active by default.

SWITCHING PROGRESSIONS

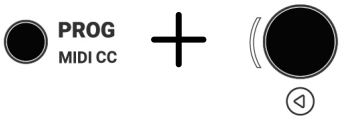
Hold PROGRESSION then press one of the 8 RGB buttons to navigate to the corresponding PROGRESSION

COPYING PROGRESSIONS

Hold PROGRESSION then press the RIGHT button to copy the current PROGRESSION to the next PROGRESSION slot.



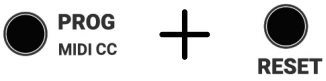
Hold PROGRESSION then press the LEFT button to copy the current PROGRESSION to the previous PROGRESSION slot.



(cont.)

INITIALISING PROGRESSIONS

Hold PROGRESSION then press the RESET to initialise the current PROGRESSION and all PATTERNS within it.



i2c

i2c is a digital communication protocol. Some musical devices, use i2c in a way very similar to MIDI.

Like MIDI, i2c is capable of sending a variety of message (e.g. pitch, velocity, gate) over a single connection. This is can be very useful when playing polyphonically.

In a Eurorack system, i2c connections are typically made on the under side of modules.

Currently, the Tetrachords is i2c compatible with the Expert Sleepers Disting EX, and the Mannequins Just Friends.

More integrations are planned. Contact us with any requests or suggestions.

For more information about i2c and a list of compatible devices see A user's guide to i2c modules/devices on the lines forum.

CAUTION

Care is required when handling the under-side of a module.

Make sure the power is off.

Avoid touching electrical components, other than switches.

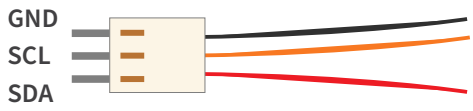
Take basic precautions to minimise the risk of static discharge, e.g. don't wear woolly jumpers or other clothes prone to static.

(cont.)

PHYSICAL CONNECTION

Connection is made via the three pronged header on the Tetrachords' bottom PCB. The module comes with a compatible 3-pin cable.

The three wired connections are labelled SDA (data) SCL (clock) and GND (ground).



When making an i2c connection, be aware of the following:

1. Power should be OFF on all modules prior to making an i2c connection.

2. Like signals must be connected i.e. connect SDA to SDA, SCL to SCL & GND to GND.

3. One, and as a general rule only one, of the modules in an i2c network must have the SCL and SDA lines connectered to a power source via what are known as 'pull-up resistors'.

   On the Tetrachords, pull-up resistors can be enabled or disabled via a switch located beside the 3-pin i2c connector.

4. It is possible to daisy chain i2c connections. Some modules, such as the Just Friends have double connectors to facilitate this.

5. i2c connections are more robust the shorter the connecting wires are. When connecting multiple modules, it's best to keep connections as short as possible.

   This is especially important to note when daisy chaining connections.

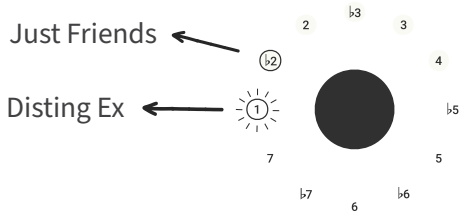
(cont.)

I2C TRACK CONFIGURATION

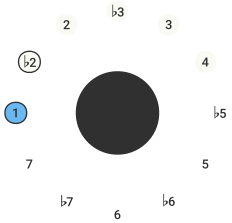
Once a physical connection is made and modules are powered on, an i2c connection is configured as follows:

1. Press SHIFT + any of the TRACK/CV buttons (SHIFT can be released at this point).

2. Use the ROTARY ENCODER to choose the i2c device to be connected.



3. Press the ENCODER BUTTON to activate/de-activate the connection for the selected track.



When i2c is activated, the LED corresponding to the connected device will assume the colour of the selected TRACK.

i2c - Disting Ex

The Tetrachords can sequence the following Disting Ex single mode algorithms:

#3 SD Multismaple
#10 Poly Wavetable
#13 Poly Exciter
#14 Quad Envelope
#19 Macro Oscillator
#20 Resonator
#21 Macro Oscillator 2
#23 Poly FM

INITIAL SETUP

1. With the power to both modules off, physically connect the Tetrachords and Disting Ex i2c headers.

   The Tetrachords and Disting Ex both have i2c pull-up resistor enable switches. Ensure that one, and only one of these is enabled.

2. With the Disting Ex powered on, enter the top level *settings* menu and then select *MIDI/I2C page 1*.

   From here navigate to *I2C address* and set the address to:

   65 0x41

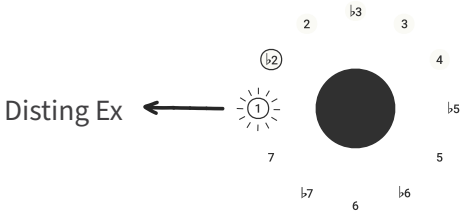
   The Disting Ex remembers its address setting, so this step only needs to be done once.

(cont.)

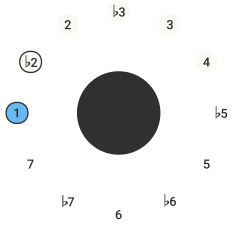
ACTIVATE THE I2C CONNECTION

1. Press SHIFT + any of the TRACK/CV buttons (SHIFT can be released at this point).

2. Use the ROTARY ENCODER to choose option 1, Disting EX



3. Press the ENCODER BUTTON to activate/de-activate the connection for the selected track.



When i2c is activated, the LED corresponding to the connected device will assume the colour of the selected TRACK.

CHANGING ALGORITHMS

When changing algorithms, it may be necessary to de-activate, then re-activate the i2c connection.

This is because a handshake occurs between the Disting Ex and the Tetrachords when an i2c connection is activated.

During this handshake, the Tetrachords learns what algorithm the Disting Ex is running and adjusts it's settings accordingly.

(cont.)

ALGORITHM SETUP

When initialised, the following algorithms require not additional setup to work with i2c:

#3 SD Multisample
#10 Poly Wavetable
#13 Poly Exciter

Setup examples for the other supported algorithms are provided below.

These examples assume an initialised algorithm as a starting point.

INITIALISING ALGORITHMS
To initialise a Disting Ex algorithm, navigate to the main Presets menu and select Reset preset

#14 QUAD ENVELOPE

Starter settings for a Quad Envelope with Envelopes 1 - 4 paired to Tetrachords CV outs 1 - 4.

Each time a Tetrachords CV OUT is updated, the corresponding envelope is triggered.
With this setup, Shape 1 is the shape for all 4 envelopes.

Envelope 1

1. Quad Envelope → Parameter 43: Inputs 1 → 7 Trig - VCA 1
2. Quad Envelope → Parameter 44: Shape 1 → 1

Envelope 2

3. Quad Envelope → Parameter 52: Inputs 2 → 14 Trig - VCA 2
4. Quad Envelope → Parameter 53: Shape 2 → 1

Envelope 3

5. Quad Envelope → Parameter 61: Inputs 3 → 21 Trig - VCA 3
6. Quad Envelope → Parameter 62: Shape 3 → 1

Envelope 4

7. Quad Envelope → Parameter 70: Inputs 4 → 28 Trig - VCA 4
8. Quad Envelope → Parameter 71: Shape 4 → 1

(cont.)

#19 MACRO OSCILLATOR

Starter settings for a 4 voice poly synth routed to Disting Ex output 1.

1. Macro Oscillator → Mix
   Set the Output 1 value for Instances 1, 2, 3 & 4 to -3dB

2. Macro Oscillator → Settings → MIDI Option
   Set all instances to option 141: ch+0

3. Macro Oscillator → Settings → Share Params

   Set all instances to 1, this has the effect that any settings made to Instance 1 are also automatically applied to instances 2,3 & 4.

4. Macro Oscillator → Parameter 15: AD VCA 1 → 1

#20 RESONATOR

Starter settings for a single* voice routed to Disting Ex outputs 1 & 2.

* Technically there are 4 voices but the Tetrachords's chord feature isn't currently compatible with the Resonator algorithm.

1. Resonator → Parameter 26: Audio input → 0 0 None.

2. Resonator → Parameter 33: I2C mode → 3 Pitch & strum

#21 MACRO OSCILLATOR 2

Starter settings for a 4 voice poly synth routed to Disting Ex output 1.

1. Macro Oscillator 2 → Settings → Instance 1 → I2C Trigger → 1
2. Macro Oscillator 2 → Settings → Instance 2 → I2C Trigger → 1
3. Macro Oscillator 2 → Settings → Instance 3 → I2C Trigger → 1
4. Macro Oscillator 2 → Settings → Instance 4 → I2C Trigger → 1

5. Macro Oscillator 2 → Settings → Instance 1 → Share params → 1
6. Macro Oscillator 2 → Settings → Instance 2 → Share params → 1
7. Macro Oscillator 2 → Settings → Instance 3 → Share params → 1
8. Macro Oscillator 2 → Settings → Instance 4 → Share params → 1

9. Macro Oscillator 2 → Parameter 65: Output mode → 1 Mix 4

#23 POLY FM

Starter settings for a 4 voice poly synth routed to Disting Ex outputs 1 & 2.

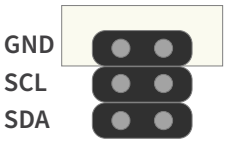
1. Poly FM → Parameter 9 : Output 1 → 4 Outputs 1/2
2. Poly FM → Parameter 16 : Output 2 → 4 Outputs 1/2
3. Poly FM → Parameter 23 : Output 3 → 4 Outputs 1/2
4. Poly FM → Parameter 30 : Output 4 → 4 Outputs 1/2

i2c - Just Friends

When Connected to the Tetrachords via i2c Just Friends operates in its *Synthesis Mode*, operating as a six voice polysynth with voices dynamically assigned.

CONNECTION

With the power to both modules off, physically connect the Tetrachords and Just Friends i2c headers.



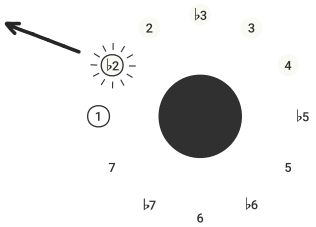
The white stripe on the Just Friends PCB panel indicates GND.

ACTIVATE THE I2C CONNECTION

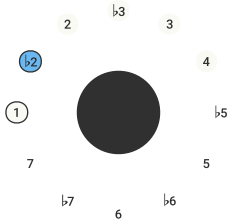
1. Press SHIFT + any of the TRACK/CV buttons (SHIFT can be released at this point).

2. Use the ROTARY ENCODER to choose option 2, Just Friends

Just Friends



3. Press the ENCODER BUTTON to activate/de-activate the connection for the selected track.



When i2c is activated, the LED corresponding to the connected device will assume the colour of the selected TRACK.

Utility Buttons

The SHIFT, RESET and LATCH buttons have utility functions on the Tetrachords.

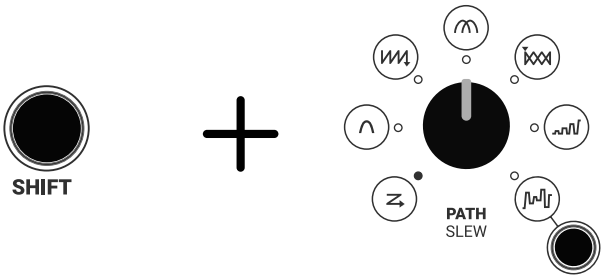
This section details the utility functionality.

Shift

Many of the Tetrachords controls have primary and secondary functions.

Secondary functions are accessed using the SHIFT button.

For example, pressing and holding the SHIFT button, then turning the PATH knob sets the amount of slew applied to the CV output.



Note that the primary function PATH is labelled more prominently than the secondary SLEW.

Where any control has two labels. The less prominent label describes the SHIFT function.

UNLABELLED SECONDARY/SHIFT FUNCTIONS

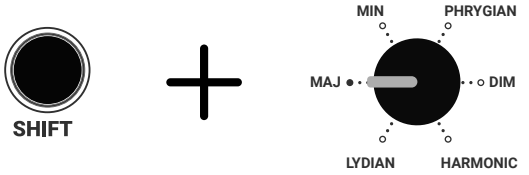
There are four unlabelled secondary functions.

1. **LFO RATE**

(TETRACHORD 1)

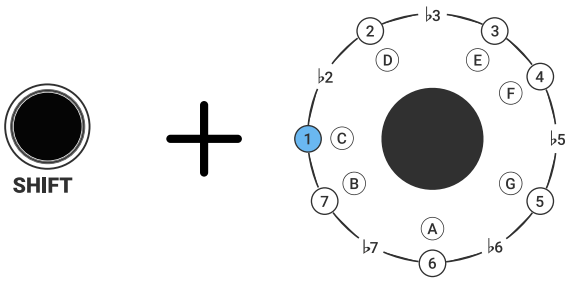
(cont.)

2 LFO AMOUNT

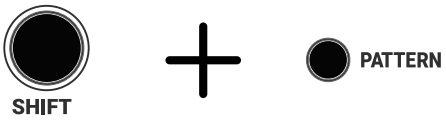


(TETRACHORD 2)

3 CASCADING INVERSIONS



4 ACTIVATE/DEACTIVATE PATTERN MODE



Press and hold SHIFT, then press and hold PATTERN (SHIFT can then be released).

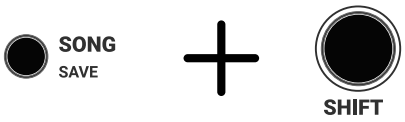
Then use the RGB BUTTONS to deactivate and reactivate patterns.

(cont.)

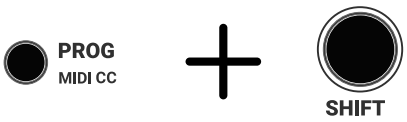
SHIFT TO INITIALISE SONGS/PROGRESSIONS/PATTERNS

The SHIFT button can also be used to clear SONGS, PROGRESSIONS or PATTERNS, functioning as an ergonomic alternative to the RESET button.

INITIALISE SONG



INITIALISE PROGRESSION



INITIALISE PATTERN

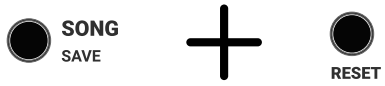
Reset

In addition to its primary function of restarting a PATTERN's sequence, the RESET button has a secondary function.

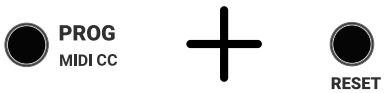
It can clear or initialise SONGS, PROGRESSIONS,PATTERNS, and many of the Tetrachords' sub-settings.

For reference, an exhaustive list is given below but in practice, if you would like to initialise or clear something, try pressing RESET

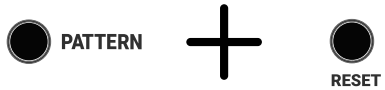
INITIALISE SONG



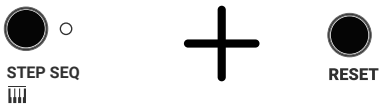
INITIALISE PROGRESSION



INITIALISE PATTERN



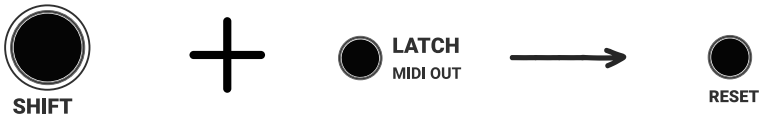
INITIALISE (CLEAR) THE STEP SEQUENCER



(cont.)

INITIALISE MIDI IN SETTINGS

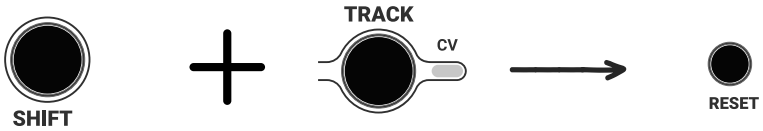
INITIALISE MIDI OUT SETTINGS



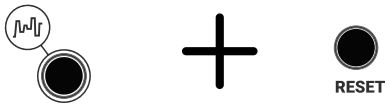
INITIALISE MIDI CC SETTINGS

INITIALISE TUNING SETTINGS

INITIALISE CV OUTS



INITIALISE RANDOM SETTINGS



Latch

The LATCH button adds two useful performance features.

1. **DELAY AND SYNCHRONIZE CHANGES**

   Changes made whilst the LATCH button is pressed and held don't take effect until the LATCH button is released.

2. **EDIT PATTERNS THAT AREN'T PLAYING**

   By default, the PATTERN playing is also the PATTERN being edited.

   Tapping the LATCH button once decouples this playing/editing link, making it possible to navigate to PATTERNS that aren't playing and edit them.

   Tapping LATCH once more to returns the module to regular operation.

Latch - Delay and Synchronize Changes

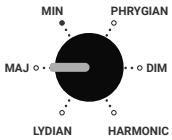
Changes made whilst the LATCH button is pressed and held don't take effect until the LATCH button is released.

This feature makes it possible to synchronize the timing of multiple simultaneous changes.

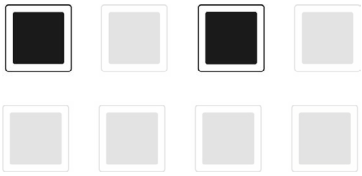
EXAMPLE

1. Initialise the Tetrachords then press and hold the LATCH button.

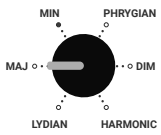
2. Turn the TETRACHORD 1 knob to MIN.



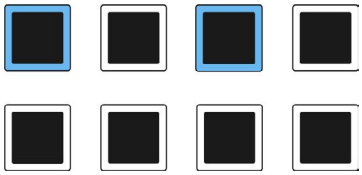
3. Press RGB buttons 1 & 3.



4. Release the LATCH button.



TETRACHORD 1 is now set to MAJ.



Note buttons 1 & 3 are now active.

Latch - Edit patterns that aren't playing

By default, the PATTERN playing is also the PATTERN being edited.

Tapping the LATCH button once decouples the playing/editing link.

The LATCH LED flashes, indicating that the UI has been unlatched from playback.

It is now possible to navigate to PATTERNS or PROGRESSIONS that aren't playing and edit them.

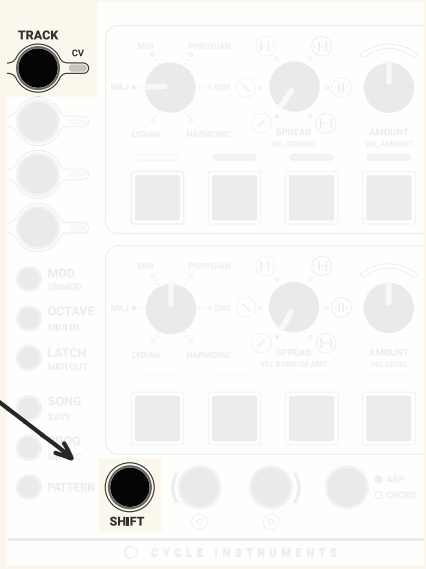
Tapping LATCH once more to returns the module to regular operation. The UI will again display the currently playing pattern.

Firmware Update

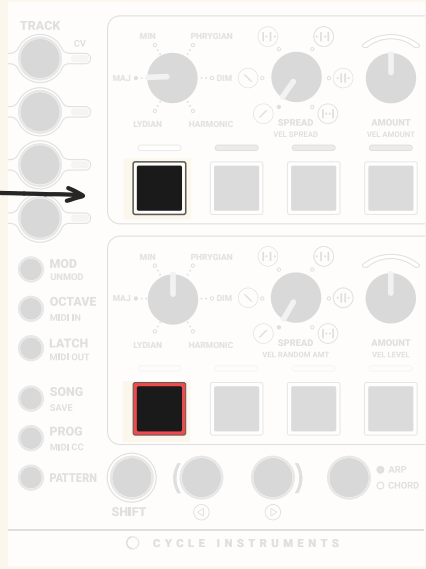
The Tetrachords firmware can be updated using the SD card.

The latest firmware file can be found at https://cycleinstruments.com/resources/

Below is an overview of the button combinations to enter the firmware update menu. The pages that follow explain the update procedure in full.



1. Whilst holding down the SHIFT and TRACK 1 buttons, power up the Tetrachords.



2. Press the white coloured RGB button to update firmware.

(cont.)

To update the firmware:

1. Power off the module.

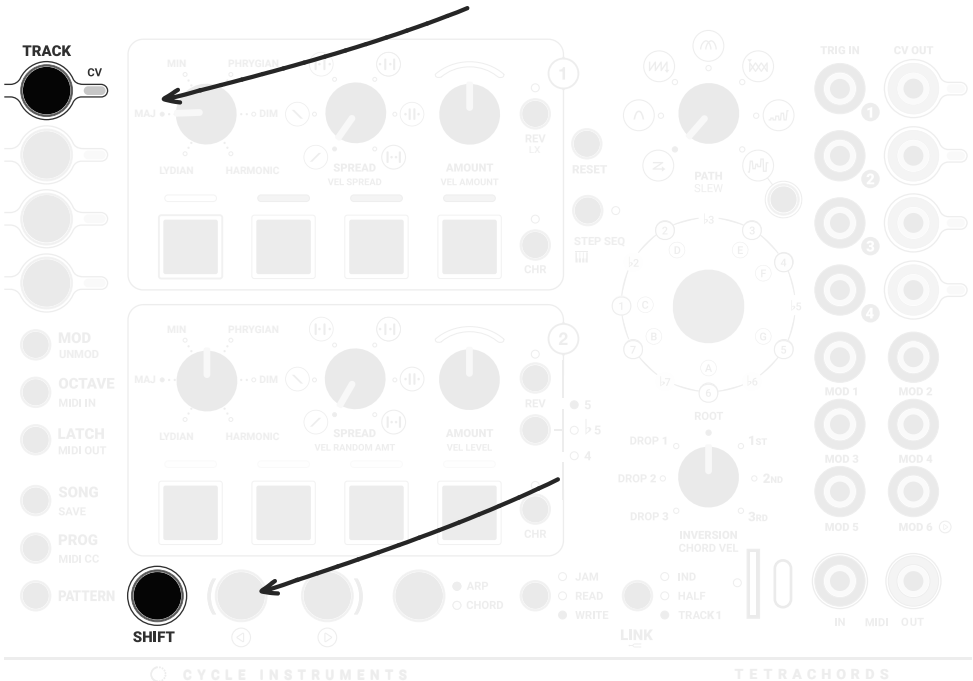
   Remove any CV, MIDI, USB or i2c connections.

2. Download and unzip the firmware file e.g. tetrachords_1_1_1_2.bin_.zip.

   Place the unzipped .bin file into the root directory of the micro SD card.

   Insert the card into the Tetrachords.

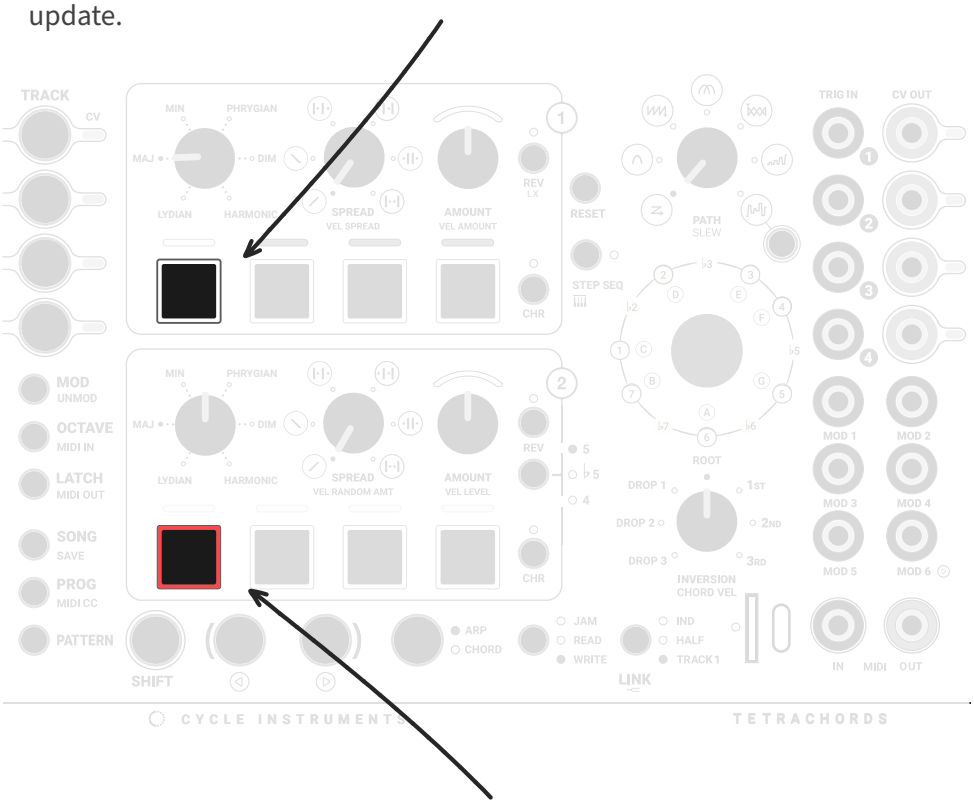
3. Whilst holding down the SHIFT and TRACK 1 buttons, power up the Tetrachords.



Once the module powers up, release SHIFT and TRACK 1.

(cont.)

4 Press the white RGB button to update.



Press the Red RGB button to boot up without updating the firmware.

5 Wait for the firmware to update. It should take about 20 seconds.

Don’t turn off the power, plug anything in or otherwise interact with the module whilst it is updating.

The progress of the update is represented on the LED ring.

Tetrachords will reboot once the update process is complete.

Config Text File

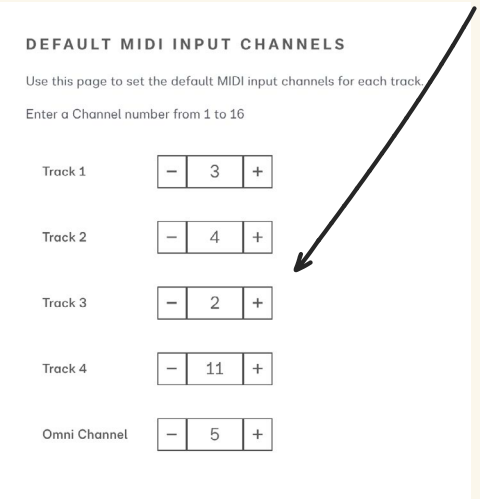
A configurable text file is included on the Tetrachords SD card.

It is possible to edit this text file to configure some of the default settings of the Tetrachords.

To streamline this process, an online configuration editor is available at https://cycleinstruments.com/tetrachords-config/

The process of updating the config text file using the online configration editor is detailed below.

1. Edit the Tetrachords default preferences.



2. When finished press the ‘download config file’ button.

3. Replace the existing Config.txt file on the Tetrachords SD card, with the newly downloaded Config.txt file.

4. Insert the SD card back into the Tetrachords and power on. The new preferences will be read from the SD card. If the SD card is removed the factory default prefences will be applied.

FAQ / Troubleshooting

Appendix

Appendix 1 - Track Input Response

When the Tetrachords receives a MIDI NOTE ON message or detects the rising edge of a CV GATE, up to three things happen.

1. 1 or more MIDI NOTE ON messages are transmitted via any active MIDI OUTPUTS.

2. A CV voltage/note signal is sent via any of the CV OUTS that have been set up to transmit pitch signals.

3. A CV voltage/velocity signal is sent via any of the CV OUTs that have been set up to transmit velocity/ gate signals.

When the Tetrachords receives a MIDI NOTE OFF message or detects the falling edge of a CV GATE, up to two things happen.

1. 1 or more MIDI NOTE OFF messages are transmitted via any active MIDI OUTPUTS.

2. Any of the CV OUTS that have been set up to transmit velocity/ gate signals output zero volts.

The graphs on the following pages illustrate these responses.

To learn how to configure the CV and MIDI output settings will be detailed later, in the vand MIDI OUT sections of this guide.

(cont.)

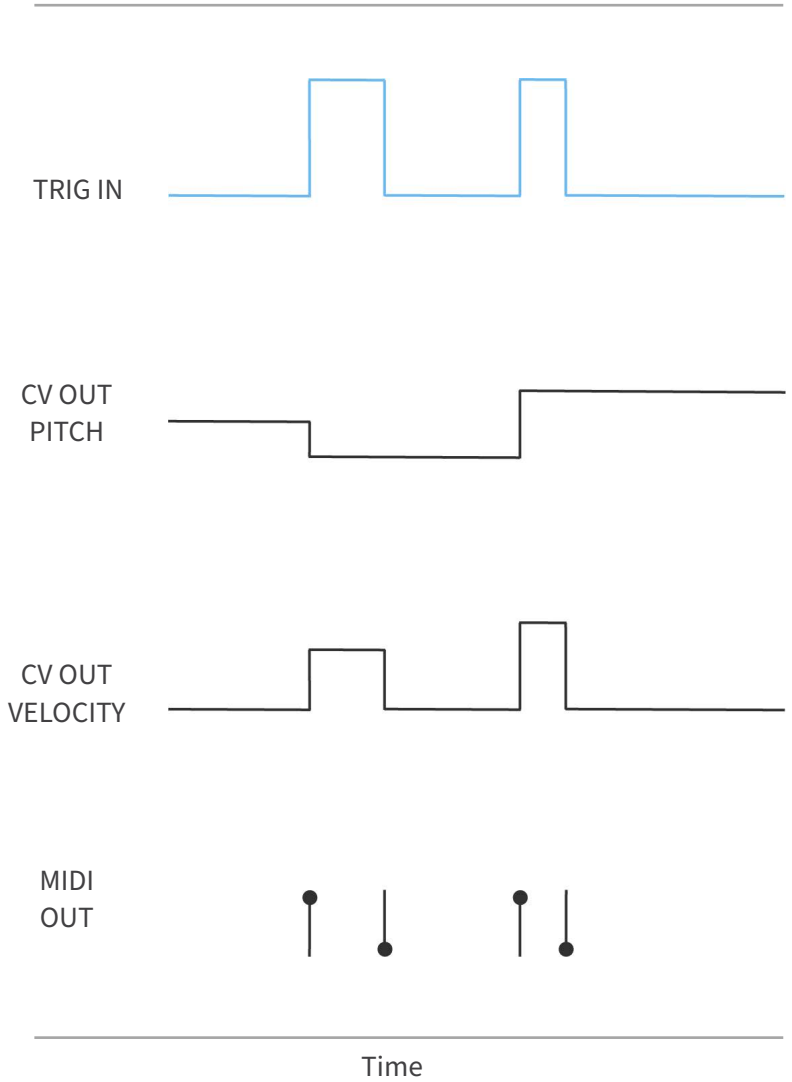
This symbol represents a MIDI note on message

This symbol represents a MIDI note off message.

Inputs are blue

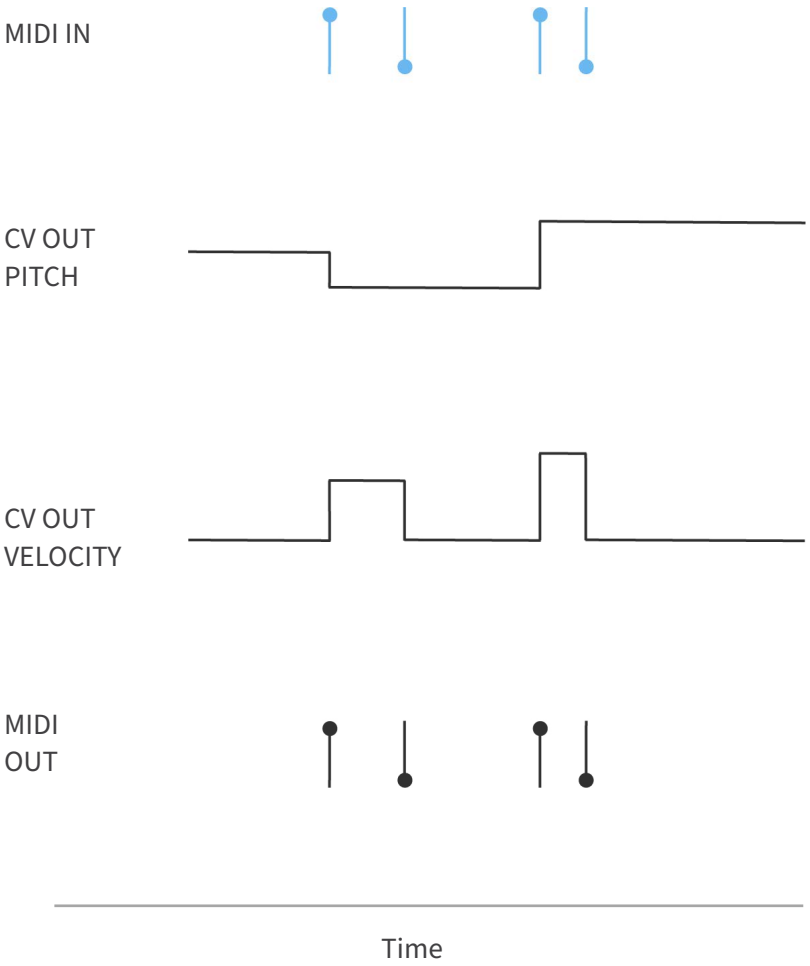
Outputs are black

TRIG IN RESPONSE



(cont.)

MIDI IN RESPONSE



Note that the CV OUT pitch does not respond to a MIDI note off message or to the falling edge of a CV TRIG IN signal.

Acknowledgements

The Tetrachords module was created on the stolen lands of the Turrbal and Yaggera people in Meinjin, Australia.

We would like to thank everyone who have generously shared with us the knowledge to bring this module to life.

Specifically, all the people behind the many open source synth projects, Mutable Instuments, Music Thing Modular and all the rest. You are all legends.

Thanks to our family's for putting up with all the late nights and ridiculous conversations about button clickyness and knob knobbyness. The patience is appreciated.

And thanks to you for buying a module.

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