Keith McMillen INSTRUMENTS

12 Step Reference Manual

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Welcome

12 Step is a chromatic keyboard foot controller. It sends MIDI notes via USB or the KMI MIDI Expander to control soft synths, MIDI Keyboards and MIDI sound modules. It has polyphonic capabilities and can play up to 5 notes per key. Each key is velocity and pressure sensitive and can use the tilt of your foot to control pitch bend, polyphonic aftertouch, or any MIDI CC value. These features come together for unsurpassed expression and control in a highly portable chromatic keyboard foot controller.

In this manual you will find detailed information to help answer all of your questions about 12 Step hardware and software.

Questions or Feedback? Contact Us!

If at any time you have any questions, please contact us:

Web: www.keithmcmillen.com
Forum: forum.keithmcmillen.com
Tech Support: www.keithmcmillen.com/support

System Requirements

We recommend the following minimum system requirements.

MAC:

- An Intel Core 2 Duo 2.3GHz or greater
- Mac OS 10.5 or later

WINDOWS:

- Windows XP, or Windows 7
- Intel Core 2 processor or greater
- 1GB of RAM with 50 MB free hard disk space

What's in the 12 Step Package

When you open up the box you should find:

- (1) 12 Step
- (1) 12 Step Protective Sleeve
- (1) USB A-to-B cable (15’)
- (1) 1/8" to 1/4" expression pedal adapter
- MIDI Expander (optional)
  - (1) USB A-to-B mini USB cable (15’)
  - (1) USB power plug
  - (1) USB A-to-B cable (6’)

12 Step Hardware

12 Step is one of the world's lightest, smallest, and most expressive foot controllers. It weighs 1 pound and is 17.5” x 4” x .75”. The keys are about 1.25” X .5”.

USB Port

12 Step is connected to a computer and powered by USB. It is a class compliant USB device and does not require a driver. This allows for maximum compatibility with an extremely wide range of other devices.

Expression Port

12 Step has a 1/8" port for an expression pedal (volume pedals are not supported). Make sure your expression pedal has a 3 wire (stereo) connection. 12 Step ships with a 1/4" to 1/8" adapter so you can connect your expression pedal to the expression port on the 12 Step.

Expansion Port

Connect the MIDI Expander (sold separately) to control MIDI hardware either with or without a computer. Power can also be supplied to 12 Step through the expansion port.

12 Step has white LED backlighting for visibility on stage. There is a 4 character, user programmable, alphanumeric display and 10 red LEDs for visual feedback.

12 Step is rubberized with a carbon fiber back for maximum strength and stability. Each key is responsive to 2 degrees of control: pressure and tilt. These are mappable to MIDI notes and various accompanying MIDI messages.

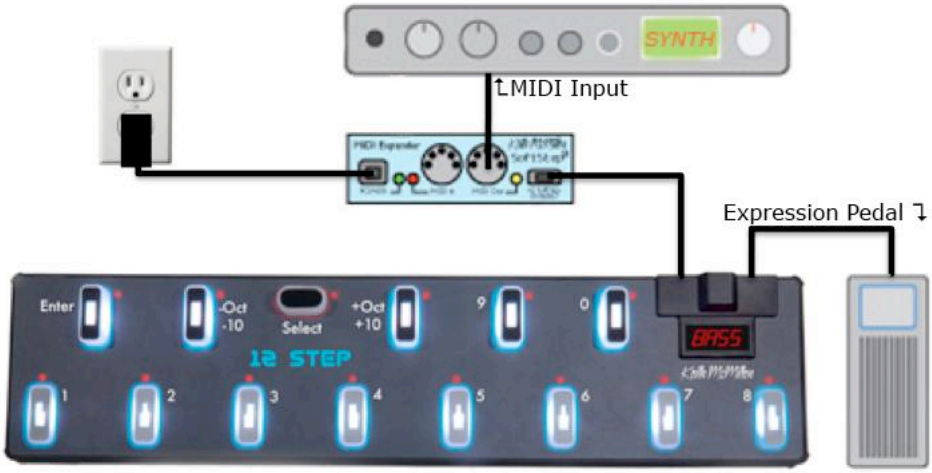
Connecting 12 Step

Connect 12 Step to a computer

This image shows 12 Step set up to send MIDI data to a computer.

1. Use a USB A-to-B cable to connect the main 12 Step USB port to a USB port on your computer. 12 Step will receive power from the computer.
2. You can also connect an Expression pedal to the Express port using the 1/4” to 1/8” adapter. Just make sure you have an expression pedal with a 3 wire connection (a stereo jack).

Connect 12 Step to MIDI hardware



The image above shows 12 Step connected to a hardware synth via our MIDI Expander

1. Use a USB A-to-B mini cable to connect the 12 Step Expansion port to the USB “to Expand” port on the MIDI Expander.
2. Connect the power supply to the MIDI Expander USB “Power” port.
3. Connect the MIDI Out on the Expander to the MIDI In on the synth.
4. You can also connect an Expression pedal to the Express port using the 1/4” to 1/8” adapter. Just make sure you have an expression pedal with a 3 wire connection (a stereo jack).

Connect 12 Step to an iPad

The image above shows 12 Step connected to an iPad

1. Use a USB A-to-B cable to connect the main 12 Step USB port to the iPad via the iPad Camera Connection Kit.
2. Connect the power supply to the 12 Step expand port.
3. Connect the MIDI Out on the Expander to the MIDI In on the synth.
4. You can also connect an Expression pedal to the Express port using the 1/4" to 1/8" adapter. Just make sure you have an expression pedal with a 3 wire connection (a stereo jack).

Or connect a 12 Step and MIDI Expander to an iPad:

The image above shows the 12 Step connected to an iPad and MIDI Expander

1. Use a USB A-to-B cable to connect the main 12 Step USB port to the iPad via the iPad Camera Connection Kit.
2. Connect the MIDI Expander to the 12 Step Expand port
3. Connect the power supply to the MIDI Expander's "Power" port.
4. You can also connect an Expression pedal to the Express port using the 1/4" to 1/8" adapter. Just make sure you have an expression pedal with a 3 wire connection (a stereo jack).

MIDI Expander

The KMI MIDI Expander enables you to use 12 Step with your hardware MIDI devices. Plug your MIDI devices into the KMI MIDI Expander and you're ready to send and receive MIDI data (with or without a computer).

Setup A:

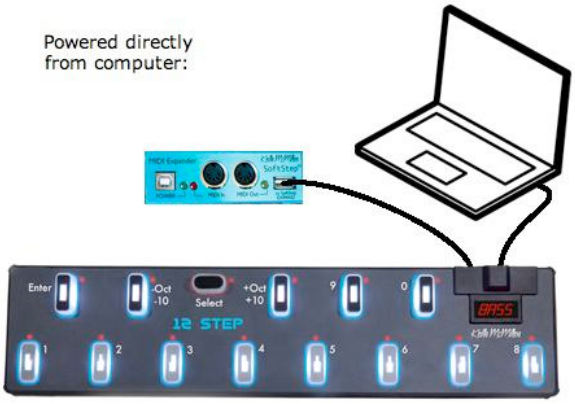
Connect the "Expand" port on 12 Step to the "to Expand" port on the MIDI Expander using the USB A-to-B mini cable. Connect the MIDI Expander to the USB power supply using the USB A-to-B cable.

Setup B:

Connect the "Expand" port on 12 Step to the "to Expand" port on the MIDI Expander using the USB A-to-B cable. Connect 12 Step to the USB power supply using the USB A-to-B cable.

Setup C:

Connect the "Expand" port on 12 Step to the "to Expand" port on the MIDI Expander using the USB A-to-B mini cable. Connect 12 Step to a computer using the USB A-to-B cable. (There is no need to use the USB power supply.)



Getting Started

Thanks again for purchasing a 12 Step, let's get started. Now that you've got your 12 Step connected properly you can start sending MIDI Notes and investigating the factory installed presets. (If you haven't connected your 12 Step and need guidance read the above chapter called Connecting 12 Step).

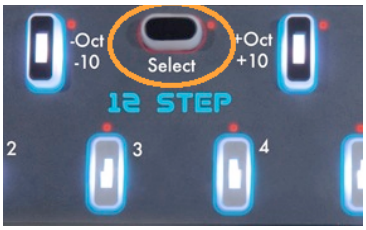
Your First Notes

When you first plug in the 12 Step it will open up on the first preset.

Preset 0: **CHrO** - "Chromatic Scale" - This is our simplest preset. The keys play a chromatic scale starting with C2 (note number 48) and going up to C3 (note 60). Stepping on a key sends a note on, releasing sends a note off. The velocity of the note is dependent on how hard you step on the key.

Changing Presets - The Select Key

To navigate to other presets hold down the **Select Key** until all of the red LEDs for each key pad begin to flash. Now you are in **Select Mode**. Push any of the numbered keys (0-9) to change presets. In Select Mode you can also navigate through decades and select one of the numbered key pads to go to a preset outside of the original decade.



Pressing the **Enter Key** while in select mode allows you to use the **-10** or the **+10** key pads to increment or decrement through preset decades. The current decade is displayed on the alphanumeric display.

Fill in the last digit by pressing one of the numbered key pads. After selecting the last digit you will automatically be taken out of select mode and be sent to the preset in that slot.

For Example: To move to preset 26. Press the **Enter Key** while in select mode and use the **-10** or the **+10** key pads to increment or decrement through preset decades until you see "02_" on the display. Then hit key 6 and you'll be taken out of select mode and into preset 26. The next time you go to change a preset you'll already be in the 20s decade so if you're going to another preset in the 20s you can just step on the numbered key for the last digit.

Changing Octaves

Select mode can also be used to shift octaves. After entering Select mode use the -Oct or the +Oct keys (another name for the -10 and +10) to shift up or down an octave. After shifting octaves you will be taken out of select mode automatically.

12 Step Key Behavior

12 Step uses **Note Modes** to choose how your foot presses effect the note on and note off messages:

Normal - Stepping on a key sends a note on, releasing the key sends a note off. All presets use this note mode unless otherwise noted in their descriptions.

Legato - Pressing on a key sends a "note on". When a different key is pressed, the previous key's note is turned off along with the new "note on". If you wish to turn a note off before hitting another key, tap on the select key.

Hold - This mode allows you to switch back and forth between normal mode and legato mode using the select key (several older bass pedal boards use this mode). When you first go to a preset that uses Hold mode the select LED will flash and the keys will be in Legato mode. If you tap once briefly on the select key all notes will turn off, the LED will stop blinking and the mode will switch to Normal. Step on the select key again and the keys will go back to Legato mode and so on...

Toggle - Pressing a key sends a "note on", a second press sends a "note off". Stepping on a different key sends a "note on" without turning off the previous key. Tapping briefly on the select key will turn off all active keys.

12 Step uses **Key Safety Modes**. These determine whether or not stepping on one key locks out all other keys to prevent accidental triggers:

Single Key - Only one key can be triggered at a time. While your foot is pressed on one key all other keys are locked out and cannot be triggered. This helps prevent accidentally triggering wrong notes. All presets use this mode unless otherwise noted in their descriptions.
Multi Key - You can trigger multiple keys at the same time without any safety feature implemented to prevent you from accidentally triggering another key.

12 Step MIDI Output

All presets unless otherwise indicated in their descriptions include the following MIDI data:

- The ability to bend pitch is included and is mapped to the tilt source. Tilting your foot up and down on the key activates pitch bend. The bend range is set to 2 semitones (**note**: synths may differ in the interpretation of the bend range).
- Pressure information is sent out on MIDI CC #3. CC #3 can be mapped to a parameter of your choosing on your synth.
- The expression pedal is mapped to volume (CC#7) on all presets unless otherwise noted.

Factory Presets

The following is a description of all of the factory presets that come on your 12 Step:

0. **CHrO** - "Chromatic Scale" - This is our simplest preset. The keys play a chromatic scale starting with C2 (note number 48) and going up to C3 (note 60).

1. **bEnD** - "Tilt Pitch Bend" - This preset plays a chromatic scale starting with note C1 (note number 36) and going up to C2 (note 48). This preset uses the **Hold** note mode rather than the **Normal** note mode.

2. **LGtO** - "Legato" - The keys play a chromatic scale starting with C2 (note number 48) and going up to C3 (note 60). This preset uses the **Legato** note mode.

3. **tOGL** - "Toggle" - The keys play a chromatic scale starting with C3 (note number 60) and going up to C4 (note 72). This preset uses the **Toggle** note mode.

4. **PrES** - "Pressure Volume" - The keys play a chromatic scale starting with C2 (note number 48) and going up to C3 (note 60). The velocity of the note is always 127. The ability to use the pressure of your foot on the key as volume control is included in this preset. The pressure of your foot on any key pad sends out the pressure data on MIDI CC #7 (typically used by synths for volume control). This has the effect of softening the attack of the notes. Note that in this preset since pressure is used for volume, the expression pedal is not mapped.

5. **5OCt** - "5 Octaves" - This preset has 5 octaves stacked on each key. For Example: Key 1 plays C1, C2, C3, C4, & C5, Key 2 plays D1, D2, D3, D4, & D5, etc...

6. **EPO** - "Power Chords Legato" - This guitar friendly preset has power chords for each key and begins in the key of E on key 1. For Example: Key 1 plays E0, B0, & E1, Key 2 plays F#0, C#1, & F#1, etc... The legato note mode is enabled which means that stepping on a key sends a note on but releasing it doesn't send a note off. Stepping on a second key will send a note off to the previous note or tap on the select key to stop a note without stepping on another key.

7. **SUS9** - "Sus 9 Chords" - This preset has sus 9 chords on each key and begins on a C2 sus 9 chord and goes up to a C3 sus 9 chord. For Example: Key 1 plays C2, G2, A#2, D3 & F3, Key 2 plays D2, A2, C3, E3, & G3, etc... This preset uses the **Legato** note mode.

8. **trtn** - "Tritone" - This preset has a tritone interval on each key and begins on C2 and F#2 and goes up to C3 & F#3.

9. **dSEt** - "Drum Set" - This preset was arranged with drummers in mind. It uses the general MIDI drum arrangement that appears on MIDI channel 10. It is arranged so that Key 1 = Closed Hi-hat, Enter Key = Open Hi-hat, Key 2 = Low Tom 2, -Oct/-10 Key = Crash Cymbal 1, Key 3 = Low Tom 1, Key 4 = Mid Tom 2, +Oct/+10 Key = Chinese Cymbal, Key 5 = Mid Tom 1, Key 9 = Tambourine, Key 6 = Side Stick, Key 0 = Cowbell,

Key 7 = Snare Drum 1, and Key 8 = Bass Drum 2. This preset also has **Multi Key** mode enabled so that you can trigger 2 notes at once.

10. **POLY** - "Polyphonic" - This preset has **Multi Key** mode enabled so that you can trigger 2 notes at once. The keys play a chromatic scale starting with C2 (note number 48) and going up to C3 (note 60).

11. **AFtr** - "Poly AfterTouch" - The keys play a chromatic scale starting with C2 (note number 48) and go up to C3 (note 60). Pressure for this preset is used to send out Poly AfterTouch. Since pressure is used for Poly AfterTouch, it doesn't get sent out CC #3 on this preset.

12. **A__b** - "2 Voices" - The keys on channel 1 play a chromatic scale starting with C2 (note number 48) and go up to C3 (note 60). A second voice (voice B) is enabled to play the same thing only 1 octave lower on channel 2.

13. **CrOS** - "Voice XFade" - The keys on channel 1 play a chromatic scale starting with C2 (note number 48) and go up to C3 (note 60). A second voice (voice B) is enabled to play the same thing only 1 octave lower on channel 2. The 2 voices are also set to cross-fade using the tilt source. Tilting your foot up and down on the key, the volume of voice A and B will crossfade. By tilting your foot towards the bottom of the pad, the volume of voice A is turned all the way down and voice B is up. Since the Tilt source is used for the volumes of the 2 voices in this preset, pitch bend is not turned on.

14. **PAn** - "KeyNumber Panning" - The keys play a chromatic scale starting with C2 (note number 48) and go up to C3 (note 60). This preset uses the key number to indicate where the notes will be panned. So starting at the bottom of the scale and working up to the top of the scale you will notice that each note gradually goes from left to right across the stereo field. This preset does not send CC #3.

15. Blues Lead "**LEAd**" - This preset plays a Blues scale in the key of E starting on E3 (note number 64) and going up to E4 (note 76). You may notice that there are some repeated notes; this is so you don't accidentally hit a note that isn't in this Blues scale.

16. Blues Bass "**bLUE**" - This preset plays a Blues scale starting with C1 (note number 36) and going up to C2 (note 48). You may notice that there are some repeated notes; this is so you don't accidentally hit a note that isn't in this Blues scale. The legato note mode is enabled which means that stepping on a key sends a note on but releasing it doesn't send a note off. Stepping on a second key will send a note off to the previous note or tap on the select key to stop a note without stepping on another key.

17. Major Pentatonic "**PEnt**" - This preset plays a Major Pentatonic scale starting with C3 (note number 60) and going up to C4 (note 72). You may notice that there are some repeated notes; this is so you don't accidentally hit a note that isn't in this Major Pentatonic scale.

18. Minor Pentatonic "**-Pnt**" - This preset plays a Minor Pentatonic scale starting with C1 (note number 36) and going up to C2 (note 48). You may notice that there are some

repeated notes; this is so you don't accidentally hit a note that isn't in this Minor Pentatonic scale.

The rest of the presets operate in the standard fashion. The names of the presets are indicative of what notes you will encounter. Enjoy!

19. **-3rd** - "Minor 3rds"
20. **3Rd** - "Major 3rds"
21. **dIA3** - "Diatonic 3rds"
22. **4tHS** - "4ths"
23. **dIA4** - "Diatonic 4ths"
24. **StC4** - "Stacked 4ths"
25. **trtn** - "Tritone"
26. **5tHS** - "5ths"
27. **dIA5** - "Diatonic 5ths"
28. **StC5** - "Stacked 5ths"
29. **-6tH** - "Minor 6ths"
30. **6tHS** - "Major 6ths"
31. **dIA6** - "Diatonic 6ths"
32. **-7tH** - "Minor 7ths"
33. **7tHS** - "Major 7ths"
34. **OCt** - "Octave"
35. **5OCt** - "5 Octaves"
36. **-9tH** - "Minor 9ths"
37. **9tHS** - "Major 9ths"
38. 38. **-10S** - "Minor 10ths"
39. **10tH** - "Major 10ths"
40. **-trd** - "Minor Triads"
41. **trAd** - "Major Triads"
42. **dtrd** - "Diatonic Triads"
43. **-145** - "1-4-5-7 Minor Chords"
44. **1457** - "1-4-5-7 Major Chords"
45. **dI** - "Diminished Chords"
46. **AUG** - "Augmented Triads"
47. **PO** - "Power Chords Normal"
48. **EPO** - "Power Chords Legato"
49. **POtG** - "Power Chords Toggle"
50. **InPO** - "Inverted Power Chords"
51. **d_LO** - "Drop D -12"
52. **drOP** - "Drop D Legato"
53. **-6CH** - "Minor 6th Chords"
54. **6CHd** - "Major 6th Chords"
55. **-FL7** - "Minor b7 Chords"
56. **FLt7** - "Major b7 Chords"
57. **dI7C** - "Diatonic 7th Chords (Major)"
58. **SUS4** - "Sus 4 Chords"
59. **SUS9** - "Sus 9 Chords"

12 Step Editor

If you wish to make changes to the 12 Step's factory presets you will need to acquire and use the 12 Step Editor.

Downloading the Editor

Please make sure to do all of the following **in this order:**

1. Download the 12 Step Music Application from: http://www.keithmcmillen.com/12step/downloads/
2. Install onto your computer:
    a. **for mac:** Install using the .dmg file. Once installed **keep everything in the 12 Step folder as is** so that the applications can access everything they need to run.
    b. **for windows:** Unzip the file and move the entire 12 Step directory into your Program Files directory. Make sure you **keep all the folders and files in their original locations** so that the applications can access everything they need to run.
3. Plug the 12 Step into your computer via USB

4. Open up the 12 Step Editor. Use this manual as a reference for the 12 Step Editor.

Updating the 12 Step Editor

After downloading an upgrade from the 12 Step downloads site, install it using the .dmg file (**mac**) or unzip it and drag and drop the entire "12 Step" folder into your "Program Files" folder (**windows**). You can keep the old version if you'd like, it will cause no problems or conflicts with the newer version. If you do keep your old versions, make sure to update any shortcuts you have created so that they link to the correct version. If you decide to delete your old version, remember to save your presets. Your presets are located in the preset folder so just make sure to copy it out of the folder and put it in a safe location.

Updating the Firmware

Make sure the editor and the firmware versions are compatible with each other.

The 12 Step Editor will automatically prompt you to update your 12 Step's firmware if it is not compatible. When the application prompts you to perform this update click the "update" button and wait until it is finished before continuing.

Keith McMillen Instruments cannot be held liable for damage resulting from installation and operation errors or improper use.

Ports

The 12 Step communicates with the computer via USB on 2 MIDI ports, **12Step Port 1 and 12Step Port 2.**

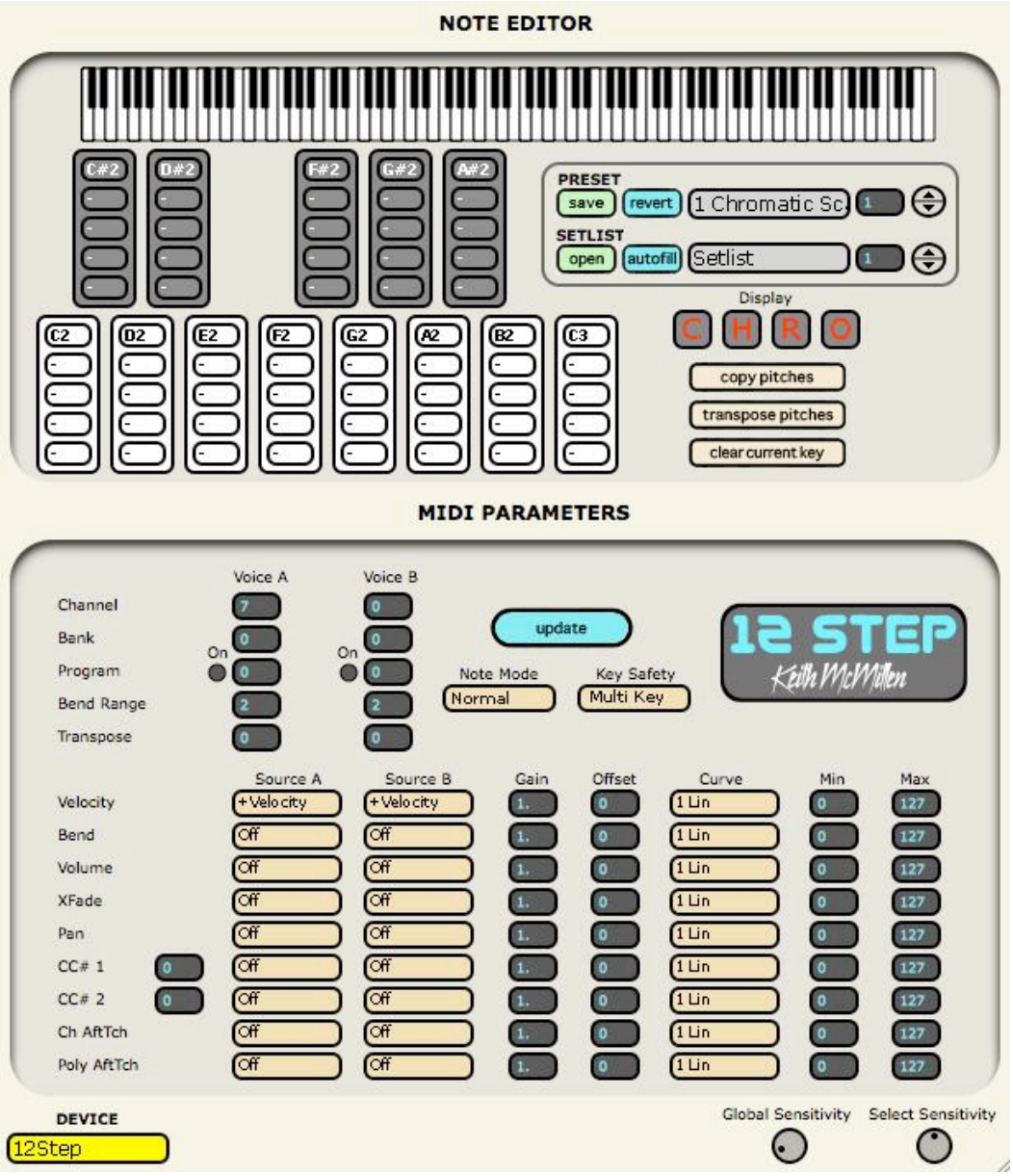
"12Step Port 1" is the port for MIDI communication between 12 Step and the computer. So if you're using 12 Step with your computer with audio/MIDI applications (Ableton Live, Logic, Garage Band, Guitar Rig, Kontakt, etc...) 12Step Port 1 will be the port you'd want those applications to listen to 12 Step on. For **Windows** users, variations on how 12Step Port 1 is displayed in other applications sometimes occurs. It might appear as just "12Step" or on XP computers, "USB Audio Device (1)".)

The port used with the **KMI MIDI Expander** to talk to external hardware is 12Step Port 2. For **Windows** users, variations such as "MIDIOUT2 (12Step)" or "USB Audio Device (2)" often show up in other applications.

The 12 Step will automatically send all MIDI data out through both ports. So whether you're using the 12 Step with hardware or software you don't have to change a thing in the editor to make sure the data's set to the correct port.

Main Window Overview

When you open the 12 Step Editor you will be presented with a window that looks like this:



The top part of the window is for selecting the notes that each key pad will play. You can choose up to five notes for each key by using the **Note Editor**. You can also save your settings into a preset.

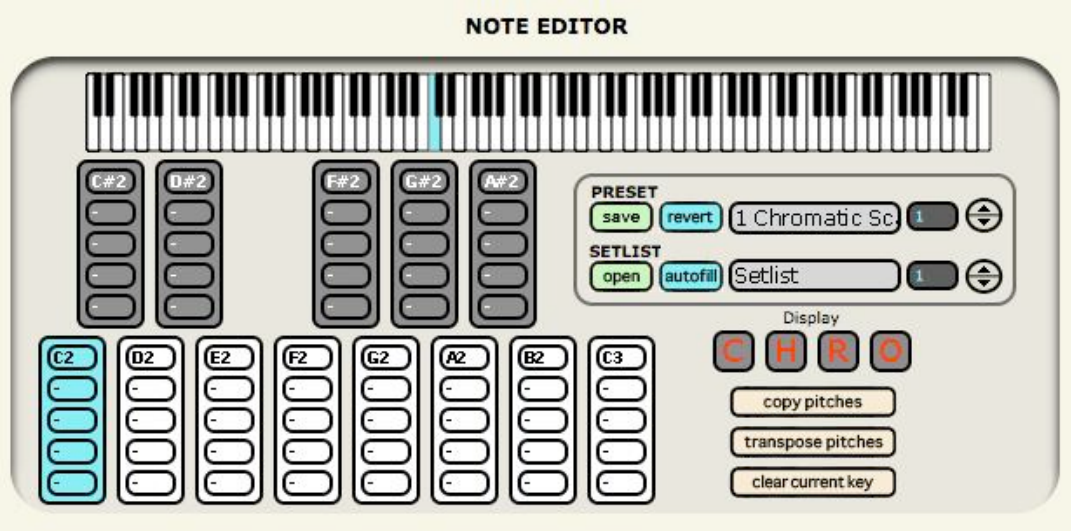
The bottom part of the window is for setting up your **MIDI Parameters**. You can have up to 2 voices per preset and implement various types of MIDI data including velocity, pitch bend, volume, pan, Poly Aftertouch, etc...

in the bottom on the left side of the screen is a drop-down menu for selecting the 12 Step **device**. If the 12 Step is connected to your computer via USB the device menu should

automatically change to "12Step" after the application fully loads to show that a connection between the Editor and the device has been made.

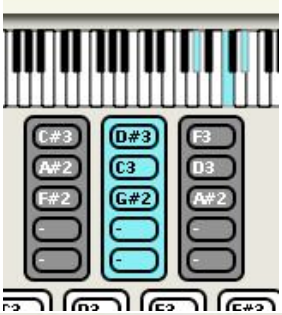
On the bottom right side of the window you can set the **Global Sensitivity** of the key pads and the sensitivity of the select key.

Note Editor

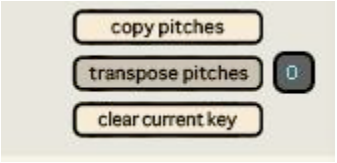


The Note Editor is arranged like the keys on the 12 step and stores and displays the notes for each key. To select notes for a key just click on the key you wish to assign notes to so that it is highlighted. Above you can see that the key pad in the lower C position is highlighted. Once a key is highlighted you can select the notes you want from the keyboard image along the top.

The image to the right shows the G# assignments as a major triad: G#, C and D#. The notes are highlighted on the longer keyboard image and shown as letters on the key itself. If you wish to remove a note just click it again from the keyboard image to deselect it. To choose notes for a different key click on another key to highlight it.



When you're done selecting your notes you can click the "**transpose pitches**" button and a little number box will appear allowing you to transpose your selected notes up or down in semitones. The "**clear current key**" button clears all of the notes you've selected on the highlighted key.



The **copy pitches** button allows you to copy all of the pitches on each key for one preset into the note editor of a different preset. After clicking the copy pitches button go to a different preset and click the same button which would at that point say **paste pitches**. Then you can save your preset. This is useful for when you wish to use the same notes from one preset but paste them into a preset with different MIDI Parameter settings.

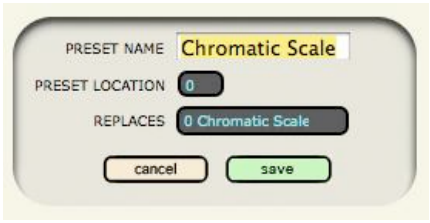
You can also choose the characters for the 4 letter alphanumeric display on the 12 step by clicking on the red letters and choosing from a menu of letters and numbers. Make your display name to help you remember what preset you are using.

Note: the 12 Step alphanumeric display is 7 segment and there are a few letters that cannot be represented. K, M, V, W, and X cannot be displayed on the 12 Step.

Saving

The preset saving functions are also available in the top area of the main 12 Step window. You can select presets in the list, save, revert, and add things to your setlist.

When you click the "Save" button a save dialog box will appear. Here you can either save over your existing preset or save a brand new preset in a new slot. You can give your preset a name by typing it into the **preset name** text field. Change the slot number by scrolling through the **preset location** number box. The **replaces** field lets you know if a preset already exists in the selected slot. If the replaces field says "(unnamed)" you will know that you can save a preset in that slot without overwriting another preset.

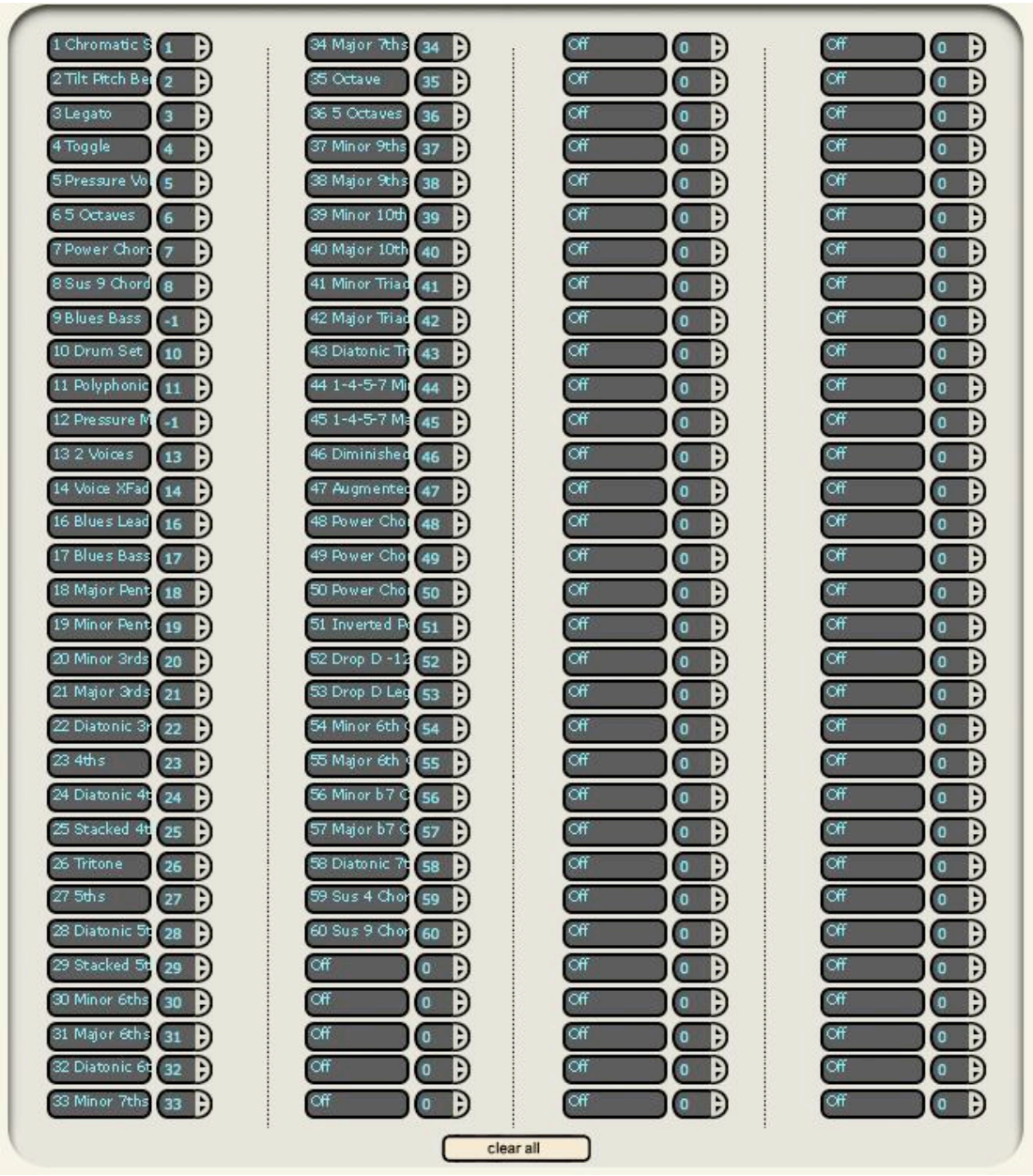


When you are ready to save your preset after selecting your preset name and location slot you can hit the **save** button. After saving, your preset will show up in the preset menu in the slot you indicated, however you will stay on the preset you were saving from.

The **revert** button allows you to disregard any changes you've made in a preset before you save. So basically it's just an easy way to reselect the preset and go back to its last saved settings.

The setlist is for selecting which presets you want to appear on your 12 Step. This way you don't have to have all of the presets you've ever made show up on your 12 Step. This makes it easier to navigate through your preset list during a performance if you only have look through presets you need for that performance. You can also list your presets in any order you wish.

To add presets to your setlist click on the **open** button. The Setlist window will open up.

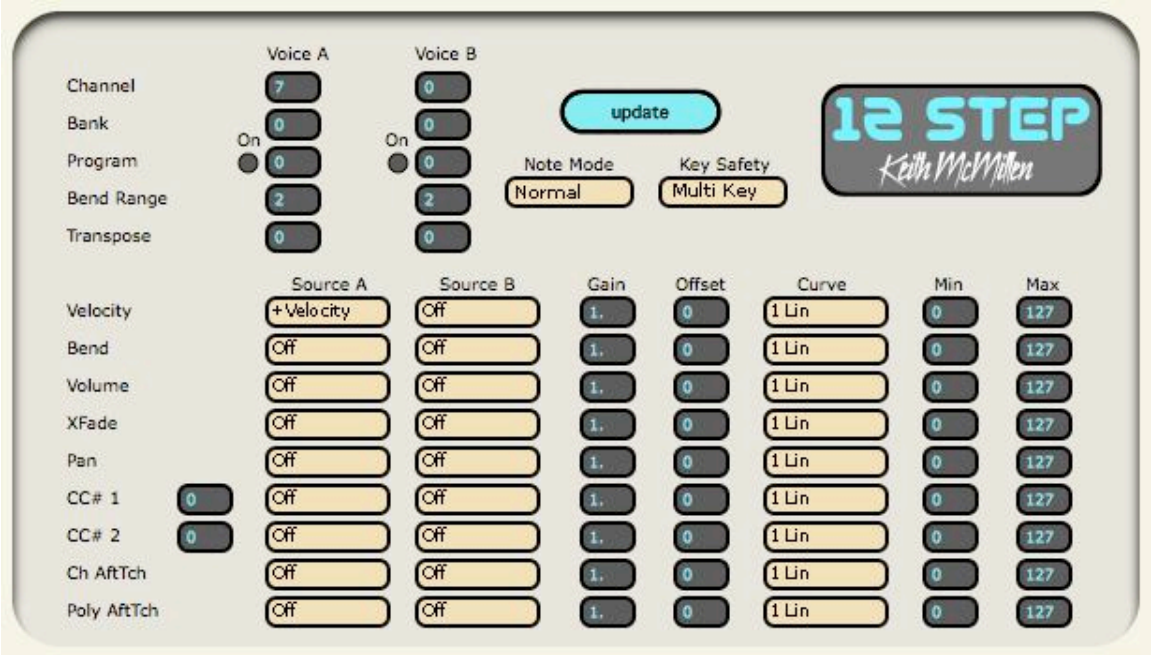


You'll see an array of text fields and number boxes. You can turn on a slot by selecting a preset or turn it off. Choose which scene to use by selecting it from the drop-down menu when you click inside the text field, scrolling through the numbers, or pressing the inc/dec buttons on the right hand side. Use the **clear all** button at the bottom to clear the setlist and start fresh.

The order of presets listed in the setlist will be the order of presets when using the select key to select them.

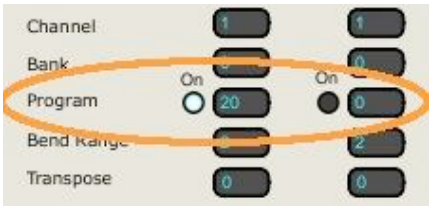
The setlist allows up to 128 presets. The presets that are not in the setlist will not be downloaded to the 12 Step.

MIDI Parameter Assignments

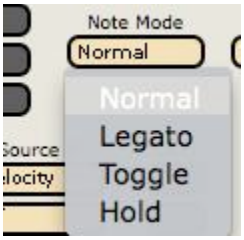


Here you can choose how your MIDI data outputs. You have the option of having 2 voices that will play the notes you selected in the Note Editor. For each voice you can choose a separate **Channel**, **Bank**, **Program**, **Bend Range**, and you can even **Transpose** them to play different notes.

You may notice that the Program row includes an **On** button. This feature comes in handy at times when you might not wish to include a program change message with your preset. To make sure the scene uses a specific program change message click on the Program number box so that it lights up. The image to the right shows that the program for Voice A is on and set to output a program change value of 20. The program for Voice B is off.



Now look over to the right of where you select programs and bend ranges. You will see a menu for selecting **Note Modes**. By selecting various Note Modes you can choose how your foot presses effect the note on and note off messages.



Normal - Upon pressing on a key a "note on" message is triggered. When the key is released a "note off" is sent.

Legato - Pressing on a key sends a "note on". When a different key is pressed, the previous key's note is turned off and the new key's note turns on. If you wish to turn a note off before hitting another key, tap on the select key.

Toggle - Pressing a key sends a "note on", a second press sends a "note off". Stepping on a different key sends a "note on" without turning off the previous note. Tapping on the select key will turn off all active notes.

Hold - This mode basically allows you to switch back and forth between normal mode and legato mode using the select key. When you first go to a preset that uses Hold mode the keys will behave as though they were in Legato mode. If you tap on the select key once all notes will turn off and the keys will switch to behaving as though they were in Normal mode. Step on the select key again and the keys will go back to behaving as though they were in Legato mode and so on...

Just to the right of the Note Modes menu is the **Key Safety** menu. The key safety menu gives you 3 different options: Multi Key and Single Key.

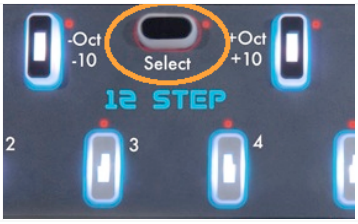
Multi Key - you can trigger multiple keys at a time without any safety feature implemented to prevent you from accidentally triggering another key.

Single Key - only one key can be triggered at a time. While your foot is pressed on one key all other keys are locked out and cannot be triggered. This helps prevent accidentally triggering wrong notes.

Select Key

The select key on the 12 Step plays an important role in the operation of the device.

To navigate to other presets hold down the **Select Key** until all of the red LEDs for each key pad begin to flash. Now you are in **Select Mode**. In Select Mode you can step on one of the numbered key pads to go straight to the preset of that particular number.



If you press the enter button while in select mode you can use the -10 or the +10 key pads to increment or decrement through preset decades and then fill in the second digit by pressing one of the numbered key pads.

You will be able to see which decade you are in while incrementing and decrementing by looking at the alpha numeric display on the upper right side of the 12 Step. After selecting the preset you will automatically be taken out of Select Mode.

Select mode can also be used to shift octaves. After entering Select mode use the -Oct or the +Oct keys (another name for the -10 and +10 keys) to shift up or down an octave. After shifting octaves you will be taken out of select mode automatically.

Modlines

In addition to playing notes you can also use the pressure sensor sources for each key pad to control an abundance of MIDI parameters. **Velocity, Bend, Volume, X-Fade, Pan,** 2 **CC #**'s, **Ch AfterTouch,** and **Poly AfterTouch** can all be controlled in various ways by using a modline for the corresponding MIDI parameter you would like to use. Below is an image of the velocity modline:

The first thing in the modline that you can modify is the sources for voice A and voice B. These can be different if you like. The sources all interpret the sensor data in different ways and will produce different types of responses from your foot presses. This will depend on what selection you make from the source drop down menu next to each parameter:

Sources

Using our sensor key technology we can tell how hard (Pressure) and at what angle (Tilt) you are activating the key. This is a very powerful set of performance modifiers. We also provide the inverted version of each source so you can easily do crossfades and pans.

Velocity is based on how hard you press on the key to trigger

+ Velocity - this outputs a value that represents the overall pressure of your foot on the key pad when you first step on the key. The value will be between 0 and 127 with 127 indicating the most pressure.

- Velocity - this outputs a value that represents the overall pressure of your foot on the key pad when you first step on the key. The value will be between 0 and 127 but this source is inverted so 0 would indicate the most pressure.

Pressure is the combined force of how hard your foot is pressing on the key

+ Pressure - this outputs continuous values that represent the pressure of your foot on the key pad. The value will be between 0 and 127 with 127 indicating the most pressure.

- Pressure - this outputs continuous values that represent the pressure of your foot on the key pad. The value will be between 0 and 127 but this source is inverted so 0 would indicate the most pressure.

Tilt is the angle of the key determined by the relative pressure on the front vs the back of the key. You must move the key through its On Angle which is where the front and back of the key are pressed equally. This allows you to invoke Tilt when you want it. For example, Tilt is mapped to bend, but you really want most keys to

play in perfect tune. When you want to bend a not you wiggle the key front to back and Tilt becomes engaged for that key.

+ Tilt - this outputs continuous values and increases and decreases depending on the tilt of your foot on the key. In other words if your foot is exerting more pressure on the top sensor of the key, the value will increase. If you tilt your foot pressure down so more pressure is on the bottom of the key, the value will decrease.

- Tilt - this outputs continuous values and increases and decreases depending on the tilt of your foot on the key. This is the inverted version of + Tilt. In other words if your foot is exerting more pressure on the top sensor of the key, the value will decrease. If you tilt your foot pressure down so more pressure is on the bottom of the key, the value will increase.

The keys are numbered chromatically left to right as 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13. This source ignores the text that may be printed by the key. A good example would be to multiply the KeyNum by 10 and apply to MIDI Pan. Then the left side of the 12 Step will come out the left speaker and the right side of the 12 Step out the right speaker.

+ KeyNum - this will output the number of any key you step on.

- KeyNum - this will output the inverted number of any key you step on.

You can plug an expression pedal into the 3.5mm jack on the rear of the 12 Step. An adapter is provided for use with ¼" (6.5mm) pedals. You can also supply a 0 - 5V Control Voltage to the tip of this connector.

+ Pedal - this will output the values coming from an expression pedal if you have one plugged into your 12 Step.

- Pedal - this will output the inverted values coming from an expression pedal if you have one plugged into your 12 Step.

After selecting your source you can then further modify what values you are sending to your MIDI parameter by using the math modifiers in the rest of the modline.

gain - this is the first place where you can use math to modify the data signal from the source. Whatever number is in the gain box is used to multiply the raw value coming from the source. For example clicking on the gain number box and typing "2" will double whatever value is received from the controller.

offset - set a number to add to the raw value after it has been multiplied by the gain value.

curve - the result value is entered into the selected lookup table, and used to plot the index on a chart. There are a number of table options, each which will affect the modulation differently as it changes value over time.

min / max - These allow you to constrain the data values between a minimum and a maximum number. If the min is set to 10 and the max is set to 15, then the output cannot be less than 10 or more than 15.

The example in the image above shows the Velocity MIDI parameter. The source for voice A is set to +Velocity so the harder you initially press on the key, the greater the velocity will be. Voice B is set to -Velocity so the harder you initially press on the key, the lower the velocity will be. The gain is set to 1 and the offset is set to 0 so at this point the outputting values have not yet been altered. A linear curve is used so again the value is not altered. With Min set to 0 and Max set to 127, the full range is allowed so the values are able to output as they are. This is a simple way to set up 2 voices with opposite velocities.

If you experience any problems or have questions regarding the 12 Step install process submit a support ticket outlining the problems you're experiencing at www.keithmcmillen.com/support. The more detailed you are in describing your problem (information about your computer, the software you're running, the circumstances around the issue), the more easily we will be able to help you.