Continuum and ContinuuMini

User's Guide

May 24, 2021

Firmware Version 9.55

Edmund Eagan, Lippold Haken,
and Richard Kram



About this document

This User Guide includes information for the latest "Slim" Continuum Fingerboards, full and half size Continuum Fingerboards, and the ContinuuMini (also referred to as "Mini"). If Full-Size or Half-Size models are specifically referenced those terms will be used, otherwise the term "Continuum" when used on its own will apply to all continuums (except the ContinuuMini). Note that the "Slim" Continuum Fingerboard models have the same overall function and feel as the full and half size models and use the same EaganMatrix sound engine. The differences relate to form factor, physical connection types and on-board user interface.

The current version of this document can be found online in the Resources section of www.HakenAudio.com. It is also included in the latest firmware release file set under "User Guides" and available in the EaganMatrix Cogwheel pull down menu. We suggest "Slim" Continuum Fingerboard owners read this guide at least up to Section 10. ContinuuMini owners should consult section 16. The knowledge you gain will save you time in the future and significantly enhance your experience with your Continuum Fingerboard or ContinuuMini. After you finish reading this guide, please keep it available as a reference.

Continuum Fingerboard, Continuum, ContinuuMini, Haken Continuum, Haken ContinuuMini, Haken, and EaganMatrix are trademarks (TM) of Haken Audio. Eagan Instruments, Eagan Sounds, and Eagan are trademarks (TM) of Edmund Eagan. All other trademarks are property of their respective owners.

IMPORTANT!

The analog audio/headphone output of the Continuum Full Size and Half Size models and ContinuuMini, and dedicated headphone output of the "Slim" Continuum models is a TRS stereo (unbalanced) connection. DO NOT use a mono TS audio cable to connect to this output. Damage to the analog circuitry can be caused by doing this for an extended time period. Refer to the hook up diagrams in Section 12 for proper Continuum Fingerboard connections.

Always use the current version of the Editor to Upgrade firmware. For example, if you are upgrading to 9.55 from an earlier version, always use the 9.55 editor to perform the upgrade.

Table of Contents

1.0 OVERVIEW OF THE CONTINUUM FINGERBOARD 8
1.1. The Playing Surface 8
1.2. The EaganMatrix 9
1.3. What Sets the Continuum Fingerboard Apart 9
2. HAKEN AUDIO HARDWARE 11
2.1. The Continuum Fingerboard 11
2.2. The ContinuuMini 12
2.3. The Continuum Voltage Converter (CVC) 14
3. HISTORICAL CONTEXT 15
3.1. Continuum "Touch Area" 15
3.2. Fast Continuous-Pitch Playing 16
4. MIDI ENCODING 18
4.1. Encoding Principles of the Continuum Fingerboard 18
4.2. Connecting an External Midi Synthesizer 19
4.3. Specialized Kyma Encoding 21
5. SPECIFICATIONS 22
5.1. I/O Connections for the "Slim" Continuum Fingerboard 22
5.2. Left and Right Panels of the Full-size and Half-size Continuum Fingerboard 23
5.3. Hardware Specifications for Continuums and ContinuuMini 25
6. OPERATING THE CONTINUUM FINGERBOARD 26
6.1. Turning On the Continuum Fingerboard 26
6.2. Playing the Continuum Fingerboard 26
6.3. Mono (Multiple Fingers Combined Create a Single Note) 28
6.4. Rounding, Pitch Tables, and the Pitch Table Editor 31
6.5. Pedal Jacks 34
6.6. Kenton Mini Controller and Kenton USB Midi Host 35
6.7. Arturia BeatStep and BeatStep Pro 38
6.8 Anckorage Continuum Remote Support 40
7. CALIBRATION OF THE CONTINUUM FINGERBOARD 41
7.1 Refining Calibration using the Haken Editor 41
7.2 Refining Calibration using Front Panel ("Slim" Continuum) 41
7.3 Refining Calibration using the Overlay Strip (Half-Size & Full Size Continuums) 42
7.4 Discarding Calibration 42
7.5 Actuation – Addressing Stuck Notes and Sensitivity on "Slim" Continuums 42
8. INTRODUCTION TO THE HAKEN EDITOR (WITH 9.5X NEW FEATURE SUMMARY) 43
8.1. Setting up the Haken Editor 49
8.2. Using the Haken Editor 52
8.3. Haken Editor Shortcuts 54
8.4. Current Preset and Selecting System Presets 55
8.5. Open and Save User Presets in the Editor 57
8.6. User Preset Slots and Preset Groups (Selecting, Saving & Storing Presets) 58
8.7. Open a Preset Group File 59
8.8. Save a Preset Group File 61
8.9. CEE Combination Presets 62

8.10. Designing Sounds for the Continuum Fingerboard and ContinuuMini 71

9. CONTINUUM CONFIGURATION AND CONTROL WITHOUT USING THE HAKEN EDITOR 72

9.1 Introduction to the Front Panel Display and Controls ("Slim" Continuums) 72
9.2 Introduction to the Overlay Strip (Half-Size and Full-Size Continuums) 81

10. CONFIGURATION OPTIONS 83

10.1. Levels (Pre and Post) – New to 9.53 Firmware 83
10.2. Internal Sound (Load System Preset) 84
10.3. Midi Program, Midi Routing 84
10.4. CVC 87
10.5. (Base) Polyphony 87
10.6. Channel (Note) Priority 89
10.7. X Bend 90
10.8. Y Control 92
10.9. Z Control 92
10.10. Midi Note Processing 93
10.11. Middle C 95
10.12. Split Point and Split Mode 96
10.13. Mono Function and Mono Interval 99
10.14. Round Initial, Normal Rounding, Release Rounding, Rounding via Y 100
10.15. Round Rate 102
10.16. Tuning (Select Pitch Table) 103
10.17. Pedal 1 and Pedal 2 Assignments 104
10.18. Pedals Min and Max Range 105
10.19. Options 107
10.20. Send 109
10.21. Load and Store (User Preset Slots) 109
10.22. Cogwheel Menu: Global Settings, Kenton Settings, Pitch Table Editor, User Guides, Editor Shortcuts, Control Styles, List of System Presets, About 110
10.23. Surface Display 111
10.24. Pitch Trim 112

11. LOADING NEW FIRMWARE INTO THE CONTINUUM FINGERBOARD OR CONTINUUMINI 114

12. CONNECTING TO EXTERNAL HARDWARE AND THE EDITOR 116

12.1. Analog Audio Only ("Slim" and Half-Size/Full-Size Models) 117
12.2. Digital Audio Output ("Slim" and Half-Size/Full-Size Models) 118
12.3. Connecting "Slim" Continuums to Generation 1 and Generation 2 CVCs 119
12.4. Analog Audio and CVC 120
12.5. Digital Audio and CVC 121
12.6. Analog Audio and CEE (For Half-Size/Full-Size + CEE Owners Only) 122
12.7. Digital Audio and CEE (For Half-Size/Full-Size + CEE Owners Only) 123
12.8. Analog Audio, CVC and CEE (For Half-Size/Full-Size + CEE Owners Only) 124
12.9. Digital Audio, CVC and CEE (For Half-Size/Full-Size + CEE Owners Only) 125
12.10. Connecting a Softsynth 126
12.11. Connecting to Kyma (Mac) 127
12.12. Connecting to Kyma (PC) 128
12.13. Connecting Midi Keyboard, Continuum and Kyma (Mac) 129
12.14. Connecting Midi Keyboard, Continuum and Kyma (PC) 130
12.15. Connecting to External Midi Synthesizer through Haken Editor 131
12.16. Connecting a Kenton Controller with Computer 132
12.17. Connecting a Kenton (or other) Controller Standalone (No Computer) 133

12.18. Using a BeatStep or BeatStep Pro with Computer 134
12.19. Connecting a BeatStep Standalone (No Computer) 135
12.20. Connecting Multiple USB Controllers Standalone (No Computer) 136
12.21. Processing Digital Sound (AES) Through Continuum/EaganMatrix 137
12.22. Using Multiple EaganMatrix Instruments with Editor 138
12.23. Using Continuum as a DSP Processor 139
12.24. Connecting an iOS App to ContinuuMini (USB Host based Continuum Connection) 140
12.25. Connecting an iOS App to Half or Full Size Continuum through Bluetooth Interface 141
12.26. Connecting an iOS App to ContinuuMini or Slim Continuum through Bluetooth Interface 142
12.27. Connecting a ContinuuMini to Evaton Technologies uCVC 143
12.28. Using Sensel Morph with ContinuuMini (or Continuum) 144
12.29. Using Multiple MPE External Controllers (i.e. two Sensel Morphs) with ContinuuMini 145

13. HARDWARE MAINTENANCE FOR THE CONTINUUM FINGERBOARD 146

13.1. Cleaning 146
13.2. Surface Alignment (Half-Size and Full-Size Models Only) 146
13.3. Continuum Fingerboard Hardware Problems 147
13.4. Sensor Stuck On, or Sensor Intermittently Turn On 148
13.5. Sensor Stuck Off – Scan File 148
13.6. Factory Calibration of the Continuum Fingerboard 148
13.7. Factory Alignment of the "Slim" Continuum Fingerboard 149
13.8. Do - It - Yourself Repairs and Adjustments (Contact Haken Audio) 151

14. PERFORMANCE CONTROLLER ASSIGNMENTS 152

14.1. Sending Midi Performance Values to the Continuum Fingerboard 152
14.2. Receiving Midi Performance values from the Continuum Fingerboard 152
14.3. Assignments 152

15. CONFIGURATION CONTROLLER ASSIGNMENTS 155

15.1. Load, Store, and List Presets 155
15.2. Midi Device Compatibility 156
15.3. X, Y, and Z Coding 156
15.4. Rounding and Pitch Tables 157
15.5. Polyphony, Routing, and Split 157
15.6. Pedals (see also Section 14) 158
15.7. Mono Function 158
15.8. Firmware Version and CVC Serial Number 159
15.9. Other Configuration Controller Assignments 159

16. USING THE CONTINUUMINI 160

16.1. Connecting Up 160
16.2. The ContinuuMini Seven Segment Display 162
16.3 ContinuuMini Lever 162
16.4 Preset Display 163
16.4. Connecting to the EaganMatrix (Haken Editor) 163
16.5. Playing the ContinuuMini 165
16.6 Octave Buttons and ContinuuMini Range 166
16.6. Menu System Options and Preset Selection 167
16.7. CVC Connection and Setup (Used with "I2C" setting = 1) 171
16.8. Pitch Reference 173
16.9. Continuum vs. ContinuuMini Presets and Usage 174
16.10. Use of Pedals and System Presets on the ContinuuMini 175
16.11. Error Codes 175

16.12. Using the ContinuuMini in Parallel with a Half or Full Size Continuum 177
16.13 Playing the ContinuuMini from an External MIDI Controller Through EaganMatrix 177
16.14. Monophonic vs. Duophonic vs. Polyphonic MPE ContinuuMini Operation 178
16.15. Playing the ContinuuMini from the Continuum (or another MPE controller) 181
16.16. Playing the Continuum from the ContinuuMini 182
16.17. Playing the ContinuuMini from Other MPE and non-MPE MIDI Instruments/Controllers through the EaganMatrix - Use Cases 183
16.18. Playing the ContinuuMini Directly from Another Source 184
16.19 Connecting the Anckorage Spring Sound App to the ContinuuMini 185
16.20 Connecting without Computer - Reliably 186
16.21. Recording the ContinuuMini with a DAW for processing and playback 188
16.22. ContinuuMini Troubleshooting Use Cases 189
16.23. ContinuuMini Factory Calibration 196

17. "SLIM" CONTINUUM TROUBLE SHOOTING 199

17.1 Powering Issues & Booting 199
17.2 Haken Editor will not connect or does not display as expected 199
17.3 Presets do not display Categories as Expected after firmware Upgrade 200
17.4 I cannot record through the USB MIDI Interface 200
17.5 I can't figure out how to get my CVC (or uCVC) to work 200
17.6 I can't get the Continuum to work with my DAW as expected 200
17.7 My Kenton "KillaMix" USB Controller does not work 201
17.8 My BeatStep (or other USB Controller) does not work 201
17.9 How do I connect a Linnstrument to my Continuum 202
17.10 The Continuum surface does not respond as expected 202
17.11 The LED display looks like I am playing it but I am not 202
17.12 The Continuum makes no sound or sounds very faint. 202
17.13 The Digital Audio I/O does not work 203
17.14 After Loading New Firmware my custom presets are gone 203
17.15 I Do Not Seem to be Getting the Stereo Separation I Expect 203
17.16 I Can't Connect my Expressive-E Touche Controller to the Slim without a Computer 204
17.17 I Can't Seem to Upgrade my Slim using my Mac 204
17.18 My Editor keeps disconnecting from the Continuum over USB 204
17.19 Firmware starts loading but never finishes or aborts with an error message 204
17.20 AES Inputs Don't seem to work in the Matrix 205
17.21 My Kenton USB Midi Host is not Working as Expected 205
17.22 Can I use a MIDI-CV Converter with the Slim instead of a CVC? 205
17.23 I can't seem to get rid of Noise or Hum from the Audio Output Port 205
17.24 I tried upgrading to 9.x or later from 8.x or earlier and my Continuum doesn't work now 206
17.25 I have stuck notes after upgrading firmware on my Slim model 206
17.26 I Keep Getting DSP Messages and Possibly Can't connect Editor 206
17.27 Some Presets Sound Distorted 206
17.28 I get "Something is Fishy" Messages when updating firmware 206
17.29 Presets don't seem to be displayed correctly or Preset Categories are Missing 207
17.30 When recording Y in a DAW I get unexpected curves 207
17.31 When working on big presets in EaganMatrix I can't type in any more values 207
17.32 The Slim USB connection sometimes disconnects with the Haken Editor 207
17.33 My fingers do not Seem to be detected when playing the Slim Fingerboard 207
17.34 Can't run two Haken Editors at the same time 208
17.35 TRS Mini Midi Jacks not outputting as expected to external Synth or Eurorack 208

18. CREATING DEBUG FILES FOR SUPPORT 208

18.1 Creating a Max Console Hardware Log 208
18.2 Creating a Continuum Profile 209

18.3 SCAN FILES (CONTINUUM AND SLIM CONTINUUM ONLY) 209

19. CURRENT EAGANMATRIX PRESETS AS OF FIRMWARE 9.55 211

1.0 Overview of the Continuum Fingerboard

1.1. The Playing Surface

The Haken Audio Continuum Fingerboard tracks the position and pressure of fingers on its playing surface. Unlike a Midi keyboard, which only starts and stops notes, the Continuum Fingerboard lets the performer intimately interact with the sound throughout every note, breathing life and expression into the musical performance.

The Continuum Fingerboard is neither an easy-to-use gadget nor a device for replacing electronic or acoustic instruments; instead, it is a new instrument in its own right, with immediate appeal as well as lifelong challenges for the serious musician.



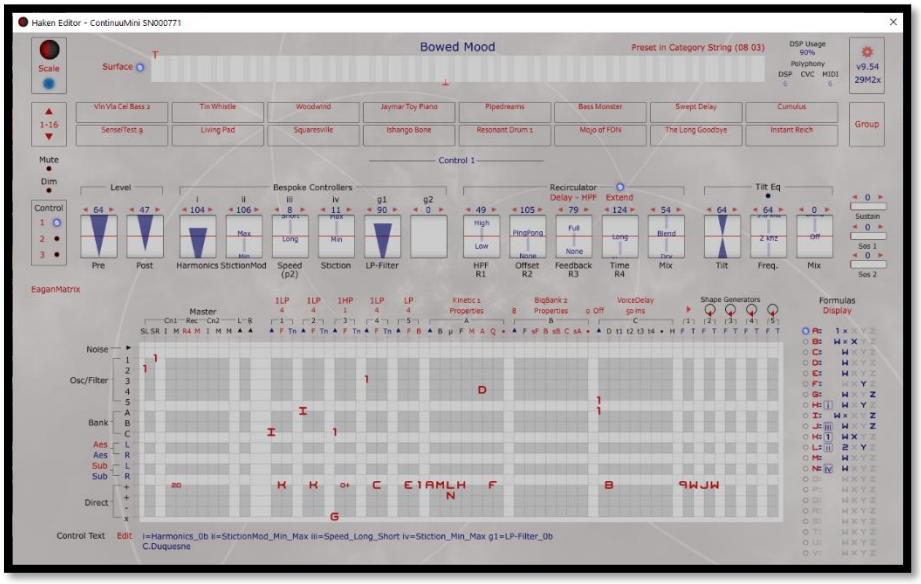
The Continuum Fingerboard has a built-in synthesizer specifically designed for Continuum playing. The internal synthesizer has predefined sounds as well as the ability to create user-defined sounds. Stereo output from the internal synthesizer can be heard through the high quality analog output (stereo line level and headphone level) as well as the AES digital audio outputs.

All Continuum Fingerboards share the same sensing technology and differ only in playing surface size, form factor and connection/interface types. The ContinuuMini is a much smaller device, sharing the same synthesis technology but simplified finger sensing. The ContinuuMini can track the pitch of only one or two fingers.

The Haken Editor application (for Mac and Windows), connects to the Continuum Fingerboard via Midi. The Continuum Fingerboard performance data can control external synthesizers via Midi, or analog modular synths via the Continuum Voltage Converter (option).

1.2. The EaganMatrix

The EaganMatrix is the modular digital synthesizer built into the Continuum Fingerboard and ContinuuMini programmed though the Haken Editor.



For the Performer

Many new sound algorithms have been finely crafted with the EaganMatrix. These EaganMatrix Presets exploit the unprecedented control possible with the Continuum Fingerboard. They provide the performer with an ever-increasing set of sophisticated sound environments to shape and explore using novel finger techniques.

For the Sound Designer

Not only does the EaganMatrix provide a large number of new presets for the performer. It is also a fantastic tool for the sound designer. The Haken Editor provides the EaganMatrix user interface. Since the EaganMatrix requires no external synthesizer other than normal Continuum connection, sound designs can easily be shared with other Continuum Fingerboard players.

The radically new design of the EaganMatrix requires the sound designer to think in a mathematical way that is different from traditional hardware and software synthesizers. A large variety of traditional and non-traditional sound generation functions are built into the EaganMatrix allowing for the generation of an incredibly large sonic palette using many different kinds of synthesis. As the sound designer masters the EaganMatrix, its novel capabilities will allow creation of musically satisfying relationships between fingers on the playing surface and the sounds produced, relationships that rival the warmth and complexity of acoustic instruments. For more information, please see the EaganMatrix User's Guide available in the Resources area at www.HakenAudio.com.

1.3. What Sets the Continuum Fingerboard Apart

The Continuum Fingerboard has been under development since the 1980s, culminating in the Continuum Fingerboard with Light Action. In recent years, the idea of "Expressive Controllers" and "Expressive Midi" have been popularized, and many devices based on inexpensive sensing technologies have hit the market. As a result, there is much confusion of the capabilities of the Continuum Fingerboard compared to other "Expressive Controllers".

These are five key features of a Continuum Fingerboard with Light Action that set it apart from other "Expressive Controllers":

1. The Continuum Fingerboard has unparalleled temporal resolution. This means it has quick response to user actions. The Continuum Fingerboard hardware does a complete scan of all of its sensors several times per millisecond, and this is evident in the resulting sound when a skilled player performs well-designed presets.

2. The Continuum Fingerboard has unparalleled pressure resolution. The pressure resolution is up to 15 bits in long sustained notes, allowing tiny pressure-related timbre changes, and detailed pitch trajectories in pressure-weighted portamentos, not possible on any other electronic instrument.

3. The most important part of a note (from a psychoacoustic perspective) is the attack. On the Continuum Fingerboard, the detailed pressure trajectory of the finger is tracked and reported, and the details of the attack shape allow an experienced player to intricately control the sound in that all-important part of each note. Other "Expressive Controllers" encode the attack as a single 7-bit number, called the "strike value." This 7-bit "strike value" is used to trigger envelopes; the fine structure of the real attack is lost, and attack details are automated just as they are with Midi keyboards. In contrast to this single value, the Continuum evaluates a high speed stream of surface data which can effectively encode the complex trajectory of an attack.

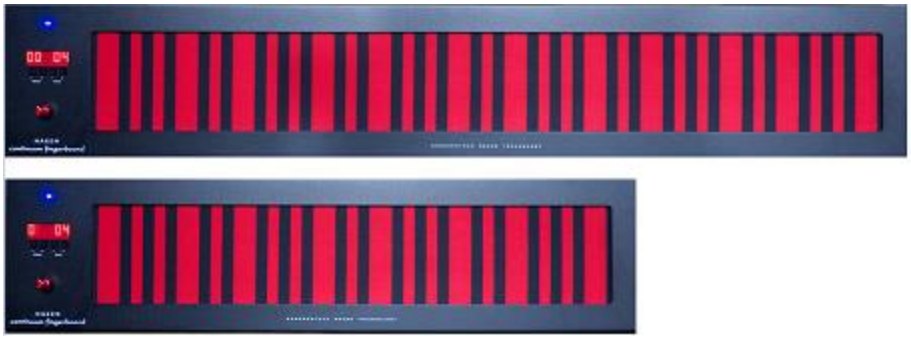
4. On the Continuum Fingerboard, you can roll your finger slightly to create beats in intervals, or make the beats melt away. Precise pitch requires accuracies of position (center of finger) of about 30 microns, or put another way, accuracies to 1/500th of a semitone. The Continuum Fingerboard alone makes it possible to play each note with this micro-tuned pitch accuracy from beginning to end. The Continuum Fingerboard alone allows for perfect fifths, perfect fourths, exact major thirds, etc. (standard performance technique in acoustic string instruments and vocal choral ensembles) — exact finger placement allows a skilled performer to play all intervals in a piece with perfect frequency ratios or slide in and out of perfect ratio during notes. We have become accustomed to the strictly quantized 12-pitches-per-octave music in the synth world, but any good singer, string player, woodwind player, etc. adjusts each note's pitch to fit what is going on.

5. The EaganMatrix synthesizer developed for the Continuum Fingerboard is far beyond any other synthesizer in how it uses finger information to affect the sound. Other "Expressive Controllers" use standard synth designs with simple parameter mappings (both in their own device and in controlling other third party synths) but those cannot give the depth of interaction between the finger motion and the sonic result that is possible with the EaganMatrix. In acoustic instruments, performer's motions have a complicated effect on the timbre, and this is much of what makes an acoustic instrument interesting to listen to for many hours. Nobody would listen to a single synth patch for very long if there is no interesting fine-structure control, it gets boring quickly, and synths make up for this shortcoming by playing lots of different timbres. Other "Expressive Controllers" do not solve this problem as well as the Continuum Fingerboard does.

Conventional wisdom assumes fast live performance is not possible on a continuous pitch instrument like the Continuum Fingerboard, because it is too difficult to place fingers accurately quickly enough. This is incorrect; please see Section 3. Playing fast passages as well as playing slow passages expressively on a Continuum Fingerboard will require much practice. An acoustic instrument requires extensive skills and musicianship to create an expressive performance; it should be expected that the same is true for an electronic instrument. The Continuum Fingerboard should not be seen as a way to replace other instruments or to "make it easy" (thereby deskilling the musical performance process); the Continuum Fingerboard has been designed to give the skilled performer the depths of expression and capabilities found in a fine acoustic instrument.

2. Haken Audio Hardware

2.1. The Continuum Fingerboard



"Slim" Continuum Fingerboards – 70 and 46 Half-Step Size Models

The Continuum Fingerboard has been under continual development since the 1980's. Early versions used many different sensing technologies. By the 1990's experience showed that an electromechanical system involving magnetic technologies provided the most accurate way to track tiny movements of multiple fingers. By the early 2000's, the nylon-manufactured-into-neoprene over the electromechanical sensing system was found to give the best surface feel and consistent tactile feedback. Five years later, Continuum Fingerboards incorporated a custom-designed DSP board to scan the sensors, synthesize internal sounds, and do I/O.

In more recent years all Continuum Fingerboards incorporate a "Light Action" playing surface, made possible by a combination of state-of-the-art sensor technologies (super-sensitive Hall-effect sensors), as well as state-of-the-art precision-machined mechanical components, underneath the layer of neoprene. Continuum Fingerboards with "Classic Action" were already the most sensitive electronic instrument in existence. The "Light Action" playing surface has extended the Continuum Fingerboard's pressure sensitivity, pitch accuracy, and temporal resolution even further.

Since the middle of 2016 until 2020, Continuum Fingerboards shipped as "L2x" (Light Action with a double-processing-power DSP), or as "L6x" (Light Action with Continuum EaganMatrix Expansion (CEE) for a total of three double-processing-power DSPs). As of late 2018, ContinuuMinis are shipping as "M2x". Other configurations are possible, such as the "C1x" (Classic Action with single-speed processor, no longer manufactured). What is in a particular Continuum Fingerboard can be identified by running the Haken Editor and noting the System Identifier. Note: All "Slim" Continuums are configured as "L6x".

The Continuum uses a system identifier to easily note its size and processing power that can be viewed in the Haken Editor next to the new "DSP Usage" display. Current firmware version installed also appears in this area.



*This System Identifier is coded as XXYZZ, where XX (70 here) is the number of half-steps on the playing surface, Y="**S**" (Slim), "**L**" (Light Action), "**C**" (Classic Action) or "**M**" (ContinuuMini) and ZZ = Processing power (1x, 2x, 6x, etc.) **70S6x** would then be a "Slim" 70 note 6x processing model. Note: All "Slim" models are 6x processing.*

Full and half size models of the Continuum could be upgraded in processing power using an internal or external Continuum EaganMatrix Expander (CEE). These are no longer available, however, for those who still use them, the CEE User's Guide is still included in the Editor's Cog Wheel menu section.

"Slim" Continuum Fingerboards incorporate a 1.2" depth low profile form factor versus the earlier half-size and full-size models (ca. 2.75" depth). "Slim" models use full 6X processing requiring no expansion. They are available in 70 and 46 half step versions (See HakenAudio.com).

2.2. The ContinuuMini



Original ContinuuMini and Updated Model – Identical to Original with Optional (Screw On) Touch Lever

The ContinuuMini has been designed to be a portable and more affordable version of Haken Audio's larger Continuum Fingerboards. The ContinuuMini is fun to play, has the same sound engine as the larger Continuums, and delivers its own unique and rewarding musical performance experience.

The ContinuuMini has exactly the same sound engine as the full-sized Continuum Fingerboard, delivering the same level of sound quality that Continuum owners have come to enjoy with 2x DSP processing support.

The playing surface of the ContinuuMini has been designed to translate finger movement from one or two fingers at a time into beautiful musical expression. While based on similar design philosophies as the Continuum Fingerboard, the ContinuuMini has its own unique playing experience. The Mini's playing surface can respond to incredibly light touch, which leverages an underused aspect of human control, the ability of the hand to deliver delicate light touch finger input. Lighter than playing a piano, or strumming a guitar, or even lighter than the action of modern Midi keyboard controllers.



Every nuance of finger movement is captured and translated into sound through interaction with this highly-optimized playing surface. And complete control of the fully programmable EaganMatrix sound engine opens up a world of sonic possibilities.

Due to its robust bidirectional implementation of MPE and MPE+, the ContinuuMini can control external synths or be played by external Midi controllers.

The pedal input can be used as a continuous sustain pedal input, for dynamic sustain or a variety of other uses within the EaganMatrix.

The pedal input can also function as a bidirectional serial port. Currently this communicates with control voltage convertors, like Haken Audio's CVC or Evaton Technologies microCVC, useful for interfacing with analog modular systems. We're excited about the possibilities of future uses for this port, further harnessing the EaganMatrix engine in new and novel ways.

We are very proud of how we have been able to leverage our decades of hardware and software expertise into the ContinuuMini. The ContinuuMini fulfills a need for a small portable musical instrument that is intimate and expressive.

Information on using the ContinuuMini can be found in Chapter 16.

2.3. The Continuum Voltage Converter (CVC)



Second Generation Continuum Voltage Converter (works with all Continuum models)

Haken Audio's Continuum (Control) Voltage Converter is designed for use with analog control-voltage synthesizers. The CVC converts the polyphonic X (pitch), Y (front-back), and Z (pressure) outputs of the Continuum Fingerboard into control voltages and gates. Alternatively, user-defined preprocessed control voltages can be defined with the EaganMatrix.

A total of 16 unique continuous voltage streams are available from a CVC. It is capable, for example, of being configured to produce four separate sets of X, Y, Z and Gate outputs to drive a variety of modular systems playing four part harmony from the fingerboard.

The CVC may be used as a desktop device or mounted in a standard 19 inch rack with optional rack ears. The current second-generation CVC model is less deep than the first-generation model, but in all other respects is identical in function with the addition of a 3.5mm TRS I2C interface for connection to the "Slim" Continuum model's IC2 port. (See Section 12.3 for CVC connection options for the "Slim" Continuum.) The CVC can also be used with half-size and full-size Continuums using the five pin DIN I2C connection and a fully populated Midi cable (as unused Midi pins are used for the I2C connection).

"Slim" Continuums can also use the first-generation CVC and MicroCVC with a custom 3.5mm to DIN adapter available from Haken audio (or you can make your own – see section 16.7 as it's the same adapter used to connect the ContinuuMini to the first-generation CVC). The ContinuuMini connects to the second generation CVC with a standard 3.5mm TRS cable.

For more information, please see the CVC User's Guide available in the Resources area at www.HakenAudio.com.

3. Historical Context

Electronic music history can teach us about greater possibilities that are different from what current Midi instruments offer. Rather than discount historical instruments as "old", Haken Audio endeavors to revive lost skills and ideas, and build on them.

The two historical electronic music instruments most like the Continuum Fingerboard are the Ondes Martenot and the Trautonium. Like the Continuum, both the Martenot and the Trautonium have continuous pitch capabilities, and both have pitches arranged horizontally with constant cents-per-inch spacing.

The Martenot can only play one pitch at a time when it is played in continuous-pitch mode. The Continuum extends this to polyphonic continuous-pitch playing. Unlike the Martenot, where the right hand controls pitch and the left controls articulation, on the Continuum each finger controls both pitch and articulation of a note.

The Trautonium has two monophonic continuous-pitch manuals, and the right and left hands can play simultaneously on each manual. The Continuum extends the Trautonium's dual polyphony to higher polyphony; on the Continuum each finger can play its own note on the super-sensitive multi-touch surface. The ContinuuMini is more limited than the Continuum, and closer to Trautonium in implementation.

3.1. Continuum "Touch Area"



A Martenot player controlling amplitude with the left hand and continuous pitch with the right. The left hand is pressing the Martenot's Touché; the right hand is in front of the keyboard, moving the Martenot's ring for continuous pitch changes.

In certain performance situations, the Martenot's separation of right hand (pitch) and left hand (articulation) is advantageous. For such situations, the Continuum supplies a similar capability through a configurable "Touch Area". The Touch Area on the Continuum is a small user-definable (and programmable) area on the surface set aside for left hand articulation control; the rest of the surface is for playing notes. The articulation for each note may be totally controlled by this area, or articulation may be controlled by a combination of the Touch Area and the fingers of the right hand. Since playing Continuum with Touch Area control is very different from playing without it, sounds are specially designed for use with the Touch Area. A performer can use the Touché when playing polyphonically — the left hand affecting articulation for all the notes played with the right hand. The Continuum's

Touch Area is more sophisticated than the Touché on the Ondes Martenot; the Continuum's Touch Area responds more quickly, is more accurate, and can control sound parameters in more complex ways.



The Continuum Touch Area can be placed anywhere on the Continuum surface, allowing for easy left or right handed control, though it normally is placed at the lowest end of the Continuum's playing surface.



The above graphic shows the Touch Area in its default position in the Haken Editor. It should be moved into the appropriate position for the Continuum model being used. Ranges of all Continuum Fingerboards are noted above, with the "Slim" models listed on top of the fingerboard graphic above.

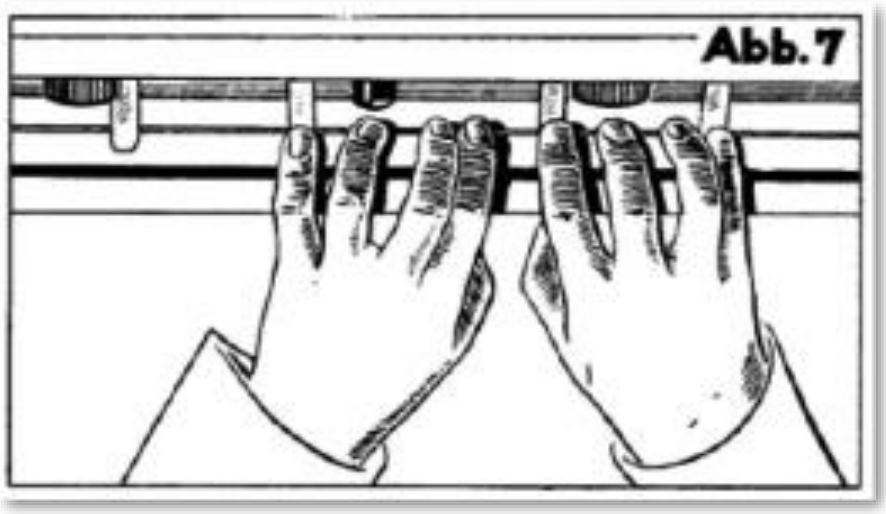
3.2. Fast Continuous-Pitch Playing

The Trautonium pioneered fast duo-phonic playing in a continuous-pitch electronic environment. This is a challenge, because continuous-pitch instruments require accurate finger placement, and it is hard to place fingers accurately while playing fast passages that cover several octaves.

Oskar Sala overcame this problem, as you can hear in his magnificent Trautonium performance of Genzmer's Rondo in 1940 https://www.youtube.com/watch?v=8g_3UfPEpsY. This recording is largely forgotten, or erringly discounted as must-have-been-faked by people that know of it.

The Oskar Sala Mixtur-Trautonium,
played in the 1940 recording of Genzmer's Rondo.

The same techniques Oskar Sala used to play fast passages can be used on the Continuum Fingerboard, by a performer willing to practice extensively and attain advanced playing skills. Oskar Sala's technique is built on three



ideas:

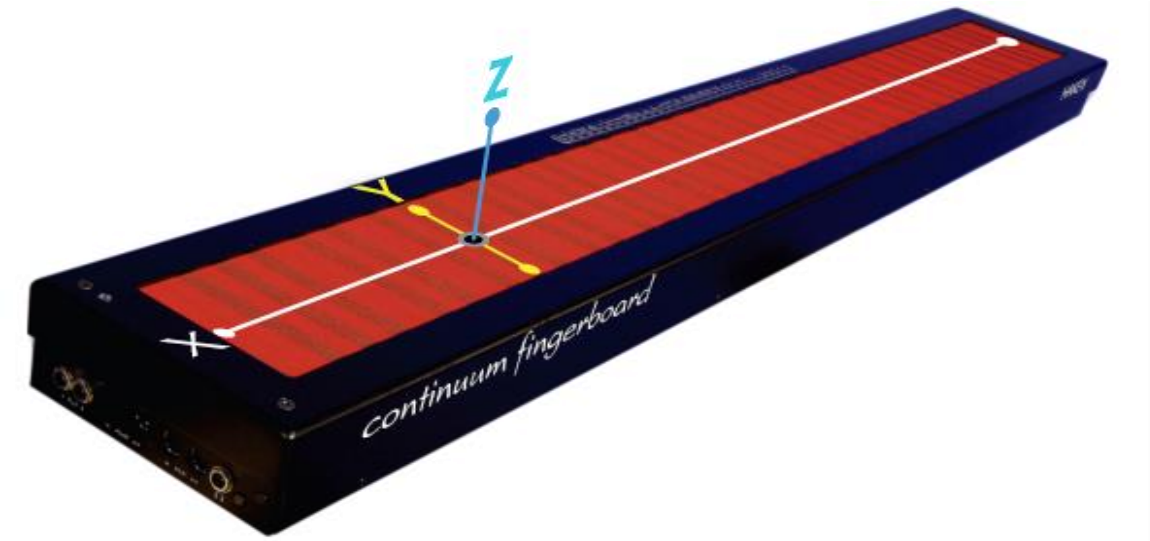
(1) The image above is from the 1933 Trautonium User's Guide (in German: "Trautoniumschule"). Notice how the fingers are positioned for a major scale; the left-hand pinky is on the tonic of the scale. This could be any major scale; all major scales have this same spacing between fingers. To change major scales, the hands only need to be moved left or right to a different tonic. Since 7 fingers are required for the 7 notes in an octave, this technique requires both hands to cover an octave (5 fingers will not suffice).

(2) The performer 'parks' fingers in position for the micro-tuned pitches of one octave and can play any note in that octave without moving the hands. The hands stay in one position for the duration of the fast passage; only vertical finger movement is required to play each note in the passage. Octaves are switched with a Tri-Value pedal. The Tri-Value pedal has three positions: at rest, up one octave, and down one octave. The Continuum Fingerboard's Tri-Value pedal is a *custom-wired* Linemaster 476-S (Haken Audio no longer sells these but you can order and wire your own – see section 6.5). The Continuum improves on the Trautonium by requiring much less vertical finger motion to play a note, much finer and faster articulation control, and higher polyphony — at the same time inheriting the Trautonium's capability of playing super-fast continuous-pitch passages.

(3) For uniform dynamics within the super-fast passage, use the "Legato TZ" mono mode (see Section 6.3).

4. Midi Encoding

4.1. Encoding Principles of the Continuum Fingerboard



The Continuum Fingerboard assigns each finger on the playing surface its own Midi channel. By default it tracks 8 fingers, using Midi channels 1-8. It may be configured to track between 1 and up to 16 fingers by using all 16 available Midi channels, 1-16. The ContinuuMini tracks the pitch of at most two fingers and is encoded in a similar way to the Continuum.

The Continuum Fingerboard tracks pitch (X), front-back position (Y), and pressure (Z) for each finger. The exact pitch of each finger is encoded as the nearest Midi note number to the initial position of the finger, plus the Pitch Bend on the finger's Midi channel. Note numbers range from 15 to 109 on a full-size Continuum Fingerboard, and from 39 to 85 on a half-size Continuum Fingerboard. Note number range can be changed by transposing or scaling the range of the Continuum Fingerboard. This is accomplished by selecting a new Middle C location (Section 10.11) or a custom Pitch Table (Sections 6.4 and 10.16). The default Pitch Bend range is eight octaves. The default encoding for finger pressure uses Midi Channel Pressure, and the default encoding for front-to-back uses Midi controller 74 (Brightness).

The Continuum Fingerboard's Midi encoding can follow the "Multidimensional Polyphonic Expression" (MPE) standard. As per the MPE standard, the Continuum uses controller 127 on channel 1 to specify polyphony, RPN 0 on channel 2 to specify bend range, and channels 2 through P+1 for notes (P is the polyphony).

MPE is very similar, but not exactly the same as, the Continuum Fingerboard's encoding that dates from 2001. You can customize the Continuum Fingerboard's Midi encoding if you are controlling a synth that does not support MPE. For example, you might configure Z as Midi controller 11 (Expression) rather than Channel Pressure. Also, you can configure the Continuum to use 14-bit pressure encoding (Section 10.9).

Continuum Fingerboard configuration changes may be made three ways: using the Haken Editor computer application (Section 8), using the Continuum Fingerboard's playing surface (Section 9), or by sending Midi configuration messages to the Continuum Fingerboard (Section 15).

4.2. Connecting an External Midi Synthesizer

In addition to playing internal sounds, you may want to connect your Continuum Fingerboard to an external Midi synthesizer. If your Midi synthesizer can do the "MPE" standard, simply load one of the MPE or MPE+ System Presets (in the "Midi" category of System Presets) in the Continuum, and set your Synthesizer to use MPE, and it should work. In practice, many synthesizers do not support MPE. This section will describe how to configure your Continuum without using MPE or MPE+.

To play polyphonically, the externally connected synthesizer should be capable of creating channelized voices, that is, Midi voices that are on discrete Midi channels. On some synthesizers this is called Multi-Timbral Mode. A requirement for the Continuum Fingerboard is that this multi-timbral aspect extends to any continuous controller that the Continuum is sending out to the synthesizer. Each continuous controller must affect only its own Midi channel and cannot affect other Midi channels. Each Continuum Fingerboard note contains channelized information in the X, Y, and Z directions, and that includes Midi Note information and continuous controller (Midi cc) information. The chart below shows the output of a Continuum Fingerboard that is set to four voice polyphony (not 4+), with a preset configured such that Y is sending out Midi cc74 and Z is sending out Midi cc11 (MPE/MPE+ is not set for Y or Z).

Voice Number	X (left to right)	Y (front to back)	Z (pressure)
1	Midi Note and Pitch Bend on Channel 1	Midi cc74 on Channel 1	Midi cc11 on Channel 1
2	Midi Note and Pitch Bend on Channel 2	Midi cc74 on Channel 2	Midi cc11 on Channel 2
3	Midi Note and Pitch Bend on Channel 3	Midi cc74 on Channel 3	Midi cc11 on Channel 3
4	Midi Note and Pitch Bend on Channel 4	Midi cc74 on Channel 4	Midi cc11 on Channel 4

If the Y/Z setting for the preset is set to MPE or MPE+, the Continuum or ContinuuMini will output on Midi channels 2 to max polyphony set+1, as MPE normally reserves channel 1 for configuration information. Also note that if you press monophonically, repeatedly articulating separate notes, each note will cycle through the available channel polyphony based on the Note Priority set.

If the connected external synthesizer is not capable of this kind of discrete channel operation, then it may not work well with the Continuum in a polyphonic sense. However, it is possible that it could be used very well monophonically; see Section 6.3.

Note that a special Channel 1 processing mode is now implemented if the preset is set to MPE+ or MPE mode for Y/Z. In this mode, the Continuum/ContinuuMini will still output on channels 2 to Max Polyphony +1, but it will accept polyphonic external input on channel 1. This is particularly useful when connecting an external non-MPE MIDI keyboard to the ContinuuMini which can only output duo-phonically from the playing surface. When connected, the external MIDI keyboard (or sequencer/controller) can play up to eight voice polyphony on the Mini on channel 1.

When you connect your Continuum Fingerboard to your synthesizer, you will need to configure both the Continuum Fingerboard and the synthesizer.

The easiest way to properly configure an external synthesizer is to follow these two steps:

(1) Connect your synthesizer through the Haken Editor, so you can use the Editor and your synthesizer at the same time (see Sections 12.9 and 12.14). Make it work predictably and reliably with a polyphony setting of 1 both on the Continuum Fingerboard and the external synthesizer. Then, once this working well,

(2) Change polyphony on the synthesizer and the Continuum Fingerboard to match the multi-timbral capabilities of your external synthesizer.

For step one, configure your external synthesizer to respond to Midi channel 1. Set the maximum pitch bend range allowed with an equal value for positive and negative value pitch bends (some synthesizers allow different values for the two directions). Set a matching pitch bend range on your Continuum Fingerboard (Section 10.7).

Set the Continuum Fingerboard to send a Midi cc value for Z (Section 10.9) to something that will control an amplitude change in the external synthesizer, usually Midi cc11 or Midi cc07.

Set Y (Section 10.8) to a Midi cc value that typically controls a timbral shift in the synthesizer. Setting Y and Z this way will mean the Continuum's lowest MIDI output channel will be 1 (not 2 and in MPE/MPE+ modes).

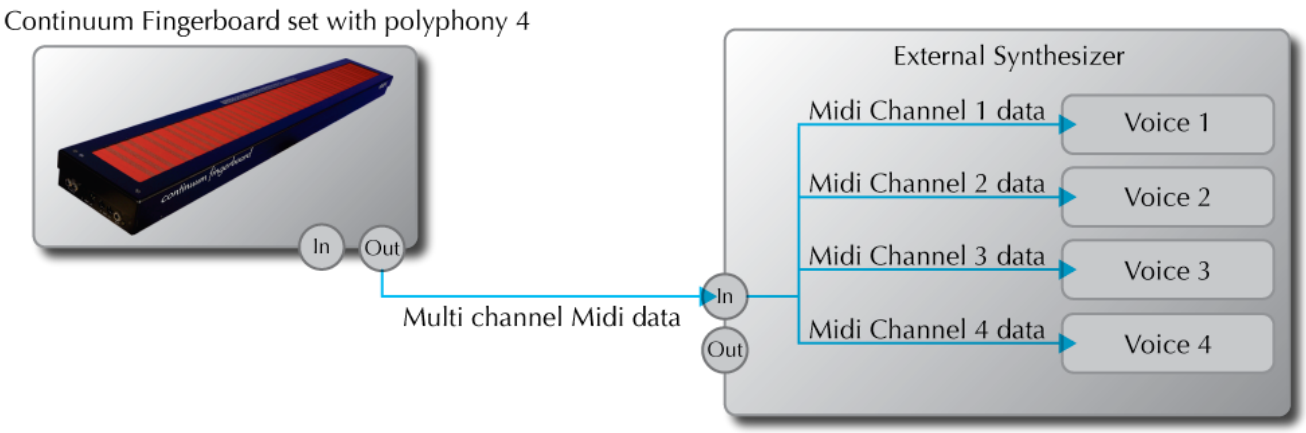
To confirm that pitch bend has been set up correctly, you can do the following test: Play an octave glissando on your Continuum Fingerboard. Then lift your finger and put it down again at the location where the glissando ended. The pitch you hear should match the ending pitch of the glissando. If it does not, pitch bend ranges are not configured to match each other correctly.

Play the synthesizer and confirm that the sound gets louder and quieter when the surface is pressed harder and softer, and that changes in the Y direction have a desired timbral shift effect. It is a good idea to read through Section 8.10 on further sound design considerations.

Once all of this is working as expected, increase the polyphony of the Continuum Fingerboard, and set a matching polyphony change on the synthesizer. This is where it can get confusing. Polyphony on an external synthesizer usually means number of simultaneous notes on a single Midi channel. Polyphony for a Continuum Fingerboard means number of Midi channels, each channel with a single Midi note, pitch bend and control values for Y and Z. This is a very important concept to understand.

The external synthesizer needs a multi-channel functionality to work correctly, such as the 4 channel example below (in this case set to non MPE/MPE+ mode):

For wiring information and diagrams, refer to Sections 12.9 and 12.14 of this User Guide.



4.3. Specialized Kyma Encoding

If you use Symbolic Sound Corporation's Kyma with your Continuum Fingerboard, each finger's position and pressure is available in standard Kyma Midi-event values of !KeyPitch (left-to-right position), !KeyTimbre (front-to-back position), and !KeyVelocity (finger pressure). These values continually change as the fingers move. Note that !KeyPitch is Midi note numbers, with a fractional value to indicate exact finger position.



The start of each finger's placement on the Continuum Fingerboard surface is interpreted as a !KeyDown. Kyma will send Midi information back to the Continuum which will automatically configure the polyphony of the Continuum Fingerboard surface to match the currently playing Kyma sound. Kyma uses the default Continuum Fingerboard cc values for Y and Z and will automatically configure the Continuum accordingly.

It may be useful to smooth !KeyVelocity (finger pressure) when you use it in Kyma. Undesirable audible effects can be caused by the Continuum Fingerboard's scan rate, or the parameter updates at Midi transmission rate. Continuous event smoothing is available globally within the Kyma system preferences.

To get the quickest real-time response from Kyma, choose the shortest Overall System Delay that works for your Sound (also in the Kyma preferences).

See Section 10.10 for required Kyma-specific configuration, and Sections 12.10 through 12.13 for connection diagrams.

5. Specifications

ContinuuMini players may wish to skip to Section 5.3, as sections 5.1 and 5.2 are specific to the larger Continuum Fingerboards.

5.1. I/O Connections for the "Slim" Continuum Fingerboard

This section describes the connections for the "Slim" Continuum Fingerboard which has same internal processing and playing capabilities of the L6x Full and Half Size models in a lower profile form factor with slightly different connection options and a new onboard user display/control interface. It uses the same EaganMatrix sound engine and editor as the other continuums. Connections are made to the Continuum Fingerboard on only the left side of the instrument.



	Left End of Continuum Fingerboard
1	Power Inlet. (110V/220V 8 Amp Universal power supply included with purchase). Note: There is no power switch on the "Slim" model Continuums. They will power on and automatically boot when the 5VDC power supply is plugged into a wall outlet.
2	Pedal 1 input. Connect a standard passive switch, damper pedal, or passive continuous pedal using 1/4" TRS cable; see Section 6.5 for pedal details.
2	Pedal 2 input. Connect a standard passive switch, damper pedal, or passive continuous pedal using 1/4" TRS cable; see Section 6.5 for pedal details.
3	3.5 mm MIDI I/O. Universal Midi (Note: Slim Continuum supports TRS Type B Midi Output pin configuration and TRS A or TRS B for Midi input. Make sure you have the right adapter for your equipment. (Note: Not required to be connected if USB MIDI connection is being used – the preferred connection). Uses 3.5mm to MIDI DIN adapters (not included).
4	MIDI over USB (Note: MIDI Host required to play Continuum directly without a computer). A to B USB cable included with purchase. **Note: This is not an audio USB interface. You cannot record Continuum audio over this USB connection. You must connect the Continuum's audio outputs to a sound interface or mixer.**

	Left End of Continuum Fingerboard
5	I2C port for connection to the Continuum Voltage Converter (CVC). Uses 3.5mm TRS cable to the current CVC or custom 3.5mm TRS to DIN IC2 adapter (not included) if connecting to the Generation 1 CVC that only has Midi DIN ports.
6	Digital Audio I/O. 3.5m SPDIF Connections Uses RCA connectors assuming digital audio cable (not included).
7	Analog Mono audio Left and Right outputs. A standard 1/4" mono cable can be used. **To connect your Slim L and R analog output to equipment that uses UNBALANCED audio**: Use TS (MONO) 1/4 inch cables between the Slim L and R output and your equipment. Use high-quality cables that are as short as possible for best results. If you have only one speaker, connect only to the Slim L output; the Slim will detect this and automatically mono sum the signal. **To connect your Slim L and R analog output to equipment that uses BALANCED audio**: Use TRS 1/4 inch shielded cables (cables you would use for any high-quality BALANCED audio) between the Slim L and R output and your equipment.
8	Analog audio out, headphone level. TRS Stereo jack. **Note: Never connect a mono cable to this jack. Damage could result to the headphone circuitry.**
	Right End of Continuum Fingerboard
9	On/Off Switch

5.2. Left and Right Panels of the Full-size and Half-size Continuum Fingerboard

Connections are made to the Continuum Fingerboard on both the left end and the right end of the instrument.



	Left End of Continuum Fingerboard
1	LED. Normally dim blue. Changes colour depending on configuration state, via interaction through the Haken Editor or the Red Button (9).

	Left End of Continuum Fingerboard
2	Pedal 1 input. Connect a standard passive switch, damper pedal, or passive continuous pedal; see Section 6.5 for pedal details.
3	Pedal 2 input. Connect a standard passive switch, damper pedal, or passive continuous pedal; see Section 6.5 for pedal details.
4	Digital audio input (AES3 format), and a high-speed link from the Continuum EaganMatrix Expander (xCEE).
5	Digital audio output (AES3 format), and a high-speed link to the Continuum EaganMatrix Expander (xCEE).
6	Midi input.
7	Midi output and Continuum Voltage Converter (CVC) control output.
8	Analog audio out, headphone level. TRS Stereo jack.
9	The Red Button, used for configuration procedures when the Haken Editor is not available.
	Right End of Continuum Fingerboard
10	Power plug (110/220v, 50-60hz)
11	Fuse (4 amp)
12	On/Off switch

For detailed connection diagrams showing how to interface the Continuum with the outside world visit Section 12 of this User Guide.

5.3. Hardware Specifications for Continuums and ContinuuMini

	Full-size Continuum	Half-size Continuum	ContinuuMini
Pitch Range	Nearly 8 octaves (9350 cents)	Nearly 4 octaves (4610 cents)	Over 2 octaves (2850 cents)
Pitch Resolution	better than .1 cents	better than .1 cents	better than 1 cent
Magnetic Sensors	512	256	4
Surface Polyphony	max 16 fingers	max 16 fingers	1 finger, 2 limited
EaganMatrix Max Polyphony	8 voice (L2x standard), 24 voice (L6x option)	8 voice (L2x standard), 24 voice (L6x option)	8 voice (M2x)
EaganMatrix Combinations	1 matrix (L2x standard), 3 matrices (L6x option)	1 matrix (L2x standard), 3 matrices (L6x option)	1 matrix (M2x)
Specialty Sounds Max Polyphony	24 voices	24 voices	8 voice
Control Voltages using CVC	16 (4 each for 4 voices), 16 (8 each for 2 voices)	16 (4 each for 4 voice), 16 (8 each for 2 voice)	16 (8 each for 2 voice)
Midi Polyphony	15	15	1 (2 limited)
Scan Interval	330 µs	330 µs	700 µs
Interface	Midi, 1/4" headphone, AES3, i2c for CVC, two 1/4" pedal jacks	Midi, 1/4" headphone, AES3, i2c for CVC, two 1/4" pedal jacks	Usb, 1/8" headphone, i2c for CVC, one 1/8" pedal jack
Audio Output (Analog)	24 bit D/A, up to 5v p-p, 100 mW power	24 bit D/A, up to 5v p-p, 100 mW power	24 bit D/A, up to 5v p-p, 100 mW power
Audio Output (Digital)	24 bit AES3, 48/96 kHz or sync to AES3 input	24 bit AES3, 48/96 kHz or sync to AES3 input	n/a
Power	50W, 110 or 220 Vac	50W, 110 or 220 Vac	500 mA Usb (210 avg)
Size	135·19·7.5 (54·7.5·3")	72·19·7.5 (28.5·7.5·3")	53·6·2 cm (21·2.5·0.75")
Case Size	150·28·16.5 (59·11·6.5")	86·28·16.5 (34·11·6.5")	n/a (tube is 24" by 2.5")
Weight	10.2 kg (22.5 lb), with case 17 kg (38 lb)	7.3 kg (16 lb), with case 11.2 kg (25 lb)	0.25 kg (9 oz)

6. Operating the Continuum Fingerboard

ContinuuMini players may wish to skip to Section 6.4, as the next few sections are specific to the Continuum Fingerboards.

6.1. Turning On the Continuum Fingerboard

The Continuum Fingerboard should be placed on a solid stand or table. The stand or table should not move appreciably when vibrato or other finger motions occur on the playing surface. Many performers prefer the Continuum Fingerboard at a slight angle; for ideas please see the description of Edmund Eagan's Continuum Stand in the Accessories area of www.HakenAudio.com.

"Slim" continuum models turn on automatically when powered through the included 5V wall adapter. Half-size and Full-size Continuum Fingerboards have a power switch. In both cases, when powered, the top LED should light within a few seconds and turn solid blue. If it doesn't, please turn it off and check the power connection and then (on Half-Size and Full-Size models) the fuse. If you repeatedly blow fuses, please contact technical support; this indicates a serious problem.

The Continuum Fingerboard will be slightly warm to the touch if it has been turned on for a while. This is normal and does not indicate a problem.

When you first receive your Continuum Fingerboard, connect the supplied USB cable (for "Slim") or USB-Midi interface cable (Half-Size/Full-Size) between your Continuum and your Mac or PC, and run the Haken Editor (see Section 8 for setup details). Once the Editor is running, refine the surface calibration (see Section 7).

You will want to use high efficiency headphones with your Continuum's headphone jack. *Take care when you first put on your headphones; verify that the Gain setting is appropriate. Refer to Sections 8 and 10.1 to learn how to set the Gain (Pre and Post).* The Continuum Fingerboard's headphone jack is capable of a wide output voltage range and can optionally be used for professional-level audio stereo line level output. (**Never plug a mono cable directly into the headphone jack; that would short one channel to ground and potentially damage the headphone circuit.)**

We suggest you play with the Continuum Fingerboard's many built-in sounds before connecting external synthesizers and get used to the feel and operation of the playing surface.

6.2. Playing the Continuum Fingerboard

Performing on the Continuum Fingerboard is challenging. Like a fretless instrument, you must rely on audio feedback, finger memory and manual dexterity for accurate intonation and expression. You will find that the Continuum Fingerboard requires its own technique, different from any other instrument.

When you play a traditional music keyboard, it is normal to feel the key hit a hard stop as you play a note, even if you are playing quietly. Also, traditional keyboards are usually velocity sensitive. On an instrument like a piano, a single velocity value is associated with the speed of the key movement.

In contrast, the Continuum Fingerboard is both velocity sensitive and, more importantly, pressure sensitive. It continually outputs a stream of pressure values. (A continuous stream of velocity values can be derived from the pressure values, since velocity is pressure-change-over-time.) The pressure values continue whenever pressure changes until the note is terminated. It is unusual to hit the hard stop (or "bottom out") except for the very loudest notes. This distance from zero pressure to maximum pressure is relatively small yet offers an extremely wide range of dynamic possibilities. Note that many presets will distort if you try and press to the bottom of the finger bed. The lighter the touch you master on the Continuum Fingerboard, the greater the expressive possibilities it will offer you.

Even if you have a refined keyboard technique on a piano or synthesizer you will still need to develop new playing skills to master the Continuum Fingerboard.

Don't assume that the Continuum Fingerboard will respond like a pressure sensitive drum pad. The Continuum Fingerboard's playing surface has been designed for a finger technique. The human hand is an extremely sensitive input/output device. Thanks to the Continuum Fingerboard's design the performer is free from the greater mechanical forces that are required to actuate a note on an acoustic keyboard instrument like a piano or harpsichord. As such, the mechanical feedback devices inside the Continuum Fingerboard are designed to take advantage of the lighter pressures that a human hand can easily and quickly generate. Keep this in mind as you play your Continuum Fingerboard. You'll be rewarded with a decidedly musical response to your subtle and dynamic playing gestures. A lighter touch will also minimize heat buildup on the fingertips that can be caused by overly aggressive contact with the surface.

As a suggestion, start playing the Continuum Fingerboard with just one note at a time; leave the chords until later. Practice vibrato and dynamic variations. Try to imitate the expressive playing of other performers on other instruments; a favorite is to imitate Clara Rockmore playing Rachmaninoff on the Theremin. When you start playing chords, start simple and listen to the beats adjust as you roll your fingers on the playing surface. Try playing drone tones and add a melody. Practice just intonation and alternate tunings.

A finger's initial contact with the surface is especially important. As with acoustic instruments, your Continuum Fingerboard allows you to shape the first milliseconds of a sound — much more detailed and varied control than provided by other electronic instruments. Much of the skill of an advanced Continuum Fingerboard player involves shaping the fine structure of attacks of sounds (for presets that do not impose an attack profile using shape generators – see the EaganMatrix manual).

Chords containing half-step intervals present a particular challenge. When you place fingers closely together (less than 150 cents apart) on the playing surface, the Continuum Fingerboard can have trouble resolving the two fingers. This may result in a smaller pitch interval than you expect, or it may result in a single finger (not two fingers) being detected. If this occurs, try spreading the notes vertically on the fingerboard so that the notes in the half-step interval are not horizontally on the same plane.

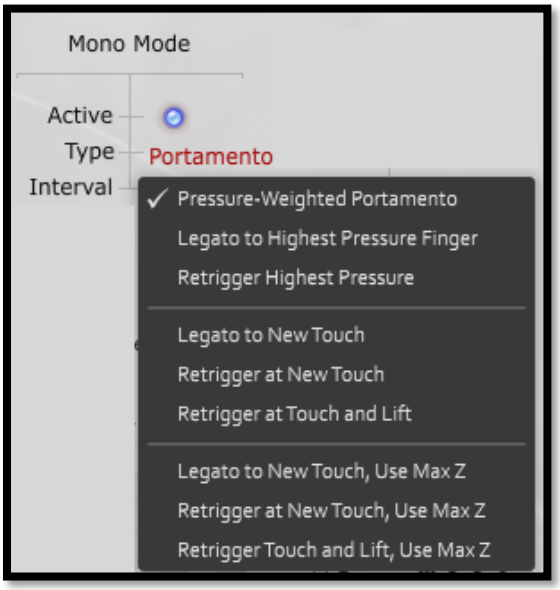
If playing chords with smaller than 100 cent intervals is of interest to you, and if you learn how to program the EaganMatrix or have an external flexible synthesis system, one approach is to have the front-back position enable an octave shift in your synthesis system. This will allow you to play tiny intervals and unisons by placing fingers an octave apart at the front and back of the playing surface. Another approach is to use a Sustain Pedal to build up a tone cluster from several closely spaced pitches that you touch one at a time. A third approach is to use custom Pitch Tables to stretch half steps or repeat surface pitches (Section 6.4).

6.3. Mono (Multiple Fingers Combined Create a Single Note)

The Continuum Fingerboard tracks up to 16 fingers on its playing surface. When multiple fingers are touching the surface, each finger can trigger its own note, or the combination of fingers can correspond to a single note. This latter can be done a variety of ways on the Continuum Fingerboard — using the Touch Area (Section 3.1), using Lowest Channel Number (abbreviated LCN, Section 10.6) with a custom-programmed EaganMatrix, or, most commonly, using "Mono." Mono is a powerful performance feature unique to the Continuum Fingerboard. It can be used for playing single-note lines with articulation reminiscent of wind instruments, for oscillating back and forth accurately between two pitch centers, for whammy-bar effects, for piano-style glissandi (when used with Round Rate 127, Section 10.15), or for special trills, turns, and other ornamental effects. *These mono functions are beyond the sensing capabilities of the ContinuuMini.*

Mono Functions

The Continuum Fingerboard supplies nine Mono Functions that allow you to process the combination of multiple fingers different ways. These are available in the Control 2 Panel of the Haken Editor Under "Mono Mode/Type" selections. Click the selectable (red) text to view and change the current option.



Haken Editor Mono Mode Selections

For the description below, we will assume Mono is being used to perform single-note lines with a variety of transitions between notes. If one finger is down, and another is pressed, Mono can convert this into two consecutive single notes with one of the following transitions between the notes:

Mono Function	Details	Midi Encoding
Portamento	The second note has no attack or decay of its own; instead, it continues with the sustain portion of the first note, but smoothly glides to the new pitch, based on the relative pressure of the two fingers.	A highly optimized series of Pitch Bend messages will be used to glide the pitch to the new note.

Mono Function	Details	Midi Encoding
Legato Z	The second note sounds when the pressure of the second finger exceeds the pressure of the first finger. The second note has no attack or decay of its own; instead, it continues with the sustain portion of the first note but jumps to the new pitch.	When the second finger reaches a pressure greater than the first, a Pitch Bend will be used to jump to the new pitch; no Note Off or Note On will be transmitted.
Retrigger Z	The second note sounds when the pressure of the second finger exceeds the pressure of the first finger. The second note has an attack and decay; it sounds much like it would if the first note had not been played.	When the second finger reaches a pressure greater than the first, a Note Off will be transmitted for the first finger, and a Note On for the second finger.
Legato T	The second note sounds as soon as the second finger touches the surface. The second note has no attack or decay of its own; instead, it continues with the sustain portion of the first note but jumps to the new pitch.	As soon as the second finger touches the surface, a Pitch Bend will be used to jump to the new pitch; no Note Off or Note On will be transmitted.
Retrig T	The second note sounds as soon as the second finger touches the surface. The second note has an attack and decay; it sounds much like it would if the first note had not been played. If the second finger is lifted before the first, the pitch jumps back to the first finger's pitch.	As soon as the second finger touches the surface, a Note Off will be transmitted for the first finger, and a Note On for the second finger. Then, if the second finger is lifted before the first, a Pitch Bend will be used to jump back to the first finger's pitch.
Retrig TL	The second note sounds as soon as the second finger touches the surface. The second note has an attack and decay; it sounds much like it would if the first note had not been played. If the second finger is lifted before the first, the first note re-attacks.	As soon as the second finger touches the surface, a Note Off will be transmitted for the first finger, and a Note On for the second finger. If the second finger is lifted before the first, a Note Off will be transmitted for the second finger, and a new Note On will be transmitted for the first finger.
Legato TZ	The second note sounds as soon as the second finger touches the surface. The second note has no attack or decay of its own; instead, it continues with the sustain portion of the first note, but jumps to the new pitch, and uses the max pressure of the two fingers.	As soon as the second finger touches the surface, a Pitch Bend will be used to jump to the new pitch; no Note Off or Note On will be transmitted. The dynamics will be controlled by the highest pressure finger.
Retrig TZ	The second note sounds as soon as the second finger touches the surface. The second note has an attack and decay; it sounds much like it would if the first note had not been played. If the second finger is lifted before the first, the pitch jumps back to the first finger's pitch, and uses the max pressure of the two fingers.	As soon as the second finger touches the surface, a Note Off will be transmitted for the first finger, and a Note On for the second finger. Then, if the second finger is lifted before the first, a Pitch Bend will be used to jump back to the first finger's pitch. The dynamics will be based on the highest pressure finger.

Mono Function	Details	Midi Encoding
Retrig TLZ	The second note sounds as soon as the second finger touches the surface. The second note has an attack and decay; it sounds much like it would if the first note had not been played. If the second finger is lifted before the first, the first note re-attacks, and uses the max pressure of the two fingers.	As soon as the second finger touches the surface, a Note Off will be transmitted for the first finger, and a Note On for the second finger. If the second finger is lifted before the first, a Note Off will be transmitted for the second finger, and a new Note On will be transmitted for the first finger. The dynamics will be based on the highest pressure finger.

Fingers Pressure and Mono Transitions

Mono transitions can be controlled by finger pressure or by time. If one finger is pressed down, and then a second is pressed down in addition to the first, the transition is as follows:

Portamento: The transition begins when the second finger touches the surface (the pitch glide begins) and ends when the first finger is lifted (the pitch glide is completed). The pressure of each finger, as well as the pitch of each finger, determines the pitch played during the transition. Long and short transitions may be performed under control of finger pressure, without changing any externally configured parameters. The pitch glide rate may vary within a single transition, depending on how the performer adjusts the relative finger pressures. If many fingers are down, the pitches and the pressures of each finger are combined to compute the total pitch. The variable nature of this pitch glide allows the performer to create complex glide curves that would be difficult if not impossible to program into a conventional synthesizer.

Legato Z and Retrigger Z: The transition occurs when the second finger reaches a higher pressure than the first. If many fingers are down, the finger with the highest pressure is played; if fingers are changing pressure, transitions occur whenever a new finger becomes the finger with highest pressure.

Legato T, Retrig T, Retrig TL: The transition occurs as soon as the second finger touches the surface. If many fingers are down, the last finger to touch the surface is played.

Legato TZ, Retrig TZ, Retrig TLZ: The transition occurs as soon as the second finger touches the surface. If many fingers are down, the last finger to touch the surface is played. The dynamics are based on the highest pressure finger. This mode is especially useful for fast playing with the Tri-Value Pedal (Section 6.5).

Activating Mono Functionality

Mono is active in the following three situations:

(1) The Continuum Fingerboard has polyphony 1. Multiple fingers are tracked, but only one note at a time is played on the synthesizer. Only single-note lines can be played, with Mono transitions between the notes.

(2) The Continuum Fingerboard has polyphony greater than 1, but the surface is split so that only one voice is assigned to a range of pitches. Within that pitch range, Mono is used, and only single-note lines can be played in that range.

(3) Polyphony is greater than 1, and the Mono Interval (the pitch interval within which single-note transitions will occur) has been configured. If the second finger is within the Mono Interval of the first finger, a single-note line will be played. If the second finger is outside the Mono Interval of the first finger, multiple notes will sound at once. This feature can be selectively enabled and disabled during a performance using the Mono Switch pedal function, allowing a performer to play (for example) both mono mordents and polyphonic mordents.

6.4. Rounding, Pitch Tables, and the Pitch Table Editor

Rounding

The Continuum Fingerboard and ContinuuMini include a sophisticated mechanism to quantize finger positions to predetermined scale grids ("Pitch Tables"), such as Equally Tempered or Just tunings. It allows you to place fingers with positional errors, and still hear a note (or a chord, if you are playing polyphonically) that corresponds to perfectly placed fingers. You may then slide your fingers (glissando) to new positions; the notes will glide in pitch to the new finger positions, and then they will be corrected. When finger positions are corrected, we refer to this as "rounding the finger position". Finger position may be corrected when the finger first touches the surface (Round Initial), and after as the finger slides on the surface (Round Rate). The Round Rate mechanism works in such a way as to not diminish the expressive possibilities of subtle pitch changes like vibrato (periodic variation in pitch), grace notes (small glissandi) or large pitch sweeps. For instance, if a note is played with vibrato, small adjustments will be made so that the averaged finger position (and the perceived pitch) is precisely correct.

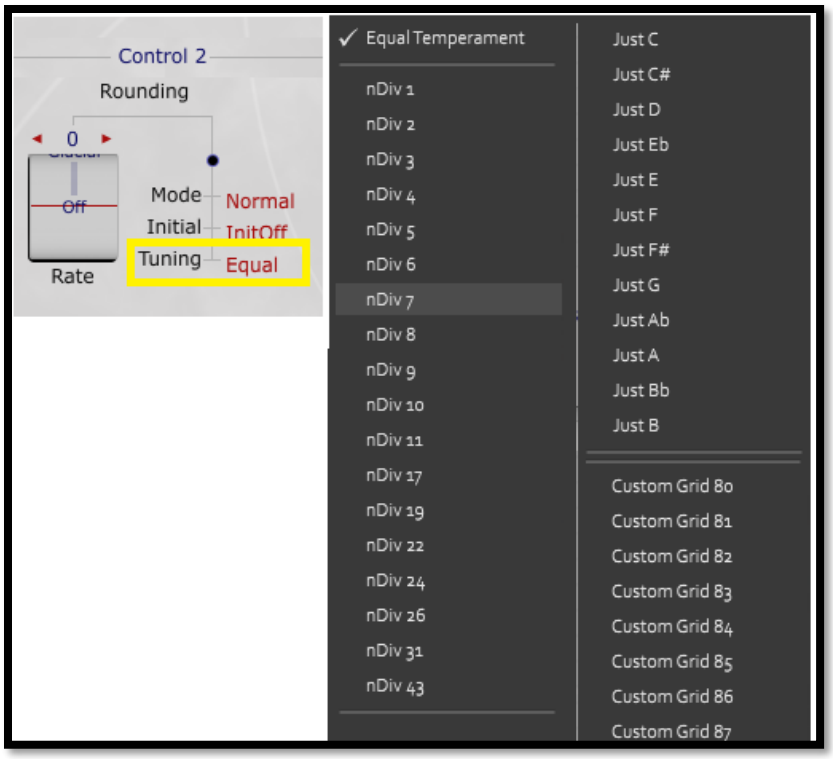
The Round Rate mechanism allows you to control the rate at which finger position correction drifts toward the currently active Pitch Table, anywhere from instantaneous to glacial (minutes long). A Round Rate of 0 means no rounding; small Round Rates cause a slow drift to grid positions; larger rates round more quickly. The maximum Round Rate of 127 causes immediate rounding; with this fully rounded rate you will get a fretted guitar style half-step glissando when you slide a finger over adjacent grid positions.

The Round Rate mechanism not only corrects finger position while the finger is in contact with the surface, but it continues to correct even after the finger is lifted from the surface (during the release portion of the note).

The Round Rate can be modified at any time during a performance. You can configure the Round Rate (Section 10.15) using the Haken Editor, front panel display ("Slim" Continuum) or the Configuration Strip (half-size and full-size Continuums). You can also change the Round Rate using pedals or Midi Input CCs (see Section 14).

Pitch Table

The Haken Editor (for all Continuums) and Continuum Fingerboard (for half-size and full-size models) allows you to choose Pitch Tables for Just tuning, equal tuning, N Division tuning, and user-defined custom Pitch Tables for correcting finger positions via Rounding. In the Just tuning, any of the major triads (I, IV, V) will have perfect 4:5:6 frequency ratios in the rounded finger position, and the ii and vi minor triads will have perfect 10:12:15 frequency ratios. You can change the tonic key for the tuning at any time, even while fingers are pressing on the Continuum Fingerboard's playing surface; the Round Rate mechanism will correct the positions of those fingers to the new tuning. As in equal temperament tuning the time the tuning rounding takes is dependent on setting of Round Rate. N Division tuning rounds the surface to a number of divisions of each octave on the playing surface, based on all the C pitches. For instance, an N Division setting of 1 will round every finger position to the closest C note. An N Division setting of 2 will round each finger to the closest C or F#, whichever is closest. An N Division setting of 24 will round each finger to the closest quarter step.



Pitch Table Options from Control Panel 2 of Haken Editor

Disadvantages of Rounding

Ideally, the Continuum Fingerboard is played without the idea of a predetermined scale unless a preset specifically relies on full rounding (such as some of the organ presets). A skilled violinist is not constrained to pitches from a particular scale during a performance; instead, the violinist micro-adjusts the pitch of each note for optimal harmonic musical results. Similarly, a skilled Continuum player is constantly listening and adjusting finger position to obtain the desired results and does not rely on the Round Rate mechanism to make up for inability to place fingers properly. For beginners, the Continuum's Rounding feature seems to be helpful, but the short-term convenience will eventually have long-term consequences. Important finger placement, muscle memory, and listening skills will be compromised. A Continuum player that requires Round Rate is a bit like a singer that requires auto-tune to sing in tune. The exception would be in playing a preset that has a pitch center that is indeterminate, like an ensemble of strings or voices.

Release Rounding

Release Rounding is different from the Continuum's other Rounding mechanisms. Release Rounding limits the effect of Round Rate so that it only adjusts pitch once a performer's finger is lifted but has no effect while the finger is touching the surface. Once the finger is lifted from the Continuum's surface and the note is still sounding through a release envelope, a performer can no longer correct an "out of pitch" note. Release Rounding is valuable for timbres which are plucked and have a long release after the finger is lifted, such as the Continuum's internal sound "Metal Bar." Release Rounding may be of interest to Continuum players who otherwise avoid the Round Rate mechanisms.

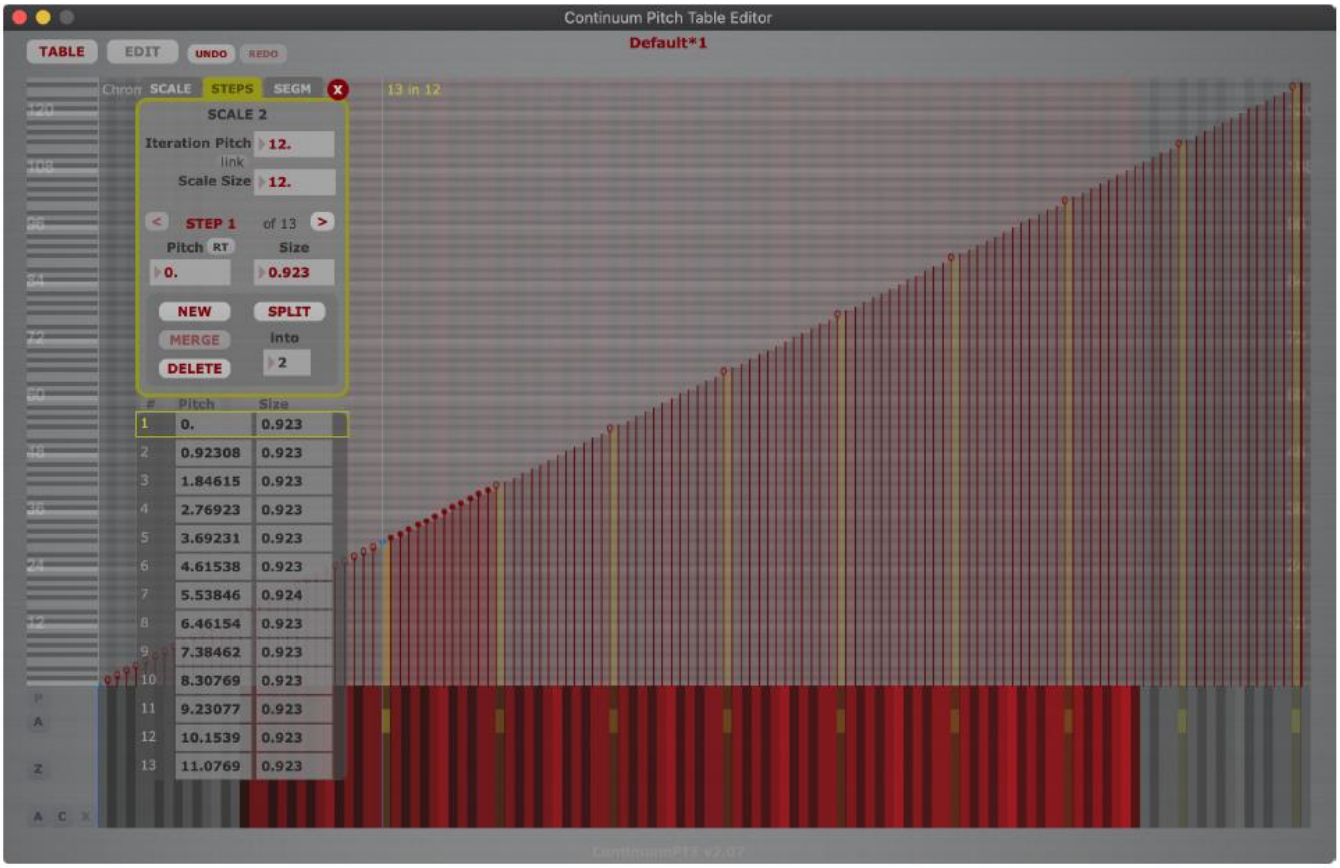
Rounding via Y Position

Rounding via Y Position allows a variable amount of finger position correction, depending on the front-to-back placement of a finger on the surface. If the loaded preset does not use Y for timbral control, Rounding via Y Position can be a convenient way to use finger position correction as-needed for certain notes in a performance. During

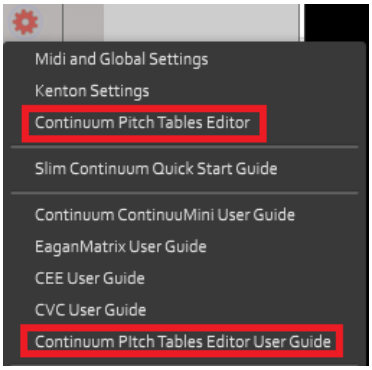
practice sessions, Rounding via Y Position provides an convenient way to rely less and less on rounding: as a player's proficiency at placing fingers accurately improves, the player can gradually change Y position to reduce automatic finger position correction. See Section 10.14 for details.

Pitch Table Editor: Simple and Radical Uses

A graphical Pitch Table Editor (PTE) and its User Guide are available in the Cogwheel menu (Section 10.22). The PTE is for creating custom downloadable Pitch Tables and was written by Continuum Fingerboard player Pablo De La Loza. The PTE can be used for creating Pitch Tables for use with Rounding, or for radically pitch-warping the playing surface. For example, the PTE allows you to define Pitch Tables that stretch or shrink the size of octaves or repeat or reverse the same pitches at different points on the surface.

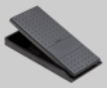


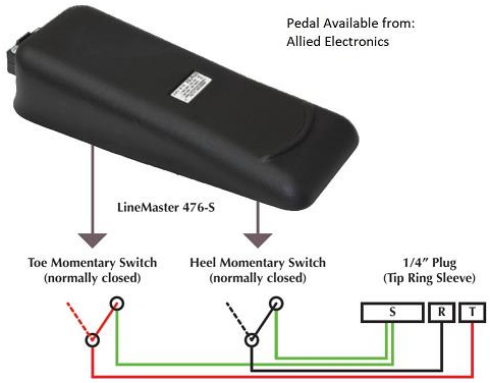
Accessing Pitch Table Editor and its User Guide from the Cogwheel menu::



6.5. Pedal Jacks

Continuum Fingerboards have two quarter inch pedal jack inputs, located on the left interface panel between the power adapter input and the SPDIF digital interface connectors. These are labeled Pedals 1 and 2. ContinuuMinis have a single 3.5mm pedal jack that requires a Hosa MHE-100.5 (or equivalent) adapter. The pedal jacks have been tested with Yamaha FC3, FC4, FC5, and FC7 pedals (others may work but have not been qualified). Many of the parameters to control with pedals are continuous parameters, so the FC3 and FC7 are recommended as they have continuous output values. Using a pedal jack is equivalent to sending the corresponding Midi controller value to the Continuum Fingerboard's Midi In (see Section 14), except the pedal jack has higher precision.

Pedal Model	Output	Use
Yamaha FC7 	Continuous data values from 0 to 127. This pedal's "dual zone" feature requires additional pressure to reach the highest output values; this feature can be disabled with the pedal's adjustment screw. The pedal's range can be reduced and/or reversed, using the Haken Editor's Pedal Min/Max settings (Section 10.18). The EaganMatrix and CVC read this pedal with high accuracy; Midi accuracy is limited to 7 bits.	A sweepable pedal from 0 to 127, with the ability to stay at a non-zero point when the foot is removed (used by many of the EaganMatrix system presets as Pedal 2).
Yamaha FC3 	Continuous data values from 0 to 127. This range can be reduced and/or reversed, using the Haken Editor's Pedal Min/Max settings. The EaganMatrix and CVC read this pedal with high accuracy; Midi accuracy is limited to 7 bits.	As a traditional sustain type pedal action, with the added benefit of a sweepable range from minimum to maximum. Returns to zero when the foot is removed (used by many of the EaganMatrix system presets as Pedal 1).
Yamaha FC4 	Switch with two values, 0 (off) and 127 (on). Other values for off and on can be selected using the Haken Editor's Pedal Min/Max settings. (When this pedal is detected by the Haken Editor, a picture of the FC5 will appear; the FC4 and FC5 are equivalent.)	As a traditional sustain type pedal action limited to switch values. Returns to zero when the foot is removed.
Yamaha FC5 	Switch with two values, 0 (off) and 127 (on). Other values for off and on can be selected using the Haken Editor's Pedal Min/Max settings.	A compact alternative to the FC4.
Linemaster 476-S 	Tri-Value pedal, a switch pedal with three positions: at rest, heel, and toe (Available from Allied Electronics though you will have to wire yourself). The corresponding values generated for each pedal position depend on the pedal's assigned function. Wiring Diagram:	Ideal as an Octave pedal (Section 3) or as Advance pedal (Full Advance and Half Advance functions, Sections 8.9 and 14.3).

Pedal Model	Output	Use
		

On the Continuum Fingerboard, Sustain and Sostenuto are continuous controls, allowing for fade and swell of sustained notes. They can also be applied using switched pedals for traditional effects. Section 10.17 describes changing the pedal assignments for the jacks; a complete list of pedal assignment options is in Section 14.

6.6. Kenton Mini Controller and Kenton USB Midi Host

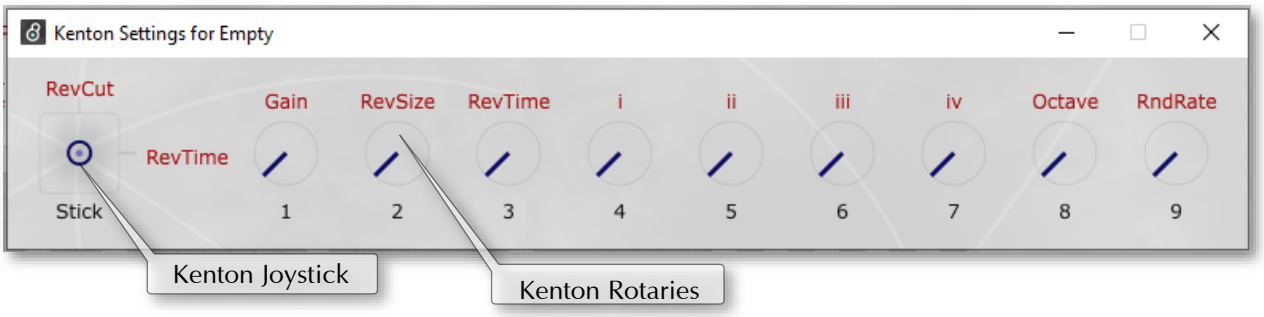


Kenton Mini USB Controller

The Kenton Killamix™ Mini Controller seamlessly integrates with the Continuum Fingerboard. http://www.kentonuk.com/products/items/midicontrol/kmix-mini.shtml. The Kenton Mini Controller provides physical buttons for loading presets from the Continuum Fingerboard's Internal User Preset Slots, and the buttons are lit to indicate which preset is loaded. It also provides physical rotaries for configuration parameters and pedal values, allowing precise setting of parameters. Each rotary has a ring of LEDs that indicates its current value.

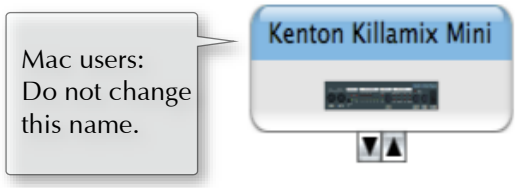
When the Kenton Mini Controller is used in conjunction with the Haken Editor, changes made via the Kenton will also be updated on the Haken Editor's screen, and changes in the Haken Editor are reflected by the Kenton's LEDs.

The Kenton Settings option in the Editor's Cogwheel Menu (Section 10.22) allows you to customize Kenton functionality. The shortcut for the Kenton Settings window is Command+K (Control+K Windows).



Kenton Mini Controller Window

Whenever the Kenton Mini Controller (or any controller for that matter) is used in conjunction with the Haken Editor, its USB cable must be plugged into the computer **before** launching the Editor. **Mac users:** When the Kenton is connected, do not rename the device called "Kenton Killamix Mini" in the AudioMidi setup program. The Editor uses that name to auto-connect to the Kenton controller. Changing the name will cause a failure in the connection routine.



The Kenton functions are:

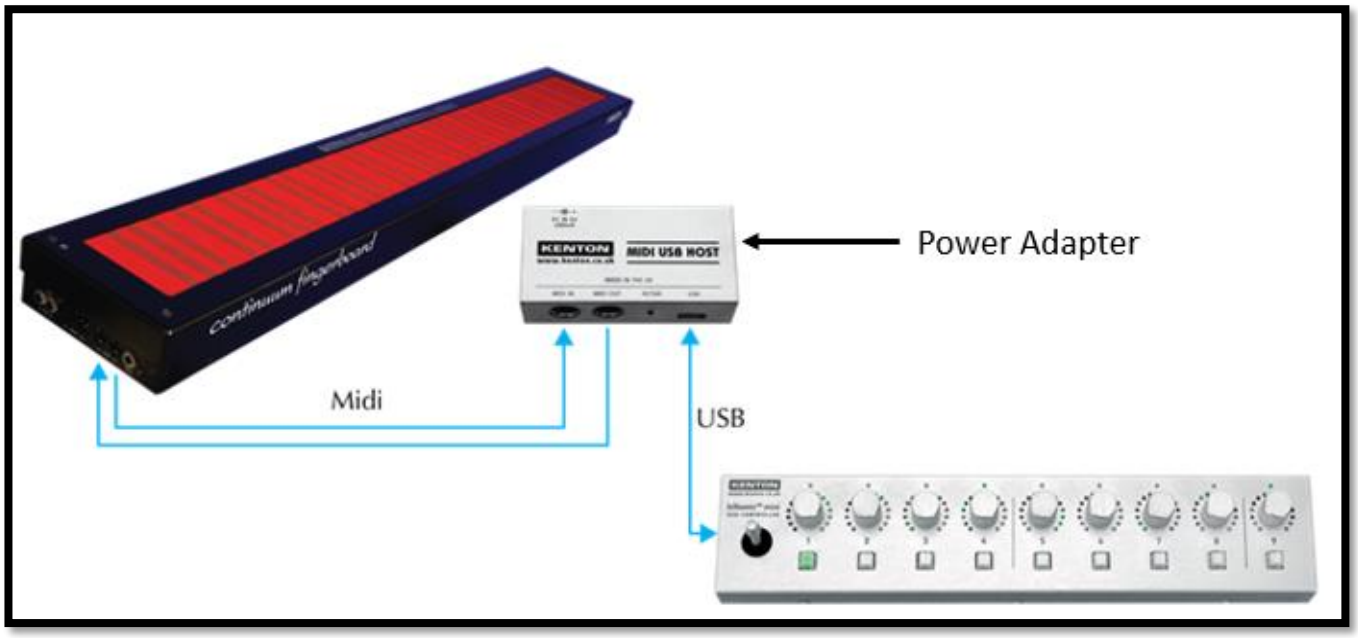
Buttons 1..8 load from Internal User Preset Slots 1..8 (if Button 9 is unlit) or Internal User Preset Slot 9..16 (if Button 9 is lit). Button lights 1..8, together with Button light 9, always indicate which Internal User Preset Slot was most recently loaded.

Rotaries 1 through 9 are assignable in Kenton Settings, in the Cogwheel Menu. The rotaries are predefined with default assignments shown below.

Kenton default rotary assignments	
1	Gain (Post) level of the internal synthesizer
2	Tweak mouseover Editor parameter
3	Internal Sound's recirculator R4 control ("time" control)
4	Internal Sound's recirculator mix control
5	Internal Sound Bespoke Control i
6	Internal Sound Bespoke Control ii
7	Internal Sound Bespoke Control iii
8	Internal Sound Bespoke Control iv
9	Audio In level of the AES3 digital input

Special operations are initiated by pressing the rotaries on the Kenton. Pressing rotary 1 or 2 toggles rotary 1 or 2 respectively to values between 0 and 127. Pressing rotaries 3 or 4 changes which System Preset is selected. Pressing rotary 9 before a button press will store to an Internal User Preset Slot, rather than load.

In some live performance situations, it is inconvenient to have a computer running the Haken Editor. The Kenton Mini Controller together with a Kenton USB Midi Host (or other Midi host) can be used with a Continuum Fingerboard, without the need of a computer. For a live performance situation, the Kenton Mini Controller provides lights that indicate the most recently loaded Internal User Preset Slot, and physical switches for loading presets; this may be preferable over loading presets using the Continuum's front panel or Configuration Strip (for half-size and full-size models).

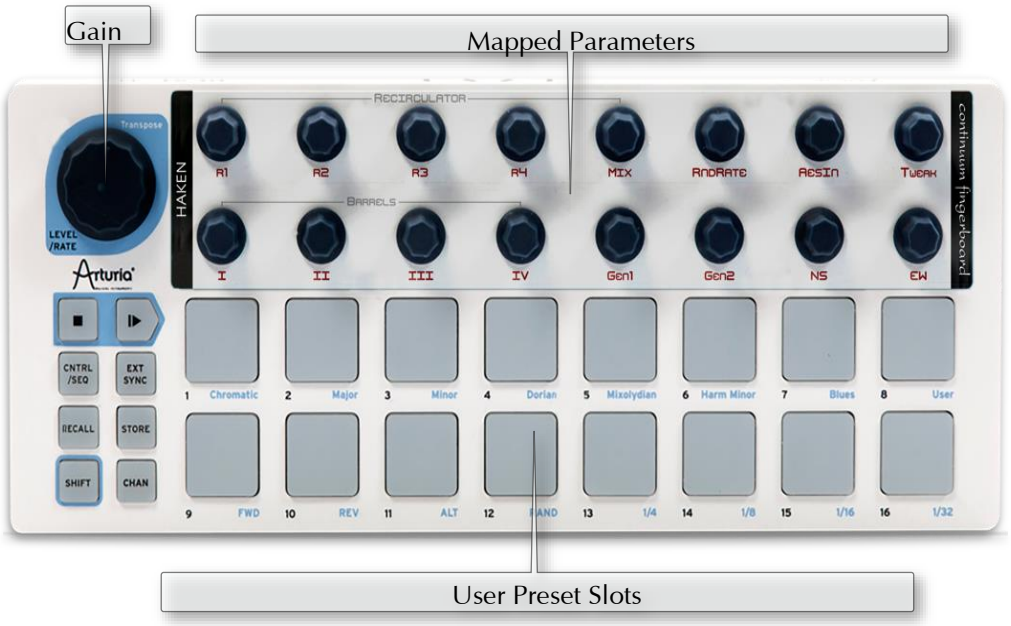


Kenton Mini Controller together with a Kenton USB Midi Host, without need of a computer

See Sections 12.15 and 12.16 for connection diagrams for the Continuum Fingerboard and the Kenton Mini Controller, with and without the Editor.

NOTE: The latest Kenton USB Midi Host may not output at least 5V when powered by external hubs. You should connect this directly to a USB adapter connected to a wall socket if it is to power the ContinuuMini. You may also experience issues when trying to use the Kenton Midi Host connected to a hub for expanding USB ports. It appears to work fine for USB-to-Midi DIN connections, but if you want to use multiple USB devices that require USB Hosts, for example a ContinuuMini and Slim Continuum and/or BeatStep together, a USB interface that supports multiple USB Midi hosts (like iConnectivity MIO XM) is recommended.

6.7. Arturia BeatStep and BeatStep Pro



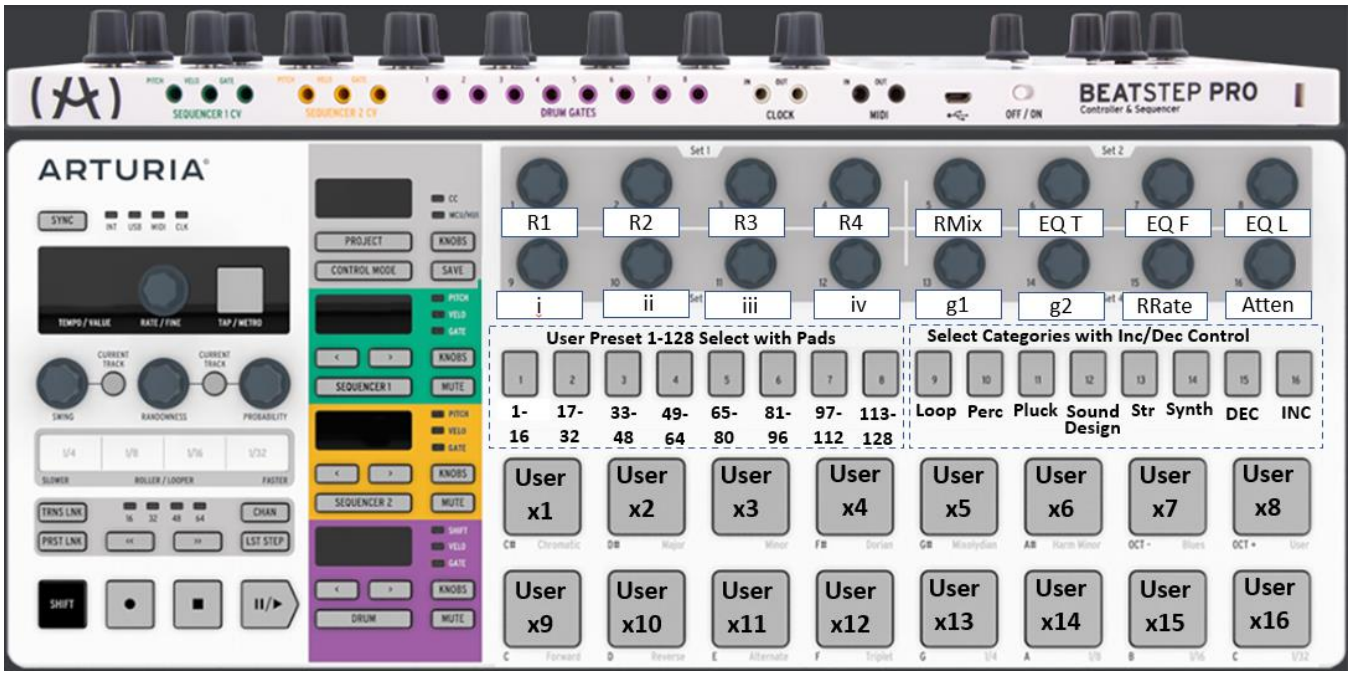
The Arturia BeatStep and BeatStep Pro seamlessly integrate with the Continuum Fingerboard. They provide physical buttons for loading presets from the Continuum Fingerboard's Internal User Preset Slots, and it also provide physical knobs for manipulation of configuration/control parameters and pedal values, allowing precise setting of parameters. Each of its "endless" rotary knobs control values in a relative mode – twisting to the right increases the parameter value and twisting to the left decreases the parameter value. When the BeatStep is used in conjunction with the Haken Editor, changes made via the BeatStep will also be updated on the Haken Editor's screen.

Haken Audio provides a configuration file for the BeatStep (in the Third Party folder). When this configuration file is loaded into the BeatStep, each knob has a standard function for use with the Continuum Fingerboard. Haken Audio can provide a plastic overlay for the BeatStep that indicates the function of each BeatStep knob for the Continuum Fingerboard.

The BeatStep and the Kenton have some similar functionality, but unlike the Kenton, the BeatStep does not have two-way communication with the Continuum Fingerboard. On the other hand, the Arturia BeatStep has the advantage that it is much less expensive, and it is simpler to hook up in a standalone situation. The BeatStep and BeatStep Pro come with a 3.5 mm TRS Mini to Midi Din cable to connect between it and the Continuum Fingerboard's Midi In for Half-Size and Full-Size models. A 3.5 mm TRS-TRS Mini cable can be used to connect to the latest "Slim" Continuums without need for MIDI host required is the USB connection is used.

See Sections 12.17 and 12.18 for connection diagrams for the Continuum Fingerboard and the Arturia BeatStep, with and without the Editor.

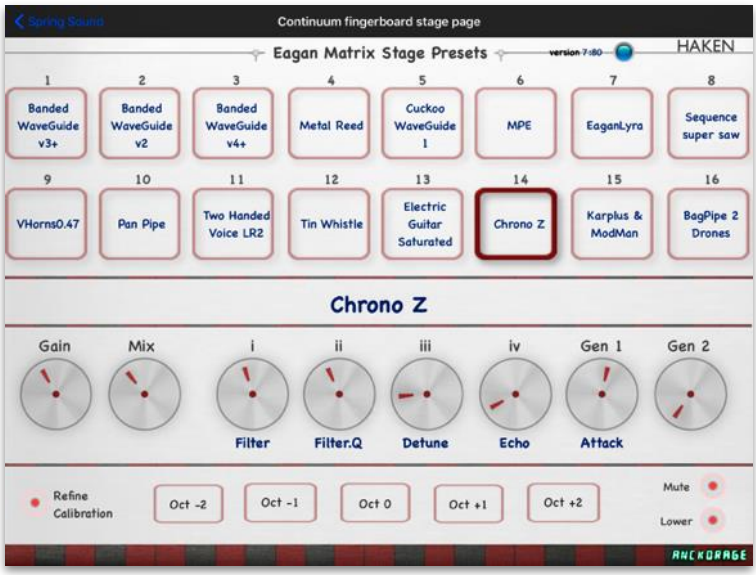
Note that BeatStep Pro configuration files are also available for both the Continuum and ContinuuMini. The BeatStep Pro has the advantage of being able to easily select any of the 128 User Presets now supported by the Continuum (after firmware release 9.0). A BeatStep Pro template has been created allowing the user to select any User Preset with only 2 button pushes (bank + preset 1..16) and the user can also directly access a number of categories and scroll up and down through them.

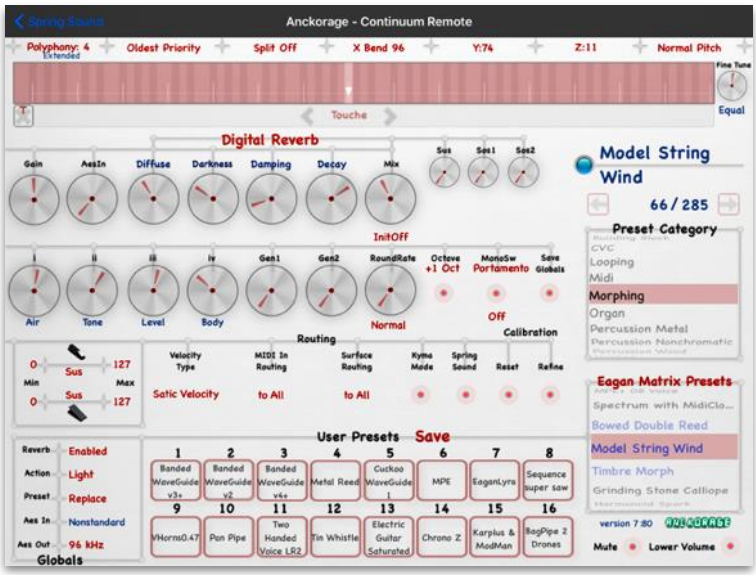


6.8 Anckorage Continuum Remote Support

The **Continuum Remote** is an iPad and iPhone interface for loading presets from the Continuum Fingerboard's Internal User Preset Slots and loading system-defined internal sounds. The Continuum Remote includes graphic readout and touch-based control for sound parameters and pedal values. Unlike the Haken Editor, the Continuum Remote does not provide EaganMatrix editing capabilities. The Continuum Remote is intended for use in situations where an iPad or iPhone is more convenient than a laptop, and sound editing capabilities are not required.

The Continuum Remote is part of **Anckorage's SpringSound App**, a spring-based physical modeling synthesizer, available for iPad and iPhone through Apple's App Store. The app is designed and programmed by Christophe Duquesne.





7. Calibration of the Continuum Fingerboard

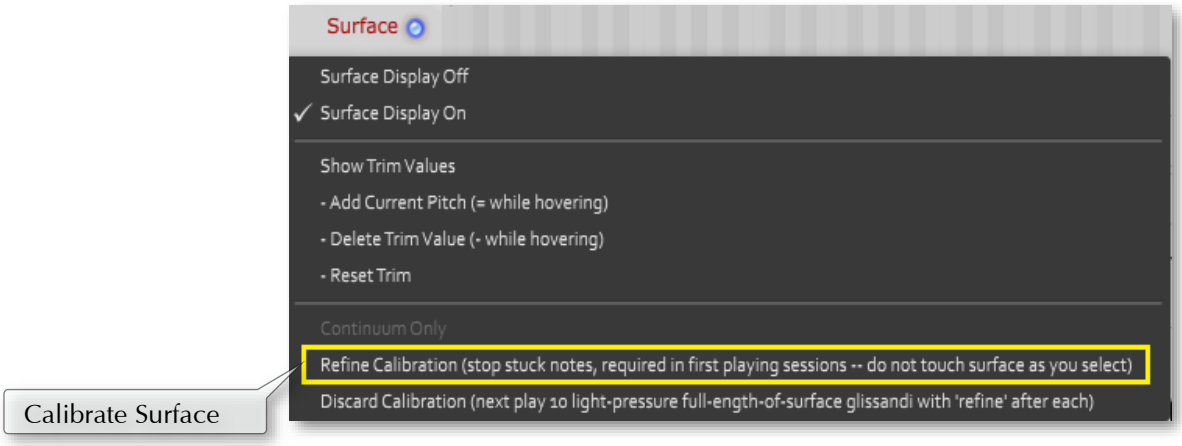
ContinuuMini players may wish to skip this section, as it is specific to the Full-size and Half-size Continuum Fingerboard (the ContinuuMini auto-calibrates on startup).

Before playing the Continuum Fingerboard for the first time, and each time it is transported it to a new location, it is important to refine its calibration. A refined calibration avoids "stuck notes". Calibration results are stored in the Continuum Fingerboard's permanent memory, so it is not necessary to refine calibration every time you turn it on. Refine calibration using the Haken Editor (see Section 8) or the Overlay Strip (see Section 9).

This Calibration is for the Half-size and Full-size Continuum Fingerboard only, not for the ContinuuMini.

7.1 Refining Calibration using the Haken Editor

At time you may experience a "stuck" note and need to refine the calibration of the playing surface. Make certain nothing is pressing on the Continuum Fingerboard (no fingers or other objects on the playing surface or frame), then click on the Surface control at the top left-hand corner of the editor and then select the Refine Calibration option.



7.2 Refining Calibration using Front Panel ("Slim" Continuum)

Make certain nothing is pressing on the Continuum Fingerboard (no fingers or other objects on the playing surface or frame). Perform the following steps (be careful to do nothing else).

1. Press the "Octave –" and "Octave +" buttons on the front panel together and release to enter the Edit System.
2. Use the "Octave +" or "Octave –" buttons to navigate to the "Cal" Option.
3. Press "Preset +" button.
4. Press "Octave –" and "Octave +" buttons together to exit the Menu System

7.3 Refining Calibration using the Overlay Strip (Half-Size & Full Size Continuums)

Make certain nothing is pressing on the Continuum Fingerboard (no fingers or other objects on the playing surface or frame). Press and release the Red Button (on the left side next to the headphone jack), then touch the surface at the spot labeled "Calibrate" on the Overlay Strip. Release that spot then touch the Surface at the spot labeled "1". Release that spot; your calibration has been refined.

7.4 Discarding Calibration

This discards all previous calibration data. Discarding the calibration can make the playing surface too responsive, resulting in stuck notes. You can expect stuck notes to occur during the first hour of playing after discarding calibration; it will be necessary to refine calibration (see above) whenever you get stuck notes.

Using the Haken Editor: Click on the Calibrate Surface menu then choose Discard. This is the preferred method.

Using the Front Panel on the "Slim" model:

1. Press the "Octave –" and "Octave +" buttons on the front panel together and release to enter the Edit System.
2. Use the "Octave +" or "Octave –" buttons to navigate to the "Cal" Option.
3. Press "Preset -" button. The screen should indicate calibration was discarded.
4. Press "Octave –" and "Octave +" buttons together to exit the Menu System

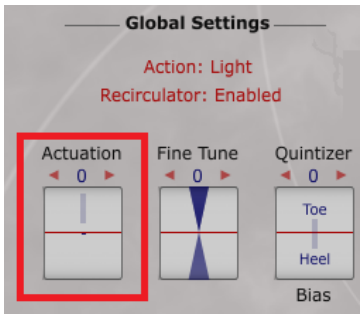
Using the Overlay Strip – Half-Size and Full-Size models: Press and release the Red Button, then touch at "Calibrate", then touch at "0".

Help is Available

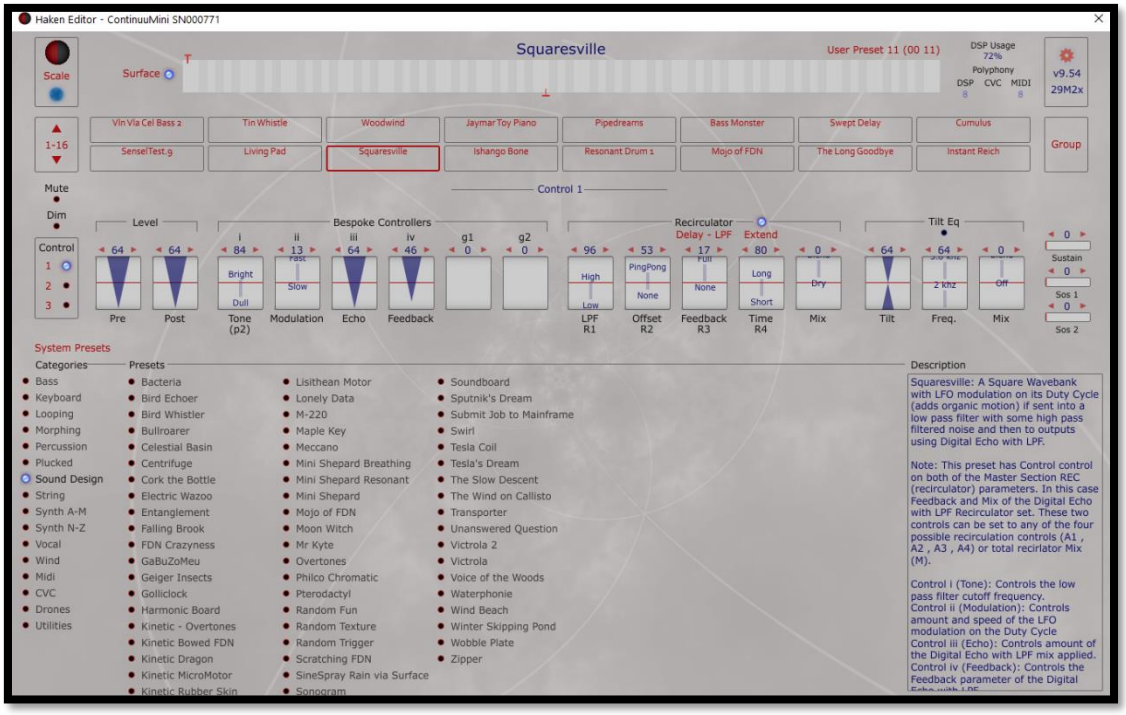
If you cannot get a good calibration, please contact Haken Audio for help. A good calibration is vital to a good Continuum Fingerboard playing experience.

7.5 Actuation – Addressing Stuck Notes and Sensitivity on "Slim" Continuums

If you perceive the fingerboard sensitivity is a bit sluggish on slight pressure to actuate a note, or if after upgrading firmware on the Slim models you have some stuck notes and you have performed "Refine Calibration" a couple times, you may need to change the "Actuation" Control setting in Midi and Global Settings. This is a "fine-tune" control to optimize the behavior of the playing surface's low level sensitivity. Typically (but not always) higher settings increase surface sensitivity. The default value is 0. You can experiment with this control. It won't harm anything. If you happen to have stuck notes when you are playing (or the notes play fine but the LED display appears to still be playing notes when you are not), try a refine calibration and continue. If the stuck notes persist, after a few cycles of playing and refine calibration, then try adjusting the Actuation value until stuck notes disappear (normally setting it lower if you have set it higher to try and increase sensitivity). (Note this has no effect for Half and Full Size models).



8. Introduction to the Haken Editor (with 9.5x New Feature Summary)



The Haken Editor is used with all Continuum Fingerboard models. The Haken Editor is an application by Edmund Eagan and Lippold Haken, available for both Mac and PC from the Haken Audio website. Most interaction with the Haken Editor comes from one expandable interface window that has a number of sub control panels and now different themes/skins, light theme shown above. The editor is used to create and configure all presets for playing parameters as well as (for half-size and full-size models) emulate the Continuum Fingerboard's Overlay Strip (Section 9), the Editor can also be used to save presets to your computer's file system, and open/load them later (Section 8.5), and to load new firmware into the Continuum Fingerboard or ContinuuMini (Section 11).

IMPORTANT: Keep the Editor application in the "Haken Editor" folder as supplied by Haken Audio. The Editor refers to other folders in this Haken Editor folder and will not function correctly when moved outside the Haken Editor folder. The editor is only meant to be used in conjunction with Continuum Fingerboards. It is not a stand-alone application and must be connected to the Continuum for operation. Also it does not load samples into the Continuum. It is used to create physical models that are loaded into the Continuum for sound generation (presets using a .mid extension but they are not MIDI files).

The Editor requires a bidirectional Midi communication. For the ContinuuMini, use the USB cable supplied with your ContinuuMini or any fully populated USB cable (as the Mini required power though the USB cable in addition to data).

For the Half-Size and Full-Size Continuum Fingerboards, use a Midi DIN cable to connect between your Mac or PC and your Continuum Fingerboard (if they have Midi DIN connections), or if the computer does not support MIDI directly, a USB-to-MIDI interface is required. Connect the USB-Midi Adapter cable's MIDI Out DIN connector to the continuum's Midi In; connect the USB-Midi cable's MIDI DIN In connector to the Continuum's Midi Out. The Haken Editor automatically detects the Roland UM-ONE USB-Midi interface, but other USB-Midi cables will also

work, once you configure them in the Haken Editor (see Section 8.1). However, to upgrade firmware on the half-size and full-size models, you must use the Roland UM-ONE.



If you have trouble with your USB-Midi cable:

(1) Try resetting the USB-Midi cable by unplugging and re-plugging its USB connector.

(2) If you continue to have problems, try connecting your USB-Midi cable through a **powered USB hub**.

For "Slim" Continuum Models, you have the choice to connect to the computer running the Haken Editor with a USB connection direct to the computer's USB port (or through as USB hub). The same connection applies for the ContinuuMini. This is the preferred option and a USB cable is included with the Continuum for this purpose. You also have the option to use a USB to MIDI interface and connect to the Continuum using MIDI DIN-to-3.5mm adapters (not included).





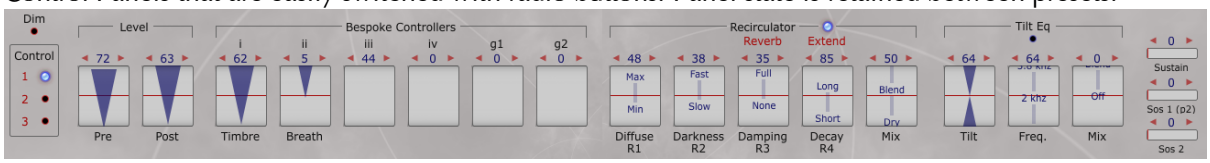
Note: A variety of USB-to-MIDI interfaces might be used, however Haken Audio recommends the Roland UM-One, which is required for half-size and full-size models for firmware upgrades. Half-Size and Full-Size models must use this Roland USB interface for firmware updates. "Slim" Continuums and ContinuuMinis can use the standard USB Midi interface.

For other connection examples, please see Section 12. For ContinuuMini connections see section 16.

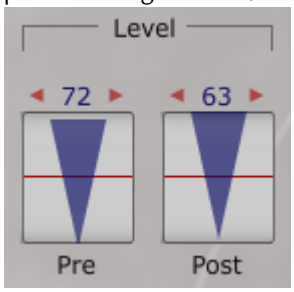
8.0.1 What's New in the Haken Editor and EaganMatrix (Post 9.0 Firmware)

Note that the Haken editor has been redesigned for use with all firmware after 9.0. Some of the top level new features and improvements are:

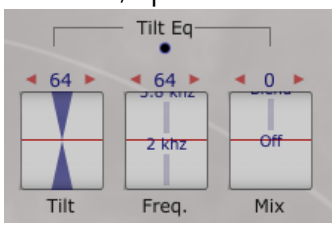
- Many new presets geared for the new feature set and additional presets that use previous features.
- Totally redesigned Editor window with a less crowded look and feel. Parameters are now grouped into Control Panels that are easily switched with radio buttons. Panel state is retained between presets.



- Two Level control options (version 9.53 on) for Pre and Post Master section output control to replace the previous single Gain (Post Master Section) control.



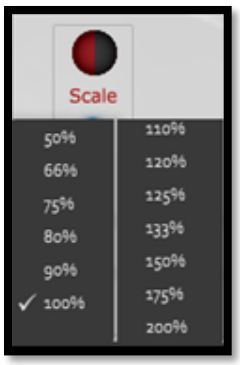
- A new Tilt/Eq control is available for use in all presets:



- Different window themes/skins are available in the Midi and Global Settings menu (under Cogwheel). Some are best for performance and others are better suited to editing presets.



- Different window scaling options are available from the Scale Control at the top left-hand corner of the screen.



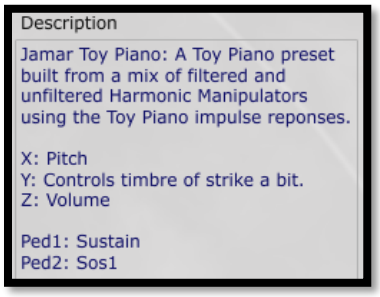
- A new easy access Preset selection panel is used which alternates with the EaganMatrix display when selecting the "System Presets / EaganMatrix" toggle text at the middle left-hand side of the screen.



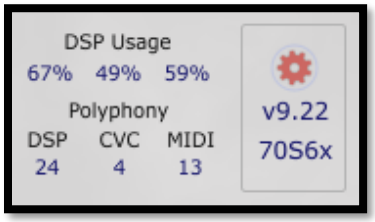
- User Preset have been expanded from 16 to 128, arranged in banks of 16. A bank selection icon is used to change banks. The user select which of the 16 presets in the bank as in previous editor versions. (Note: The extra preset banks are only available on 2x and 6x Continuums).



- Integrated on-screen, up/down draggable System Preset descriptions



- Processor Usage and Related Statistics for the current preset loaded. This indicates the DSP Usage of each (up to three) of the DSPs along with Polyphony usage underneath - Total DSP processing for the preset, CVC channels (if CVC connected) and total MIDI channels used. This information is always visible at the top right-hand corner of the editor.



1x and 2x Continuums or ContinuuMinis have a single DSP processor.

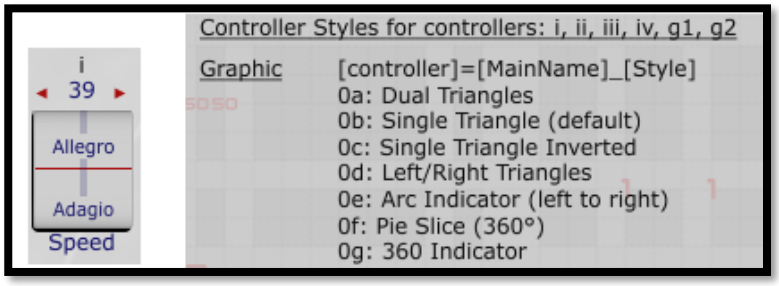
  - A 3x Continuum has three 1x DSPs
  - A 4x Continuum has one 2x and two 2x DSPs
  - A 5x Continuum has one 1x and two 2x DSPs
  - A 6x Continuum has three 2x DSPs

For example, a ContinuuMini or 1x/2x Continuum that only has one DSP will display the statistics similar to the following (only one DSP Usage value is displayed).

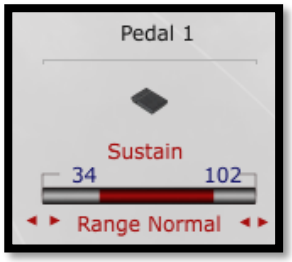


Note: The Polyphony DSP number is an indication of DSP processing power in relation to Polyphony, not physical DSPs. It takes expanded Polyphony into account. Without Expanded Polyphony set, it will match Polyphony up to a max of 8. If Expanded Polyphony is not set, the DSP number will match the Polyphony. If expanded Polyphony is set, the DSP number (unless reduced by certain resource limitations) will normally be Polyphony x Processing Power (6x, 5x, 4x, 3x, 2x, or 1x) up to a maximum of DSP Polyphony 24 for 3 DSP 6x Continuums. Thus, a 6x continuum set to Polyphony 4+ will normally display Polyphony DSP as 24 (4 * 6x) and 18 at Polyphony 3+ (3 x 6x). A 2x Continuum such as the ContinuuMini will display a DSP value of 8 for a preset set to Polyphony 4+ (4 * 2x). The ContinuuMini has a max DSP Polyphony of 8.

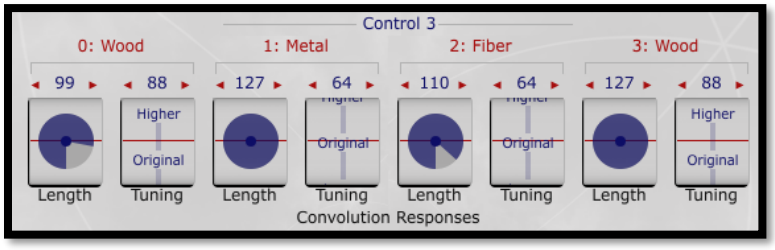
- More flexible Controller Configuration. Barrels and Gens are now called Bespoke Controls. Gens ("g1, g2") are defined and act identically to ("i", "ii", "iii" and "iv"). Arbitrary names can now be assigned to internal control display values (i.e. "Adagio", "Allegro", etc.)



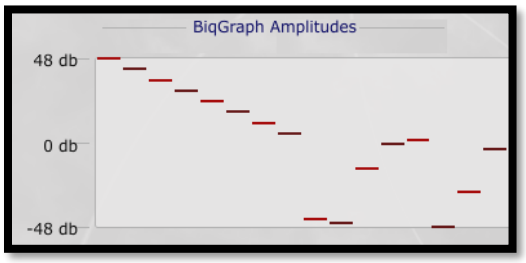
- Improved Pedal Control allowing more flexible range support including pedal inversion.



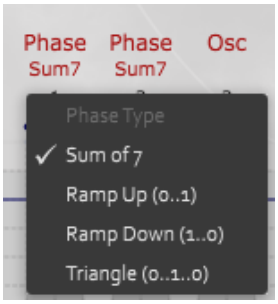
- Improved Convolution Response Controls



- Easier BiqGraph Configuration ("BiqMode" now renamed "BiqGraph")

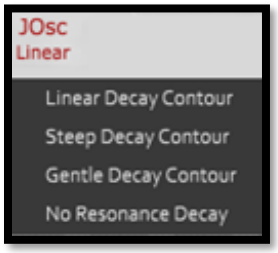


- New Phase Generator Options

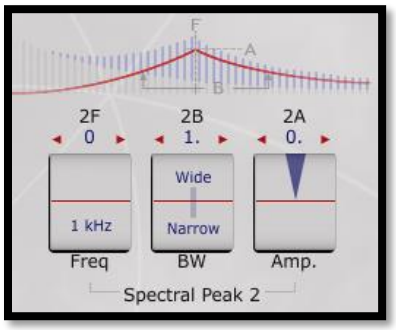


The EaganMatrix also includes a few new exciting physical modelling additions and enhancements:

- Jenny (pronounced "Genie") Oscillator (works in conjunction with OSC or phase to its right in matrix)



- BiqBank and SineBank Improvements – With new Configurable Graphic Property Controls and inclusion of Spectra Peak options.

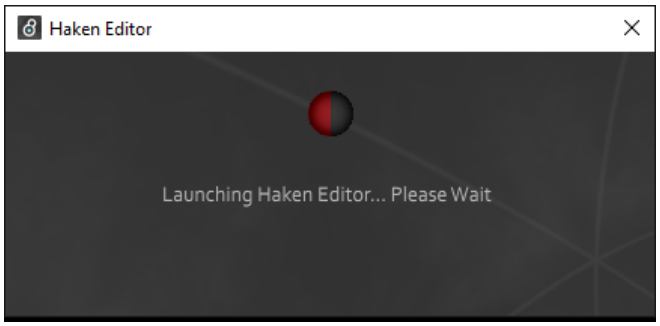


- And don't forget the recently added physical modelling options from 9.0 if you are updating from 8.5 or earlier:
    - Signal Multiplier (under OSC)
    - Additive Bank
    - Kinetic Bank with Kinetic Modeler

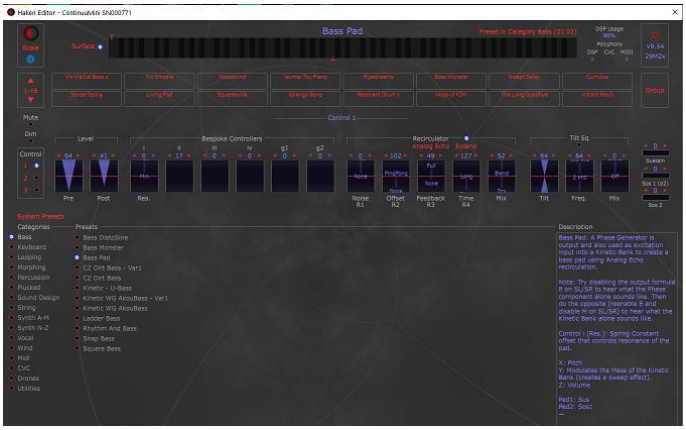
8.1. Setting up the Haken Editor

When you run the Haken Editor for the first time, make sure that you have the before-mentioned bidirectional Midi connection set up. The Haken Editor will not function at all if this is not set up properly.

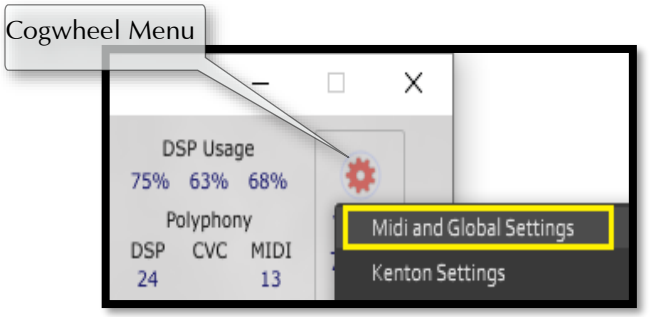
Make sure your Continuum or ContinuumMini is on and connected to your computer through USB, then launch the Haken Editor, and wait for the Editor to appear on the screen. An intro splash screen will appear for about 45 seconds:



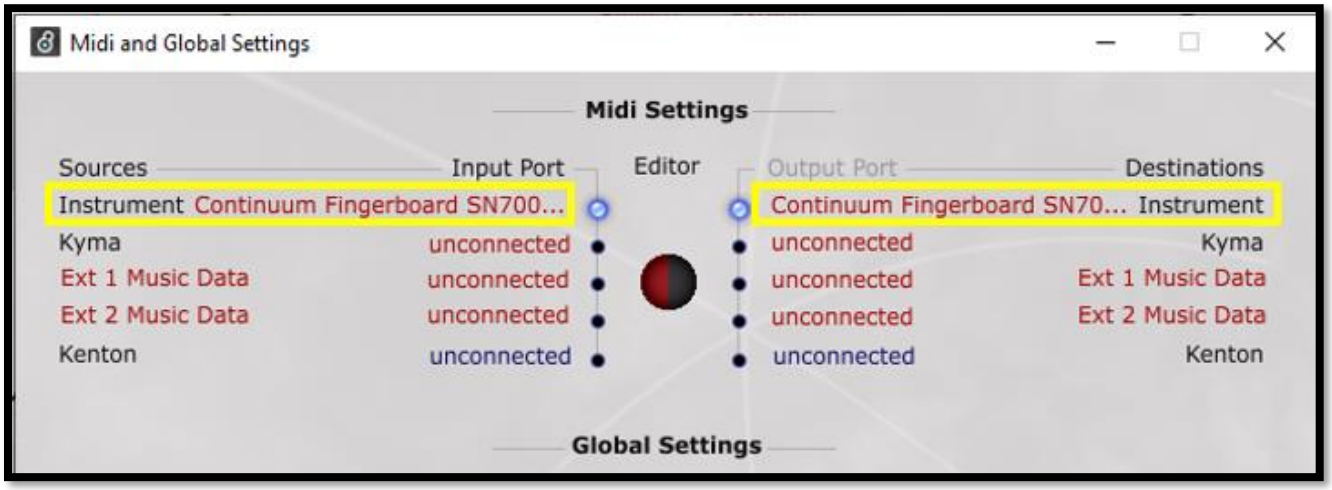
after which the editor should come up and finish loading for about 15 seconds. If running for the first time, the default dark theme will appear (this can be changed in Midi and Global Settings to a Light or Neon Theme).



The LED on your Continuum may change colors but should eventually change to a steady blue state as should the LED in the Editor (indicating connection established). Normally the Continuum or ContinuumMini will be automatically detected, however, if the LED in the editor remains gray at first launch, the Midi routing in the Editor might have been connected to a different Continuum device if you have more than one (for example a ContinuumMini or Osmose). To establish/verify this connection, go to Midi and Global Settings in the cogwheel menu as shown below.



Select Midi and Global Settings to view the Midi Settings selections.



Midi and Global Settings (in the cogwheel menu)

Check that the (Continuum) Instrument Source and Destination I/O Port LEDs are both blinking. It is possible for the Output Port LED to blink but not the Input port. If the Source Instrument Continuum Input Port LED is not blinking, the editor has not established proper connection with the Instrument. The example above uses a "Slim" Continuum connected using its onboard USB interface. In this case the Continuum device is detected and displayed. If you connect to the Continuum using a UM-ONE Midi interface, the UM-ONE device will be detected and displayed. It is possible to connect both Continuum USB and UM-ONE to your computer and select the one desired, but not recommended. Note: "Slim" model continuums do not require a UM-ONE for operation or firmware download if the USB port is used. Always connect the USB device to your computer before bringing up the editor.

The Midi Connections area has three pairs of popup menus for routing Midi data from Source/Input Port and Destination/Output port, as described below.

The "Continuum" Instrument connections: Connections from/to the Continuum Fingerboard.

If you are using a direct USB connection to "Slim" Continuums, ContinuuMini or a Roland UM-ONE USB-Midi cable connection, your Continuum connections will be automatically detected (though if you have multiple Continuums or ContinuuMini's connected the editor will normally remember the last one connected and default to that). Otherwise, click on the popup menus (red text) to select your connections. Once the input and output connections for the Continuum Fingerboard are correctly made, the LED at the top-left of the main Editor window will change to from "off/gray" to "blue".

If the LED does not change from "off" (or possibly a temporary green state in "Slim" models) to "blue":
(1) Double-check your cable connections. For a Continuum Fingerboards using the direct Midi Connection, the USB-Midi cable's "Out" should be plugged into the Continuum Fingerboard's Midi In, and the USB-Midi cable's "In" should be plugged into the Continuum's Midi Out.
(2) Double-check your popup selections in the Haken Editor's "Midi and Global Settings" making sure the desired Continuum Instrument is selected.
(3) Try resetting the USB-Midi cable by unplugging and re-plugging its USB connector.
(4) If you continue to have problems, try connecting your USB-Midi cable through a powered USB hub.
(4) If using the direct USB connection on "Slim" models and ContinuuMini verify the USB port is operational. If you repeatedly plug different Continuum devices into the same USB port, the computer can become confused and expect a wrong device. Rebooting the computer normally solves this issue. In some cases you may have to go into the operating system are clear the USB port allocation.

Note: If you are connecting more than one Continuum or ContinuuMini to your computer, you can only run one editor connection at a time, but you can easily switch between Continuum connections by changing the input and output port Instrument devices in Midi and Global settings.

The "Kyma" connections: Connection between the Continuum Fingerboard and Symbolic Sound's Paca(rana) hardware via the Editor.

If you are running Symbolic Sound Paca(rana) hardware, you can connect to it via Midi or (even better) connect to it using Delora's KymaConnect software. A bidirectional connection between the Paca(rana) and the Continuum is necessary in order for Kyma to communicate information about its currently playing sound to the Continuum Fingerboard. Set to "unconnected" if no Kyma Paca(rana) system is present. (Also see Section 10.10 for a required Kyma-specific configuration option.)

The External Device ("Ext1, Ext2") connections: Connections between the Continuum Fingerboard and an External Midi Devices via the Editor.

The "ExtDevice" connections create a bidirectional communication with a hardware or software synthesizer and the Continuum Fingerboard through the Haken Editor. If you do not have an external synthesizer or controller, set the "ExtDevice" to "unconnected." Make sure the desired device is selected. This can be a ContinuuMini if you wish to send data from a Continuum to ContinuuMini. Make sure you connect the device before bringing up the editor or it will not be detected. Set the Ext device for the desired input and output data types:

- Music – Midi Note, Pitch Bend, Aftertouch, Velocity and some Continuum controller data
- Config – Control data such as preset changes
- All – Both Music and Config Data

Remembering the Midi Setup connection in the Haken Editor:

When the Editor is closed, the Midi connections are automatically remembered. When the Editor is reopened it will try to establish connections with the same named Midi ports. Midi devices should be turned on and connected before starting the Editor. If you connect an external device while the editor is running, it will not be detected until the editor is restarted.

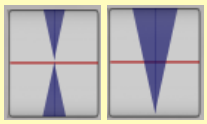
Examples

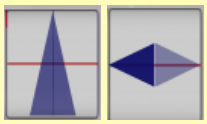
Please see Section 12 for examples showing connections to external hardware.

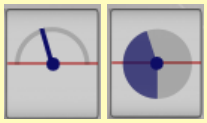
8.2. Using the Haken Editor

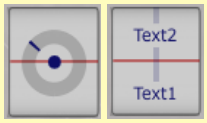
The control types in the Haken Editor are popup menus, dials, toggles, controls, and sliders.

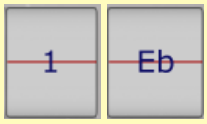
Bespoke Controls (i, ii, iii, iv g1, g2)

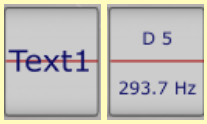


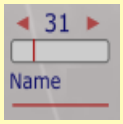




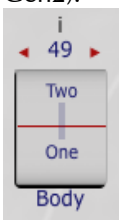








The i, ii, iii, and iv Bespoke Controls are parameters for the currently loaded preset. Click and drag mouse vertically to desired value. Numerical value above each control will update as well. Note: These were previously called "Barrels" and "Gens". They are now all identical in nature and simply called "Controls" (I, ii, iii, iv, g1 (old Gen1) and g2 (old Gen2).

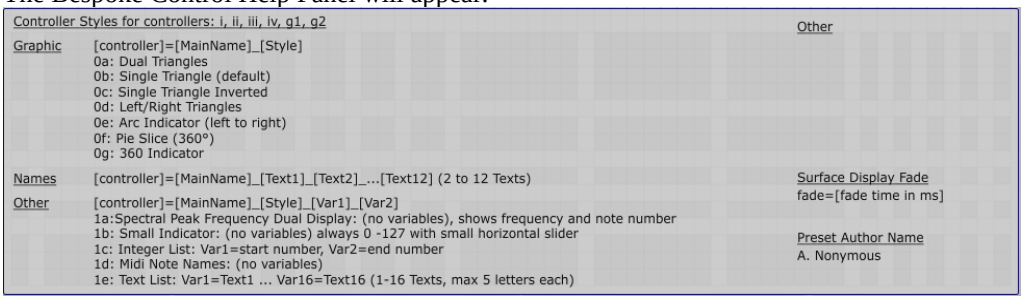


Most of the earlier "Barrel" graphics have been removed. The previous "Barrel" styles are no longer available from the Cog Wheel. Online help on configuring Bespoke Controls is available by selecting the Edit text at the bottom left of the matrix. Note: The option for opening Controller Style is no longer supported as all the styles are listed in the table.

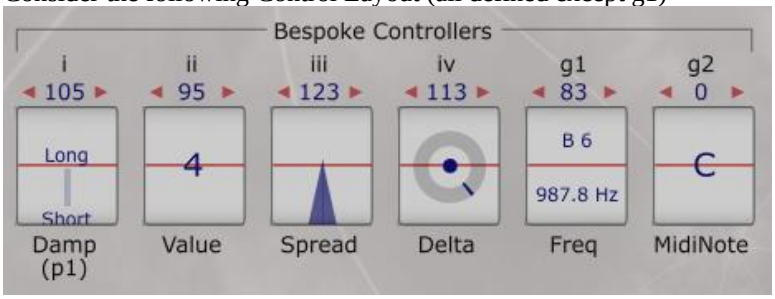


To add Bespoke Controls Select Edit at the lower left hand corner of the editor and enter your desired control(s).

The Bespoke Control Help Panel will appear.

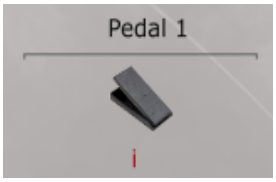
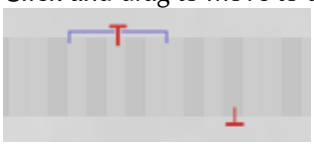
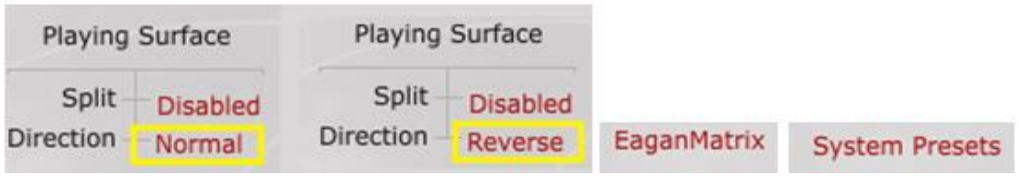


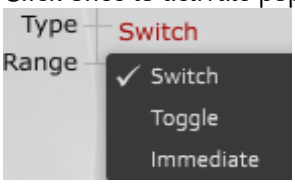
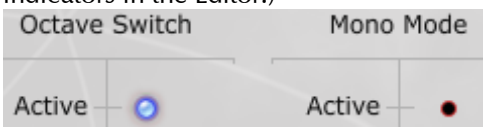
Consider the following Control Layout (all defined except g1)



The edit text to define these would be:
"i=Damp_Short_Long ii=Value_1c_1_5 iii=Spread_0c iv=Delta_0g g1=Freq_1a g2=MidiNote_1d"

Also note Pedal 1 has been assigned to the first control (see pedal assignments):

	
Radio Button Selections	Selection one option from a number of selections (primarily Control Panels and System Preset selections) 
Slider	Click and drag indicator to desired value (Pedal controls). 
Draggable Objects	Click and drag to move to a selected position (Middle C and Touch Control) 
Dial	Click and drag mouse vertically to desired value (alternate control style). 
Toggle Text Value	Click to toggle value which might also change a display state (as in "System Preset"/"EaganMatrix" Toggle). 
Selectable Exclusive Objects	Click Red Text in an object to select from a series of other objects and perform an operation (load presets). 

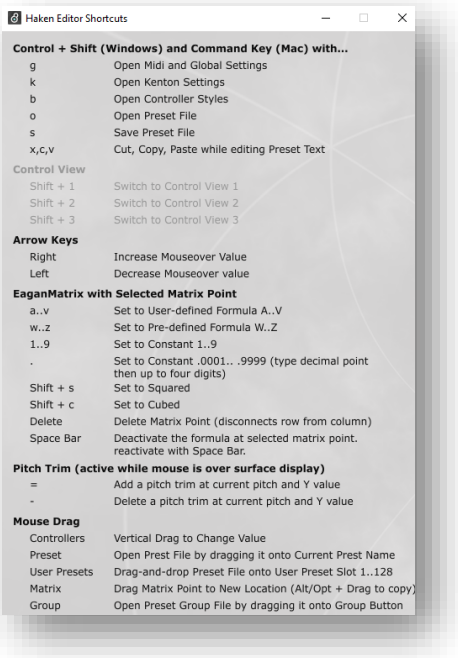
Popup Menu Text or Numerical	Click once to activate popup, click on the desired value to make a selection. 
LED State Change with Blue Halo	Click to change. Shines blue for "on", dark for "off". (Here "Led" refers to small status indicators in the Editor.) 

The Haken Editor gets the current configuration from the ContinuuMini's or Continuum Fingerboard's internal memory. When the Haken Editor is running, changes made any of these ways will also be updated on the Haken Editor's screen:

- the ContinuuMini's 4-button interface, or
- the Continuum's front panel interface ("Slim" Continuum)
- the Continuum Overlay Strip (Half-Size and Full-Size Continuums), or
- the Kenton Mini Controller, Arturia BeatStep/BeatStep Pro, or another external Midi controller that might change a Continuum parameter including loading presets.

8.3. Haken Editor Shortcuts

This list of keyboard shortcuts can be found inside the Cogwheel menu of the Haken Editor.

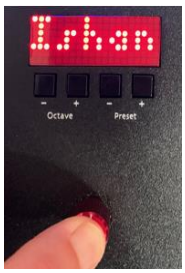


8.4. Current Preset and Selecting System Presets

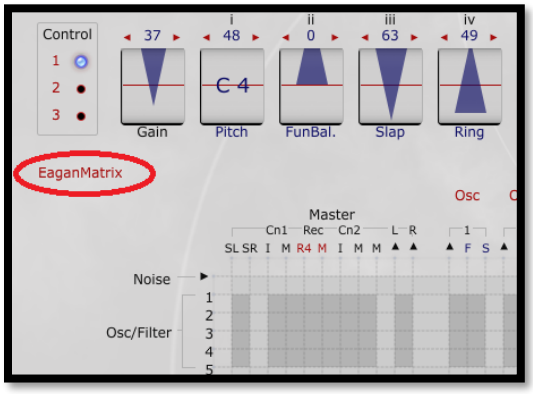
The "Current Preset" is the preset that sounds when you play on the surface. This may be one of the 128 User Preset, one of the 400+ System Presets or one you or the Continuum user community might have created or modified yourself. The Current Preset can be also be edited, saved to disk (Section 8.5), or stored to a User Preset Slot (Section 8.6).

Haken Editor releases after 9.0 always show the current preset at the top of the screen. The "Red Button" on "Slim" Continuum models can be pushed to scroll the current preset across the LED screen in normal playing mode.

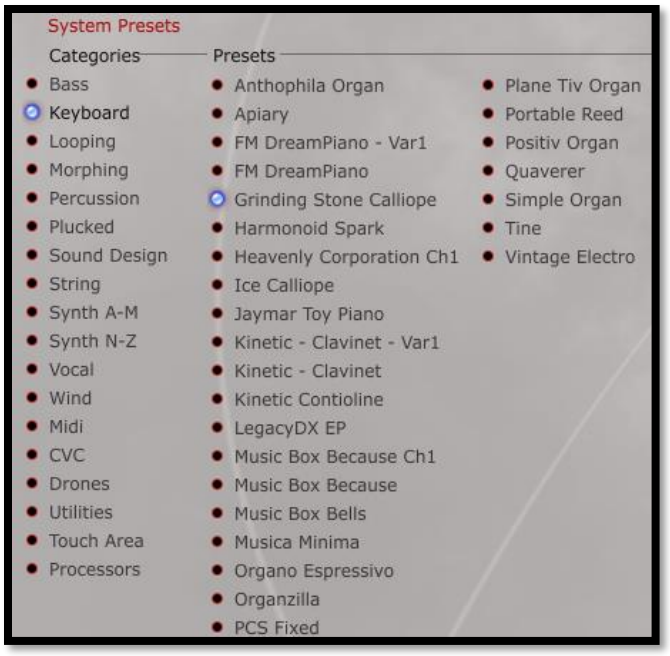




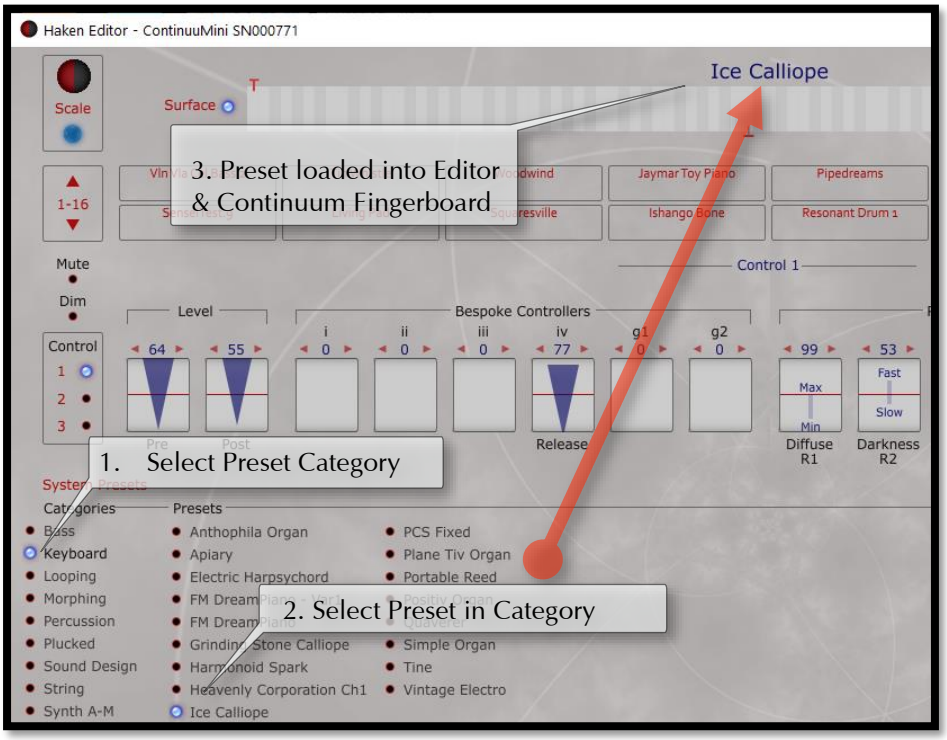
System Presets in the Haken Editor are organized into a number of categories, like Bass, Percussion, Wind, Midi, Synth, etc. System Preset selection in the Haken Editor (after version 9.0) is performed by entering the "System Presets" selection window that appears on the bottom half of the editor screen. This is the default view when running the editor. If the EaganMatrix is displayed, select the "EaganMatrix" toggle text on the left hand side of the screen to enter the System Preset selection panel.



The System Presets selection panel displays a list of Categories that can be selected using a radio button. The complete selection of System Presets available for that category is then displayed (Keyboard category in the below example).



To load one of the System Presets into the Current Preset, simply select the desired preset from the Presets list.



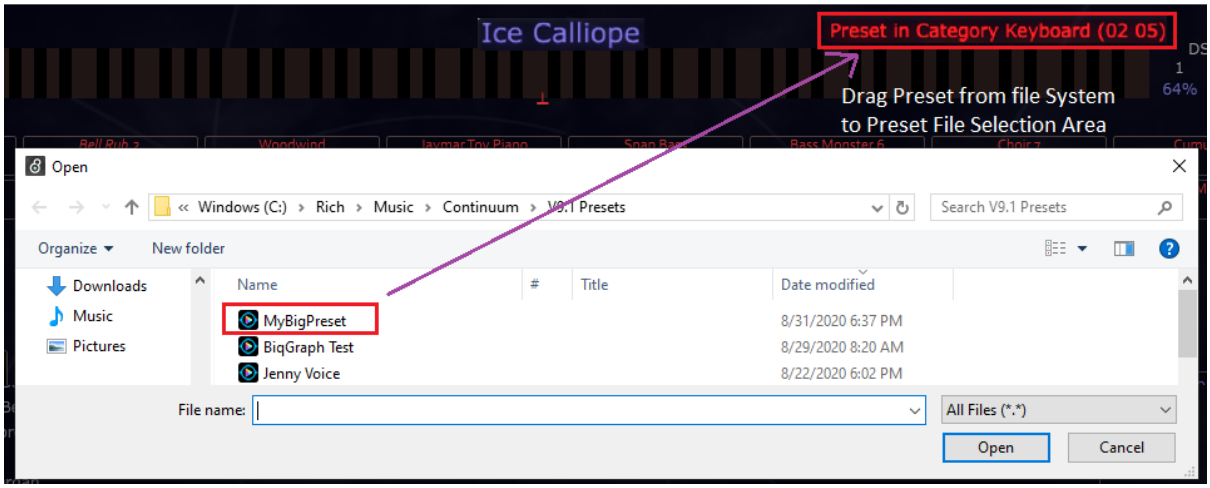
8.5. Open and Save User Presets in the Editor

In new versions of the Haken Editor (post version 9.0) a toggle text field appears to the right of the Preset name at the top of the screen which lists the numeric preset category and preset number. Click the "Preset in Category …" text to bring up menu selection to Open and Save a preset to disk.



Open Preset from Disk

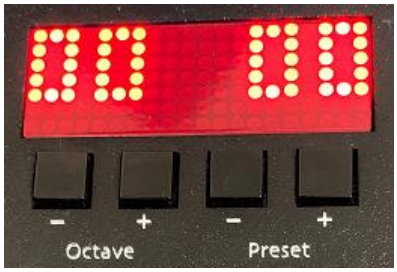
To open a Preset file on your Mac or PC, choose "Open Preset from Disk", or press Command+O (Mac) or Control+O (Windows). Navigate to the directory of your choice in the Open dialog and select the desired preset. You can also drag a file from the Finder (Mac) or Explorer (Windows) and drop it onto the Editor's "Preset" File selection area:



The Preset indicator will change to note that the current preset has been loaded from disk.



In this case, the Preset number on the LED for "Slim" model Continuum Fingerboard will change to 00 00, indicating the file is an externally loaded preset - not a User or System Preset (User Presets start at 00 01).



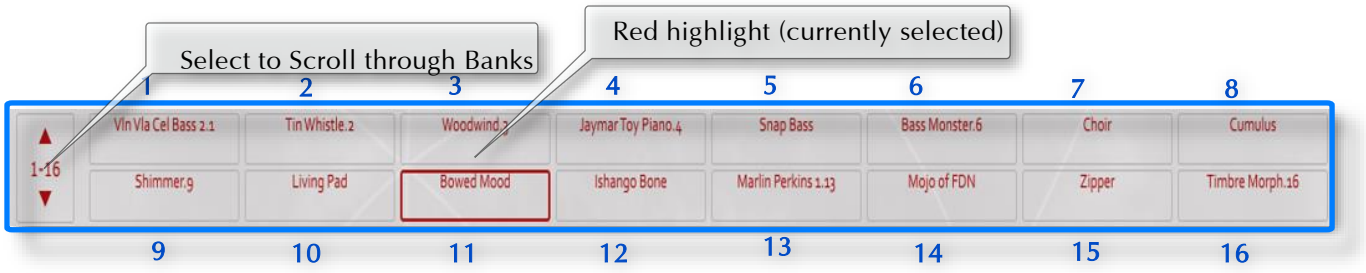
A Preset file holds a complete configuration of the Continuum Fingerboard (except for a few settings that are Global and are common for all presets). You can find Preset files in the Archives folder within the Haken Editor's folder, or anywhere else on your computer where you have previously saved Preset files. These use the .mid file extension so be careful not to load a general MIDI file which should be rejected by the editor.

Save Preset to Disk

To save a Preset file on your Mac or PC, choose "Save Preset to Disk" in the Current Preset popup menu, or press Command+S (Mac) or Control+S (Windows). The default name selected for the file in the "Save As" dialog will be the current preset name reflected in the Haken Editor, which you can change to any name you like if desired before saving.

8.6. User Preset Slots and Preset Groups (Selecting, Saving & Storing Presets)

In addition to opening and saving Preset files on your computer, you can also load and store presets into any of the 128 Internal User Preset Slots inside your Continuum Fingerboard. This number has been expanded from 16 User presets in earlier Haken Editor releases (for 2x and 6x models). They are arranged into eight banks of 16 presets for ease of use through editor selection. When you change or add presets to them in the editor, they will be written to the Continuum or ContinuuMini. External Midi devices such as the BeatStep Pro can be used to bring up any of them as the current preset being played in addition to using the editor or front panel on the Slim Continuum.



The display defaults to Bank 1 (Presets 1-16) which are prepopulated in the EaganMatrix release. The other banks are accessible in the Haken Editor by scrolling down (and up) using the arrow indicators in the bank select area to the left of the User presets. You can access bank presets 1-16, 17-48, 49-64, 65-80, 81-96, 97-112, 113-128. Currently all but Bank 1 is empty on firmware installation. Haken Audio may prepopulate more in future. Note: Only 2x and 6x Continuums can access the extra banks. Note that once all 16 presets in a bank have been loaded as a group or individually using Shift-Click, they cannot be erased (blanked out). You can load the /Utilities/Empty preset into a preset slot if you want that position to make no sound.

Note on the Slim Continuum these show up a "**00 0-128**" in he LED display and you can use the Preset +/- buttons to scroll through them. On the ContinuuMini they show up as **0-128**, however presets 120-128 are displayed as 1'0 = 120, 1'1 = 121, … 1'8 = 128. This is because the number 2 requires more segments in the display that this allows three digits to be fit into two segment slots.

It is usually preferable to save Preset files in your Computer's file system (Section 8.5), but when you do not have your computer connected to your Continuum Fingerboard and need access to custom user designed sounds, the Internal User Preset Slots give you access to up to 128 presets stored internally in your Continuum Fingerboard that will be retained on power off/power on (as are all the System Presets).

To recall a User Preset from a slot, simply click on the desired User Preset Slot.



User Preset Slot 2 ("Tin Whistle") has been recalled and is now the Current Preset.

To store the Current Preset into a User Preset Slot, shift-click on the target User Preset Slot. The preset will be renamed appending ".n" to the name, where n is the preset slot number 1-16.

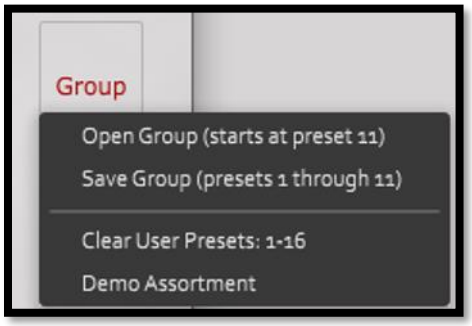


Tin Whistle has been stored into User Preset slot 97 (slot 1 of 16 for that bank).

It is also possible to drag and drop a preset (.mid) file directly from your disk into any of the 16 User Preset slots. In this case the preset will not be renamed. Note that only .mid files created with the Eagan Matrix can be used as this is not a general MIDI file.

8.7. Open a Preset Group File

A "Preset Group" provides a convenient way to load a group of user presets into the User Preset Slots from your computer's file system. Preset Group operations are accessed from the Group control at the top right of the screen:



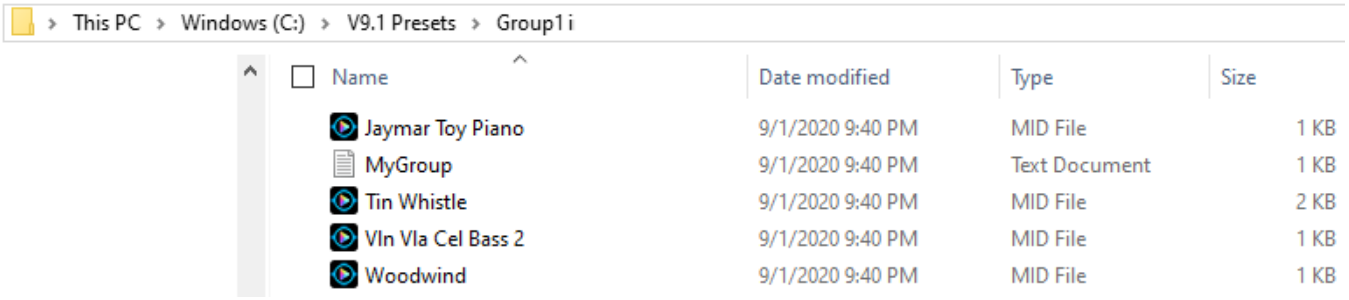
A Preset Group can have anywhere from 1 to 16 members and can be loaded into any User Bank starting at any position. The members of a Preset Group load back into the selected user bank at the selected preset position starting at the first preset in the group. If there are more presets in the group than can be restored based on the position selected,

they will be ignored. A common use of the preset group is to store a full set of 16 presets than can be restored into a complete bank, but any smaller set from 1 to 16 presets can be placed in a group.

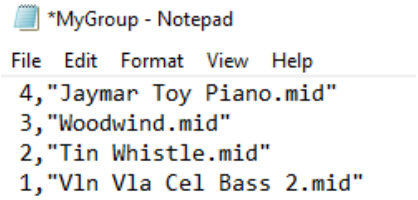
To open a Preset Group file, select a User Preset in any bank of User Presets, go to the Group control and choose "Open Group" in the Group popup menu, or drag a Preset Group .txt file you have created from the Finder (Mac) or Explorer (Windows) and drop it onto the Editor's Group popup area. The group will start loading from the first preset in the group at that position.

A Preset Group file contains a list of User Preset files for the Internal User Preset Slots. When you open a Preset Group file, the Internal User Preset Slots will be updated to contain the presets listed in the Preset Group file. It is suggested that each Preset Group be stored in its own its own folder as it will contain the group.txt file and all the group member presets (.mid files).

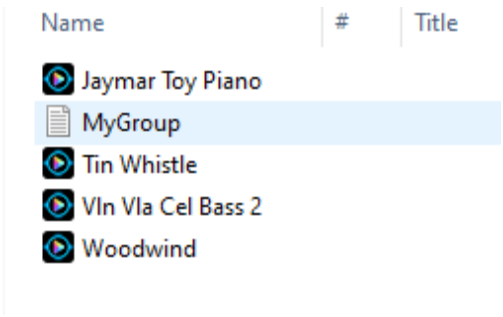
As an example, a preset Group (MyGroup.txt) has been stored in directory Group1 and it contains four presets. The folder containing the Preset Group can have any name. It does not need to match any of the names of the files inside the folder.



The order of the presets can be seen by looking at the group.txt file. Note presets are stores and restored in reverse order.



Let's select an empty bank and then select User Preset #3. Then select Group control "Open Group (starts at preset #3)" – note it tells you what User Preset you are restoring the selected Group from. Navigate to the Group you want to restore ("MyGroup.txt" in this case).



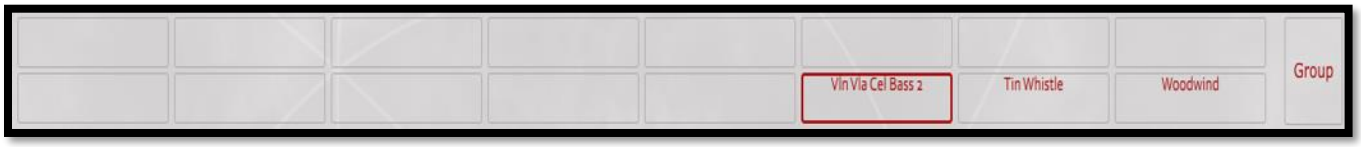
Select it and then the group should restore at your selected position activating the first preset as the current preset. (Note: You could have dragged a group file to that position to perform the same operation).



Group of four preset restored at Use Position #3

After restoration, User Presets 1-2 are still blank and the original sequence of presets in the group are restored in positions 3-6.

If this same operation is performed at User Position 14, the first three presets in the group will be restored, but the last (*Jaymar Toy Piano* in this case) will be discarded.



8.8. Save a Preset Group File

To save a Preset Group file onto your Mac or PC, select the ***last*** Internal User Preset Slot you want included in the Preset Group file, then choose Save in the Group popup menu. This Save Group option will create the Preset Group file as well as individual Preset files. For example, if you click on the Internal User Preset Slot 5 and then choose Save in the Group popup menu, you will get a Preset Group file that contains the list of Internal User Preset Slots 1..5, as well as 5 Preset files (one for each listed preset). It is best to save each Preset Group is in its ***own*** folder; that folder will contain the Preset Group .txt file as well as all the group member presets (.mid files). The "Save Group" menu option will inform you what preset range will be saved.



Highlighting User Preset 7 and choosing Save Group from the Group pop up menu will prompt the disk system for a location to store the Preset Group .txt as well as its 7 User Presets from slots 7,6,5,4,3,2 and 1. The Save Dialog will also allow creation of a new folder for the Preset Group; it is best to save each Preset Group in its own folder.

To avoid accidentally overwriting your Preset Groups with a possible future firmware update it is best not to store the Preset Group folders in the Haken Editor folder.

8.9. CEE Combination Presets

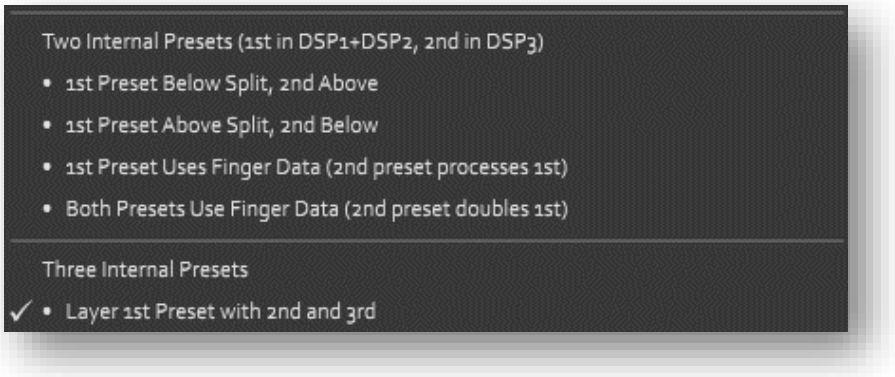
Note: As opposed to a split that uses an EaganMatrix preset on one half of the fingerboard and External Midi output on the other (allowing the Continuum to be used seamlessly in conjunction with other MPE instruments), all combination presets will reduce available polyphony. You may get "Reduce Polyphony" messages in some combination groupings especially if playing polyphonically. You may have to reduce polyphony to the point that the preset does not perform as expected. This is normal operation as combination presets reduce the available DSP processing versus loading a single preset. Also because each preset is often tightly coupled with specific fingerboard operation, layering presets may produce unexpected results as the same fingerboard inputs will be applied to all layers. They are provided as a way to expand the Continuum's sonic palette and you may find them useful depending on the presets selected (or programmed) - as long as you are aware of these limitations.

Combination Presets can *only* be used on Continuum Fingerboards that have at least 3x DSP processing capability. Thus they are supported on all "Slim" model Continuums and those expanded past 2x processing. Combination Presets cannot be used by the ContinuuMini which is limited to 2x processing. Also note that multiple Continuum Fingerboards cannot be connected to provide more processing power, but you can play one Continuum Fingerboard or ContinuuMini from another in effect simulating some of the CEE combinations modes.



A Combination Preset made of three presets, in User Preset Slots 1, 2, and 3.

A Combination Preset consists of two or three adjacent User Presets whose outputs ae combined in a number of ways. The Editor will clearly note the combination grouping by highlighting the border around all presets in a group as shown above. When a Combination Preset is loaded, each of the presets in it is assigned one or more of three DSPs, referred to as DSP 1, DSP 2, and DSP 3. A Combination Preset can be in one of several playing modes depending on the selection in the Split options in the Control 2 Panel (Section 10.12):



Available Combination Preset Modes: (Note some of these have changed from previous combination mode options). Now the first preset in a dual grouping uses DSPs 1 and 2 and the second preset in the grouping uses Preset 3.

Split between Two Presets (Below/Above): The Continuum surface is split so that the first preset in the combination is played below the split point and the second preset above it.

Split between Two Presets (Above/Below): The Continuum surface is split so that the first preset in the combination is played above the split point and the second preset below it.

Processing of Two Presets (Finger/Processing Only): The first preset uses finger data and the second preset processes the first.

Processing of Two Presets (Finger/Finger): Both presets use finger data and the second preset doubles (mixes with) the first.

Three Presets (Layered): Each preset uses its own DSP and all three layer with each other.

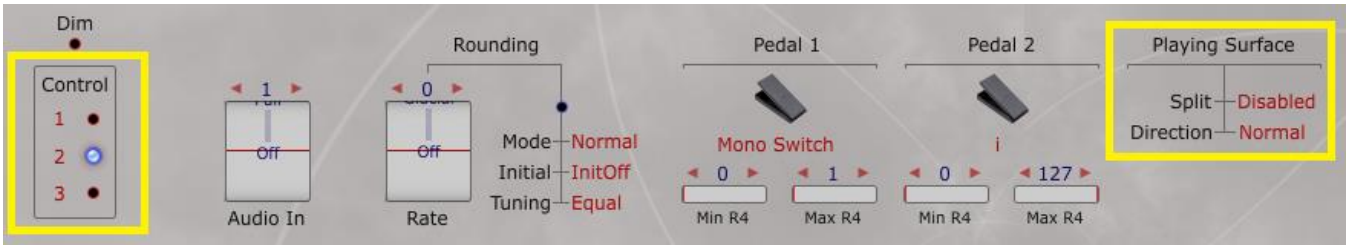
8.9.1 Creating Combination Presets

You are not limited to creating only one Combination preset. You can create as many as can be made from the number of User Presets you have set, though they cannot overlap. They can be created in all User Preset banks.

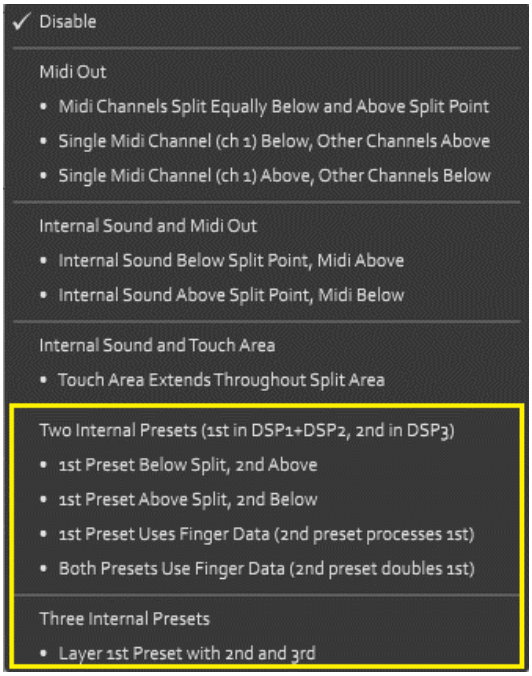
To create a Combination Preset, store two or three presets into consecutive User Preset Slots. Then click on the first of the presets you want in your combination group. This will also make that preset the current preset until you create the combination group.



Then bring up the **Control 2** panel and locate the **Playing Surface/Split** option which will be Disabled if not previously set.



Bring up the Split Panel and make the desired Combination Preset selection. Note there are other options in this panel that relate to how sound and MIDI are output based on the split point.



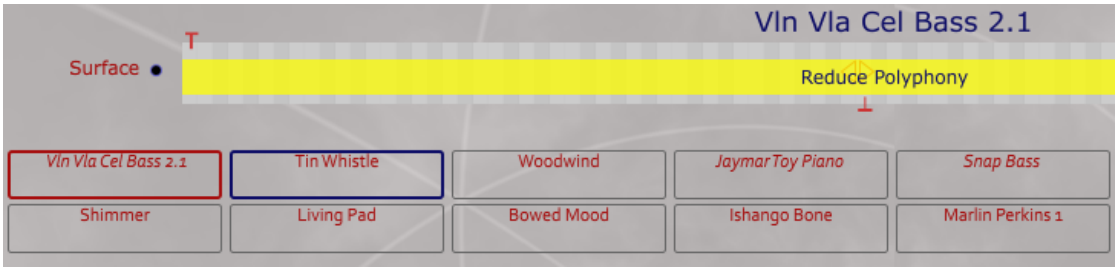
Once you make your Dual or Triple Preset Combination selection, the appropriate User presets will all be highlighted in the group that has been created. The currently selected preset in the group is highlighted in red and the others in blue. IN addition the first preset in the group will be renamed with the User Preset slot number appended to the name.



You can select another User preset and that will be highlighted as normal, but if you click any of the presets in the combination group the entire set will be highlighted so you always know all are in effect. You must however remember the type of Dual or Triple combination created as that is not displayed.



You may get "Reduce Polyphony" messages when creating Combination presets, especially with 6x processing continuums. In this case go to the first preset in the group and reduce its Polyphony by 1. That will normally remove the message.



8.9.2 Combination Presets and Slim Continuum

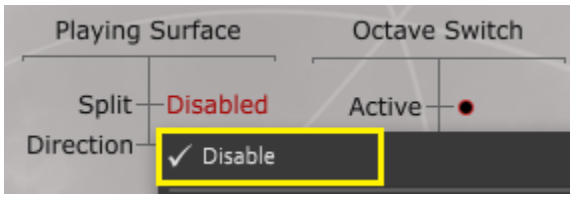
On "Slim" model Continuum Fingerboards, a combination preset is also indicated on the front panel placing two or three LEDs on the bottom LED panel display for any preset that is part of the combination:





8.9.3 Removing/Disabling Combination Presets

To remove any combination preset, select the first User Preset in the Combination Group (all will still be highlighted) and in Control Panel 2, Playing Surface/Split option, set to Disabled. Note that if you select the second or third preset in an active combination group, it will always show up as Disabled.



The combination outline will disappear and the User Presets will be back in their normal playing state for that group.



If desired you can set to a current Combination Preset to a different combination or split type as well in this manner.

8.9.4 Editing Presets in a Combination Group

You can select any preset in the Combination Group for editing. The currently selected preset in a group will be highlighted in red. The others will be highlighted in Blue:



When a Combination Preset is selected for edit ("Tin Whistle" in the image above), edits you make in the EaganMatrix only affect that preset, but you will also hear the other presets in the Combination Preset when you play on the surface. After you make edits to the first preset, *you **must** shift-click on that User Preset Slot to save edits to the slot*. (You will lose edits unless you remember to do this!) If you try ad save a preset to a different slot in the combination preset you will get an error message:



If you want to edit the other presets in the Combination, first save any edits you made to the first preset by shift-clicking on its User Preset Slot. Then click on the second (or third) User Preset Slot. When you complete your edits, once again *shift-click in the same preset's User Preset Slot to save your combination edits*. **(Once again, you will lose edits unless you remember to do this!)**

8.9.5 Storing (Saving) and Loading (Opening) Combination Presets

When storing a preset group that contains one or more combination presets, those combination configurations will be retained if you restore (Open) the group.

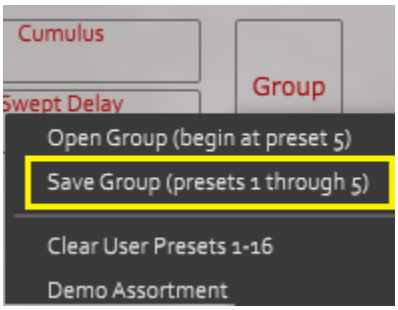
For example, let's say we want to store the first five presets in a group and the first three of those contain a combination preset:



Select the fifth User preset. That will be highlighted as the current preset (and the combination indication then disappears (but the combo is there there).



Then go to the Group icon and the Save Group option will be available:



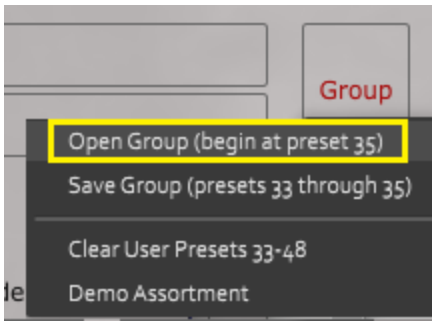
Select Save Group and store to a desired location on the disk (not in the current firmware directory that will get overwritten if you load a new firmware release).



Or perhaps you want to Clear your current displayed group of 16 presets, or perhaps you navigate to a group that has nothing stored yet. Select a User Preset position where you want to restore the group:



Then use the Group Icon's Open Group option. It will tell you the User Preset position it will start restring at:



Select the Group preset file to restore:



After selecting Open, the preset group will be restored to the selected location and the combination group will be maintained.



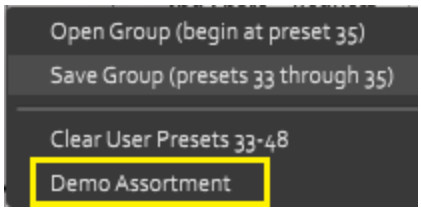
Important: To change a Combination Preset to back to the original individual presets, save the parts of the Combination to disk first that you may have edited except for the first preset. Disable the Combination preset as noted above and then load the individual preset files. Then you can save the first preset. The first preset in a combination group retains the combination information. If you save that preset and then load it back into a user position, the following presets will be treated as if they are part of the original combination group. Retaining the combination information in the first preset allows a group to be saved and restored as a combination group.

Note: When saving a set of preset with a combination group in it, if the combination ends the group, make sure to select the last preset in the group. If you select the first preset in the combination and save, the other one or two presets will not be stored in the group.

8.9.6 Demo Groups and Combination Groups

Several example Combination Presets may be available in the Group menu in future releases.

Currently only the default Demo group assortment is available that sets User Preset 1-16 to a select set (this can be restored in any User Preset bank).



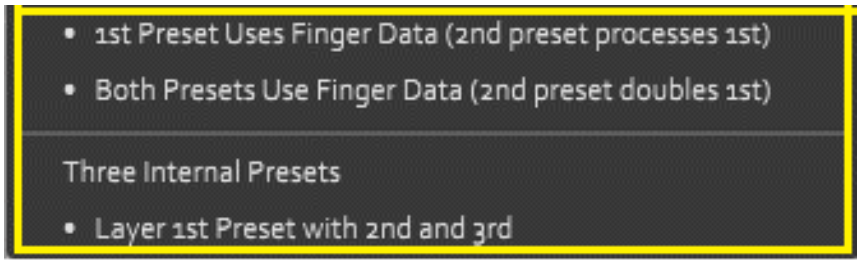
Note: Never delete any files in the directory you store your Groups to, be they normal Groups or Groups that contain Combination presets. If you do the presets used in each group may be deleted and the group will not load correctly (will stop loading at the point it encounters a missing preset).

8.9.7 Special Preset 1 Combination and Split Preset Usage

Important: A Combination Preset will get most of its performance parameters from the first preset in the Combination Preset. This includes settings such as transposition, mono interval, round rate, etc., ignoring the performance parameters that are stored in the second or third preset in the Combination Preset.

As noted above, all the combination preset information (and split information) for a combination preset is stored in the first preset. Disabling the Combination or split will then allow that preset to be treated normally. If you store the first preset in a combination group or store a preset that has been configured as a Split and then load that and store in another user position. That position will take on the associated combination or split characteristics.

8.9.8 Combination Presets – Preset Layering and DSP Processing



Combination presets can be played as layered presets and can also be programmed in the EaganMatrix to use DSP information from one preset in another to create complex preset combinations (the letter being a very advanced EaganMatrix programming topic). Layered presets simply combine the two presets. No EaganMatrix programming is needed.

- To play two presets at the same time all using the same fingerboard input select "Both Presets Use Finger Data (2nd preset doubles the first)
- To play three presets at the same time all using the same fingerboard input select "Layer 1st Preset with 2nd and 3rd.

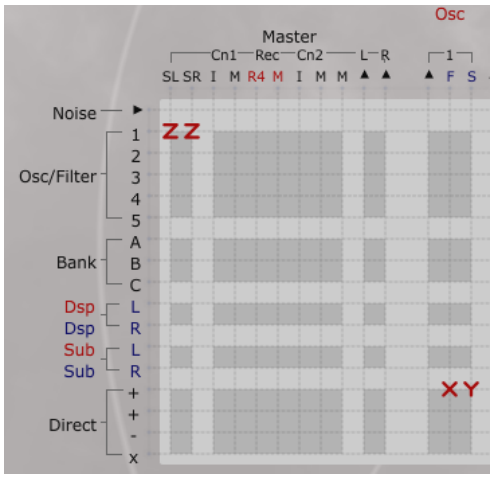
Note: The following options are for Expert/Advanced Level EaganMatrix programmers:

The third option "1st Preset Uses Finger Data (2nd preset processes the first) should only be used if you intend to program the DSP information from the first preset in the second preset. There may be some preset groups in the future that will be included in firmware release for general use, but for now the user must program this themselves and in this case the second preset does not use W (gate), X, Y or Z formulas as it does not process fingerboard data. In fact, all three of the combination modes above allow for the processing of DSP data according to the following rules:

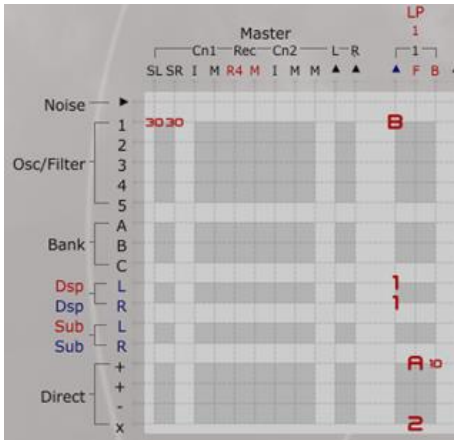
The DSP EaganMatrix rows are used to send DSP information from one preset to be processed by the other in Combination mode:

- DSP matrix rows provide output from other DSPs in combination presets.
- DSP matrix rows have meaning only in the 2nd or 3rd preset of Combination presets.
- If one pair of DSP rows is used in the matrix of the last preset of a two- or three-preset combination, that pair of DSP rows provides stereo output summed from the Master Sections of the other preset(s) in the combination.
- For three-preset combinations: If both pairs of DSP rows are used in the matrix of the third preset, the first pair of DSP rows provides stereo output from the Master Section of the first preset in the combination, and the second pair of DSP rows provides stereo output from the Master Section of the second preset in the combination.
- For three-preset combinations: If a pair of DSP rows is used in the matrix of the second preset, that pair of DSP rows provides stereo output from the Master Section of the first preset in the combination. There is no option to exclude fingerboard data in preset #2 or preset #3 in the triple combination option. If you want preset #2 or #3 to operate in this manner, simply don't use fingerboard related formulas to process the DSP information.

When designing a preset for this category remember the first preset in the combination group should contain the fingerboard X, Y and Z programming desired to play the preset. The following is a simple example of that the first preset might be (but it could be any preset you choose). In this case a simple Oscillator uses standard X pitch tracking with Y controlling the Spectral Balance and Z is used to output to SL/SR (very similar to the Utilities/Sine Wave examples only with Y control on Spectral Balance).

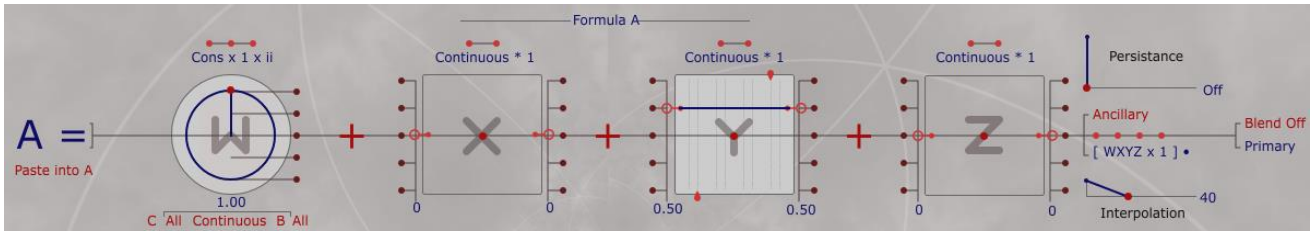


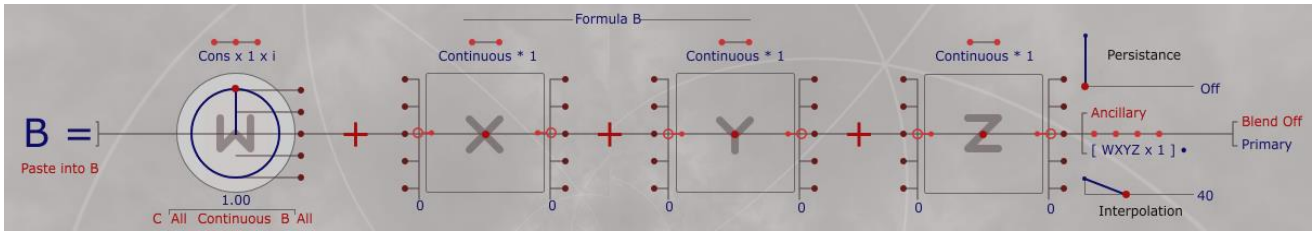
However, the second preset is intended to be a DSP processor that does not use fingerboard. If it does use X, Y or Z in formulas, unpredictable results can occur. In this case the DSP inputs are used to process the digital output of the first preset.



Here the DSP inputs are sent into a Low Pass Filter. Note the output of the filter is sent to SL/SR using a constant, not a fingerboard pressure (Z) formula.

The formulas used in the filter to control the filter Frequency (Formula A) and modulation input to the filter (formula B) both are "math" only formulas that do not use X, Y or Z in a manner that assumes they will be used on the fingerboard:

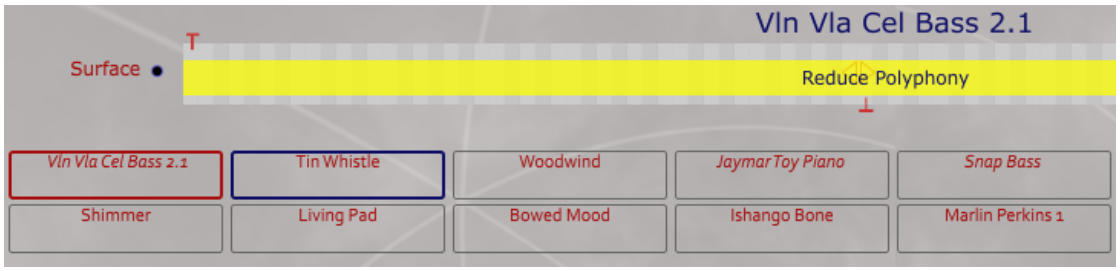




Note: For the second preset to take effect, you must set the Control Panel 2, "Audio In" control to allow output of the first preset to be used as input to the second DSP processing preset.



See the EaganMatrix Manual for information on creating presets.



8.9.9 Combination Presets and External Midi Input

When sending Midi control data to combination presets (for example changing Bespoke Control iii), the first preset in a combination group will receive the Midi data. It will not be sent to the second or third presets in the group so that control options are not misinterpreted. If you want to change control data for the second or third preset in a combination group it must be done manually through the controls in the editor. You can also assign a pedal to be used in one preset and another pedal to be used in another to get limited external control of both presets. External Midi note data will apply to all presets in the combination group.

8.10. Designing Sounds for the Continuum Fingerboard and ContinuuMini

The Continuum Fingerboard and ContinuuMini can be used to control a wide variety of sound synthesis algorithms. The System Presets, and User Preset files prepared by other Continuum players, provide many possibilities. You may also design your own custom sounds in the EaganMatrix or using an external synthesizer. Presets are usually customized specially for Continuum Fingerboard or for ContinuuMini, since the ContinuuMini has a different playing surface and different feel from the Continuum Fingerboard. Please consider the following suggestions when selecting or designing sounds to be used with the Continuum Fingerboard and ContinuuMini.



The X Direction

The X direction of the Continuum Fingerboard is generally mapped to pitch.

The left to right (X) direction is extremely accurate and can be used for accurate continuous pitch creation and pitch effects like vibrato and glissandi. Unless otherwise desired as a specialized effect, avoid synthesis algorithms with built-in vibrato. A performer's finger movements can create far more expressive pitch and amplitude modulations that produce a much more realistic vibrato than what is programmed into the typical sound synthesis patch.

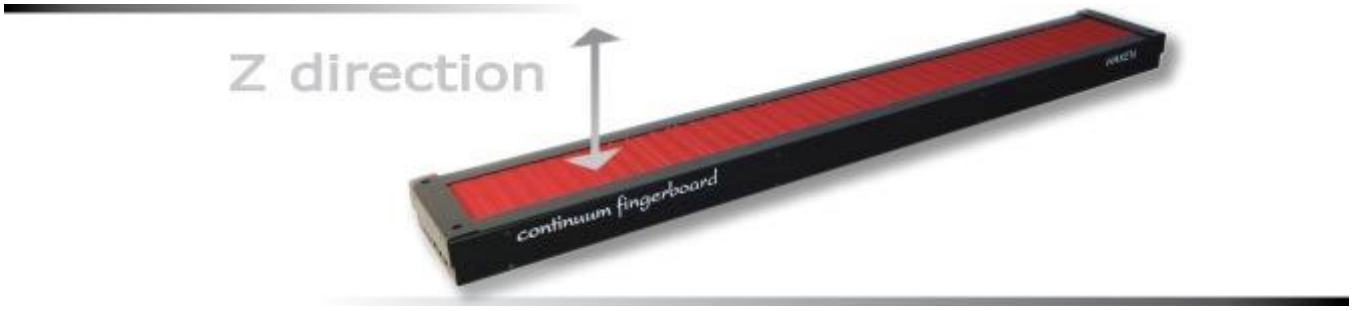


The Y Direction

The Y direction of the Continuum Fingerboard is generally mapped to a timbre shift.

Make good use of the front-back (Y) position available from the Continuum Fingerboard. When deciding what parameters to control by front-back position, keep in mind that the Continuum Fingerboard measures front-back position less accurately than pitch or pressure. The front-back position can provide an important expressive tool for the performer when it is used to control appropriate timbre parameters. All the System Presets in the Continuum Fingerboard utilize Y to some extent. The Eagan Pluck String is a good example of Y usage, as Y is mapped to multiple sound destinations with formulas employing different Y transfer functions.

The Z Direction



The Z direction of the Continuum Fingerboard is generally mapped to a loudness shift.

Use synthesis algorithms that have timbre changes associated with loudness changes. Some sampling synthesizers change only the volume as the performer's finger pressure changes during a note. This limits the apparent dynamic range and expressive possibilities available to the performer. With acoustic instruments, the timbre changes as the volume changes. Keep this in mind as you design your Continuum Fingerboard sounds.

Generally you should use synthesis algorithms that have dynamics controlled by a continuous controller (like expression, volume, or breath). Avoid using Note On key velocity to control dynamics. While the Continuum Fingerboard can be configured to transmit Note On key velocity, it is rarely recommended. Key velocity (sometimes also called Strike in other "Expressive Controllers") is a single discrete value that is determined on the note's attack and discards the fine structure of the attack. For musically interesting and expressive performance, a finger's initial contact with the surface is especially important. Much of the skill of an advanced Continuum Fingerboard player involves shaping the fine structure of attacks of sounds. For this reason the Continuum Fingerboard (like Midi breath controllers) defaults to transmitting a constant 127 for key velocity and does all dynamic control (for attack and other parts of the sound) in a continuous fashion.

Finally, avoid synthesis algorithms that trigger amplitude envelopes on Note On. An apparent 'double trigger' or 'stutter' effect can result:. First you hear the amplitude envelope that is triggered when the finger comes in contact with the playing surface, then you hear a second amplitude increase as the performer's finger pressure increases on the playing surface. In most cases only the performer's finger pressure variations should be controlling the amplitude, not a built-in envelope. However, if you find that the sound uses an amplitude envelope that you like and don't want to discard, consider mapping pressure into another controller that does not affect amplitude.

9. Continuum Configuration and Control Without Using the Haken Editor

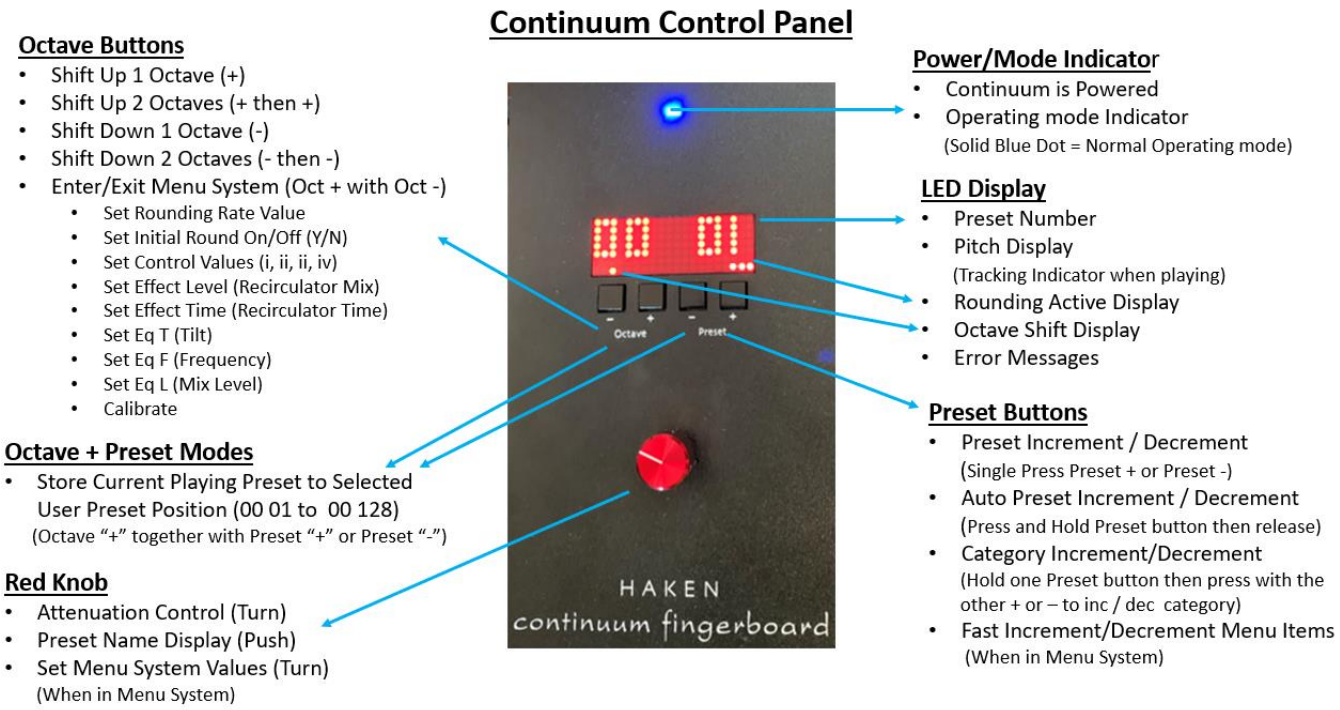
All Continuum models can be controlled from the instrument without the need for the external Haken Editor or external EaganMatrix configuration.

ContinuuMini players may wish to skip this section, as it is specific to the larger Continuum Fingerboards though ContinuuMini is also configurable without the Haken Editor. See Section 16 for details on controlling the ContinuuMini without the editor.

9.1 Introduction to the Front Panel Display and Controls ("Slim" Continuums)

See Section 5.1 for connection descriptions. New model "Slim" Continuums do not use the Overlay strip used on half-size and full-size models (discussed in the next section). They have a front panel user interface similar to that used on the ContinuuMini and an additional "red knob" used for volume/attenuation control and preset display. This section described the on-board user interface that provides the following features:

- LED Power and Continuum Mode Indicator
- Current Preset Display
- Preset Selection
- Pitch Tracking Display
- Octave Transposition
- Control Parameter Settings



9.1.1 Power / Mode Indicator

A small single rectangular LED at the top of the user panel indicates that the Continuum is powered on and in one of the following modes of operation

- Constant Blue – Continuum has booted and is in normal playing mode. The current preset should be displayed, or Empty.
- Blinking Blue – The Continuum did not boot properly. Does the display read "DSP"?. The Continuum may have booted into SAFE mode.
- Blinking Pink and or Green for a short time and then goes to solid blue. Expected display when booting.
- Green (Yellowish) – Firmware is being downloaded

9.1.2 Red Knob

The "Red Knob" on the Continuum front panel has the following functions

- When turned it changes attenuation. On the center setting it registers ca. -24 dB. When turned all the way to the left it decreases gain to -infinity (silence). When turned all the way to the right it increases gain to a max of 0dB. Note: It does not totally reduce volume to zero. That can be done with the gain Control in the EaganMatrix Editor or a pedal programmed to control Gain.
- When pushed during normal operation, the current preset name will scroll on the LED display while the knob is pushed and when released the LED will return to the current preset number (Category/Preset) display.
- When turned in the Menu System, it can change parameter values quickly versus using the Preset increment and decrement buttons.

- When pushed in a Control Mode (i, ii, iii, iv) in System menu, it will display the name of the Control set in the Haken Editor.
- When changing Attenuation or a menu system item, it should start changing from the current displayed position.
- If power is applied to the Continuum while the Red Knob is depressed, the Continuum will revert to its default factory state and the user must perform a factory calibration and refinement procedure. Note: This operation should only be performed if there is an issue with the continuum that indicates a factory reset is required. Please consult Haken Audio before performing a factory reset.

Note: When using the Red Knob to modify, you always have to "capture" the value (rotate past the value) before it starts modifying the value – that is true for Attenuation as well as in the menu system.

9.1.3 LED Panel Display Functions

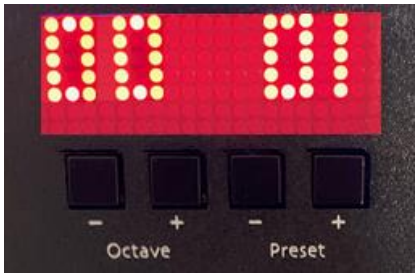
The LED display reports a number of things to the user depending on the operating mode

- Status information when booting – Current Firmware version
- Error messages – For example will report a (Midi) Loop
- Current Preset Number
- Current Preset Name
- Pitch tracking when playing
- Octave
- Menu System Options

Normal LED Display When Not Touching the Fingerboard

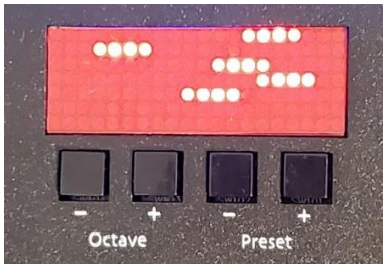
The LED Display works in conjunction with the "Octave +/-" buttons, "Preset +/-" buttons and user interaction with the fingerboard.

On successful booting the LED panel displays the last user preset loaded into the Continuum or User Preset **00 01** after firmware updates. Presets are displayed as an EaganMatrix Category followed by the associated preset number in that category, for example: **01 05**. Category **00** is reserved for User presets. Preset **00 00** has the special meaning: A custom preset was loaded from disk.



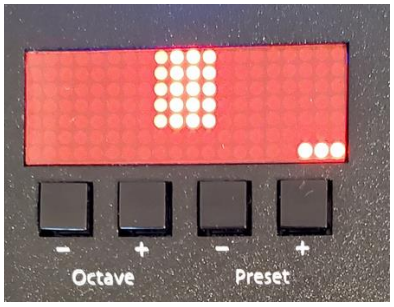
Pitch Tracking Display

In order to assist the performer in learning how to play in tune on the Continuum and also determine exact tuning when playing, when the fingerboard is depressed, the LED panel displays four adjacent LED elements for up to five polyphonic voices indicating how far off the pitch played in each voice is from 0 cent offset tuning (four dots in the center of the display). If you play in the center of a fingerboard note on a non-rounded preset and rock your finger you will see the tuning indicator follow on the screen in the left or right direction indication how far off from the 0 cent offset the pitch is. If you move far enough in once direction, the pitch will slide to the next note and the indicator will scroll completely off the panel and reappear on the other side. The following is an example of five voice polyphony where it is evident the tuning played for all five voices is not optimal.

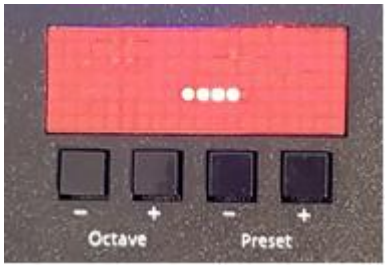


Dots under the tuning display on the right side (over the "Preset +" button) indicate that rounding is applied to the preset.

A rounded preset will display the tuning dots in the center of the display if the fingers are kept stationary as they are automatically pitch corrected when played. If rounding is not total, when the fingers are moved slightly the pitch indication will move as expected. Fully rounded presets will in a fixed position on a given note.



Of course if only one voice is playing, only one row of tuning indicators will be displayed.



9.1.4 LED Display Messages

The LED panel can display the following messages with associated meanings:

- '**FACtRY**' – Continuum is in factory calibration (from the Cal menu – should be a rare operation)
- '**ALIGN**' – In surface alignment procedure (from Cal menu - not a user operation unless instructed to by Haken support).
- '**REFINE**' and '**DISCRD**' – also Cal menu option. This might be used when a note gets stuck.
- '**editor**' – appears when you have made changes in the Editor that are unsaved, and you press "Preset – ". Avoids discarding current presets under edit if accidentally Pressing "Preset –" instead of Octave+ button. To get out of this mode, either save your edits, or if you do not want to save edits use the Editor to go to other preset, or if you do not want to save edits you can also press Preset+ (which is not protected like this and then "Preset –" twice to decrement from there.
- '**loop**' – Midi loopback detected; need to fix your setup so you don't have a MIDI loopback. This can happen (for example) if software unexpectedly loops back Midi data, or if a third party MIDI hardware defaults to copy midi-in-to-midi-out before it is initialized. Users are strongly recommended to use Midi and Global Settings to route third party midi softsynths through the Editor using "Ext 1" or "Ext 2". If that is done

properly, all Midi loopbacks can be avoided, and also you can avoid having Continuum configuration data sent to your softSynth/DAW, etc.

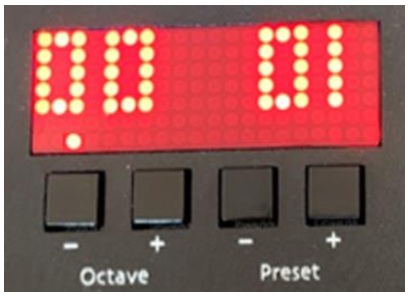
- '**Wait**' – sending list of user preset names and categories to Editor or iPad or displayed when storing a current preset to disk that gets updated on the Continuum.
- '**9.20**' (example) – during powerup the firmware version is displayed for a short time.
- '**dsp**' – the dsp chips inside the Slim are not communicating with each other properly. This should not occur, and probably indicates a firmware bug or serious problem. It also might occur if the editor crashes for some reason and sends unexpected information to the Continuum. Try repowering. If the condition persists, please contact Haken Audio support.
- '**FILE1**' – when in RECOVERY MODE (power-up with red knob pressed down), after some initializations, this will come up indicating it is ready for Update File 1. RECOVERY MODE not expected to be needed by the user. Please contact Haken Audio before attempting this procedure.
- '**FILE2**' – After update file 1 is completed, this comes up indicating it is ready for Update File 2.

9.1.5 Octave Shift Control

The Octave Down (-) and Octave Up (+)controls can be pressed at any time before or during playing to shift the current octave up to two octaves up or down.

If the octave buttons are pressed while no finger is playing, the expected octave shift will occur when the next note is played and affect all notes played. If the Octave Shift buttons are pressed while one or more notes are being played, the octave shift will occur the next time all fingers release form the surface and start playing again.

Octave Shift up and down indicators appear above the associated Octave Buttons on the bottom row of the LED Display. If no indicators are present, Octave Shift is not engaged. One LED on over the respective octave increment or decrement buttons indicates a shift of one octave is in effect and two LEDs on indicate a shift of two octaves.





9.1.6 Preset Selection (Incrementing and Decrementing Presets)

The preset buttons increment and decrement presets within each EaganMatrix Category. Once the presets in a category are reached the next category and its presets will be displayed. For the User Preset category "00", only presets that are defined (this can include the Empty preset) are displayed. Unallocated user preset positions will be skipped using the Preset "+/-" buttons.

A quick press will increment or decrement from the current preset/category. Holding down the "-" or "+" buttons will fast increment or fast decrement through all the presets.

To randomly access a preset either connect to the Haken Editor or connect a MIDI device programmed to select presets through buttons or other controls. Templates are available for Arturia BeatStep and BeatStep Pro controllers that can be useful here.

Note: A special function applies to the "Preset -" button. If you are editing a preset in the Halen Editor and press the decrement button, the preset will not change and the LED display will show: "EDITOR". This is a safety feature

to prevent the EaganMatrix programmer from losing work when editing a preset when accidentally changing presets on the Continuum.

9.1.7 Category Selection (Incrementing and Decrementing Categories)

When the Preset + or Preset – button is pressed (Preet will advance as above) and then the other Preset button is pressed, the current category will either increment or decrement based on the initial Preset button pressed. Preset 01 will be defaulted in this case for a category change. You can scroll up and down through preset categories in this case. They will be numerically displayed.

Every time you hold down one Preset button and then Press the other Preset button the category will increment or decrement. If you hold down both Preset buttons after a category change, the Category/Preset display will remain fixed until you release one or both fingers.

9.1.8 Storing System Presets in User Preset Positions

The Continuum now supports up to 128 User Presets that are stored in Category 0, Preset positions 1 to 128 (these are arranged in banks of 16 presets in the EaganMatrix Editor for simplified access). Use the following button sequence to store any of the System Presets in one of these positions:

- Bring up a System Preset you wish to store in one of the User Positions (could also be a preset of your own you loaded into position 00 00).
- Press the octave increment ("+") button and then either the preset increment ("+") or decrement ("-") button (you can also press them together).
- The display should change to show "**to nnn**", where "nnn" is +/- one from the last user position stored depending on whether you pressed the preset increment or decrement button along with the octave increment button.
- While continuing to hold down the octave increment button use the Preset increment or decrement buttons to move to a user preset position of your choice noting it may have a preset already stored in it.
- Release all buttons and the current system preset should not be stored in the desired user preset "nnn") location you selected. Scroll to preset "00 nnn" to confirm.

Note: You can also use the EaganMatrix Editor to store System Presets or presets of your own creation in one of the 128 User Preset positions (preferred method if you have the editor connected).

9.1.9 Continuum Menu System

The Control Panel's Menu System functions allow you to edit/change the value of a number of EaganMatrix Preset parameters and Continuum controls (such a controls, rounding, recirculation etc.) and also perform calibration if required. The Menu System is entered by pressing both of the Octave buttons together.

One single simultaneous press is all that is required to enter the Edit System. You can then release. Pressing both Octave buttons together again will exit the Edit System.

Once in the Edit System, the Octave increment and decrement buttons will scroll sequentially through the menu options. The Preset increment and decrement buttons are then used to change the value of the control parameter selected. The Red Knob can also be used to change parameter values.

Control Parameters are described below.

Note: You can move back and forth between parameters in the Menu System setting them to values as you wish and they will be retained after exiting the Edit Mode. These parameter changes will only apply to the current preset being edited and played. If you move to another preset and come back to the one you have edited, the original setting of that preset will be restored. If you store the current preset with changes to a User preset, the changes will be retained. In this case make sure to store that preset to your computer from the EaganMatrix editor if you want to retain those changes as they will be overwritten the next time you store something to that User Preset location.

The values of the parameters displayed in the Menu System will also change on the display if altered by the EaganMatrix or some other MIDI controller programed to change these values, such a BeatStep Pro.

9.1.9.1 Round Rate ("Rrt nnn")

This control changes the rounding rate of the current preset for entire notes played (the Normal setting in EaganMatrix). A value of zero means no rounding is applied. You can set this from a value of 1 (minimum rounding) to 127 (full rounding/totally quantized).

The LED indication for Round Rate set are the two right most LEDs on the bottom row set to on.



The leftmost LED indicates that rounding will be applied when playing a note. The rightmost indicator indicates that rounding will be applied when releasing a note. This is the default (Normal) setting for Round Rate, however, in the EaganMatrix, Round Rate during the note can be disabled and only rounding on release can be set if desired. In this case only the rightmost LED will be displayed on the panel.



9.1.9.2 Round Initial ("RIn Y/N")

This control changes the preset to use Round Initial Mode or not. I can be used in conjunction with the Round Rate control or set by itself if Round Rate is set to zero.

Press the Preset Increment button to change Round Initial to YES ("Y") if it is set to No ("N"). Press the Preset Decrement button to change Round Initial to NO ("N") if it is set to No ("Y").

The LED indication for Round Initial set is the third LED on the bottom row from the right set to on.

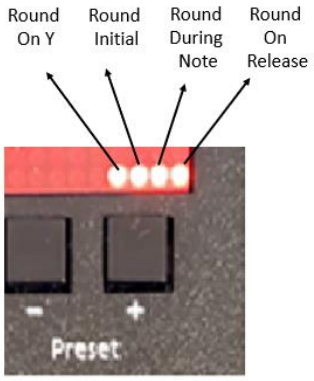


If Round Initial is set with Normal Round rate, three LEDs will bet set to on.



Note: The EaganMatrix allows for two additional rounding modes on Y (Round Max from Y=0 to no rounding at top of Y and Round Max at Y=1 no rounding at bottom of Y) that are not used that often, but if set in the EaganMatrix for a preset will be indicated by the fourth LED from the right on the bottom row being enabled.

Here is the full LED indicator key for determining rounding mode in the LED display:



9.1.9.3 Controls ("i, ii, iii, iv nnn")

Four Menu System options cycling through the Menu System to set the four EaganMatrix control values from 0 to 127. When selected, the current control value is displayed which can be incremented or decremented with the Preset buttons.

The Red Knob can also be used to change the control value but it must "capture" the current value by rotating past first and then values will change. If the Red Knob is pressed, the name of the control set in the EaganMatrix is displayed (or blank if no control name is set).

9.1.9.4 Effects Level ("EfL nnn")

Sets the Recirculator Mix to a value from 0 (Recirculator Off) to 127 (Max Effect Level). The Preset increment and decrement buttons can be used to change the value.

The Red Knob can also be used to change the value but it must "capture" the current value by rotating past first and then values will change.

9.1.9.5 Effects Time ("EfT nnn")

Sets the Recirculator Time to a value from 0 (Off) to 127 (Max). The Preset increment and decrement buttons can be used to change the value.

The Red Knob can also be used to change the value but it must "capture" the current value by rotating past first and then values will change.

9.1.9.6 Eq Tilt ("EqT nnn")

New to 9.1 and later firmware. EqT refers to a parameter in the new master equalization filter section added to the EaganMatrix stereo output processing. This can be applied to any preset. It is a general eq based on a stereo pair of shelving filters with separate controllable low and high frequency components in the range 120Hz to 15KHz. The Eq settings can shape the sound either subtly or drastically "brighter" or "darker".

EQ Tilt sets the balance between the lower frequency and higher frequency filters. The further one goes to each extreme, the sharper the eq slope (tilt) is. In this way it can be used for subtle or major tonal shaping.

9.1.9.7 Eq Frequency ("EqF nnn")

New to 9.1 and later firmware. EqF refers to a parameter in the new master equalization filter section added to the EaganMatrix stereo output processing (See above).

EQ Frequency defines the crossover point between the two shelving filters. It thus has little effect when Eq Tilt is set to flat. The larger the tilt, the great effect this will have.

9.1.9.8 Eq (Mix) Level ("EqL nnn")

New to 9.1 and later firmware. EqL refers to a parameter in the new master equalization filter section added to the EaganMatrix stereo output processing (See above).

EQ Mix (Level) sets the dry/wet blend/mix of the Eq control. 0 means EQ is bypassed, 64 means half-filtered half-dry, 127 means all EQ.

Currently existing presets from the 9.0 release default to Eq Mix = 0 so that the sound of the previous preset is retained for those used to it. Some suggested values for Eq Tilt and Eq Frequency are already applied in some presets which will take effect proportionally as Eq Mix is incremented.

9.1.9.9 Calibration ("Cal -/+")

This function performs the following operations, which should not be needed as they are performed at the factory prior to shipment. At times, however, you may experience stuck notes that are not resolved using the Refine Calibration procedure in the EaganMatrix Editor.

Refine Calibration: In the Cal Menu press the "Preset +" button

Factory Calibration

See Section 13.7.1. Contact Haken Audio before attempting this procedure to make sure it is indicated. At times you may experience stuck notes that are not resolved by quickly moving your finger over the fingerboard surface or using the Refine Calibration procedures available int eh Editor.

Surface Alignment

See Section 13.8.

9.1.9.10 Factory Reset / Restoration

If the Continuum does not upgrade firmware correctly and appears to be hung on repowering or in an unexpected state, a Factory Reset may be required. To restore the ContinuuMini to its default Factory configuration

- Remove power from the Slim Continuum.
- Exit the Editor if it is running and connected
- Depress the Red Knob and while depressed repower the Continuum
- Rerun the Editor and hopefully you will connect and get the Blue LED in the Editor (as well as on the Continuum). At this point the Continuum will likely be restored to a previous firmware version and will require an upgrade to the current desired version. See Haken Audio Web Site for versions.
- Refinement / Factory Recalibration may be required if the instrument does not perform as expected after restoration.

Note: This operation should only be performed if there is an issue with the continuum that indicates a factory reset is required. Please consult Haken Audio before performing a factory reset.

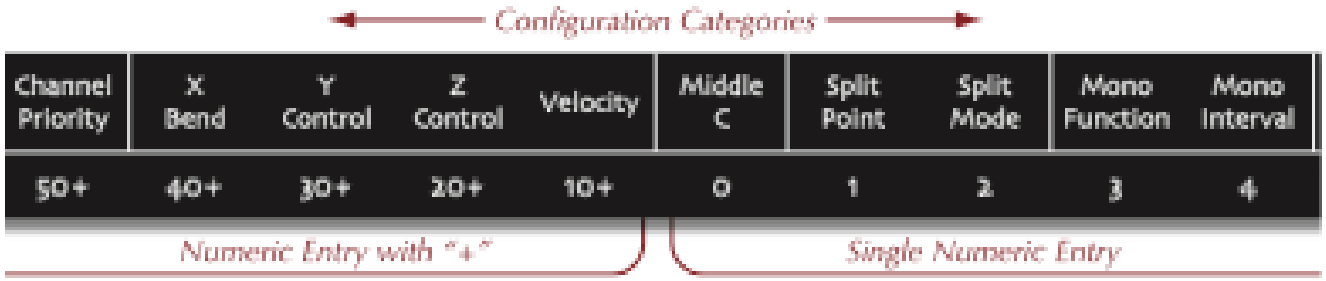
9.2 Introduction to the Overlay Strip (Half-Size and Full-Size Continuums)

The Continuum Fingerboard's Overlay Strip specifies where to press for each configuration option available from the playing surface.



The Overlay Strip

The Overlay Strip area is divided so that each option and numeric area matches one semitone of Continuum Fingerboard surface.



Below is a close up of a section of the Overlay Strip:

The configuration categories are along the top of the Overlay Strip. Along the bottom are numeric entry values. The numeric values to the left have a "+" after the number. That denotes they are used in conjunction with the numeric values to the right to create composite value. For instance "30+" and "2" makes the number "32".

The Continuum Fingerboard's configuration is changed by using this Overlay Strip and following these general directions:

Start	The colour of the LED is dim blue during normal operation.	✹
Red Button	Press and release the Red Button next to the Headphone output on the side of the Continuum Fingerboard. The LED will turn from dim blue to bright red.	✹
Configuration Category	Touch the far edge of the Continuum Fingerboard surface at a configuration category. The LED will shine a brighter green while your finger is touching the surface and return to a dim green after the touch.	✹
Numeric Entry	Touch the far edge (back) of the Continuum Fingerboard playing surface at a numeric value. Touching a numeric with a plus after the numeral means the Continuum Fingerboard is waiting for a second numeric touch. For instance, touching "80+" then "4" is equivalent to a numeric value of 84. The LED will shine a brighter green while your finger is touching the surface. The LED will return to a dim green when it is waiting for the second half of a dual numeric touch.	**single** ✹ **or dual** ✹✹✹

Configuration Changed	After the single numeric touch or the dual numeric touch the LED will go back to dim blue. The configuration has been changed.	

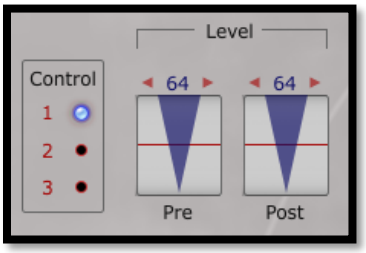
10. Configuration Options

Sections 10.1 to 10.24 describe configuration options available for the Continuum Fingerboard and ContinuuMini. The descriptions apply to configuration from the Haken Editor, as well as from a Continuum Fingerboard's playing surface using the Overlay Strip (for Half-Size and Full-Size models). Each configuration option uses a table with this layout:

Category Name (as it appears on the Overlay Strip) *This is the first surface touch when you configure using the Overlay Strip.*	
Numeric Value(s) on the Overlay Strip *This is the second and possibly the third surface touch when you use the Overlay Strip.*	In here will be the explanation as to what this Category-Numeric value combination means.
◉	Functionality specific to the Haken Editor. For half-Size and Full-Size models, almost all the functionality of the Overlay Strip is replicated in the Editor.

The Haken Editor now is formatted allowing selection of three Control panels containing different functions that all used to be on one page. These will be noted in all descriptions below so the user can easily find them.

10.1. Levels (Pre and Post) – New to 9.53 Firmware



Pre and Post Level	
0	The two Level controls let you set Pre and post Master Section gain. (Note that gain works independently from the Attenuation knob on "Slim" Continuum Fingerboards) Note: Pre and Post Level controls that replace the previous single Gain control. "Pre" and "Post" Levels are for controlling level before and after the master section. This is important for changing levels on presets designed (for example) for low polyphony to high polyphony -- adjust "pre" level and thereby avoid saturation effects or adjust "post" level if you like the saturation effects and just want it quieter (Post = old Gain control).
1 to 127	Level of the output from soft to loud. Excessively high gain may clip at high polyphony in Post mode.

Pre and Post Level	
◉	The Post Level is the last step in the signal chain, just before the Continuum Fingerboard's audio signal is converted from floating point to integer and sent to the Digital to Analog converters. Tip: Use low Post Level values, together with high SL and SR values in the matrix, to introduce a soft saturation in the EaganMatrix. Found in Control Panel 1. Relatively low levels of Pre and high levels of Post make to harder to saturate the output. Relatively high levels of Pre and low levels of Post make to easier to saturate the output.

10.2. Internal Sound (Load System Preset)

The Continuum Fingerboard's built-in synthesizer has hundreds of System Presets available.

To select a System Preset in the Editor: Choose a Category (click on the red category name, below the grey word "Category," to see the popup of categories). Then choose a System Preset within the Category (click on the red System Preset name, below the grey words "System Preset," to see the popup). For details see Section 8.4.

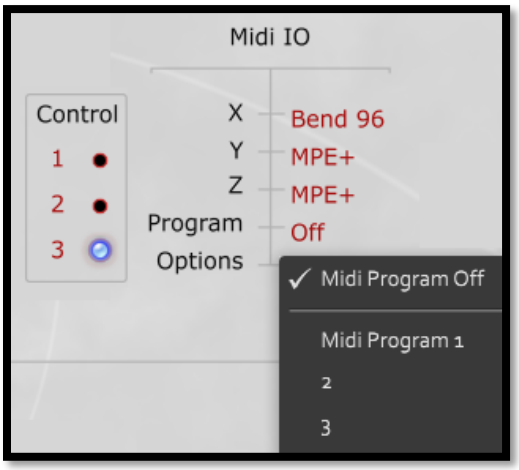
To select a System preset using the Overlay Strip: Use numeric touches that add up to the system preset number. For example, to select System Preset #171, press and release the Red Button, touch "Internal sound," touch 100+, touch 70+, touch 1. (Any combination of numeric touches adding up to 171 can be used.) The preset number of each System Preset in shown in the Editor's System Preset menu, and a complete listing of all system presets (with preset numbers) is available in the Editor's cogwheel menu.

System Presets can be modified by setting configuration values for i, ii, iii, iv, and Gen 1 in the Haken Editor, or via the Overlay Strip, or by pedal, or using an Arturia BeatStep, or using the Kenton Mini Controller, or a custom programmed Midi controller. They can be further modified using the EaganMatrix (see the EaganMatrix User Guide).

See Sections 8.4 through 8.8 for more information on loading and storing Presets, Preset Groups, and saving presets to your Mac or PC disk.

10.3. Midi Program, Midi Routing

Midi Program: (On Control 3 Panel)

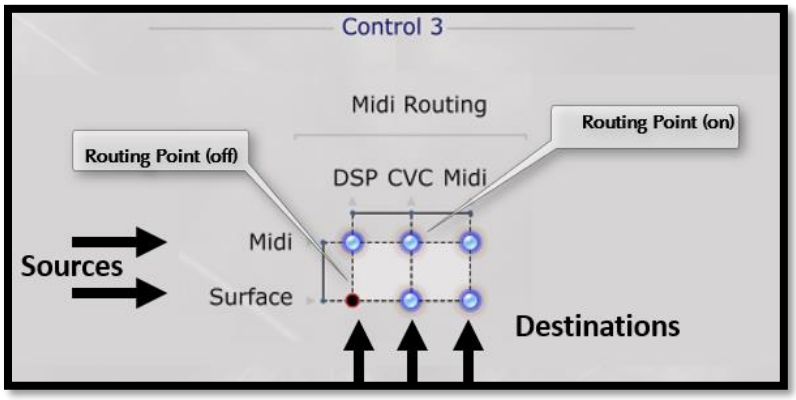


Found on the Control 3 panel under Midi IO. This will cause the Continuum Fingerboard to send a Midi Program

(1 to 20) Change message selected from a dropdown list on all active Midi channels through its Midi output. The Program Change is sent immediately when you configure it, and each time the preset is loaded.

Midi Program	
1 to 20	Sends the numeric Midi Program message on all active Midi channels.
0	The Continuum Fingerboard external Midi Program feature is disabled.

Midi Routing: (On Control Panel 3)



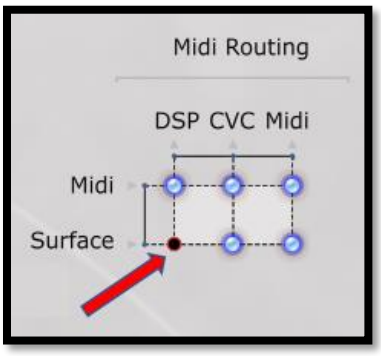
By default, the Continuum Fingerboard merges Midi messages from the Midi In jack to all of the following: Midi Out jack, CVC (Continuum Voltage Converter), and the built-in synthesizer. The Midi In messages are merged with the Midi messages that track fingers on the playing surface. Caution: If you supply Midi notes to the Midi In jack, you will want to avoid having notes from both the playing surface and the Midi In using the same Midi channel; the merged Midi messages will interfere with each other.

These are the values for the Routing configuration option from the playing surface:

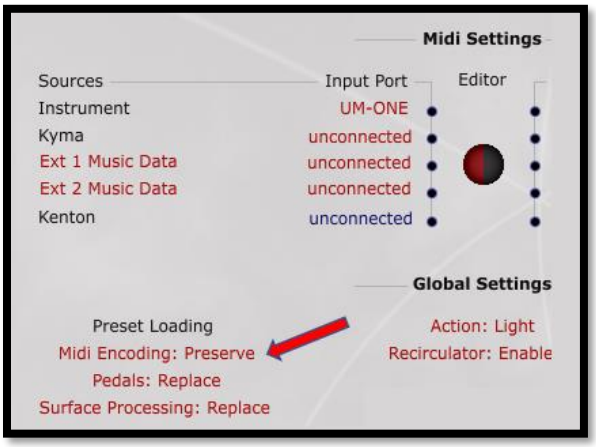
Routing	
0	Disable merging data from the Midi In jack.
1	Midi In data is merged with playing surface data and goes to Midi Out.
2	Disconnects the playing surface from the Internal Sound.
3	Disconnects the playing surface from the CVC.
◉	More options are available in the Haken Editor program, which uses a routing matrix, as explained below.

◉ Haken Editor Midi Routing Matrix	
Led On (Blue)	Data passes from the source to the destination below. Click Led to turn off.
Led Off	Data is blocked from the source to the destination below. Click Led to turn on.

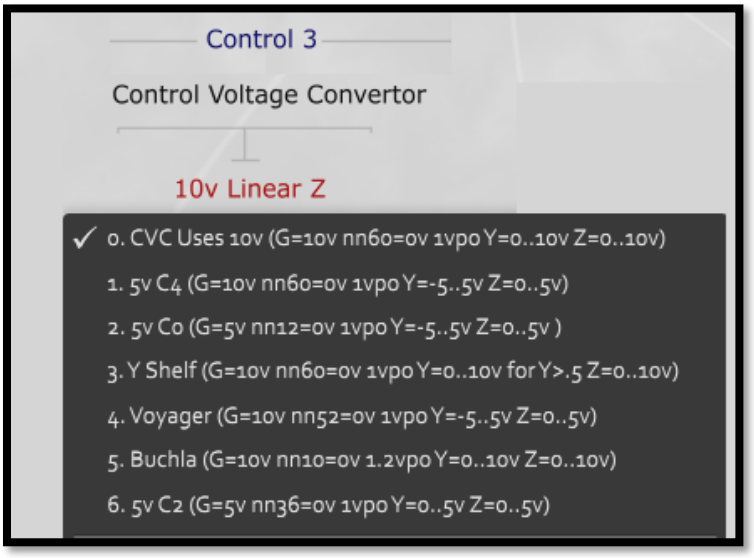
A common routing option that applies to both Continuum and ContinuuMini is disabling the fingerboard from sending data to the DSP for those who want to use the device as a MIDI controller, perhaps sending data directly to a DAW. You can disable output to the DSP as follows. Note that the blue light is still on in the DSP column for input. This will allow the DAW to still play the EaganMatrix DSP synth.



This will apply for the current preset. If you want this to apply for all presets, go to Midi and Global Settings through the cogwheel and set MIDI encoding from the default "Replace" to "Preserve" to retain the settings for all presets.



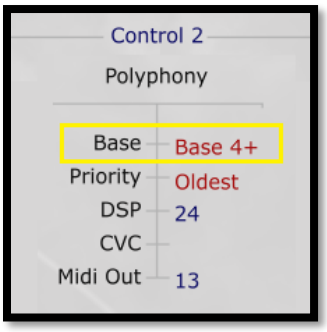
10.4. CVC



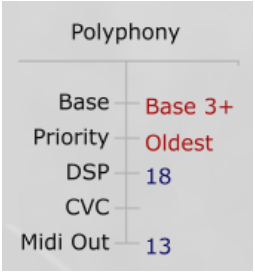
Found in Control Panel 3. Select standard CV definitions for the Continuum Voltage Converter (CVC), as described in the CVC User Guide (available in the Resources area of www.HakenAudio.com). This option has no effect if there is no CVC connected, or if an EaganMatrix preset is active and the matrix's CVC section specifies control voltages.

10.5. (Base) Polyphony

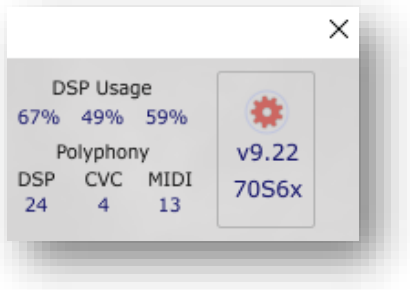
Found in the Polyphony section in Control Panel 2. Sets the base polyphony of the preset.



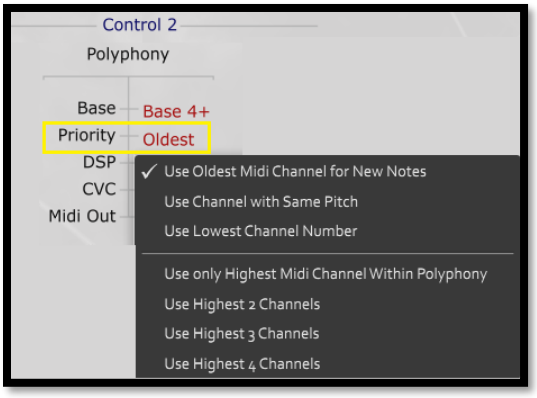
Polyphony	
1 to 16	Select base polyphony. Controls the maximum number of simultaneous output notes. The actual polyphony can be greater or smaller than the base polyphony you choose, due to split, mono interval, and other influences. When base polyphony is set to 16, certain Specialty Sounds can play at DSP polyphony 24. The CVC polyphony is limited by the number of CV outputs. Note: Each DSP supports a max polyphony of 8, thus the max polyphony/voices for the following Continuum processing is: 1x DSP Models = 8 (earlier half-size and full-size models) 2x DSP Models = 16 (later half-size and full-size models and ContinuuMini)

Polyphony	
	3x DSP Models = 24 (6x Expanded Continuums and all "Slim" models)
Allow Expanded Polyphony (+)	Allows using increased polyphony on Continuums that have extra processing power. This affects "Slim" model Continuums that have 6x processing power, Continuums with double-processing-power DSPs (2x processing power), internally or externally expanded Continuums (3x to 6x processing power, see System Identifier in Section 2.1.), and ContinuuMinis (2x processing power). ◉ Indicated in Editor by "+" after Base Polyphony value. Expanded Polyphony will increase the polyphony N times, where N is the DSP processing power of your Continuum (6x for "Slim" model Continuums, 2x for ContinuuMini, etc). For example, on a "Slim" model 6x Continuum Fingerboard if you set Polyphony 3+, it will allow creation of 3x6 = 18 DSP voices. Also note that the max number of Midi Channels output also is multiplied by the 6x processing power (however the max number of Midi channels a Continuum outputs on is 13 – channels 2-14 in MPE/MPE+ modes or channels 1-16 for non MPE modes – Y/Z set to a specific CC).  For 6x processing models, setting polyphony greater than 3+ will not affect the number of output channels, but will for lower processing models. The Continuum will never output MIDI performance data on Channels 15 and 16 which are reserved for control information. Note that some MPE implementations use Channel 1 for control information. Setting the Continuum to MPE or MPE+ modes will never output on Channel 1. <u>1x DSP Continuum Users Note</u>: With the introduction of the "Slim" model, numerous presets are set to Polyphony 2+ or 3+ allowing 16 or 24 voice Polyphony respectively. Since 1X models do not support expanded polyphony the polyphony is always the base polyphony (max 8 regardless of what is set). You may have to expand the base 2 or 3 to a higher value if you want to play more than 2 or 3 voices in this case.
Allow Increased Computation Rate	Doubles sample computation rate on Continuums that contain only 2x DSPs. This affects L2x and L6x Continuums, and M2x ContinuuMini. This should be used sparingly, since doubling the sample computation rate will reduce the number of voices that can be computed, and most EaganMatrix sounds do not benefit from a higher sample computation rate. ◉ Indicated in Editor by "^" after Base Polyphony value.
◉	The Editor also displays the actual polyphony for DSP, CVC, and max Midi Out channels. Click on Polyphony to change the base polyphony. Found in Control Panel 2.

A Polyphony status summary also appears at the top right-hand corner of the editor under DSP Usage. This information is always displayed. It includes the DSP Usage, CVC channels (if CVC is connected) and max MIDI Channels that will be used for the preset.



10.6. Channel (Note) Priority



Found in the Polyphony section of Control Panel 2. Fingers on the playing surface will generate output for Midi channels depending on the Polyphony and Split configuration. The order in which new notes from the playing surface are assigned to Midi channels can be Oldest (assign the new note to the Least Recently Used channel), Same (assign to channel that played the same pitch), or Lowest (assign to the lowest channel number that is available). The default is Oldest. The High 1 through High 4 settings are useful in directing which Midi channels are being currently used by the Continuum in overdub Midi performances.

Channel Priority		
0	Oldest	Assign to channel that was least recently used.
1	Same	Assign to channel that was playing same pitch.
2	Lowest	Assign to lowest channel number (LCN) that is not already playing a note. (Note: This mode is convenient when you want to predict what channel you are playing on.)
3	High 1	Only highest channel of current polyphony is used. See explanation below.
4	High 2	Only highest two channels of current polyphony are used.
5	High 3	Only highest three channels of current polyphony are used.
6	High 4	Only highest four channels of current polyphony are used.

High 1 through High 4

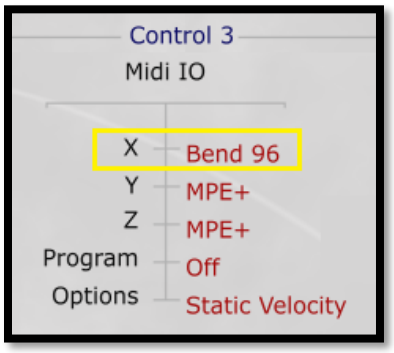
To do a Midi overdub recording with the High 1-4 settings, decide on the number of voices for each overdub pass. For instance, if the sound used for playing has a polyphony of 8 and it is desired to have two voices available for each overdub pass, then:

1. For the first pass set Channel priority to High 2 and Polyphony to 2. The first pass (the initial recording) is recorded onto Midi channels 1 and 2.
2. For the second pass leave Channel priority at High 2 and set Polyphony to 4. The second pass is recorded onto Midi channels 3 and 4, while the first pass can be heard on Midi channels 1 and 2.
3. For the third pass leave Channel priority at High 2 and set Polyphony to 6. The third pass is recorded onto Midi channels 5 and 6, and the first two passes are heard on channels 1 through 4.
4. For the final pass leave Channel priority at High 2 and set Polyphony to 8. The fourth pass is recorded onto Midi channels 7 and 8, and the other three passes are heard on channels 1 through 6.

An Important Caveat!

Midi-based multitrack recording like this may or may not compromise the Midi bandwidth. The Continuum Fingerboard's Midi bandwidth is highly optimized in relation to the current polyphony of a Continuum performance. Recording and overdubbing Midi in this fashion described above may overflow the Continuum's Midi stream, since the Continuum doesn't "know" the overall polyphony from the combination of surface and Midi In activity but can only make data streaming adjustments according to polyphony from the playing surface.

10.7. X Bend



Found in Midi IO section in Control Panel 3. X Bend is the Midi pitch bend range that the Continuum Fingerboard uses to encode its Midi output. Set X Bend to the match the Midi pitch bend range you set on your external synthesizer. You should select the largest bend available on your synthesizer, so that you can play the longest possible glissandi. The pitch bend range of 96 allows you to glissando over the complete pitch range of the full-size Continuum Fingerboard. Since Pitch Bend is encoded in 14 bits, it provides 1.2 cent encoding accuracy at a 96 half-step range, and 0.15 cent accuracy at a 12 half-step range. MPE+ always uses 96 half-step range; MPE+ pitch bend encoded with 21 bits has .009 cent accuracy

X Bend	
1 to 96	Midi Pitch Bend range as expressed in half steps (default is 96).
MPE+ 96:2, 96:5, 96:7, 96:12	The Midi Pitch Bend range is 96 half steps for MPE+ encoding on Midi channels 2 and above. The Bend Range for Channel 1 input to the Continuum (from a sequencers or keyboards) is 1, 2, 5, 7, or 12 half steps. Encoding of MPE+ X value with 21 bits of accuracy: The 7 LSBs are encoded with cc87 (LSBs are 0 if no cc87 is present). When cc87 is followed by Pitch Bend, the cc87 bits are appended as LSBs to the Bend data bits, for a synchronous 21-bit update.
◉	The Haken Editor has a reduced selection set comprised of the most useful values.

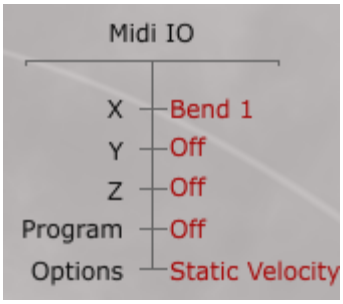
When using an external synthesizer, it is important to verify proper Pitch Bend Range configuration: Play a glissando; when you lift your finger at the end of the glissando, play a new note at the spot where you lifted your finger. The pitch at the end of the glissando should match the new note's pitch; if not, the Pitch Bend Range configured on your Continuum Fingerboard does not correctly match your synthesizer.

Note that MPE defaults a minimum pitch bend of 12. If you need to use one of the smaller values, set your preset to a Y or Z preset value to take it out of MPE mode. The pitch bend setting of 1, 2, 3 and 4 +/- semitones will then be available in addition to higher values.

At times you may want to set a standard (non-MPE+) pitch bend to output a maximum resolution based on the size of your Continuum or ContinuuMini. Normal Pitch Bend (what you would expect for example on a PB Wheel) uses two bytes with 14 bit resolution as noted. The center (no effect) point is typically displayed as 8192 (or 0) bending down to 0 (or -8192) and up to 16384 (or 8191). Min maps to 0,0 (MSB=0H, LSB=0H). Center maps to 0,64 (MSB=0H, LSB=40H). Max maps to 127,127 (MSB=7FH, LSB=7FH). This is easy to grasp on a pitch bend wheel, but the Continuum is a dynamic playing surface. It has note guides but if you are not rounding they are just guides, not "keys". It will be very difficult to find the exact center of a pitch when pressing so in some sense pitch bend center is a bit relative when playing on the dynamic fingerboard.

Obviously the smaller the pitch bend is set the more pitch bend resolution is available for that bend range. For ContinuuMini then, a pitch bend of 96 is not that useful even though it is the MPE+ default as the range of the ContinuuMini is much closer to a max pitch bend of 24. Sometimes you need to play around a bit with your controller to map pitch bend accurately to the desired range to get portamentos to map to the right pitches as described above.

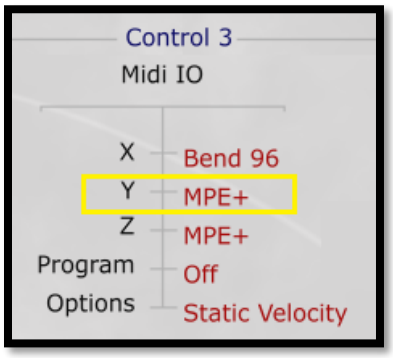
Also at times you may want to do some debugging of pitch bend using a Midi monitor such s Midi-Ox. IT can be difficult to decipher pitch bend in the sea of other CC messages that will be output by the Continuum or ContinuuMini (CC1, Aftertouch, CC74, etc.). One way to limit your Midi output stream to only Note On, Note Off and pitch bend is to set Y and Z to Off for that preset, however, that will take it out of MPE mode.



From here on your Midi output stream only contains Note On, Note Off and Pitch bend and can easily be analyzed with your Midi Monitor:

```
311426  2  --   144   69  127   1  A  4 Note On
311427  2  --   224   35   83   1  ---  Pitch Bend
311428  2  --   224   83   79   1  ---  Pitch Bend
311428  2  --   224   16   78   1  ---  Pitch Bend
311430  2  --   224   50   77   1  ---  Pitch Bend
311432  2  --   224   90   76   1  ---  Pitch Bend
311432  2  --   224  110   75   1  ---  Pitch Bend
311434  2  --   224  124   74   1  ---  Pitch Bend
311434  2  --   224    5   74   1  ---  Pitch Bend
311436  2  --   224   17   73   1  ---  Pitch Bend
311438  2  --   224   49   72   1  ---  Pitch Bend
311438  2  --   224   62   71   1  ---  Pitch Bend
311440  2  --   224   87   70   1  ---  Pitch Bend
```

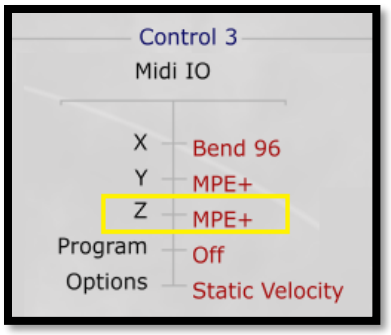
10.8. Y Control



Found in Midi IO section in Control Panel 3. The continuous controller number that Y (front to back position) sends through the Midi output. The most common choices are: 1 for "modulation", 2 for "breath", or 74 for "brightness" (the default).

Y Control	
0	Off (no controller information sent).
1-4, 7,11,74	Continuous controller number generated by the Y position (default is 74 when set MPE mode). When Y is set to non-MPE mode, MIDI is output on channels 1 to N instead of 2 to N+1 in MPE/MPE+ modes.
127	Transmit Y value using controller 74, without shelving values at both ends of the y range.
MPE+	Encoding of MPE+ Y value with 14 bits of accuracy: The 7 LSBs are encoded with cc87 (LSBs are 0 if no cc87 is present). When cc87 is followed by cc74, the cc87 bits are appended as LSBs to the cc74 data bits, for a synchronous 14-bit update.

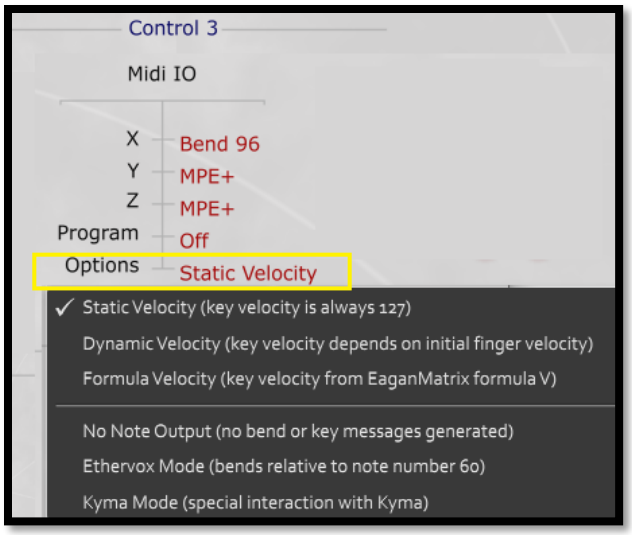
10.9. Z Control



Found in Midi IO section in Control Panel 3. The continuous controller number that Z (finger pressure) sends through the Midi output. The most common choices are: 127 for MPE encoding (channel pressure), or controller 7 for "channel volume" or controller 11 for "expression". In some synthesis situations 7-bit accuracy is not adequate for finger pressure; for these situations the Continuum Fingerboard can use 14-bit MPE Encoding.

Z Control	
0	Off (no controller information sent).
1-4, 7,11	Continuous controller number generated by the Z position (11 is default in MPE mode). When Y is set to non-MPE mode, MIDI is output on channels 1 to N instead of 2 to N+1 in MPE/MPE+ modes.
70 (MPE+)	Use MPE+ Encoding: This is Haken Audio's enhancement to MPE Encoding; please see the Haken Audio web site for more information on MPE+. Encoding of MPE+ Z value with 14 bits of accuracy: The 7 LSBs are encoded with cc87 (LSBs are 0 if no cc87 is present). When cc87 is followed by Channel Pressure, the cc87 bits are appended as LSBs to the Channel Pressure data bits, for a synchronous 14-bit update.
127 (MPE)	Use MPE encoding. This will encode Z position as Channel Pressure. In addition, Controller 127 on channel 1 specifies polyphony, RPN 0 on channel 2 specifies pitch bend range. NB: As per MPE standard, the Continuum will encode notes starting on channel 2, up to channel P+1 (where P is polyphony).

10.10. Midi Note Processing



Found in Midi IO section in Control Panel 3. Midi key velocity can either be static (always at 127) or dynamic (a value generated by calculating finger velocity when the surface is touched). The static setting is usually preferable and is the default.

Midi Note Processing (Options)	
0	Static: Midi key velocity is always 127
1	Dynamic: Midi key velocity depends on initial finger velocity.
2	Formula: Midi key velocity is computed by EaganMatrix formula V. Use this only with an EaganMatrix preset that has formula V specially designed for velocity values. The value of Formula V must be in the range 1..127, normally Quantized 1 as it maps to a Key Velocity in that range (output may be close but not exact). When this is set, only the first DSP is used and the Polyphony will be allocated as if the Continuum was a 1x DSP model (thus overall Polyphony will be reduced from what is expected in multiple DSP models)
3	No Note Output: The Continuum does not output Midi Note and Pitch Bend information.
4	External Note Mode: For EaganMatrix sounds designed for use with Midi keyboards or sequencers. Such EaganMatrix sounds process notes coming in on Midi Channel 1, and add continuous control using the Continuum's Touch Area. A Formula Blend control (see the EaganMatrix User Guide) allows specialized processing for notes coming from Midi channel 1 vs. notes from the Continuum's playing surface, to adjust for the coarse aftertouch and limited pitch abilities of Midi keyboards and sequencers.
5	Ethervox Mode: Always uses 60 for the Midi key number, and all bends are referenced from Middle C. This is the type of encoding used by the Moog Ethervox Theremin.

Midi Note Processing (Options)	
6	Kyma Mode: Special Midi handling for Symbolic Sound Corporation's Kyma. This transmits a Midi message once per second to let Kyma know a Continuum Fingerboard is present. Kyma will automatically update the Continuum Fingerboard when sounds are loaded and changed inside Kyma. Kyma-controlled Continuum Fingerboard parameters include: Polyphony, X Bend, Y Controller, Z Controller, and Splits. ◉ All affected Kyma parameters will have blue text in the Haken Editor. Technical details: The Continuum Fingerboard will use controller 74 to encode Y, controller 11 for Z, and 96 for the pitch bend range. Splits in Kyma override the Continuum Fingerboard's split. In this special Kyma mode, Continuum notes are transmitted on high-numbered Midi channels starting with channel 16.
	To connect both a Midi Keyboard and Continuum Fingerboard to Kyma at the same time: The Haken Editor must be running, it must have the Midi keyboard as its ExtDevice input, the Keyboard must transmit on Midi channel 1, and the Midi Routing in the Continuum must pass Midi In to Midi Out. Technical detail: The Editor routes the ExtDevice to the Continuum, and the Continuum moves channel 1 KeyOn/KeyOff messages to high-numbered Midi channels, one note per channel.

10.11. Middle C

Middle C is notated on the Surface display using a red inverted T shape. This can be dragged by half-step either lower (to transpose up) or higher (to transpose down). For example if you set Middle C to be an octave lower, playing the actual middle C position on the fingerboard will now play one octave higher, etc. Using the Overlay strip, you may select a transposition of the playing surface in half-step increments by specifying a midi note number for the Middle C position.



Middle C	
0 to 127	The specified Midi note number is the new pitch for the "Middle C" position. For instance, a value 60 is no transposition, value 48 transposes down one octave, and a value of 72 transposes up one octave.
◉	Drag the red triangle to adjust Middle C.

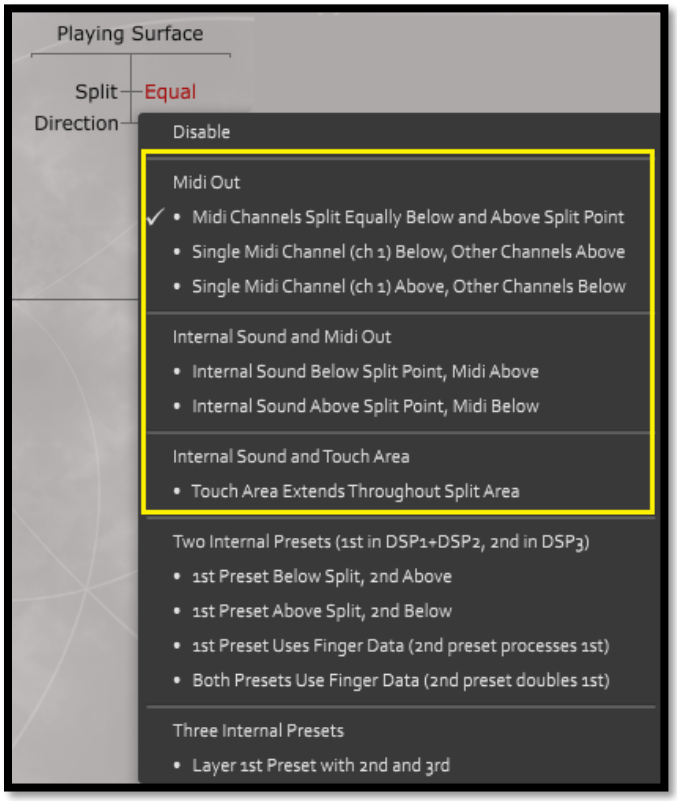
10.12. Split Point and Split Mode

ContinuuMini players may wish to skip this section, as it is specific to the Full-size and Half-size Continuum Fingerboard.

Note: The split point for "Slim" model Continuum Fingerboards currently must be set using the Haken Editor. Surface Display must be on.

Found in Control Panel 2. You may select a playing surface split point. For the split point to have effect, you must also select a split mode. The split mode together with your polyphony configuration determines how many simultaneous notes you can play above and below the split point and if you desire some notes to only output through MIDI and not through the sound engine. The split mode can also be used for Combination Presets, to split notes between the three DSPs in a Continuum Fingerboard with greater than 2x DSP processing power.

The split point can be set in the Haken editor by turning the Surface Display On and going to the Split menu and selecting one of the non-combination split options.



The split point will be displayed on the Surface display. It can be dragged to a new location if desired.



Split Point	
Surface position	Division point for the split. For instance, moving the split point in the Editor "Slim" models or touching the surface in models supporting the overlay strip at Middle C will create a split point at Middle C.

All Continuum Fingerboards except the ContinuuMini support the following:

Split Mode		Notes
0	Split is deactivated/disabled.	
1	Split into two polyphonic ranges. All pitches below the split point will be encoded on the first half of your Midi channels, and pitches above the split point will be encoded with the remaining Midi channels.	Split modes 1-3 treat Midi, CVC, and internal sounds all the same. See note after this table.
2	Split into a monophonic low range and polyphonic high range. All pitches below the split point will be encoded on Midi channel 1, and the pitches above the split point will be encoded with the remaining Midi channels.	Split modes 1-3 treat Midi, CVC, and internal sounds all the same. See note after this table.
3	Split into a monophonic high range and polyphonic low range. All pitches above the split point will be encoded on Midi channel 1, and the pitches below the split point will be encoded with the remaining Midi channels.	Split modes 1-3 treat Midi, CVC, and internal sounds all the same. See note after this table.
4	Split into internal synthesizer low range and external synthesizer (and CVC if connected) high range. All pitches below the split point will be played by the internal synthesizer and not sent to Midi Out, and the pitches above the split point will be sent to Midi Out and CVC but not played internally.	The full polyphony will be used for the external synthesizer and/or CVC, and the full polyphony will be used for the internal synthesizer. **For example**: With a polyphony of 4, 8 total notes are possible: 4 from Midi or CVC, and 4 from the internal synth.
5	Split the playing surface into internal synthesizer high range and external synthesizer (and CVC if connected) low range. All pitches above the split point will be played by the internal synthesizer and not sent to Midi Out, and the pitches below the split point will be sent to Midi Out and CVC but not played internally.	
6	Option allow the Touch Area to extend through the split area, otherwise the Touch Area will be limited to the current split area it resides in.	

Split Mode		Notes
7	Combination of Two Presets: First preset plays notes below the split point, second plays notes above the split. First preset uses DPSs 1&2. Second Preset uses DSP 3.	These split modes split are exclusively for use with CEE Combination Presets; see details in Section 8.9.
8	Combination of Two Presets: First preset plays notes above the split point, second plays notes below the split. First Preset sues DSPs 1 and 2. Second Preset uses DSP 3.	
9	Combination of Two Presets: First Preset uses finger data. Second preset processes the first. First Preset sues DSPs 1 and 2. Second Preset uses DSP 3. No split is used.	
10	Combination of Two Presets: Both presets use finger data. Second preset layers with the first. First Preset sues DSPs 1 and 2. Second Preset uses DSP 3. No split is used.	
11	Combination of Three Presets: All notes are played by all three presets; all three presets layer with each other. Teach preset uses its own DSP. No split is used.	

Notes:

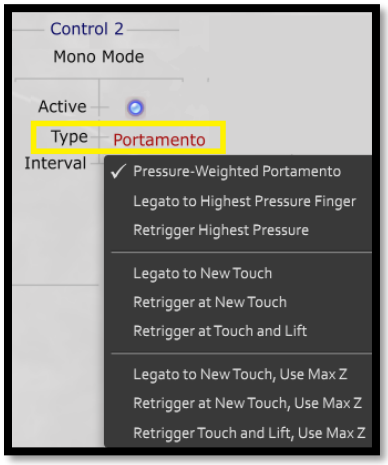
If you want a monophonic CVC range and a polyphonic Midi range on different side of the split, use mode 2 or 3. Then use the first 4 outputs on the CVC and ignore the other outputs. For Midi, use channels 2, 3, 4, 5, 6, etc. but ignore channel 1. (For an additional way to control Midi channel usage, see Section 10.6.)

A multi-split mechanism is available for use by third-party software, but it is neither saved in presets nor is it displayed in the Editor. Technical details: Controllers 88 and 89 on Midi channels 1-16 override the split normally used in the Continuum Fingerboard; cc 88 specifies the lowest note number allowed on the Midi channel; cc 89 specifies the highest note number allowed on the Midi channel.

The split information is stored in the preset if saved. Disable split on any preset you want to save in its original state. If you save a preset that has been split and restore it to a user location or load it as a user defined preset, it will retain its split information.

10.13. Mono Function and Mono Interval

ContinuuMini players may wish to skip this section, as it is specific to the Full-size and Half-size Continuum Fingerboard.



Found in Control Panel 2. The Mono function allows single-note lines to be performed with legato, retrigger, or portamento transitions between notes; transitions can be pressure-based or time-based (see Section 6.3 for details). The Mono Function (MonSW) lets you select what kind of transitions to use. (Mono can also be used for other purposes, see Section 6.3.) It has no effect unless it is activated (Active LED will be on).

Mono Function	
0	Portamento - smooth pitch transitions, based on the relative Z values of fingers
1	Legato Z - smooth amplitude transitions, max Z finger is played (Legato means it does not retrigger; the sound has to be designed to take advantage of it)
2	Retrigger Z - retrigger at transitions, max Z finger is played
3	Legato T - legato to new touch, no retriggering during transition
4	Retrig T - retrigger at new touch
5	Retrig TL - retrigger at new touch and at finger lift
6	Legato TZ - legato to new touch, no retriggering during transition, use max Z of all fingers
7	Retrig TZ - retrigger at new touch, use max Z of all fingers
8	Retrig TLZ - retrigger at new touch and at finger lift, use max Z of all fingers

The Mono Interval allows you to play single-note lines when the Continuum Fingerboard is configured with polyphony greater than 1. If you play two notes within the Mono Interval, a legato, retrigger, or portamento

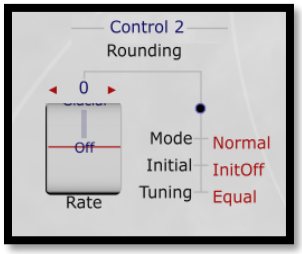
transition will be used, as selected by the Mono Function. You can set any number of half steps for the Mono Interval by touching "Mono Interval" and then a value corresponding to the number of half steps. If you select value 0 or if the Mono Switch is off, the Mono Interval function will be disabled.

Mono Interval	
0	Disabled.
1 to 127	Sets the range in half steps of the mono interval.
◉	The Haken Editor has a reduced selection set comprised of the most useful values. Also, the Mono Function can be enabled and disabled via the switch in 10.13 in the Editor Legend.

If Mono Interval is turned (set to a nonzero Mono Interval) you can activate and deactivate that interval using the Mono Switch (which can be assigned to a pedal), as described in Section 14.3, or via the Editor as described above.



10.14. Round Initial, Normal Rounding, Release Rounding, Rounding via Y

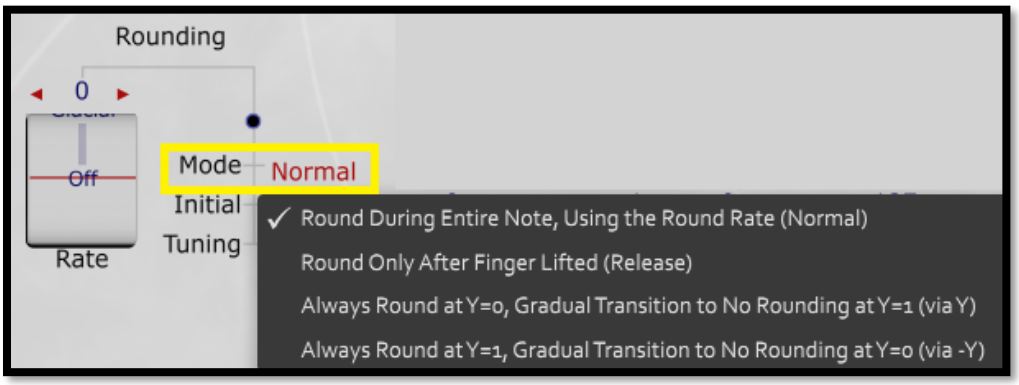


Found in Control Panel 2. The Continuum Fingerboard's "Finger Position Rounding" features help a performer sound in tune, when the performer cannot place fingers for proper intonation. Please thoughtfully consider the pros and cons of rounding finger position in Section 6.4 before using the "Finger Position Rounding" feature.

Round Initial: Found in Rounding section in Control Panel 2. When Round Initial is selected, the Continuum Fingerboard and ContinuuMini correct the finger position each time a finger first touches the surface. This aids a player in creating equal temperament pitches and intervals, or pitches and intervals in alternate tunings (see Sections 6.4 and 10.16). Subsequent vibrato and glissando finger moves are interpreted at full micro-pitch resolution until a new note is sounded.



After the finger first touches the surface, several additional options are available for rounding as long as Rounding Rate is set to a non-zero value (not set Off):



Normal Rounding: The Round Rate pitch correction (Section 10.15) will automatically round finger positions to the nearest half step any time during a note and after the finger is lifted.

Release Rounding: The Round Rate pitch correction (Section 10.15) occurs when a note is still sounding after the finger is lifted from the surface, but not during sustained notes. With Release Rounding, the Round Rate takes effect only after a finger is lifted. See Section 6.4 for details.

Rounding via Y Position: When the ***finger position is at Y=0***, the pitch is the nearest half step. A vibrato effect can be achieved by rocking the finger right and left. (Technically, this vibrato-like pitch variation is based on the finger's X derivative.) When the ***finger position is at Y=1***, the "Normal Rounding" occurs. Thus, if the Round Rate is zero (Section 10.15), no rounding occurs at Y=1. If the Round Rate is a medium value (for example, 70), mild rounding occurs at Y=1. When the ***finger position is between Y=0 and 1***, then a combination of the Y=0 and Y=1 pitch correction methods is used.

Rounding via Y-Reversed: This is the same as "Rounding via Y Position", for the reverse of Y.

Round Initial, Release Rounding, and Rounding Via Y (using Overlay Strip)	
0	Normal Rounding enabled (using Round Rate value), Round Initial disabled.
1	Normal Rounding enabled, Round Initial enabled.
2	Release Rounding enabled, Round Initial disabled.
3	Release Rounding and Round Initial enabled.
4	Rounding via Y enabled, Round Initial disabled.
5	Rounding via Y and Round Initial enabled.
6	Rounding via Y-Reversed enabled, Round Initial disabled.
7	Rounding via Y-Reversed and Round Initial enabled.

10.15. Round Rate

Found in Rounding section in Control Panel 2. If set to a non-zero value (not set Off), the Round Rate will automatically round finger positions to the nearest half step any time during a note and after the finger is lifted. The greater the value set, the more rounding will be applied until the max value of 127, total rounding (complete quantization to the half-step) will be applied. After you complete a glissando, it can automatically correct your pitch. If you are playing vibrato the average finger position will be rounded so that the vibrato will be centered at the nearest half step. Please thoughtfully consider the pros and cons of rounding finger position in Section 6.4 before using this feature.

Round Rate	
0	No Rounding (default setting).
1 to 127	Small Round Rates cause a slow drift to half-step finger positions; larger rates round more quickly. The maximum Round Rate of 127 causes immediate rounding; with this rate you will get a piano-style glissando when you slide a finger over several half steps.

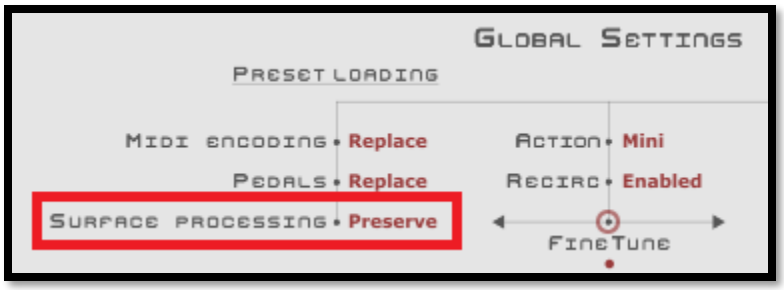
Notes:

(1) The Round Rate mechanism is a separate feature from Round Initial (Section 10.14), and it may be used with or without Round Initial.

(2) You can limit the Round Rate to have effect only after a finger is lifted using the Release Rounding feature (Section 10.14).

(3) You can use foot pedals to influence the round rate as you play; see details in Section 14.

A common desire is to retain the current round rate when moving between presets that may have a different or no rate. This can be achieved by going into Midi and Global settings through the cogwheel and set Surface Processing from the default "Replace" to "Preserve". Any RndRate dial setting you set while in the current preset will be retained after selecting any new preset.

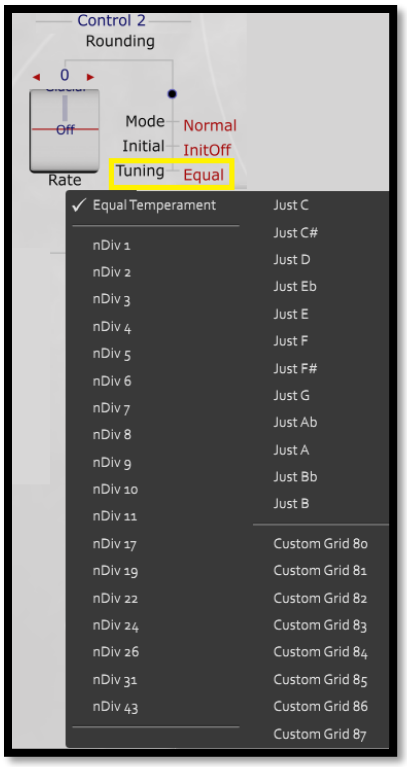


10.16. Tuning (Select Pitch Table)

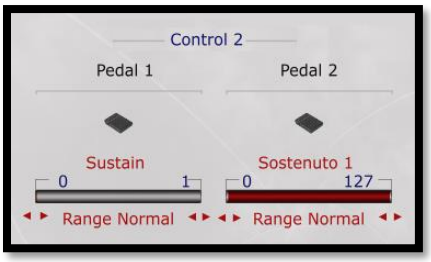
The Continuum Fingerboard allows you to select Pitch Tables, for use with rounding (Sections 10.14 and 10.15) or for radical pitch transformations of the playing surface (Section 6.4).

Tuning (Select Pitch Table) – Overlay Strip	
0	12-tone equal tempered tuning (default setting).
1 to 50	N-tone Equal tuning, where N is a number from 1 to 50. (Labelled nDiv in Editor)
60 to 71	Twelve Just tuning tonic centers. You will notice that the value "0" lines up with Middle C, so if you touch "Tuning", then "60+", then middle C, the Just C tuning (value 60) will be selected; the C#, Just C# tuning (value 61) will be selected; etc. In this Just tuning, any of the major triads (I, IV, V) will have perfect 4:5:6 frequency ratios in the rounded finger position, and the ii and vi minor triads will have perfect 10:12:15 frequency ratios.
80 to 87	Eight downloadable custom Pitch Tables (Custom Grid b0..B7 in the Editor). A graphical Pitch Table Editor, and its User Guide, are available in the cogwheel menu (see Sections 6.4 and 10.22).

In the editor a slightly smaller number of options are selectable under the Rounding section in Control Panel 2.



10.17. Pedal 1 and Pedal 2 Assignments



Pedal settings found in Control Panel 2. Note that the ContinuuMini only supports one pedal input. All other Continuum models support two pedals. All assume a TRS connection for normal pedal usage.

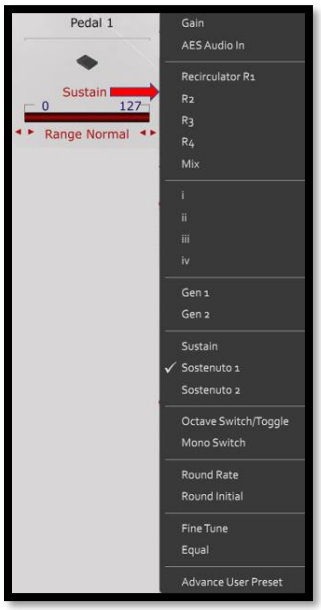
Use Pedal 1 and Pedal 2 to select a Midi controller (cc) for the pedal jacks (Section 6.5). The pedal jack data values are truncated to 7 bits for Midi, but the EaganMatrix and the CVC use the exact pedal data values (no truncation).

Pedal 1 and Pedal 2 must be assigned one of the performance controller numbers that has special meaning to the Continuum Fingerboard. For example, 64 is Sustain, 66 is Sostenuto, 69 is a second Sostenuto, 8 is Octave Shift (works with the Tri-Value Pedal), 9 is Mono Switch, 20 through 24 are Recirculator controls for the Internal Sound, and 31 is the Advance pedal. See Section 14.3 for a complete pedal listing.

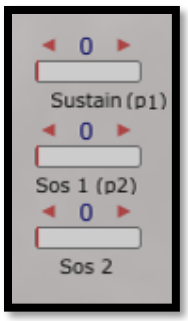
The ContinuuMini has only the first pedal jack, so only the Pedal 1 setting is used with the ContinuuMini.

Pedal 1 and Pedal 2	
9-10,12-31, 64-69, 80-83	Continuous controller number (cc) for pedal 1 or pedal 2. Note: ContinuuMini only supports Pedal 1.
◉	A subrange of data values can be created using the Min and Max controls in the Editor (see below).

In the Editor Pedals can be assigned a controlled by name in the pulldown list selection:



When the Pedal is assigned to a control, a "(p1)" or "(p2)" indication will appear beneath or beside the affected control:



10.18. Pedals Min and Max Range

Min and Max values are used to set the output range of the pedal jacks. This allows for fine control of subranges of parameters. For the EaganMatrix and the CVC, reducing the pedal range does not reduce accuracy. The pedal range can be set starting at zero or at any other value. The range can also be set for reverse operation.

For switch pedals, Min specifies the value when the pedal is at rest, and Max when the pedal is pressed.

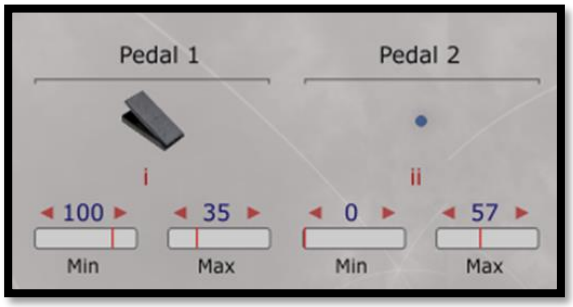


Pedal 1 above is assigned to Bespoke Control I with a range of 31-79, and Pedal 2 assigned to Bespoke Control ii with a range of 0-57.

These are two sided sliders allowing the user to set a low and high value from the same slider. TO use the pedals sliders to set range:

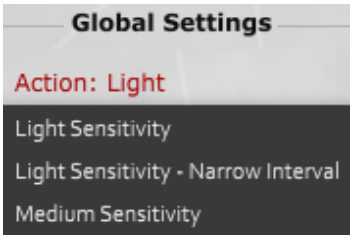
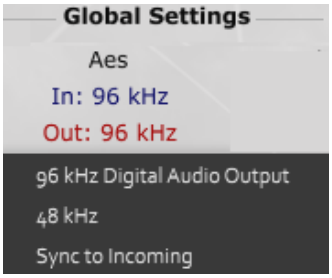
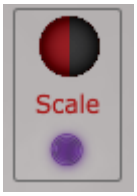
- Drag over the slider area to set low and high point at one time or use the Arow controls.
- Shift-drag nearer to one side of the slider to change ONLY that end.
- Ctrl (command) and drag to offset both sides of the range.
- Alt (option) and drag to expand/contract the range.
- Use the increment/decrement triangles to fine tune each end.

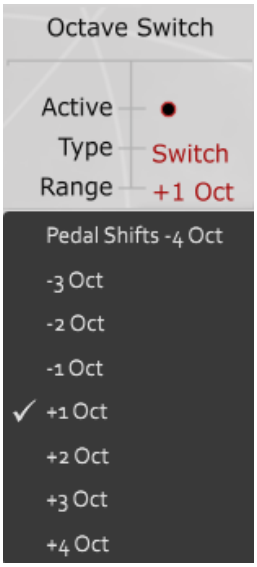
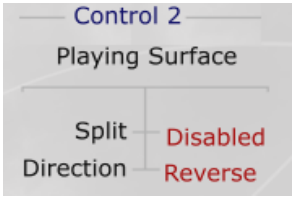
The Range control can be selected to **Reverse** the direction of values when pressing the pedal from its **Normal** default setting. The following example reverse pedal values starting at 100 and diminishes are pedal is pressed for Pedal 1. This is a ContinuuMini example so no Pedal 2 is available.



10.19. Options

Less frequently used Continuum Fingerboard configuration choices are grouped under Options. For a more detailed explanation of what each of these options does, refer to the text after the table below. Options 8, 9, and 127 are not available in the Editor where they occur in their respective controls.

Options	
0	This will disable any of the Options below that were previously enabled.
1	Medium Action. ◉ In "Midi and Global Settings" (in the cogwheel menu) an additional option, "Light Action - Narrow" is Light Action optimized for narrow intervals. Note: In the Editor, Action defaults to light for all models that support it. 
2	Digital audio output syncs to digital audio input. "Slim" Model Continuums use SPDIF digital jacks. Half-size and Full-Size continuums use XLR AES connections. The ContinuuMini does not support digital audio. ◉ AES options are in "Midi and Global Settings" (in the cogwheel menu). Note: The AES Input should be detected and assigned automatically to the input rate (typically 96KHz or 48 KHz). If it is unassigned (set to "None"), check your AD/DA converter settings and make sure you don't have your digital cables swapped.
3	Digital audio output rate (typically 96Khz or 48Khz). Must be set manually. ◉ AES options are in "Midi and Global Settings" (in the cogwheel menu).  Note if Sync is lost when expected the Continuum's LED will turn a solid Pink/Purple color along with the Editor's LED if open. Try and re-establish sync 

Options	
	This may occur if you set AES to "Sync to Incoming" and no signal is present.
4	Make octave foot switch transpose two octaves instead of one octave. ◉ 4.18b Note: The editor provides up to four octave foot switch transposition in either direction. This will take affect after setting and also has three modes: Switch, Toggle and Immediate. 
5	Make octave foot switch transpose four octaves instead of one octave. ◉ 4.18b Editor: See note above.
6	Direction Reverse X (pitch) inverts the laying direction so the lower notes are to the right and the higher notes to the left. ◉ 4.18a. This is available in the Playing Surface section in Control Panel 2. 
7	Disables Continuum Fingerboard's recirculator. Useful if you prefer an external reverb. ◉ This option is in "Midi and Global Settings" (in the cogwheel menu), as well as an option to enable the recirculator on the analog headphone output but disable it on AES3.
8	Limit Continuum Fingerboard's Midi transmission to 8% of the Midi bandwidth (200 Byte/sec).
9	Limit Continuum Fingerboard's Midi transmission to 5% of the Midi bandwidths (150 Byte/sec).
10	Load User Preset Slots with "Demo Assortment." ◉ This option is in the Group menu.
127	Factory reset.

See additional text for certain options below.

Option 1: Continuum Fingerboards built after 2012 are capable of Light Action, responding to lighter finger pressure than the Classic Action of older Continuum Fingerboards. Choosing Medium Action makes a newer Continuum's action equivalent to the Classic Action.

Option 2: Use external clock sync from the AES3 input. The Continuum Fingerboard's Led while shine purple (pinkinsh) if this option is selected and no valid digital sync is present at the AES3 input. The led will switch to blue when sync is present.

Option 3: Causes the external digital audio output to transmit at 48 kHz instead of the default rate of 96 kHz.

Options 4 and 5: Additional transposition values are available using the Haken Editor. Settings can range from +/- 4 octaves in one octave increments.

Option 8 and 9: This data rate is much too slow for Continuum playing, but convenient for configuration with wireless Continuum Remote apps. See Section 15.7.

Option 127: Factory reset sets all presets (the current configuration as well as Internal User Preset Slots 1-16) and the Global options to factory default.

10.20. Send

Send	
1	Transmit current configuration via Midi, using the messages described in Section 15.

10.21. Load and Store (User Preset Slots)

Load	
1 to 128 (stored in banks of 16 presets)	This will load from the selected Internal User Preset Slot. **A single-touch alternative** is available for loading user presets from the surface: Press the red button and then press the playing surface on the opposite side of the Overlay Strip, at the desired user preset number. This saves the intermediate step of pressing "load". **Hardware alternatives** are also available for loading user presets, see Sections 6.6, 6.7, and 6.8.
◉	Select one of 8 banks of 16 User presets and then click on one of the 16 Internal User Presets to load the current configuration from it (Section 8.5).

Store	
1 to 16	This will store into the selected Internal User Preset Slot. It will also store the Global settings internally.
◉	Shift-click on one of the 16 Internal User Presets to store the current configuration into it, or drag a preset file from the Finder (Mac) or Explorer (Windows) and drop it onto one of the Internal User Presets (Section 8.6).

10.22. Cogwheel Menu: Global Settings, Kenton Settings, Pitch Table Editor, User Guides, Editor Shortcuts, Control Styles, List of System Presets, About

Cogwheel Menu: Midi and Global Setting	
◉	Select USB-Midi connections for the Editor (Section 8.1), and set Global settings: Recirculator Enable, Light Action, Preserve Parameters (see below), and AES Digital Audio Rates. Shortcut: Command+G (Mac) or Control+G (Windows).

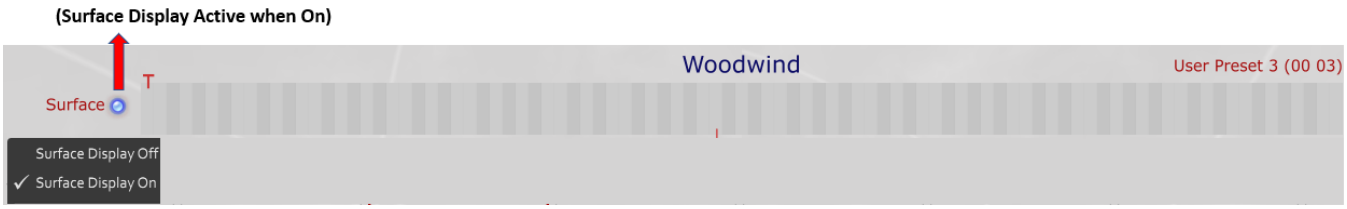
Preserve Parameters (in Midi and Global Settings): When a preset is opened from your Mac or Windows computer, or when a preset is loaded from an Internal User Preset Slot, you may globally preserve the existing values of certain sets of parameters as follows:

- **Midi Encoding**: X Bend, Y Controller, Z Controller, Midi Note Processing, Midi Program, Midi Routing, CVC Standard CV Definition (Note: use to preserve MPE+MPE modes between presets).
- **Pedal**: Pedal Assignments, Pedal Min/Max, Octave Shift Effect
- **Surface Processing**: Channel Priority, Reverse, Split, Transpose, Mono Switch, Mono Interval, Mono Function, Round Rate, Pitch Table

Cogwheel Menu: Kenton Settings	
◉	View and customize functionality of Kenton Mini Controller. Separate Kenton Settings are stored for each preset (see Section 6.6). Shortcut: Command+K (Mac) or Control+K (Win).
Cogwheel Menu: Pitch Tables Editor	
◉	A graphical editor for creating custom downloadable Pitch Tables, written by Pablo De La Loza (see Section 6.4, and the Pitch Tables Editor User Guide in the Cogwheel menu).
Cogwheel Menu: User Guides	
◉	Select "Continuum User Guide," "EaganMatrix User Guide," "CEE User Guide," "CVC User Guide," or "Pitch Tables Editor User Guide" to launch a window showing the Guide. The User Guide pdf files are located in the User Guides folder inside your Haken Editor folder.
Cogwheel Menu: Editor Shortcuts	
◉	A reference list of keyboard shortcuts and mouse drags available in the Haken Editor.
Cogwheel Menu: Deprecated: Barrel Styles	
	Note. The old "Barrel Styles" selections from the Cogwheel are no longer supported. Barrels are now called Bespoke Controls and they are now configured identically with the two Gens (now labeled as "g1" and "g2"). A new set of styles is used and set directly from the "Control Text" section at the bottom left hand corner of the Editor screen. A full help display is available by clicking the "Edit" text. Any Control text is visible next to the Edit function. 

Cogwheel Menu: Kenton Settings	
Cogwheel Menu: List of System Presets	
◉	Displays a text list of all stored System Presets. You can copy and paste the preset list into your favorite word processor for formatting or printing. The list includes the system preset numbers required for loading presets using the Overlay Strip (Section 10.2).
Cogwheel Menu: About	
◉	Select "About" to see the Editor version, as well as information on the Editor authors Edmund Eagan and Lippold Haken.

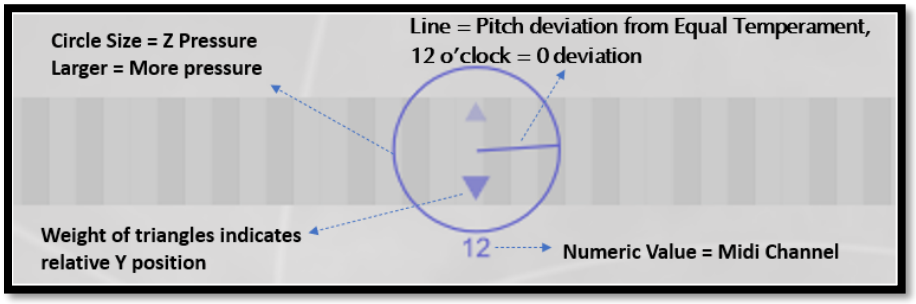
10.23. Surface Display



A detailed visual display of finger activity on the Continuum Fingerboard can be activated by clicking on this menu in the Editor:

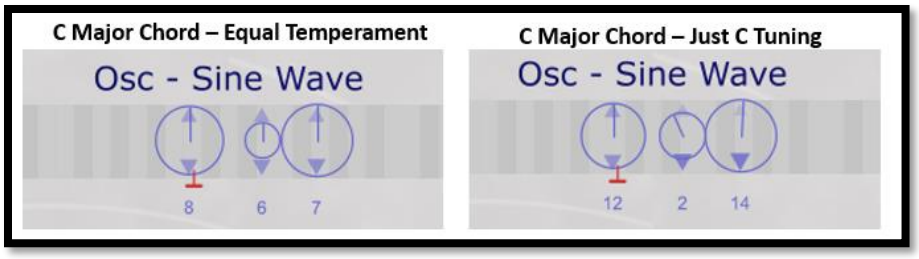
When the Surface Display is turned on, finger activity from the Continuum Fingerboard's playing surface will be displayed on on-screen Continuum surface. Each new note played will display as a combination of a circle, line, number, and a pair of triangles:

- Circle diameter: Pressure (Z) value, larger diameter means more pressure.
- Circle placement: Centre of circle reflects the left-to-right (X) position.
- Line: Deviation left-to-right from vertical reflects the pitch deviation from nearest equal temperament pitch.
- Triangle Pair (Y position): The lower triangle gets darker as finger is towards the front; upper triangle gets darker as finger is towards the back.
- Numerical: The Midi channel of the note.



The Surface Display showing symbol interpretation

For the same finger position, if you change tunings you will see the resulting pitch deviation in the surface display.



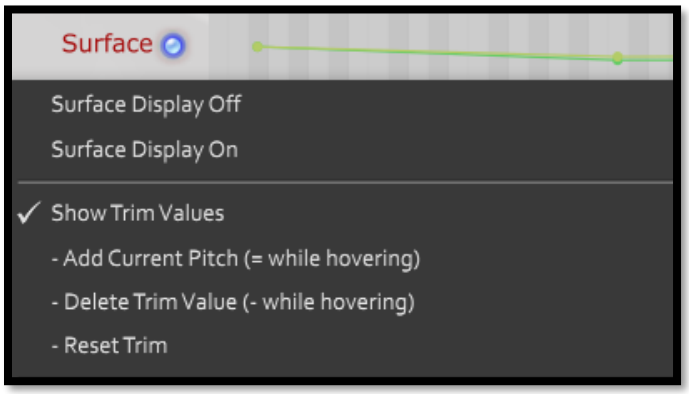
The Surface Display showing C Major Chord fully rounded. Note the third in the Just tuning is noticeably flat. Variations in pressure and Y position are also noticeable.

10.24. Pitch Trim

Editor Only:

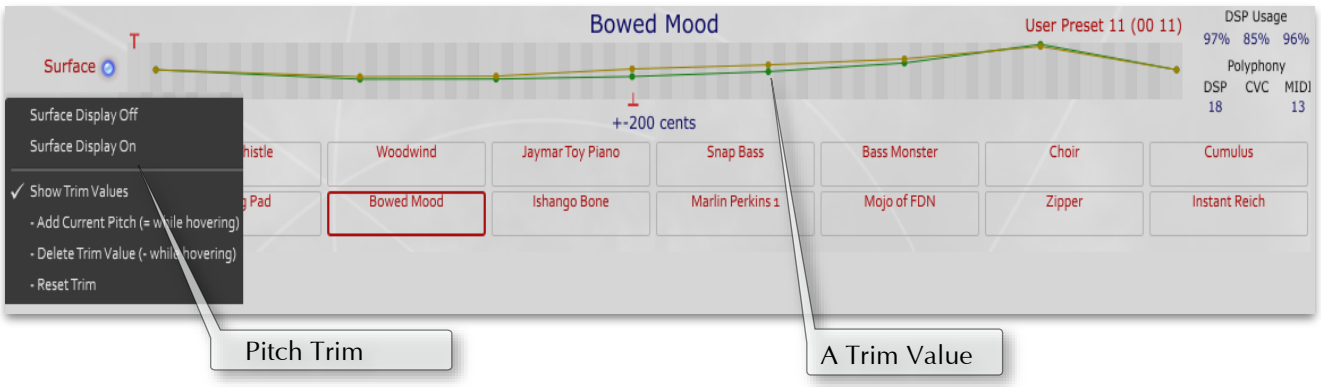
Some algorithms for sound generation, such as physical models that use delays, generate pitches that are sharp or flat over parts of their pitch range. The Pitch Trim functionality provides a way for the preset designer to correct for this. The Pitch Trim consists of two user-definable graphs, overlaid onto the Surface Display (see Section 10.23).

To see and edit the pitch trim values make sure Surface Display is On and Trim Values are displayed.



The blue pitch graph is for Y=0 Pitch Trim, and the red pitch graph is for Y=1 Pitch Trim. The Pitch Trim is particular to each preset and will be stored with the preset.

To see the Pitch Trim graphs, select Pitch Trim from the Surface Display menu. Each Pitch Trim graph can specify a trim value at half-octave positions; these half-octave positions are indicated with vertical colored lines (Yellow =



Y0, Green = Y1) on the Pitch Trim display.

To add a trim value to the Pitch Trim graph, place a finger on the surface at Y=0 (to add to the Y=0 graph) or Y=1 (to add to the Y=1 graph) at one of the half-octave positions. Then move the finger until the pitch generated is correct for that half-octave position and choose "Add Current Pitch" from the Surface Display menu (or type "=").

To remove a trim value you added previously, place a finger on the surface at Y=0 (to remove from the Y=0 graph) or Y=1 (to remove from the Y=1 graph) at the half-octave point, and choose "Delete Trim Value" from the Surface Display menu (or type "-").

The remove all pitch trim values, choose "Reset Trim" from the Surface Display menu.

The Pitch Trim functionality should not be confused with the Pitch Table Editor, which is available in the Cogwheel menu (see Section 6.4 for more about Pitch Tables).

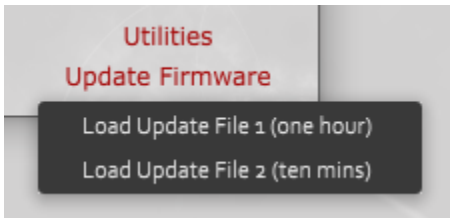
Pitch trim range is indicated under the graph. It defaults to -/+ 100 cents and more extreme trim adjustments will increase the range, up to +/-300 cents.

11. Loading New Firmware into the Continuum Fingerboard or ContinuuMini

Note: If you are running firmware older than 8.5 on half-size and full-size continuums, you will have to update in stages. Please contact Haken Audio for that procedure. **Always directly connect your Slim Continuum or ContinuuMini to your computer with the appropriate USB cable when updating firmware over USB (do not use a hub or a dongle that is hub based).**

New firmware is supplied from Haken Audio integrated into the Editor. If you have presets you previously created and stored in your Continuum's Internal User Preset Slots, please save those presets to a unique directory (using your previous version of the Editor) to your Mac or PC before updating firmware as they will be overwritten on firmware update). Then, to update the firmware as follows:

1. Run the new Haken Editor (available in the Resources area at www.HakenAudio.com). Make sure the Editor is communicating with your Continuum Fingerboard as outlined in Section 8.1. Also make sure you are running the right version of the editor for the given firmware (for example, don't try and upgrade a 9.5x firmware version with a 9.0 version editor). Then go to the Haken Editor's Midi and Global Settings window (from the Cogwheel). At the bottom right hand corner of the window a Utilities / Update Firmware selection is available:



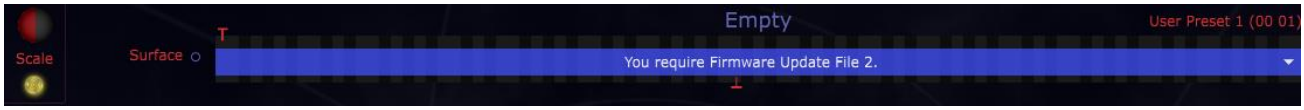
2. Select "Load Update File 1" from the Update Firmware menu. If the Update procedure does not start please take a screen shot of the Midi and Global Settings page please contact Haken Audio. File1 updates the firmware on the Continuum. The yellow status line in the editor will display % complete as the firmware update progresses and the LED will also change to yellowish indicating firmware download is in progress.



3. When Update File 1 finishes, you may be asked to repower/restart the continuum and wait 30 seconds. The Editor may also have to be restarted if it does not display the solid blue LED. You should then see a message asking for File 2 as below. Then select "Update File 2" which updates the System presets. Presets may start scrolling on the screen as they load into the Continuum.

   After File 2 loads, the LED on the "Slim" model continuums might change from a yellowish-green to green and then maybe blink pink for a bit, possibly blinking blue for a few seconds after that and should eventually go to solid blue indicating that File 2 has completed and User Preset 00 01 should normally be displayed.

   When Update File 2 finishes your instrument has been updated to the desired firmware version which will be displayed on the "Slim" Continuum's LED panel when it boots up.



Note: Continuum firmware updates MUST be done with a Roland UM-ONE interface for half-size and full-size models. "Slim" model Continuum fingerboards and ContinuuMinis can be updated through the USB interface. "Slim" model continuums also can use the UM-ONE for Midi direct update if desired. If the USB interface does not update correctly, try the direct Midi interface. The times noted for update in the Update Firmware menu may change depending on your model.

If you have trouble with your USB-Midi cable:

(1) Try resetting the USB-Midi cable by unplugging and replugging its USB connector.
(2) If you continue to have problems, try connecting your USB-Midi cable through a **powered USB hub**.

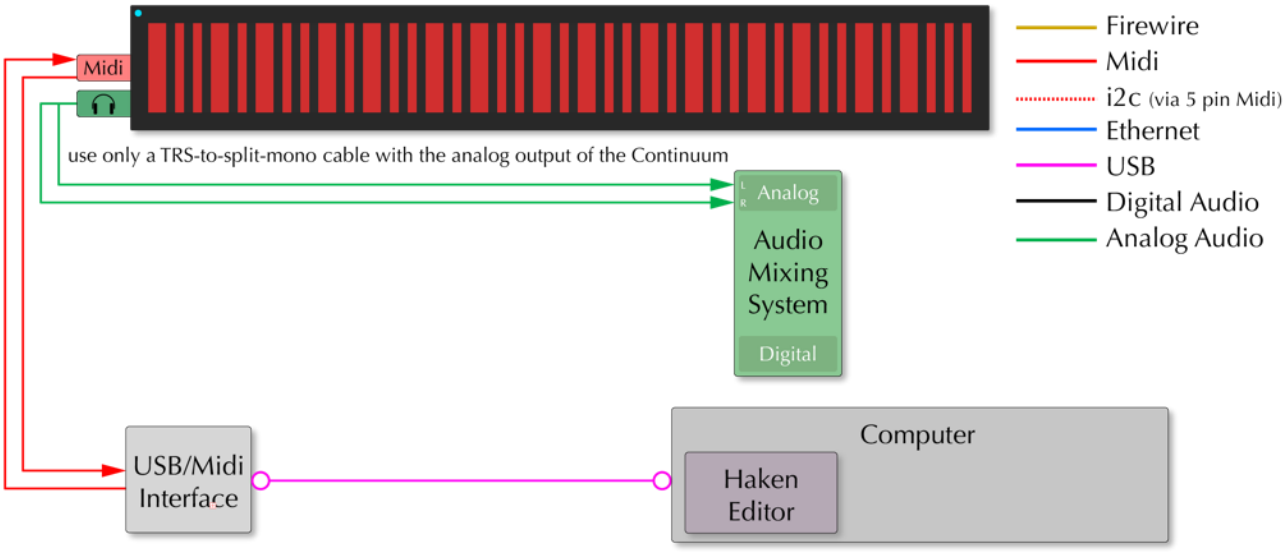
If the % indicator does not update after a few minutes:

(1) Make sure you are running the right version of the editor for the firmware version desired.

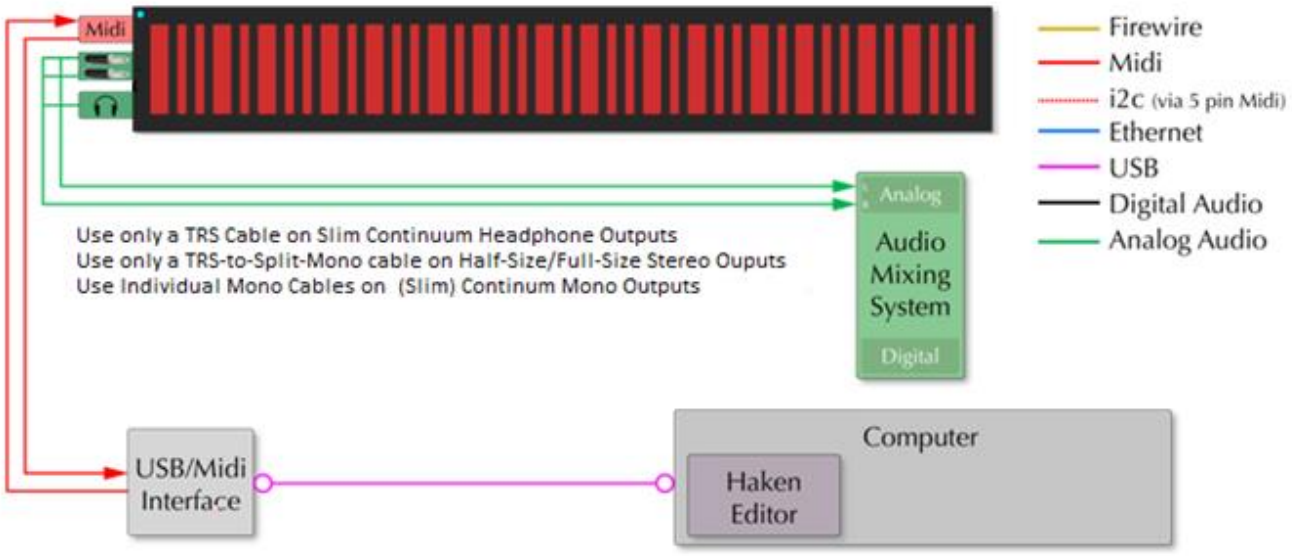
(2) If this never updates or your update is taking more than one hour, please contact Haken Audio.

12. Connecting to External Hardware and the Editor

The following are a number of recommended configurations for connecting the Continuum Fingerboard and its accessories to external hardware. Also shown where appropriate is the settings for the Haken Editor's "Midi and Global" page (Section 8.1).



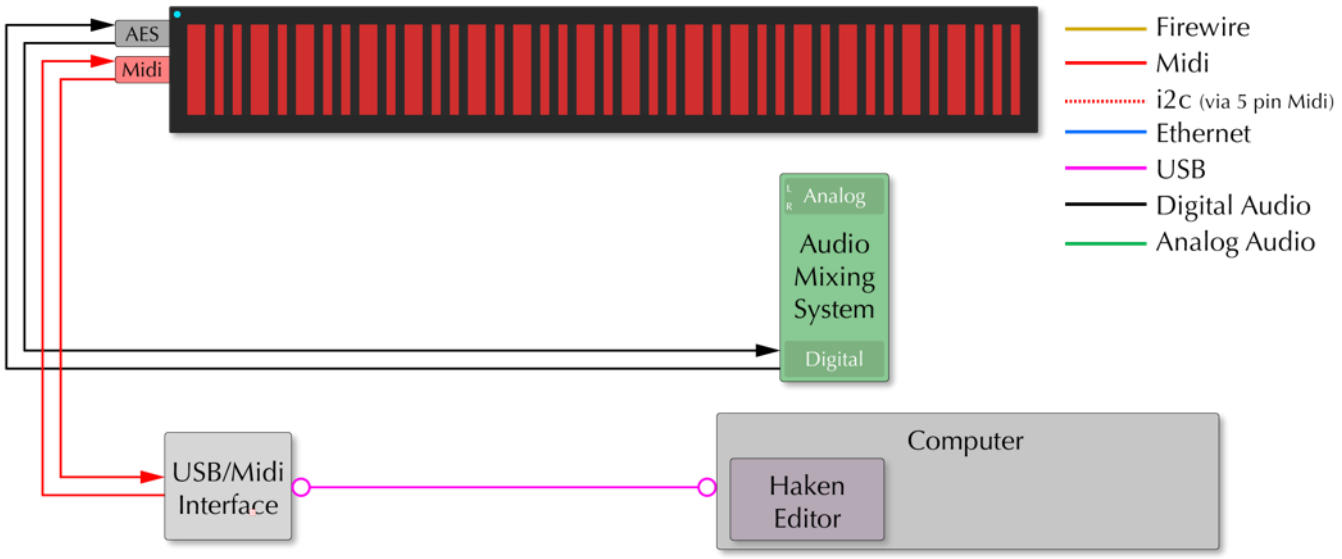
12.1. Analog Audio Only ("Slim" and Half-Size/Full-Size Models)



Analog Audio: The Continuum's analog headphone output is connected to an external audio mixer. It is important not to mono sum the audio signals from the Continuum; a TRS-to-split-mono cable must be used. The same applies to the ContinuuMini Stereo output jack. "Slim" model Continuums support individual Mono outputs. The "Slim" Continuum's Headphone jack still requires a TRS connection, but it is now intended specifically for headphones.

Haken Editor: Connections to the Editor on an external computer are made through the supplied Roland UM-ONE USB connection, which is auto-detected and shows up in the "Midi and Global Settings" page of the Editor. "Slim" model Continuums also support a direct USB-A connection.

12.2. Digital Audio Output ("Slim" and Half-Size/Full-Size Models)



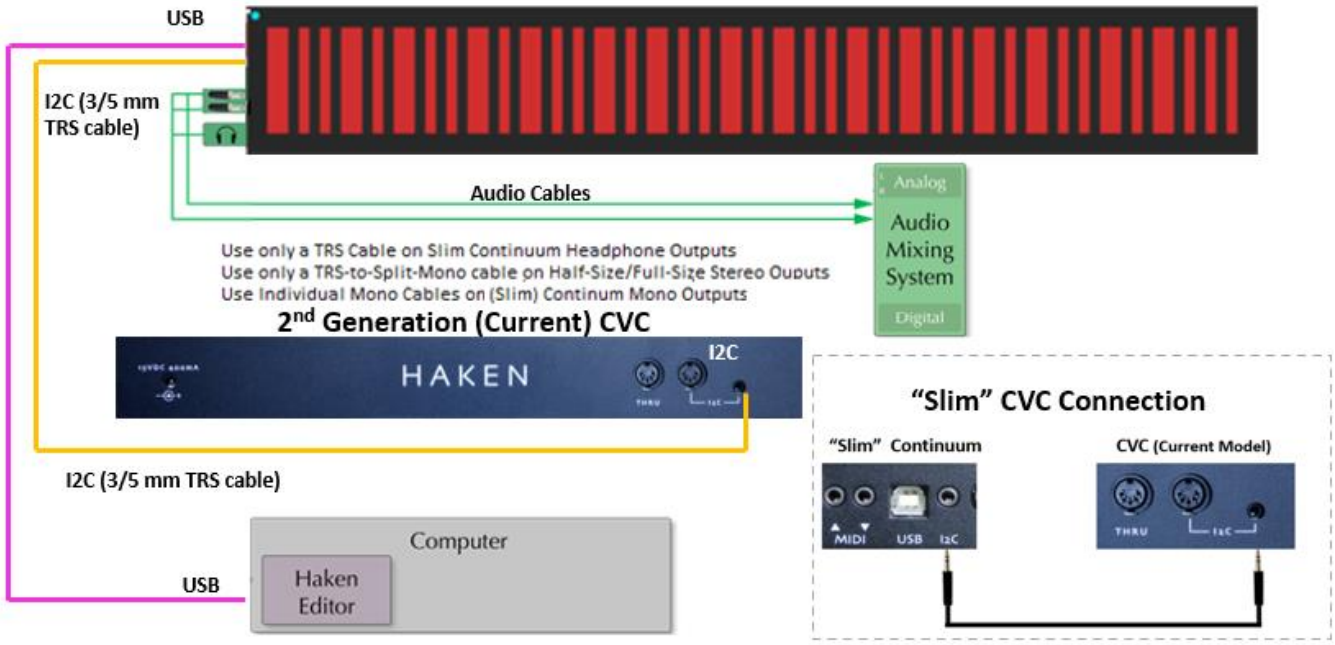
Digital Audio: The Continuum's digital output is connected to an external audio mixer. A digital signal is fed back to the Continuum so that the Continuum can optionally sync to the AES signal supplied by the external source. Notice that the Sync out in the Editor has been set to "sync to incoming", so that the Continuum can sync to that digital signal. Successful digital clocking will report "Sync". "Slim" model Continuums use RCA-type SPDIF AES connectors. The Half-Size and Full-Size models require an XLR AES connection. In both cases a cable specifically designed for digital audio should be used for best performance.

Haken Editor: Connections to the Editor on an external computer are made through the supplied Roland UM-ONE USB connection, which is auto-detected and shows up in the "Midi and Global Settings" page of the Editor. "Slim" model Continuums also support a direct USB-A connection.

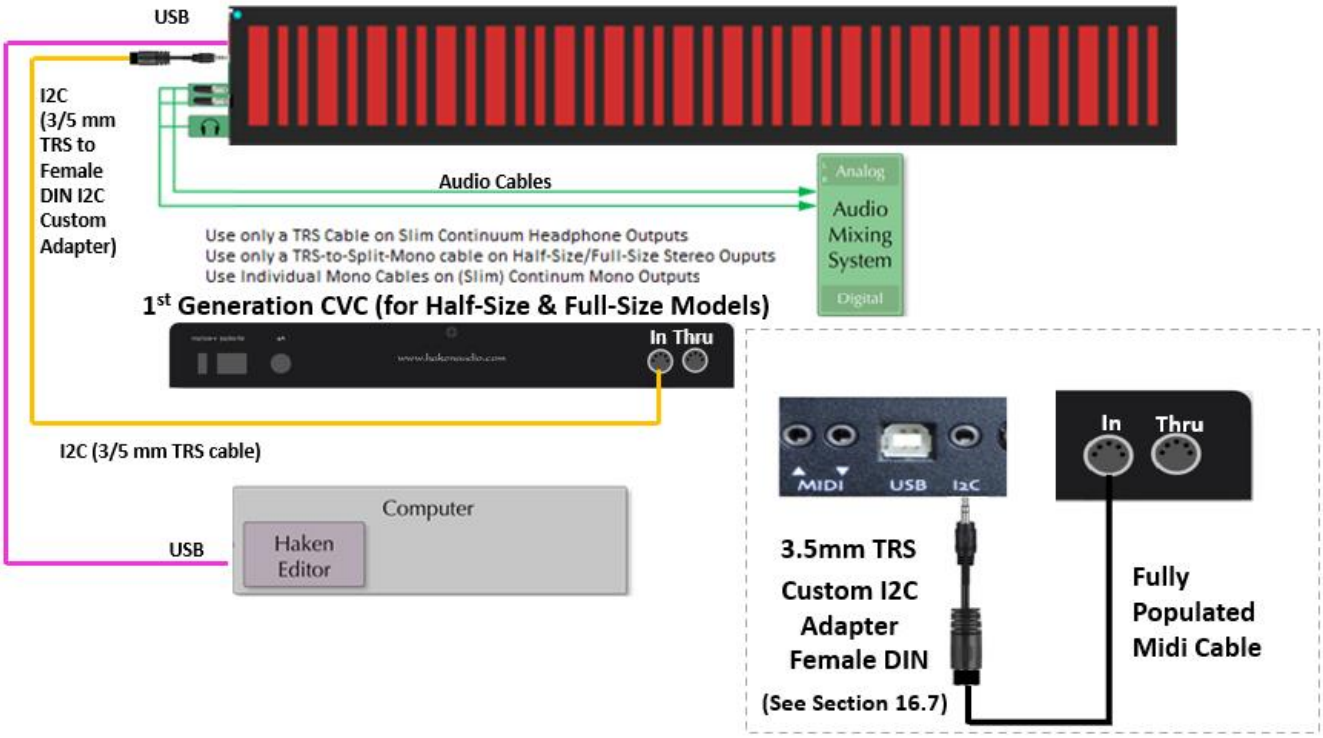
Note: When designing presets that take digital audio and manipulate it, make sure you have the Control Panel 2 / "Audio In" control turned up.

12.3. Connecting "Slim" Continuums to Generation 1 and Generation 2 CVCs

The "Slim" Continuum uses the I2C port to connect to the CVC through the 3.5mm port using a standard 3.5mm TRS cable. If connecting to the Generation 1 CVC model designed for Half-Size and Full-Size models it requires a custom 3.5mm TRS-to-I2C DIN adapter (same as used on ContinuuMini) as noted below (a fully populated Midi cable must be used to connect the adapter to the CVC in the latter case). See section 16.7 for information on the I2C pinouts.

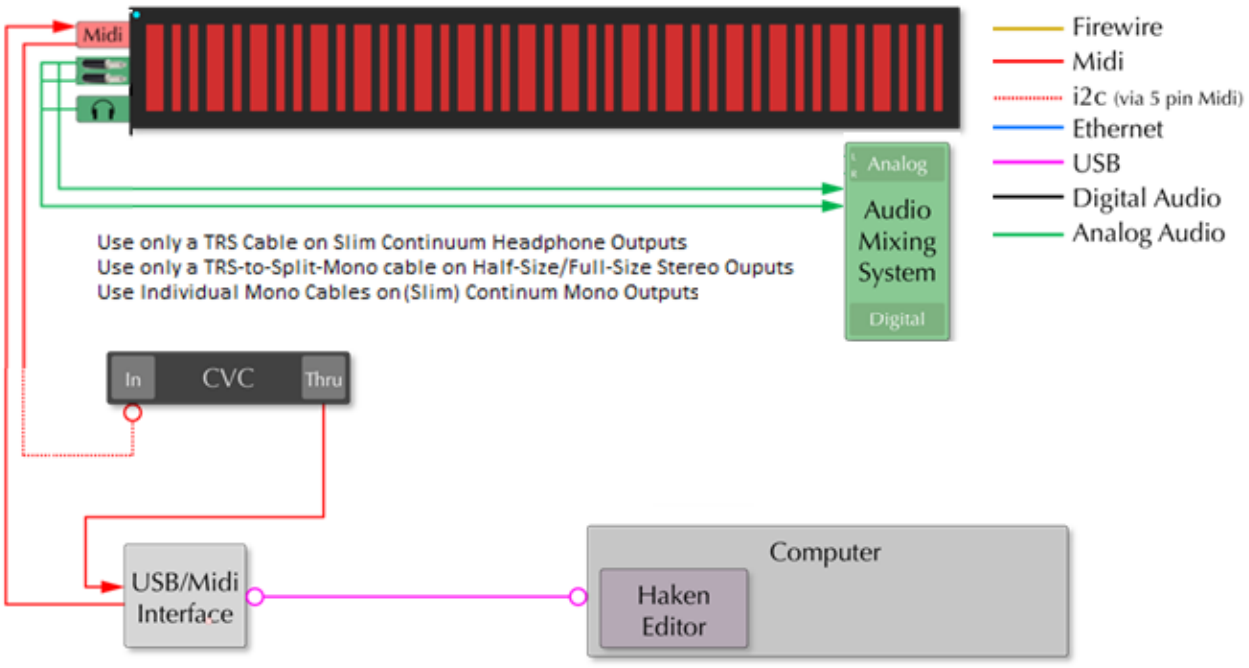


Connecting "Slim" Continuum to Generation 2 CVC



Connecting "Slim" Continuum to Generation 1 CVC Designed for Half-Size and Full-Size Models

12.4. Analog Audio and CVC



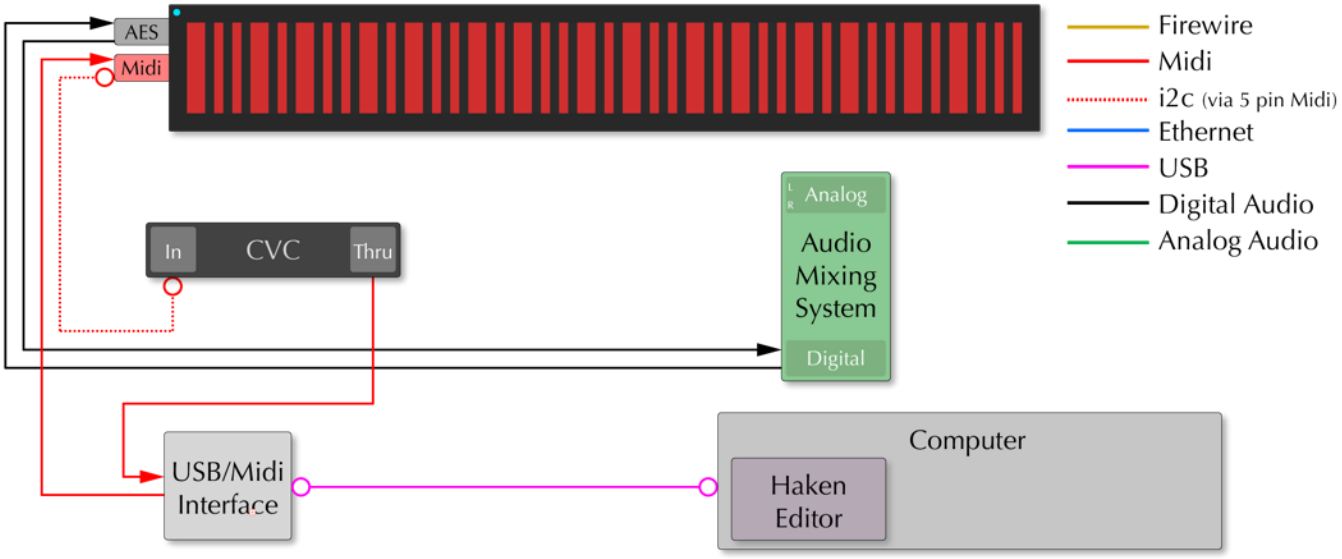
Analog Audio: The Continuum's analog headphone output is connected to an external audio mixer. It is important not to mono sum the audio signals from the Continuum; a TRS-to-split-mono cable must be used.

CVC: The CVC is connected to the Continuum via the i2c information that is carried through the unused pins of the Midi cable. The i2c cable is a high quality Midi cable with all 5 pins connected. It connects the Midi Out of the Continuum to the In on the CVC. A new model CVC is available that in addition to the standard MIDI DIN connections also supports a Mini Midi connection for use with "Slim" model continuums. If you have an older CVC that only supports Midi DIN inputs you should use a Midi Din-to-Mini Midi adapter (see section 12.3).

Haken Editor: Connections to the Editor on an external computer are made through the supplied Roland UM-ONE USB connection, which is auto-detected and shows up in the "Midi and Global Settings" page of the Editor. "Slim" model Continuums also support a direct USB-A connection.

12.5. Digital Audio and CVC

Digital Audio: The Continuum's digital output is connected to an external audio mixer. A digital signal is fed back

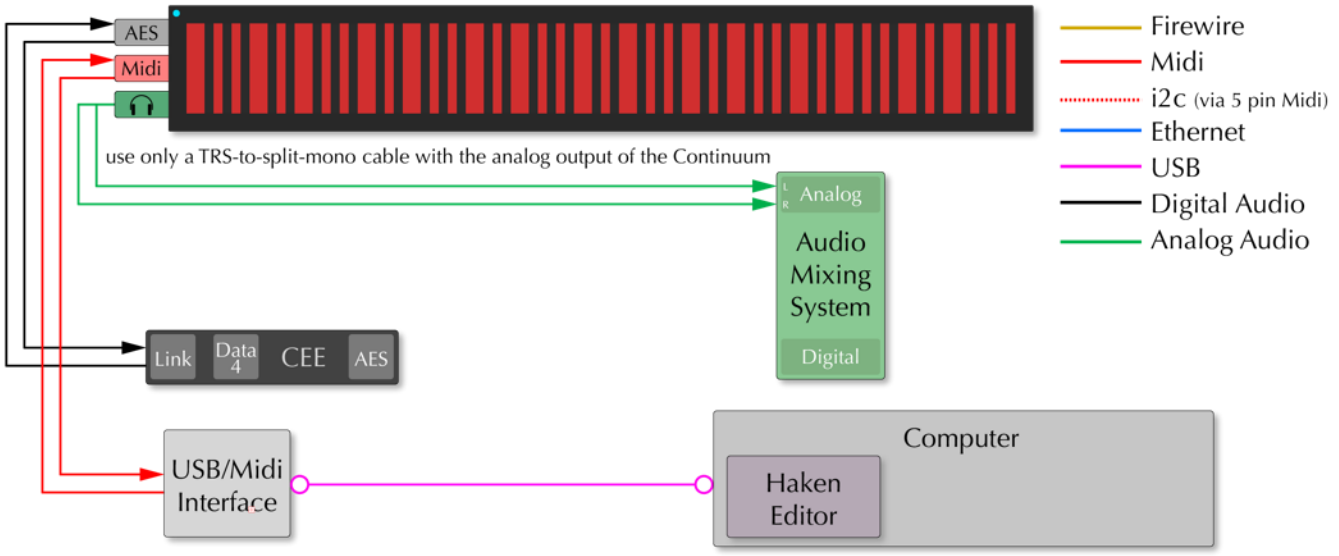


to the Continuum so that the Continuum can optionally sync to the AES signal supplied by the external source. Notice that the Sync out in the Editor has been set to "sync to incoming", so that the Continuum can sync to that digital signal. Successful digital clocking will report "Sync".

CVC: The CVC is connected to the Continuum via the i2c information that is carried through the unused pins of the Midi cable. The i2c cable is a high quality Midi cable with all 5 pins connected. It connects the Midi Out of the Continuum to the In on the CVC. For "Slim" Continuum CVC connections see section 12.3.

Haken Editor: Connections to the Editor on an external computer are made through the supplied Roland UM-ONE USB connection, which is auto-detected and shows up in the "Midi and Global Settings" page of the Editor. "Slim" model Continuums also support a direct USB-A connection.

12.6. Analog Audio and CEE (For Half-Size/Full-Size + CEE Owners Only)



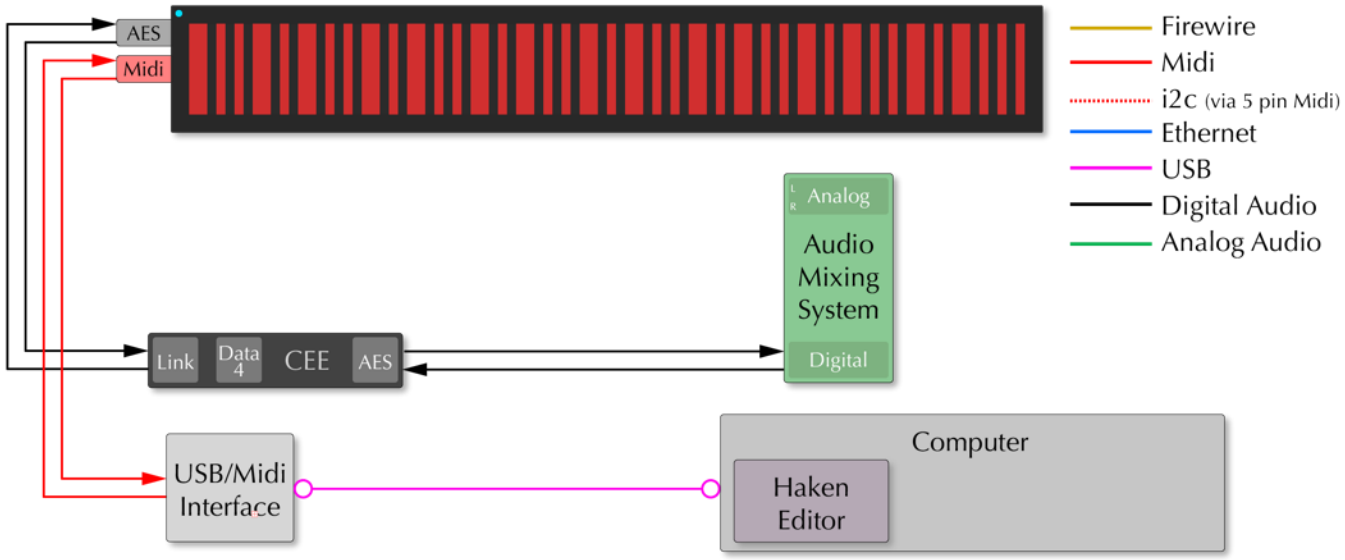
Note: Note: The Continuum EaganMatrix Expander (CEE) is no longer available. This section is included for those who own the unit with Half-Size or Full-Size Continuum Models. "Slim" model Continuums are all 6x processing models and require no expansion.

Analog Audio: The Continuum's analog headphone output is connected to an external audio mixer. It is important not to mono sum the audio signals from the Continuum; a TRS-to-split-mono cable must be used.

CEE: The CEE is connected to the Continuum via a bidirectional connection via the AES on the Continuum to the Link on the CEE. Using analog "mic" cables instead of proper digital audio cables for this connection may compromise performance.

Haken Editor: Connections to the Editor on an external computer are made through the supplied Roland UM-ONE USB connection, which is auto-detected and shows up in the "Midi and Global Settings" page of the Editor.

12.7. Digital Audio and CEE (For Half-Size/Full-Size + CEE Owners Only)



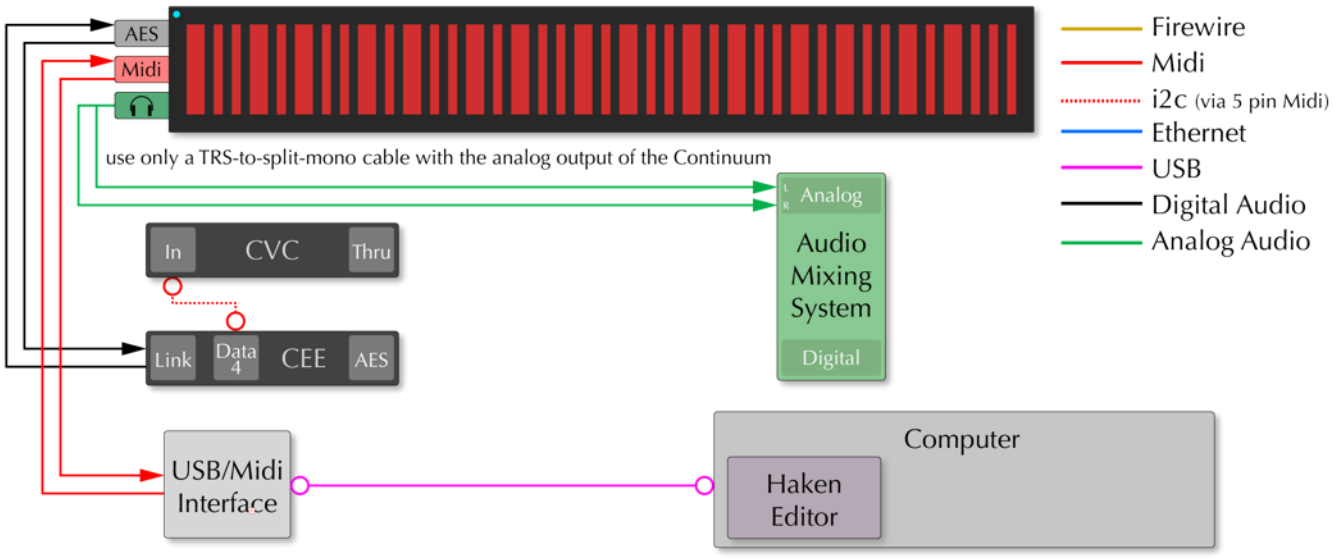
Note: Note: The Continuum EaganMatrix Expander (CEE) is no longer available. This section is included for those who own the unit with Half-Size or Full-Size Continuum Models. "Slim" model Continuums are all 6x processing models and require no expansion. They use SPDIF AES connections direct to the appropriate D/A converter.

Digital Audio: The CEE's digital audio output is connected to an external audio mixer. Using analog "mic" cables instead of proper digital audio cables for this connection may compromise performance. A digital signal is fed back to the CEE so that the Continuum and CEE can optionally sync to the AES signal supplied by the external source. Notice that the Sync out in the Editor has been set to "sync to incoming", so that the Continuum and CEE can sync to that digital signal. Successful digital clocking will report "Sync".

CEE: The CEE is connected to the Continuum via a bidirectional connection via the AES on the Continuum to the Link on the CEE. Using analog "mic" cables instead of proper digital audio cables for this connection may compromise performance.

Haken Editor: Connections to the Editor on an external computer are made through the supplied Roland UM-ONE USB connection, which is auto-detected and shows up in the "Midi and Global Settings" page of the Editor.

12.8. Analog Audio, CVC and CEE (For Half-Size/Full-Size + CEE Owners Only)



Note: Note: The Continuum EaganMatrix Expander (CEE) is no longer available. This section is included for those who own the unit with Half-Size or Full-Size Continuum Models. "Slim" model Continuums are all 6x processing models and require no expansion. They use SPDIF AES connections direct to the appropriate D/A converter.

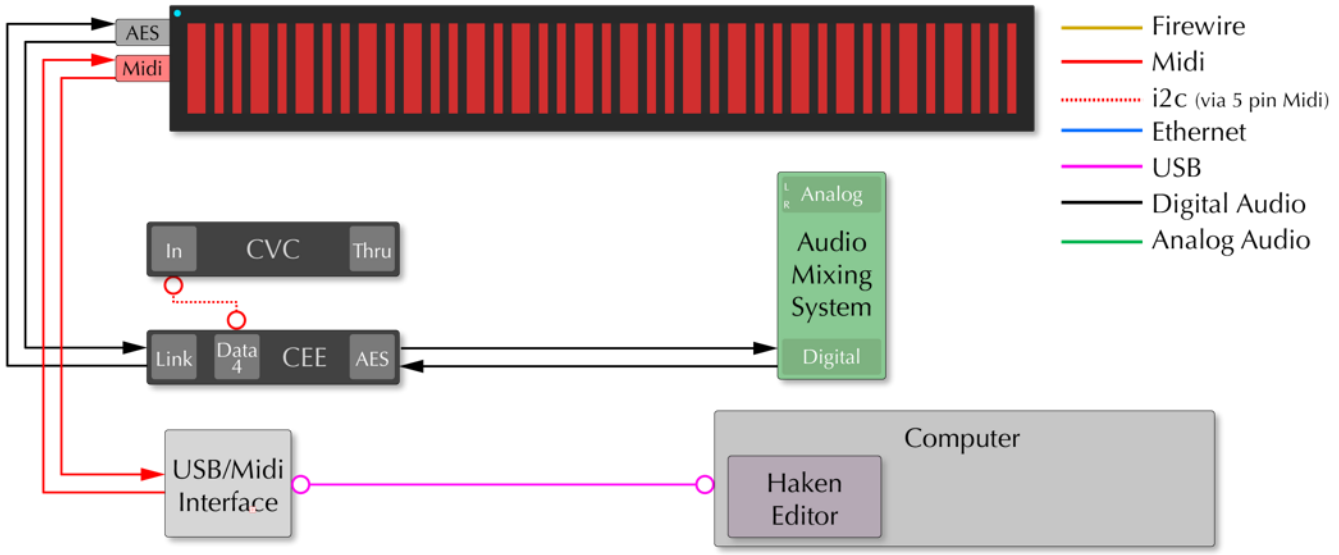
Analog Audio: The Continuum's analog headphone output is connected to an external audio mixer. It is important not to mono sum the audio signals from the Continuum; a TRS-to-split-mono cable must be used.

CEE: The CEE is connected to the Continuum via a bidirectional connection via the AES on the Continuum to the Link on the CEE. Using analog "mic" cables instead of proper digital audio cables for this connection may compromise performance.

CVC: The CVC is connected to the CEE using i2c. The i2c cable is a high quality Midi cable with all 5 pins connected. It connects the Data 4 port of the CEE to the In on the CVC. For "Slim" Continuum CVC connections see section 12.3.

Haken Editor: Connections to the Editor on an external computer are made through the supplied Roland UM-ONE USB connection, which is auto-detected and shows up in the "Midi and Global Settings" page of the Editor.

12.9. Digital Audio, CVC and CEE (For Half-Size/Full-Size + CEE Owners Only)



Note: Note: The Continuum EaganMatrix Expander (CEE) is no longer available. This section is included for those who own the unit with Half-Size or Full-Size Continuum Models. "Slim" model Continuums are all 6x processing models and require no expansion. They use SPDIF AES connections direct to the appropriate D/A converter.

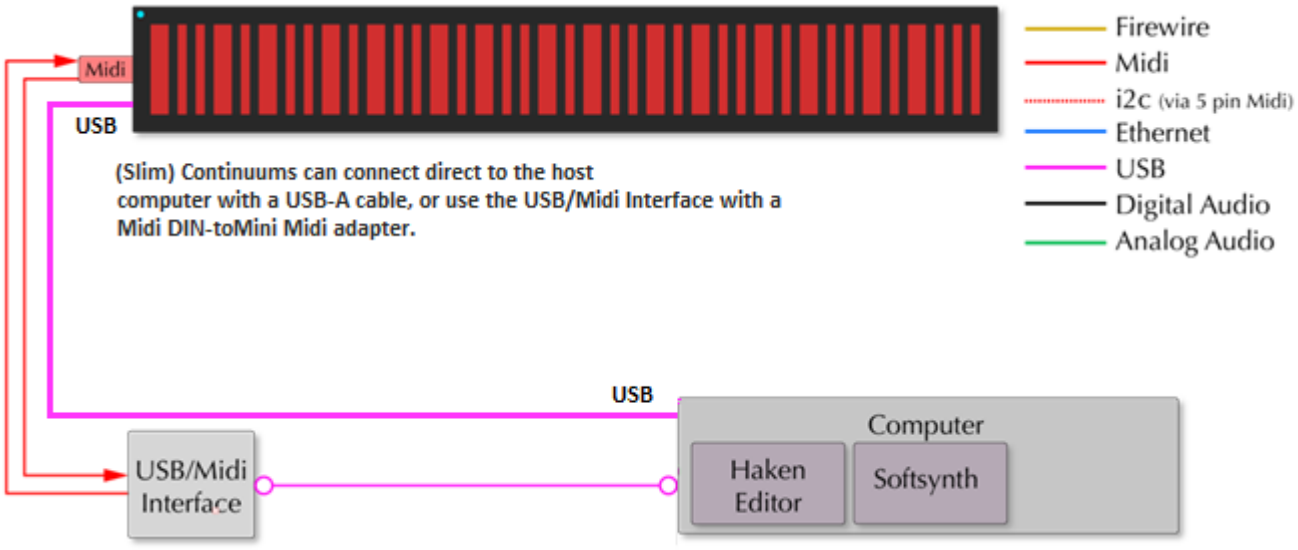
Digital Audio: The CEE's digital audio output is connected to an external audio mixer. Using analog "mic" cables instead of proper digital audio cables for this connection may compromise performance. A digital signal is fed back to the CEE so that the Continuum and CEE can optionally sync to the AES signal supplied by the external source. Notice that the Sync out in the Editor has been set to "sync to incoming", so that the Continuum and CEE can sync to that digital signal. Successful digital clocking will report "Sync".

CEE: The CEE is connected to the Continuum via a bidirectional connection via the AES on the Continuum to the Link on the CEE. Using analog "mic" cables instead of proper digital audio cables for this connection may compromise performance.

CVC: The CVC is connected to the CEE using i2c. The i2c cable is a high quality Midi cable with all 5 pins connected. It connects the Data 4 port of the CEE to the In on the CVC. For "Slim" Continuum CVC connections see section 12.3.

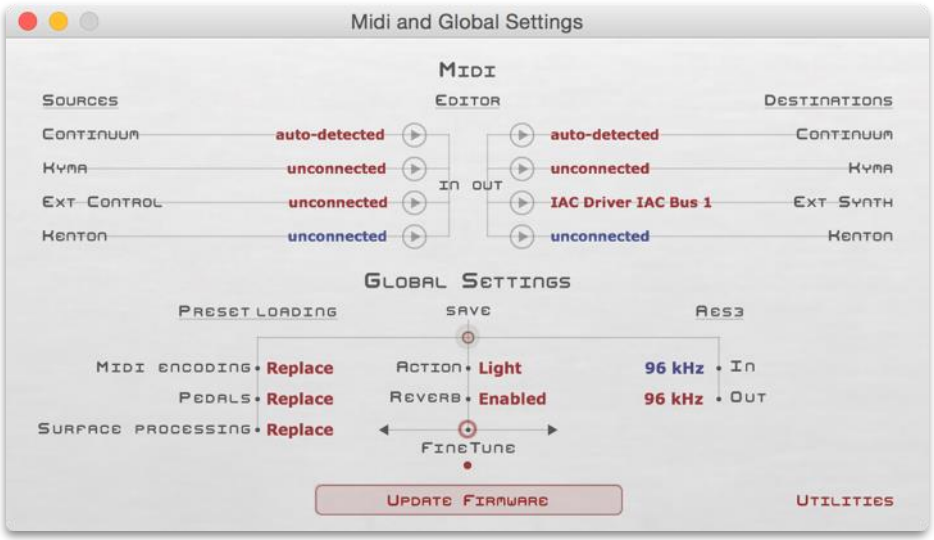
Haken Editor: Connections to the Editor on an external computer are made through the supplied Roland UM-ONE USB connection, which is auto-detected and shows up in the "Midi and Global Settings" page of the Editor.

12.10. Connecting a Softsynth

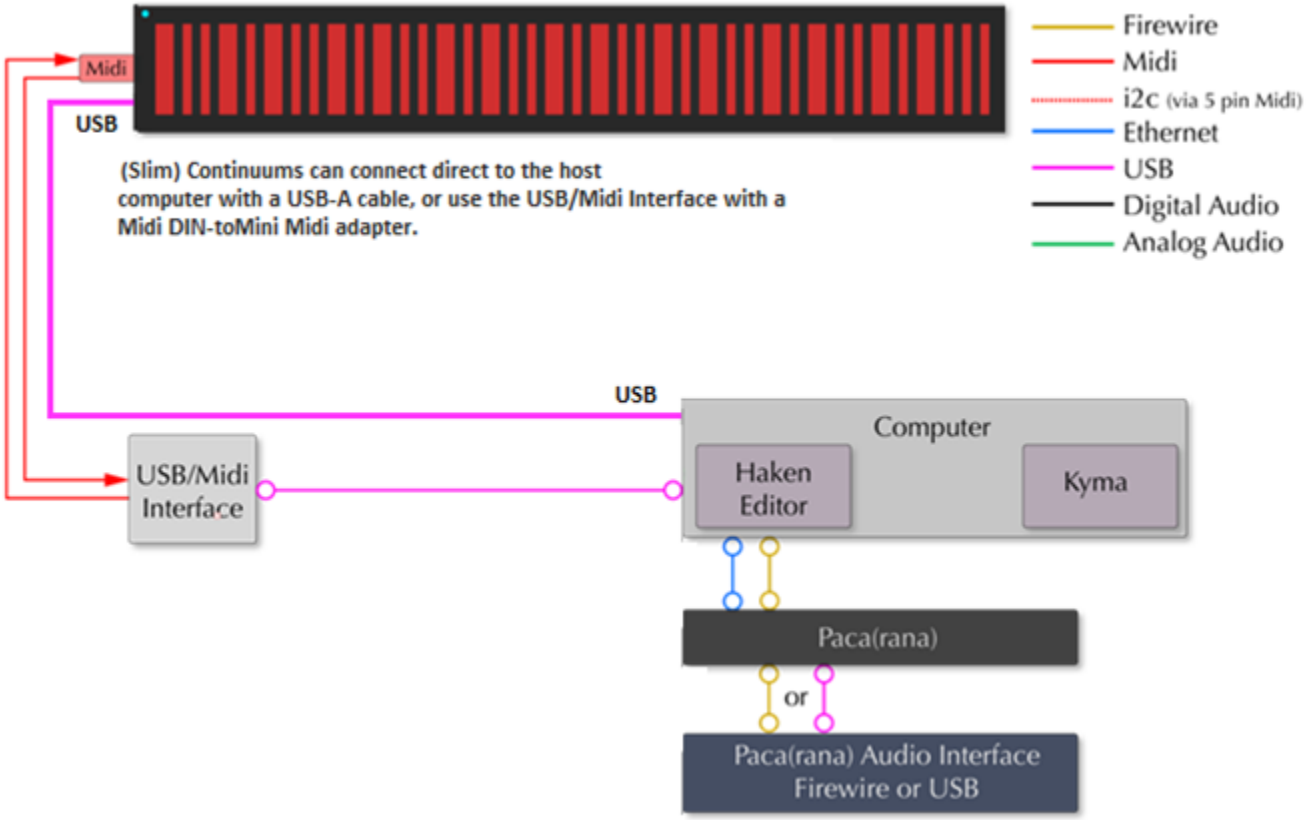


Note: "Slim" Model continuums can use either standard Midi (though a DIN-to Mini Midi adapter) or a direct USB interface to the host computer. USB is preferred.

Softsynth: A Midi connection to a soft synth running on the same computer as the Haken Editor is established by creating a virtual Midi bus, in this case labeled IAC Driver IAC Bus 1.



12.11. Connecting to Kyma (Mac)



Note: "Slim" model Continuums can use either standard Midi (though a DIN-to Mini Midi adapter) or a direct USB interface to the host computer. USB is preferred.

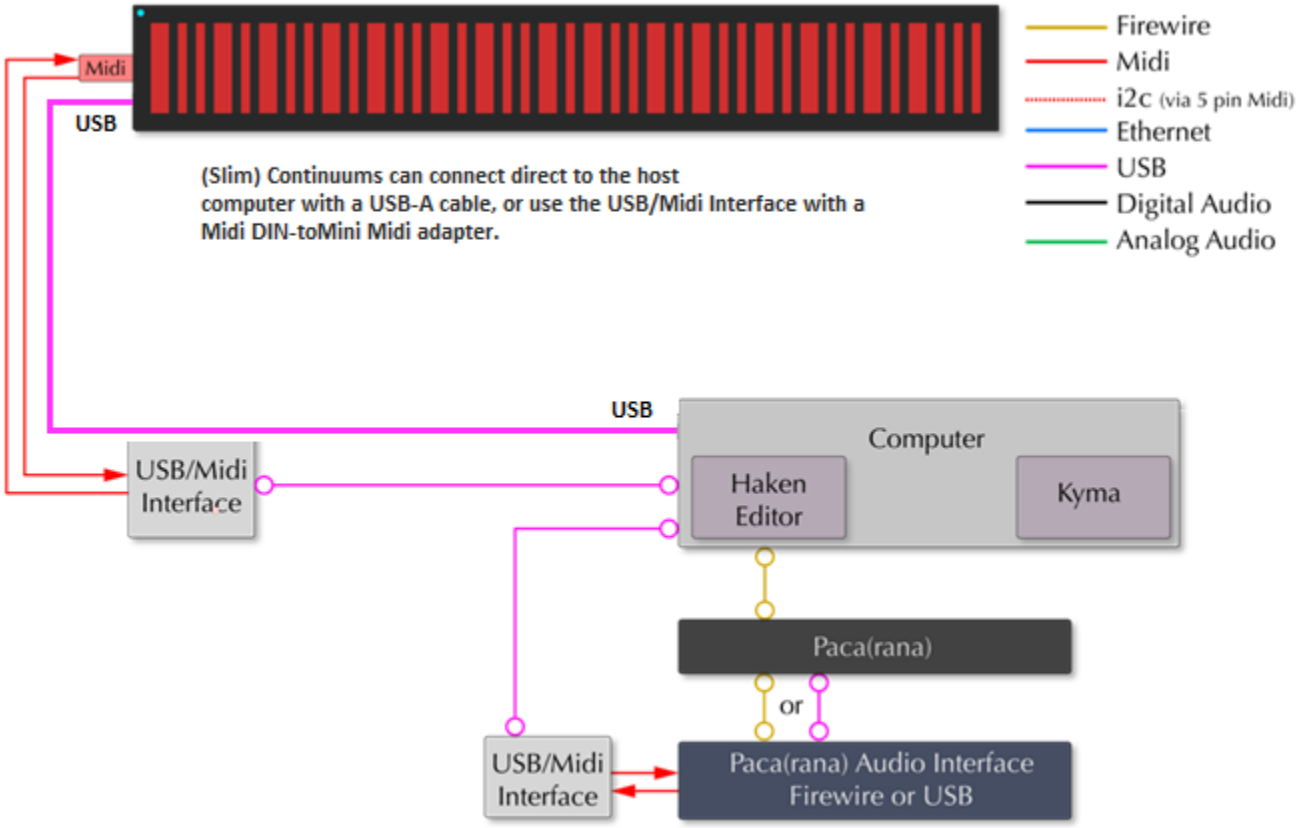
Haken Editor: Connections to the Editor on an external computer are made through the supplied Roland UM-ONE USB connection, which is auto-detected and shows up in the "Midi and Global Settings" page of the Editor. "slim" model Continuums also support a direct USB-A connection.

Kyma: A Midi connection to the Paca(rana) and Kyma running on the same computer as the Haken Editor is established by using Delora Software's Kyma Connect via a virtual Midi bus via ethernet called vPacarana. See Section 10.10 for a necessary Kyma-specific configuration setting.

Paca(rana): A data connection to the Paca(rana) and the computer is established via Firewire.

Paca(rana) Audio Interface: A data connection to the Paca(rana) and the Interface is either Firewire or USB, depending on the interface.

12.12. Connecting to Kyma (PC)



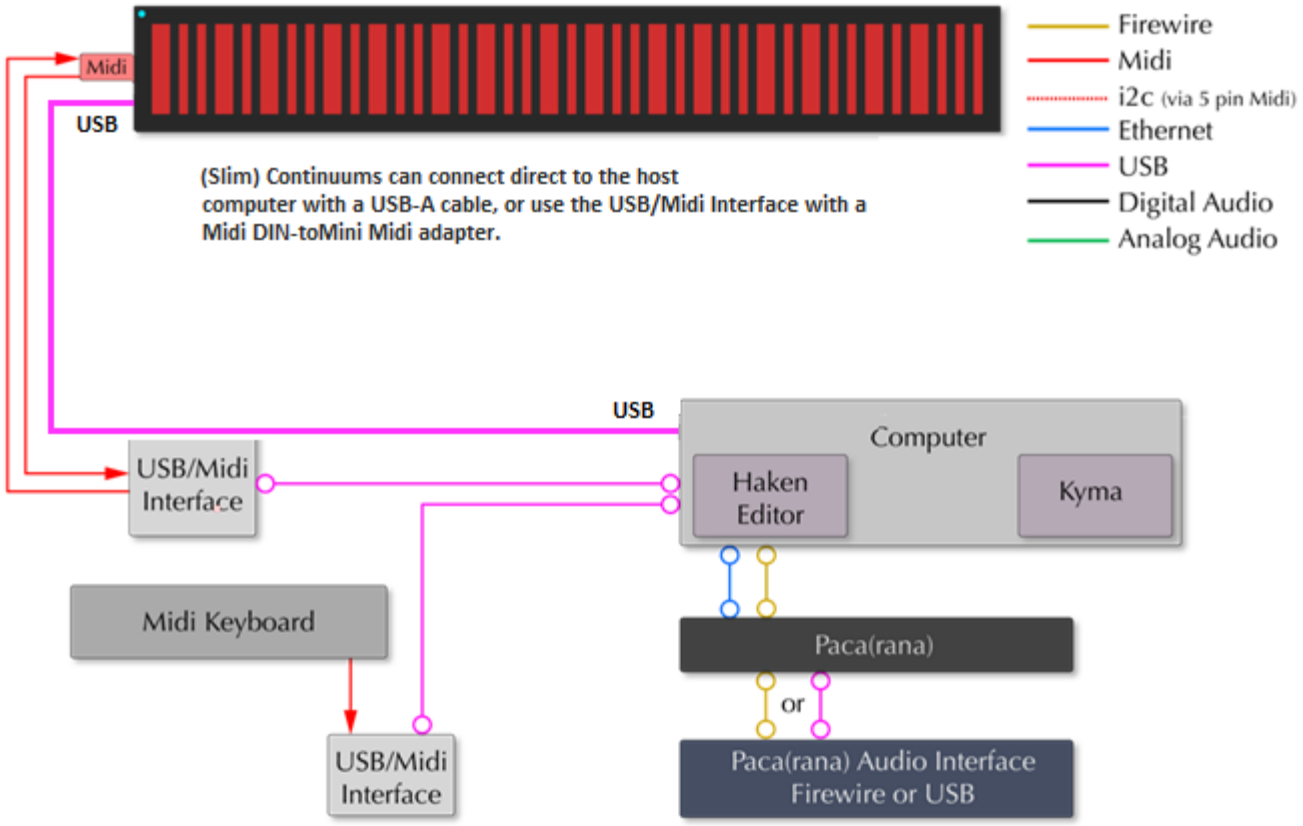
Haken Editor: Connections to the Editor on an external computer are made through the supplied Roland UM-ONE USB connection, which is auto-detected and shows up in the "Midi and Global Settings" page of the Editor. "Slim" model Continuums also support a direct USB-A connection.

Kyma: A Midi connection to the Paca(rana) and Kyma running on the same computer as the Haken Editor is established by using a USB Midi connection. In this case the "Midi and Global Settings" page this connection is labeled UM-1. See Section 10.10 for a necessary Kyma-specific configuration setting.

Paca(rana): A data connection to the Paca(rana) and the computer is established via Firewire.

Paca(rana) Audio Interface: A data connection to the Paca(rana) and the Interface is either Firewire or USB, depending on the interface.

12.13. Connecting Midi Keyboard, Continuum and Kyma (Mac)



Haken Editor: Connections to the Editor on an external computer are made through the supplied Roland UM-ONE USB connection, which is auto-detected and shows up in the "Midi and Global Settings" page of the Editor. "Slim" model Continuums also support a direct USB-A connection.

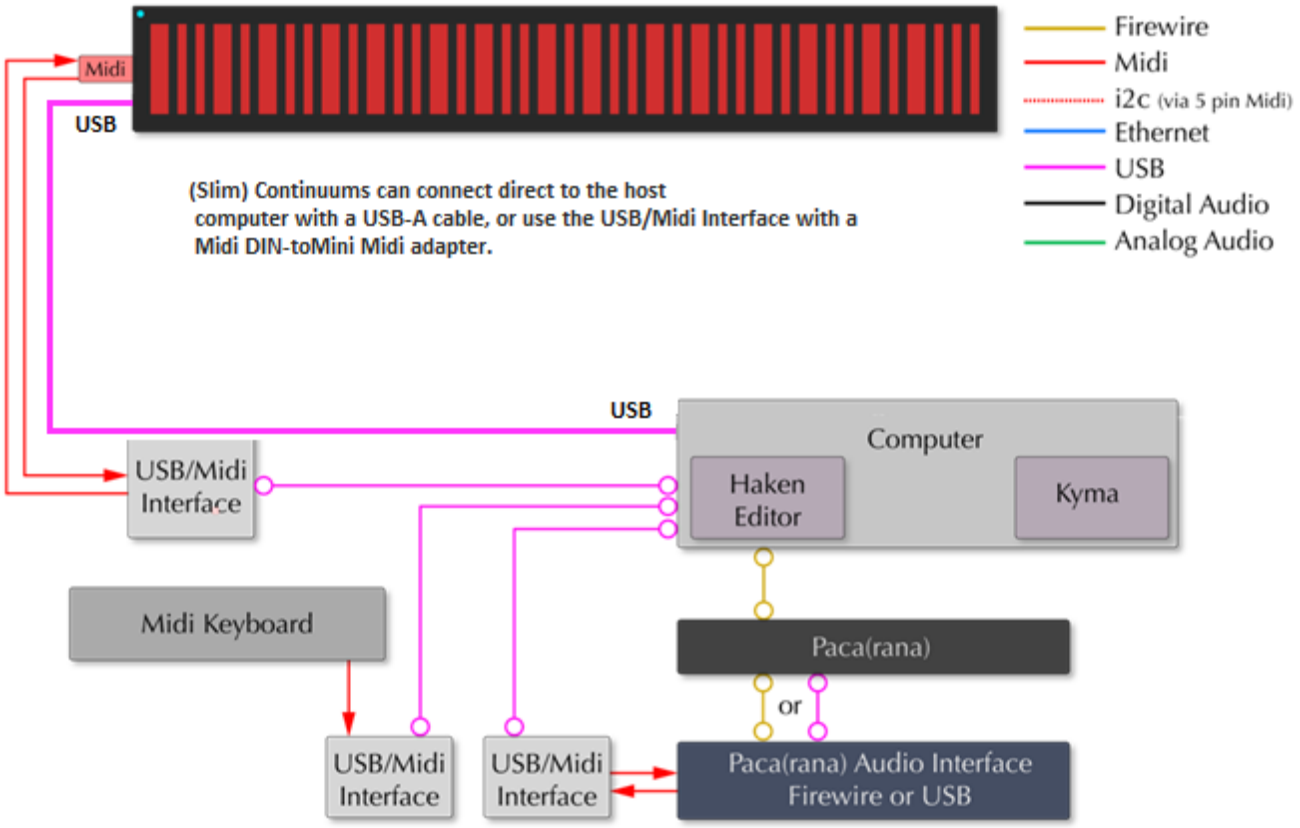
Kyma: A Midi connection to the Paca(rana) and Kyma running on the same computer as the Haken Editor is established by using Delora Software's Kyma Connect via a virtual Midi bus via ethernet called vPacarana. See Section 10.10 for a necessary Kyma-specific configuration setting.

Paca(rana): A data connection to the Paca(rana) and the computer is established via Firewire.

Paca(rana) Audio Interface: A data connection to the Paca(rana) and the Interface is either Firewire or USB, depending on the interface.

Midi Keyboard: A connection is made via Midi/USB, in this case labeled UM-1 in the Midi and Global Settings. **CME xKey** keyboards are often used with the Continuum and ContinuuMini. Certain presets are set up for the xKey, explicitly combining MPE+ "Channel 1 Data" with playing surface data from the Continuum or ContinuuMini. For this to work properly, configure the xKey with **First Aftertouch** value is derived from Velocity.

12.14. Connecting Midi Keyboard, Continuum and Kyma (PC)



Haken Editor: Connections to the Editor on an external computer are made through the supplied Roland UM-ONE USB connection, which is auto-detected and shows up in the "Midi and Global Settings" page of the Editor. "Slim" model Continuums also support a direct USB-A connection.

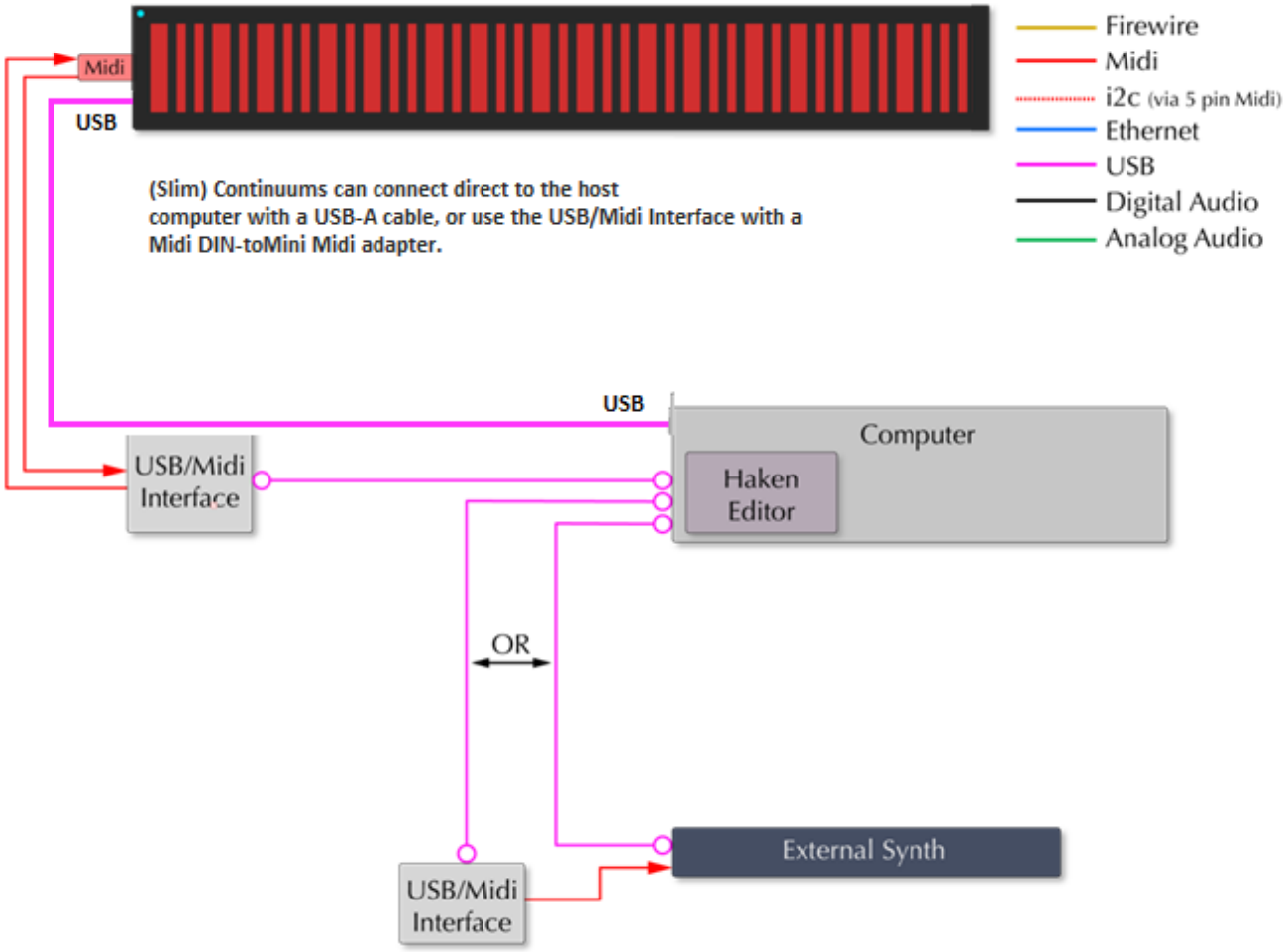
Kyma: A Midi connection to the Paca(rana) and Kyma running on the same computer as the Haken Editor is established by using a USB Midi connection. In this case the "Midi and Global Settings" page this connection is labeled UM-1. See Section 10.10 for a necessary Kyma-specific configuration setting.

Paca(rana): A data connection to the Paca(rana) and the computer is established via Firewire.

Paca(rana) Audio Interface: A data connection to the Paca(rana) and the Interface is either Firewire or USB, depending on the interface.

Midi Keyboard: A connection is made via Midi/USB, in this case labeled Vmidi 1 in the Midi and Global Settings. **CME xKey** keyboards are often used with the Continuum and ContinuuMini. Certain presets are set up for the xKey, explicitly combining MPE+ "Channel 1 Data" with playing surface data from the Continuum or ContinuuMini. For this to work properly, configure the xKey with **First Aftertouch** value is derived from Velocity.

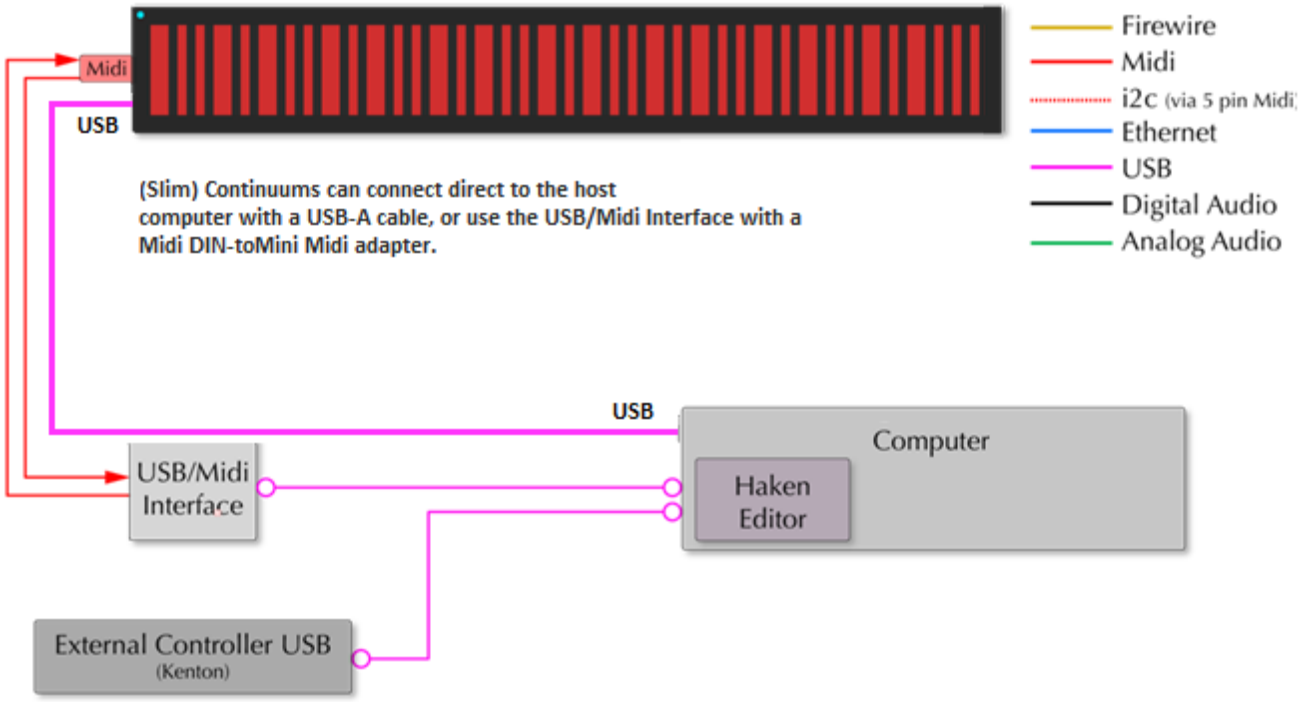
12.15. Connecting to External Midi Synthesizer through Haken Editor



Haken Editor: Connections to the Editor on an external computer are made through the supplied Roland UM-ONE USB connection, which is auto-detected and shows up in the "Midi and Global Settings" page of the Editor. "Slim" model Continuums also support a direct USB-A connection.

External Synth: A connection is made via Midi/USB, in this case labeled UM-1 in the Midi and Global Settings.

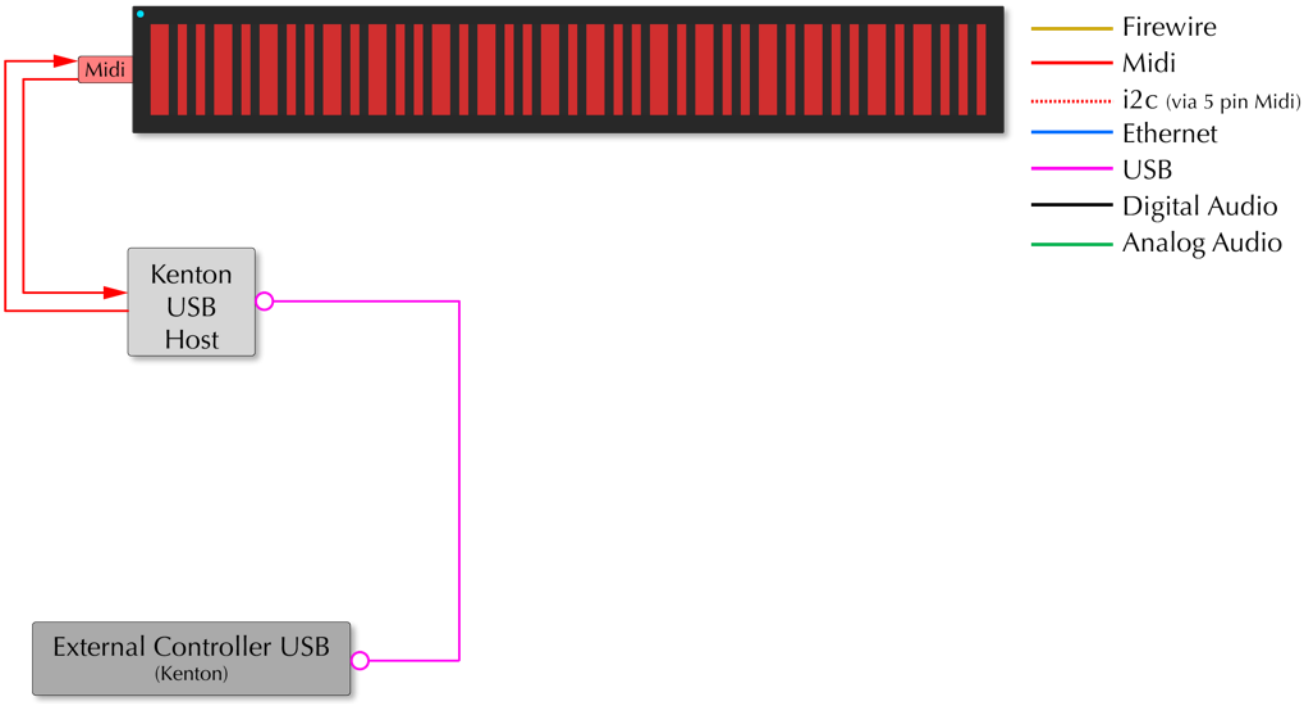
12.16. Connecting a Kenton Controller with Computer



Haken Editor: Connections to the Editor on an external computer are made through the supplied Roland UM-ONE USB connection, which is auto-detected and shows up in the "Midi and Global Settings" page of the Editor. "Slim" model Continuums also support a direct USB-A connection.

Kenton Controller: A connection is made via USB, and the Kenton is auto-recognized as shown in the Midi and Global Settings.

12.17. Connecting a Kenton (or other) Controller Standalone (No Computer)



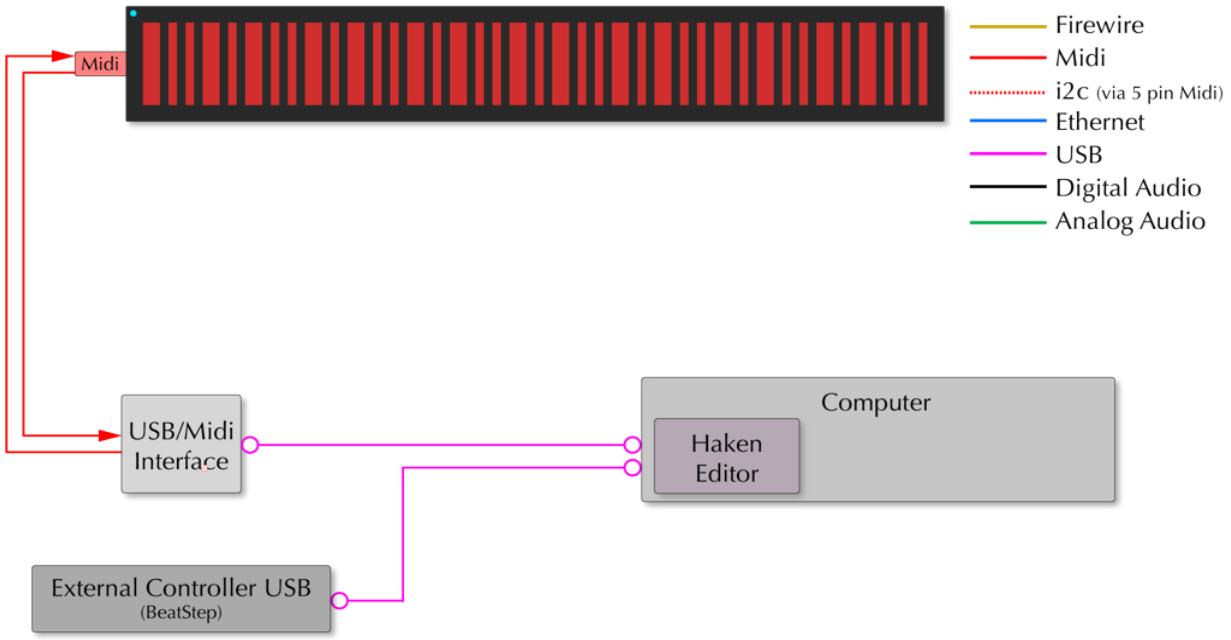
Note: This Diagram applies to Half-Size and Full-Size Continuums or a "Slim" Continuum model that is using its Midi (not USB) connection through Midi DIM-to-Mini Midi adapters.

Kenton USB Host: A bidirectional Midi connection is made between the Kenton Midi Host and the Continuum. Other Midi Hosts may also be used, for example IConnectivity MIO XM (if more than one MIDI host port is required).

Kenton Controller: A connection is made via USB to the Kenton USB Host. The Kenton Controller is directly integrated into the Haken Editor (see section 6.6).

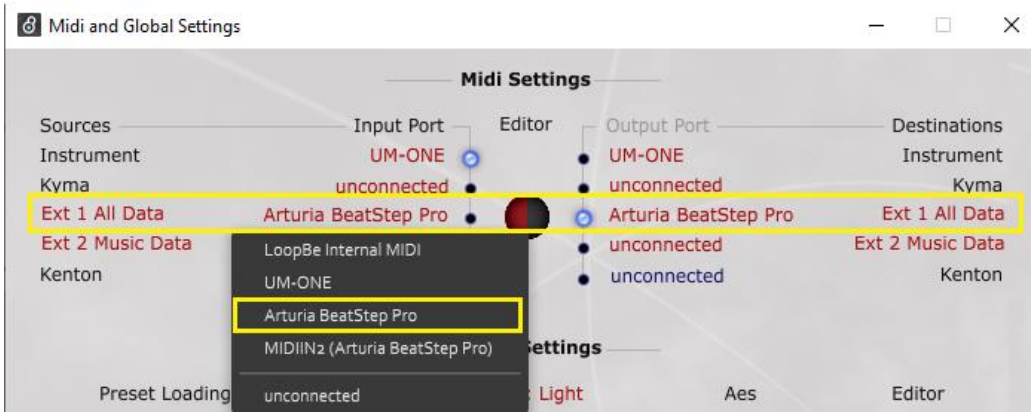
12.18. Using a BeatStep or BeatStep Pro with Computer

Haken Editor: Connections to the Editor on an external computer are made through the supplied Roland UM-ONE



USB connection, which is auto-detected and shows up in the Midi and Global Settings page of the Editor. **This connection assumes direct Midi Connection to the Continuum (not the "Slim" USB connection). Make sure you connect the external Midi Controller to the computer before you launch the Haken Editor or it will not be recognized.**

BeatStep or BeatStep Pro Controller: A connection is made via USB, and "Arturia BeatStep" is chosen as the Ext 1 (with "Config Data" or "All Data" selected) in Midi and Global Settings. "Config Data" will only allow you to change presets. "All Data" will allow the BeatStep to play notes and change presets.



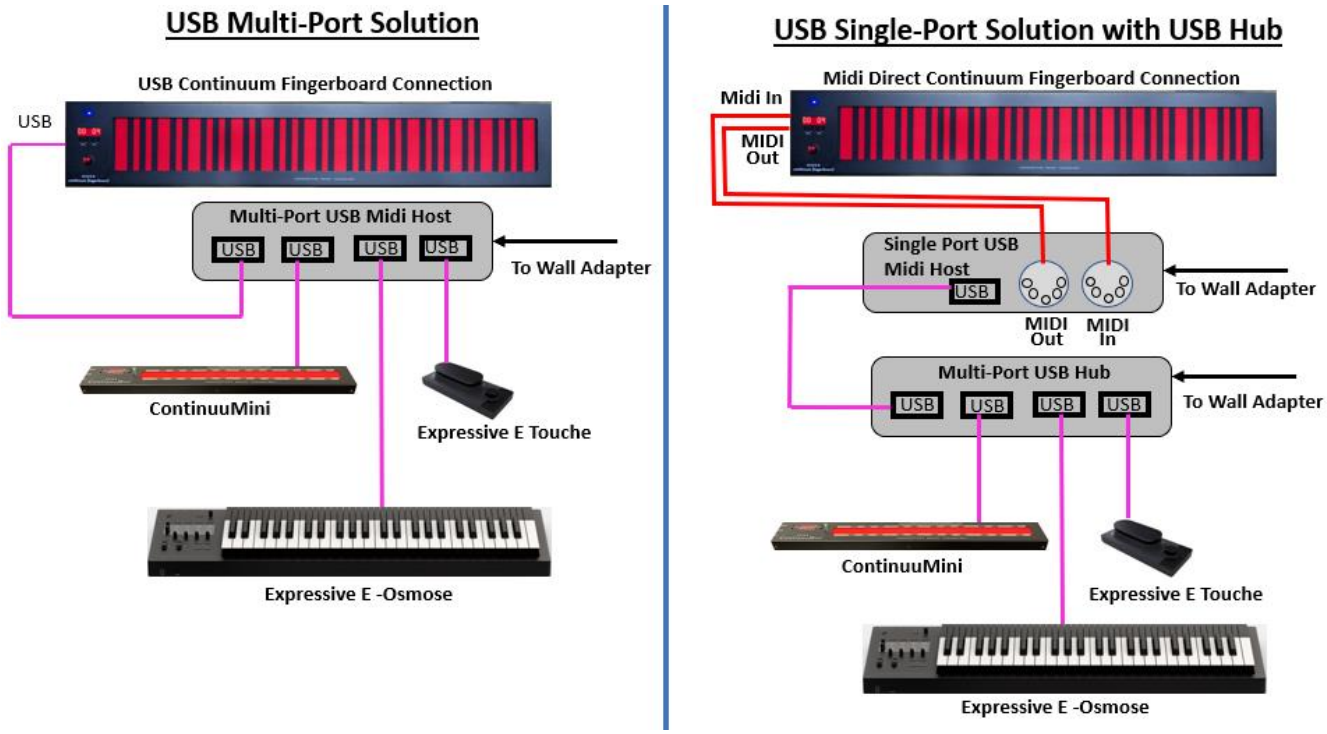
12.19. Connecting a BeatStep Standalone (No Computer)



BeatStep Controller: A connection is made via the BeatStep's or BeatStep Pro's direct Mini Midi Out. Note that in this configuration the BeatStep will require external USB power. For Full-Size and Half-Size Continuums a Mini Midi-to Midi DIN adapter is required. The "Slim" model Continuum uses a Mini Midi connection supported on the BeatStep so only a 3.5mm TRS cable is required.

Templates for BeatStep and BeatStep Pro for controlling the Continuum are available from Haken Audio and some are included in the firmware release in the Arturia BeatStep directory in the "Third Party Support" folder.

12.20. Connecting Multiple USB Controllers Standalone (No Computer)

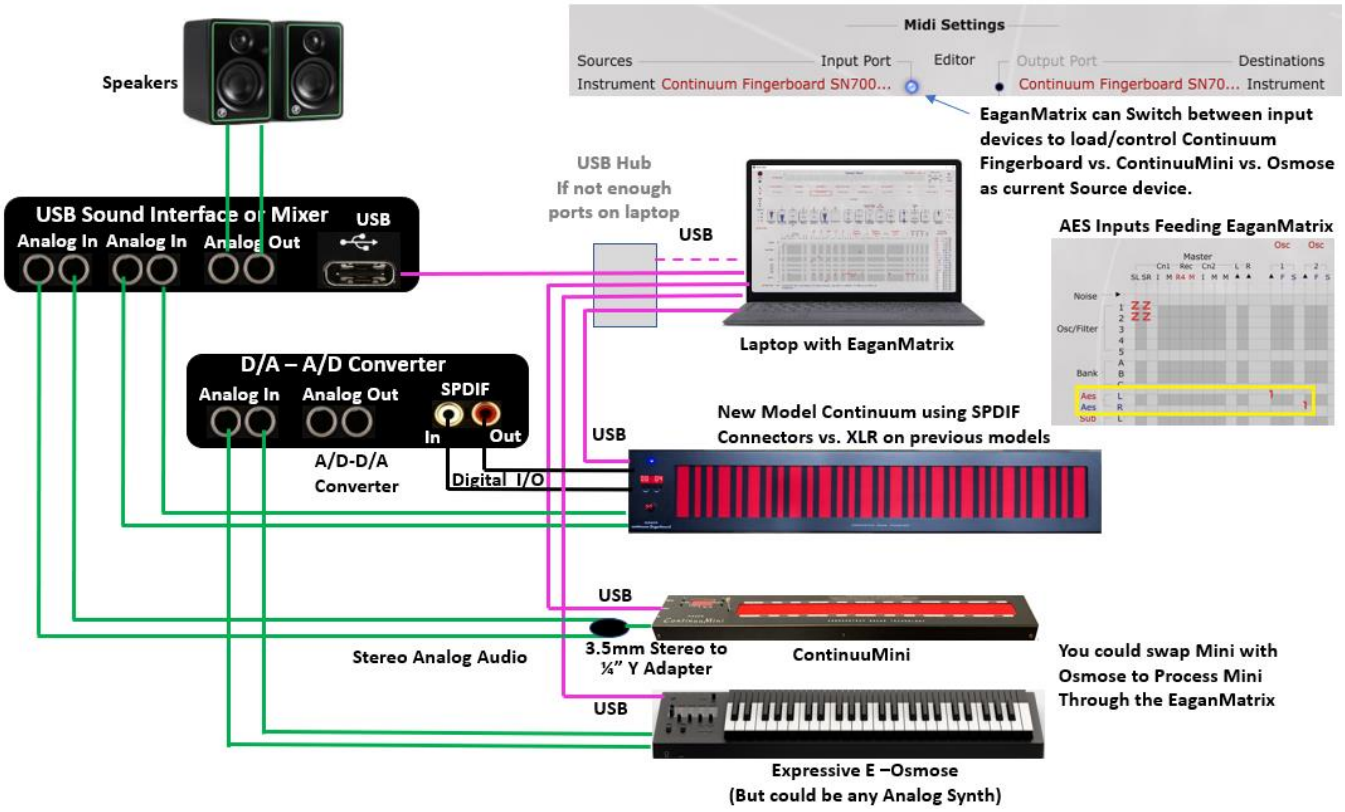


USB Controller or External USB Keyboard: This can be a variety of USB controllers that output MIDI though their USB connection such as a ContinuuMini, Expressive E Touche or Osmose (when available), Linnstrument, Keith McMillen Bop Pad or SoftStep 2, Roli Rise or Block, etc.

USB Midi Host: This can be an number of USB Midi Hosts available such as iConnectivity MIO XM (4 host ports) or LX (10 host ports) or a single Midi Host device. Ideally a powered multi-port host device is preferred for most reliable use. However if you want to connect multiple USB devices to the Continuum a powered USB hub will be required if you have a single USB host device. In some cases the powered hub may not work well in this setup.

USB Hub: This must be a powered Midi Hub without enough output power on the USB line to power all devices connected to it that will be USB-powered. If a single USB port Midi Host is used, a USB hub is required to connect all devices.

12.21. Processing Digital Sound (AES) Through Continuum/EaganMatrix

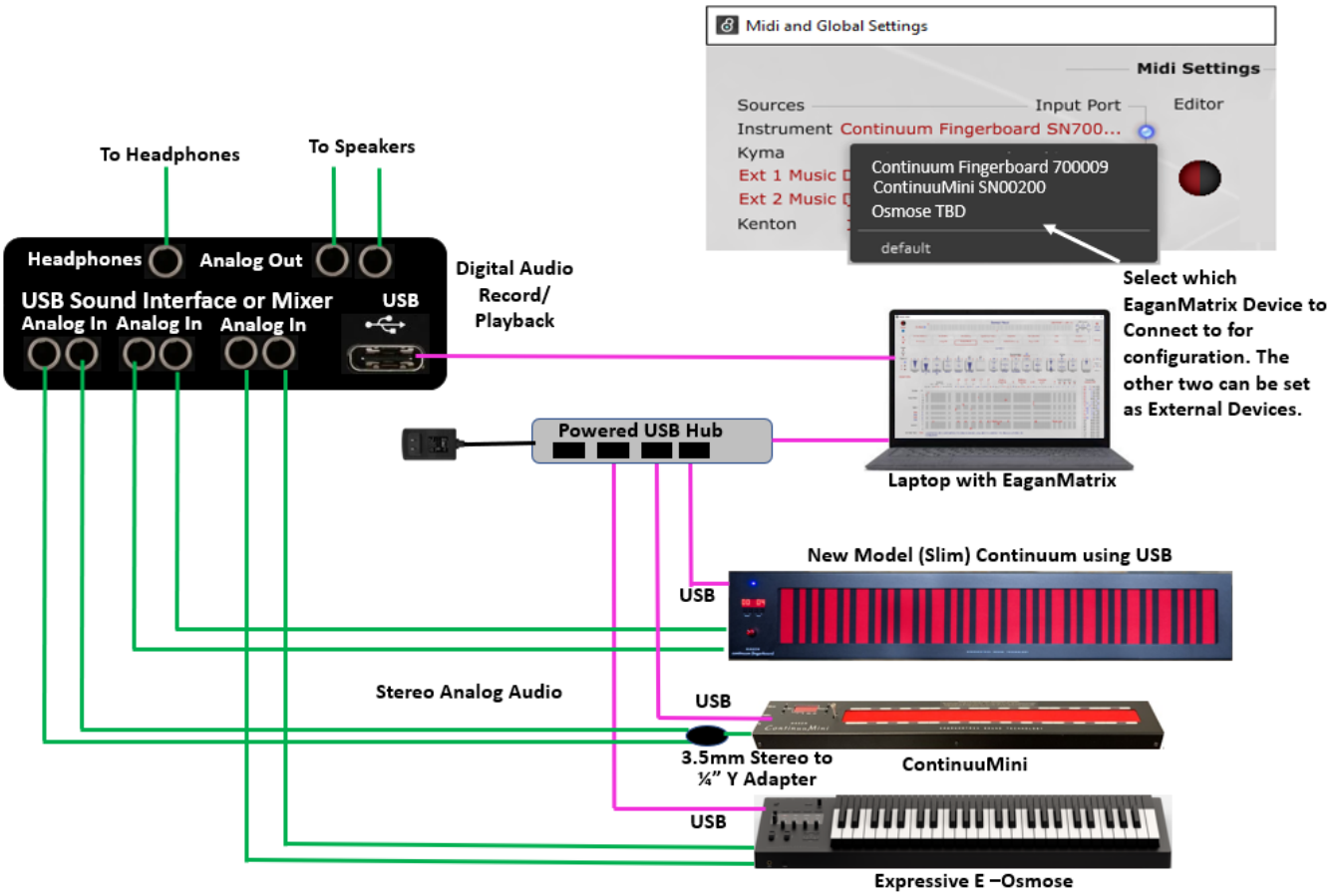


The EaganMatrix allows digital IOS (AES Inputs) to be fed into the matrix for processing by other EaganMatrix functions. The most common application will be to use an AD/DA converter to take an external sound source and convert to the SPDIF or AES data stream needed to feed the Continuum. Note that you may only have XLR AES connections on your converter, in which case an XLR-AES to SPDIF converter can be used in the signal chain.

External USB Keyboard with analog outs: This can be a variety of devices such as a ContinuuMini or Expressive E Osmose that have analog outputs that will be fed into the A/D converter.

AD/DA converter: Required for convert the analog signal to digital that will be sent to the Continuum through the SPDIF (or EAS inputs).

12.22. Using Multiple EaganMatrix Instruments with Editor

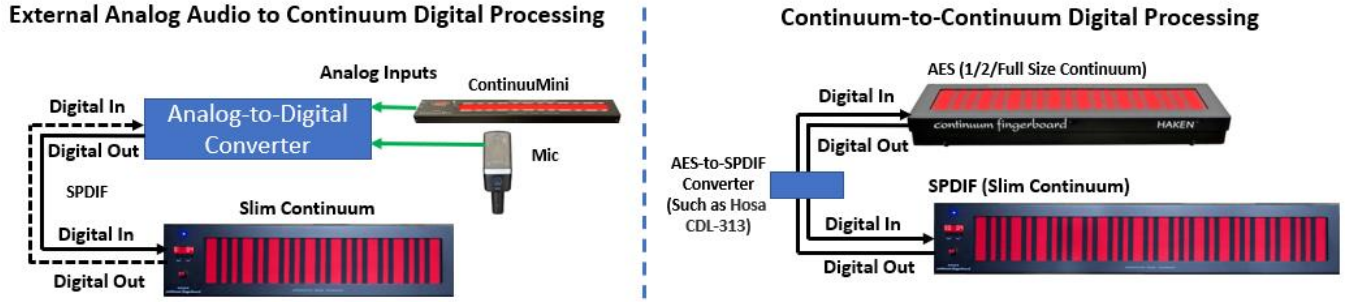


Typically the EaganMatrix can only run one version on a computer at a time. It may be possible try and install multiple copies into separate directories, but the more common use will be to connect one version of the editor to multiple devices through a USB hub (powered if ContinuuMini is being used) if there are not enough USB ports on the host computer to attach to all devices. Analog output of all instruments can be sent to a sound interface or mixer to be recorded and processed as desired.

In this configuration, you can go to Midi and Global Settings under the Cogwheel and select which EaganMatrix Device is the input and output device. You can also select the other devices as External 1 and or External 2 inputs (Music, Data or Both) if for example you want to play the Continuum using the Osmose through the EaganMatrix interface. Just be careful to select the right setting as if you set the External Input for Control, you may change presets on all EaganMatrix devices to unwanted settings. Typically the "Music" option is used if you just want to play one EaganMatrix device from the other. In this case also make sure you use MPE or MPE+ presets and does not transmit control information on Channel 1 or again multiple instruments may be affected.

Remember that the USB connection in all cases is only for Midi. It is not a USB audio connection. The instruments must be connected to an audio interface or mixer for recording and playback.

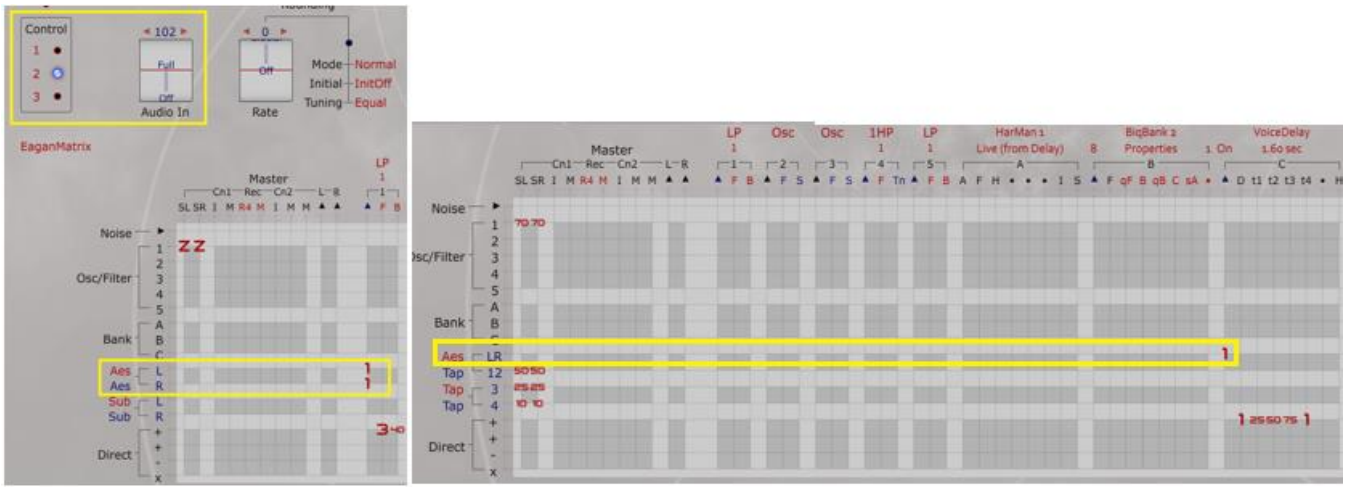
12.23. Using Continuum as a DSP Processor



The continuum can be used as an External DSP processor when specifically programmed in the EaganMatrix to take Digital Inputs: AES in Size / Full Size case and SPDIF when using the Slim Continuum. For example you can connect a microphone to an A/D converter and connect that to the Continuum. You can then route the AES inputs in an EaganMatrix preset to be a DSP processor, or you can take the AES input and integrate it into a preset that also uses Continuum Sound modelling in combination. With the exception of the ContinuuMini that does not support digital I/O, you can also connect one Continuum's digital I/O directly to another if you want to process the digital output from on as the digital input to another.

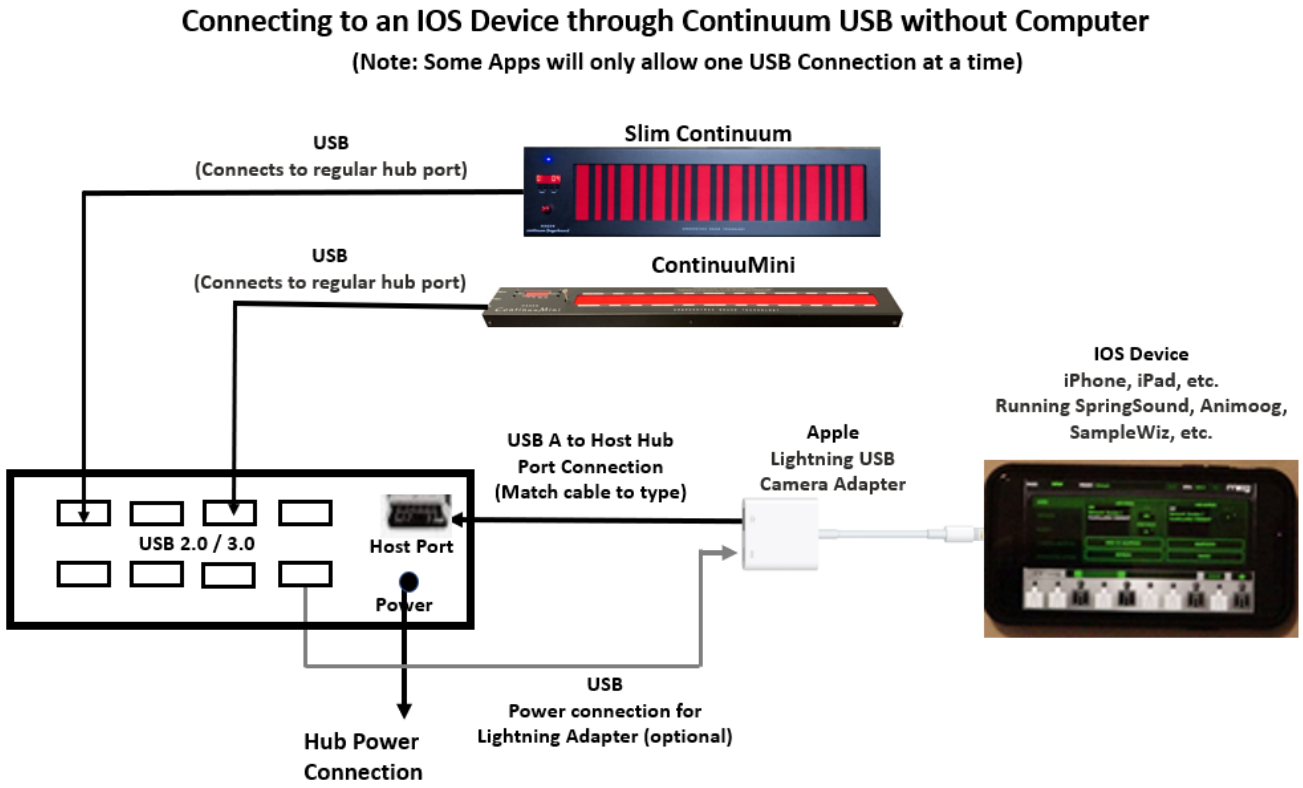
Make sure you turn up the Control Panel 2 "Audio In" on the Continuum that processes the digital audio. A simple preset example follows (left side of the two). Note it turns up the "Audio In" and sends Stereo AES inputs into a Low Pass filter that are then routed to outputs using the standard Z pressure function. Any EaganMatrix component that processes audio input can be used to create a wide variety of real time audio DSP and sound processing options (including the Live from Delay Harman/ModMan functions if you send the external audio into a delay).

Note that if you are only processing a single digital channel (for example AES L that is connected to a microphone) you will not then use both AES inputs into the Matrix. If you want to use all Taps in addition to AES inputs, a second option is available in the matrix to allow both to be programmed. The right side preset below takes a microphone input and sends it into a tapped VoiceDelay allowing multiple delay percentages to be output on each tap. No fingerboard use is assumed – it's a simple stand-alone DSP processor. As you can see, there is a world of DSP processing possibilities for manipulating external audio either as a stand-alone external processor or in combination with other preset functions.



12.24. Connecting an IOS App to ContinuuMini (USB Host based Continuum Connection)

Many may want to play the SpringSound app or perhaps Animoog, SampleWIz or some other sound app from the ContinuuMini without a computer. The following setup should allow you to do that. Note that these application also can often support Bluetooth Midi and RPT Networked Midi interfaces, but this example assumes a simple Apple Camera Adapter interface (and a lightning connector).



Note that there are other IOS connection options such as using iConnectivity Midi Host connections on MIOXM. XL or Audio 4+ devices in addition to other Midi host connection options.

12.25. Connecting an IOS App to Half or Full Size Continuum through Bluetooth Interface

Many may want to play an IOS app such as Animoog through a Bluetooth interface assuming the app supports it. The Yamaha MD-BT01 has been tested and works for this use case. The SpringSound app has also been tested to work with Continuum using this interface. The connection diagram follows:

Connecting to an IOS Device to Half/Full Size Continuum with Bluetooth (without Computer)



1. Turn off Continuum
2. Plug the Yamaha MD-BT01 into the Midi Din ports (In to In, Out to Out)
3. Turn On Continuum, light on MD-BT01 should start blinking



4. On your IOS device bring up app supporting Bluetooth
5. Select the MD-BT01 interface and pair. Light on MD-BT01 should go solid red
6. Set App to use the interface and set app MIDI parameters as desired (pitch bend, MPE or Omni mode, etc)
7. Continuum Should not be able to play the app

Note: There are other Bluetooth Midi interfaces you can try, but this one has been tested to work with Continuum

12.26. Connecting an IOS App to ContinuuMini or Slim Continuum through Bluetooth Interface

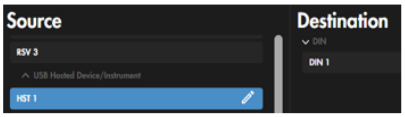
Many may want to play an IOS app such as Animoog through a Bluetooth interface assuming the app supports it. The Yamaha MD-BT01 has been tested and works for this use case in the following setup. Because this is a Midi Bluetooth interface that requires a Midi DIN connection, a Midi USB Host Routing device that also uses Midi DIN ports needs to be used. The iConnectivity MIO XM or XL Midi host interfaces are ideal for this use case. The following Diagram illustrates how to do this:

Connecting to an IOS Device with ContinuuMini or Slim Continuum with Bluetooth (without Computer – using Yamaha MD-BT01 and iConnectivity MIO XM)



1. Connect Mio XM's USB cable to Computer and turn on
2. Plug the Yamaha MD-BT01 into a Mio XM Midi DIN Port – support DIN 1)
3. Plug the ContinuuMini or Slim Continuum USB cable into a spare host port on the Mio XM. Remember the HST port on XM will be in the order plugged in unless a Host reservation has been made. In this case, it will be HST1.
4. Turn On/Power Mio, light on MD-BT01 should start blinking.
5. Run the iConnectivity Auricle app and route HST1 to DIN1 (DIN1 also should route to itself). Once configured Computer can be removed.

iConnectivity Auricle Application (on PC or MAC)





6. On your IOS device bring up app supporting Bluetooth
7. Select the MD-BT01 interface and pair. Light on MD-BT01 should go solid red
8. Set App to use the interface and set app MIDI parameters as desired (pitch bend, MPE or Omni mode, etc)
9. Continuum Should not be able to play the app

Note: There are other Bluetooth Midi interfaces you can try, but this one has been tested to work with Continuum. The Slim connection would be the same as the ContinuuMini (only one might be supported by the app at a time)

12.27. Connecting a ContinuuMini to Evaton Technologies uCVC

The Evaton Technologies uCVC is ideal for connecting the ContinuuMini to a modular for those who use Eurorack. The uCVC is available from Evaton Technologies. Order the proper cable for ContinuuMini as it will also work with a Continuum. The uCVC is a monophonic Eurorack card, however you can daisy chain up to two of them which will allow you to support the full two voice output of the ContinuuMini. Note: The CVC will also work with the ContinuuMini using the correct cable detailed in ContinuuMini section of this manual. The Setup for using the uCVC with the ContinuuMini follows:

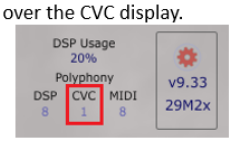
Using the Evaton Technologies uCVC with ContinuuMini





Haken Editor will display CVC=1 in stats if it is detected and CVC device will display if you hover over the CVC display.

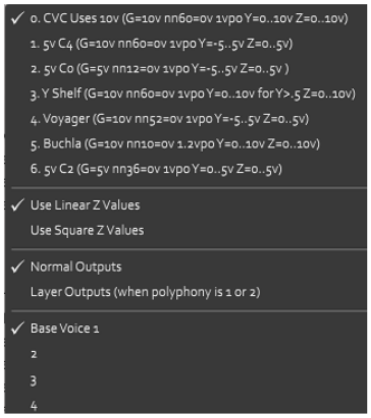




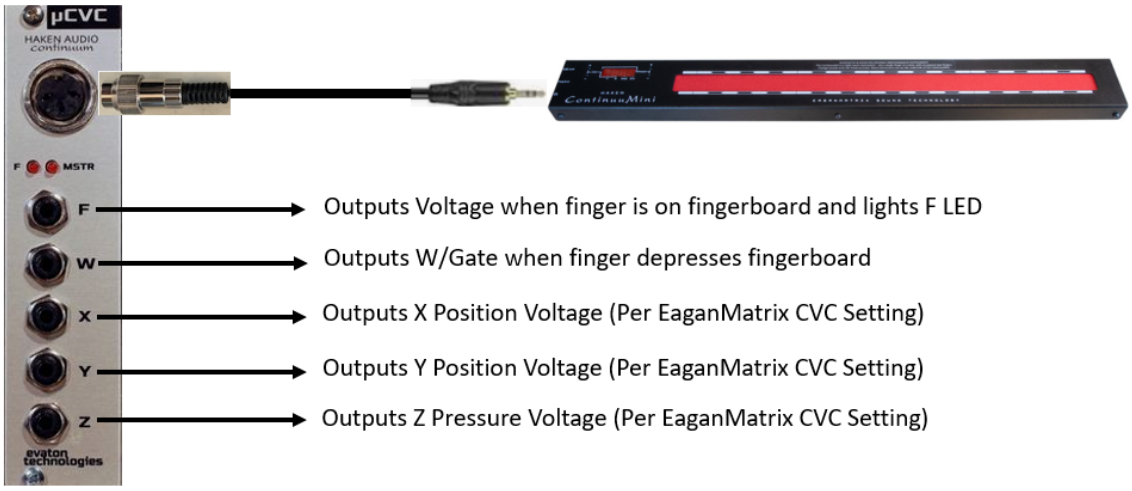
Steps

1. Connect uCVC Cable to uCVC and Ped/Ext Input on ContinuuMini (when ordering uCVC specify ContinuuMini or Continuum to get the proper cable).
2. Oct +/- to Enter Menu System and set ContinuuMini i2C setting to 1 (from default 0 pedal setting). Then Oct +/- to Exit Menu System
3. Connect the uCVC outputs as desired
4. Bring up Haken Editor (after uCVC is connected and powered). Verify CVC is connected
5. Set CVC settings as required for the device you are connecting to in CVC settings (in Control Panel 3).
6. Play ContinuuMini and uCVC will output
7. Note: You can chain two uCVCs together to play two voice polyphony. See Evaton Technologies documentation. If you only have one uCVC, it's best to set your EaganMatrix ContinuuMini preset to Polyphony 1 – so you don't have to worry about dropped notes if you mistakenly play polyphonically. If you are not playing along with ContinuuMini analog output, just set an Empty preset to Polyphony 1. If properly connected the Editor will display the CVC as active.

EaganMatrix CVC Options (Match to your device)



uCVC Operation

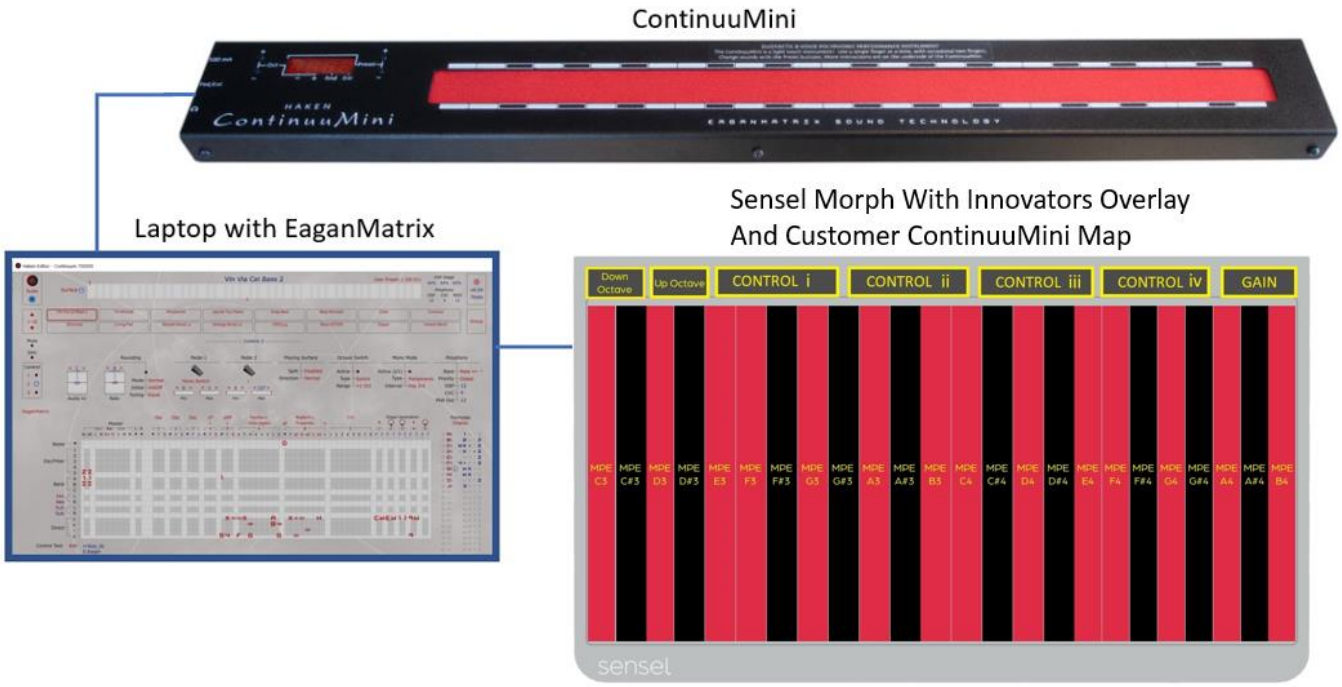


- F → Outputs Voltage when finger is on fingerboard and lights F LED
- W → Outputs W/Gate when finger depresses fingerboard
- X → Outputs X Position Voltage (Per EaganMatrix CVC Setting)
- Y → Outputs Y Position Voltage (Per EaganMatrix CVC Setting)
- Z → Outputs Z Pressure Voltage (Per EaganMatrix CVC Setting)

12.28. Using Sensel Morph with ContinuuMini (or Continuum)

The Sensel Morph (paired with the Innovator's Overlay that allows you to create a custom graphic map to emulate the fingerboard) allows you to create an emulation to the ContinuuMini playing technique and as a bonus gives you an expanded Y area almost identical in width to the Continuum. Because the Morph does not allow dynamic Pitch bend scaling, the map has to use the scaling of the Morph's Piano keyboard overlay which requires the fingerboard note widths to be less than the width on the ContinuuMini, but it is still playable and a very nice adjunct to the ContinuuMini fingerboard for those who want expanded Y control. You can also add support for Bespoke Controls and other functions. It can be used like any USB Midi Controller either connected as an external input in the Haken Editor or as a stand-alone controller used with a Midi Host.

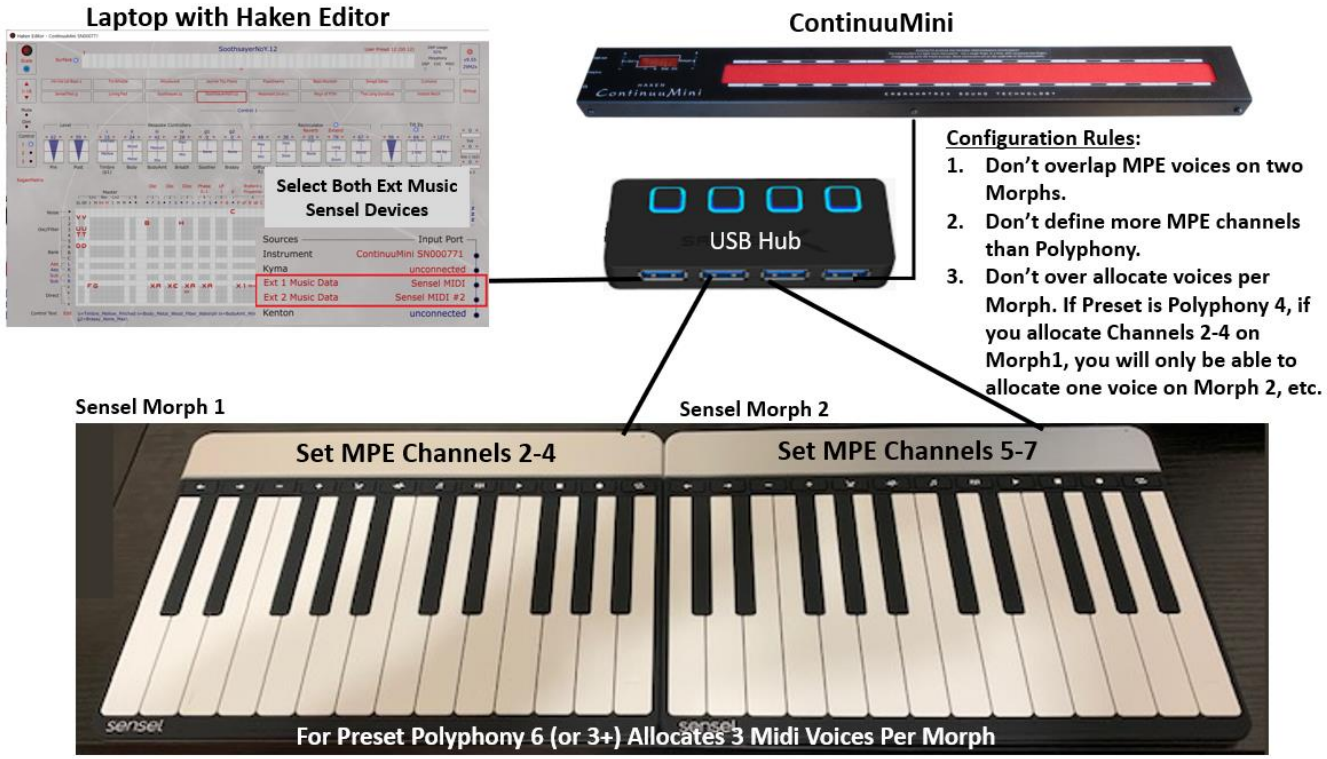
The Morph editor allows you to assign MPE XYZ blocks to create a fingerboard that will send Midi on Channels 2-Max Polyphony you play. Aftertouch and Y=CC74 are supported. You can also add Octave Up/Down buttons and CC sliding controls, Pre/Post Level, etc. A Morph generic map for ContinuuMini has been created shown below that allows for pitch bend through the octave (if using this map, set Pitch bend in your preset to 12). YOU even customize a special control interface for specific presets that can be used in conjunction with the ContinuuMini or Continuum.



12.29. Using Multiple MPE External Controllers (i.e. two Sensel Morphs) with ContinuuMini

You can connect two External Midi USB devices as External Music inputs to the Haken Editor (or directly using a USB Midi Host). The example here is using two Sensel Morphs to create an extended range keyboard-like controller for the ContinuuMini, basically turning it into a "Slim-47". In these multiple MPE-based external music controller configurations you need to be mindful of a few things:

1. Do not allocate more MPE voices between your multiple MPE instruments than Polyphony available the preset being played. You can get Midi channel dropouts if you play on More MPE channels than the preset expects. For example if the preset is set to Polyphony 4 on the ContinuuMini and 4 Midi channels are displayed. You should only play on Channels 2-5. Set your Min and max MPE channel output accordingly.
2. Do not play the same MPE channel simultaneously on two MPE controllers. You can get dropouts or erratic output. If you assign MPE channel 2 to one device, you should not allow channel 2 to be output on the second device. It's best to always use Low Priority so you can track what channels are being output (the Morph uses Low Priority).
3. Make sure you allocate Channels for best playing without overallocation. If you have Polyphony 6, for example, if you configure and play on channels 2-5 on the first MPE device, you will only be able to play on two channels (6 & 7) on the other. In this case it may be best to split three channels on one controller (2-4) and the remaining three channels (5-7) on the other. This can be a challenge on some presets that have low Polyphony (like VlnVlaVlcBass presets) that only allow 3 Midi channels in the default preset. Try adding ore polyphony in this case until the preset does not play as expected if you want to play with more polyphony on the Morphs.



13. Hardware Maintenance for the Continuum Fingerboard

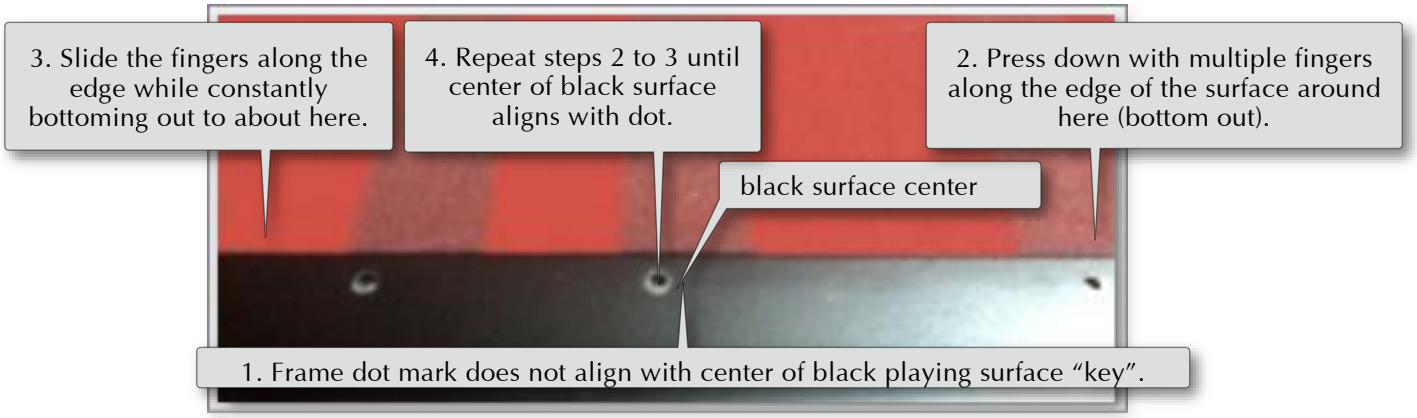
ContinuuMini players may wish to skip to section 14, as the next sections are specific to the Full-size and Half-size Continuum Fingerboard.

13.1. Cleaning

The Continuum Fingerboard can be treated much like any modern electronic device. If you feel the Continuum Fingerboard playing surface or body requires cleaning, wipe with a slightly damp cloth. If necessary, you can use a cleaning agent like Windex. Never spray a cleaning material directly on the Continuum Fingerboard. As with any electronic device avoid all accidental liquid spills.

13.2. Surface Alignment (Half-Size and Full-Size Models Only)

A Continuum Fingerboard with a plain (unmarked) playing surface does not have surface alignment problems. But Continuum Fingerboards that have reference markings on the playing surface must have the marked areas on the playing surface aligned with the precise dot markings on the frame around the playing surface. The playing surface may eventually come out of alignment, sometimes due to overly vigorous playing. To correct this surface alignment problem, press multiple fingers on the playing surface and move it into position. Refer to the step-by-step instructions in the diagram below.



Depending on the model of your hardware, your Continuum Fingerboard may have screws on the sides of the top frame, as shown in the images below. A half-size of this design will have 6 such screws, a full-size will have 8.

Loosening these screws by **a single turn** may make it easier to adjust the surface. After you have done the





adjustment, tighten the screws with **a single turn** — do not over-tighten the screws.

If you have trouble getting good surface alignment, please contact Haken Audio. Please do not open up your Continuum Fingerboard without instructions from Haken Audio; hundreds of springs may come out of position in the playing surface unless the proper procedure is followed.

13.3. Continuum Fingerboard Hardware Problems

Applies to Half-Size and Full-Size Continuums only.

If you suspect your Continuum Fingerboard is not functioning properly, please try the following:

If you have trouble with your USB-Midi cable:
(1) Try resetting the USB-Midi cable by unplugging and re-plugging its USB connector.
(2) If you continue to have problems, try connecting your USB-Midi cable through a **powered USB hub**.

If you are using an external synthesizer, reset and test your synthesizer:
Power cycle and do a full reset on your synthesizer, then test the synthesizer with a standard Midi keyboard, to ensure the synthesizer is in a known working configuration.

Discard Calibration:
Discard the calibration, then follow the calibration procedure described in Section 7.

Try the built-in synthesizer:
Connect headphones and play internal sounds. If this works, then you probably have a Midi configuration problem.

Discard all Internal User Presets and reconfigure:
Discard all the presets using Options then 127, as outlined in Section 10.19. Use Section 10 to guide you in reconfiguring your Midi encoding.

Perform the Factory Calibration:
Please contact technical support before you resort to this. The Factory Calibration is described in Section 13.7.

Boot in "Safe Mode":
Please contact technical support before you resort to this. If you suspect problems with your firmware, you can revert to the factory-programmed firmware. Turn off power, press and hold the Red Button, then turn on the

power as you keep the button pressed. Wait until power-up completes and the light flashes dim blue before you release the button. The light will continue to flash all the time, indicating a Safe Mode boot. You will need to recalibrate and set configuration options.

Other things to try:
If you are still having problems, please contact technical support. It may be that new firmware will correct the problem you are seeing. If it is a hardware problem, the procedures below may be effective in hiding the problem, but it is important to inform tech support so that any necessary repairs can be made as soon as possible. You can have Haken Audio make repairs, or (for most repairs) you can obtain instructions from Haken Audio to make the repairs yourself.

13.4. Sensor Stuck On, or Sensor Intermittently Turn On

Applies to Half-Size and Full-Size Continuums only.

The Continuum Fingerboard has hundreds of Hall-Effect sensors. In the unlikely event that a sensor has a hardware failure, this can cause a sensor to be stuck on, or intermittently turn on, causing spurious notes. To quiet such a sensor, press and release the Red Button, then touch "Calibrate", then value "1". This will set the at-rest threshold for the sensors and should quiet any sensor that was active while you first pressed the button. This procedure is necessary even if there is no hardware problem, if you have Light Action (Section 10.19) selected.

13.5. Sensor Stuck Off – Scan File

If a normalized sensor value is stuck off, this can cause gross discontinuities in pitch (more than 40 cent jumps) on the Continuum Fingerboard's playing surface, or it can cause two notes to sound (with pitches about 85 cents apart) for a single finger. Please contact technical support to discuss the situation and verify the cause of the problems – pitch discontinuities and note doubling can be caused by Midi problems and other problems as well. If the problem is due to misbehaving sensors, Haken Audio e can provide a customized Scan File for your Continuum, which will resolve the issues

13.6. Factory Calibration of the Continuum Fingerboard

At the end of a Continuum Fingerboard's manufacturing process, a Factory Calibration is done. Factory Calibration is a one-time procedure and need not be repeated. Continuum Fingerboard owners need to know how to refine calibration and discard calibration (Section 7), but this three-step Factory Calibration is only described here for completeness. Do not undertake it without first contacting Haken Audio support.

13.7.1 Factory Calibration of "Slim" Continuum Fingerboards

This procedure only applies to "Slim" Continuum Fingerboards.

1. Enter the "Cal" option in the Menu system
2. Press "Preset –". The LED Panel will show "Discard".
3. Then **simultaneously** press "Octave –" with "Preset –" and hold for a few seconds until "FACtRY" appears on the LED panel.
4. Run the fingers up and down front and back, near and far side, all the way under left and right ends, at forte pressure. Maybe use back of finger's fingernail surface to slide easily. Be sure to include all the way under the

left and right end at the arrowheads with your finger – many people lift up their finger early and do not get the very ends.



5. Press Red Knob to exit Factory Calibration procedure.
6. In "Cal" menu, press "Preset –" twice to discard calibration. Holding the "discard" labelled button down for a second or two each time is recommended (makes it collect new data for longer)
7. Exit System Menu ("Octave –" together with "Octave +")
8. You should not need this step, but if there are any "stuck notes" when playing after the procedure, enter "Cal" menu again and Refine Calibration (in the Cal Menu Press "Preset +") then exit the Menu System.
9. Also look at Actuation for additional surface refinement in Firmware 9.40 and later (though this is not part of factory calibration)

13.7.2 Factory Calibration of Half-Size and Full-Size Continuum Fingerboards

This procedure only applies to Half-Size and Full-Size Continuum Fingerboards.

1. Make sure nothing is pressing on the Continuum Fingerboard (no fingers or other objects on the playing surface or frame). Press and release the Red Button, then touch at "Calibrate", then "120+", then "7". Now the Continuum's LED should shine bright white, and (if the Haken Editor is running) the Editor will display a special message for Factory Calibration.
2. Slowly drag the back of a fingernail (to minimize friction) horizontally across the whole span of the playing surface (from one end all the way to the other) several times, using a forte finger pressure. Do this a few times next to the front edge of the playing surface, and also next to the back edge of the playing surface. Be sure to include the very ends of the surface.
3. Next, make sure nothing is pressing on the Continuum Fingerboard (no fingers or other objects on the playing surface or frame), then press and release the Red Button. The LED will now shine dim blue, indicating normal operation.

13.7. Factory Alignment of the "Slim" Continuum Fingerboard

Note: This procedure only applies to "Slim" Continuum Fingerboards, not the Half-Size and Full-Size models. It should not be needed but is included for completeness. Please contact Haken Audio to determine if you should perform it.

Surface alignment is performed at the factory and should not be required, however, at times, particularly after shipping or possibly on a firmware upgrade you may notice that pitch is not consistent across the fingerboard surface. This procedure changes the alignment in software, so that the surface stays physically the same but the alignment procedure fixes the offsets.

Note that your fingerboard may be consistently out of tune across the fingerboard. This typically is caused by the Fine Tune adjustment in Midi and Global Settings being set to a non-zero offset value. If that is your problem the alignment procedure is not required and will not solve the issue.

Warning: Do not try and open up the Continuum or physically readjust the fingerboard surface. Please contact Haken Audio if you think your Continuum needs factory calibration or alignment readjustment.

To perform a firmware alignment of the fingerboard surface:

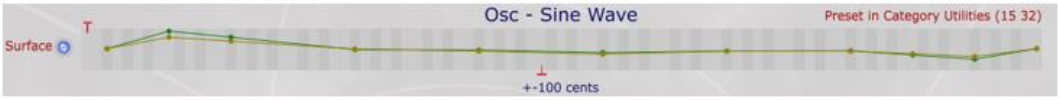
1. In the Editor, under Surface at the top left, turn on the trim graph: Select "Show Trim Values".
2. Choose a Preset that does not use the trim graph, so the trim graph is clear (as the trim graph will give you visual feedback that it is updating alignment points.) Suggestion: "Utilities/OSC Sine Wave" preset. You should see a straight trim line across the surface area.
3. On the Continuum, bring up the Menu System navigate to the Calibration ("Cal") menu.
4. Hold down the "Preset –" button, and while holding it down press "Preset +" (Note: Not simultaneous, "Preset –" first and then while holding hat "Preset +"). The display should change to "ALIGN". (If you pressed together it will enter factory calibration mode).
5. Use a capped sharpie pen (ONLY THE BUTT END) or some implement that can act as a "thin" finger, but nothing too sharp that will damage the playing surface.
6. At Y=0, press the implement into the center of an F#, and as holding it down press the "Preset +" button. The trim graph should reflect the offset, if any.
7. Repeat for all F#s and the highest C, making sure you move your body each time to look at the note straight on, to avoid any errors from a parallax viewing point. Record each point by pressing the "Preset +" button each time.
8. Now repeat for all F#s and high C for Y=1.
9. If everything finishes correctly, you should see that the graph extrapolates off the far ends (left and right).
10. When all done, hit "Preset –", and the trim graph will return to normal and store the Surface Alignment. Exit Menu System (Octave "+" with Octave "–")

Factory Alignment Procedure – Should not be needed (performed at the factory)

Step 1 – Display Trim values. In Haken Editor turn surface display on and Show Trim Values. Pick a preset with flat trim (like Sine Wave)

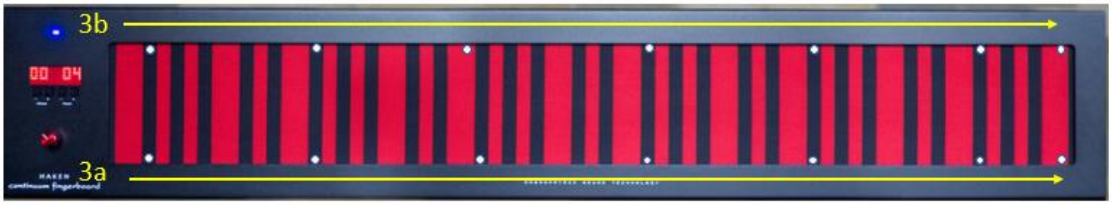


Step 2 – Enter ALIGN MODE. Enter Menu System ("Octave +" together with "Octave –"). Navigate to "Cal". Press "Preset –" and then while holding that press "Preset + to enter ALIGN mode. LED screen should say "ALIGN". Trim alignment map should appear on surface display.



Step 3a – Perform Alignment Process. Take a small but **blunt** tip object so you don't damage the fingerboard surface (like a Sharpie butt end or ¼ cable tip) and press at Y0 of the lowest F# in the center of the note and then press "Preset +" to store alignment value and trim on screen may change.

Step 3b - Repeat for All F#s. Then do the same on the highest C. Now repeat at Y1. Press the lowest F# in center of note and then press "Preset +". Repeat for All F#s. Then do the same on the highest C.



Example using "Slim" 70 half-step model. 46 Half-Step model procedure is the same – only less notes to push to align.

Step 4 – Exit ALIGN Mode back to playing mode. Press "Preset –" to exit ALIGN mode back to "Cal" menu. You should see the flat trim line you started with. Exit Menu System ("Octave +" together with "Octave –").

Factory Alignment Procedure Sequence

13.8. Do - It - Yourself Repairs and Adjustments (Contact Haken Audio)

Applies to Half-Size and Full-Size Continuums only.

If you loosen the screws in the Continuum Fingerboard, hundreds of springs inside your Continuum Fingerboard may slide out of position, causing serious damage to your instrument. If you wish to perform modifications or repairs on your Continuum Fingerboard, please discuss your situation with Haken Audio technical support and obtain an up-to-date Continuum Fingerboard Repair Manual. After you read the repair manual, you can decide if you would rather have Haken Audio do the repairs for you.

14. Performance Controller Assignments

Midi controller data sent to the Continuum Fingerboard and ContinuuMini on Midi channels 1 and 2 has special functionality. This functionality allows external Midi controller of performance parameters that are normally available as pedal performance controls on the Continuum and ContinuuMini.

14.1. Sending Midi Performance Values to the Continuum Fingerboard

If you use a third-party device (or software) to supply performance controller Midi values to the Continuum Fingerboard or ContinuuMini, you have the choice of using relative or absolute encoding.

Use Midi channel 2 for relative encoding. Send a pedal cc from the table below on channel 2 and use data value 63 to decrease the data value by 1, or 65 to increase by one. The relative change will be DataValue-64. If you send only values 63 and 65, the Continuum will automatically implement an acceleration algorithm for repeated decrements or increments. This feature is used with early-firmware Arturia BeatStep to work around bugs in the BeatStep's native acceleration (for more information on the BeatStep, see Sections 6.7, 12.17 and 12.18).

Use Midi channel 1 for absolute data encoding. Send a pedal cc from the table below on channel 1, with data value 0 to 127.

You can either connect your device directly to the Continuum Fingerboard's Midi In jack, or, if the Haken Editor is running, connect via the External Device ("Ext") controls (with "Music Data" or "All Data" selected) in the "Midi and Global Settings" (see Section 12 for examples).

14.2. Receiving Midi Performance values from the Continuum Fingerboard

If you want third-party software (or a device) to receive performance pedal values from the Continuum Fingerboard, connect it via the "Ext Synth" connection (with "Config Data" or "All Data" selected) in "Midi and Global Settings" (see Section 12). The performance pedals will be encoded with the cc numbers from the table below on channel 1, and the data value will be absolute from 0 to 127.

14.3. Assignments

Channel 1 (Control Messages)	
cc 8 Octave Shift	Shift the playing surface by one octave down (value 48) or one octave up (value 72), or no octave shift (value 60). Regular switch pedals, as well as the Tri-Value pedal, can generate cc 8. The shift values generated by may be configured to shift a different number of octaves (see cc 54 in Section 15.1, and Section 10.19).
cc 9 Mono Switch	The Mono Switch enables single-note lines when Polyphony is greater than 1, for notes that are within the Mono Interval (see cc 48 below, and Sections 6.3 and 10.13).
cc 10 Fine Tune	Fine Tune control, in cents. 64 is normal, 63 is one cent flat, 65 is one cent sharp.
cc 12 i	The Continuum Fingerboard's internal sound parameter "i" – maps to Bespoke Control "i". This may also be set using the Continuum Menu System or on Half and Full size models the Overlay Strip's "i".

Channel 1 (Control Messages)	
cc 13 ii	The Continuum Fingerboard's internal sound parameter "ii" - – maps to Bespoke Control "ii". This may also be set using the Continuum Menu System or on Half and Full size models the Overlay Strip's "ii".
cc 14 iii	The Continuum Fingerboard's internal sound parameter "iii" - – maps to Bespoke Control "iii". This may also be set using the Continuum Menu System or on Half and Full size models the Overlay Strip's "iii".
cc 15 iv	The Continuum Fingerboard's internal sound parameter "iv" - – maps to Bespoke Control "iv". This may also be set using the Continuum Menu System or on Half and Full size models the Overlay Strip's "iv".
cc 16 g1 (old Gen1) cc 17 g2 (Old Gen2)	g1 and g2 Bespoke Controls are used with the EaganMatrix. g1 is also is used to control release time for certain Specialty Sounds. These now function identically to i, ii, iii and iv in the EaganMatrix.
cc 18 Level (Post)	Output post Master Section level of the internal sound. (Previous Gain control) See Section 10.1.
cc 19 AES Input Level	Level for AES/SPDIF digital input.
cc 20 R1	Recirculator control R1, 0 (minimum) to 127 (maximum). The EaganMatrix's Master Section can provide an offset to the cc 20 value, scaled 0..1. Depending on the setting this controls Diffuse, ModDepth, Noise, LPF or HPF).
cc 21 R2	Recirculator control R2, 0 (minimum) to 127 (maximum). The EaganMatrix's Master Section can provide an offset to the cc 21 value, scaled 0..1. Depending on the setting this controls Damping, ModRate, or Offset.
cc 22 R3	Recirculator control R3, 0 (minimum) to 127 (maximum). The EaganMatrix's Master Section can provide an offset to the cc 22 value, scaled 0..1. Depending on the setting this controls Darkness or Feedback.
cc 23 R4	Recirculator control R4, 0 (minimum) to 127 (maximum). The EaganMatrix's Master Section can provide an offset to the cc 23 value, scaled 0..1. Depending on the setting this controls Decay or Time. Note: Controls "EfT" in Continuum Menu System.
cc 24 Recirculator Mix	Mix between recirculator output and dry signal. 0 = 100% dry, 127 = 100% recirculator. The EaganMatrix's Master Section can provide an offset to the cc 24 value, scaled 0..1. Note: Controls "EfL" in Continuum Menu System.
cc 25 Round Rate	Sets the rate for the Continuum Fingerboard's finger position rounding feature (see Sections 6.4 and 10.15). Note: Controls "RrT" in Continuum Menu System.
cc 26 Level (Pre)	Pre Master Section Level Control (new to firmware 9.53)
cc 27 Attenuation	Controls output attenuation. Value can be set from 0 (-24dB) to 127 (0dB). Note: Equivalent to turning attenuation knob on "Slim" continuums. Not supported on half-size, full-size continuums or ContinuuMini.
cc 28 Round Initial	Round initial finger positions to nearest half step (or nearest point in the current Pitch Table). Note: Controls "RIn" in Continuum Menu System.

Channel 1 (Control Messages)	
cc 31 Advance	Advance to next User Preset (value 127, also called "Full Advance"), or to next preset within a Combination Preset (value 64, also called "Half Advance"; see Section 8.9). *The ideal Advance pedal is a Tri-Value pedal, which does both Full Advance and Half Advance (see Section 6.5). A Yamaha switch pedal by default does only Full Advance but can be changed to Half Advance by setting Pedal Max to 64 (see Section 10.18).*
cc 65 Equal	This is used to temporarily disable rounding, and to temporarily ignore the selected Pitch Table. Value 0 ignores rounding; value 64 does the rounding specified by the preset; value 127 does rounding but uses the Equal scale (ignores the preset's Pitch Table).
cc 64 Sustain cc 66 Sostenuto 1 cc 69 Sostenuto 2	The Continuum Fingerboard supports one sustain and two sostenuto pedals. These pedals are dynamic: if the pedal's data value is 127, the sustain or sostenuto will be at full volume; smaller pedal values can be used for lower volume (if you use a continuous-valued pedal as opposed to a switch pedal). The Continuum Fingerboard will wait until the sustain or sostenuto pedal is released before it sends Midi Note Off. If you use a continuous-valued pedal and release it gradually, the sustained notes will fade out. If you use the two sostenuto pedals at the same time, you can control two sets of sostenuto notes.
cc 83 Eq Tilt	This is used to set the Eq Tilt value. Sets the Eq balance between lower frequencies and higher frequencies. Can be set from 0 to 127. A value of 64 sets the balance to be flat. The further one goes to each extreme, the sharper the eq slope is. In this way in can be used for subtle shaping or major shaping.
cc 84 Eq Frequency	This is used to set the Eq Frequency crossover point between the filters. Can be set to a value from 0 (120Hz) to 127 (15Khz).
cc 85 Eq Mix (Level)	This is used to set the Eq wet/dry Mix ratio. A value of 0 means EQ is bypassed, 64 means half-filtered half-dry, 127 means all EQ.

15. Configuration Controller Assignments

15.1. Load, Store, and List Presets

Channel 16		
cc 0 (category) cc 32 (preset) Load Preset	Select Category with cc 0; first preset in Category will be activated. Select Preset Within Category using cc 32. Alternative method for loading preset: cc 81 and cc 82 (see below). Note: For firmware versions 9.1 and later, the User Preset Category (Category 0, cc0=0) is expanded to allow for storage of up to 128 presets. To set User presets send cc=0 followed by cc32 = 0-127 to load the desired preset.	Category and Preset within Category
cc 81 (lsb) cc 82 (msb) Load Preset	Load User Preset Slot (Section 8.6) with values 1-16. Load System Preset with values 17-511 (add 17 to system preset #), The 7 LSBs (cc 81) *must always be* followed by the MSBs (cc 82). cc81=1-16, cc82=0 (User Presets 1-16) cc81=17-127, cc82=0 (System Presets 17-110) cc81=0-127, cc82=1 (System Presets 111-238) cc81=0-127, cc82=2 (System Presets 239-366)	Absolute preset number: 1-16 Load User Preset, 17-511 System Preset
cc 109 Store Config	Store current configuration and store global settings to flash.	8 store config
cc 57 (lsb) cc 58 (msb) Store Preset	Store User Preset Slot (Section 8.6) with values 1-16. Store System Preset with values 17-511 (*for Editor use only*). The 7 LSBs (cc 57) *must always be* followed by the MSBs (cc 58).	Absolute preset number: 1-16 Store User Preset, 17-511 System Presets
cc 109 Demo Setup	Load 16 demo presets into User Preset Slots and transmit names of the 16 demo presets using cc 56 Text (see below).	39 demo setup
cc 109 Transmit Config	Transmit the current configuration on its Midi Out jack, using the same Midi messages used to download the configuration.	16 transmit config
cc 55, bit 0 Transmit Updates	The Continuum Fingerboard will automatically transmit the current configuration whenever the configuration changes, using the same Midi messages used to download configurations.	0 no updates (default), 1 transmit updates
cc 109 Transmit Names	Transmit names of 16 User Preset Slots and all System Presets, using cc 56 Text (see below). Category names will be included.	32 transmit names
cc 56 Text	Identifies the Ascii text that follows; included in the Continuum Fingerboard's response to Transmit Config, Transmit Updates, and Transmit Names (see above). Ascii data is transmitted as channel 16 channel pressure, terminated by value 127. Finally, if text is a preset name, cc 57 and 58 (see above) identify the preset number.	0 preset name, 1 preset text, 8 category name

15.2. Midi Device Compatibility

Channel 16		
cc 61, bit 3 Kyma Mode	Communicate with Symbolic Sound's Kyma; automatically update polyphony and multi-split as Sounds are loaded within Kyma; if the Haken Editor is running and has a Midi keyboard as ExtDevice, the Continuum will channelize the keyboard data (one note per Midi channel) allowing both keyboard and Continuum.	1 to activate, 0 is default
cc 109 Low Power Bluetooth	Use 5% of Midi Data Rate, for Low Power Bluetooth Midi. This data rate is much too slow for Continuum playing, but convenient for configuration with wireless Continuum Remote apps.	38 5% Midi rate, 37 33% Midi rate, 36 100% Midi rate
cc 117 Loopback Detect	When receiving Midi input, the Continuum outputs cc 117 once per second to test for Midi loopback. Both Channel 16 and Channel 1 are checked with this mechanism.	0-127 random data

15.3. X, Y, and Z Coding

Channel 16		
cc 44 Middle C	Midi note number corresponding to middle C position.	0-127 60 is default
cc 54 Octave Shift Configuration	Midi note number corresponding to middle C position while the Octave Shift is active. This value and 60 minus this value will be encoded in the Octave Shift (cc 8) if the Tri-Value pedal is used.	0-127, 48 is -1 octave, 72 is +1 octave
cc 40 X Bend Range	Number of half steps for Midi Pitch Bends. Values > 96 indicate MPE+ bend range of 96, with ch1 input bend range = Value-95.	1-96 bend range >96 MPE+ ch1 range
cc 41 Y Controller Assignment	Controller assignment for finger Y position (front-back). No value is transmitted for Y if the controller assignment is 0. Controller assignment 127 will transmit using cc 74, without shelving at the extremes of the Y range.	1-127, 74 is default, 0 no output
cc 42 Z Controller Assignment	Controller assignment for finger Z position (pressure). Special value 127 selects MPE encoding: Channel Pressure for Z, ch 1 cc 127 for polyphony, ch 2 RPN 0 for pitch bend range (see Section 10.9). No value is transmitted for Z if the controller assignment is 0. Value 70 selects MPE+ Encoding (see Section 10.9 for details).	1-69 to select Z cc, 70 MPE+ (default), 127 MPE, 0 no output

Channel 16		
cc 43, bits 0-2 Midi Note Processing	A value of 0 sets the Note On velocity to a constant maximum (127). A value of 1 encodes initial finger velocity in the Note On velocity byte. Value 2 encodes Note On velocity computed by EaganMatrix formula V. Value 3 avoids transmitting any Note On, Note Off, or Pitch Bend messages. Value 4 makes the Continuum act as a 3-d ribbon controller, providing pitch bends for an external Midi keyboard. Value 5 always uses 60 for the Midi key number, and all bends are referenced from Middle C. Value 6 enables special Kyma processing. See Section 10.10 for details.	0 constant 127, 1 velocity, 2 formula, 3 no note output, 4 External Note mode, 5 Ethervox mode, 6 Kyma mode

15.4. Rounding and Pitch Tables

See Section 14.3 for the Round Rate controller. The following configuration affects how Round Rate is used.

Channel 16		
cc 61, bit 1 Release Only	Round rate has effect only after finger is lifted from surface (during release portion of note).	1 to activate, 0 is default
cc 51 Select Pitch Table	Select Pitch Table for Round Initial, Round Rate, and surface pitch warping. 60..71 for Just tuning with C..B tonic center. 1..50 for n-tone Equal tuning, with n divisions per octave. 80..87 for a user-defined downloadable Pitch Tables (see Section 6.4)	1-50 n-tone Equal, 60-71 Just, 80-87 custom, 0 is default
cc 61, bit 0 Reverse Pitches	Reverse X so that high pitches are to the left and lower pitches are to the right.	1 to activate, 0 is default

15.5. Polyphony, Routing, and Split

Channel 16		
cc 39 Polyphony	Base polyphony, and two flags: Allow Increased Sample Computation Rate and Allow Expanded Polyphony.	1-16, +32 Increased Rate, +64 Allow Expand Poly
cc 49, bits 2-4 Channel Priority	Select how new notes get assigned to Midi channels: Oldest (assign the new note to the Least Recently Used channel), Same (assign to channel that played the same pitch), or Lowest (assign to the lowest channel number that is available). Select High 1, High 2, High 3, or High 4 to restrict notes from the playing surface to the highest Midi channel(s) within the polyphony (see Section 10.6).	0 Oldest, 1 Same, 2 Lowest, 3-6 High 1 to 4
cc 36, bits 0-2 Surface Routing	The Continuum Fingerboard's surface activity may be merged to any or all of the following: Midi Out, Continuum Voltage Converter (CVC), and Internal Sound.	bit 0 for Midi Out, bit 1 for Internal, bit 2 for CVC

Channel 16		
cc 36, bits 3-5 Midi In Routing	The Continuum Fingerboard's Midi In may be merged to any or all of the following: Midi Out, Continuum Voltage Converter (CVC), and Internal Sound.	bit 3 for Midi Out, bit 4 for Internal, bit 5 for CVC
cc 45 Split Point	Note number for split point.	0-127, 60 is default
cc 43, bits 3-5 Split Mode	Select split mode (see Section 10.12). An alternative split mechanism, Multi-Split, is described in Section 10.12.	0 off, 1 polyphonic, 2,3 single below/above, 4,5 internal b/a, 6-8 CEE Combination, 9-10 CEE triple

15.6. Pedals (see also Section 14)

Channel 16		
cc 52 Pedal1 Jack	Midi controller assignment for Pedal 1 Jack.	See Section 14, 64 is default
cc 76 Pedal1 Min	Minimum data value for Pedal 1.	0-127, 0 is default
cc 77 Pedal1 Max	Maximum data value for Pedal 1.	0-127, 127 is default
cc 53 Pedal2 Jack	Midi controller assignment for Pedal 2 Jack.	See Section 14ß, 66 is default
cc 78 Pedal2 Min	Minimum data value for Pedal 2.	0-127, 0 is default
cc 79 Pedal2 Max	Maximum data value for Pedal 2.	0-127, 127 is default

15.7. Mono Function

Channel 16		
cc 46 Mono Function Configuration	Select between portamento, legato, and retrigger in single note lines. Transitions can be pressure-based or time-based. See Section 6.3 and Section 10.13.	0 Portamento (default), 1 Legato Z, 2 Retrigger Z, 3 Legato T, 4,5 Retrig New/All

Channel 16		
cc 48 Mono Interval	Sequential notes played within the Mono Interval will be performed as single-note lines. The Mono Switch (see Section 14.3) can be used to enable and disable effect of the Mono Interval during a performance.	0 disables this, 1-96 interval, 0 is default

15.8. Firmware Version and CVC Serial Number

Channel 16		
cc 102 Firmware Version	High 7 bits of firmware version. This is included in the Continuum Fingerboard's response to Transmit Config and Transmit Updates.	0-127
cc 103	Low 7 bits of firmware version.	0-127
cc 104 CVC Serial	Bits 15-14 of 16-bit CVC serial number. The is included in the Continuum Fingerboard's response to Transmit Config and Transmit Updates (see above).	0-3 high bits serial number
cc 105	Bits 13-7 of 16-bit CVC serial number.	0-127 medium bits serial number
cc 106	Bits 6-0 of 16-bit CVC serial number.	0-127 low bits serial number

15.9. Other Configuration Controller Assignments

Channel 16		
cc 35 Midi Program	Transmit Midi program change on each Midi channel used by the Continuum Fingerboard. The Midi program change will be transmitted immediately, and whenever this preset is loaded.	0 disabled, 1-20 Midi program
cc 33, bits 3-4 Aes3 Options	Select the AES3 output sample rate. This rate can be internally generated or slaved to the AES3 input sample rate.	0 96 kHz, 1 Slave, 2 48 kHz
cc 91 Tweak	When the Haken Editor is running, this will modify (tweak) the mouseover parameter in the Editor.	0-127
cc 109 Calibration	Refine calibration, and discard calibration (see Section 7).	35 refine, 34 discard

16. Using the ContinuuMini

ContinuuMini Specific Information

Now that you have your new ContinuuMini, how do you connect, configure and use it to its full potential? This section will get you on your way.

Note: in this section when the term "Continuum" is used, it refers to the half or full-size Haken Continuum, not the ContinuuMini.

Additional Equipment You Might Consider Useful:

All you need to start using your ContinuuMini is a USB power supply (for example your laptop), a USB MINI-B cable (provided) and a 1/8" (3.5mm) TRS stereo cable to connect to your mixer, amplifier or possibly DAW (or a compatible set of headphones). You might also consider purchasing one or more of the following items (or similar items) depending on your needs.

- Mobile Power: APC 3400mAh Mobile Power Pack - APC M3PMBK - or similar (for battery-powered playing). Add a pair of headphones or earbuds and you can play your ContinuuMini anywhere, anytime.
- Pedal Connection: HOSA MHE-100.5 Right Angle 1/8" TRS to 1/4" TRS Adapter. The ContinuuMini supports a single pedal which can be a switched pedal, Continuous pedal or the tri-octave pedal available from Haken Audio. Depending on the preset, you may want to invest in both a switched (perhaps for a sustain) and continuous (perhaps for Controller i, ii, etc.]) pedal.
- RCA Connection: Stereo mini to RCA cable - HOSA CMR-206 - for connection to RCA connections on amplifier
- Carrying Case: A nice solution is the 25" Clear 2 ID Alvin Ice Tube – Model: MT25-CL (also comes in a variety of colors).

Firmware Download

One of the first things you may need to do after receiving your ContinuuMini is update the firmware. See firmware download section (Chapter 11). The ContinuuMini downloads firmware identically to the Continuum once it is connected to your computer, however, make sure to download the ContinuuMini firmware versus the Continuum firmware. If you download firmware and the Menu System seems strange, make sure you have not downloaded Continuum firmware by mistake. You can always redownload at any time.

16.1. Connecting Up

The ContinuuMini is simple to set up and use right out of the box with no computer involvement. This may in fact be the way you want to play it much of the time either for pleasure or perhaps on stage. You only need to do three things to start.

1. Connect your ContinuuMini's USB port (labelled "500 mA") to a USB source using the provided MINI-B USB cable or a longer one of your own if you wish. This source could be a USB port on your computer, a USB charger or even a battery powered USB device. Windows and Mac computers will automatically recognize the USB connection and you can then also bring up the EaganMatrix Editor as well if you like. Once powered, the ContinuuMini will boot up almost instantly and be ready to play once you see the LEDs on the 7 Segment Display (front LED panel) show a non-blinking preset number. If the Display shows "ERRP", the USB host or other device you are using to power the ContinuuMini is not providing the required 500 milliamps. On first boot, you should see a "001" (User Preset 1) in the LED display - or the last preset number set if you are

powering up from a previous playing session. If you see an "ERRL" message, you have a MIDI loop – check your MIDI connections. Note: The ContinuuMini performs a self-calibration when booting. It is important not to touch the surface during this time or you will receive an ERRF error message. If you get this message, simply depower and repower the instrument through its USB connection making sure not to touch the playing surface while booting.

2. Connect the audio headphone output using a mini stereo TRS cable to the desired source (mixer, amplifier, sound system, headphones, etc.) If you hear hum and suspect a ground loop, you can try a ground loop noise isolator such as that provided by www.*besign-tech.com* (which comes with the ContinuuMini Kickstarter units). Connect this to the headphone port and then connect your stereo TRS cable to the isolator. You can also connect a 3.5mm to 1/8" headphone adaptor to the isolator if you wish to connect to a stereo mixer, amp or headphone. As with the continuum, always use a stereo audio cable for this connection.

   Ground Loop Isolator Note: You will never need the isolator when you have headphones plugged into your ContinuuMini. But when you connect your ContinuuMini to your home stereo (using cables like HOSA CMR-206), or a studio amplifier, or an A/D converter to your DAW – then you might need the Isolator. Only use the Isolator if you need it – try the connection first without Isolator – if it sounds good, great! If you hear noise, then insert the Ground Loop Isolator. You want one and only one ground connection between the ContinuuMini and whatever you connect it to. For headphones and battery-powered speakers, the audio cable provides this one ground connection. But in a home or studio setup, there might be multiple ground paths. While USB connections are convenient, they are not ground-isolated like traditional DIN-5 Midi, so it is easy to get ground loops. If you hear ground loop noise, it is easy to fix - use the Isolator. The Isolator referenced above has two matched transformers inside, one for the right channel audio and one for the left channel audio.

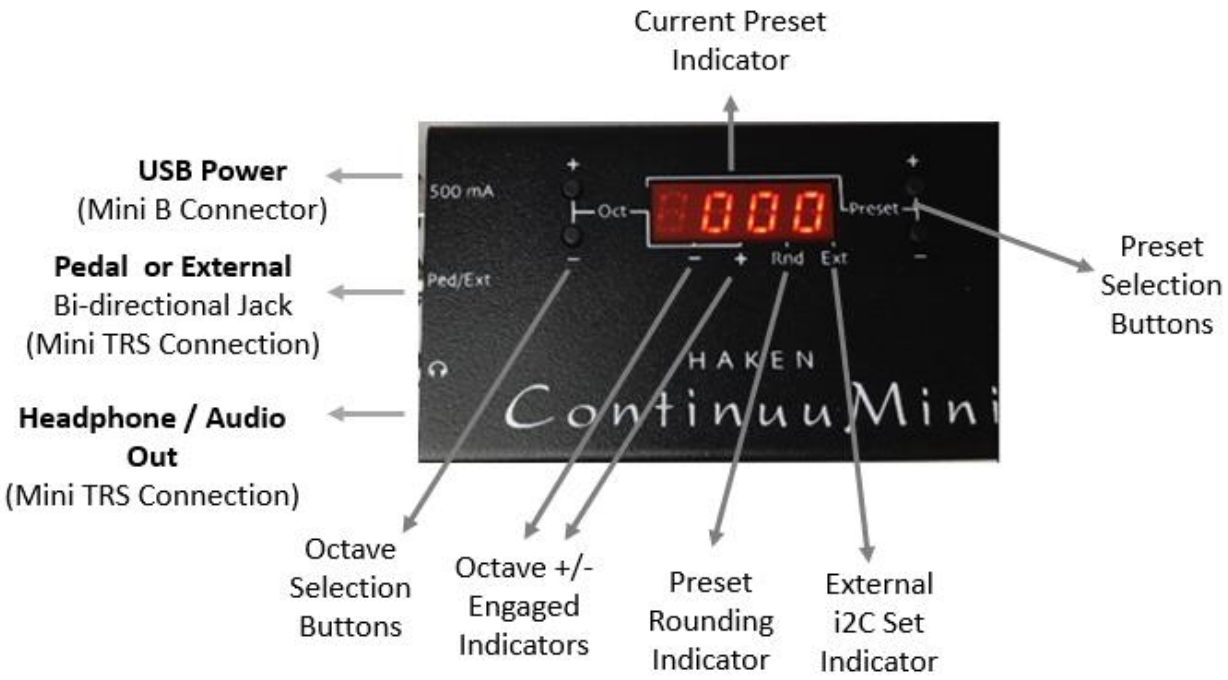
3. Finally, if you wish to use a switched or continuous pedal (depending on the needs of your presets) or perhaps the Tri-Value pedal. Connect it to the Ped/Ext bi-directional port using a 3.5mm to 1/4" stereo adapter as recommended above. See the Pedal Jacks section of this manual for pedal recommendations. Note that certain presets assume the pedal has specific EaganMatrix programmed functions pertaining to one or more aspects of the preset. You can assign the pedal to various ContinuuMini functions of any preset using the ContinuuMini display or the EaganMatrix. The Ped/Ext port is also used to connect to a Haken Audio Continuum Voltage Converter or Evaton Technologies uCVC (Eurorack) using a custom cable allowing you to interface (send CV outputs) to a modular synthesis system. A special CV cable as detailed below is also available to allow CV inputs to be sent directly into the ContinuuMini using the same pedal port.

Now simply use the "Preset +" and "Preset –" buttons to scroll through the hundreds of presets stored on the ContinuuMini (more on this in a bit). We suggest you start by turning down the volume/(pre/post) level and bring it up gradually as you press the playing surface – especially if you are connecting a set of headphones. The ContinuuMini is preset to "dim" the audio in case you start by plugging in a headphone and play too loud. This can be removed through the display function described below. Consult the "Continuum Mini Presets" .PDF file in the EaganMatrix Editor (or Editor directory) for a full catalog of all presets in the current firmware release.

These "factory" system presets will always be available from the internal storage of the ContinuuMini without need for an external computer, however you can load any user created preset using the EaganMatrix Editor and store that in a user defined preset if you wish (just like on the Continuum).

Cycle through a few presets to get the feel of playing the instrument. Have fun!

16.2. The ContinuuMini Seven Segment Display



The ContinuuMini 7 Segment Display allows you to perform the following functions that will be explained in greater detail below.

- Displays the storage code for the present preset (you will need the EaganMatrix to see the text associated with each preset code).
- Allows you to scroll through presets and preset categories
- Allows you to store a currently displayed preset in one of the 16 user defined preset locations
- Displays how close you are to being in tune while playing
- Displays if rounding is set for a preset
- Displays if the external (Ext) port is activated for a pedal or I2C mode (for CVC or uCVC connection)
- Allows you to change octave – up to two octaves up or down
- Displays if octave up or octave down is engaged (applies to pedal octave control as well)
- Allows you to enter the Menu System and display and edit various settings
- Displays error code

16.3 ContinuuMini Lever

Current models of the ContinuuMini are in every way identical to the original version, however they include a metal lever that can be screwed into a lever socket to provide an alternate volume control manipulated with the left hand as you play normally with your right hand. The Lever allows for a bit more Y control at the ends of the ContinuuMini and in some ways acts similar to the Touch Area of the Continuum Fingerboards. If the Level is not screwed on, the ContinuuMini acts identically to models without it.



16.4 Preset Display

The initial release of ContinuuMini firmware contains 350+ System Presets arranged into 15 categories accessed by category number (for example 101, 309 or 1302). Presets 0..016 are reserved for User Presets that can be set to any system or user created preset. The ContinuuMini system preset categories are:

1. Bass (1xx) – A few different bass synth sounds
2. Keyboard (2xx) – Presets that emulate keyboard and tine sounds (but note the continuum is not a sampler and the intent is not to try and exactly duplicate acoustic instruments such as a piano).
3. Looping (3xx) – Presets that contain internal looping elements
4. Morphing (4xx) – Presets that morph between sounds in various ways
5. Percussion (5xx) – Pitched and non-pitched percussion presets
6. Plucked (6xx) – A separate set of presets for plucked sounds
7. Sound Design (7xx) – A set of presets that show off the many sound design capabilities of the EaganMatrix.
8. String (8xx) – String presets – bowed, plucked and struck
9. Synth (9xx) – Various presets emulating different synthesizer sounds
10. Vocal (10xx) – Presets using the EaganMatrix formant generator to create all kinds of vocal sounds
11. Wind (11xx) – Presets that emulate wind instrument both real and fantastic
12. Midi (12xx) – These are for playing external MIDI devices and create no sound
13. CVC (13xx) – These are for connecting to the Continuum Voltage Converter or Evaton Technologies uCVC. They create different voltage outputs based on the requirements of various popular modular and CV controlled devices.
14. Drones (14xx) – These are presets that play themselves without touching the fingerboard. They concentrate on the use of Shape Generators (see EaganMatrix Manual).
15. Utilities (15xx) – Various presets that are used to create noise for calibrating speakers perhaps, and simple presets for demonstrating EaganMatrix basics. If you are interested in programming your own presets, start with these examples.

More presets and sound design features will be coming in future releases and you can load presets you or others in the Continuum and ContinuuMini community create using the EaganMatrix at any time. Note that the categories in the Continuum are slightly different due to some functions in the Continuum that are not supported by the ContinuuMini.

Any Continuum preset can be loaded into the ContinuuMini (and vice versa), however many ContinuuMini presets have been optimized for the Mini's playing surface versus the Continuum and some Continuum presets use functions not available on the ContinuuMini. Otherwise the sound engine and method of preset creation is identical for Continuum and ContinuuMini.

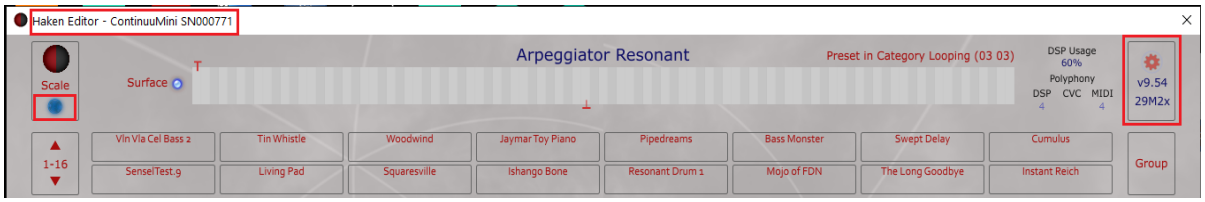
16.4. Connecting to the EaganMatrix (Haken Editor)

Connection to the EaganMatrix editor can be of great assistance when using the ContinuuMini as it lets you easily access presets and most features you have available on the seven segment display. It also is required for the following:

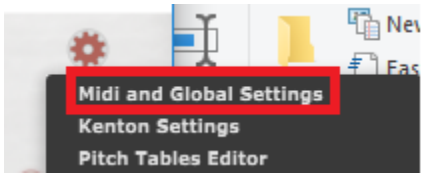
- Updating ContinuuMini firmware
- Programming and making changes to EaganMatrix presets
- Loading user created presets to user preset locations
- Easily interfacing external MIDI-host based keyboards and other MIDI controllers to the Mini - especially if you want to use more than one MIDI host device, as it is hard to find stand-alone MIDI host interfaces supporting more than one MIDI host.

Assuming you have installed the ContinuuMini firmware, which includes the EaganMatrix application, do the following:

1. Connect the ContinuuMini to the computer's USB port (or USB hub if you are using one). The Mini should be autodetected by your computer.
2. Make sure the ContinuuMini boots and displays its current preset (normally 001 when first starting).
3. Bring up the EaganMatrix program by clicking on its icon (it will be labelled "Haken Editor" in the top level Firmware directory.
4. Wait for the program to load and detect the ContinuuMini. This could take a few seconds. Initially the top right hand corner of the screen may display a Version 0.00 until the actual firmware is detected and displayed in the upper righthand corner of the screen.
5. Eventually the version should change to the current firmware release installed and you should see the type of Continuum listed as **M2x** for the Mini. You should also see the active LED icon on the left side of the screen turn blue. The top left notice should also display Haken Editor text with the ContinuuMini Device in parentheses (ContinuuMini SN00nnnn)".



6. If the Blue LED icon does not light, the ContinuuMini is not being detected properly. In this case go to the top right Cogwheel and bring up the "MIDI and Global Settings" window:



7. From there, make sure the Sources/Continuum and Destinations/Continuum selections are set to your ContinuuMini device. If you have the Mini connected before you bring up the editor it should be automatically recognized and placed in the Continuum Source and Destination slots. If you also have a continuum and use the same computer to bring up the editor, the continuum device may have previously been set instead of the Mini. In this case always check that the correct device is being detected in the EaganMatrix. You cannot connect to both devices at the same time using a single instance of the EaganMatrix.



8. Also note that the Blue triangle icons on the Continuum line should be blinking indicating the ContinuuMini is connected to the editor. From here please consult the EaganMatrix manual for details on its operations and preset programming. If the ContinuuMini is not listed as the Source and Destination or the blue triangles are not blinking make sure you do not have another copy of the Haken Editor running or another program running that has already connected to the ContinuuMini's USB interface (such as a DAW).

16.5. Playing the ContinuuMini

Here are a few tips to getting the most out of playing the instrument:

1. The ContinuuMini's surface is not a soft neoprene bed like the Continuum. It is a very sensitive plate that can be depressed and slightly rocked inwards as you play from the bottom to the top of the surface. Its sensors can detect very slight pressure changes in the Pitch (left to right direction - X), Volume (pressure - Z) and to a lesser extent front to back motion (Y). Try gently rocking your finger left-to-right on a pitched preset that does not have the Rnd (Rounding) indicator lit such as "VlnVlaCelBass2". You should be able to get a very expressive vibrato similar to what you would achieve playing a string instrument. Try playing individually articulated notes and glissandi up and down the fingerboard. Note that some presets are static and do not change with Y motion, others do, especially as you approach the top of the playing surface. For those that own continuums, the playing surface of the ContinuuMini uses the same fabric, however it feels quite different due to the harder surface on the Mini. So while the ContinuuMini retains many of the expressive fundamentals of the Continuum, it is in other ways a different instrument that requires its own playing techniques to be mastered.

2. As indicated on the instrument, the ContinuuMini is duo-tactic. This means you can play up to two notes at a time (unless the preset only supports monophonic playing). Most of the time you will be playing with one finger and one internal voice. The most common use of using two voices is either playing a drone in one hand and some melodic line with it in the other or playing some interval in one hand, perhaps as a glissando. Internally, the instrument can play up to eight voices. For example, one note can be sustained as another is triggered to build up layers of polyphony even though only two voices can be played at any time. See the online videos that will be more instructive to demonstrate the various ContinuuMini playing techniques.

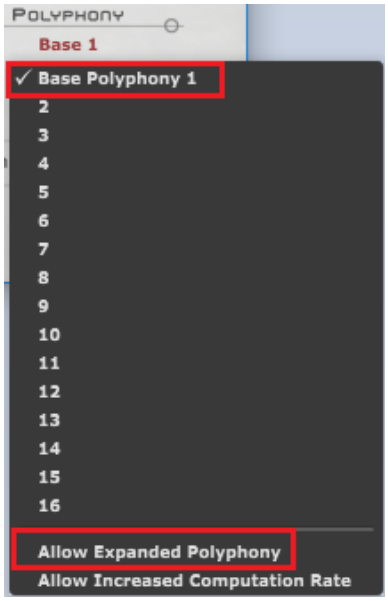
   Note that not all presets react the same to duo-tactic playing. Presets that are highly dependent on pressure changes in formulas may not respond well when two fingers are playing at the same time. You may find the volume of the second finger increases dramatically in some presets when playing duo-tactically, especially those involving Shape Generator envelope control of noise inputs to formulas (for example Karplus Basic and other Waveguide based formulas). These presets are best played monophonically. Take care when articulating to not overlap fingers which may create a breaking sound if you are not careful when articulating - if two fingers touch the surface at once when you expect monophonic output. In general, it will take a while to get used to developing ContinuuMini playing technique, but it should not take that much time to become attuned to the instrument. If you are a Continuum owner, don't expect the Mini to respond exactly like the Continuum. They are two different instruments even though they share a number of basic performance characteristics and have a common sound engine.

3. A special note on playing front to back (Y): Obviously there is limited range in Y on the playing surface, however, Y itself has certain performance characteristics that you should be aware of. The range sensitivity of Y is most pronounced in the middle two thirds of the playing surface. Here Y will respond from min to max (default values 0..1) depending on how you place your finger on the playing surface. However, the range of Y reduces towards the ends of the playing surface. If you want to make use of Y to its fullest, play in the center two thirds of the fingerboard.



4. If you notice a preset does not respond well to duo-tactic playing or you are getting unwanted transitions between notes because two fingers slightly overlap and you desire to set it to purely monophonic mode (as

may be the case with many solo instrument presets such as a sax or trumpet), you can go into the EaganMatrix for that preset and set "Base Polyphony" to 1, making sure the "Allow Expanded Polyphony" option is not checked. You can tell if this is set correctly if the Preset displays Polyphony as "Base 1". If it displays "Base1+", you have "Allow Expanded Polyphony" checked. Be aware that some presets assume higher polyphony for sound design. If you set a preset to Base 1 from a higher polyphony and it does not sound right, that preset may have to be kept at its original polyphony setting.



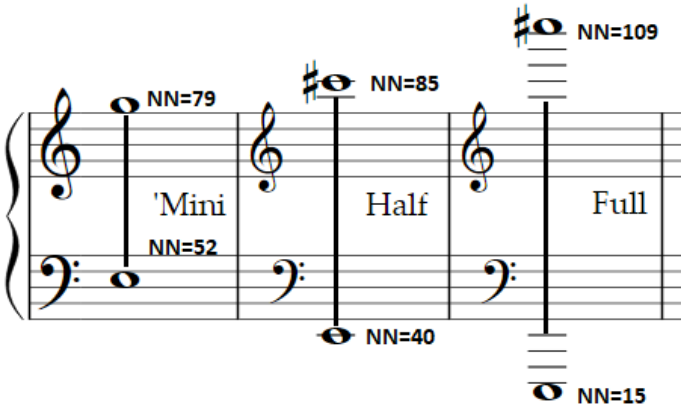
16.6 Octave Buttons and ContinuuMini Range

The "Oct +" and "Oct –" buttons can be pressed at any time to raise and lower the current pitch by up to two octaves (press once for one octave and twice for two octaves). The "+" or "-" octave indicator (".") will be lit if you have raised or lowered the default octave setting. Note that you cannot raise or lower an octave while you are playing a pitch. You must press the octave buttons before the note comes in you want to shift. The new octave setting will remain until changed. On resetting the ContinuuMini the default octave setting will be applied.

You can also change octaves with a pedal and the display's octave indicators will respond as expected.

Range Comparison

The ContinuuMini (without octave transposition engaged) has a range of 28 notes, MIDI Note Numbers 52..79. This compares to the half and full size Continuums as follows:



16.6. Menu System Options and Preset Selection

Consult the template on the back of your ContinuuMini for a summary of configuration operations.

If the two Octave buttons are pressed simultaneously, the front panel enters the Menu System and blinks. From there you can press either the "Oct +" or "Oct –" buttons to scroll through the ContinuuMini's menu options and use the "Preset +" or "Preset –" buttons to select values for the current option.

Menu settings are retained if you turn the ContinuuMini off and on.

16.6.1. Menu Option 1: Preset Category and Preset Selection and Storage.

The default Menu option displays the preset number. Press both octave buttons together when the preset is displayed and you will enter Category selection mode. The leftmost digit in the preset will blink. Select either the "Preset +" or "Preset –" buttons to scroll through the Preset categories: 001 (user preset) to 1501 (Utilities category). When you reach a desired category, once again press the "Oct +" and "Oct –" buttons simultaneously to exit the Menu System. Now you can use the "Preset +" or "Preset –" buttons to scroll forward and backward through the current category's presets. You can in this manner continue to scroll to the next or previous category's presets as well.

The quickest way to traverse presets is to bring up the EaganMatrix editor which allows you to easily select them from the "Category" and "System Preset" pull downs – the same as with the continuum.

After selecting preset values 1..15 (User Presets), if you power the ContinuuMini off and on, the last selected User Preset will be maintained.



Storing a User Preset Using the 7 Segment Display

If you want to store the current preset being played to a user preset (be it a System Preset or one you loaded from disk to current preset storage using the EaganMatrix), when out of the Menu System, press the "Oct +" and "Preset +" buttons simultaneously. "tonn" will be displayed. While continuing to hold down the "Oct +" button scroll to the desired user preset location ("to01".."to16") you want to store the preset to using the "Preset +" or "Preset –" buttons and then release the "Oct +" button. The System or loaded preset will be stored to that user location and if the EaganMatrix is connected, the name of the newly stored preset will appear in the user preset display.

Fast Preset Increment/Decrement

If you press the "+" button and then press "+" and "-' together you will fast increment through the presets to the max preset as you continue to hold both buttons. If you press the "-" button and then press "+" and "-' together you will fast decrement through the presets to the min preset (001).

16.6.2. Menu Option 2: Audio Dim

The second menu option is the audio dimming setting ("di n"). This allows for eight levels of audio attenuation where n can range from 0..7. The zero setting is unity level (no added attenuation). The default setting is 4. This function was included to guard against connecting headphones without realizing a preset may be set to a volume level that could be distressing. This also can be helpful when you are creating EaganMatrix presets and want to set max dim in case you program a sound that generates a massive burst of sound (easily done if you are new to EaganMatrix programming). Default = 3 (Maximum audio dimming). Minimum = 0 (full volume). Note that the EaganMatrix has an additional dim function that works independently from the ContinuuMini dim.

If you power the ContinuuMini off and on, the last Dim value set will be retained. Future firmware release will add additional Dim options.

16.6.3. Menu Option 3: Gain Setting

This sets the current preset's output gain that can also be adjusted in the EaganMatrix ("ga nn"). If you set the gain in the 7 Segment Display, the EaganMatrix gain dial will change accordingly, and vice versa.

As in the preset selection, press "Preset +" or "Preset –" to increment or decrement the gain and press both Preset buttons simultaneously to fast increment or decrement (depending on whether you last pressed the "+" or "-" button.

Note that there are only four values displayed and two are taken for display of "ga". If you go past 99, values 100..127 will be displayed as ".00" through ".27". Other options use this display code.

As always, press both Oct buttons simultaneously to exit the Menu System and retain the last Gain value set. Minimum value = 0, maximum value = 127. Default = 52.

16.6.4. Menu Option 4: Round Rate

This option sets the round rate (pitch quantization) of the preset ("rr nn"). If "rr" is greater than 0, the "RND" indicator in the 7 Segment Display will be lit (".."). The round rate ranges from 0 (no rounding) to 127 (full rounding). At full rounding, pitches on the fingerboard will change in increments of a semitone (unless programmed differently in the EaganMatrix).

As you change values in the 7 Segment Display, the associated rounding dial in the EaganMatrix will be changed in tandem. Changes in the EaganMatrix Round Rate dial will be reflected in the ContinuuMini 7 Segment Display.

Note that a round rate of 1 has a special meaning (glacial rounding – see section 6.4). Minimum value = 0, maximum value = 127.

16.6.5. Menu Option 5: Round Initial

This menu option sets initial rounding ("**ri** n"). This allows you to instantly move to the closet semitone you press on the fingerboard, but after that the rounding will be determine by the round rate (from none to full). Default = 0 (Initial Rounding = Off), 1 = Initial Rounding is On.

16.6.6. Menu Options 5-8: Setting Controls i, ii, ii, iv

This menu option ("**b[1..4**] nn") allows you to set the designated Control to a value. In practice, using the EaganMatrix or an external MIDI controller will be a much better and faster way to dynamically change Control settings during performance or set the pedal to control a desired Control. Minimum value = 0, maximum value = 127.

Examples:

"b110" indicates Bespoke Control i is set to MIDI value 10

"b237" indicates Bespoke Control ii is set to MIDI value 37

"b3 0" indicates Bespoke Control iii is set to MIDI value 0 (minimum)

"B4.27" indicates Bespoke Control iv is set to MIDI value 127 (maximum)

16.6.7. Menu Option 9: Effect Level

This menu option ("**EL** nn") allows you to set the Recirculator Mix level (amount) control from 0 (no Recirculator effect) to 127 (Max Recirculator effect). The associated EaganMatrix dial is affected and that dial also sets the 7 Segment Display effect level.

16.6.8. Menu Option 10: Effect Time

This menu option ("**Et** nn") allows you to set the Recirculator Time from 0 (none) to 127 (max reverb time). The associated EaganMatrix dial is affected and that dial also sets the 7 Segment Display recirculator time.

16.6.9. Menu Option 11: Pedal Setting

This menu option ("**PEd** n") allows you to set the Pedal control association. Values are:

- 0 = Octave control (default)
- 1 = Bespoke Control i
- 2 = Bespoke Control ii
- 3 = Bespoke Control iii
- 4 = Bespoke Control iv
- 5 = Output Level
- 6 = Sustain
- 7 = Sostenuto
- 8 = Advance Preset

The associated EaganMatrix control is enabled when setting through the ContinuuMini's display and setting the control in the EaganMatrix will set the appropriate pedal setting on the ContinuuMini. Note that the EaganMatrix contains more pedal options than are supported in the 7 Segment Display. If any of the unsupported pedal options are set in the EaganMatrix, the ContinuuMini's Pedal option will be defaulted, normally to 6 (Sustain).

16.6.10. Menu Option 12: i2C Setting

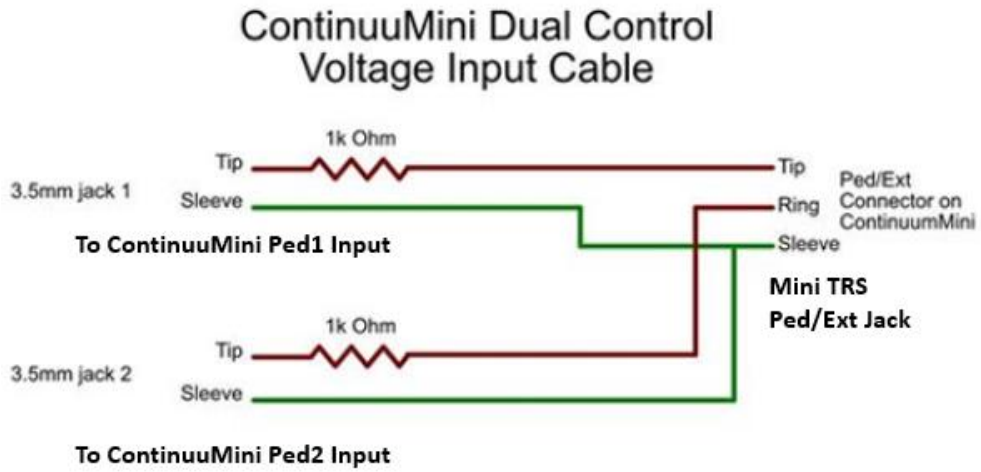
This menu option ("**i2c** n") sets the Ped/Ext jack setting. Values are:

- 0 - Jack is for a pedal. Yamaha pedals, and ones that are electrically equivalent, are autodetected (See Pedal Jack section)
- 1 - Jack is for i2c. At this time, that means CVC or uCVC and possibly more devices in the future. See CVC connection information below.
- 2 - Jack allows two non-audio rate control voltage (CV) inputs to be used by the ContinuuMini for controlling certain parameters of a preset, at this time through Ped1 and Ped2 control. Requires a custom made dual CV cable which can be purchased from Haken Audio or you can make your own (see below). This cv-in-cable allows you to use a Eurorack (or other format) sequencer or LFO to control timbre changes or do other things you would otherwise do with an expression pedal or a damper pedal. Ideally scale your input voltage in the +/- 2.5V range, though the circuit has headroom up to +/- 3V. Try and avoid higher voltages (for example you can use a mixer to scale a +/- 5V or +/-10V CV signal into the desired range). You may also need to offset a unipolar CV signal depending on the sound design programmed).

Note: The "Ext" indicator will be lit in the display if "ic2" is set greater than zero. If you set "ic2=1" and do not connect to a CVC through the "Ped/Ext" jack, the EaganMatrix will issue a "Turn on CVC or Disconnect it" warning:



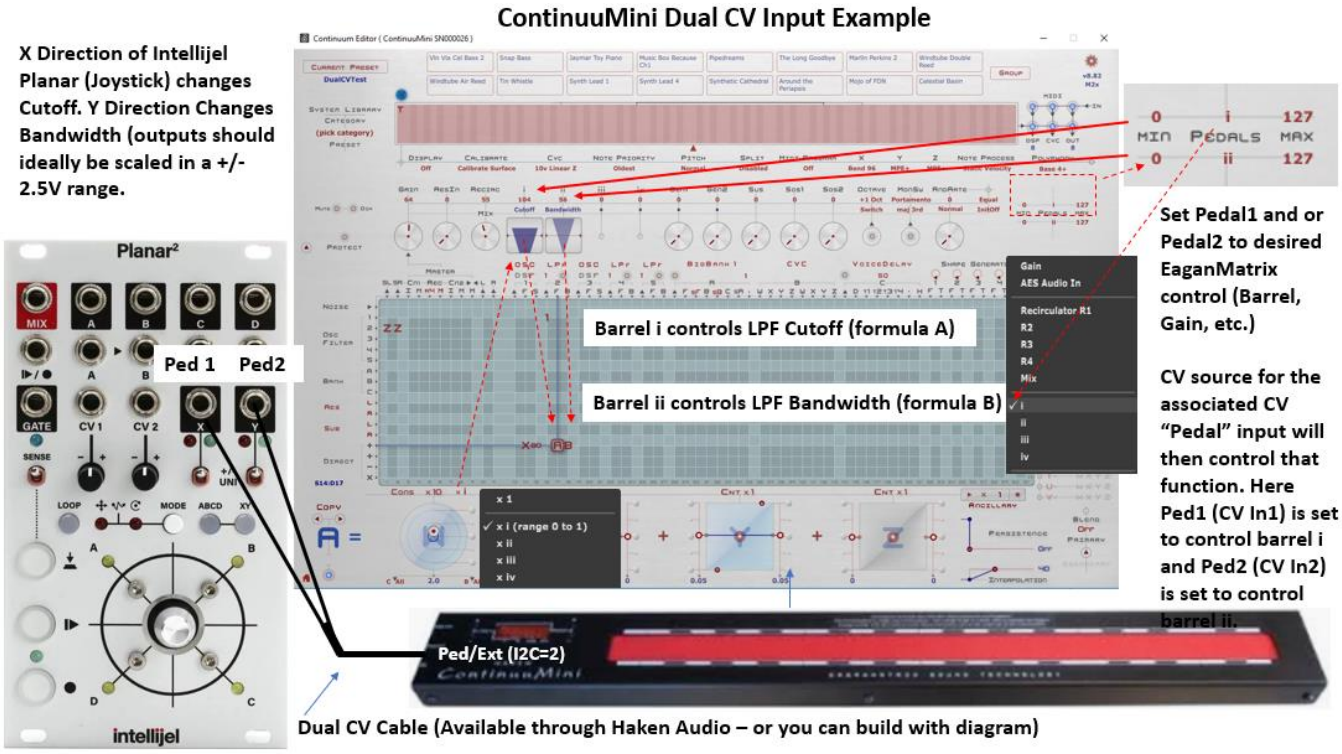
If you do not want to order a dual CV cable through Haken Audio, the specification for the custom cable to connect two CV inputs to the Ped/Ext jack is as follows. This diagram assumes standard Eurorack connectors but two 1/4" to Mini TRS is also an option.



Once connected and the i2C setting is set to "2", the EaganMatrix Ped1 and Ped2 controls can be used as they normally would in an EaganMatrix program, only now they might be associated with a CV controller input. Remember, when I2C is set to "0", a Yamaha pedal (or other as previously defined here) is assumed to be connected to the Ped/Ext jack and in this case only Ped1 is active in the EaganMatrix.

Here's an example of how the Dual CV input control might be used in practice. Perhaps I want to use an Intellijel Planar(2) Joystick to have the X axis and Y axis control respectively the cutoff frequency and bandwidth of an OSC fed Low Pass Filter, programmed in the EaganMatrix. You would connect the CV outputs from the Planar (ideally scaled +/- 2.5V) using the dual CV custom cable to the Ped/Ext input jack of your ContinuuMini which has the Ped/Ext setting set to I2C="2" (this setting was not used in earlier ContinuuMini releases). Then you would assign Ped1 and Ped2 to

Controls (i, ii, etc.) using the pedal pulldown options. Then set formulas tied to those Controls and perhaps associate those formulas with filter cutoff and bandwidth of the LPF. If things are set up right, you can then play the ContinuuMini with one hand and manipulate the joystick with the other to dynamically change your filter settings through Eurorack CV control. Note that this function is intended for CV control signals, not audio rate signals (which will not harm anything but will alias) . This lets you have direct control of pedal associated EaganMatrix functions through CV.



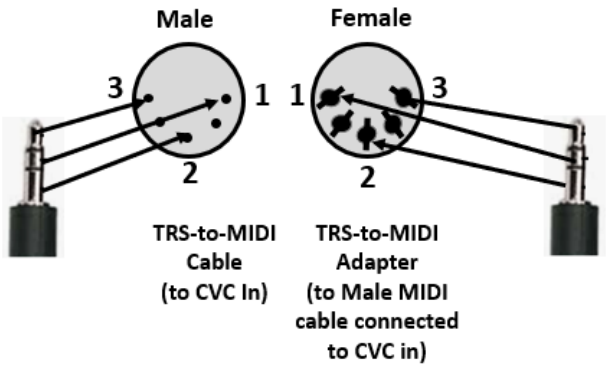
16.6.11. Menu Options 12: 7 Segment Display Brightness Setting

This menu option ("brt n") sets the brightness of the 7 Segment Display from 0 (min) to 3 (max). On powering the ContinuuMini off and back on, the previous brightness setting will be retained. The default setting is 3 (max brightness).

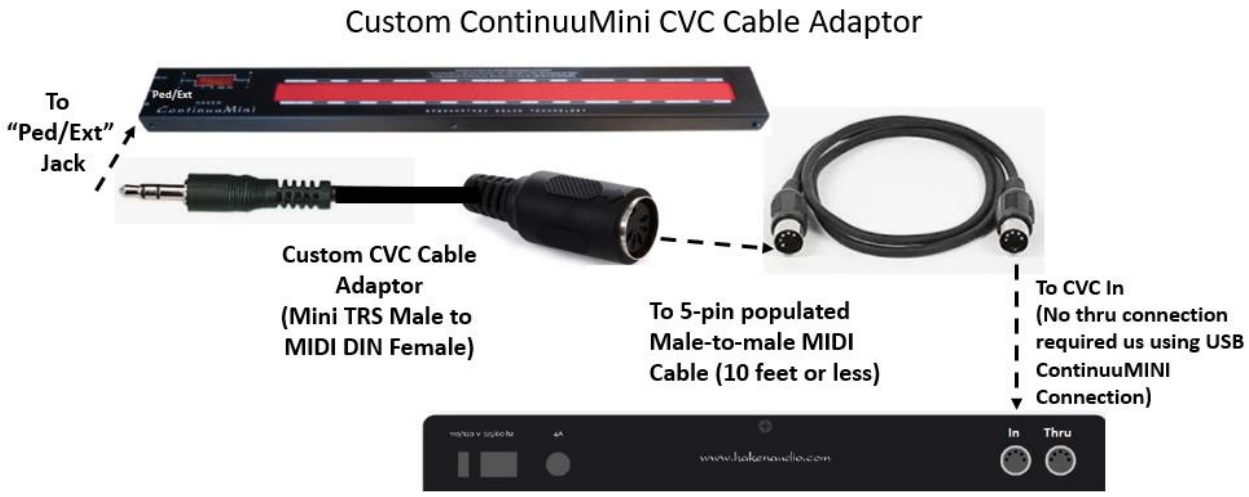
16.7. CVC Connection and Setup (Used with "I2C" setting = 1)

The CVC connection requires a special cable or adapter which you can make or purchase from Haken Audio.

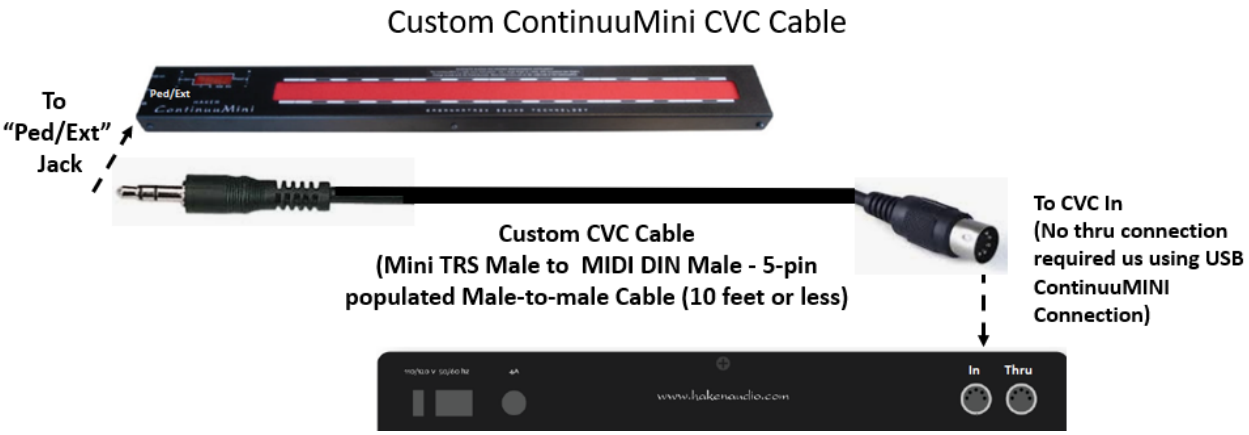
If you want to make your own CVC cable or connection adapter, which you will connect to your CVC with a 5 pin populated male-to-male MIDI cable. The CVC uses unused MIDI pins 1 and 3 for I^2C connections in addition to reusing the MIDI shield (Pin2). Here are the Mini TRS to DIN wiring connections:



In one case you can use a Mini TRS to Female MIDI DIN connector to create the adaptor. The adaptor is useful if you already have a Continuum and you want to easily switch the CVC connection from one to the other by just changing the MIDI cable from Continuum to ContinuuMini adaptor. It will be used as follows with the ContinuuMini:

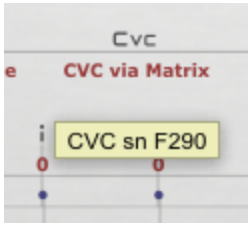


If you desire you can also use the same pinouts (1-3 reversed for Male connection) to create a cable that will connect directly from your ContinuuMini to the CVC Input. In this case you will use a MINI TRS on one end of the cable and a Male MIDI DIN on the other. The cable you create should be no more than 10 feet long.



To test the CVC setup:

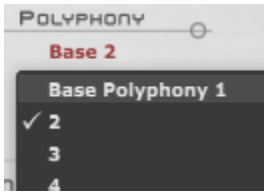
- Set the "i2c" menu option = 1
- Connect a MIDI cable from CVC out to the ContinuuMini's custom cable's Female DIN output connection. The MIDI cable you use must contain all five pins terminated (as some MIDI cables only connect the pins MIDI requires (2, 3 and 4), but the CVC uses pins 1, 2 and 5.
- Connect the TRS end of the customer cable to the Ped/Ext port of the ContinuuMini
- In the EaganMatrix, select preset CVC: "CVC 10V Linear Z" (assuming you are connecting to a Eurorack modular system. See other settings if you are connecting to a Buchla or Voyager, etc.
- Verify that the EaganMatrix sees the CVC by hovering your mouse over the CVC section. I should display a message indicating the CVC is connected or not. If the CVC is connected properly, a message similar to the following will be displayed:



- It is suggested that you set the Note Priority (also referred to as Channel Priority in this manual) to Low to test (Use Lowest Channel Number). The ContinuuMini can only play two notes at a time but it will cycle through all MPE channels to max polyphony of the preset if you set a Note Priority to Oldest.



- If you want to play duo-phonically and send two CVC channels to your modular make sure your preset is not set to Polyphony Base 1. It must be set greater than 1 for sending two CVC channels (though it will only send a max of two channels regardless of how much higher you set polyphony).



- Connect up the CVC WXYZ outputs as you desire for channels 1 and 2 (the setup above will only play duo-phonically on two channels). Note for example that if you kept the default Note Priority Oldest setting in the EaganMatrix and set polyphony of the preset to 4, all four channels of the CVC would output as you play (but only two channels at any time).
- Play your ContinuuMini and you should both see the lights on your CVC activate and the appropriate channels engage and the WXYZ CV outputs should be controlling your modular or other CV controlled device as you expect. Note that Y changes very quickly from 0V to 10V (with the test setting described here). When you lift your finger, Y will remain at whatever voltage output setting it was at when you broke contact with the playing surface. Z will always return to zero when you lift your finger (unless you have programmed Y and Z to do other things in the EaganMatrix for a preset).

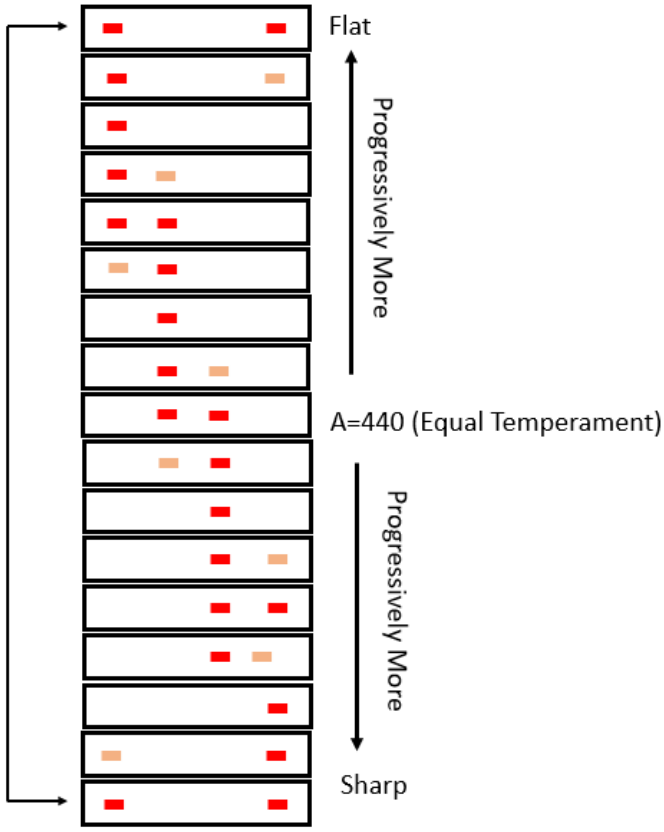
16.8. Pitch Reference

Once you start playing the ContinuuMini, the display changes from showing the current preset to pitch display mode. A series of hashes are displayed indicating how true the finger placement is to "correct" pitch. If you are playing monophonically the pitch display will appear in the middle of the display. If you are playing two voices, the pitch display of the lower voice will appear at the bottom of the seven segment display and the pitch of the upper voice will appear up top.

The pitch display is interpreted as follows:

Two bright hashes in the middle of the display indicate the tone is perfectly in tune to Equal Temperament, A=440 Hz. The reference dashes are in absolute cents (where 4900 cents are A440, or if you prefer Midi note numbers over cents units, 49.00 is the Midi note number for A 440).

The hashes move to the left or right progressively dimming and brightening following the following scheme as you slide from note to note, basically giving you 1/8 of a semitone resolution on each side of the note's center. This example assumes the second A from bottom on the MINI is being played, A=440 Hz (MIDI note 49, which internally maps to 4900 Cents from MIDI 0).



The display is most useful when playing slowly to get accustomed to the playing surface. If you set rounding to full, you will notice that you get a consistent set of bright hashes in the middle as pitches are always corrected from note to note, not matter where you press in the note's X axis.

A "note" template is stenciled on the ContinuuMini for assisting in playing. Some may choose to ignore this and just concentrate on the playing surface, especially if you are interested in microtonal performance. Pianists will need to get used to this a bit as each note on the Mini is the same distance from the last/next.

16.9. Continuum vs. ContinuuMini Presets and Usage

Almost all of the system presets that are part of the ContinuuMini's firmware release are also part of the Continuum's firmware. However a number of these have been optimized for use on the ContinuuMini, for example adjusting Y due to its reduced range of motion versus that available on the Continuum. If you have a Continuum and a Mini, you may notice that not all presets sound exactly the same on the two instruments. This is usually due to differences in how Y shapes a sound. On the ContinuuMini, because the range of motion is compressed, you may hear that changes in timbre (or other parameters based on Y) occur much quicker. You may want to go into the EaganMatrix for some presets and adjust Y motion to best suit your ear.

Another difference between the ContinuuMini and the Continuum is that the Continuum has more precise sensing technology. If you are comparing how the same preset responds to touch, you may perceive that the articulation profile of the Continuum is slightly different than that of the Mini. Nothing is wrong. These are two different instruments with different playing techniques and different response.

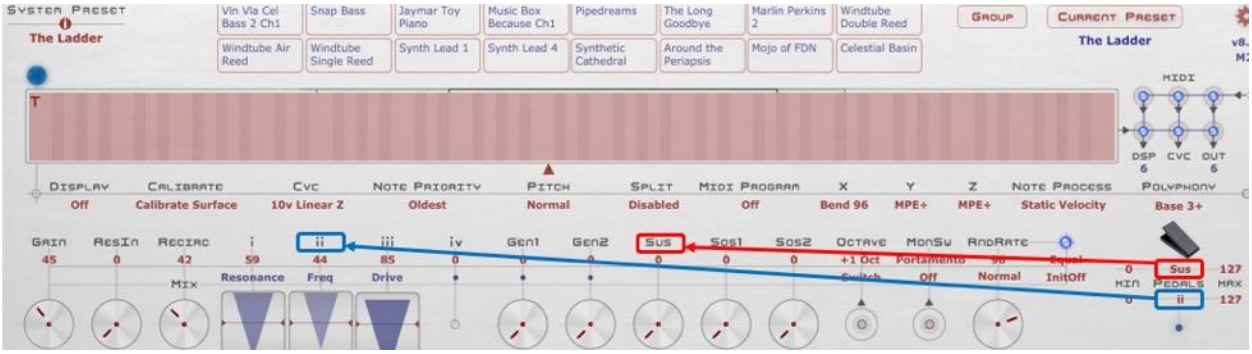
16.10. Use of Pedals and System Presets on the ContinuuMini

The ContinuuMini supports a single pedal jack whereas the Continuum supports two. Because the ContinuuMini presets are based on Continuum versions, you will often see two pedal assignments defined.

The default pedal assignment used in the "Utilities/Empty" preset assigns Pedal#1 to Sustain (Sus) and Pedal #2 to Sostenuto1 (Sos1). You can set the first pedal to some other control if you like (for example Control i) but setting Pedal2 will have no effect on the ContinuuMini.



Many presets will define a control for Pedal #2 as they are carried over from Continuum definitions. You will have to decide which control you will assign to Pedal #1. For example, the following preset "Utilities/TheLadder" defines Pedal #1 as the default Sustain and Pedal #2 is set to Bespoke Control ii (defined in this preset as "Freq").



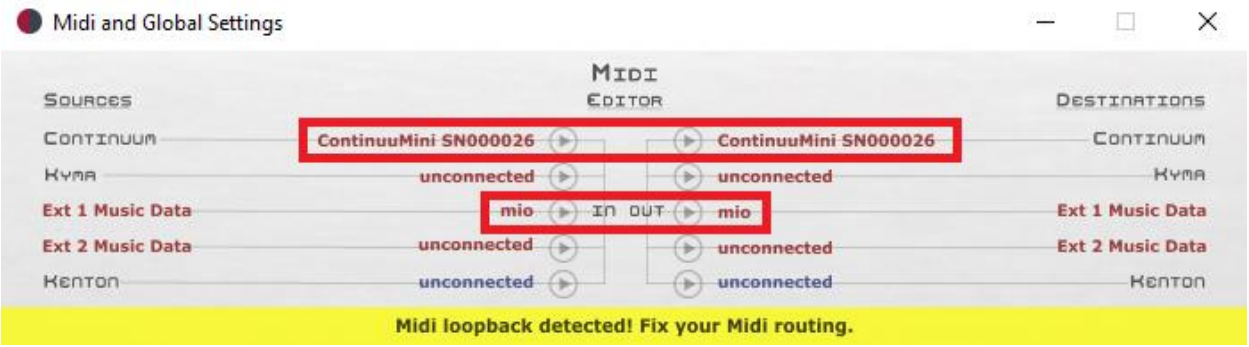
If you prefer to use your pedal to set Bespoke Control ii and not sustain, you can set it to Ped1 with a Mini pedal option or go into the EaganMatrix and make the assignment.

16.11. Error Codes

The ContinuuMini can display a few error codes that are valuable to know for troubleshooting:

ERRP – This indicates that the USB device you are using to power the ContinuuMini does not put out enough power. It must supply at least 500 milliamperes.

ERRL- MIDI loopback detected. Check your MIDI setup to make sure you are not creating a MIDI loop. If you are using a Continuum with the ContinuuMini, make sure you do not have them both set as Continuum and External devices as below. This example, where the Mio is the MIDI interface connected to the continuum, will cause an ERRL Midi loop – and the EaganMatrix will also create the warning:



ERRF – A finger has been detected on the playing surface during power up. Make sure when you power the ContinuuMini that it completes its bootup and the preset number is visible before playing.

Other Codes – If you receive any other error codes, it likely indicates an unexpected problem. Note the code and contact Haken Audio if resetting the ContinuuMini does not solve the problem.

16.11.1. Factory Reset / Restoration

Note: This operation should only be performed if there is an issue with the ContinuuMini that indicates a factory reset is required. Please consult Haken Audio before performing a factory reset.

If the ContinuuMini does not upgrade firmware correctly and appears to be hung on repowering (possibly displaying a "0") or in an unexpected state, a Factory Reset may be required. To restore the ContinuuMini to its default Factory configuration

- Remove USB power from the ContinuuMini
- Exist the Editor if it is running
- Depress the "Oct +" button and while depressed reconnect USB power to the instrument
- Try Reconnecting to the editor. Hopefully you will connect and get the solid blue LED in the editor. Note the firmware version.
- At this point the ContinuuMini will likely be restored to a previous firmware version and will require an upgrade to the current desired version using the normal upgrade process. Never try and restore a ContinuuMini to a firmware version before 8.71.
- After restoration to the desire firmware version, Factory Recalibration may be required if the instrument does not perform as expected (for example you play a note and hear two notes).

16.12. Using the ContinuuMini in Parallel with a Half or Full Size Continuum

You can have a Continuum and a ContinuuMini connected to your computer at the same time but the EaganMatrix will only detect one. If you have both connected, the ContinuuMini will be defaulted as the connected device unless it was previously manually set to detect the Continuum.

You cannot at this time without a special configuration procedure (that may not work for all MIDI interfaces) run two separate instances of the EaganMatrix on a single computer, one connected to the Continuum and the other to the Mini. You can, however, easily switch the EaganMatrix between the two instruments for control and programming.

Assuming you are connected to the ContinuuMini and want to switch to connect to the Continuum, bring up the "Midi and Global Settings" window and in the Source and Destination fields replace the ContinuuMini device with the MIDI device you have connected to your Continuum (in this case a "MIO" interface).



In a few seconds the EaganMatrix firmware version will change to that supported by the Continuum (which for some releases may be the same as for the ContinuuMini). Any operations you perform in the EaganMatrix at this point will now be recognized and performed on by the Continuum.

Once manually switched to the Continuum device in this manner, the editor will thereafter default to the Continuum. To switch back to editing the ContinuuMini, go back to the "Midi and Global Settings" window and replace the Continuum MIDI device with your ContinuuMini device. In a few seconds the version should change back to the ContinuuMini version and you are back to editing the Mini.



16.13 Playing the ContinuuMini from an External MIDI Controller Through EaganMatrix

If you would like the play the ContinuuMini either with an External MIDI controller/keyboard (or even along with another MIDI controller) and you are connected to the EaganMatrix perform the following steps.

1. Make sure your ContinuuMini is connected to your computer's USB port (or USB hub if you are using one).
2. Exit the EaganMatrix if it is running (the EaganMatrix will not recognize new MIDI controllers added to your system while it is running).
3. Connect your MIDI USB controller/keyboard to the PC's USB connection (or USB Hub if you are using one). Verify the device is seen by your computer and any drivers are loaded that might be required. In this example we will use a Linnstrument, which is autodetected.
4. Bring up the EaganMatrix.
5. Go to the Cogwheel at the top right of the screen and select the "Midi and Global Settings" pull down option.
6. Up to two External device connections are allowed ("Ext1" and "Ext2"). These will initially be defined as "Unconnected" if they were not previously set to a device.



7. Select the USB device you have connected from the pull down list for Source, Destination or both depending on if you want to pass MIDI data to the ContinuuMini (source) or have the ContinuuMini pass data to your device (Destination) or both. If you just want to play the Mini from an external controller, only the Source field is required.



8. Select an external data type. Each external control supports three data filtering options.
    a. **Music Data** – This allows Music data to pass to/from the selected device. This is normally data affecting the MIDI notes and durations you will be playing, pitch bend data, pedal data, octave transposition and even Controls (i, ii, etc.). If you only want to play the Mini's sound engine from your external source and do not want to risk changing presets, choose this option.
    b. **Config Data** – This allows EaganMatrix specific configuration data to be sent to/from the ContinuuMini along with other configuration information such as preset selection. If you only want to connect an external controller to change presets, choose this option.
    c. **All Data** - This allows both Music data and Config data to pass through to/from the external device. If you want to use both MIDI note and MINI configuration information choose this option. If you want full Continuum control, choose this option.

9. From here you will want to determine what kind of external MIDI controller/device you are using. Does it need to be defined on Channel 1 only? Is it an MPE device? Will you need to set up the EaganMatrix to use CC74 for Y detection or Channel 11 for Z, etc. Read the Section below for more information. You will want to match the MIDI configuration of the ContinuuMini to the MIDI device you are attaching for control

10. Finally remember the ContinuuMini is limited to 8 voices. In MPE/MPE+ mode it accepts data on Midi Channels 2 to 9. In non-MPE modes (for example Z is set to CC7), it accepts data on Midi Channels 1 to 8. Also if you set Polyphony to less than 8 (or 4+), you will have to limit the midi channels you send to match the polyphony.

16.14. Monophonic vs. Duophonic vs. Polyphonic MPE ContinuuMini Operation

If you have never owned an MPE MIDI instrument there are a few things you need to know to understand how the ContinuuMini is receiving (for using an external MIDI controller) and transmitting MIDI data (for controlling other MIDI instruments or recording in a DAW).

The ContinuuMini can never transmit on more than two MIDI channels at a time when played, however, depending on the polyphony set for the current preset it can receive and transmit on up to eight MIDI channels. The Continuum for example can transmit eight simultaneous MIDI channels if set to Base Polyphony 8 if you press eight fingers at the same time. No matter how many fingers you press on the ContinuuMini, it will only transmit a maximum of two MIDI channels (if polyphony is set greater than 1). However, if you connect an external MIDI keyboard to the Mini, it is possible to play up to eight simultaneous notes using the Mini's sound engine depending on the polyphony set.

The ContinuuMini uses a 2x DSP processor and will display M2x under the Cogwheel. It will support Base Polyphony and Expanded Polyphony with the following limitations as it cannot be further expanded.

ContinuuMINI Preset Polyphony	Max Number of MIDI Input Channels Accepted and Output Channels Processed	MIDI Input/Output Channels (Channel #) Processed	Number of Sound Engine Voices Played (complex presets may force reduced polyphony to be set)	Max Number of ContinuuMini Voices Playable on the Mini
Base 1	1	1 (or 2 MPE)	1	1
Base 1+	2	1-2 (or 2-3 MPE)	2	2
Base 2	2	1-2 (or 2-3 MPE)	2	2
Base 2+	4	1-4 (or 2-5 MPE)	4	2
Base 3	3	1-3 (or 2-4 MPE)	3	2
Base 3+	6	1-6 (or 2-7 MPE)	6	2
Base 4	4	1-4 (or 2-5 MPE)	4	2
Base 4+	8	1-8 (or 2-9 MPE)	8	2
Base 5	5	1-5 (or 2-6 MPE)	5	2
Base 5+	8	1-8 (or 2-9 MPE)	8	2
Base 6	6	1-6 (or 2-7 MPE)	6	2
Base 6+	8	1-8 (or 2-9 MPE)	8	2
Base 7	7	1-7 (or 2-8 MPE)	7	2
Base 7+	8	1-8 (or 2-9 MPE)	8	2
Base 8	8	1-8 (or 2-9 MPE)	8	2
Base 8+	8	1-8 (or 2-9 MPE)	8	2

A plus sign after the Base Polyphony numeral indicates expanded polyphony is set for that preset which doubles the polyphony.



While a Continuum can support up to 24 voices on fully expanded unit, the ContinuuMini supports a maximum of 8 MIDI channels. Thus, a "Base 1+" preset will allow you to send data in on two MIDI channels and the Mini will play duo-phonically outputting on up to two MIDI channels. "Base 2+" will process on up to four MIDI channels, etc.

MPE instruments normally expect MIDI input channels to start on Channel 2 (Channel 1 being reserved) and will start outputting MIDI data on Channel 2. The ContinuuMini is an MPE instrument and will operate in this mode. However, the Mini's MPE modes also will accept polyphonic MIDI input data on Channel 1 (Channel 1 mode). This allows a standard MIDI keyboard that does not support MPE to be used with the ContinuuMini. In this case, all polyphony should be transmitted on Channel 1 with the following assumptions:

- MPE/MPE+ Channel 1 operation assumes Polyphonic Pressure is sent for Z pressure if the controller supports it but it will process standard MIDI keyboard velocity. It will support up to eight channels/voices based on the Base polyphony setting. When playing, MPE mode will always output Aftertouch and MPE+ mode will output Polyphonic Pressure. Output will always be on channels 2..Max Polyphony+1 even though polyphonic input is accepted on channel 1. Note Process should be set to "Dynamic" if you are recording the ContinuuMini MIDI data and you cannot process aftertouch or polyphonic pressure. If note process is set to its default of "Static", the output MIDI velocity of all notes will be set to 127.
- If MPE is not set and Y/Z are set to explicit CC values (defaulting Y=CC74, Z = CC11), the pressure CC specified (default CC11) should be used and the MIDI channels processed start on one, not two. For example if you set "Base Polyphony 1+", the ContinuuMini will play two incoming voices on channels 1 and 2 but will not recognize polyphonic input on Channel 1.

16.14.1. Note Priority

Because the ContinuuMini plays a maximum of two notes, it is advisable to set Note Priority to "Low" if you are recording in a DAW. Depending on if you are playing monophonically or duo-phonically, MIDI output will always be on channels 1 and 2 (if X/Y set to a CC value) or 2 and 3 (if X/Y is set to MPE/MPE+). You can thus predict the channels you are outputting on. If you set Note Priority to its default of "Oldest" you will cycle through channels every time you play a note through your maximum polyphony and you will not be able to predict what channels you are playing on. See section 10.6.

16.14.2. Configuring Bend, Timbre (Y) and Pressure (Z) Control

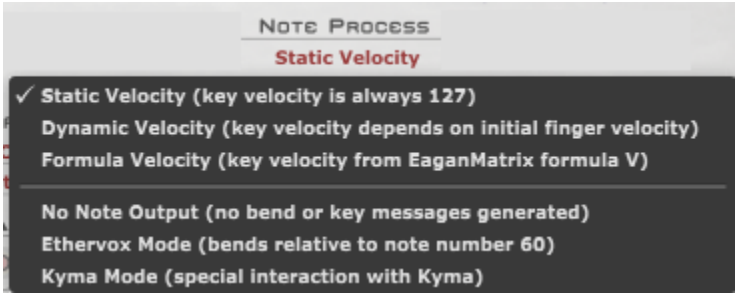
X (Bend), Y (front to back) and Z (pressure) configuration works as follows:

Bend can be set independently from the X or Y settings. If MPE or MPE+ mode is set for Y/Z bend is limited to 12, 24 36, 48 or 96 semitones assuming the MPE device playing the ContinuuMini is set to the same bend value. If Y/Z are set to a specific CC value (for example: Y=74/CC=11), all Bend range selections are then available. If MPE/MPE+ is set and you are playing the ContinuuMini with a Midi controller in Channel 1 mode, the 96:2, 96:5, 96:7 and 96:12 options should be used to map to your bend device. If ether Y or Z are set to MPE+ or MPE mode, both will be set to that value. If either Y or Z are set to a specific MIDI channel, the other will be set to its CC default (Default Y=CC74, Default Z=CC11) – though they can be set to specific values at this point as noted in the option list.



Polyphony for the ContinuuMini presets you create should be set from 1 to 8 without expanded polyphony or 1 to 4 with expanded polyphony (as max polyphony is 8). Also note that if MPE+ or MPE is set for Y/Z, channels 2 through max polyphony +1 will be used. Channel 1 in this case is reserved for control use. If Y/Z are set to specific CCs (Y=CC74, Z=CC11 for example), midi channels 1 through max base polyphony will be used.

Finally MIDI operation is also influenced by the EaganMatrix Note Process Setting:



As noted, if you are using MPE.MPE+ Channel 1 playing mode and your device is not an MPE device, you likely want to set Note Process to Dynamic to allow the ContinuuMini to process Midi Velocity as expected.

16.14.2. Channel and Priority Processing Preservation on Preset Loading



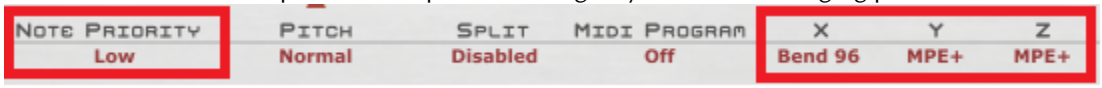
Normally, the X/Y MPE/MPE+ setting and Channel priority (as well as other settings such as rounding) are stored per preset. If you go to Midi and Global Settings in the Cogwheel options, you can set the Preset Loading option from the default of "Replace" to "Preserve". Replace will replace the options using whatever values are stored with the preset.

This option is very useful if you are using Channel 1 processing mode (Y/Z set to MPE+ or MPE) and you want to quickly move between presets and insure you are always going to stay in that mode (use "Preserve Midi Encoding"). Use "Preserve Surface Processing" to preserve Note Process. This is detailed above in section 10.22.

16.15. Playing the ContinuuMini from the Continuum (or another MPE controller)

While the ContinuuMini cannot be used as a Continuum DSP extension (like an iCEE or xCEE) it is easy to play the ContinuuMini from the full or half size continuum with up to 8 voice polyphony. This will allow you to use the ContinuuMini to augment your presets with other presets that will play with them if you mix the outputs of both instruments. Follow these steps for use with EaganMatrix:

- Bring up the EaganMatrix connected to the Continuum. Select the preset you wish to play on the Continuum along with a preset you will play on the ContinuuMini (if you only want to play the Mini from the Continuum, it is suggested you select the Empty preset so no sound will be generated from the Continuum).
- In the Continuum preset, set Y/Z to MPE+ and Bend to 96 and Select a desired Note Priority (you can set Midi and Global "Preserve" options to keep these settings if you will be changing presets on the continuum).



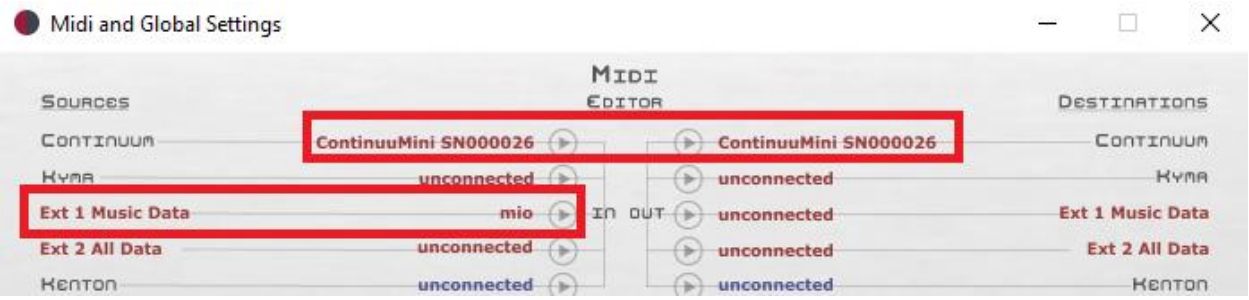
- Match polyphony as best you can. Select a polyphony for the preset you wish to play on the ContinuuMini. Here is where there may be a conflict. You are setting the preset for play from the Continuum, but you also want to play the ContinuuMini. If you have a preset of Base 4 set on the Continuum for example, you will only be able to play four of the eight possible voices on the preset you are playing on the Mini. Be aware of this if you are playing and you do not hear the number of voices you expect being played on the ContinuuMini.

- Save that preset to a user position on the Continuum if you like for recall later so you do not have to make any more modifications.

- Exit the editor for the Continuum (if you are using the old editor) or change the input source to be the ContinuuMini if you are using the new integrated editor.

- Make sure the ContinuuMini is connected to the editor (blue dot on).

- Go to MIDI and Global Settings and select the Continuum's MIDI controller as the External Source and make sure it is set to Music Data (as you do not want to pass Continuum configuration data to the ContinuuMini). In the case below, the MIO interface is the Continuum's interface:



- Select a preset on the ContinuuMini you want to play on the Continuum and make sure that is also set to Y/Z MPE+, Bend=96 and to be safe set that preset to the same Note Priority you set in your Continuum controlling preset.

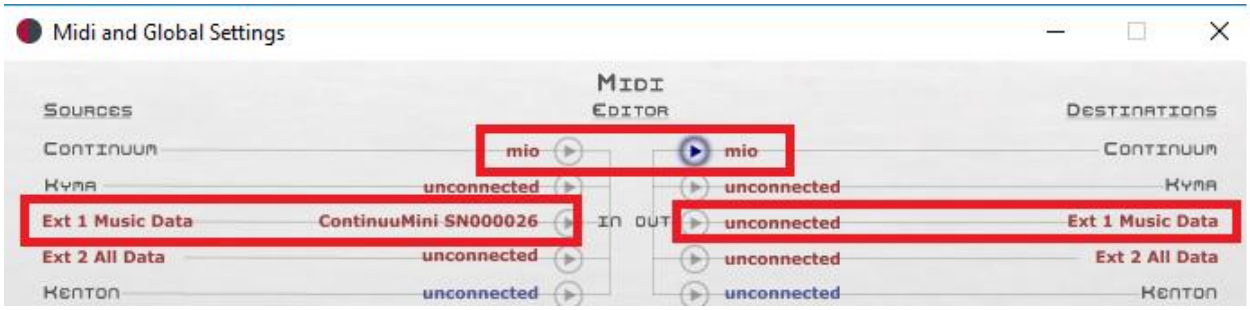
- You should now be able to play the ContinuuMini from the Continuum, however the Mini is now a "satellite" of the Continuum and for best effect, you should not try and play the ContinuuMini while you are playing the Continuum controlling the MINI or notes may cut out or distort as they are both playing on the same channels.

- Note that the Continuum will output on Midi channels greater than 9 if Polyphony I set higher and you are in default Priority=Oldest mode. This will cause cutouts in the sound when playing the ContinuuMini as it can only accept data on channels 2-9 in MPE/MPE+ mode or channel 1-8 in non-MPE mode (for example Z is set to CC7 or CC11). In this case it is best to set the Continuum to Priority=Low. This will guarantee you send on channels 2-9 or 1-8 (depending on MPE mode) as long as you play with Polyphony 8 or less (most do not use more than 8 finger polyphony when playing). Of course if your preset is set to a lower polyphony, you will have to adjust the Continuum output to match the max polyphony of the Mini or you will get cutouts in the sound. The same holds true when playing from any other MPE controller like Linnstrument or Roli.

16.16. Playing the Continuum from the ContinuuMini

It is possible to play the Continuum from the ContinuuMini, though likely if you have them both you will be playing the Mini from the Continuum as described above. To play the Continuum from the Mini:

- Bring up the Haken Editor by replacing the ContinuuMini Source/Destination with the interface of your Continuum (MIO in this case).
- Select a preset on the Continuum you want to play. Set Y/Z to MPE+.
- In the External Data Source select your ContinuuMini as Source device – but make sure to leave the Destination unconnected or you will create a MIDI loop and get an error:



- Make sure your ContinuuMini is playing a preset that sets Y/Z to MPE+ and bend is set to whatever will be set in the Continuum preset being played, likely 96. Set the Continuum preset to match.
- You should now be able to play the Continuum from the Mini.

16.17. Playing the ContinuuMini from Other MPE and non-MPE MIDI Instruments/Controllers through the EaganMatrix - Use Cases

Here are some use cases for MIDI operation that might be useful if you are trying to use the ContinuuMini with external Devices and DAWS:

Use Case 1: Using a Non MPE-based MIDI Controller/Instrument to play the ContinuuMini (Standard UBS MIDI keyboard for example).

- Connect MIDI instrument to computer USB port
- Verify it is recognized by your operating system (if not a class compliant USB interface and drivers need to be loaded)
- Bring up EaganMatrix
- Select the Device in MIDI and Global Settings as External Source (set as "Music" if you just want to control notes or "All" if you also want to control preset functions with knobs or dials)
- Set MIDI Instrument to play on Channel 1
- Set EaganMatrix Preset's Y/Z to "MPE+" (if you set Y or Z to a CC you will not be able to play polyphonically). Set Midi and Global Setting Preset Loading to "Midi Encoding Preserve" if you want to guarantee you preserve Channel 1 processing as you change presets.
- Set EaganMatrix Preset's Bend = 96:N, where N=2, 5, 7, or 12 semitones. A standard MIDI keyboard's bend wheel will go to the max bend you set, so if you set 12 you will be able to bend up/down an octave, etc. If your MIDI controller has a bend setting, set to the same value.
- If possible set your modulation wheel to CC74 (or some other control you might have for that purpose if you want to control Y while you play). However, the EaganMatrix will interpret the default CC1 as Y if you do not set to 74 (but the EaganMatrix will not display Y changing in the latter case).
- You should now be able to play the ContinuuMini polyphonically using standard MIDI Velocity for dynamic control.
- If you have any dials or push buttons that can be set to CCs, consult Chapter 15 for proper settings to be able to control preset functions such as Controls (including g1 and g2), Recirculator, etc.

Use Case 2: Using a Semi MPE-based MIDI Instrument to play the ContinuuMini (that supports Aftertouch but perhaps not MPE Channel per Note operation – such as the CME XKey37).

- Connect MIDI instrument to computer USB port
- Verify it is recognized (MIDI class compliant devices should be recognized automatically)
- If your device needs configuring in a software tool do that first as you may not be able to run the tool once the device is connected to the EaganMatrix.

- Set Aftertouch to Polyphonic Key Pressure (so each key can react independently to pressure)
- Set other aftertouch and key sensitivity, velocity curves, etc. as desired if you can. In the XKey37 case, set "First Aftertouch value is derived from Velocity".
- Save setting to your MIDI controller.
- Bring up EaganMatrix
- Select the Device in MIDI and Global Settings as External Source (set as "Music" if you just want to control notes or "All" if you also want to control preset functions with knobs or dials)
- Set MIDI Instrument to play on Channel 1
- Set EaganMatrix Y/Z to "MPE+"
- Set EaganMatrix Bend = 96:N, where N=2, 5, 7, or 12.
- You should now be able to play with Polyphonic Aftertouch on Channel 1

Use Case 3: Using an MPE-based MIDI Instrument to play the ContinuuMini (such as Linnstrument or Roli Rise as examples of settings to use for other MPE controllers).

- Connect MIDI instrument to computer USB port
- Verify it is recognized (MIDI class compliant devices should be recognized automatically)
- If your device needs configuring in a software tool do that first as you may not be able to run the tool once the device is connected to the EaganMatrix (for example the Roli Rise the Roli Dashboard for configuration as the Linnstrument can be set manually on the fly at any time).
    - On Linnstrument:
        - Set Midi Mode = Channel Per Note
        - Set View = Per Note Channels
        - Set Channels = 2..Max Polyphony+1 (as set in your desired Mini preset)
        - Set Pitch = On
        - Set Timbre/Y=C74
        - Set Loudness (Pressure) Z = Chan Pres (Channel Pressure)
        - Set X Bend = 12, 24, 36, 48 or 96 (suggest 24)
    - Roli Rise:
        - Bring up Roli Dashboard
        - Set MIDI Channel Mode = Multi
        - Set MPE = On
        - Set Range = 2..Max Polyphony+1 (as set in your desired Mini preset)
        - Set Glide and Slice Tracking = Last Note Played (default)
        - Set Press Tracking (Z) = Last Note Played (default)
        - Set Pitch Bend Range = 96 (or less if you don't need large bend – just match ContinuuMini setting)
        - Set Octave setting to match your desired range of ContinuuMini output (normally this would be down one octave on Rise).
        - If using a pedal, set that to desired CC (see CC control section in this manual). IN this case make sure EaganMatrix is set to receive "All" Midi data, not just "Music" data.
    - On ContinuuMini:
        - Set Y/Z= "MPE" for desired preset ("MPE+" will work too)
        - Set Z/Bend = 12, 24, 36, 48 or 96 (whatever you set your MIDI instrument to)

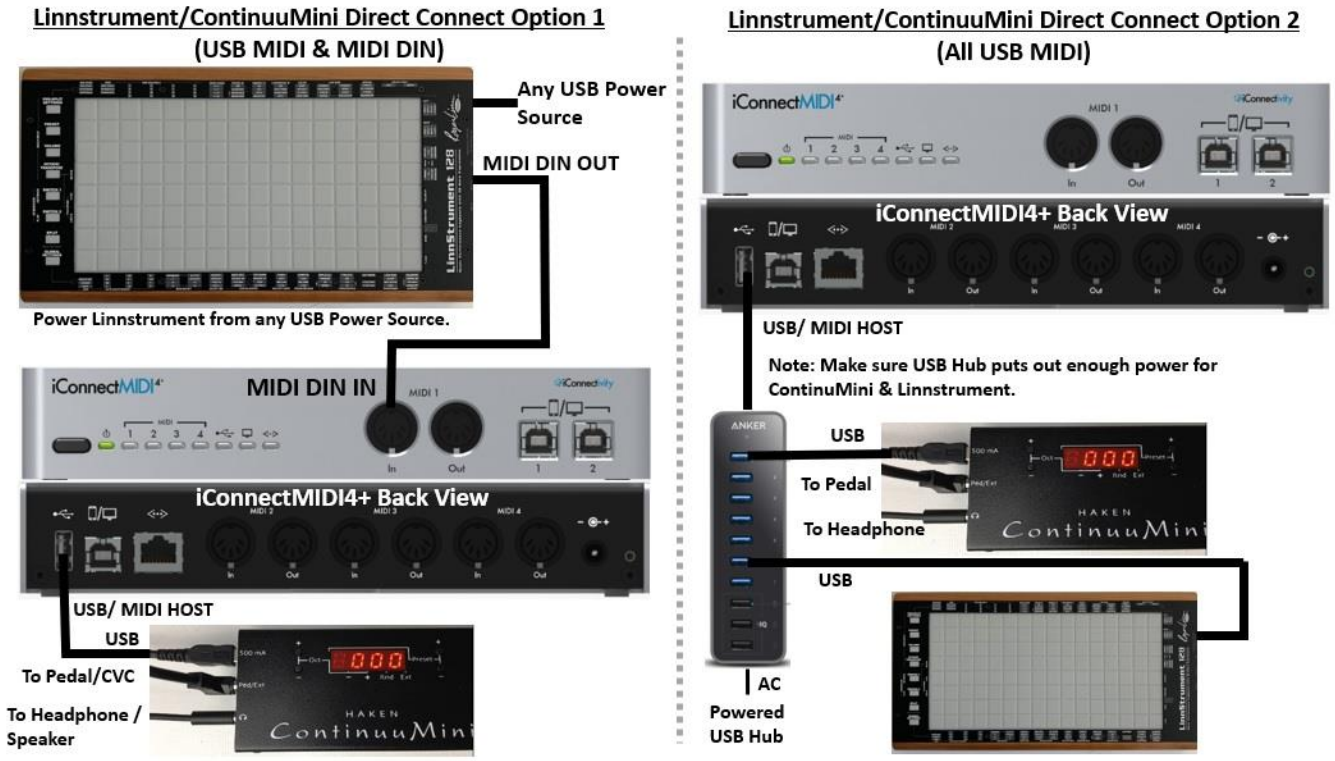
16.18. Playing the ContinuuMini Directly from Another Source

If you wish to play the ContinuuMini directly from another MPE or Standard MIDI controller without interfacing to a computer, a MIDI interface with a host connection port will be required. In cases where you want to connect two instruments that use a host MIDI connection (such as ContinuuMini and Linnstrument) you will need a way to connect multiple host ports through a USB/MIDI hub configuration of some sort.

Perhaps the controller has a MIDI DIN port or perhaps a MIDI USB port or as in the case of the Linnstrument or XKey37 they have both MIDI output options. Here are two configuration options that can be used. This example uses an iConnectMIDI4+ MIDI interface, but any similar device that can support a MIDI USB host port with DIN inputs should also work.

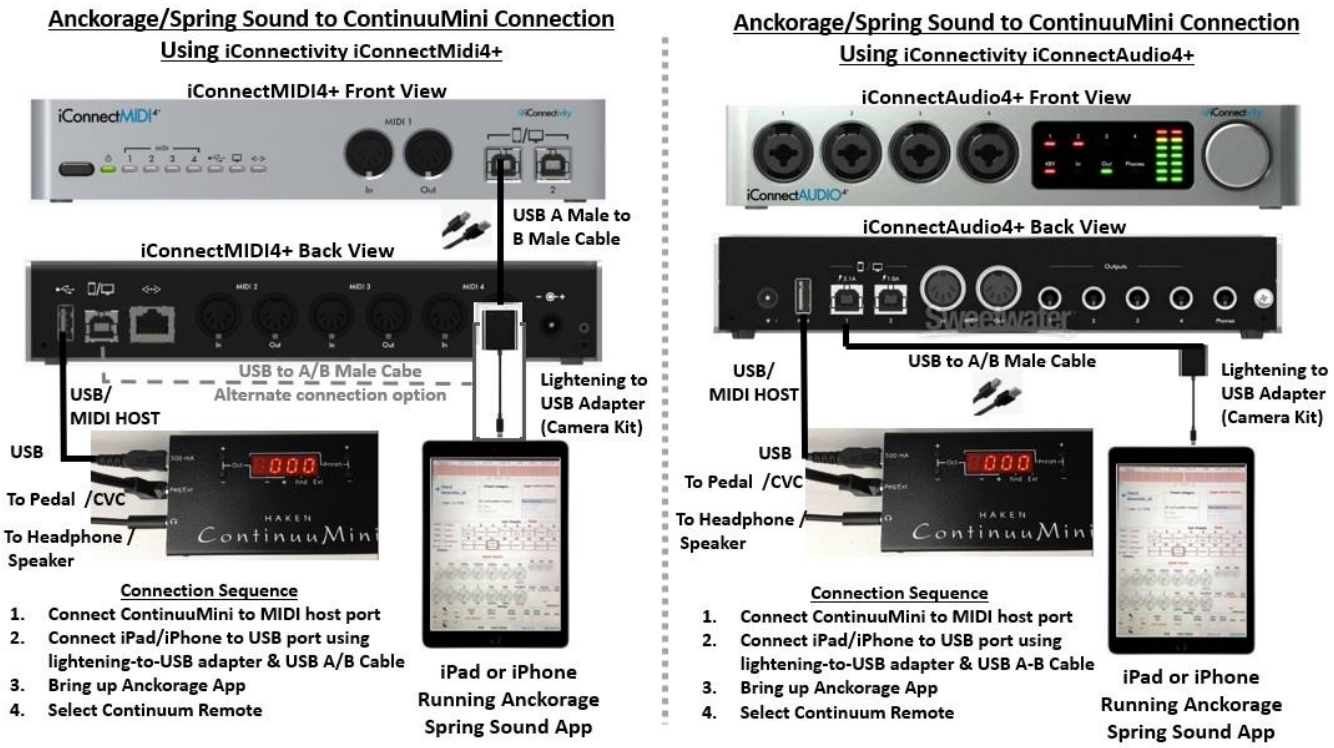
The first uses a USB host connection to a MIDI interface and then MIDI DIN Linnstrument output to the MIDI interface. The second uses a secondary USB hub to connect to the MIDI interface host port and then everything gets connected over USB (but you have to make sure the hub has enough port power for your devices). The Linnstrument is an example in the diagram below. Other MIDI controllers could be substituted in its place.

Note: We have found that some hub combinations do not put out enough voltage (5V) for a stable ContinuuMini connection, especially if other things are attached. This is particularly true using the latest Kenton USB Midi Hosts. A direct USB host connection is preferred to a hub. If more than one USB device requiring a USB host is required, the more reliable option is to use a multiple port USB host (not many are available but iConnectivity MIO XM or XL has been tested successfully).



16.19 Connecting the Anckorage Spring Sound App to the ContinuuMini

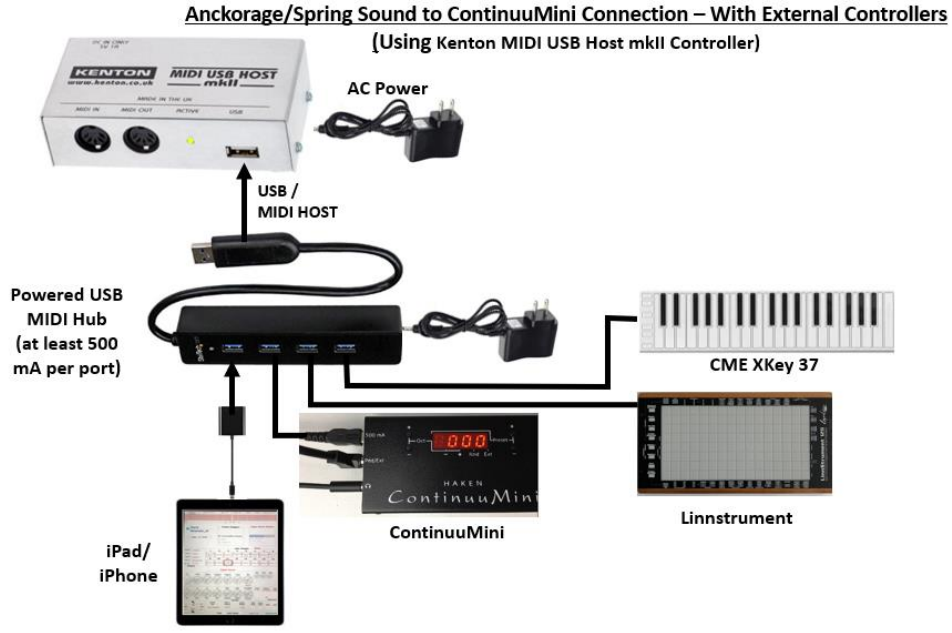
If you plan on using the Continuum Remote function in the Anckorage Spring Sound app with your ContinuuMini running an iPad or iPhone, you will need to connect the Mini to the USB host port of a MIDI interface such as the iConnectivity iConnectMidi4+ or iConnectAudio4+ interfaces and then with a Lightening-to-USB adapter (the Apple camera adapter can be used or a generic alternative) connected to the IOS device, connect to the USB port of the Midi interface. In the iConnectivity device case, this will require a USB A-male to USB B-male cable.



16.20 Connecting without Computer - Reliably

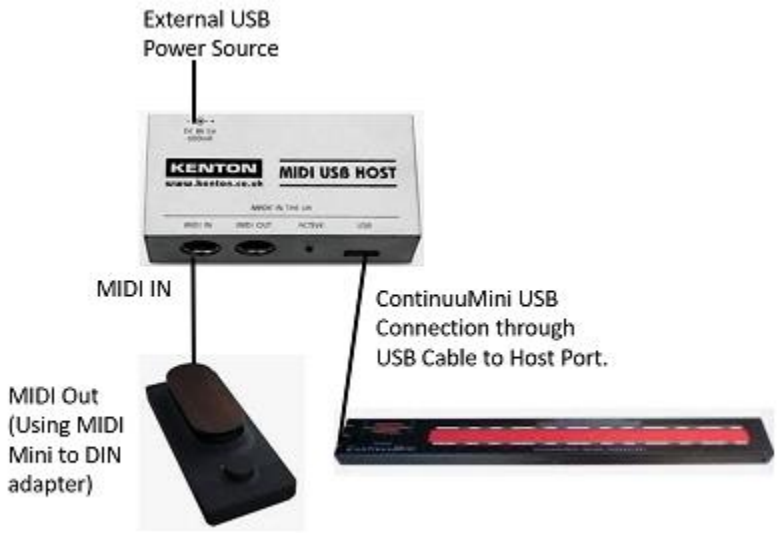
Many wish to connect a ContinuuMini to a USB controller for performance without a computer. A USB Midi Host must be used in this case.

An alternative if your MIDI interface has a USB MIDI host port but no extra USB ports (such as the Kenton MIDI Host mk2 interface) is to connect a powered USB hub capable of supporting the ContinuuMini (5V and 500mA) to the host port of your MIDI interface and connect the iPads or iPhone to that using a Micro USB to USB-A cable from the Lightening-to-USB adapter. In this configuration you can also connect other external controllers like a Linnstrument or XKey37 if you wish.

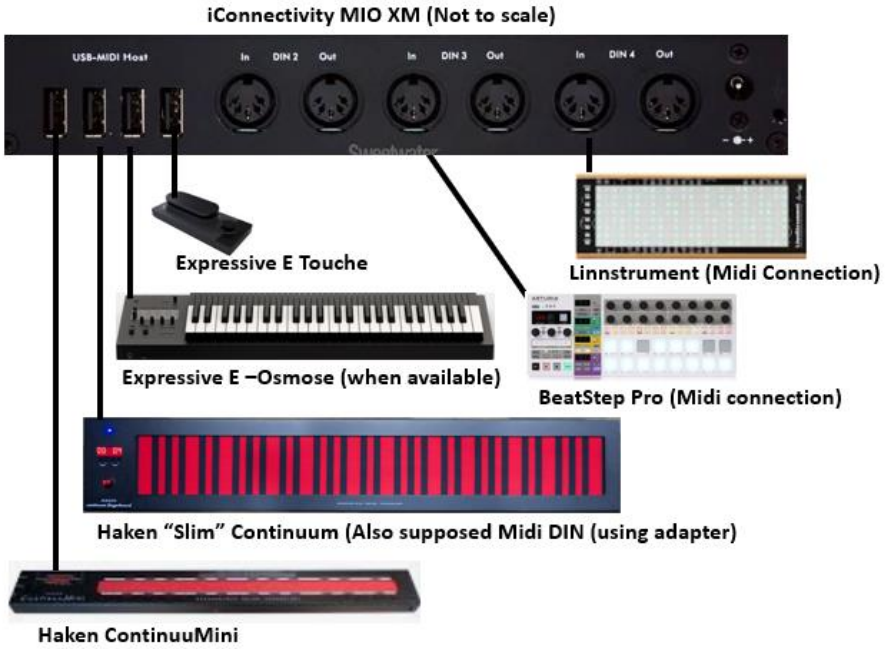


NOTE: Many have found this hub based connection with the Kenton does not work reliably. The better option is to use a multi-port USB Host – see below.

If you only want to connect one device to your ContinuuMini without a computer and it supports a MIDI DIN (or mini Midi to CIN connection with adapter) that is the best choice versus trying to use a hub with the Kenton. For example, the Expressive-E Touch has both USB and Midi connections. To use the Touche with a ContinuuMini (or Continuum) and a Kenton Host, connect it to the MIDI Din port – see below.



If you wish to use multiple USB devices that require a MIDI host, the preferred solution is to use a multiple USB Midi Host interface such as the iConnectivity MIO XM or XL. This allows you to connect and route multiple class compliant USB Midi devices that need host connections (in addition to standard Midi Devices as well).



16.21. Recording the ContinuuMini with a DAW for processing and playback

Not many DAWs support MPE operation. Bitwig does and Traction, Reaper and Cubase to some degree, but any DAW can be used to record ContinuuMini MIDI data, though you may need to edit CCs for best operation. Here are some tips for general DAW use:

- Set up the ContinuuMini as you desire and exit the EaganMatrix prior to bringing up your DAW as it may not see your Mini device if the Editor is still connected to it.
- When recording the ContinuuMini in your DAW it recommended that you avoid setting both the Input and Output device as the Mini as in some default DAW configurations this can set up a Midi loop (specific DAW configurations may get around this but that is beyond the scope of this manual). If recording the Mini, set the output device to your normal MIDI controller (or its current setting). When you are ready to play, set the input device to something other than the ContinuuMini and set ContinuuMini as the output device (if you are planning to play back from the Mini).
- If you only want to record monophonically, set the EaganMatrix preset you are on to Base 1. In this case, it doesn't matter what Note Priority you set. Everything will be recorded on Channel1 (if Y/X is set to a specific CC value) or channel 2 (if Y/X is set to MPE/MPE+). This will make it easier to play back Mini data if you want to do this on a non MPE compliant MIDI instrument or instrument plugin (else you may have to duplicate sample plugin channels for example to process all MPE outputs).
- If you set anything other than polyphony Base 1 and you play duo-phonically, you will always be recording on more than one MIDI channels.
- Always look at your MIDI data stream after recording the Mini to have a better idea of what it has output, as it may not be recording what you expect if you don't fully understand Note Priority and duo-tactic voice assignments.
- Remember based on your Y/Z setting (specific CCs set, "MPE" or "MPE+") you will be generating different MIDI Data channel outputs:
    - MIDI Velocity will always be set to 127 if Note Process for the current preset is set to the default "Static Velocity". For DAW input and playback expecting Velocity, the preset should be set to "Dynamic Velocity" (initial finger velocity) which will create a better default playback if you are not going to record/process Z data.
    - If Y and Z are set to specific CC values, those will be generated in the MIDI output stream for example defaults: Y=CC74 (brightness), Z=CC11 (expression). MIDI will be output between channels 1 and max polyphony set in your preset depending on the Note Priority used.
    - IF MPE mode is set, Aftertouch will be output for Z along with CC74
    - If MPE+ is set Aftertouch plus CC 87 will be output for Z along with CC74
    - Pitch Bend information is always sent on the current channel played/output (even if 96:NN is set – as that is for receiving bend information).
- Note Priority will affect how MIDI Channels are output. If you are recording multiple times, the channel that you last played will be the last in the Note Priority sequence for the next recording. This will make it impossible for you to really know what channel is being recorded to for some Note Priorities (Oldest and Same Pitch for example). If you need predictability in what channels are output, set to Base 1 so you can predict Channel 1 (or 2) or use "Lowest Channel Number" or one of the "Highest" options. For example, if you set Base polyphony to Base 4 and Note Priority to "Lowest", because you can play a maximum of two notes on the ContinuuMini, you know you will always be recording channels 1 and 2 if Y/Z are set to a CC value or recording channels 2 and 3 if you are set to MPE or MPE+ mode.
- If you want to record the ContinuuMini on a specific MIDI channel, set Note Priority to "Highest Channel Within Polyphony" and then set Base Polyphony to the Channel you want to record (if YZ are set to a specific CC) or to Base Polyphony +1 (if you are using MPE/MPE+ mode). This will have the effect of setting you to Base 1 as only the highest channel in the polyphony you set will be recorded even if you play duo-phonically (last finger pressed will be the note sent). Note that you can set the Polyphony higher than 8 in this case if you want to record to channels 9-16 but that should be avoided. Remember to take the Expanded Polyphony setting into account when determining the highest voice in the polyphony. Here's a table that will let you predict what channel you will be recording monophonically on if you use the "Highest Channel Within Polyphony" setting and MPE/MPE+ mode.

Base Min Polyphony	Highest Channel within Polyphony Output (Y=CC74,Z=CC11 / MPE or MPE+)	Base Mini Polyphony	Highest Channel within Polyphony Output (Y=CC74,Z=CC11 / MPE or MPE+)
1	1 / 2	1+	2 / 3
2	2 / 3	2+	4 / 5
3	3 / 4	3+	6 / 7
4	4 / 5	4+	8 / 9
5	5 / 6	5+	8/ 9
6	6 / 7	6+	8/ 9
7	7 / 8	7+	8 / 9
8	8 / 9	8+	8/ 9

16.22. ContinuuMini Troubleshooting Use Cases

Here is a representative list of possible issues you may experience and suggested solutions:

Case 1: Low Volume

I connect my ContinuuMini to a sound system, but the output seems much lower in volume than expected.

Check: Is your Gain menu setting too low?

Check: Do you have the Dim setting at a high value?

Check: Is Dim in the EaganMatrix selected?

Case 2: No EaganMatrix Connection

The ContinuuMini will not connect to the Haken Editor/EaganMatrix. I don't get the expected Blue connection LED displayed.

Check: Are you running a compatible version of the editor. YOU must run Version 8.71 or later and version 9.0 is the current official version. Never run a version of the editor that is older than the version of firmware on the ContinuuMini. Always upgrade with the editor version that you want to upgrade to. For example if you ae running 8.85 and you want to upgrade to 9.0, run the 9.0 version of the editor and then upgrade.

Check: Is your Source and Destination in Midi and Global Settings set to a ContinuuMini device?

Check: Do you have a proper USB connection to your computer

Check: Did you disconnect and reconnect the ContinuuMini to your computer? For example, if you unplugged your ContinuuMini from a USB port on a Windows computer and reinserted the cable into a different port. On Windows, when you plug into a different port, Windows changes the name of the device (it appends numbers) -- so that you can have several of the "identical" device at once. It is normally a nice convenience, but in this case, restart the EaganMatrix editor.

Check: Do you have another device connected to the ContinuuMini? For example are you connected to it in your DAW or some other MIDI controller or MIDI program? Exit the DAW and then bring up the editor and see if it now connects to the Mini.

Case 3: ContinuuMini Presets Sound Different than on Continuum

I'm playing presets on my ContinuuMini but they don't sound exactly the same as on my Continuum.

Check: Does the preset make use of the Y parameter in very noticeable ways. Y has a much greater range of motion on the continuum. On the Mini you more use a rocking motion for engaging Y and some presets that are highly dependent on Y may not sound exactly the same as Y will be engaged much quicker from min to max. You may want to experiment altering Y control in the EaganMatrix to tweak some presets to your liking.

Check: Did you reset the Polyphony of the preset on the Mini? Certain presets make assumptions on base polyphony and if you set it lower than expected the sound may not be what you expect.

Case 4: ERRF Message

I just applied power to my ContinuuMini and it is displaying ERRF?

Check: Make sure when you booted the ContinuuMini your finger was not on the playing surface. The device needs to initialize when starting up and a finger on the surface will interfere with this process.

Case 5: Pedal Doesn't Work

I just connected a pedal but it does not seem to work

Check: That the preset you are playing has Pedal 1 set to control the expected parameter you assume the pedal will trigger (for example sustain).

Check: That the EaganMatrix if you have it up displays the expected pedal icon. If not check you pedal type compatibility and possibly pedal adapter.

Check: That the "I2C" setting is set to 0 (pedal mode) and not 1 or 2 (CVC and external input modes).

Case 6: No Sound for Preset

I set the ContinuuMini to a preset number but no sound is coming out.

Check: Your audio output is properly connected

Check: That you did not load a preset that is meant for playing CVC (12nn) or MIDI (13nn). These presets are not programmed to output a sound but instead to control external devices.

Check: The Empty preset is not set as it creates no sound and it is meant as a blank EaganMatrix template to use as a starting point to create your own presets.

Check: The presets are loaded correctly. Does the ContinuuMini say "load File 2". Sometimes you can send a stream of Midi data to the Mini and it will invalidate presets. At times you may not see the "Load File 2" message.

Check: You did not plug a Mono cord into the audio jack that requires TRS/Stereo cable. You can damage the audio circuit by doing this.

Case 7: External Controller Doesn't Work with EaganMatrix

I plug an external MIDI controller into my computer to use with the ContinuuMini but the EaganMatrix does not see it to select it for External Music Data Control in the Midi and Global Settings window.

Check: Did you connect the device while the Editor was running? The EaganMatrix editor should be exited and restarted if you attach a USB device while it is running. Then it should see the new external device for selection.

Case 8:Duophonic Playing Doesn't Work

I can't seem to play two voices at the same time for a preset.

Check: Check that the preset is not set to Polyphony Base 1 in the EaganMatrix. For two voice playing this must be set to Base 2 or above (though you will only be able to play a maximum of two voices at the same time, but you can build up a higher layer of internal polyphony using sustain).

Case 9: Duo-Phonic Playing Not What I Expect

I can play two voices at the same time for some presets but they are not as independent as I would like.

Check: The ContinuuMini is not 100% independently polyphonic from the playing surface. If you have one finger down, that will control some of the characteristics of the sound if you press a second finger. For example, the dynamic level of your polyphony is based on the highest pressure level played on either finger. You can however play minor second intervals on the ContinuuMini without any problems (that can be a challenge on the Continuum). The best use of two voice playing is to use one voice as a pedal tone and play the second along with that or play intervals, perhaps in glissando.

Case 10: CVC (or uCVC) Doesn't Play as Expected

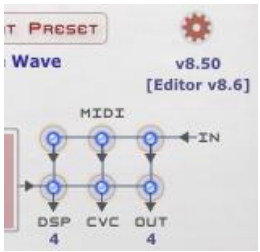
I've connected by ContinuuMini up to my CVC and set i2C=1 on the Mini and it seems to be doing something, but it does not play as I expect it to. Notes cut out.

Check: Remember that the CVC follows the Note Priority setting, that defaults to Oldest (MIDI channel used for new notes). Depending on what your polyphony setting is this means that any of the four CV sets of parameters may be playing. If you are set to Polyphony Base 2 and Oldest Priority, the CVC channels will alternate between the first 2 channels. Because the ContinuuMini can only play a max of two voices, you likely will get the most desired CVC results by setting Polyphony to "Lowest".

Case 11: Can't Switch Between Continuum and ContinuuMini in Editor

I have a Continuum and ContinuuMini and can't seem to switch back and forth in the EaganMatrix Editor.

Check: In Midi and Global Settings make sure you have the Source and Destination set to the MIDI device connected to your Continuum or Mini and 2) Make sure you are set to MPE+ and the routing indicators are all lit for In and Out.



Case 12: Unknown Error Code is Displayed

My ContinuuMini is displaying a strange error code (not ERRP, ERRL or ERRF).

Check: Write down the code and simply unplug the ContinuuMini from USB and reconnect. The error code will likely disappear and you are back to normal playing mode. If this happens again please contact Haken Audio.

Case 13: Trouble Recording in a DAW

I've connected up a MIDI device to control the ContinuuMini or a DAW (for example Cubase) to record or control, however I don't seem to be able to use the DAW properly but it sees the Mini as an input source (for example, the DAW will not record ContinuuMini MIDI information).

Check: If Windows: Is the EaganMatrix editor running and connected before you brought up the DAW and connected it? The EaganMatrix should be closed out if you want to perform certain operations that use the ContinuuMini USB interface with other connections. The EaganMatrix Editor can normally be left up if you are using a device that sends information to the Mini through the Editor (by selecting the device in the Editor MIDI controls). Note: this is not an issue on the MAC where multiple devices can grab the ContinuuMini device.

Check: This may be data stream issues as ContinuuMini Output a huge amount of data the DAW may not handle or it may be MPE related. You can try these options in any order and any combination until you find out if its MPE channels or data stream issues.

1. Set rounding to full (this will greatly limit the amount of data output - basically eliminating pitch bend messages (that are half of the huge data stream with pressure messages). If that works then bring up rounding until it breaks. You likely don't need and can't hear full rounding anyway.

2. Set MPE mode vs. MPE+. This will eliminate the 14 bit high resolution Z & Y data that outputs on CC87.

3. Always set Priority to Low so you don't cycle through all your MPE channels. On Mini that means you will always output on Channels 2 and 3 (3 if playing polyphonically).

4. Set Z = CC11 or CC7 to test. (Takes things out of MPE mode). This will remove Aftertouch output. Again Set Priority to Low. This will Output on Channels 1 and 2.

5. Set Z=CC11 or CC7. Set Polyphony to 1. Set Priority to Low. This will always output on Channel 1.

6. If in Windows make sure you do not have the Editor up and then attach your Mini device to Ableton for record. Windows might grab the device first for Editor. So try recording without editor if that has been up.

Suggest you watch this to learn about how the ContinuuMini (and Continuum) deal with Midi.
https://www.youtube.com/watch?v=kR4xEBQ3v2k&t=1617s

Case 14: ContinuuMini Doesn't Play as Expected from Continuum

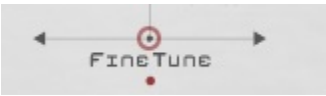
I'm trying to play the ContinuuMini from my Continuum and it plays but I get notes that cut out and bend does not seem to work.

Check: Make sure that you have set both to Y/Z = MPE+ with bend 96 and that the External Source when you have the ContinuuMini connected to the EaganMatrix is set to the MIDI interface you use to connect your Continuum to the EaganMatrix.

Case 15: ContinuuMini Seems out of Tune

When running the Haken Editor, turning on the surface display and then pressing down on the surface, the tracking is shown to be slightly off in the x-direction. In addition, the ContinuuMini plays out of expected tune.

Check: When you go to MIDI and Global Settings in Cogwheel, is the Fine Tune setting set to no pitch offset (exactly in the middle)?



Case 16: Recirculator/Reverb Does Not seem to Work

The Recirculator (reverb) functions do not appear to work. None of the reverb options do anything to the sound.

Check: When you go to MIDI and Global Settings in Cogwheel, is the Recirculator (Recirc) option set to Enabled?



Case 17: I want to use the ContinuuMini as a MIDI Ribbon Controller but can't seem to get it to output on a single channel

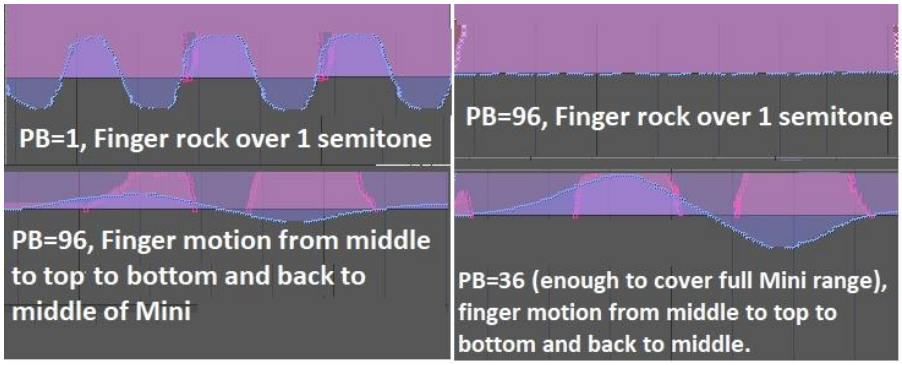
Remember you will change MIDI output channels if polyphony is > 1 every time you play a new note. In MPE modes, the output channel starts at 2 and will cycle through channels 2..9 depending on the polyphony set. If you set Y=74 (or any non MPE setting) then MIDI output channels start at 1 and you will cycle through channels 1..8 (if max polyphony is set to 8 or 4+). So if you want to use the Mini as a MIDI ribbon sending output to a single channel (CH1), set Y=74 and Polyphony=1 (not 1+) for your preset. If you set to MPE/MPE+ only channel 2 will be output in this setting. And you can turn MIDI routing off to the DSP if you don't want the Mini to play on pressing. Note: On Pitch Bend input to the Mini on Channel 1, there are four new options: 96:2, 96:5, 96:7, 96:12. These let you set incoming PB range when you are sending data to the Mini on channel 1 - which you would likely do for most external keyboard/controller or sequencing applications for example. (Also Applies for Continuum)

Case 18: Pitch Bend magnitude when recording to my DAW is lower than I expect

The pitch bend range you set will affect the magnitude of the pitch bend messages. This may be important to you if you are recoding the pitch bend into a DAW and cannot easily scale it to your desired range. There is normally no reason to set the ContinuuMini to PB=96 range as the normal playing range of the Mini is 28 notes without using octave keys or octave scaling. The following MIDI input examples of a DAW recording give you an example of what the pitch bend magnitude scaling is for min and max settings. It is suggested if you want to use the ContinuuMini as a pitch bend recorder, set to Y-74 and then set your desired PB range. In MPE modes, the minimum range allowed is 12. If Y=74 (or some non-MPE setting) the EaganMatrix has lower settings. (Also Applies for Continuum)

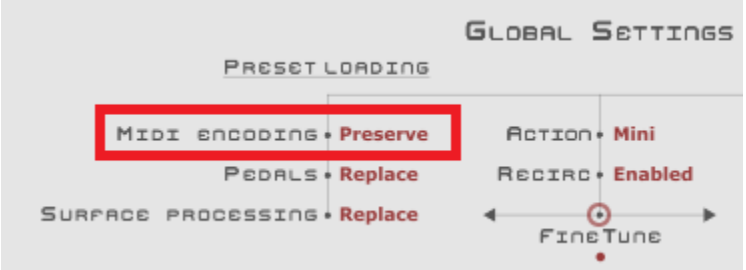


You can set anything up to 96 in this case if you are programming it through MIDI. The Editor choices are limited. The Pitch Bend data is the blue graph in the following. See how PB magnitude is affected based on the bend range set.



Case 19: I want the Pitch Bend amount to stay the same from preset to preset but it keeps changing

In the MIDI and Global Settings page, set MIDI ENCODING to "Preserve". All preset selections will then maintain the MIDI encoding until you set the option back to its default value of "Replace". (Also applies for Continuum)



Case 20: I want the Rounding Rate to stay the same from preset to preset but it keeps changing

In the MIDI and Global Settings page, set SURFACE PROCESSING to "Preserve". All preset selections will then maintain the MIDI encoding until you set the option back to its default value of "Replace". (Also Applies for Continuum)



Case 21: I Get ERRP Messages

This message means the ContinuuMini is not getting enough power or voltage.
Check: Are you outputting 500mA (0.5 Amps) from your USB connection. Actually the ContinuuMini should power ok with even 0.25 A.
Check: Are you outputting at least 5V from your USB source. This is normally the reason for this message. Most computer ports put out at least a steady 5V, but hubs may not, especially if you have other devices plussed into the hub. It is recommended that you connect the Mini directly to your computer's USB port and not use a hub.
Check: Are you using a Kenton USB Midi Host. The newer models seem to output less than 5V we powered by a hub for example. Always power the Kenton Midi Host directly from a USB adapter connected to the wall socket. It is suggested that you get a USB voltage/power monitor for debugging this kind of problem. They are available online for around $10.

Note: If you have issues where you are not getting 5V from a Kenton USB Midi Host or some other power source and the ContinuuMini constantly puts out ERRP messages (more likely this will be voltage related than power) you might try a USB Y cable that will allow you to power the Mini directly from a USB source connected to the wall and connect the data interface to the desired source (Kenton USB MIDI Host for example that has shown not to put out 5V in some cases, especially if powered from a hub):



Case 22: My Haken Editor keeps disconnecting from the ContinuuMini over USB

Check: Make sure USB port is active. Try another port.
Check: On MACs always try and use the same port connecting to the Continuum, especially if you have more than one Continuum or ContinuuMini as ports can become fixed on a USB device and will think the new Continuum device is the old one.
Check: Try different and possibly shorter USB cable.
Check: Remove any hubs between the Continuum and the computer. Some hubs cause connection issues in the real time handshaking between Continuum and computer.

Case 23: I can't load new firmware or things are strange after loading new firmware

Check: First make sure the editor you are using to load the firmware is correct for the firmware you are trying to load. Many people bring up an older editor to try and load new firmware. The Version of the editor displayed at the top right of the Editor screen should be no older in version than the version of firmware it says is on the ContinuuMini. You often will of course run a version of the editor that is newer than the current firmware version – as you are trying to update to that new version.
Check: The ContinuuMini requires version 8.71 of the editor or later. Version 9.0 is the current version most will be running. You should be able to update from any version after 8.71 to a 9.x version. Do not use version 8.5 or earlier to do anything with a ContinuuMini.
Check: You must have the solid blue LED in the top left of the editor active to load firmware. Also go to Midi and Global Settings and make sure the Source and Destination indicators are flashing. If neither of these are true, check your USB connection.

Case 24: I seem to be getting double notes played when I am only playing one note

The Surface display might also show double notes when pressing a single note:



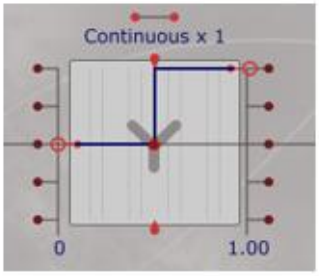
Check: You might try Refine Calibration but this may not work. This double note effect often indicates the ContinuuMini needs new factory calibration. It may also be an indication that the ribbon has a problem. Try repowering. Set to the Utilities Sine Wave Preset and then set that to Polyphony 1 (not 1+). If you still have the issue, this is likely a calibration or hardware issue and please contact Haken Audio support before trying the following factory calibration procedure below (section 16.23).

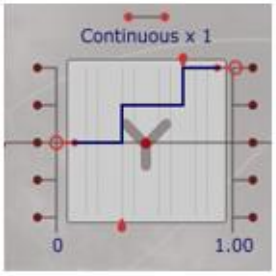
Case 25: When playing sometimes I get some notes that seem to explode in volume

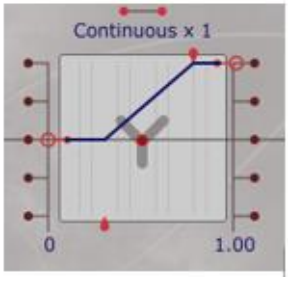
Check: Check the Polyphony of your preset. Some presets are constructed in such a way that a duo-tone (second polyphonic note played) will sound at a volume much higher than the first due to the ContinuuMini's pressure polyphonic pressure sensing algorithm. In this case, you need to be very careful to play monophonically with no polyphonic overlapping tones, even for a split second. One way to solve the problem is to set the polyphony to 1 (not 1+) that will avoid the possibility of polyphonic overlaps. However, in some cases setting polyphony to 1 can affect the sound of the preset itself and in this case this operation may not produce acceptable results.

Case 26: Some presets when played seem distorted or overly noisy especially in the middle of the fingerboard

Check: Does the preset make use of Y changes in formulas, especially more than one formula and do those formulas have a stepping Y function? Even a relatively smooth Y function can be an issue here.





or possibly even:


Because most presets are originally designed for the Continuum that has a very large Y range in comparison to the ContinuuMini, changes in Y of this nature can create discontinuities in some presets as the finger on the ContinuuMini can very quickly traverse a wide Y ranges and you might hear a cracking or break up int eh sound when playing in the mid area of the fingerboard. Sometimes playing with a lighter pressure can help, but if the discontinuity is too bothersome, the solution is to go into the preset and adjust Y so that it has less of an effect, in some cases setting to a fixed Y value you like instead of dynamic Y motion.

Case 27: My ContinuuMini does not seem to work with USB hubs or seems to disconnect from the Editor

Check: Are you running firmware 9.55 or later? Versions of ContinuuMini firmware before 9.33 had issues using USB hubs that is now fixed. USB in general is also more stable and has performance improvements over 8.71 and 9.0 (that some may still be using). It is recommended that all ContinuuMini users update to the current firmware release if they are experiencing USB issues.

Case 28: My ContinuuMini for some presets shows a strange number like "1'2"

Non-Issue: Nothing is wrong. The ContinuuMini's display now uses an apostrophe to indicate the number 2 in User preset display such as "122" = "1'2". This allows three digits to fit into two.

Case 29: Pedal Preserve option in Midi and Global Settings does not seen to work outside of Editor

Check: Nothing is wrong. Make sure you have the Preserve option set on the Pedal option you desire (i.e. Sos1 or Sustain, etc). Then when powering the ContinuuMini make sure pedal is attached before powering.

Case 30: Spring like twang with power off when playing ContinuuMini

Check: Quickly depress and release the fingerboard a bottom of Y and top of Y over its range. You should hear a flapping sound as the fingerboard pops up back into contact with the metal perimeter. This is normal. At bottom of Y, between the two Cs, you may hear a slightly different more high pitched sound. But if you can hear a sound that sound like a spring releasing and coming to rest over a short time, the instrument may need to be repaired. Please contact Haken Audio support.

16.23. ContinuuMini Factory Calibration

Normally, the ContinuuMini needs no calibration once shipped. Occasionally the unit might be dropped or otherwise exhibits some unusual playing behavior, most notably two notes being sounded when only one is played. This section will detail the factory calibration procedure which normally should be performed only when Haken Audio support confirms it is indicated.

1. After your ContinuuMini has powered on, press the **Oct+** and **Oct-** buttons simultaneously. The first digit on the screen should begin blinking - this means you have entered the menu system.



2. Press **Oct-** to move to the Brightness menu entry. The screen should show "brt" along with the current brightness value you have set.

3. At this point, calibrate the surface by playing in 3 spots as follows.

   Using a blunt but rather pointed object that will not harm the fingerboard – we recommend the back of a permanent marker as it allows for more accuracy while calibrating: Press each of the pictured spots in the middle of the fingerboard at full pressure - the very first note, the middle of the playing surface (between the "O" and "U" of "SOUND"), and the very last note.

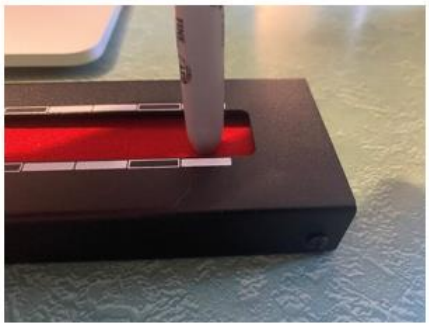
Step 1: Press Middle of Low E



Step 2: Press Between OU Above Sound (between F & F#)



Step 3: Press Middle of High G



4. Now press the **Oct-** and **Preset-** buttons at the same time. You will see all the text on the screen begin to blink - you will need to hold these buttons for 3 seconds after the text begins blinking. After 3 seconds you can release.



5. You can now press Oct+ and Oct- simultaneously again to exit the menu system and return to normal playing mode.

6. Set a sound for testing. The Utilities/Sine preset is a good choice. Test all black keys to ensure one note is played. Play each black key directly in the center. On the ContinuuMini's display, you should see the tuning display. If you see two solid bright dashes next to each other while playing the note, in the middle of the seven segment display, that signifies that the playing surface is registering your finger correctly and you are playing exactly in tune (see section 16.8 for pitch reference information).



7. Finally check for expected pressure sensitivity. Ensure that each note sounds even in volume, and that the pressure sensitivity responds as you would expect. You can do this either via listening to the audio out and/or viewing the Surface Display in the Haken Editor.

17. "Slim" Continuum Trouble Shooting

Note: While most of this section is intended for the "Slim" Continuum, much of it will apply to all models.

17.1 Powering Issues & Booting

There is no power switch on the "Slim" model. It requires the included 110/220V power adapter that will power the Continuum as soon as it is connected and plugged in. On powering the firmware version will appear for a couple of seconds before the firmware finishes booting. The last preset that was set in the editor or manually with the Preset Buttons should be displayed. After a firmware upgrade the display will show "00 00".

It is normal for the LED to blink green and red for a short time when powering/booting, This Continuum shout boot in a few seconds. if the Continuum displays a constant "DSP" message on the LED screen, or the LED is blinking and not in the expected constant Blue State, the firmware has not properly booted or possibly has not been properly upgraded or there may be some other issue. Try repowering.

If the unit does not boot into the constant blue LED state, turning the power off and powering again while pressing the red button will boot into SAFE mode. This can be useful for recovering if something goes wrong when botting – however it is suggested that you always contact Haken Audio support if your Continuum does not boot as expected.

Although the Continuum uses a 5V input, do not try to power if from a USB source as you can the ContinuuMini. Always power the "Slim" Continuum using the power adapter that is included with the instrument.

If possibly make sure your Continuum is connected to an appropriate Surge Protector to protect your investment in the case of sudden power outage or a lightning strike, etc. Running off an isolate power supply is always a good idea if you have one.

17.2 Haken Editor will not connect or does not display as expected

1. Do not use an earlier Haken Editor that is meant for Continuum firmware - 9.0 and earlier. These will not work with the "Slim" model. Note the firmware version when booting on the LED panel. The version of firmware you use should be at least that version or later. If you have not updated firmware in a while always run the latest version of the editor (which may be later than your firmware version of course) and update your firmware using that newer version.

2. Always connect the Continuum to your computer before running the editor. It is suggested you use the USB connection to connect to the "Slim" model however you can connect to the MIDI DIN ports if desired using a MIDI DIN-to-USB adapter. You can connect both at the same time, but the editor will only use one connection. You could use the other perhaps to connect a MIDI controller directly to the DIN ports while you use the USB connection for the editor.

3. The Haken Editor "look and feel" has been redesigned after firmware 9.0. The editor defaults to a "dark" template. A few other choices are available in Midi and Global Settings. If you want the lighter "Classic" display that can be set there. On rebooting the last screen template set will be used.

4. Make sure the editor did not crash and another copy can't run. Check your process list and kill the MAX process if in the list and the editor GUI is not being displayed

17.3 Presets do not display Categories as Expected after firmware Upgrade

1. After upgrading the main firmware file (File 1), you must then upgrade File2 that sets up the presets. Your Continuum and Editor should prompt you for this. Occasionally you may get a message to repower after upgrading File 1. There should be no issues doing that. After repowering, the "File 2" message should be displayed.

2. There are two File2 files in the firmware distribution – one for the Continuum and one for the ContinuuMini. Make sure you do not load the File2 for the ContinuuMini by mistake or presets may not display as expected. You can always reload File2 without reloading the Main firmware file.

3. Also note that the Preset display method for post 9.0 Haken editors is totally different that in earlier editors. You now select "System Preset/EaganMatrix" toggle to display the preset selection panel or EaganMatrix in the bottom half of the screen.

17.4 I cannot record through the USB MIDI Interface

Yes you cannot. The USB interface on the Continuum is not a USB Audio interface. It is used for MIDI connection only. If you wish to record audio from the Continuum (same with all models) you need to use a USB audio interface connected to the L/R Mono outputs or a digital recording interface if you have one that will connect to the SPDIF ports.

17.5 I can't figure out how to get my CVC (or uCVC) to work.

Like the ContinuuMini, the "Slim" continuum does not connect to the CVC (or uCVC) through the Midi port. Generation 2 CVCs have a mini 3.5mm jack to connect a standard 3.5mm TRS cable from the "Slim" Continuum's dedicated 3.5mmm CV port. This is for CVC output only.

If you have a Generation 1 CVC, it only has a MIDI Input port (and through port if you want to pass through the Midi Stream). IN this case, assuming you are using the Continuum's USB port to connect to your computer, you will need to either build or order the special cable/adapter required to send I2C data to the CVC. This is exactly the same pinout used for the CVC connection on the ContinuuMini (see section 16.7).

If you are using the uCVC or considering ordering one, ask for the same cable interface that is used for the ContinuuMini.

If connected the CVC indicator will show you the number of active channels. This will normally be 4, but if polyphony for a preset is set less than that, the number of CVC channels will match:

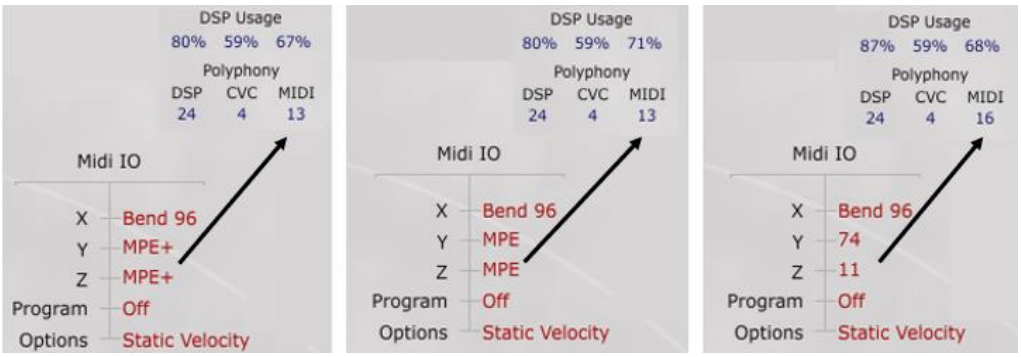
Polyphony		
DSP	CVC	MIDI
1	1	1

Polyphony		
DSP	CVC	MIDI
12	4	12

17.6 I can't get the Continuum to work with my DAW as expected

1. If you are using the USB interface, on Windows, you may not be able to run both the Haken Editor and a DAW if they both connect to the Continuum's USB port for data. The same may apply to any two external USB interfaces that try to connect to the Continuum's USB port. If the DAW is not recording properly, try disconnecting the editor and rerunning the DAW, or possibly try connecting the MIDI DIN ports to the computer using a separate USB-MIDI interface. See Chapter 12 for Connection diagrams that may be useful.

2. Remember the Continuum will never output on Channel 1 if the current preset is set to MPE/MPE+ mode. Depending on the Polyphony set, the Continuum will output on Channels 2-14 for MPE/MPE+ mode and channels 1-16 if set to a Y/Z is set to a CC (non-MPE mode).



3. Remember most DAWS do not support MPE operation which may give you unexpected results. You should record MIDI from the Continuum in a mode that will record all the possible Midi channels the Continuum will output on. When playing back it is expected that the DAW will play back on the same channels it was recorded on.

4. If you are playing back the Midi data recorded by the Continuum into another Midi instrument be aware that the Continuum outputs a tremendous amount of pitch pend and aftertouch data. Many Midi instruments cannot handle this data stream. If you get into this situation turning down rounding may decrease the Midi stream. Also many Midi instruments will not process aftertouch/channel pressure data. If your intent is to record continuum and play it back on some other Midi instrument you should take the following things into account.

- Always match the Continuum's Pitch Bend to the max pitch bend you have set on the external Midi instrument. Likely that instrument will not support the default of 96.
- If your external Midi instrument does not support Aftertouch, the default Velocity output of the Continuum is the Static Velocity (127) for all notes. Set your Midi IO Option to Dynamic velocity.
- If you have a controller that is using CC74 (brightness), remember that will be defaulting to Y position unless you set Y to some other value (doing so will bring you out of MPE modes.
- If you are set MPE+ mode, CC 87 will be used for increased resolution on Z and Y. Make sure you are not using that for anything (same for CCs 111, 117 and 118 if you are using the Haken Editor as those are used for editor communication to the Continuum).
- If your instrument seems to have trouble dealing with the MIDI stream, try a combination of setting Rounding Off, reducing pitch bend and setting CC to 11 (normal expression) for testing. This will drastically limit the Continuum's normal Midi output and if thing then work as expected you can start to increase the settings to get a best data fit.

17.7 My Kenton "KillaMix" USB Controller does not work

The Kenton Controller is integrated into the Editor. Connect it before bringing up the editor and it should show up in Midi and Global Settings as "Connected". Use the "Kenton Settings" Utility under the Cog Wheel to change the default Control settings. If you intend to use the Kenton controller without a computer you must use it with a Midi host as described below.

17.8 My BeatStep (or other USB Controller) does not work

A common tool for changing presets and activating Controls is to use the Arturia BeatStep or BeatStep Pro. Here are some tips.

1. If using the BeatStep or BeatStep Pro with the Haken Editor, connect it to your computer's USB port (or USB hub if you are using one) before bringing up the Editor. Once in the Editor go to Midi and Global Settings and you should be able to select it as an Ext 1 or Ext2 input. Set it for "All Data" input if you want to both manipulate Controls and change presets (as the former will be done on Channel 1 on the latter on channel

16). Make sure you load the appropriate template for use with the Continuum that should be in the "Third Party Support" folder and also available from Haken Audio.

2. If you want to connect the BeatStep or Beastep Pro (or any other USB Midi Controller) to the Continuum without a computer, a Midi Host must be used such as the Kenton or if you wish to connect multiple USB devices perhaps the IConnectivity MIO XM or XL. YOU might be able to connect the Midi Host to a USB Hub and connect multiple controllers that way, but we have found that the most reliable solution for multiple connections is to use a multi-USB Host interface.
3. See Chapter 12 for connection diagrams that may be useful.

17.9 How do I connect a Linnstrument to my Continuum

See the similar information in the ContinuuMini section 16.7 (Use Case #3) as the Linnstrument will connect in the same fashion, with the main difference being the Continuum will support more Midi channels than the ContinuuMini.

17.10 The Continuum surface does not respond as expected

1. All Continuums are calibrated at the factory and should need no surface adjusting other than normal "Refine". It may be possible that things got shifted a bit during shipping. In this case, after contacting Haken Audio, you may be instructed to perform a factory calibration or surface alignment. NEVER TRY AND OPEN UP THE INSTRUMENT WITHOUT DIRECTIONS FROM HAKEN AUDIO.

Other things to remember:

2. Remember some presets are fully rounded and will not produce portamento if you are always expecting it.

3. Not all presets use Y if you are expecting to hear a change in sound based on Y in all presets.

4. There are also settings that will send MIDI out on a part of the fingerboard but not play

5. Some presets using the Touch Area do not make sound if pressing in that area.

17.11 The LED display looks like I am playing it but I am not

There may be a stuck note or it may be possible that the Editor connection to the Continuum died and the Continuum displays unexpected operation (such as the LED screen looking like it is being played when it is not).

1. Try running your fingers across the full length of the fingerboard around the perimeter to see if the LED screen returns to displaying a preset when you are not playing.

2. At times the Red Button may stick a bit if pressed, try pulling up on very slightly and see if the preset display returns.

3. Try repowering and see if everything is back to normal. If not please contact Haken Audio.

17.12 The Continuum makes no sound or sounds very faint.

1. ALWAYS MAKE SURE YOU NEVER PLUG A MONO CORD INTO THE STEREO HEADPHONE JACK. This could damage the circuitry and cause no sound to be output.

2. Make sure you have the audio outputs connected to a sounds source that is active. If you are not sure plus in a pairs of stereo headphones and see if you can hear anything. Make sure the Attenuation knob is at least to the middle position.

3. If you are using Digital IO, you may not have you AD/DA converter settings matching what is expected on the Continuum. Use headphones to validate.

4. Make sure you have a preset loaded. Not all User Presets are set when firmware is loaded (higher user banks may be empty).

5. Make sure you are not on the Empty preset. Always good idea to load the Utilities/Sine preset for simple preset validation.

6. Make sure the Dim LED is not on in your preset and Red Knob is not set to minimum ("- Infinity").

7. If everything seems ok, try repowering the Continuum.

8. Sometimes File 2 becomes invalidated. You will normally get a message to that effect to "Load File 2". Sometimes not. If you connect headphones and move through presets and red knob is up and no sound, try reloading File 2.

9. You might also try performing a factory recalibration. This is especially indicated if you have firmware issues that forced you to do a Factory Restore. Also this is indicated in situations where you find that when you press the fingerboard you do not get the pitch tracking indicator but just stay on a preset name (i.e. your fingers do not seem to be detected).

10. If these suggestions do not fix the issue please contact Haken Audio for support.

17.13 The Digital Audio I/O does not work

1. Make sure you are set to match the Continuum's expected settings.

2. Set the AES Output to the rate you set on your converter (normally 96 KHz or possibly 48 KHz)

3. AES Input should automatically set to your AD/DA rate

4. Set your converter to S/PDIF. If only AES inputs are available, you will need a SPDIF/AES converter for your setup (HOSA Model CDL-313 Coaxial-AES/EBU Link has been tested and works – other options are also available).

5. Set bit rate as appropriate (24 bits).

6. You may have to set PLL Lock / Digital In, etc. Check your converter documentation.

17.14 After Loading New Firmware my custom presets are gone

1. Make sure you always store your custom presets in a different directory than the Haken Editor directory as it will be overwritten if you use the same file name. Reloading firmware will overwrite your current User presets with the defaults.

17.15 I Do Not Seem to be Getting the Stereo Separation I Expect

1. This could be due to a number of things. First the recirculator will mix channels. Try setting the Recirculator Mix to 100% Dry and see if you get more expected Stereo. IF you want totally unprocessed stereo separation you can use the L/R master section outputs in conjunction with the Master section Mix next to it to set an unprocessed/processed master output section ratio. Just note that many presets rely on the Recirculator for the effect.

2. If you are experiencing unexpected stereo results on the digital audio output, be sure you have set things to the matching SPDIF/digital matching rates with your converting interface. Some interfaces may sum the channels making it sound like a mono mix. To test this you can load the "Noise - Out of Phase" preset. If digital summing is being done, the preset will produce no noise as the channels cancel each other out. From there you can look into your converter settings.

17.16 I Can't Connect my Expressive-E Touche Controller to the Slim without a Computer

1. If trying to connect using the USB interface a USB host will be required. The Kenton USB Host will work here as you can connect the Host port to the Slim and then connect the Touche's MIDI Out to the Kenton MIDI port. Same will apply if you want to use this on the ContinuuMini here.

2. The opposite is also likely possible. Connect the Touche's USB port to the Kenton Host and the Slim's Mini MIDI port to the Kenton.

3. If you want to connect both USB ports without using a computer, the Kenton is not recommended. A multiport Midi Host interface (like iConnectivity MIO XM) is recommended in this case.

17.17 I Can't Seem to Upgrade my Slim using my Mac

1. The very first thing is to precisely follow the installation instructions. If not the notarize/quarantine security features of the Mac will prevent from launching the Editor. And if something was done wrong, restart from the very beginning and don't try to find a work around.

2. Old Macs can't read recent DMG files .... so for these old Macs we created a specific Zip file (where also, the security level is different since previous MacOS version were not so strict on security... a Zip is not possible anymore for example). Contact Haken Audio for support here.

3. If you have not used the Midi interface in a long time and it does not appear to be working correctly, it is good to 1) unplug it 2) remove it (all possible instances, there are sometime several) from the *Audio and Midi Configuration* (Midi window of course) 3) re-plug it in.

17.18 My Editor keeps disconnecting from the Continuum over USB

1. Make sure USB port is active. Try another port.
2. On MACs always try and use the same port connecting to the Continuum, especially if you have more than one Continuum or ContinuuMini as ports can become fixed on a USB device and will think the new Continuum device is the old one.
3. Try different and possibly shorter USB cable.
4. Remove any hubs between the Continuum and the computer. Some hubs cause connection issues in the real time handshaking between Continuum and computer.

17.19 Firmware starts loading but never finishes or aborts with an error message

1. Make sure USB port is active and connection stable. Try another port. Assume you have constant USB connection before downloading.
2. If you are using a hub, try connecting directly to the Continuum for firmware download.
3. Sometimes the update will occur but you will need to repower. If you repower and it asks for File2, the update probably was ok. Proceed to load File2 in this case.
4.Make sure you are using the right editor for the firmware you are downloading. Never use an editor version earlier than the version you are trying to download for firmware update.
5. You might try connecting and downloading using the MIDI port vs. UDB port if you have a Roland UM-ONE USB interface, but the USB port should work for all firmware download and editor operations.
6. If nothing works and you can't download, please contact Haken Audio support.

17.20 AES Inputs Don't seem to work in the Matrix

1. Make sure your D/A converter matches the Continuums settings in Midi & Global Settings.
2. Make sure you are processing inputs from the AES rows in the Matrix
3. Make sure Control Panel 2 "Audio In" is turned up or you will get no sound.
4. Make sure you are processing the audio in the EaganMatrix as an audio input
5. If you are using a Mono digital input, make sure you have the correct AES channel routed into the Matrix

17.21 My Kenton USB Midi Host is not Working as Expected

This device has issues if powered off of a USB hub. Always power it directly from the wall as it does not put out the expected 5V when powered from a hub we have found in testing. It also may have issues when its USB data interface is connected to a hub. It is best used for the simple application of connecting a single MIDI DIN instrument to your Slim Continuum or ContinuuMini without the need for a computer. A multi-port USB host if suggested if you wish to connect multiple class compliant USB devices to control your Continuum through USB

17.22 Can I use a MIDI-CV Converter with the Slim instead of a CVC?

Yes but there will be limitations as no MIDI-CV converter can do this of this to provide totally smooth analog conversion. If you want to try and used a MIDI-CV converter for more than standard Note On/Note Off and Velocity translation it must:
1. Be able to deal with MPE data as channels will change with every polyphonic note, etc.
2. Handle the Continuums massive amount of Pitch Bend data (that you may have to reduce to match your converter's max capability)
3. Be able to deal with Translating aftertouch as Velocity is not useful in replicating the fingerboard's expression.
4. Also be able to Handle smooth CC74 conversion
You will certainly have hiccups, discontinuities, etc from most converters. In short you will get notes played but likely lose all the magic of the Continuum. Nothing currently known will get as smooth conversion as the CVC.

17.23 I can't seem to get rid of Noise or Hum from the Audio Output Port

1. This is most likely grounding issues and not the Continuum
2. Is the Hum there or lessened if you use headphones versus the audio outputs? This is an indicator of noise.
3. If you have your PC/MAC laptop connected and powered from the wall, remove the wall power and run on battery. If better again likely grounding noise issues.
4. Use Short, High Quality audio cables
5. Make sure there are no appliances, fluorescent lights or light dimmers on the same circuit.
Never plug a two prong cable into a 3 prong adapter.
6. Try not to put large pieces of audio gear next to each other that can pick up hum from each other.
7. Try and run everything from the same circuit using a protected power strip.
8. Try and use a passive (unpowered) ground loop eliminator (isolation transformer) (these are common for 1/8" TRS but not so common for 1/4" TRS connections). On Slim you have separate mono outputs and you can find 1/4" dual channel isolators (from Radial and ART as examples).
9. Try a powered Hum Ground loop eliminator that plugs into the wall (for example Ebtech Hum Eliminator).
10. Try and Opto-isolated transformer – running everything from that or a power strip connected to it

17.24 I tried upgrading to 9.x or later from 8.x or earlier and my Continuum doesn't work now

As noted, never try and install release 9.0 or earlier on a Slim continuum, however those with half and full size models might be running an earlier release than 9.0 and want to upgrade to 9.0 or Post 9.0 releases. Depending on the release you have installed, this might have to be done in stages. This only applies to half and full size continuums as all Slim Continuums are shipped with a post 9.0 release. You must upgrade to 9.1 or later on a full or half size continuum from 9.0. If you are running a release earlier than 9.0 you must upgrade in steps. Contact Haken Audio if you do not have the older firmware releases required.

1. If running 8.x, go to the Haken Audio site and download the 9.0 release and upgrade to that using normal instructions. Then Install the post 9.0 release per User Guide Instruction.
2. If running a 7.6 release, go to the Haken Audio site and download the 9.0 release and upgrade to that using normal instructions. Then Install the post 9.0 release per User Guide Instruction. If running a 7.x release below 7.6, upgrade to 7.6 first and then go to 9.0.
3. If running a 6.x release, Contact Haken audio to get a 7.x release to install (File 1 only) then install the 9.0 release. Then Install the post 9.0 release per User Guide Instruction.
4. If running a 5.x release, Contact Haken audio to get a 6.x release and a 7.x release. Install 6.x (File1 only) and then install (File 1 only) then install the 9.0 release. Then Install the post 9.0 release per User Guide Instruction.

17.25 I have stuck notes after upgrading firmware on my Slim model

1. Try Refine Calibration.
2. If that does not work try adjusting the "Actuation" setting in Midi and Global Settings (see section 7.5).

17.26 I Keep Getting DSP Messages and Possibly Can't connect Editor

1. DSP messages on the SLIM LED panel indicate the instrument is not in a normal state. First try disconnecting power, wait 30 seconds and then reapply power.
2. This could be an indication that the firmware was loaded incorrectly. Try disconnecting USB and any Midi DIN connection you might have and repower as above.
3. At times if you get a constant DSP message, even on repowering, try pressing the Preset buttons a few times. This sometimes gets back to normal playing state.
4. If the problem persists, contact Haken Audio support.

17.27 Some Presets Sound Distorted

1. Many presets will create some kind of distorted sound if you press too hard. The continuum rarely should require you r press more than half-way into the fingerboard. Pressing fully to the bottom of the fingerboard will likely create distortion. You can hear this if you bring up the Utilities/Sinewave. If you press too hard, you will get a distorted signal. So learn how to play with a light touch as many presets will give you fine sonic variations in the first 1/4 of Z.
2. Turning down the gain/Levels can help as can in some cases turning up the gain/Levels and playing very lightly to optimize your playing within a limited Z range.

17.28 I get "Something is Fishy" Messages when updating firmware

1. This indicates that the update procedure detected something unexpected, normally it is displayed after File1 loads.
2. Sometimes this message will disappear and then be replaced with "Load File 2" message. If the firmware version has not updated in the top right corner of the editor you can try repowering the continuum and reentering

the editor to see if the firmware version has updated. If the firmware version displays as expected, you likely will be asked for File2, in which case you can select that option in the "Update Firmware" selection. Never update File2, if the firmware version has not updated as expected after File1 load or you will likely corrupt the preset configuration and have to reload File 1.
3. If after repowering and rerunning the editor the firmware version remains on the original version number, try reloading File 1 again. If that also fails, please contact Haken Audio support.

17.29 Presets don't seem to be displayed correctly or Preset Categories are Missing

1. Exit the Haken Editor. Recycle power on the continuum. Rerun the editor. At times the editor may not start up correctly and this procedure often clears things and displays presets as expected.
2. If your preset categories are still missing (totally or in part) or if system presets in a category seem missing, try reloading File 2. Often midi Loops or sending expected Midi to the Continuum (from a DAW for example) can reset presets. Reloading File 2 should never be an issue, just remember to always save your customer presets to a directory outside the normal Firmware folder as reloading firmware will overwrite it.

17.30 When recording Y in a DAW I get unexpected curves

1. Y does not have the resolution of Z and if you press too hard to too lightly, you may see that the expect smooth curve (if you moved up and down Y smoothly) appears distorted, perhaps with unexpected jumps or backtracking in the Y data. If you want to record Y, make sure to set your preset to MPE or Y-74 (non-MPE) mode, not MPE+. Also use a pressure in the medium range (not too light or deeply depressed) to get best Y output results. If you must have Y output as a smooth curve at all time we recommend you use a controller such as Expressive E Touche or Sensel Morph, or you can fix up the data if it was distorted in your DAW with a controller drawing editor that most DAWs have.

17.31 When working on big presets in EaganMatrix I can't type in any more values

1. The editor allows a fixed number of matrix entries to try and maintain backwards compatibility with older models that do not have the same processing space. This allows all Continuum users to use a common set of presets. Typically you will run out of formulas before you run out of matrix inputs, but if this happens think about how to rearrange your formulas to use less Matrix inputs or if you have a 6X processing Continuum perhaps think about splitting up your preset into multiple presets using one of the Combination preset modes.

17.32 The Slim USB connection sometimes disconnects with the Haken Editor

1. Are you running Version 9.55 or later. Earlier versions of the Slim firmware had USB connection issues that were solved in version 9.33 and later. It is recommended that Slim owners always upgrade to the latest firmware version during the beta software release cycle.

17.33 My fingers do not Seem to be detected when playing the Slim Fingerboard

1. Does the editor correctly detect your Continuum and display the right firmware version? On powering is the preset number displayed and ad you can change presets but now sound is output and no pitch tracking indicators are displayed when playing. This is usually a sign that you need to perform a Factory Calibration.

17.34 Can't run two Haken Editors at the same time

1. I would like to run my ContinuuMini and Continuum Editors on the same computer to use at the same time through USB connections. Unfortunately at preset only one version of the editor can run on a computer at a time. If you try and bring up two versions of the editor, one will not connect. Even if you copy the editor to a separate directory and try and run each from its own directory tree there will still be issues. On Windows if you connect two ContinuuMini Devices they will show up as USB device_name and device_name#2 (and the device name will be the last Continuum or ContinuuMini you connected). You might have a UM-ONE Midi Interface for a Continuum and a direct USB interface for ContinuuMini or Slim Continuum. No combination of two continuum at this point will be able to be connected to two copies of the Haken Editor running on one machine.

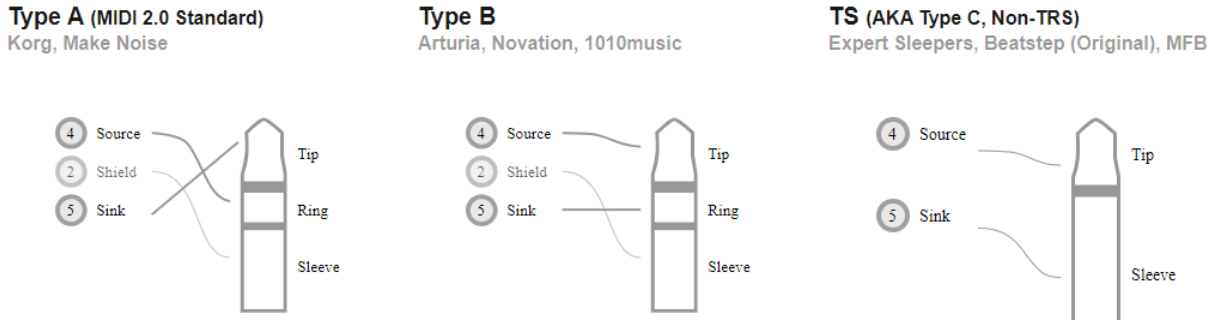
17.35 TRS Mini Midi Jacks not outputting as expected to external Synth or Eurorack

1. In addition to USB Midi, the Slim Continuum uses TRS B configuration for output and TRS A or TRS B for input. Make sure you have the right Mini TRS adapter (A< B or TS) for your equipment. This may not be well documented in vendors manuals. YOU may need a converter from TRS B to TRS A pinouts. See minimidiworld.com for more information like the following:

Type A (now the MIDI 2.0 standard)
e.g.: Korg, Make Noise, Hydrasynth

Type B
e.g.: Arturia, Novation, 1010 Music

TS sometimes called **Type C** or **Non-TRS**
e.g.: Expert Sleepers, Beatstep (Original), MFB



18. Creating Debug Files for Support

At times when contacting Haken Audio Support you may be asked to send a Max Console Hardware Log and/or a Continuum Profile for your instrument. This section explains how to create those files. For support, please email: lippold@hakenaudio.com.

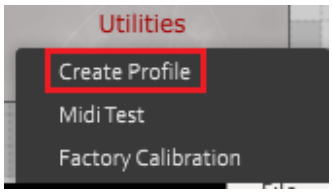
18.1 Creating a Max Console Hardware Log

- Connect your editor so it has the "blue dot" solid and is communicating properly with the Continuum
- Make the Max Console window show itself, by pressing Command-M (mac) or Control-Shift-M (PC). In Midi and Global Options
- Go to the Utilities menu and choose "Hardware Log On".

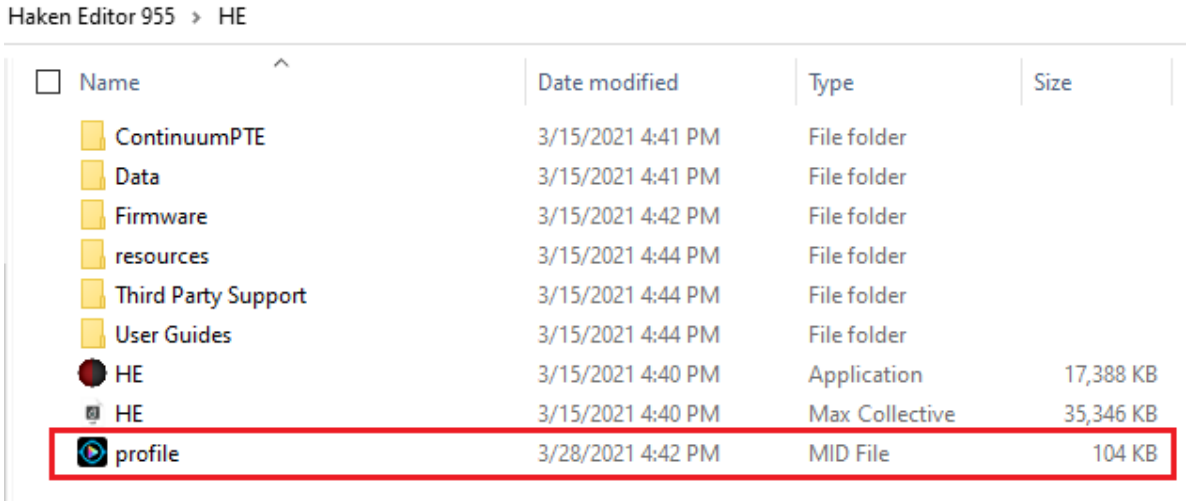
- Bring Max Console to the front
- Do Command-A (Control-A PC) to select all text then Command-X (Control-X) to copy it all
- Save that text in a text file called "MaxLog".
- Go back into Utilities and turn off the log "Hardware Log Off"

18.2 Creating a Continuum Profile

- Go to "Midi and Global Settings" and then Utilities menu



- Select "Create Profile". When you choose that option it will take around 30 seconds to a minute
- When it is done (it could take about a minute and your Continuum will display green LED), look for a "profile.mid" file inside the Firmware's HE folder.



18.3 Scan Files (Continuum and Slim Continuum Only)

At times you may experience hearing a double note played when you are only playing one and possibly see two notes in the Surface display in the editor. Haken Audio will normally ask you to send a profile file (see procedure in the previous section). If indicated Haken Audio will create a Scan file for you to load to solve the issue. Scan Files are special preset files prepared by Haken Audio for your particular Continuum containing information about "abnormal" sensors in your playing surface.

There are two different situations with "abnormal" Continuum sensors: sensors that are not responsive, and sensors that have a reduced range. The scan files identify sensors that are within one of these two categories allowing the firmware to treat them specially. The reduced range sensors (as long as they are identified) still have very high accuracy. The full range is 14 bits of data but if range is reduced, 13 bits stills works fine. Until a few years ago all Light Action continuums used 12 bits and nobody noticed the change to 14 bits. So sensors that are slightly reduced in this manner will have no perceptible difference in sound to the user.

The sensors that are not responsive at all are a different issue – they are (spline) interpolated from neighbors. In Continuums, it is not unusual to have a few sensors that are not responsive or have a reduced range. Hall effect sensors are very accurate but also very sensitive to mechanical stresses so developing a non-responsive sensor is not unusual. The Continuum firmware uses 12 sensors when tracking a finger (3 to left of finger, 3 to right of finger, both front and back sensors), and can use 11 sensors (or in the case of reduced range, 11.5 sensors) to very accurately track fingers in a manner that the user will not tell or hear any perceptible difference. It is a bit like disk drives – all disk drives have some bad sectors, but a disk is not considered defective unless the number of bad sectors is large.

If Haken Audio provides you with a Scan File for your Continuum, it will load like any other preset. You only need only load the scan file once. Upon loading, special information is copied to a permanent flash area. You do not need to keep the scan file in your user presets, nor do you need to keep the file on your computer.

19. Current EaganMatrix Presets as of Firmware 9.55

Here is the current EaganMatrix preset list, color coded as to when a preset was added by release with numbering by Continuum type. Half and Full size modes use the "Num" numbering.

9.55 (Continuum) Category/Preset	Num	Slim	Mini
Version Color Key			
8.50 Preset			
8.71 Preset			
9.0 Preset			
9.53 Preset			
01 Bass			
Bass DistoSine	0	01 01	101
Bass Monster	1	01 02	102
Bass Pad	2	01 03	103
CZ Dirt Bass - Var 1	3	01 04	104
CZ Dirt Bass	4	01 05	105
Kinetic - U-Bass	5	01 06	106
Kinetic WG AkouBass - Var1	6	01 07	107
Kinetic WG AkouBass	7	01 08	108
Ladder Bass	8	01 09	109
Rhythm And Bass	9	01 10	110
Snap Bass	10	01 11	111
Square Bass	11	01 12	112
02 Keyboard			
Anthophilia Organ	12	02 01	201
Apiary	13	02 02	202
Electric Harpsychord	14	02 03	203
FM Dream Piano - Var1	15	02 04	204
FM Dream Piano	16	02 05	205
Grinding Stone Calliope	17	02 06	206
Harmonoid Spark	18	02 07	207
Heavenly Corporation Ch1	19	02 08	208
Ice Calliope	20	02 09	209
Jaymar Toy Piano	21	02 10	210
Kinetic - Clavinet- Var1	22	02 11	211
Kinetic - Clavinet	23	02 12	212
Kinetic Contioline	24	02 13	213
Legacy DX EP	25	02 14	214
Music Box Because Ch1	26	02 15	215
Music Box Because	27	02 16	216
Music Box Bells	28	02 17	217
Musica Minima	29	02 18	218
Organo Espressivo	30	02 19	219
Organzilla	31	02 20	220
PCS Fixed	32	02 21	221
Plane Tiv Organ	33	02 22	222
Portable Reed	34	02 23	223
Positiv Organ	35	02 24	224
Quaverer	36	02 25	225
Simple Organ	37	02 26	226
Tine	38	02 27	227
Vintage Electro	39	02 28	228
03 Looping			
Acrylic Clock	40	03 01	301
Arpeggiator 4 Step	41	03 02	302
Arpeggiator Resonant	42	03 03	303
Boson Particles	43	03 04	304
Cowell Triangles Fund on Y	44	03 05	305
Cowell Triangles	45	03 06	306
Cumulus	46	03 07	307
Cyncro Ecro	47	03 08	308

Dual Resonators	48	03 09	309
Dual Sinespray	49	03 10	310
Flip Tube	50	03 11	311
Fluter	51	03 12	312
FM Trails	52	03 13	313
Ghost Moth	53	03 14	314
Harmonic Looper	54	03 15	315
Icicles 1	55	03 16	316
Icicles 2	56	03 17	317
Jenny Pulse	57	03 18	318
Jenny Random	58	03 19	319
Jenny Touch Drone	59	03 20	320
Juggler	60	03 21	321
Kinetic AnaSeq	61	03 22	322
Major Vision	62	03 23	323
Mutate Looper	63	03 24	324
Natural Law	64	03 25	325
NFS Train 900	65	03 26	326
Octave Phases	66	03 27	327
Panpipe Loops	67	03 28	328
Ping Pong	68	03 29	329
Pipedreams	69	03 30	330
Plutonium	70	03 31	331
Pulsar	71	03 32	332
Pulse	72	03 33	333
Razor Loops	73	03 34	334
Rubber Band Stars	74	03 35	335
Sineong-ri	75	03 36	336
Slip Zen	76	03 37	337
Slow Evolver	77	03 38	338
Space Flute	78	03 39	339
Space Jaw	78	03 40	340
Spinning Duet	80	03 41	341
Spinning Metal Rings	81	03 42	342
Spinning Oboe	82	03 43	343
Synchronous Orbits	83	03 44	344
The Long Goodbye	84	03 45	345
Tick Bodies	85	03 45	345
Tick Tube	86	03 47	347
TriMod	87	03 48	348
Voice Jumper	88	03 49	349
Zuie	89	03 50	350
04 Morphing			
Bowed Double Reed	90	04 01	401
Dueling BiqBanks	91	04 02	402
Harman Morph	92	04 03	403
Kinetic-Wavebank Morph	93	04 04	404
Metal Reed	94	04 05	405
Model String Wind	95	04 06	406
Morphing Church Organ	96	04 07	407
Morphing Organ	97	04 08	408
Morphing Reed	98	04 09	409
Morphing Voice	99	04 10	410
Morphing Wavebank Pad 1	100	04 11	411
Morphing Wavebank Pad 2	101	04 12	412
Timbre Morph	102	04 13	413
05 Percussion			
Bell Rub	103	05 01	501
Bells in the Fields	104	05 02	502
Bells of Digul	105	05 03	503
Bouncer	106	05 04	504
Bowed Bells	107	05 05	505
Carbon Marimba	108	05 06	506

Creaker	109	05 07	507
Cycle Kalimba	110	05 08	508
Dolce Cristallo Space	111	05 09	509
Dolce Cristallo	112	05 10	510
Dripaphone	113	05 11	511
Drum-Machine Windowed	114	05 12	512
Drum-Machine	115	05 13	513
Drum-Set	116	05 14	514
Echo of a Marimba	117	05 15	515
FM Bells	118	05 16	516
Gamelan Spinner	119	05 17	517
Genie Bottle	120	05 18	518
Glas Pfeifen	121	05 19	519
Glass Rings	122	05 20	520
Grandfather Clock	123	05 21	521
Ishango Bone	124	05 22	522
Jaw Stick 1	125	05 23	523
Jaw Stick 2	126	05 24	524
JPR Marimba	127	05 25	525
Kinetic - Kick	128	05 26	526
Marlin Perkins 1	129	05 27	527
Marlin Perkins 2	130	05 28	528
mBiraski Ch1	131	05 29	529
mBiraski	132	05 30	530
Metal Bar	133	05 31	531
Metal Rainstick	134	05 32	532
Metallic Glass	135	05 33	533
Metallic Pattern Gen	136	05 34	534
Mutable Bowl	137	05 35	535
Plinklies	138	05 36	536
Pluck Tine	139	05 37	537
Remembrance Bells	140	05 38	538
Resonant Drum 1	141	05 39	539
Resonant Drum 2	142	05 40	540
Sine Kalimba	143	05 41	541
Small Cloud Gamelan	144	05 42	542
Spectral Marimba	145	05 43	543
Spring Shimming Bell	146	05 44	544
Steel Pan Kalimba	147	05 45	545
Sympathetica	148	05 45	545
Tremelo Resonator	149	05 47	547
Tubular Bells	150	05 48	548
Wind Drum	151	05 49	549
06 Plucked			
Beautiful Pursuit Ch1	152	06 01	601
Beautiful Pursuit	153	06 02	602
Country Resonator	154	06 03	603
Eastern Slider Ch1	155	06 04	604
Electric Guitar Saturated	156	06 05	605
Electric Guitar	157	06 06	606
Feedback String	158	06 07	607
Harmonic Break	159	06 08	608
Harp	160	06 09	609
Hoop Lute	161	06 10	610
Karplus & ModMan	162	06 11	611
Kinetic Cabinet	163	06 12	612
Kinetic Soundboard	164	06 13	613
Koto	165	06 14	614
Lap Steel	166	06 15	615
Mellow Pedal Steel	167	06 16	616
Mountain Slider Ch1	168	06 17	617
Mountain Slider	169	06 18	618

Mouth String	170	06 19	619
NGoni - Kinetic	171	06 20	620
NGoni	172	06 21	621
Pluck String	173	06 22	622
Plucked Soup Can	174	06 23	623
Pusher	175	06 24	624
Resizable Guitar	176	06 25	625
Resodynamic	177	06 26	626
Rub String	178	06 27	627
SiloString Pizz	179	06 28	628
Silver Mirror	180	06 29	629
Singing Bamboo 2	181	06 30	630
Singing Bamboo	182	06 31	631
Small Steel	183	06 32	632
Snap String	184	06 33	633
Stellar Bowls	185	06 34	634
The Touch Guitar	186	06 35	635
07 Sound Design			
Bacteria	187	07 01	701
Bird Echoer	188	07 02	702
Bird Whistler	189	07 03	703
Bullroarer	190	07 04	704
Celestial Basin	191	07 05	705
Centrifuge	192	07 06	706
Cork the Bottle	193	07 07	707
Electro Wazoo	194	07 08	708
Entanglement	195	07 09	709
Falling Brook	196	07 10	710
FDN Crazyness	197	07 11	711
GaBuZoMeu	198	07 12	712
Geiger Insects	199	07 13	713
Golliclock	200	07 14	714
Harmonic Board	201	07 15	715
Kinetic - Overtones	202	07 16	716
Kinetic Bowed FDN	203	07 17	717
Kinetic Dragon	204	07 18	718
Kinetic MicroMotor	205	07 19	719
Kinetic Rubber Skin	206	07 20	720
Lisithean Motor	207	07 21	721
Lonely Data	208	07 22	722
M-220	209	07 23	723
Maple Key	210	07 24	724
Meccano	211	07 25	725
Mini Shepard Breathing	212	07 26	726
Mini Shepard Resonant	213	07 27	727
Mini Shepard	214	07 28	728
Mojo of FDN	215	07 29	729
Moon Witch	216	07 30	730
Mr Kyte	217	07 31	731
Overtones	218	07 32	732
Philco Chromatic	219	07 33	733
Pterodactyl	220	07 34	734
Random Fun	221	07 35	735
Random Texture	222	07 36	736
Random Trigger	223	07 37	737
Scratching FDN	224	07 38	738
SineSpray Rain via Surface	225	07 39	739
Sonogram	226	07 40	740
Soundboard	227	07 41	741
Sputnik's Dream	228	07 42	742
Submit Job to Mainframe	229	07 43	743
Swirl	230	07 44	744

Tesla Coil	231	07 45	745
Tesla's Dream	232	07 45	745
The Slow Descent	233	07 47	747
The Wind on Callisto	234	07 48	748
Transporter	235	07 49	749
Unanswered Question	236	07 50	750
Victrola 2	237	07 51	751
Victrola	238	07 52	752
Voice of the Woods	239	07 53	753
Waterphone	240	07 54	754
Wind Beach	241	07 55	755
Winter Skipping Pond	242	07 56	756
Wobble Plate	243	07 57	757
Zipper	244	07 58	758
08 String			
Bowed BiqBank	245	08 01	801
Bowed KinBanjo	246	08 02	802
Bowed Mood	247	08 03	803
BuzzStrings	248	08 04	804
Cimbalom - Continuous	249	08 05	805
Cimbalom - Z Pitch	250	08 06	806
Dulcimer Ghost	251	08 07	807
Haegum	252	08 08	808
Harmonic Viol	253	08 09	809
Hyper Pizz	254	08 10	810
Kinetic Kokyu	255	08 11	811
MicroDelay WaveGuide v1	256	08 12	812
MicroDelay WaveGuide v2	257	08 13	813
MicroDelay WaveGuide v3	258	08 14	814
Northern Lights	259	08 15	815
Roto String	260	08 16	816
Rub	261	08 17	817
SineBank FM String	262	08 18	818
SlideyPizz	263	08 19	819
Spiccato Tremolo Dual	264	08 20	820
Spiccato Tremolo Single	265	08 21	821
Squeaky Balloon String	266	08 22	822
Sympathy String	267	08 23	823
Tap Sitar	268	08 24	824
Tapestry	269	08 25	825
Tunable Tanpura	270	08 26	826
Uki Bells	271	08 27	827
Uki Pizz 1	272	08 28	828
Uki Pizz 2	273	08 29	829
Uki Pizz w Snap	274	08 30	830
Vln Vla Cel Bass 1	275	08 31	831
Vln Vla Cel Bass Ch1	276	08 32	832
Vln Vla Cel Bass 2	277	08 33	833
Vln Vla Cel Bass 3	278	08 34	834
Vln Vla Cel Bass 4	279	08 35	835
Vln Vla Cel Bass Bridge	280	08 36	836
VlnVlaVlcCbFull	281	08 37	837
VlnVlaVlcCbPlus	282	08 38	838
xpStrings	283	08 39	839
09 Synth A-M			
Ambient Analog	284	09 01	901
Analog ADSR - Var1	285	09 02	902
Analog ADSR	286	09 03	903
Analog Overload	287	09 04	904
Another Big One	288	09 05	905
Around the Periapsis Ch1	289	09 06	906
Around the Periapsis	290	09 07	907

Autocille	291	09 08	908
Bajaron Light Ship	292	09 09	909
Belle Isle	293	09 10	910
Buzzard	294	09 11	911
Celestial Following	295	09 12	912
Chord Generator	296	09 13	913
Chrono Z	297	09 14	914
Clinical Oscillator 1	298	09 15	915
Clinical Oscillator 2	299	09 16	916
CrossMod1	300	09 17	917
CrossMod2	301	09 18	918
CrossMod3	302	09 19	919
CS80+Ladder II	303	09 20	920
CS80+Ladder	304	09 21	921
Dirty Oscillator V2	305	09 22	922
Distortion Man	306	09 23	923
Dual 24	307	09 24	924
Echo 8va	308	09 25	925
Echo Star	309	09 26	926
Exposure Ensemble	310	09 27	927
FM 1	311	09 28	928
FM 2	312	09 29	929
FOF FixRes	313	09 30	930
FOF VariableRes	314	09 31	931
FollowDly	315	09 32	932
Follower	316	09 33	933
Four Point FM	317	09 34	934
Glass Chorus Reverse	318	09 35	935
Glass Chorus	319	09 36	936
Happy Birthday Ed 20	320	09 37	937
HarmonicSkin	321	09 38	938
Jenny Attack	322	09 39	939
Jenny Dark Acid - Var1	323	09 40	940
Jenny Dark Acid	324	09 41	941
Jenny FromTo - Var1	325	09 42	942
Jenny From To	326	09 43	943
Jenny Loops	327	09 44	944
Jenny Shepard Down - Var1	328	09 45	945
Jenny Shepard Down	329	09 45	945
Jenny Shepard Up	330	09 47	947
JennyBasicPad	331	09 48	948
Jupiter Mission	332	09 49	949
Kinetic - Dirty Osc - Var1	333	09 50	950
Kinetic - Dirty Osc	334	09 51	951
Kinetic Disto Analog	335	09 52	952
Kinetic SatPad	336	09 53	953
Lain Heart	337	09 54	954
Left Hand Filter Echo	338	09 55	955
Living Pad	339	09 56	956
Lost Beacon	340	09 57	957
Martian Beach	341	09 58	958
Martian Landing Pad	342	09 59	959
10 Synth N-Z			
Noisy Old Oscillator	343	10 01	1001
Notch Lightning	344	10 02	1002
Octavator	345	10 03	1003
Old Pad Machine	346	10 04	1004
Orchester	347	10 05	1005
OvertoneBar	348	10 06	1006
Pad Tie	349	10 07	1007
Patville	350	10 08	1008
PCS Dandelion	351	10 09	1009

Phase Controlled ModMan	352	10 10	1010
Pinched FM	353	10 11	1011
Pleasantness	354	10 12	1012
Polychromatic	355	10 13	1013
Rosin Oscillator	356	10 14	1014
Sawz	357	10 15	1015
Seasons Ch1	358	10 16	1016
Shimmer	359	10 17	1017
Simple and Nice	360	10 18	1018
Sine Chaser	361	10 19	1019
SinePhases	362	10 20	1020
Sineysitus	363	10 21	1021
Singing Noise	364	10 22	1022
SiTan	365	10 23	1023
Space Async	366	10 24	1024
Space	367	10 25	1025
Spiritus Subteranne	368	10 26	1026
Square FM	369	10 27	1027
Squaresville	370	10 28	1028
Sub-Harmonic Generator	371	10 29	1029
SuperWave	372	10 30	1030
Sweet Triangle	373	10 31	1031
Swept Delay	374	10 32	1032
Synth Brass	375	10 33	1033
Synth Lead 1	376	10 34	1034
Synth Lead 2	377	10 35	1035
Synth Lead 3	378	10 36	1036
Synth Lead 4	379	10 37	1037
Synth Lead 5	380	10 38	1038
Synth Lead 6	381	10 39	1039
Synthetic Cathedral	382	10 40	1040
Three Cycles	383	10 41	1041
Three Saws	384	10 42	1042
Three Sines	385	10 43	1043
Through the Photodiode	386	10 44	1044
Transistor	387	10 45	1045
Unstable Wave	388	10 45	1045
Venusian Beach	389	10 47	1047
Voyager	390	10 48	1048
Waterphone Strings	391	10 49	1049
WaveShaped	392	10 50	1050
Whirligigs	393	10 51	1051
Zazipad	394	10 52	1052
Zwei Baende with Noise	395	10 53	1053
Zwei Baende	396	10 54	1054
11 Vocal			
Additive Gnilham	397	11 01	1101
Additive Vocal 1 Transform	398	11 02	1102
Additive Vocal 1	399	11 03	1103
Choir on Kepler-452b	400	11 04	1104
Choir-Ah	401	11 05	1105
Choir	402	11 06	1106
Distant Transmission Choir	403	11 07	1107
Dual Spectra Voice	404	11 08	1108
Funny Voice	405	11 09	1109
Instant Reich	406	11 10	1110
Jenny Voice	407	11 11	1111
Kinetic Vinyl	408	11 12	1112
Larynx Horn	409	11 13	1113
Lost Choir	410	11 14	1114
Mahling 1	411	11 15	1115
Mahling 2	412	11 16	1116

Mahling 3	413	11 17	1117
Mantra Voice	414	11 18	1118
Mouth Sequence Ch1	415	11 19	1119
Ring Mod - Voice - Var1	416	11 20	1120
Ring Mod - Voice1	417	11 21	1121
Ring Mod - Voice2	418	11 22	1122
Ring Mod - Voice	419	11 23	1123
Should I Stay or Should I Go	420	11 24	1124
Singing Oscillators	421	11 25	1125
Tibetan Throat Stick	422	11 26	1126
Two (One Mini) Handed Voice	423	11 27	1127
Vocalise	424	11 28	1128
Vocalized Buzzard	425	11 29	1129
Vowel	426	11 30	1130
12 Wind			
Bagpipes	427	12 01	1201
Brass Mute	428	12 02	1202
Calliope	429	12 03	1203
Chinese Clarinet	430	12 04	1204
Clarinet	431	12 05	1205
Crumb Horn	432	12 06	1206
Double Reed	433	12 07	1207
Empyrean	434	12 08	1208
Fragaria Fields	435	12 09	1209
French Sax	436	12 10	1210
GrainSilo Woodwind	437	12 11	1211
Jemonica	438	12 12	1212
Jenny Trumpet	439	12 13	1213
JennyDo	440	12 14	1214
Jerrys Horn	441	12 15	1215
MicroDelay PipeWG	442	12 16	1216
Miles	443	12 17	1217
MilesBird	444	12 18	1218
OvertoneWind	445	12 19	1219
PanPipe Solo	446	12 20	1220
Saxmosis	447	12 21	1221
Sine2Sax	448	12 22	1222
SineBank Horn	449	12 23	1223
Single Reed	450	12 24	1224
Slide Wind EM	451	12 25	1225
Slide Wind	452	12 26	1226
Soprano Recorder	453	12 27	1227
Spit Tube	454	12 28	1228
Tin Whistle	455	12 29	1229
VBrass 1	456	12 30	1230
VBrass 2	457	12 31	1231
Wind	458	12 32	1232
Windtube Air Reed	459	12 33	1233
Windtube Double Reed	460	12 34	1234
Windtube Single Reed	461	12 35	1235
Woodwind	462	12 36	1236
ZawiFlute8	463	12 37	1237
13 Midi			
Kontakt 1 Perform	464	13 01	1301
Kontakt 2 Mono	465	13 02	1302
Kyma 1	466	13 03	1303
Kyma 2 Round	467	13 04	1304
Kyma Initial Round	468	13 05	1305
Kyma 4 Release Round	469	13 06	1306
MPE 04 Voice	470	13 07	1307
MPE 06 Voice	471	13 08	1308
MPE 08 Voice	472	13 09	1309

MPE 12 Voice	473	13 10	1310
MPE+ 8 Voice	474	13 11	1311
Omnisphere 1 Perform	475	13 12	1312
Omnisphere 2 Round	476	13 13	1313
Omnisphere InitialRound	477	13 14	1314
Omnisphere 4 Semitone	478	13 15	1315
Omnisphere 5 Mono	479	13 16	1316
Spectrum with MidiClock	480	13 17	1317
14 CVC			
CVC 10v Linear Z	481	14 01	1401
CVC 10v Square Z	482	14 02	1402
CVC 5v C0 Linear Z	483	14 03	1403
CVC 5v C0 Square Z	484	14 04	1404
CVC 5v C2 Linear Z	485	14 05	1405
CVC 5v C2 Square Z	486	14 06	1406
CVC 5v CLinear Z	487	14 07	1407
CVC 5v C4 Square Z	488	14 08	1408
CVC Buchla Linear Z	489	14 09	1409
CVC Buchla Square Z	490	14 10	1410
CVC Four Shape Generators	491	14 11	1411
Voyager Linear Z	492	14 12	1412
CVC Voyager Square Z	493	14 13	1413
CVC Y Shelf Linear Z	494	14 14	1414
CVC Y Shelf Square Z	495	14 15	1415
15 Drones			
2OneDrone	496	15 01	1501
Bad Weather	497	15 02	1502
Countdown	498	15 03	1503
Earthquake	499	15 04	1504
Feelings Drone	500	15 05	1505
Hal Dreams	501	15 06	1506
Hals Meditation	502	15 07	1507
Kinetic Evil Bell	503	15 08	1508
Magic Carillion - Var 1	504	15 09	1509
Magic Carillion - Var 2	505	15 10	1510
Magic Carillion	506	15 11	1511
Roller	507	15 12	1512
Rosetta Alarm	508	15 13	1513
SineSpray Rain	509	15 14	1514
Splat	510	15 15	1515
Throat Battle	511	15 16	1516
Two Chords	512	15 17	1517
16 Utilities			
Basic Bowed Spring	513	16 01	1601
Basic Jenny	514	16 02	1602
Basic Spring Bell	515	16 03	1603
BiqBank - Basic	516	16 04	1604
BiqMode - Basic	517	16 05	1605
BiqMouth - Basic	518	16 06	1606
Empty	519	16 07	1607
Filter - The Ladder	520	16 08	1608
HarMan - Basic	521	16 09	1609
JennyBasic FixRes	522	16 10	1610
Karplus - 1	523	16 11	1611
Karplus - 2	524	16 12	1612
Karplus - Pipe	525	16 13	1613
Kinetic - Bouncing	526	16 14	1614
Kinetic - Bowed Spring	527	16 15	1615
Kinetic - Bowed Waveguide	527	16 16	1616
Kinetic - Crackling Noise	529	16 17	1617
Kinetic - Filter	530	16 18	1618
Kinetic - Spring Bell	531	16 19	1619
Kinetic - StickSlip Filter	532	16 20	1620

Kinetic - Tracker	533	16 21	1621
Kinetic - Vinyl	534	16 22	1622
Kinetic - Waveguide	535	16 23	1623
Kinetic as Filter	536	16 24	1624
ModMan - Pulsed	537	16 25	1625
Noise - Out of Phase	538	16 26	1626
Noise - Pink	539	16 27	1627
Noise - White at -35	540	16 28	1628
Noise - White Stereo	541	16 29	1629
Osc - 440 at -35	542	16 30	1630
Osc - Formula Delay	543	16 31	1631
Osc - Pitch via Z	544	16 32	1632
Osc - Random Pitch	545	16 33	1633
Osc - Sine Wave	546	16 34	1634
Osc - Subtractive Synth	547	16 35	1635
Osc - Waveshaping	548	16 36	1636
Ring Mod - Basic	549	16 37	1637
SineBank - Basic	550	16 38	1638
SineSpray - Basic	551	16 39	1639
WaveBank - Basic	552	16 40	1640
17 Touch Area			
Electric Comb T	553	17 01	
Flutter Blossom T	554	17 02	
FM Bell T	555	17 03	
Helix T	556	17 04	
Jenerator T	557	17 05	
Sequencer 1 Ch1	558	17 06	
Sine Wave T	559	17 07	
Stasis Field T	560	17 08	
Stretch String m1 T	561	17 09	
Stretch String m2 T	562	17 10	
Stretch String m3 T	563	17 11	
Stretch String v2 T	564	17 12	
Srummed Gtr 3HRSolo	565	17 13	
Strummed Gtr Rhythm T 950	566	17 14	
Synth 1 T	567	17 15	
Touch Reed T	568	17 16	
Touche Voice T	569	17 17	
Vibrato Organ T	570	17 18	
Vintage Oscillator T	571	17 19	
Windtube Single Reed T	572	17 20	
18 Processors		18	
Harmonic Resonator	573	18 01	
Pitch Shifter	574	18 02	
Tuned Reverb	575	18 03	