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KEITH MCMILLEN INSTRUMENTS 12 STEP REFERENCE MANUAL



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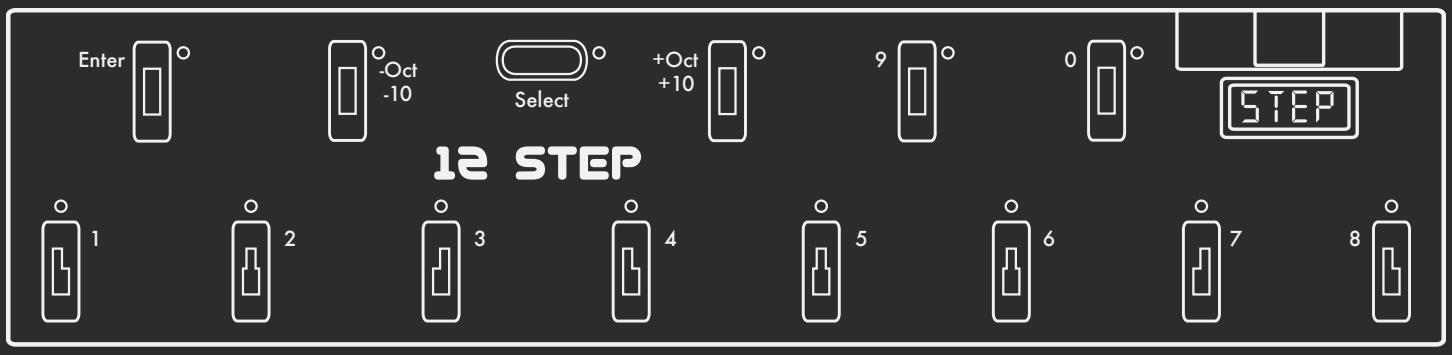

12 Step
Reference Manual

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12 Step

Version 2.0

Edited: September 3, 2014

Keith McMillen INSTRUMENTS

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Welcome

Hello, and welcome to the 12 Step manual! Taking the time to read this document is a huge step toward 12 Step mastery!

The purpose of this document is to provide a resource with helpful, detailed information regarding the use of the 12 Step and 12 Step software.

Questions? Feedback? Contact Us!

Any questions or feedback that may come up regarding the 12 Step or its software can be directed to us here:

- **Technical Support**: www.keithmcmillen.com/support
- **General Questions**: www.keithmcmillen.com/company/contact
- **Forum**: forum.keithmcmillen.com

Where To Download

If this document is being read that likely means the 12 Step software has already been downloaded, but just in case the information is needed the 12 Step software can be downloaded on the KMI website at http://www.keithmcmillen.com/12step/downloads/

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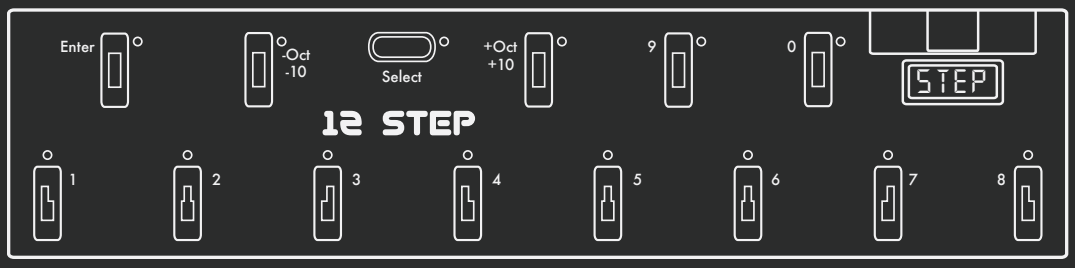
Before You Begin



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1.0 Before You Begin

This section contains a few things to know before diving in to the 12 Step world.

1.1 What's In The 12 Step Package?

The following items are included in each 12 Step box (quantities will be in parentheses):

(1) 12 Step

(1) USB A to USB B cable (15')

(1) 12 Step protective sleeve

(1) 3.5mm (1/8") to 1/4" expression pedal adapter

1.2 What's In The MIDI Expander Package?

The following items are included in each KMI MIDI Expander box:

(1) MIDI Expander

(1) USB Power Supply (5V, 500mA) (includes power converter blades)

(1) USB A to USB B cable (for connecting the Expander to the power supply)

(1) USB A to mini-USB B cable (for connecting the 12 Step to the Expander)

1.3 System Requirements

Hardware

The 12 Step is a class-compliant USB MIDI device – it will work with any hardware or software that supports MIDI.

The 12 Step hardware itself will work on any operating system (assuming there is native USB and MIDI support). It can even work with computers that may not be able to run the editors but still support USB 2.0 and MIDI (editing presets will have to be done on another computer in this case).

Software

The 12 Step editor has more specific requirements than the 12 Step hardware.

Mac

- Mac OS 10.6 or later
- Intel Core 2 Duo 2.0 GHz or greater
- Roughly 100 MB free hard disk space
- A 12 Step foot controller

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Windows

- Windows 7, or Windows 8 (*we do not support Windows XP or Windows Vista*)
- Intel Core 2 processor or greater
- Roughly 100 MB free hard disk space
- A 12 Step foot controller

1.4 Conventions In This Manual

Here are a few notes on the formatting of this document:

- ⚠ denotes an important note or piece of information – a "head's up" symbol.
- Links to external websites will appear in underlined, blue text – click on the text to open that web page in the computer's default web browser. Links to different sections of the manual will appear in **black, bold, underlined text** – click on the text to jump to that section of the manual. Key terms that do not link anywhere will simply be in **bold text**.
- Screenshots in this document were made with the Mac version of the 12 Step editor.
- The term "port" will be used often throughout this manual. "Port" can refer to a physical port (e.g. a USB port) or it can refer to a virtual MIDI port or bus (used in audio software on computers/tablets to send and receive MIDI data).
- When referring to a virtual MIDI "port" or "bus", the term "port" will be used.
- The terms "TRS cable" and "TS cable" will appear in the manual – these are also commonly referred to as a "stereo cable" and a "mono cable", respectively.
- Any measurement value followed by double quotes (") denotes inches. Measurement values followed by a single quote (') denotes feet – e.g. 1/4" refers to one-quarter inch and 3' refers to three feet.
- "MIDI cable" will be used throughout the manual when referring to a 5-pin DIN cable.

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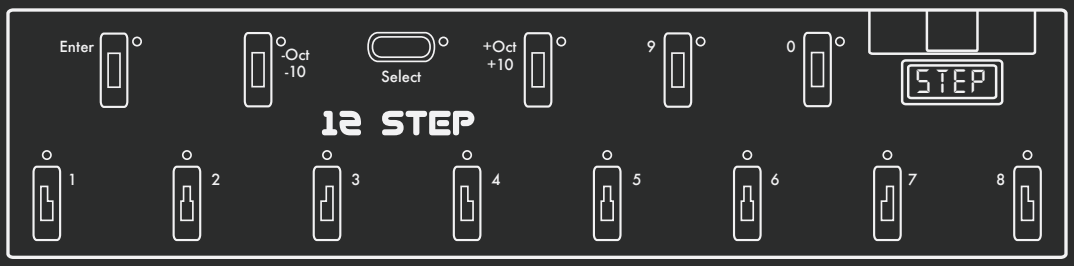
Getting Started



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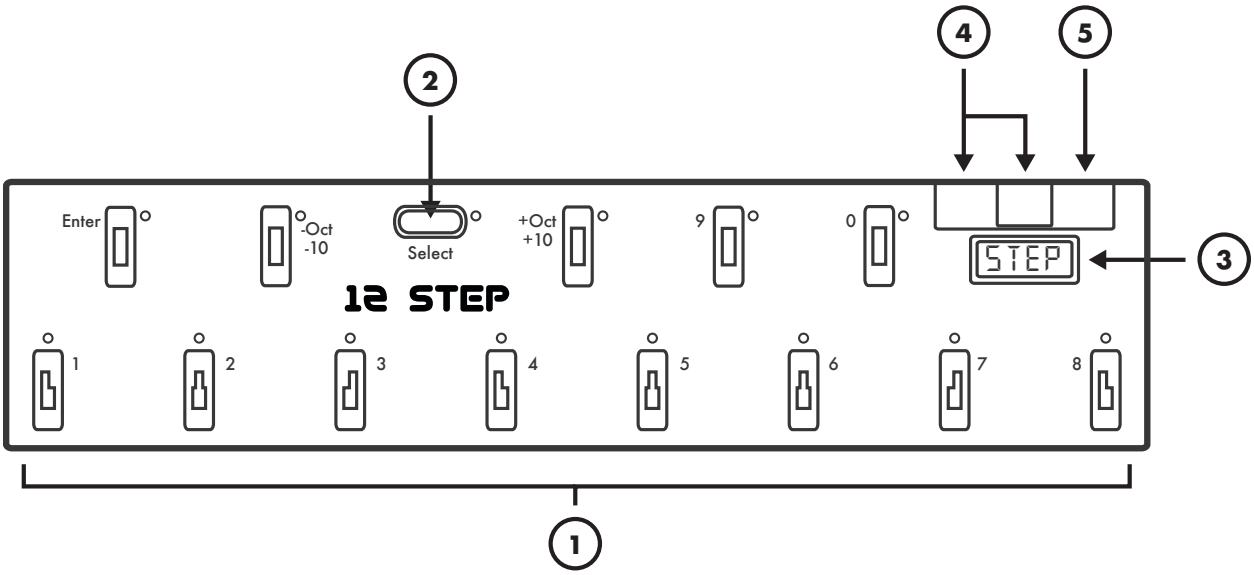
2.0 Getting Started

This section covers information that will help get started with the 12 Step. We will introduce the 12 Step hardware, the MIDI Expander hardware, how to connect 12 Step to the world, and basic operation of the pedal.

2.1 12 Step Hardware

The 12 Step hardware!!!

2.1.1 Overview



(1) Keys

Keys are where the action happens. Step on these to make the 12 Step output notes and other MIDI messages.

Each key has an accompanying red LED (located at the north or northeast corner of the key) for visual feedback.

(2) Select Button

The select key is a special, multi-function key used to change presets, shift octaves, and switch between note modes.

(3) Display

Used to show the currently loaded preset's **display name**.

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(4) USB Ports

Used to connect the 12 Step to the MIDI world. Connect a KMI MIDI Expander using the Expand port (USB-mini) or connect to a computer/tablet via the main USB port (the big one).

(5) Pedal Input

Used to connect an expression pedal to the 12 Step. All input should use a 3.5mm (1/8") TRS cable to work properly. Most expression pedals have a stereo 1/4" jack – an expression pedal adapter (female 1/4" TRS to male 3.5mm TRS) is included with every 12 Step.

2.1.2 Specs

The "deets":

Dimensions & Weight

- **Dimensions**: 4.1" x 17.7" x 0.94" (105mm x 450mm x 24mm)
- **Weight**: 1.3 lbs (0.59 kg) (approximately)

Power Draw / Requirements

The 12 Step can be powered via the main USB port *or* the Expander port. It should never be powered from both ports at the same time – this may result in damage to the hardware.

Voltage: +5V

Power draw: 150mA (approximate measurements)

⚠ **Note**: There are no user serviceable parts inside the 12 Step. Attempts to open the enclosure will void the warranty.

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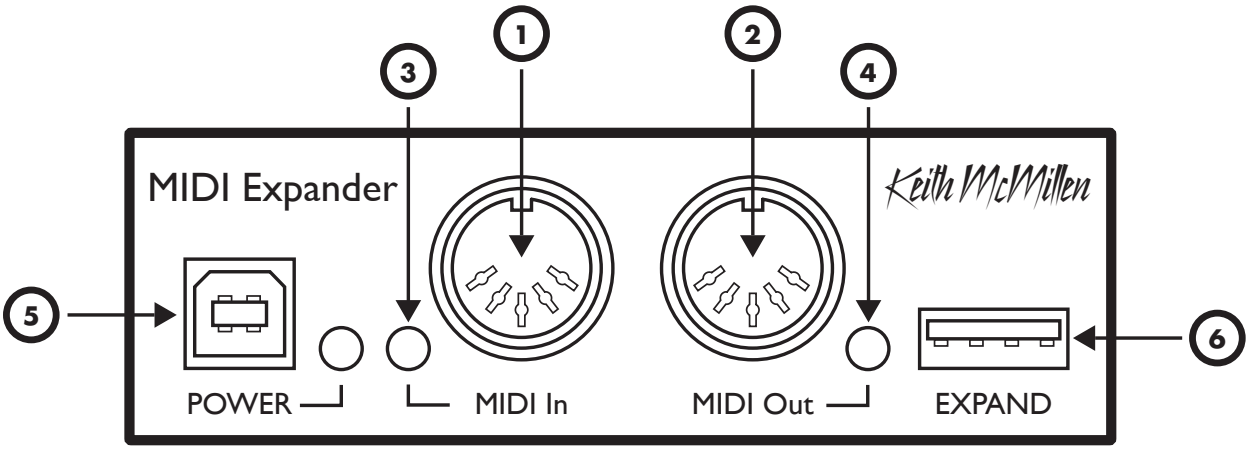
2.2 MIDI Expander Hardware

The KMI MIDI Expander is an optional accessory that allows the 12 Step to connect to external MIDI hardware via MIDI cables.

2.2.1 Overview



(1) MIDI In

MIDI input to the Expander. Incoming MIDI will be passed through the 12 Step and up the USB connection to a connected computer or tablet – similar to a MIDI interface. MIDI sent into the Expander's input can also be used to control the 12 Step LEDs, display, and presets.

(2) MIDI Out

MIDI output from the Expander. MIDI from the 12 Step (and a connected computer) can be sent out of this to external MIDI hardware.

(3) Input LED Indicator

Flashes when MIDI is received at the MIDI In port.

(4) Output LED Indicator

Flashes when MIDI is sent out of the MIDI Out port.

(5) Power Port

Used to power the MIDI Expander and an attached 12 Step. Just plug a USB power supply (one is provided with the Expander package) into an outlet, then connect the power supply to the POWER port on the Expander with a USB A to B cable (also provided with the Expander).

⚠ **Note**: If nothing is plugged into the EXPAND port when powered, the Expander's Input and Output LED Indicators will light up. This is just to indicate that the Expander is being powered – no MIDI is actually being output or received. Once a KMI controller is connected to the EXPAND port they will turn off and behave normally.

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(6) Expand Port

Used to connect the MIDI Expander to the 12 Step. Just use a mini USB cable to connect the 12 Step's Expand port to the Expander's EXPAND port.

⚠ **Note**: *Only* KMI MIDI controllers should be connected to the EXPAND port – other USB MIDI controllers and USB hubs will not work properly.

2.2.2 Specs

Dimensions & Weight

- **Dimensions**: 4" x 1.25" x 1.25" (102mm x 32mm x 32mm)
- **Weight**: 2.5 oz. (71g)

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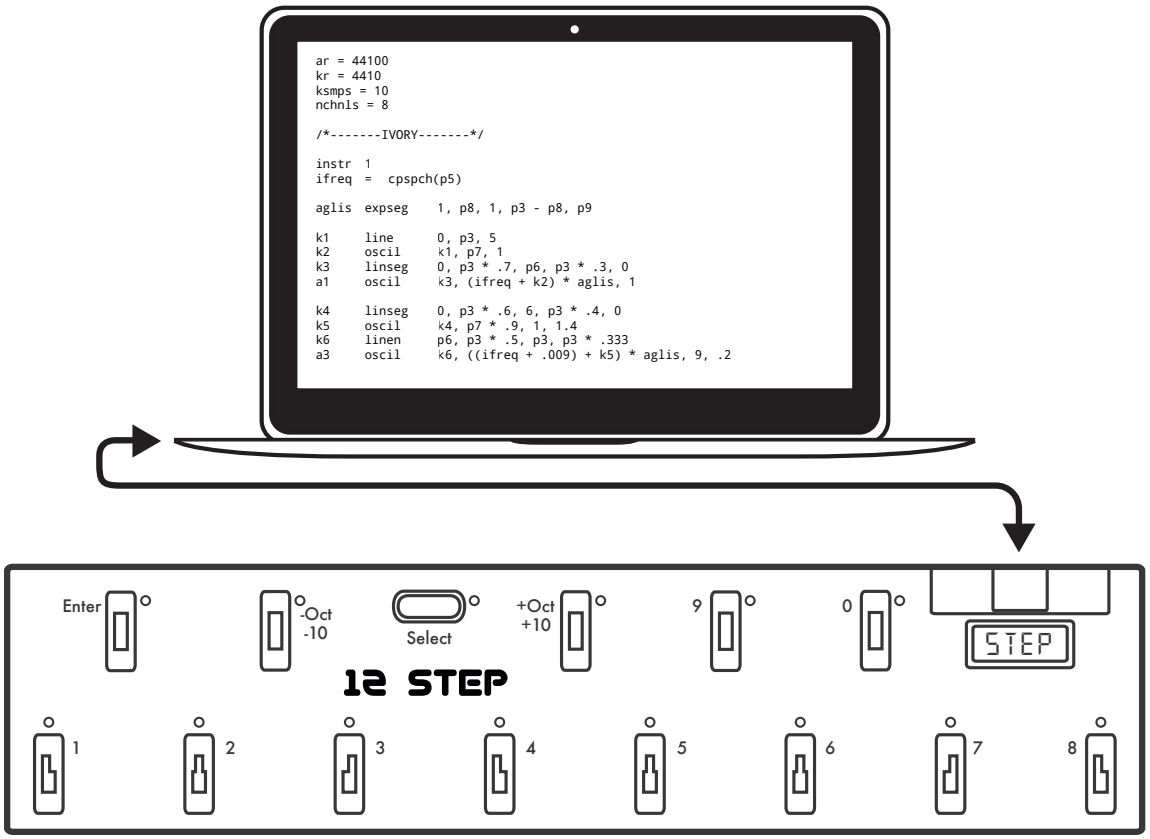
2.3 Connecting 12 Step

The 12 Step can talk to computers and tablets via USB, and MIDI hardware via MIDI cables (KMI MIDI Expander required). Both methods can be used independently or simultaneously.

2.3.1 To A Computer



Connecting the 12 Step to a computer requires three things: a 12 Step, a computer, and a USB A to USB B cable (the "classic" USB cable). Simply plug the 12 Step's main USB port into a USB 2.0 (or greater) port on the computer. The 12 Step will receive power from the computer.

⚠ **Note**: The 12 Step can also be used with a USB hub connected to a computer. It is highly recommended to use a powered USB hub, not a bus-powered hub. Bus-powered hubs may not be able to provide enough power to the 12 Step to function properly.

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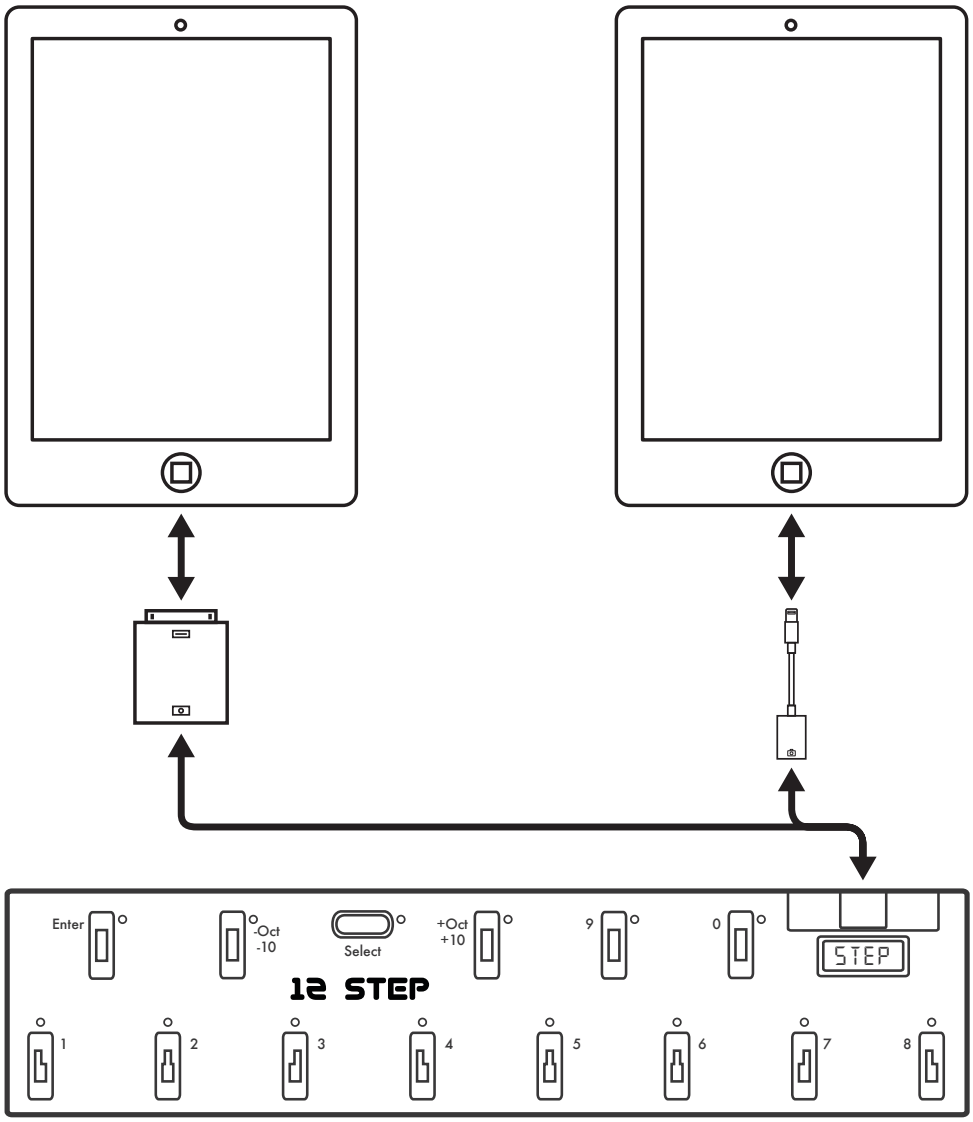
2.3.2 To An iPad



Connecting the 12 Step to an iPad is very similar to connecting to a computer, the only difference is that one more part is needed.

An Apple Lightning to USB Camera Adapter (for iPads with Lightning connectors) *or* an Apple iPad Camera Connection Kit (for iPads with the older 30-pin connectors) is required to connect the 12 Step to an iPad via USB.

Plug the adapter into the iPad, plug the 12 Step's main USB port into the adapter with a USB A to B cable, and everything is ready to go.

⚠ **Note**: Some iPad models may not be able to power the 12 Step without some help – the 12 Step may have to be powered externally with a USB power supply (5V, 500mA). Just plug the 12 Step's mini-USB port (the Expand port) into the power supply, then plug the power supply into a power outlet.

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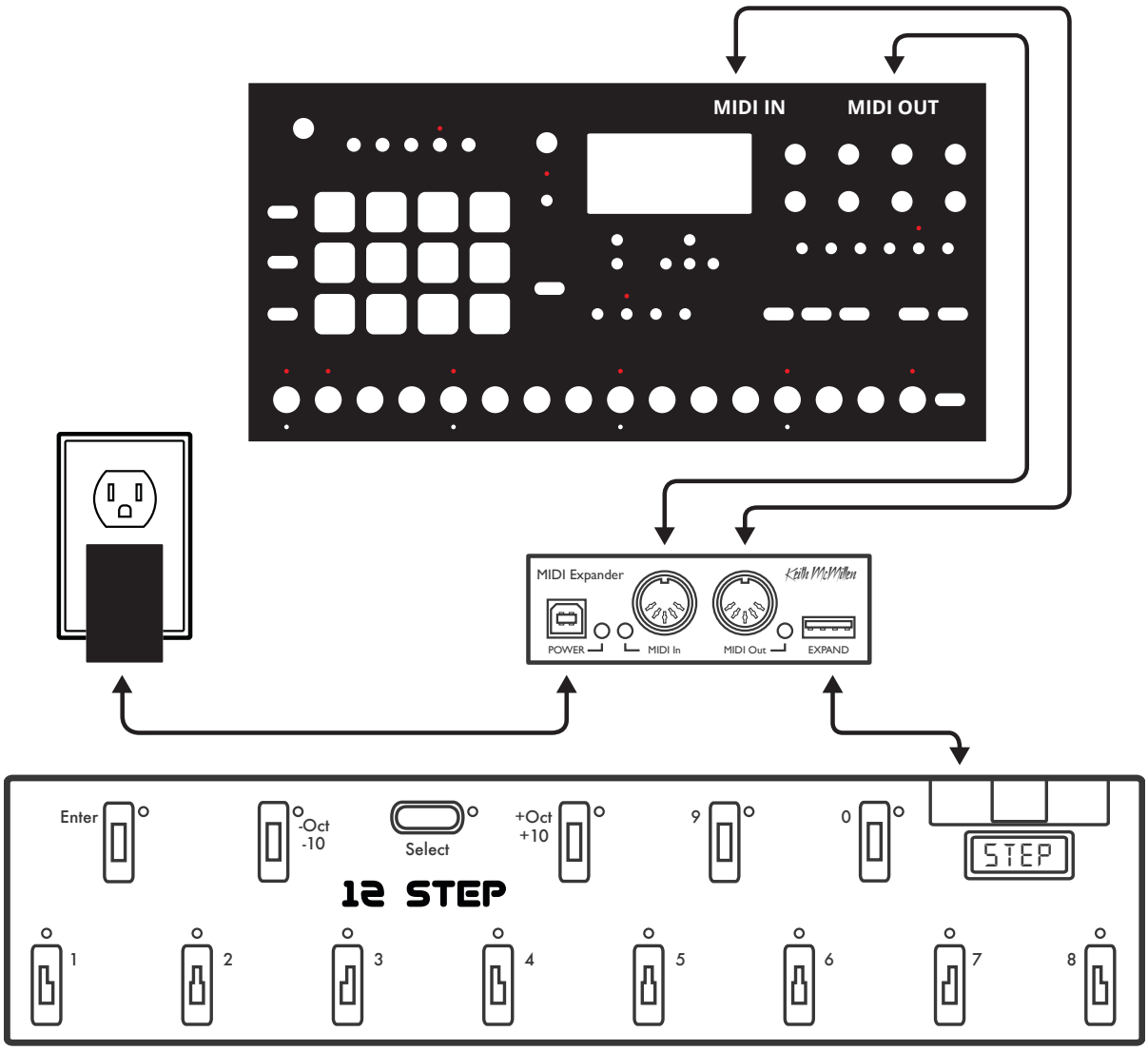
2.3.3 To MIDI Hardware



A KMI MIDI Expander is required to connect to MIDI hardware via MIDI cables.

1. Connect the 12 Step's EXPAND port to the EXPAND port on the Expander using a USB A to mini-B cable.
2. Connect the Expander's POWER port to a USB power supply (included with Expander package) using a USB A to B cable.
3. Plug the power supply into a power outlet – the 12 Step and Expander should power up.
4. Use a MIDI cable to connect the Expander's MIDI OUT to the MIDI IN on the external hardware. Use a second cable to connect the Expander's MIDI IN to the MIDI OUT on the hardware if input to the 12 Step is desired.

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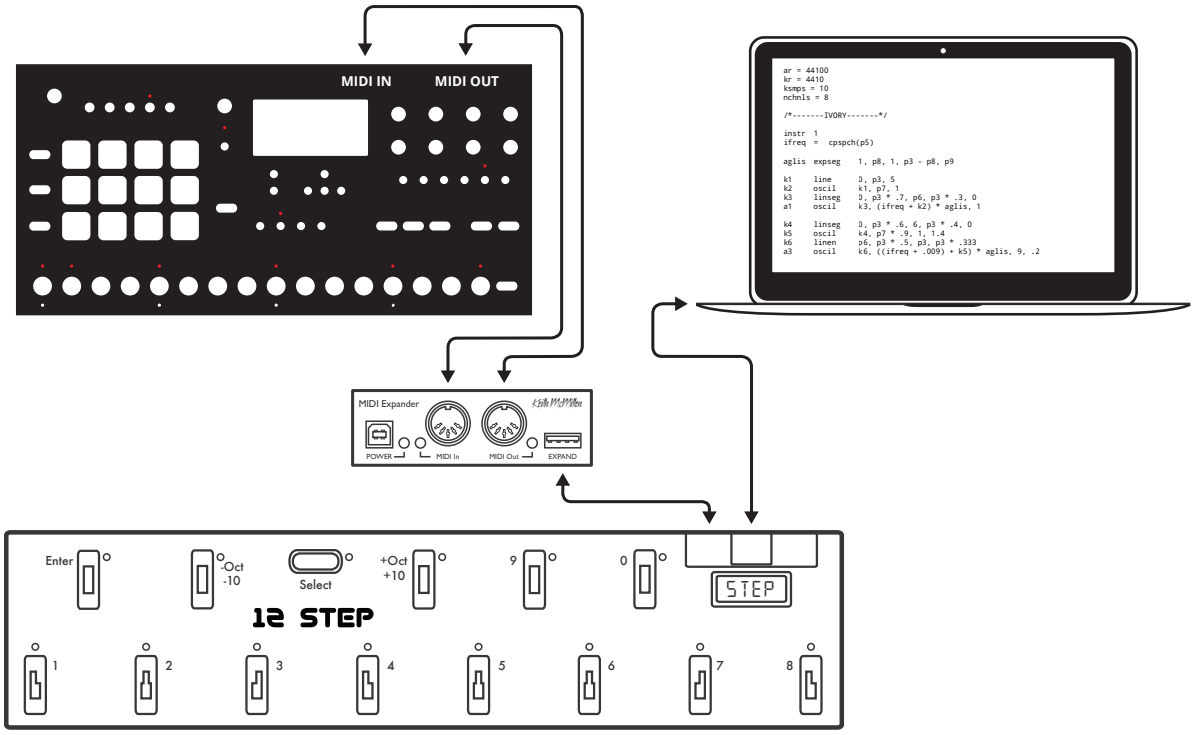
2.3.4 To MIDI Hardware + Computer



The 12 Step can be connected to both a computer and external MIDI hardware at the same time (KMI MIDI Expander required).

1. Connect the 12 Step's EXPAND port to the EXPAND port on the Expander using a USB A to mini-B cable.
2. Connect the 12 Step's main USB port to the computer using a USB A to B cable. The 12 Step and Expander should power up.
3. Use a MIDI cable to connect the Expander's MIDI OUT to the MIDI IN on the external MIDI device.

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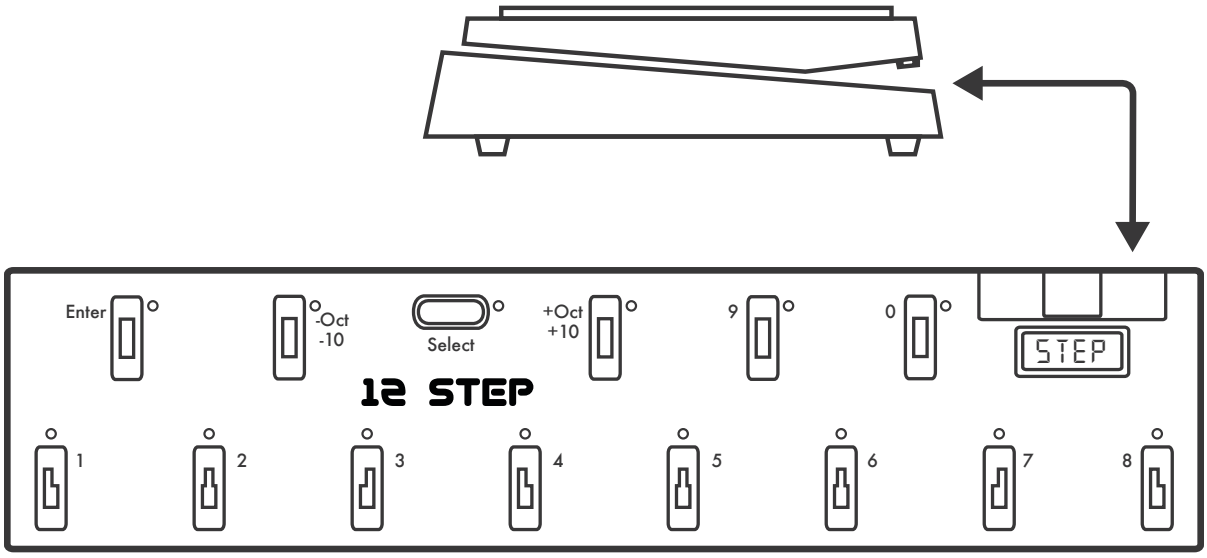
2.3.5 Adding An Expression Pedal



Most standard expression pedals can be directly connected to the 12 Step and used to send MIDI data.

1. Set up the 12 Step in whatever configuration is desired (computer/tablet, Expander, or both).
2. If the expression pedal has a 1/4" TRS connector, plug it into a 1/4" female to 1/8" male adapter (one is provided with each 12 Step).
3. Plug the expression pedal into the 12 Step's **Express** port, and setup is complete!

⚠ **Note:** Volume pedals **do not** work with the 12 Step or any KMI controller with expression pedal input. Only expression pedals are compatible. For more info, please see this **FAQ**.

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2.4 Start Playing

Here's a quick overview of how to start interacting with the 12 Step!

2.4.1 Initial State

Upon first powering up, the 12 Step will be on the default "**Chromatic Scale**" preset (the display will read "CHrO"). This preset should behave like a normal keyboard – each key plays a note when pressed and stops when released.

⚠ **Note**: The initial preset may change if any editing has been done, but the factory state of the 12 Step should load with the Chromatic Scale preset when first powered on.

2.4.2 Playing Notes

To play notes on the 12 Step, simply step on one of the keys (just not the special "**Select**" key). Typically, a note (or notes) will turn on when the key is pressed and turn off when the key is released – this behavior can be changed using the various **Note Modes**.

2.4.3 Changing Presets

Preset changing is handled using the 12 Step's **Select** key. Simply do the following:

1. Press and hold the Select key until all of the 12 Step's red LEDs begin to flash, then release the key. The 12 Step is now in what is referred to as "**Select Mode**".
2. Step on one of the numbered keys to switch to the preset associated with that particular number. After selecting a preset the 12 Step will automatically load it and exit preset selection mode.
3. Start playing!

Advanced Info

The 12 Step is able to hold up to 64 presets, but how exactly are they accessed? Like so:

1. Enter Select Mode by holding down the 12 Step's Select key.
2. Press the 12 Step's **Enter** key.
3. Use the -Oct/-10 and +Oct/+10 keys (the keys to the immediate left and right of the Select key) to select a "decade" (10s, 20s, 30s, 40s, etc) – the current decade will be shown on the 12 Step's display.
4. Step on one of the numbered keys to fill in the final digit of the decade (e.g. stepping on key 7 in the 30s decade will load preset 37). The preset will load and be ready to go.

⚠ **Note**: The 12 Step will remember which decade it's in if Select Mode is entered again. Scrolling through the decades every time is not necessary.

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2.4.4 Changing Octaves

It is possible to transpose 12 Step presets up and down by an octave directly from the board. Similar to changing presets, octave shifting makes use of the **Select** button. Do the following:

1. Press and hold the Select key until all of the 12 Step's red LEDs begin to flash, then release the key. This is referred to as "**Select Mode**".
2. Step on either the key labelled "-Oct" (to shift down an octave) or "+Oct" (to shift up an octave).
3. Start playing! After stepping on one of the octave +/- keys the 12 Step will automatically shift and exit Select Mode.

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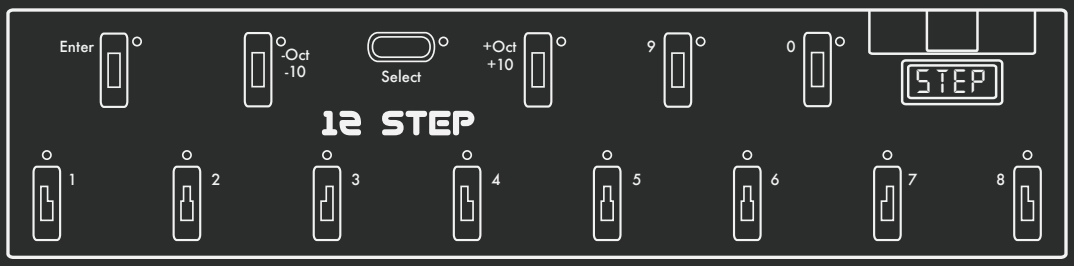
12 Step Editor



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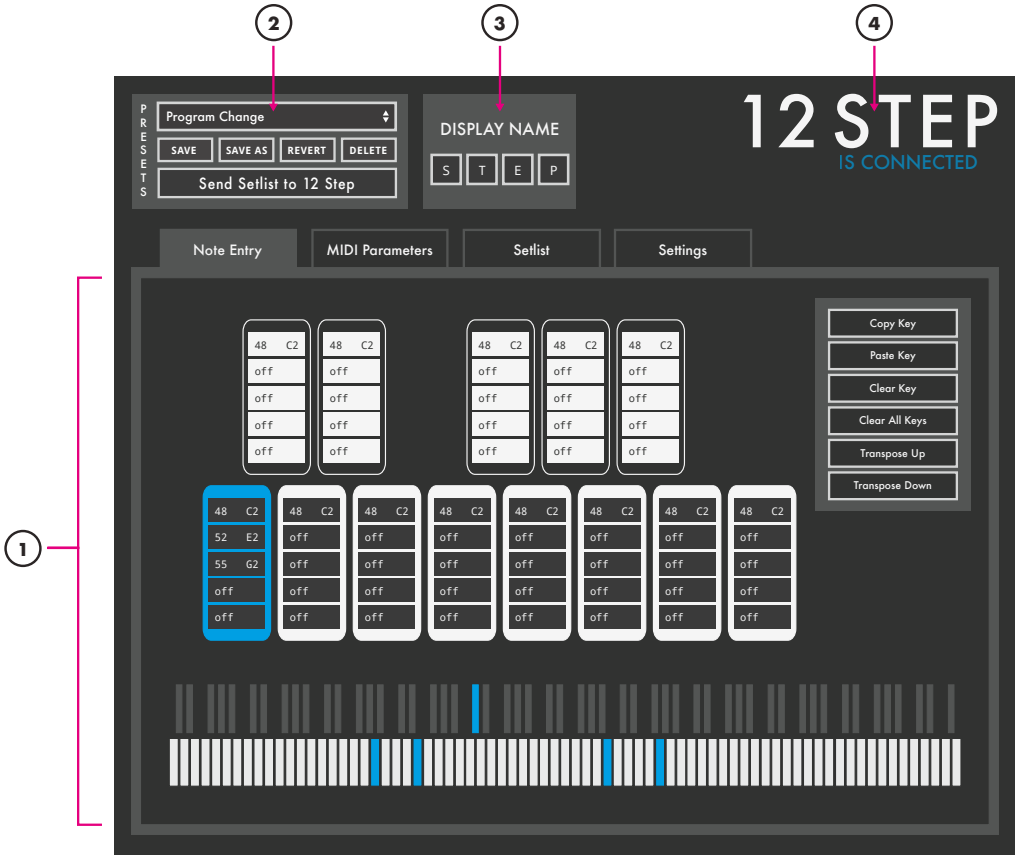
3.0 Editor

The 12 Step editor allows for up to 64 fully customizable presets to be edited and loaded onto a connected 12 Step. MIDI notes, CC messages, program changes, preset ordering/management – all this and more can be customized using the editor.

3.1 Main Window Overview

Upon first opening the 12 Step Editor the main window will be displayed. This is the gateway to everything – customizing the notes on each key, setting MIDI CCs, adjusting settings, and managing presets.

The main window looks something like this:



(1) Main Tab Area: Houses the four main editor tabs. See the **Note Entry**, **MIDI Parameters**, **Setlist**, and **Settings** sections for more detailed information on each tab.

(2) Presets Section: (see **Presets Section**)

(3) Display Name: (see **Display Name** section)

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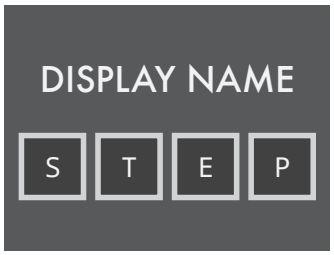
(4) Connection Indicator: Displays whether or not the editor has made a connection to an attached 12 Step controller. A connection is required to update firmware, send presets to the 12 Step, and alter the 12 Step's settings. A connection is not needed to edit or manage presets.

3.1.1 Display Name

The display name is used to set the name that appears on the 12 Step's display when a preset is loaded (four characters maximum).

To change the display name, simply click each of the four boxes and select the desired letter from the drop-down menu that appears. It is highly recommended to give each preset a distinct name to prevent any confusion that could arise from similarly named presets.



⚠ **Note**: Not all letters are available in the drop-down menus – this is because the 12 Step's display only has seven segments per character, making it unable to properly represent certain letters (K, M, V, W, and X).

3.1.2 Connected Indicator

This displays whether or not the editor has made a connection to an attached 12 Step controller. A connection is required to update firmware, send presets, and alter the 12 Step's settings. A connection is not needed to edit or manage presets.



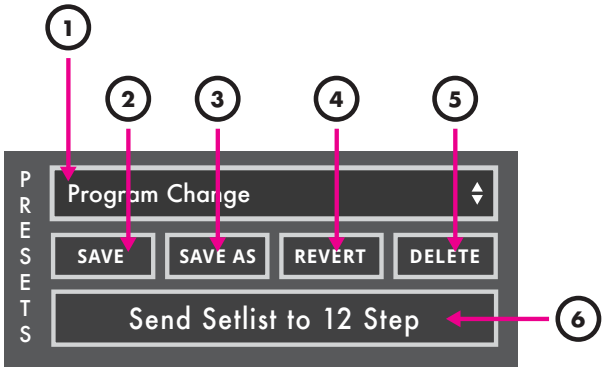
3.1.3 Main Tab Area

The main tab area is where nearly all of the editing action happens. It consists of four tabs: **Note Entry**, **MIDI Parameters**, **Setlist**, and **Settings**. Please see their respective sections in this manual for more detailed information on what each tab is for.

3.1.4 Presets Section

The top-left area of the 12 Step Editor's main window is home to the presets section. This is where presets are selected and where all preset management is handled.

The presets section looks like this:



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(1) Preset selection drop-down

Clicking this displays a list of all presets. Choosing one loads it as the currently active preset in the editor.

(2) Save

Saves any changes made to the current preset when clicked. The save button will light up red if any unsaved changes have been made.

(3) Save As

Saves the current editor settings as a new preset when clicked. A prompt will appear asking what the preset's name should be. The preset that was previously being edited will then revert to its last saved state.

(4) Revert

Restores a preset to its last saved state. Any unsaved changes will be lost.

(5) Delete

Deletes the currently selected preset. A confirmation dialogue will appear when clicked to prevent accidental deletions.

(6) Send Setlist to 12 Step

Click to update a connected 12 Step with the presets currently in the editor's **setlist**.

When clicked, the following will happen:

1. If the currently selected preset (in the editor) is *both* in the setlist and has any unsaved modifications, the preset will be automatically saved.
2. The setlist will be "cleaned up". Any empty slots in the setlist will be removed. All presets will shift up to fill in the spaces.
3. The global settings are sent to the 12 Step.
4. The setlist presets are sent to the 12 Step.

⚠ **Note**: This action will overwrite the presets currently stored on the 12 Step board. Please be absolutely sure if this is okay before sending presets to the 12 Step.

Other preset-related info

Importing/Exporting Presets

Presets can be exported from and imported to the 12 Step Editor. See the **Import Preset** and **Export Preset** section for more detailed information.

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Import Presets from v1.0

It is possible to import presets from the previous version of the 12 Step Editor (version 1.0). See the **Import All Presets from V1.0** section for more detailed information.

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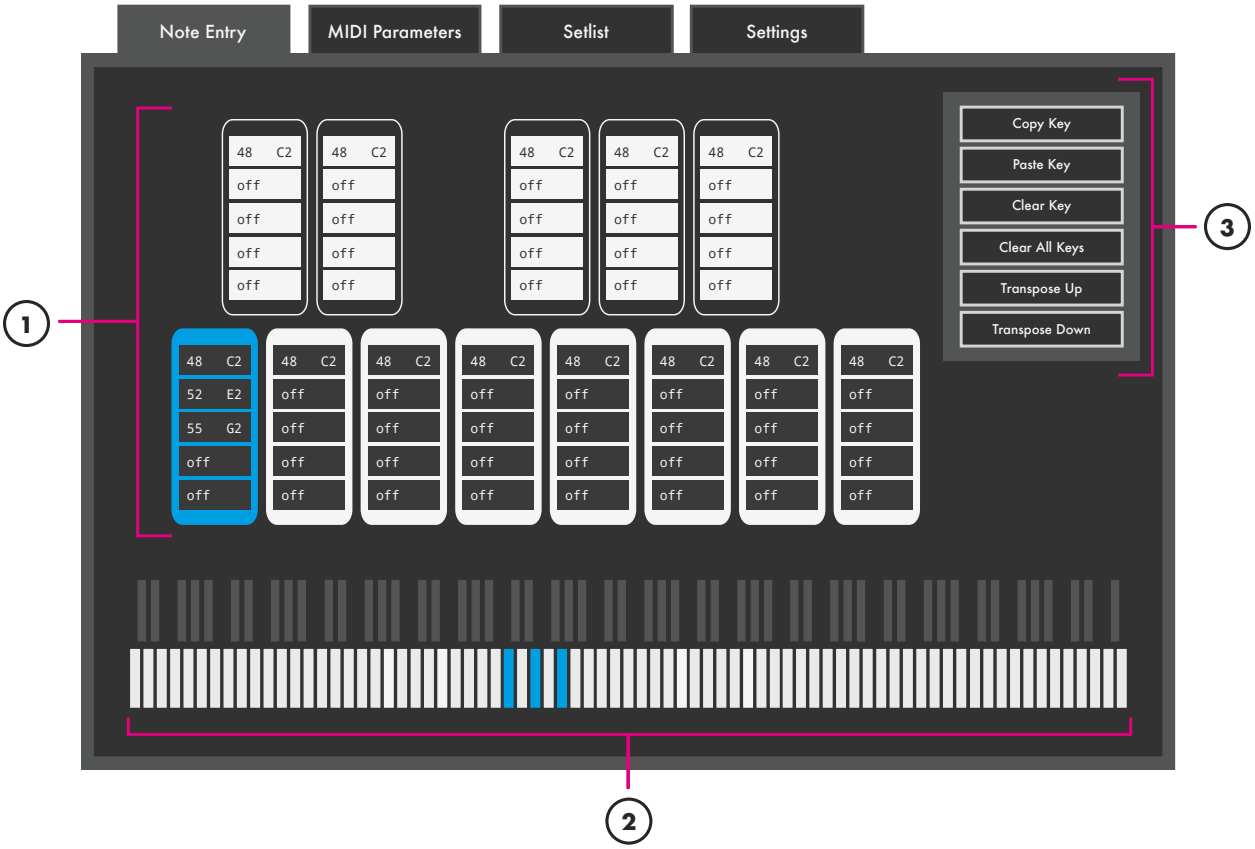
3.2 Note Entry Tab

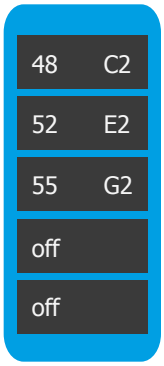
The Note Entry tab is where each of the 12 Step keys' MIDI notes get set. Each key can be set up to output anywhere from 0 to 5 notes at a time.

The Note Entry tab contains the following:



(1) Keys

The Keys area shows which notes are currently set on each key (MIDI note number along with corresponding note name) and which key is currently selected for editing.



The currently selected key will be highlighted in blue. To change the currently selected key, simply click anywhere on one of the keys and the blue highlight will follow.

Editing Keys

Each key contains five slots. Each slot can hold a single MIDI note anywhere from 0 (C-2) to 127 (G8). To edit a key, do the following:

1. Click on the key to edit.

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2. Select one of the five slots.
3. Either use the up and down arrows on the computer keyboard to increment/decrement to the desired note, or type in the desired note number.
4. Repeat for any other notes that may be needed.

Alternatively, the keyboard graphic at the bottom of the Note Entry tab may be used to edit keys.

(2) Note Entry Keyboard



The note entry keyboard is a graphical representation of a keyboard that covers the entire MIDI range – from note 0 (C-2) to note 127 (G8). It is used for editing and displaying all active notes on the currently selected key – each active note will light up blue.

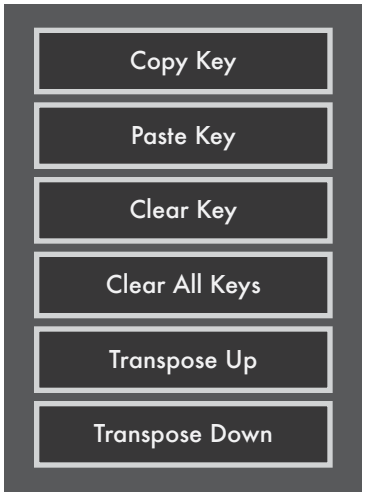
Editing Keys

The keyboard can be used to edit the notes of the currently selected key. Clicking a black or white key on the keyboard will add that pitch to the selected key. Clicking a blue key will remove that pitch from the selected key.

No more than five notes may be selected at a time.

(3) Edit Buttons

The Note Entry tab contains a number of helpful buttons that can be used to speed up the editing process. They are as follows:



Copy Key

Copies the currently selected key's settings to the clipboard.

Paste Key

Pastes a copied key's settings to the currently selected key.

Clear Key

Completely clears all MIDI notes from the currently selected key.

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Clear All Keys

Completely clears all MIDI notes from all keys.

Transpose Up

Transposes the selected key's MIDI notes up by a semitone when clicked. Notes will clip at 127 (G8) if the resulting transposition would place the note out of MIDI's range (0-127).

Transpose Down

Transposes the selected key's MIDI notes down a semitone when clicked. Notes will clip at 0 (C-2) if the resulting transposition would place the note out of MIDI's range (0-127).

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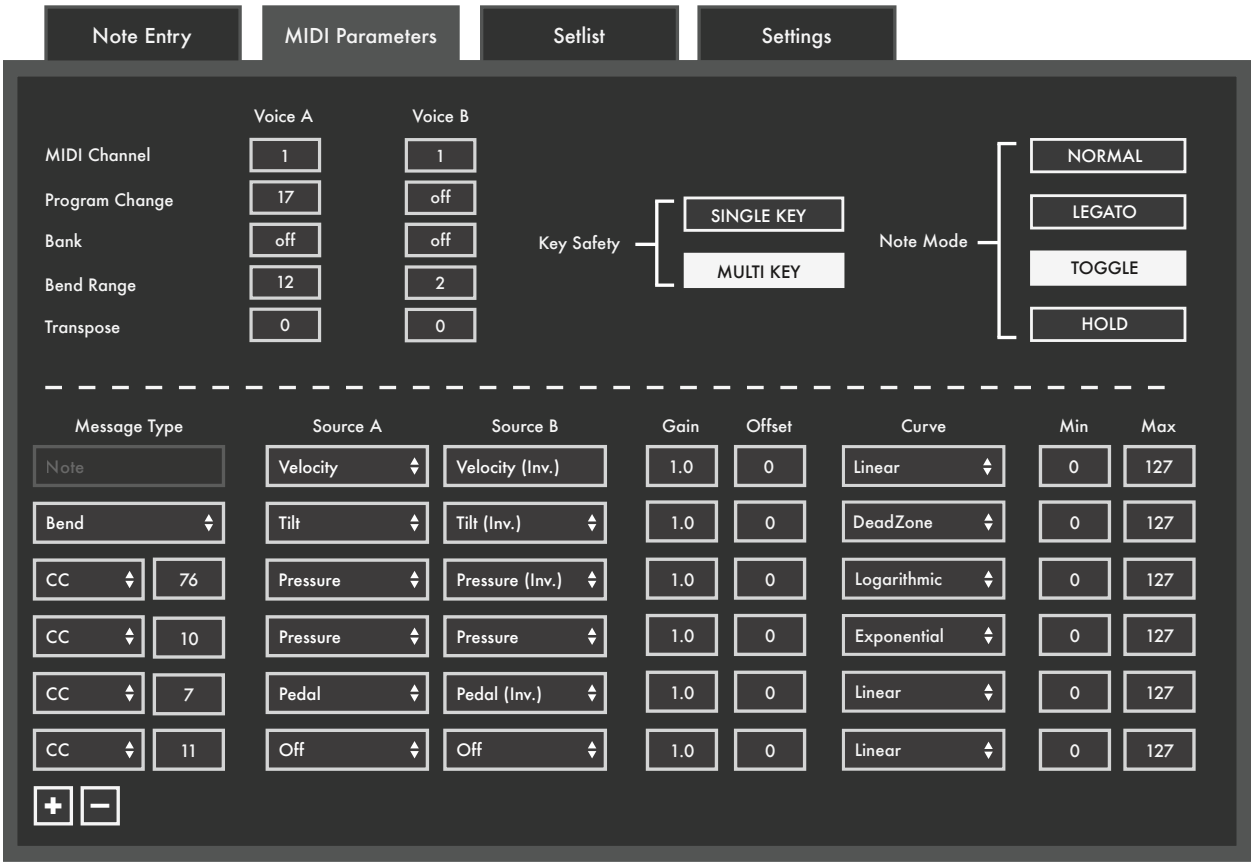
3.3 MIDI Parameters Tab

The MIDI Parameters tab is where more advanced/detailed MIDI parameters are set. The MIDI channel can be defined, program and bank changes can be set up, CC settings can be altered, and more.



The MIDI Parameters tab is divided into two sections – the **Fixed Parameters** section and the **Modlines** section.

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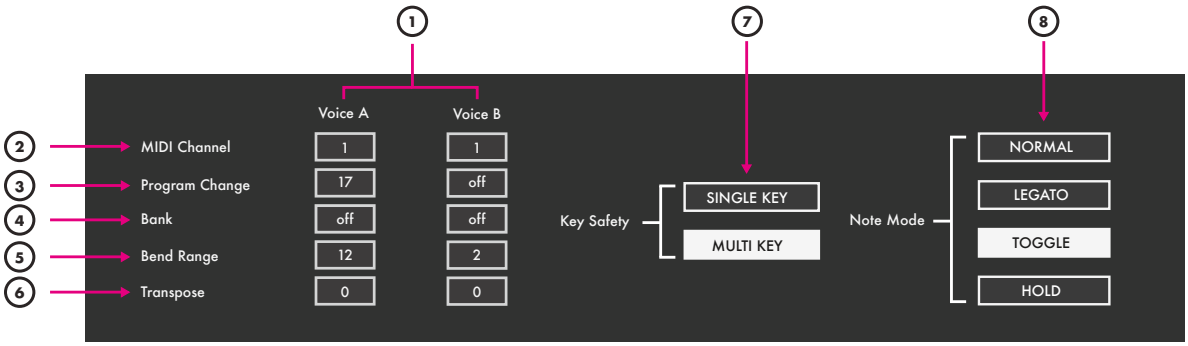
3.3.1 Fixed Parameters

The top portion of the MIDI Parameters tab contains options related to the behavior of the 12 Step and some more general MIDI parameters (program changes, MIDI channel, bend range, etc.) that remain fixed per preset.



(1) Voice A and Voice B

The 12 Step is capable of outputting MIDI on two separate "voices" simultaneously – each with independent settings. This is useful when doubling up synths and controlling them from a single controller.

There are two columns for each of the MIDI-related options – one for Voice A and one for Voice B. Each voice can be sending on a separate MIDI channel, have different transpositions, different bend ranges, and send different program change and bank select messages.

(2) MIDI Channel

Sets the MIDI channel to output MIDI messages on.

(3) Program Change

Sets a Program Change value to output whenever the preset is loaded.

This is useful for loading specific presets/settings whenever a certain 12 Step preset is selected.

- Range: 0-127

(4) Bank

Sets a Bank Select message to output whenever the preset is loaded. The bank message will only be sent out if **program change** is turned on as well.

- Range: 0-127

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⚠ **Note**: Bank Select messages are 14-bit resolution (a range of 0-16383), as opposed to the standard 7-bit MIDI message (range 0-127). This is accomplished by using two separate messages: an MSB (most significant bit) and an LSB (least significant bit). With 12 Step, values in the Bank field will set the LSB of the bank message – the MSB will be fixed at 0. The MSB is generally transmitted as a CC 0 messages, immediately followed by the LSB as a CC 32 message.

(5) Bend Range

Sets the pitch bend range (in semitones) of the 12 Step.

- Range: 1-12

(6) Transpose

Sets a transposition amount (in semitones) for the entire preset.

Example: A Transpose value of "3" would transpose all of the preset's MIDI note output by a minor third interval.

- Range: ±12

(7) Key Safety

Sets how many keys can be activated simultaneously.

- **Single Key**: Only a single key can be activated at a time.
- **Multi Key**: Any key can be activated at any time.

(8) Note Mode

Sets how MIDI notes will behave when playing the 12 Step

- **Normal**: Notes will turn on when a key is pressed and turn off when the key is released.
- **Legato**: Notes will turn on when a key is pressed and continue playing when released. When another key is pressed, the previous notes will turn off and the new key's notes will turn on.
- **Toggle**: Notes will turn on when a key is pressed and stay on until the key is pressed again.
- **Hold**: Allows toggling between Normal and Legato mode using the Select key.
- When a preset set to Hold mode is first selected, the 12 Step will be in Legato mode – indicated by the Select LED flashing. Quickly tapping the Select key will switch the board over to Normal mode – all currently active notes will turn off and the Select LED will stop flashing.

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3.3.2 Modline Section

The lower portion of the MIDI Parameters tab holds the **modlines** – a set of options/parameters that define what MIDI messages the 12 Step should output and how it should output them. The modline section contains the following:



(1) Message Type

Sets the type of MIDI message to output. For a complete list of all available message types (and what they do), see the **Message Types** section of the Appendix.

⚠ **Note**: With the "CC" message type being the exception, each message type can only be used on one modline per preset. The CC message type can be used on two modlines.

(2) Source: Voice A

Selects the type of sensor data to use (e.g. key pressure, velocity, tilt, key number) for Voice A. For a complete list of all available sources (and what they do), see the **Sources** section of the Appendix.

(3) Source: Voice B

Selects the type of sensor data to use (e.g. key pressure, velocity, tilt, key number) for Voice B. For a complete list of all available sources (and what they do), see the **Sources** section of the Appendix.

(4) Gain

Multiplies incoming values by the specified amount. Negative numbers can be used to invert values. Defaults to 1.0 (no change).

(5) Offset

Adds the specified amount to incoming values. Use negative numbers for subtraction. Defaults to 0 (no offset applied).

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(6) Curve

Sets the type of curve to apply to the incoming values. For a complete list of all available tables (and what they do) see the **Curves** section of the Appendix.

(7) Min

Sets the minimum value that can be output. All values below the minimum will be clipped to this value – they are not ignored.

(8) Max

Sets the maximum value that can be output. All values above the maximum will be clipped to this value – they are not ignored.

(9) Add/Delete Modlines

The "plus" button adds a modline (maximum of 6 per preset) and the "minus" button deletes a modline (minimum of 2). Adding a modline will place a new at the bottom of the list. Deleting a modline will remove the bottom modline from the list.

When deleting a modline, the Message Type and Sources will automatically be set to "Off". All other settings (Gain, Offset, Curve, Min, Max) will be preserved.

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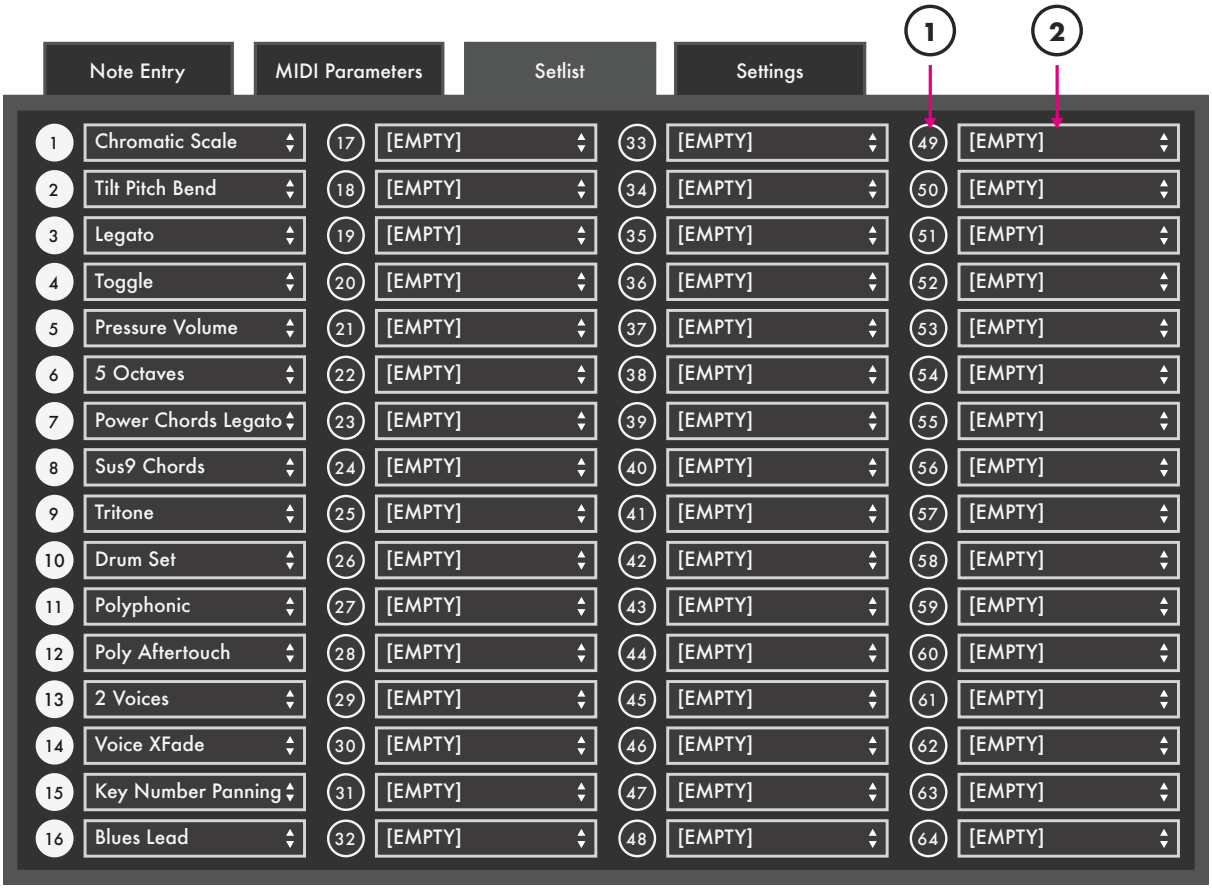
3.4 Setlist Tab

The **Setlist** allows up to 64 presets to be ordered in any way. This is the order that the presets will appear on the 12 Step when using **Select Mode**.

The setlist tab looks like this:



(1) Enable/Disable Switch

Enables/Disables the preset slot.



= enabled



= disabled

(2) Preset Selection Drop-down

Selects which preset to place in the setlist slot.

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3.5 Settings Tab

The **Settings** tab is home to a couple of adjustable options related to sensitivity of the 12 Step. The Settings tab contains the following:



(1) Global Key Sensitivity

Sets the overall sensitivity of the 12 Step keys. Moving the slider to the right will increase sensitivity – moving the slider to the left will decrease sensitivity. The **RESET GLOBAL SENSITIVITY** button directly below the slider will set the global sensitivity to the default value when clicked.

(2) Select Button Sensitivity

Sets the sensitivity of the Select button. Moving the slider to the right will increase sensitivity – moving the slider to the left will decrease sensitivity. The **RESET SELECT SENSITIVITY** button directly below the slider will set the select sensitivity to the default value when clicked.

(3) Send Full Volume On Preset Change Switch

Enables/Disables the CC 7 127 message the 12 Step outputs on preset changes.

(4) Velocity Override

When enabled, all presets will transmit all MIDI notes at full velocity (127), ignoring all velocity-related settings in the modlines. When disabled, all presets will respond to velocity as normal.

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3.6 Menu Bar Options

There are a number of useful functions and settings that can be accessed via the menu bar at the top of the screen (Mac OS) or at the top of the application window (Windows).

The following options are available in the 12 Step Editor's menu bar:

12 Step Editor

This option is only available on Mac OS. Windows users can find the options listed below in the **Help** menu.

About 12 Step Editor

Displays version information about the 12 Step Editor.

- **Editor Version**: Displays the version number of the editor.
- **Expected FW**: Displays the firmware version provided in this version of the editor. This is the version that will be loaded onto a connected 12 Step when a firmware update is initiated.
- **Found FW**: Displays the firmware version currently loaded on a connected 12 Step.

File

Export Preset

Exports the currently selected preset to an external file on the hard disk. Good for sending presets to a friend, transferring presets to a new computer, or creating a preset backup. The resulting .twelvesteppreset file can be imported to the editor using the **Import Preset** function (also located in the **File** menu).

Import Preset

Imports a .twelvesteppreset file to the editor. Use this when restoring presets from backup, importing a preset from a friend, or importing presets from an older computer.

Import All Presets From V1.0

Allows importing presets from the previous version of the 12 Step Editor – version 1.0.

1. Open up the 12 Step Editor
2. Go up to the **File** menu in the menu bar and select "Import All Presets from V1.0".
3. When the file browser appears, navigate to the old 12 Step editor's "presets" folder and select the 12Step.json file.
4. Click Choose/Open/OK – the preset import process will begin. All imported presets will be placed at the end of the current preset list.

⚠ **Note**: This will also work with presets from version 0.9.

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Edit

Clear Preset

Clears the current preset. All keys and modlines will be set to "Off".

Copy Preset

Copies the currently selected preset. Can be used later to paste over a preset or paste to a new preset.

Paste Preset

Pastes a copied preset to the currently selected preset. This option is only available if a preset has already been copied.

Paste Preset To New

Pastes a copied preset to a brand new preset. This option is only available if a preset has already been copied.

Clear Setlist

Completely clears the setlist. All slots will be disabled and set to [EMPTY].

Auto Populate Setlist

Automatically fills the setlist with presets, up to the maximum of 64 presets. Presets will be chosen in the order they appear in the preset drop-down menu.

Hardware

Update/Reload Firmware

Manually initiates a firmware update/reinstallation.

Help

Documentation

Links to a downloadable version of this manual when selected. This will open a web browser tab.

Hide/Show Tool Tips

Selecting this option will toggle between hiding and showing the tooltip pop ups displayed when hovering the mouse cursor over an object.

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3.7 Select Mode

Select Mode is used to both change presets and shift octaves on the 12 Step.

3.7.1 Entering Select Mode

To enter Select Mode, do the following:

1. Press and hold the **Select** key until all of the 12 Step's red LEDs begin to flash, then release the key. The 12 Step is now in Select Mode.

3.7.2 Changing Presets

To change presets on the 12 Step, do the following:

1. Enter Select Mode on the 12 Step.
2. Press the 12 Step's **Enter** key.
3. Use the -Oct/-10 and +Oct/+10 keys (the keys to the immediate left and right of the Select key) to select a "decade" (10s, 20s, 30s, 40s, etc.) – the current decade will be shown on the 12 Step's display.
4. Step on one of the numbered keys to fill in the final digit of the decade (e.g. stepping on key 7 in the 30s decade will load preset 37). The preset will load and be ready to go.

⚠ **Note**: Steps 2 and 3 can be skipped if loading one of the first ten presets is desired. The 12 Step defaults to the 00s decade when first powered up.

⚠ **Note**: The 12 Step will remember which decade it's in if Select Mode is entered again. Scrolling through the decades every time is not necessary.

3.7.3 Changing Octaves

To change octaves on the 12 Step, do the following:

1. Enter Select Mode on the 12 Step.
2. Step on either the key labeled "-Oct" (to shift down an octave) or "+Oct" (to shift down an octave).
3. Repeat steps 1 and 2 if a shift of more than one octave is desired.
4. Start playing! After stepping on one of the octave +/- keys the 12 Step will automatically shift and exit Select Mode.

⚠ **Note**: If a transposition would place any note outside of the MIDI range (0-127, or C-2 to G8), the notes will be clipped at 0 (when going too low) or 127 (when going too high). They will return to the correct notes once they are brought back into MIDI range.

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3.8 Ports

When a 12 Step is connected to a computer, two virtual MIDI "ports" (or "busses") are created — **12 Step Port 1** and **12 Step Port 2**. They are the "portal" to communicating with a connected 12 Step. The ports allow for bi-directional communication between the computer and the 12 Step (and MIDI Expander if one is connected), and should appear in any MIDI-capable application when a 12 Step is connected.

Understanding what each port is for and how they work is crucial to mastering the 12 Step hardware and software.

3.8.1 Port 1 vs. Port 2

12 Step Port 1 is used to receive data from (and send data to) the 12 Step itself.

This is the port applications should listen to in order to receive MIDI coming from the 12 Step. This is also the port that data should be sent *to* for controlling the **12 Step LEDs, display,** and **presets**.

12 Step Port 2 is used to receive data from (and send data to) an attached **MIDI Expander**. MIDI sent from an external device to the Expander's MIDI In will enter a computer via SSCOM Port 2. Any MIDI sent *to* SSCOM Port 2 will be sent out of the Expander's MIDI Out.

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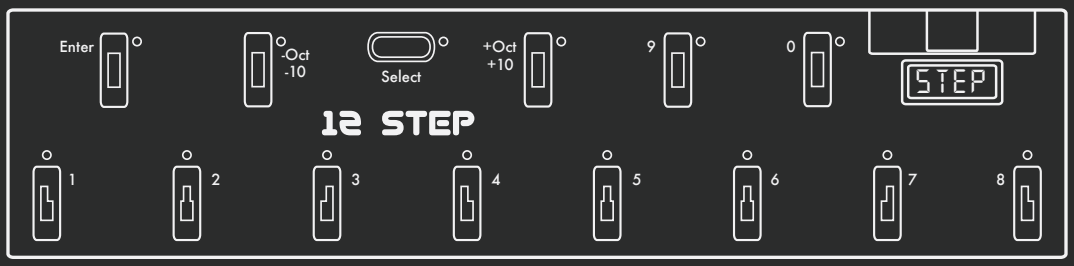
Appendix



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4.0 Appendix

4.1 Sources

Velocity

Outputs a value representing the amount of force a key is triggered with. Triggering a key with more force results in higher values, triggering a key with less force results in lower values.

- Range: 0-127 (no force to full force)

Velocity (Inverted)

An inverted version of the **Velocity** source. Triggering a key with more force results in *lower* values, triggering a key with less force results in *higher* values.

- Range: 0-127 (full force to no force)

Pressure

Outputs the amount of pressure currently being applied to a key. More pressure results in higher values, less pressure results in lower values. The value will drop to 0 when the key is released.

- Range: 0-127 (no pressure to full pressure)

Pressure (Inverted)

An inverted version of the **Pressure** source. More pressure results in *lower* values, less pressure results in *higher* values. The value will go up to 127 when the key is released.

- Range: 0-127 (full pressure to no pressure)

Tilt

Outputs the amount of bottom-to-top pressure (y-axis) currently being applied to a key. Pressure more toward the top of the key results in higher values, pressure toward the bottom of the key results in lower values. The value will return to center (63) when the key is released.

- Range: 0-127 (bottom to top)

Tilt (Inverted)

An inverted version of the **Tilt** source. Pressure toward the top of the key results in *lower* values, pressure toward the bottom of the key results in *higher* values. The value will return to center (63) when the key is released.

- Range: 0-127 (top to bottom)

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KeyNum

Outputs the key number of the currently active key. Keys are numbered in order from left-to-right – they do not follow the actual labeling on the 12 Step board itself.

- Range: 1-13 (left to right)

KeyNum (Inverted)

An inverted version of the **KeyNum** source. Instead of outputting an incrementing value from 1 to 13, the inverted version outputs a decrementing value from 127-115.

- Range: 115-127 (right to left)

Pedal

If an expression pedal is connected, this source will output the current value coming from the pedal. Rocking the pedal back (heel down, toe up) results in lower values, rocking the pedal forward (heel up, toe down) results in higher values.

- Range: 0-127 (toe up to toe down)

Pedal (Inverted)

An inverted version of the **Pedal** source. Rocking the pedal back (heel down, toe up) results in *higher* values, rocking the pedal forward (heel up, toe down) results in lower values.

- Range: 0-127 (toe down to toe up)

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4.2 Message Types

Message Types select what kind of MIDI message the modline will output. Please note that each message type may only be used once. As soon as it is placed on a modline it will no longer be available for other modlines. The only exception to this is the **CC** message type, which may be used twice.

The following message types are available in the 12 Step Editor:

Note

Outputs a MIDI note.

CC

Outputs values on a specified Control Change (CC) number.

Bend

Outputs values as MIDI pitch bend messages.

- 0 = full bend down
- 63 = center (no bend)
- 127 = full bend up

Channel Pressure

Outputs values as MIDI channel pressure messages.

Poly Aftertouch

Outputs values as MIDI aftertouch messages.

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4.3 Curves

All available 12 Step curves:

Linear

A 1:1 linear “curve”. Values passing through will not be modified in any way.

Sine

Applies a sine curve to incoming values.

Cosine

Applies a cosine curve to incoming values.

Exponential

An exponential table. Lower values rise slowly – higher values rise quickly.

Logarithmic

A logarithmic table. Lower values rise quickly, higher values rise slowly.

DeadZone

Similar to the Linear curve. This curve also has a “dead zone” in the center – values near the center will not move at all until the dead zone has been exited. This is good for sources like Tilt, making it much easier to accurately return to center.

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4.4 External Control Of 12 Step

The 12 Step can control a wide variety of MIDI software and hardware, but it can also be *controlled* from an external source via USB or MIDI Expander.

4.4.1 Controlling 12 Step LEDs

The 12 Step's LEDs can be controlled from an external software or hardware source using CC messages. Each key has an accompanying red LED that responds to the following messages:

CCs 20-33 control the LEDs on the 12 Step keys (one CC per key).

CCs accompanied with a value of:

- 0 = LED Off
- 1 = LED On

⚠ **Note**: When sending MIDI to the 12 Step via USB, CCs should be sent to 12 Step Port 1.

4.4.2 Controlling 12 Step Display

In addition to the key LEDs, the four-character display on the 12 Step can also be controlled via external software or hardware using CC messages.

The four characters on the display are addressed using four CC messages:

- CC 50 = first character
- CC 51 = second character
- CC 52 = third character
- CC 53 = fourth character

Each CC should be sent with a value between 48 and 90. These values correspond to the following:

- 48-57 = Numbers 0-9
- 65-90 = Letters A-Z
- 58-64 = various symbols/characters (or blank spaces)

So, for example, to make the third character on the display show the number "3", send CC 52 with a value of 51.

⚠ **Note**: When sending MIDI to the 12 Step via USB, CCs should be sent to 12 Step Port 1.

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4.4.3 Changing Presets With Program Changes

When in Standalone mode, changing 12 Step presets via external software/hardware is possible using program changes. Program changes sent to **12 Step Port 1** will select the corresponding preset in the setlist – e.g. sending program change 23 will load the 23rd preset in the setlist.

4.4.4 Using The MIDI Expander

It is possible to control the 12 Step LEDs, display, and presets via input to an attached MIDI Expander. When sending CCs and program change messages to control the 12 Step via the Expander, the messages *must* be sent on MIDI channel 16 – any other channels will be ignored and handled normally (see **12 Step Port 2** section for more info on "normal").

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4.5 Factory Presets Overview

The 12 Step comes loaded with a number of factory presets right out of the box. Many presets were created to showcase the various options available, and others were created with interesting chords/ progressions mapped to the keys.

All presets will output over both USB and MIDI Expander (if one is connected) on MIDI Channel 1.

⚠ **Note**: There are a few exceptions to the channel 1 rule, namely any preset using both Voice A and Voice B. Typically Voice B will be transmitting on MIDI channel 2.

The following presets are included with the 12 Step hardware and software:

CHrO ("Chromatic Scale")

A simple chromatic scale. The keys are arranged starting at C2 (MIDI note 48) and go up to C3 (note 60).

bEnD ("Tilt Pitch Bend")

The keys play a chromatic scale starting at C1 (note 36) and go up to C2 (note 48). This preset uses the **Hold** note mode rather than the **Normal** note mode, and has key Tilt set to output pitch bend messages.

LGtO ("Legato")

The keys play a chromatic scale from C2 to C3 using the **Legato** note mode.

tOGL ("Toggle")

The keys play a chromatic scale from C3 to C4 using the **Toggle** note mode.

PrES ("Pressure Volume")

The keys play a chromatic scale from C2 to C3. Note velocity is always the maximum (127). Key pressure outputs CC 7 messages, which are traditionally used to control volume. The expression pedal is not mapped to anything

5OCt ("5 Octaves")

Similar to the Chromatic Scale preset, the keys are laid out in a chromatic scale. In addition, each key has five octaves stacked on top of one another, e.g. key 1 plays C1, C2, C3, C4, and C5; key 2 plays D1, D2, D3, D4, and D5; etc.

EPO ("Power Chords Legato")

A "guitar-friendly" preset where each key is set to play a power chord (root, fifth, and octave). The keys have been transposed from a C starting note to an E starting note – e.g. key 1 plays E0, B0, and E1; key 2 plays F#0, C#1, and F#1.

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SUS9 ("Sus9 Chords")

Each key plays sus 9 chords (root, 4, 5, b7, 9), with the root notes going chromatically from C2 to C3. For example: key 1 plays C2, G2, Bb2, D3, and F3; key 2 plays D2, A2, C3, E3, and G3; etc. In addition, the note mode has been set to **Legato**.

trtn ("Tritone")

The keys are laid out chromatically C2 to C3, accompanied by a tritone interval above each note.

CLIP ("Live Clip Launching)

This preset works in conjunction with our Ableton Live clip launching script (located in the "Extras" folder that comes with the 12 Step editor download) and is almost the exact same setup as the **Chromatic Scale** preset. The only difference is this preset sends on MIDI channel 9 (instead of channel 1).

Please see the Live Clip Launching's accompanying documentation for more information regarding the behavior and setup of the script.

POLY ("Polyphonic")

Multi Key mode is enabled on this preset, allowing for multiple keys to be triggered simultaneously. The keys are arranged in a chromatic scale going from C2 to C3.

AFtr ("Poly Aftertouch")

This preset is the same as the Chromatic Scale preset, with the addition of Polyphonic Aftertouch. The amount of pressure applied to each key sends a poly aftertouch message.

A__b ("2 Voices")

This preset makes use of Voice A and Voice B. Voice A plays a chromatic scale from C2 to C3 on MIDI channel 1, while Voice B plays the same thing an octave lower on MIDI channel 2.

CrOS ("Voice XFade")

This preset is similar to the 2 Voices preset just above. In addition, the two voices are set to crossfade using the Tilt (Inverted) source.

PAn ("Key Number Panning")

This preset is the same as the Chromatic Scale preset, with the added ability to send panning information. The **Key Number** source is used to set the panning position – low notes are toward the left, higher notes are toward the right.

LEAd ("Blues Lead")

The keys are set to play a blues scale (root, minor third, perfect fourth, augmented fourth, perfect fifth, minor seventh, octave) in the key of C, starting at C3 and going up to C4. There are some duplicate notes in this layout – they're only there to prevent incorrect notes from being played.

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bLUE (“Blues Bass”)

This preset is the same as the Blues Lead preset above, just transposed down two octaves (C1 to C2).

PEnt (“Major Pentatonic”)

The keys play a major pentatonic scale going from C3 to C4. There are some duplicate notes to prevent incorrect notes from being played.

-Pnt (“Minor Pentatonic”)

The keys play a minor pentatonic scale going from C1 to C2. There are some duplicate notes to prevent incorrect notes from being played.

-3rd (“Minor 3rds”)

The keys are laid out chromatically from C2 to C3, accompanied by a minor third interval above each note.

3rd (“Major 3rds”)

The keys are laid out chromatically from C2 to C3, accompanied by a major third interval above each note.

dIA3 (“Diatonic 3rds”)

The keys are laid out chromatically from C2 to C3. Notes in the key of C (the “white” keys) will also be accompanied by a diatonic third above each note.

4tHS (“4ths”)

The keys are laid out chromatically from C2 to C3, accompanied by a perfect fourth interval above each note.

dIA4 (“Diatonic 4ths”)

The keys are laid out chromatically from C2 to C3. Notes in the key of C (the “white” keys) will also be accompanied by a diatonic fourth above each note.

StC4 (“Stacked 4ths”)

The keys are laid out chromatically from C2 to C3, accompanied by two perfect fourth intervals stacked on top.

5tHS (“5ths”)

The keys are laid out chromatically from C2 to C3, accompanied by a perfect fifth interval above each note.

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dIA5 (“Diatonic 5ths”)

The keys are laid out chromatically from C2 to C3. Notes in the key of C (the “white” keys) will also be accompanied by a diatonic fifth above each note.

StC5 (“Stacked 5ths”)

The keys are laid out chromatically from C2 to C3, accompanied by two perfect fifth intervals stacked on top.

-6tH (“Minor 6ths”)

The keys are laid out chromatically from C2 to C3, accompanied by a minor sixth interval above each note.

6tHS (“Major 6ths”)

The keys are laid out chromatically from C2 to C3, accompanied by a major sixth interval above each note.

dIA6 (“Diatonic 6ths”)

The keys are laid out chromatically from C2 to C3. Notes in the key of C (the “white” keys) will also be accompanied by a diatonic sixth above each note.

-7tH (“Minor 7ths”)

The keys are laid out chromatically from C2 to C3, accompanied by a minor seventh interval above each note.

7tHS (“Major 7ths”)

The keys are laid out chromatically from C2 to C3, accompanied by a major seventh interval above each note.

OCt (“Octave”)

The keys are laid out chromatically from C2 to C3, accompanied by an octave interval above each note.

-9tH (“Minor 9ths”)

The keys are laid out chromatically from C2 to C3, accompanied by a minor ninth interval above each note.

9tHS (“Major 9ths”)

The keys are laid out chromatically from C2 to C3, accompanied by a major ninth interval above each note.

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-10S (“Minor 10ths”)

The keys are laid out chromatically from C2 to C3, accompanied by a minor tenth interval above each note.

10tH (“Major 10ths”)

The keys are laid out chromatically from C2 to C3, accompanied by a major interval above each note.

-trd (“Minor Triads”)

The keys are laid out chromatically from C2 to C3. Each key will output a minor triad when played (root, minor third, perfect fifth).

trAd (“Major Triads”)

The keys are laid out chromatically from C2 to C3. Each key will output a major triad when played (root, major third, perfect fifth).

dtrd (“Diatonic Triads”)

The keys are laid out chromatically from C2 to C3. Notes in the key of C (the “white” keys) will output a diatonic triad (root, third, and fifth), while notes not in the key of C will only output a single root note.

-145 (“1-4-5-7 Minor Chords”)

The keys are laid out chromatically from C2 to C3. The root (C), fourth (F), fifth (G), and minor seventh (Bb/A#) keys will play seventh chord diatonic to C minor – all other keys will play a single note.

1457 (“1-4-5-7 Major Chords”)

The keys are laid out chromatically from C2 to C3. The root (C), fourth (F), fifth (G), and seventh (B) keys will play a chord diatonic to C major – all other keys will play a single note.

dI (“Diminished Chords”)

The keys are laid out chromatically from C2 to C3. Each key will output a diminished seven chord (root, minor third, diminished fifth, diminished seventh) when played.

AUG (“Augmented Triads”)

The keys are laid out chromatically from C2 to C3. Each key will output an augmented triad (root, major third, augmented fifth) when played.

PO (“Power Chords Normal”)

The keys are laid out chromatically from C1 to C2. Each key will output a power chord (root, perfect fifth, octave) when played.

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POtG ("Power Chords Toggle")

The same as the **Power Chords Normal** preset, except the note mode has been set to Toggle.

InPO ("Inverted Power Chords")

The keys are laid out chromatically from C2 to C3. Each key will output an inverted power chord (perfect fifth, root, perfect fifth) when played.

d_LO ("Drop D -12")

The keys are laid out chromatically from D0 to D1. Each key will output a power chord (root, perfect fifth, octave) when played. Good for playing along with a guitar in drop D tuning.

drOP ("Drop D Legato")

The keys are laid out chromatically from D1 to D2. Each key will output a power chord (root, perfect fifth, octave) when played. The note mode has been set to Legato.

-6CH ("Minor 6th Chords")

The keys are laid out chromatically from C2 to C3. Each key will output a minor sixth chord (root, minor third, perfect fifth, minor sixth) when played.

6CHd ("Major 6th Chords")

The keys are laid out chromatically from C2 to C3. Each key will output a major triad with an added sixth (root, major third, perfect fifth, minor sixth). Could also be considered to be dominant seven chords in the first inversion.

-FL7 ("Minor 7 Chords")

The keys are laid out chromatically from C2 to C3. Each key will output a minor seven (root, minor third, perfect fifth, minor seven) chord when played.

FLt7 ("Dominant 7 Chords")

The keys are laid out chromatically from C2 to C3. Each key will output a dominant seven (root, major third, perfect fifth, minor seven) chord when played.

dI7C ("Diatonic 7th Chords (Major)")

The keys are laid out chromatically C2 to C3. Notes in the key of C (the "white" keys) will output a diatonic triad (root, third, and fifth), while notes not in the key of C will only output a single root note.

SUS4 ("Sus 4 Chords")

The keys are laid out chromatically from C2 to C3. Each key will output a sustained four chord (root, perfect fourth, perfect fifth) when played.

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dSEt (“Drum Set”)

This preset is intended to be used with drums – it transmits on MIDI channel 10, which is General MIDI’s “drum” channel. The keys are mapped as follows:

- Key 1 = Closed Hi-Hat
- Key 2 = Low Tom 2
- Key 3 = Low Tom 1
- Key 4 = Mid Tom 2
- Key 5 = Mid Tom 1
- Key 6 = Side Stick
- Key 7 = Snare Drum 1
- Key 8 = Bass Drum 2
- Key 9 = Tambourine
- Key 0 = Cowbell
- Enter Key = Open Hi-Hat
- -Oct/-10 Key = Crash Cymbal 1
- +Oct/+10 Key = Chinese Cymbal

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4.6 MIDI Note Naming Reference

MIDI notes are numbers between 0 and 127, while music notes are lettered A through G# (in traditional Western notation) – there must be a way to convert between the two. There are actually multiple standards for naming MIDI note numbers, which can make things tricky.

KMI follows the C3=60 standard for naming/numbering notes. Below is a chart that can help with converting note numbers to note names and vice versa.

Octave	Note Names / Numbers (C3=60)											
	C	**C#**	**D**	**D#**	**E**	**F**	**F#**	**G**	**G#**	**A**	**A#**	**B**
-2	0	1	2	3	4	5	6	7	8	9	10	11
-1	12	13	14	15	16	17	18	19	20	21	22	23
0	24	25	26	27	28	29	30	31	32	33	34	35
1	36	37	38	39	40	41	42	43	44	45	46	47
2	48	49	50	51	52	53	54	55	56	57	58	59
3	60	61	62	63	64	65	66	67	68	69	70	71
4	72	73	74	75	76	77	78	79	80	81	82	83
5	84	85	86	87	88	89	90	91	92	93	94	95
6	96	97	98	99	100	101	102	103	104	105	106	107
7	108	109	110	111	112	113	114	115	116	117	118	119
8	120	121	122	123	124	125	126	127	—	—	—	—

⚠ **Note**: Other software/hardware may follow the C4=60 naming scheme (or even C5=60), which can lead to some confusion when MIDI mapping or setting up 12 Step. All MIDI notes will appear to be an octave off (by name), but in MIDI-land they have the same note number – which is all that matters.

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4.7 Changes From 12 Step V1.0

New tabbed interface

All new makeover for the 12 Step editor! Related parameters have now been grouped together and moved to different tabs. Less information overload!

Presets are now numbered from 1-128

Previously the 12 Step's presets were numbered from 0 to 127. They are now numbered from 1 to 128 to make things easier on mere humans.

Automatic CC 7 message on preset change can be disabled

Traditionally the 12 Step would output a CC 7 127 message on every preset change. This could cause problems with software/hardware that automatically respond to this message. There is now an option in the **Settings** tab to enable or disable this feature, called Send Full Volume On Preset Change.

Input to MIDI Expander has been fixed

In the previous version, changing presets on the 12 Step using program changes sent into the Expander's MIDI Input would completely freeze the 12 Step if the preset was set to Legato or Hold mode. This would only happen when using the 12 Step without a computer – if connected to a computer, the 12 Step would operate correctly. This has now been fixed and should be working properly.

In addition, control of the LEDs and display on the 12 Step is **now possible via input to the MIDI Expander**. Previously this was limited solely to program changes.

Some minor preset changes/fixes

- Blues Lead has been transposed down from E to C to match the Blues Bass preset.
- The major third interval was removed from the scales on both the Blues Lead and Blues Bass presets.
- The "Minor b7 Chords" preset was renamed to "Minor 7 Chords"
- The "Major b7 Chords" preset was renamed to "Dominant 7 Chords"
- The 1-4-5-7 presets had some incorrect notes corrected.

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4.8 Troubleshooting

Problems may pop up every now and then when using the 12 Step – here are some suggestions that can potentially solve them.

Connectivity Issues

Check that you're using the correct USB port on the 12 Step

There are two USB connectors on the 12 Step hardware – the main USB port (the USB B connector labelled "USB") and the Expander port (the mini USB connector labelled "Expand"). When connecting to a computer, *always* use the main USB port. The Expand port *will not* work when connected to a computer (though it will power up), it is exclusively for use with the KMI MIDI Expander.

Try a new USB cable

One of the first (yet most often overlooked) things to try is a different USB cable, preferably one that is known to work well. When a cable goes bad it can lead to all sorts of odd behavior, or no behavior at all.

Try plugging into a different USB port

It's possible that trying a different USB port on the computer may lead to a proper connection. While extremely rare, we have come across USB ports that just don't seem to like the 12 Step.

Do *not* use an unpowered USB hub

Unpowered USB hubs may not be able to provide enough power to the 12 Step, leading to connectivity issues. Unpowered hubs typically divide the power coming from the computer's USB port and split it into each of the hub's ports – providing less power than if the 12 Step were to be directly connected to the computer's USB port.

If a USB hub is absolutely necessary, *always* use a powered hub.

Try without a USB hub

If experiencing connectivity issues while using a USB hub, try without the hub and plug directly into the computer's USB port. This will potentially lead to a proper connection.

Be aware of bugs native to the operating system being used

While it is indeed possible the 12 Step may be the source of issues, sometimes the cause is actually due to the operating system itself. Always be aware of these issues, like the **Mac OS CoreMIDI bug** or the **Windows class-compliant device limitation**.

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Connect to a different computer

If the 12 Step is not making a connection to the computer at all, it is recommended to try connecting it to a different computer. If it works on the new computer, try the original one again. In some circumstances we have seen this solve connection issues.

Mac OS CoreMIDI "bug"

There is an interesting (potential) bug in CoreMIDI on Mac OS that can lead to some connectivity issues – not just with 12 Step, but with any class-compliant MIDI device.

Upon connecting the 12 Step (or any class-compliant MIDI device) for the *first* time since powering up the computer, the 12 Step will make a proper connection to the computer but *will not* refresh/update the MIDI device list.

The effect of this is that any audio/MIDI applications that are already open (like the 12 Step editor, Ableton Live, Logic Pro, etc.) will not detect the 12 Step, even though it's properly connected to the computer. The only way to get the MIDI device list to refresh is to unplug then reconnect the controller, or to manually refresh the MIDI devices by rescanning MIDI in Apple's Audio MIDI Setup application (located in /Applications/Utilities).

What's interesting is that this behavior does *not* occur if it is the first time the controller has *ever* been connected to the computer. It seems that when the MIDI device is created in Audio MIDI Setup the device list gets refreshed, but if the device already exists in Audio MIDI Setup the list does not refresh.

Whether or not this behavior is intentional and expected, it is something to be aware of. We have noticed it on Mac OS 10.6 through 10.9. The one thing to do to minimize the chances of running into this "bug" is...

> *After powering up the computer, always connect the 12 Step to the computer before opening any applications.*

"Okay, so how do I fix it if this does happen?" Well, if you do run into this problem, there are a number of ways to fix it:

- Unplug the 12 Step and plug it back in.
- Open Audio MIDI Setup and click the "Rescan MIDI" button in the MIDI window.
- Open another audio/MIDI application.

All three of the above methods refresh the MIDI device list, which should lead to proper "in-app" connections.

Windows Class-Compliant Device Limitation

All versions of Windows *do not* allow a class-compliant MIDI device to be connected to more than a single application at a time. As a class-compliant MIDI controller, this applies to the 12 Step.

The result of this is that if you have two or more audio/MIDI applications open at the same time (the 12 Step editor and Ableton Live, for example), only one of them will be able to connect to the

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12 Step. Because of this it is highly recommended to never edit the 12 Step with other audio applications open – it could lead to connectivity issues, and a very confusing, frustrating experience.

This does not apply solely to KMI products – this will have an effect with *every* class-compliant MIDI device.

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4.9 FAQ

4.9.1 How do I contact KMI support for questions about my 12 Step?

Support can be reached by submitting a support ticket at the following website: http://www.keithmcmillen.com/support

Before submitting a ticket it is definitely a good idea to read through the rest of the FAQ section to make sure your question hasn't already been answered.

4.9.2 What information should I include in a support request/question?

Providing helpful, useful information about any issues is an extremely important part of getting a helpful, useful response back. When submitting a support ticket, it is wise to include the following information:

- Your computer's operating system.
- The software/hardware being used with your 12 Step.
- A description of what you're trying to accomplish. Your goal.
- A description of the problem you're experiencing.
- Any steps you have taken to fix the problem (you have tried, right?).
- Any special/extra information about your setup – e.g. using a USB hub.

Failing to include the above will generally result in an email asking you to provide the above – delaying the actual solution to the issue you're experiencing.

4.9.3 Will installing the new 12 Step editor overwrite the old 12 Step editor?

No. Installing the new 12 Step editor will not overwrite the old editor. The act of "installing" is really just copying a folder onto your hard drive. The 12 Step 1.0 and 12 Step 2.0 folders are named differently and do not affect one another – they exist separately and both can still be used. You'll have to change firmwares when switching back and forth, but it will still work.

4.9.4 Can I use two 12 Steps at the same time?

Yes. A *lot* of 12 Steps can be used simultaneously. The USB spec states "up to 127 devices, including hub devices if present, may be connected to a single host controller". As a class-compliant USB MIDI device, this applies to the 12 Step.

⚠ **Note**: Only a single 12 Step can be edited at a time using the editor.

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4.9.5 Does reloading or updating firmware reset my presets?

Yes. A firmware update or reinstall will reset the 12 Step's onboard presets to factory settings. If you have any custom presets you will need to resend them to the 12 Step using one of the editors.

4.9.6 How do I update/reload my firmware?

There are a few ways firmware can be updated on a 12 Step: automatically by the editor, manually with the editor, or manually without the use of the editor.

Automatically

If a 12 Step is connected to an editor with a differing firmware version (e.g. you just downloaded a new editor update and fired it up), the editor should automatically prompt you to update the firmware. Just click the UPDATE button to initiate the firmware installation.

Manually (with Editor)

The 12 Step editor can be used to manually initiate a firmware update/reinstall – just do the following:

1. Connect the 12 Step to a computer.
2. Open the 12 Step Editor.
3. Go up to the **Hardware** menu and select "Update/Reload Firmware". This option will only be selectable if a 12 Step has successfully connected to the editor.
4. in the prompt that appears, click the UPDATE button – this will initiate the firmware update process.
5. Wait for the firmware update to complete – a progress bar will show how much of the update has completed.
6. If you have any custom presets, resend them to the 12 Step – reinstalling or updating firmware will revert all presets to their factory state.

Manually (without Editor)

Typically the 12 Step editors will do just fine updating firmware on your board, but in some cases it may be necessary to manually update the firmware (like if the controller is not connecting to the editor).

The 12 Step firmware can be loaded/installed manually using any application capable of sending SysEx files to connected MIDI devices. We recommend SysEx Librarian for Mac (http://www.snoize.com/SysExLibrarian/), and SysEx Box for Windows (http://miostools.midibox.org/) – though there are certainly other capable third-party options available.

To update your firmware...

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Mac

1. If you have not already, download and install SysEx Librarian from http://www.snoize.com/SysExLibrarian/
2. Download or locate the firmware file you would like to install. Zips of the current version and past versions can be downloaded here: http://files.keithmcmillen.com/downloads/12step/sysex_files
3. Plug in your 12 Step and open SysEx Librarian.
4. Click "Add..." in the lower-left corner of the screen. When the browser window opens, navigate to the firmware file (generally named to the effect of "12StepVA2.syx") then click "Open".
5. Select **Port 1** (for "12 Step Port 1") from the drop down menu labeled "Destination".
6. Select the firmware file in SysEx Librarian's main window – it should highlight blue.
7. Click the "Play" button in the top-left corner of SysEx Librarian to begin the firmware installation. A progress bar will appear indicating how far along the update process is. The 12 Step's display will go blank and look non-responsive while the update is taking place – this is okay and to be expected.
8. Once done, wait for the 12 Step to boot back up. This may take a few seconds, so please be patient.

Windows

1. If you have not already, download and install SysEx Box from http://miostools.midibox.org/
2. Download or locate the firmware file you would like to install. Zips of the current version and past versions can be downloaded here: http://files.keithmcmillen.com/downloads/12step/sysex_files
3. Make sure all audio/MIDI applications are closed.
4. Plug in your 12 Step and open SysEx Box.
5. Select 12 Step Port 1 in the "MIDI IN Port" and "MIDI OUT Port" drop-down menus. "12 Step Port 1" may show up as "USB Audio Device(1)" on Windows XP.
6. Click "Open Sysex File". When the browser window opens, navigate to the firmware file you want to send to the 12 Step, then click "Open".
7. Click the "Send Sysex" button. The firmware update should begin. The 12 Step's display will go blank and look non-responsive while the update is taking place – this is okay and to be expected.
8. Once done, wait for the 12 Step to boot back up. This may take a few seconds, so please be patient.

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4.9.7 Is there a way to reset the 12 Step back to factory settings?

Yes, it is possible to reset both the 12 Step to factory settings. All that needs to be done is a firmware reinstall (we just went over this in a **previous question**) – this will revert everything to factory settings and presets. Instructions on how to reinstall firmware can be found **here**.

4.9.8 How do I find out what firmware is installed on my 12 Step? Also, what firmware will the editor install?

Finding out what firmware version is installed on the 12 Step is simple. When a 12 Step is powered up it will briefly display the firmware version that is currently installed on it. Just plug in the 12 Step and look at the first thing displayed (typically something like A1 or A2) – that's the firmware version. This information is also available via the 12 Step editors.

To find out what firmware version is included in the editor, do the following:

1. Open the editor you're curious about.
2. **Mac**: Go up to the "12 Step Editor" option in the menu bar and select "About 12 Step Editor". **Windows**: Go up to the Help menu in the menu bar and select "About 12 Step Editor". The main window will now display information about the editor and connected 12 Step (if one is connected).

The **Expected FW** field lists the firmware version included with the editor – this is what will be installed if a firmware update is initiated. The **Found FW** field lists the firmware version currently installed on the connected 12 Step. The **Editor Version** lists the version number of the editor itself (not firmware related).

4.9.9 Can I import my old presets from version 1.0?

Yes. The 12 Step editor allows for importing presets from the previous editor, 1.0 (and 0.9 as well). Please see the **Import All Presets From V1.0** section of the manual.

4.9.10 Can I rip presets from a 12 Step into the editor?

No, the 12 Step does not support ripping presets from the board onto a computer. This is why it is very important to always back up your presets if you do not want to lose them – they cannot be retrieved from the 12 Step itself.

If you want to rip presets in order to transfer them over to another computer, you should instead use the Export Preset option in the File menu of the **12 Step Editor** – then import them on the other computer using the Import Preset option (also in the File menu).

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4.9.11 Can I program each key to output different MIDI messages?

The only thing that can be customized per key on the 12 Step is what MIDI notes are output when pressed. All other MIDI options (program changes, CCs, aftertouch, etc.) are global to all keys.

4.9.12 Can I control the 12 Step LEDs/Display from an external source?

Yes. The 12 Step LEDs and display can definitely be controlled from an external source. Please see the **External Control of 12 Step** section for more detailed information.

4.9.13 How do I send out of the MIDI Expander?

The 12 Step will always send data out of a connected MIDI Expander. Whatever is set in the preset will output over both USB and the Expander – there is no need to worry about selecting anything.

4.9.14 Can I use a USB hub with the Expander?

No. Plugging a USB hub into the EXPAND port on a MIDI Expander will not work, and will not allow for multiple 12 Steps to be used with a single Expander. The 12 Step must be plugged directly into a MIDI Expander for it to work properly.

4.9.15 Will the MIDI Expander work with non-KMI controllers?

No. Only KMI USB MIDI controllers will work with the Expander's EXPAND port. Plugging another USB MIDI device in will result in no MIDI being output.

4.9.16 What *is* a modline?

A **modline** (short for "modulation line") is a collection of settable options/parameters in the 12 Step editor that define how the 12 Step should behave. They let you select the type of data, how the data should be processed, and how to output the data.

This is where all the action happens. She who controls the modlines, controls the 12 Step universe.

4.9.17 Will 12 Step work with [insert software/hardware here]?

If the software or hardware in question can receive MIDI messages, it will work with the 12 Step. Note that most hardware will require a MIDI Expander in order to connect via MIDI cables.

4.9.18 I have a synth/pedal/amp/rack/etc. with a USB port on it. Can I just plug the 12 Step directly into it?

It depends.

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In order for the 12 Step's USB connection to work properly, it *must* be connected to a device that can act as a USB "host" for class-compliant MIDI devices. Host devices almost always have a USB A connector on them (the more rectangular-shaped connector, like the ones on a computer). A non-host device, or a "slave", generally has a USB B connector (the more square-shaped one, like on the 12 Step).

So, typically, if a device has a USB A connector on it there is a good chance the 12 Step will work with it when directly connected via USB. If a device has a USB B connector on it that generally means it won't work.

4.9.19 My 12 Step won't connect to the editor but it shows up in [insert application here]. What do I do?

If the 12 Step is not connecting to the editor but is showing up in other applications, there are a few things to try out.

1. Try unplugging the 12 Step and plugging it back in. On Mac OS there can be some connectivity problems due to a **potential bug in CoreMIDI**. This can also help out on Windows machines as well.
2. If you plugged the 12 Step in after opening the editor, try it the other way around. Connect the 12 Step, then open the editor. If you're already doing that, try it the other way. The order of operations can affect the results.
3. Try restarting the computer. It's amazing how many infuriating tech headaches can magically disappear with a computer restart.
4. If you're on Windows, make sure all other audio/MIDI applications are closed before opening the editor. See **this troubleshooting suggestion** for more information on why this works.
5. As a last resort, try **manually reinstalling the firmware** on your 12 Step. This is essentially a factory "reset".
6. If none of the above options solves the problem, **contact KMI tech support**.

4.9.20 My expression pedal isn't working, what do I do?

First, you should check and make sure the proper connector is being used. Expression pedals use TRS (tip, ring, sleeve – or "stereo") connections – one for ground, one for +5V power (voltage may vary), and one for the actual pedal signal. The 12 Step's expression pedal input jack requires a 3.5mm (1/8") TRS plug. Most expression pedals come with 1/4" TRS plugs, so we provide a 1/4" to 3.5mm TRS adapter with the 12 Step package. Use that. If you need a replacement, just make sure it's a TRS (stereo) adapter, not a TS (mono) adapter.

Second, you should check and make sure you're actually using an expression pedal. It can be tough because while the term "expression pedal" does have established standards, they're not always followed. Some companies say "expression pedal" when it's actually a "volume pedal" (there is a difference) – some do the opposite and call expression pedals volume pedals. Sometimes the potentiometer (often shortened to "pot") inside has a different resistance which can lead to different behavior between pedals. Some have a different "taper" (or "curve") resulting in

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different values across the pedal's travel. At KMI we use Roland EV-5 expression pedals without issue.

Third, check to make sure that your expression pedal operates on the correct voltage. All KMI gear operates from 0 to +5 volts. If your expression pedal goes beyond that there will be a lot of pedal travel that appears to do nothing.

⚠ **Note:** Volume pedals **do not** work with the 12 Step or any KMI controller with expression pedal input – at least, not without some modifications... With some basic soldering skills a volume pedal can be modified into an expression pedal. There are also some workarounds: http://www.strymon.net/2011/10/10/strymon-tech-corner-3-volume-pedal-as-an-expression-pedal/ Also note that most volume pedals use logarithmic tapered pots as opposed to linear pots – this will have an effect on the curve/ response of the pedal.

4.9.21 Does MIDI sent to the Expander's input get passed out the MIDI Out? Like a MIDI Thru?

No, the MIDI Expander's input does not behave like a MIDI Thru (pass the input out the output). The Expander's MIDI input is exclusively for getting MIDI into a connected computer (like a MIDI interface) or for **external control** of the 12 Step.

4.9.22 MIDI notes are always an octave off in [insert software/ hardware here]. Is something wrong?

Nope.

There are actually multiple MIDI note number to note name conventions – different companies follow different standards. KMI follows the C3=60 paradigm (as does Ableton, Logic, MainStage, and more), while other companies follow the C4=60 paradigm (Native Instruments and others). It's even possible to run into a C5=60 standard, but that is much more rare.

If all MIDI notes appear to be an octave off, it simply means there are two different note naming standards involved. It's only the note *number* that matters – the *name* is irrelevant.

4.9.23 12 Step only shows up as "USB Audio Device" or "USB MIDI Device" when connected. Is something wrong?

If you're on Windows XP, then nope, nothing is wrong. Windows XP lists any class-compliant USB MIDI controller as "USB Audio Device" rather than the actual port name. The correct port name should be displayed on Windows 7 and 8, as well as all versions of Mac OS.

If you would rather it show up as something else, it is possible to change the displayed port name. Instructions on how to do this can be found at this link: https://forum.ableton.com/viewtopic.php?f=4&t=176816

If you're on Mac, then this is an issue easily fixed.

1. Unplug the 12 Step from the computer
2. Open Audio MIDI Setup (located in /Applications/Utilities/)

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3. Look in the MIDI window. If the MIDI window is not visible, go up to the Window menu up top and select “Show MIDI Window”.
4. Look for a device named “USB MIDI Device” and click it.
5. Delete the device by pressing the Delete key on your keyboard.
6. Plug the 12 Step back in to the computer. A new device should appear in Audio MIDI Setup with the proper name, “12 Step”.

4.9.24 I see there is a new update. Should I update right now? The day before my show?

No.

When there’s a new update available it can be very tempting to get it and update as soon as you possibly can. While there’s nothing wrong with this urge, if you happen to have a show coming up anytime soon (or today), it is generally advisable to hold off on updating until *after* your show has passed – or at least keep the old versions so you can go back if the need arises.

While we test everything to the best of our ability, there’s no telling what bugs may be introduced to your setup – the preset you’re using may have changed in a subtle way that you don’t notice; there could be a nasty bug that didn’t get noticed because it only appears in very special circumstances; the new firmware may not like one of your other devices; or it may respond to MIDI in a slightly different, perhaps undesirable, way. Even fixing a bug with an update can cause problems if you’ve already grown accustomed to the “buggy” behavior and developed the muscle memory around it.

Always, always give yourself time to test things out before changing your performance setup. Always. You will be much less stressed if you know what to expect from your gear and software. This is an extremely useful suggestion for pretty much anything performance-related, not just the 12 Step.

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4.10 Safety Precautions



Medical Devices

12 Step may emit electromagnetic fields. These electromagnetic fields may interfere with pacemakers or other medical devices. If you wear a pacemaker, maintain at least 6 inches (approximately 15 cm) of separation between your pacemaker and 12 Step. If you suspect 12 Step is interfering with your pacemaker or any other medical device, stop using 12 Step and consult your physician for information specific to your medical device.

Medical Conditions

If you have any medical condition that you believe could be affected by 12 Step (for example, seizures, blackouts, eyestrain, or headaches), consult with your physician prior to using 12 Step.

Explosive Atmospheres

Do not use 12 Step in any area with a potentially explosive atmosphere, such as a fueling area, or in areas where the air contains chemicals or particles (such as grain, dust, or metal powders). Obey all signs and instructions.

Repetitive Motion

When you perform repetitive activities such as playing the 12 Step keys, you may experience occasional discomfort in your hands, arms, wrists, shoulders, neck, or other parts of your body. If you experience discomfort, stop using 12 Step and consult a physician.

High-Consequence Activities

12 Step is not intended for use where the failure of the device could lead to death, personal injury, or severe environmental damage.

Choking Hazard

Some 12 Step accessories may present a choking hazard to small children. Keep these accessories away from small children.

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