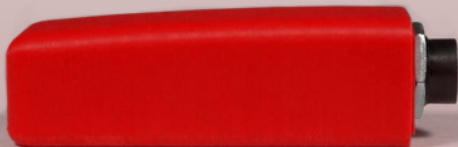


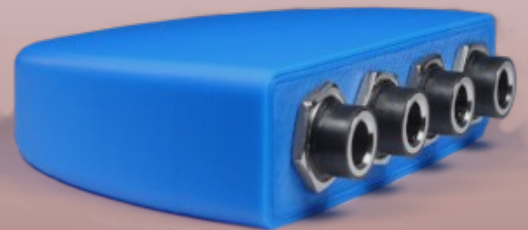
MIDI EXPRESSION | USER MANUAL



MIDI EXPRESSION



MIDI EXPRESSION
Quattro



MIDI EXPRESSION iO



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Introduction

If you've purchased a MIDI Expression device, thank you for your support and I hope you enjoy using it.

This manual gives you a good look at how MIDI Expression devices and the MIDI Expression Control application work. While they are both easy and intuitive to use, this manual is worth reading to familiarize yourself with their features and to discover aspects of their use that are not so obvious.

Features

- Pedal Sensing Technology.
- Polarity reversing inputs.
- Class compliant driverless implementation.
- Standalone operation (MIDI Expression iO)
- Powerful preset editor.
- Parameter feedback.
- Value persistence.

Pedal Sensing Technology

All MIDI Expression devices are designed with the ability auto detect the type of pedal plugged into them. They can detect expression pedals, sustain pedals, hihat controllers, and dual footswitches. The pedal sensing feature automatically loads an associated preset based on the type of pedal plugged in.

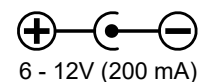
Polarity reversing inputs ensure compatibility with pedals from all manufactures. Take a look in the [appendix](#) for wiring diagrams for each pedal type.

Class Compliant

MIDI Expression devices will run on virtually any system that supports USB including Windows, OSX, Linux, iOS, and Android, without the need to install drivers. For use in the USB host port of 3rd party MIDI devices such as an iConnect interface, a 'pared-down' version of the firmware can be used as described [here](#).

Standalone Operation

The MIDI Expression iO can operate in Standalone Mode without a connection to a computer. The device automatically enters this mode when powered by a USB charger or a Roland / BOSS style 9V DC power adapter. In standalone mode, MIDI from MIDI in port is merged with MIDI generated by pedals and is routed out the MIDI Out port.



Colors

MIDI Expression devices come in six different colors, each with a unique MIDI port name. This makes it easy for you and your software to distinguish multiple MIDI Expressions plugged into the same computer. The 'color' of a device can be changed by **updating the firmware** installed on the device.

On-Board LED

Each MIDI Expression has an internal LED that provides visual feedback when you plug in the device, plug in a pedal, or select a device with the Control Application.

The MIDI Expression iO has 3 LEDs visible from the back of the unit. The top LED is a status LED, the middle LED indicates MIDI DIN in activity and the bottom LED indicated MIDI DIN out activity.

Parameter Feedback

MIDI Expression monitors its MIDI IN port and updates its values accordingly, allowing it to stay in sync with your music software. See [here](#) for more information.

Value Persistence

MIDI Expression devices remember their toggle positions and current patch values even after being unplugged, ensuring that your device is always in the exact state as you last left it in.

Default Settings

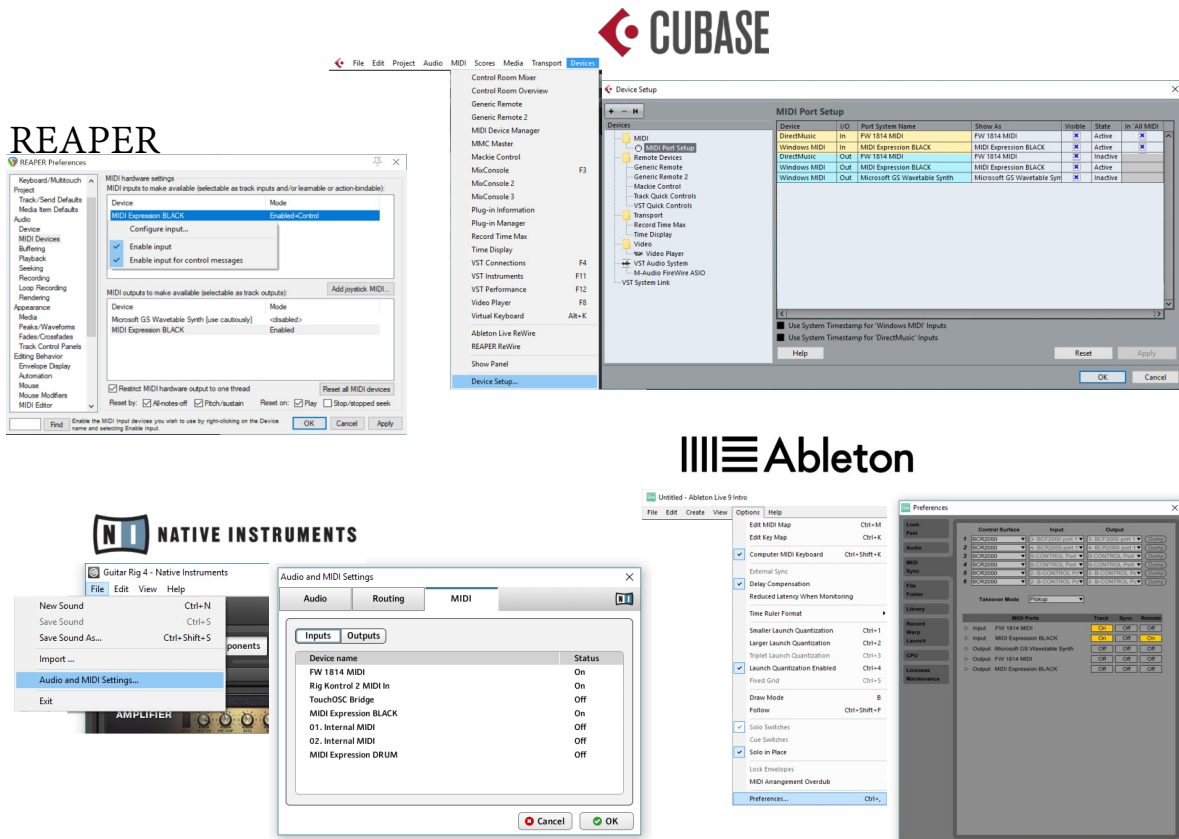
	Input 1	Input 2	Input 3	Input 4
Expression	CC Chan: 1 CC: 7	CC Chan: 2 CC: 7	CC Chan: 3 CC: 7	CC Chan: 4 CC: 7
Sustain	CC Chan: 1 CC: 64	CC Chan: 2 CC: 64	CC Chan: 3 CC: 64	CC Chan: 4 CC: 64
Hihat	CC Chan: 10 CC: 4	CC Chan: 10 CC: 4	CC Chan: 10 CC: 4	CC Chan: 10 CC: 4
Footswitch	CC Chan: 1 CC: 1 Chan: 1 CC: 2	CC Chan: 2 CC: 1 Chan: 2 CC: 2	CC Chan: 3 CC: 1 Chan: 3 CC: 2	CC Chan: 4 CC: 1 Chan: 4 CC: 2

Getting Started

Because MIDI Expression devices are class compliant, they work 'right out of the box'. Simply connect your device with a USB cable and you are ready to go.

Setting Up Your MIDI Software

If you want to be able to controlled an application via MIDI, especially in Windows, you will likely need to enabled the MIDI Expression in the application's audio / MIDI setup. Every application is slightly different and yet basically idea is the same. Here are a bunch of screenshots showing how to enable MIDI Expression in various applications.



Connecting Pedals

MIDI Expression devices support expression pedals, sustain pedals, footswitches, hihat controllers. For pedals with removable cables, it's best to plug the cable into the pedal before connecting to the MIDI Expression. Plugging in a cable without a pedal attached can confuse the Pedal Sensing and resulting in your pedal being setup incorrectly.

MIDI Expression devices do not support piezo based kick pedals. These pedals produce high AC voltages that can damage the MIDI Expression, and the MIDI Expression outputs DC voltage which can put strain on peizos.

Changing Device Settings

To change settings for you device, download and install the **Control Application**, which is available for Windows, macOS, and iOS.

Control Application

As MIDI Expression devices have no physical buttons, any changes you want to make need to be done using the MIDI Expression Control application. The window of the application is scalable, so you can adjust the size to best suit the resolution of your display.



Standalone vs. Plugin Mode

The MIDI Expression Control application comes in two varieties—a standalone version and also a plugin version. While both varieties work in pretty much the same way, there is one major difference between them. When you make changes using the standalone version, your changes are saved directly to the memory in the device. However, when you make changes using the plugin version, the settings are saved in the plugin's own memory and not the device.

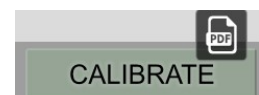
When using the plugin version, settings saved in the plugin are uploaded to the device when the plugin is loaded. When the plugin is unloaded, the settings from the plugin are offloaded and the settings stored in the device (via the standalone version) are restored. This behavior not only allows you to have different configurations loaded for each project, but also allows the two versions of the application to be complementary to each other.

The instructions for the rest of this section are assuming you're using the standalone version. Look [here](#) detailed information regarding plugin mode.

The Control Application is also available for iOS. It's recommended to **disable the keyboard interface** of your MIDI Expression as it can interfere with the iOS onscreen keyboard can cause the device to be detected slowly.

Learning the Software

Right-Clicking on most of the controls in the UI will bring up a context menu with a direct link to information about it in the user manual, and sometime links to related YouTube videos.



Device and Input Selector

The topmost part of the MIDI Expression control application is reserved for selecting the device and input you want to edit.



When using a multi-input MIDI Expression, an input can be selected for editing by clicking on its graphic in the center of the top header.

If you have more than one MIDI Expression connected, icons for each device become visible allowing you to select the device you want to edit. The control application supports editing up to four devices at one time.

Sidebar

The sidebar controls the device settings that you want to edit.



This icon displays the **Input editor**. You can use it to edit the behavior of your pedals and the kind of MIDI messages they produce.

The **Routing Editor** lets you control how MIDI is routed through the device and set the MIDI resolution of the inputs.

The MIDI Transformer is a MIDI effect that allows you to use pedals to dynamically manipulate the MIDI messages the device generates.

The **Snapshot Manager** lets you save entire snapshots of your device's memory, allowing you to quickly change the entire configuration of a device with a single click.

When the Autoselect option is on (default), the Input Editor will automatically select an input for editing when its pedal moves.

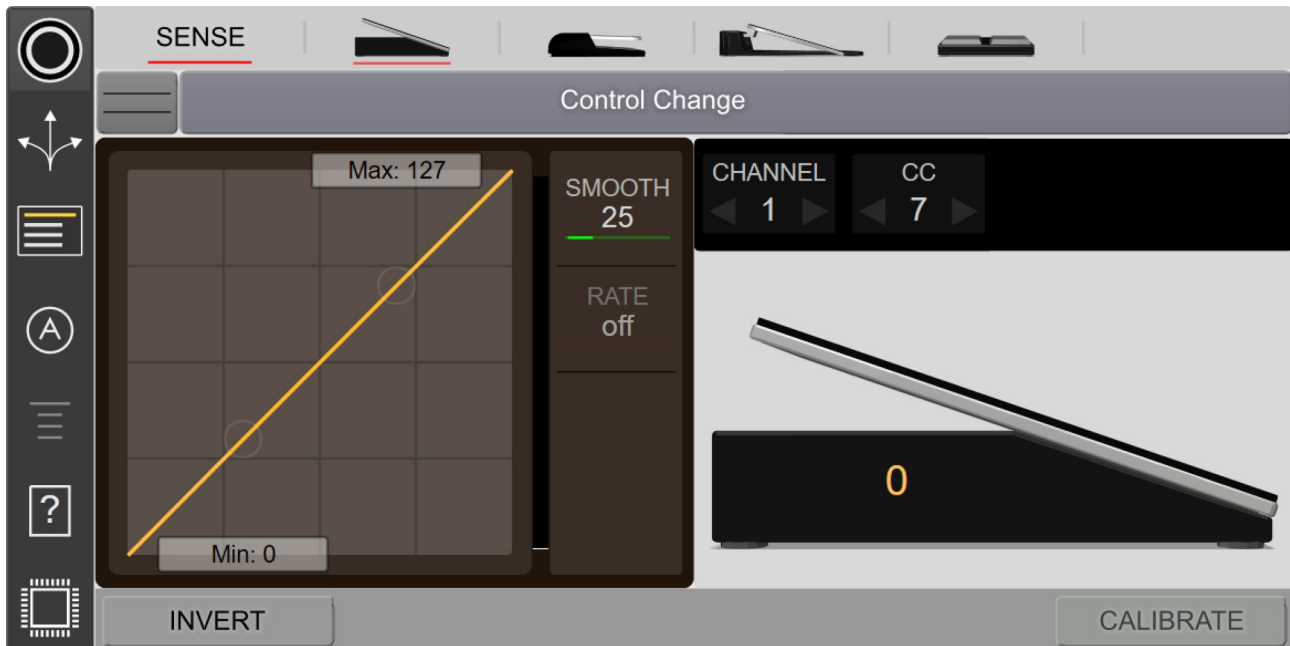
Only available on Windows, the On Top option keeps the Control Application on top of other windows.

This button opens up the MIDI Expression manual. This button is not available on the iOS version of the Control Application.

The firmware for MIDI Expression devices is periodically updated to fix bugs and add new features. Click this icon to **Update Your Firmware**.

Note: The single input MIDI Expression and first generation MIDI Expression Quattros only support a limited version of the MIDI Transformer and so this icon will be grayed out when editing these devices.

Input Editor



The Input Editor lets you make changes to the behavior of your pedals and the type of MIDI messages they produce.

Pedal Type Selector



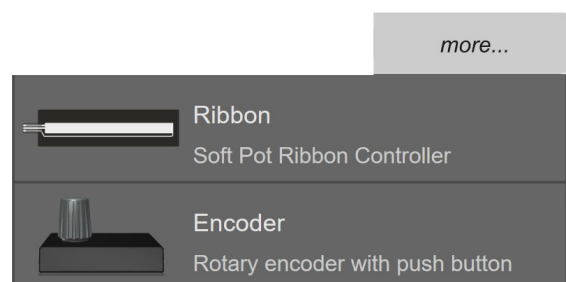
Each MIDI Expression input has a pedal sensing feature which allows it to automatically detect the type of pedal plugged in. When the **SENSE** control is underlined (default), pedal sensing is on and the pedal type is automatically selected, making the input plug 'n play.

You can override the pedal sensing by manually selecting one of the four pedal types. When manually selecting a pedal type, the Sense control is no longer underlined indicating that the Pedal Sensing feature is turned off.

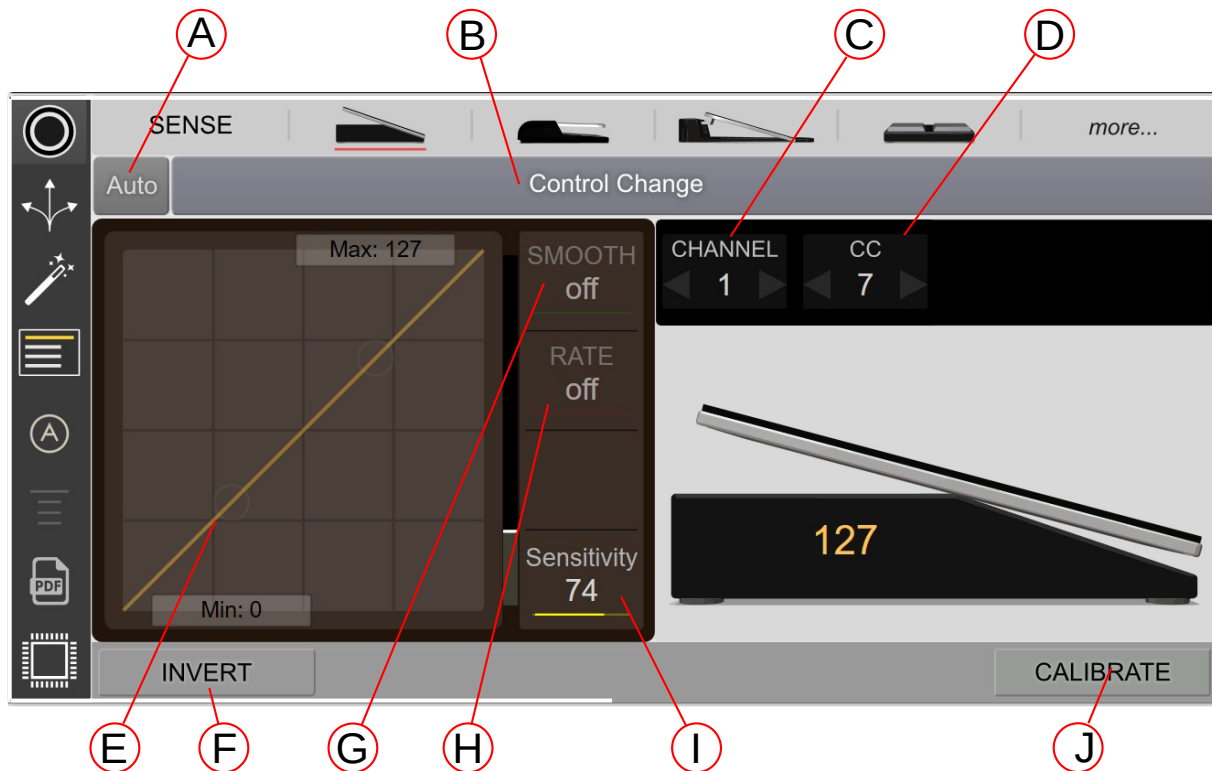
Note: With Pedal Sensing off, the input will remain configured for the selected pedal type even after plugging in a different type of pedal or unplugged the device. To restore the pedal sensing feature for that input, you will need to ensure that SENSE is switched back on.

More Input Types

MIDI Expression devices can also support **rotary encoders**, and includes a **ribbon controller** interface for softpot membrane potentiometers. Click on the more button select one of these types.



Using Expression and Hihat Pedals



Controls for Expression and Hihat Pedals

(A) Input Polarity Switch

Expression pedals can be wired in different ways. In order to support pedals from all manufacturers, the polarity of individual MIDI Expression inputs is reversible.

There are three possible values for this control, 'Auto' (Default), standard, or reversed. Generally speaking, you should leave set to auto unless your particular pedal is having issues with the 'Auto' setting.

(B) Mode Selector

Clicking the Mode Selector allows you to change the behavior of the pedal and the type of MIDI messages it generates. Look [here](#) for more detailed information about modes for expression pedals and hihat controllers.

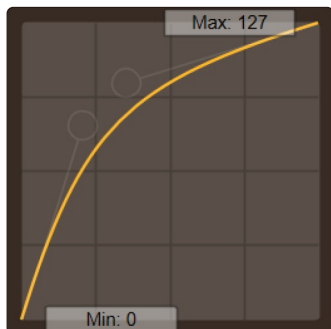
(C-D) Channel and Control Change

The values in these boxes can be adjusted in a variety of ways. Firstly, you can drag the values up or down with your mouse. For more precision, hold down the SHIFT key while you drag. Values can also be manually entered by double clicking on the box. Lastly, the values can be incremented and decremented using the up and down arrows.

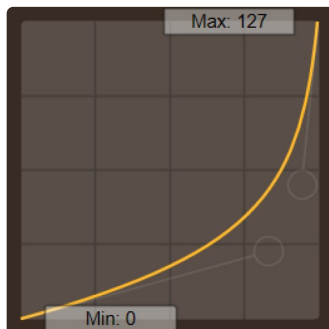
(E) Expression Curve

The Expression Curve control allows you to customize the response curve of your pedal. It allows you to set the minimum and maximum values, as well as the transition between these values.

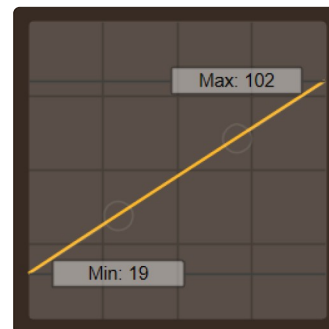
When you adjust the min, max, or curve, the background lights up indicating that the Expression Curve control is on. Clicking anywhere in the background will turn it off again. The MIN and MAX controls show a range from 0 - 127 by default, but you can change to a percentage (%) value by right-clicking on them.



Expression Curve used to add more resolution at the top of the pedal's travel.



Expression Curve used to add more resolution at the bottom of the pedal's travel.



Expression Curve used to limit the range of values output by the pedal.

(F) Invert

The invert control is pretty straight forward. If you get a value of 127 with the pedal pressed down and 0 with it up, checking INVERT will give 127 with the pedal up and 0 when pressed down.

(G) Smoothing

This function applies a filter to a pedal's input to prevent abrupt changes in the measured value. Please note that using smoothing adds a bit of delay which becomes very noticeable at higher values. If you need extremely fast response, turn smoothing off.

(H) Rate Control

This control sets a limit on the number of values that are output per second. For example, if the control is set at 10 values / second, and you move the pedal from 0 up to 100, the MIDI Expression will slowly output values from 0 to 100 over a ten second period. The feature can be very useful for controlling long sweeping motions such as fade outs and fade ins.

(I) Sensitivity

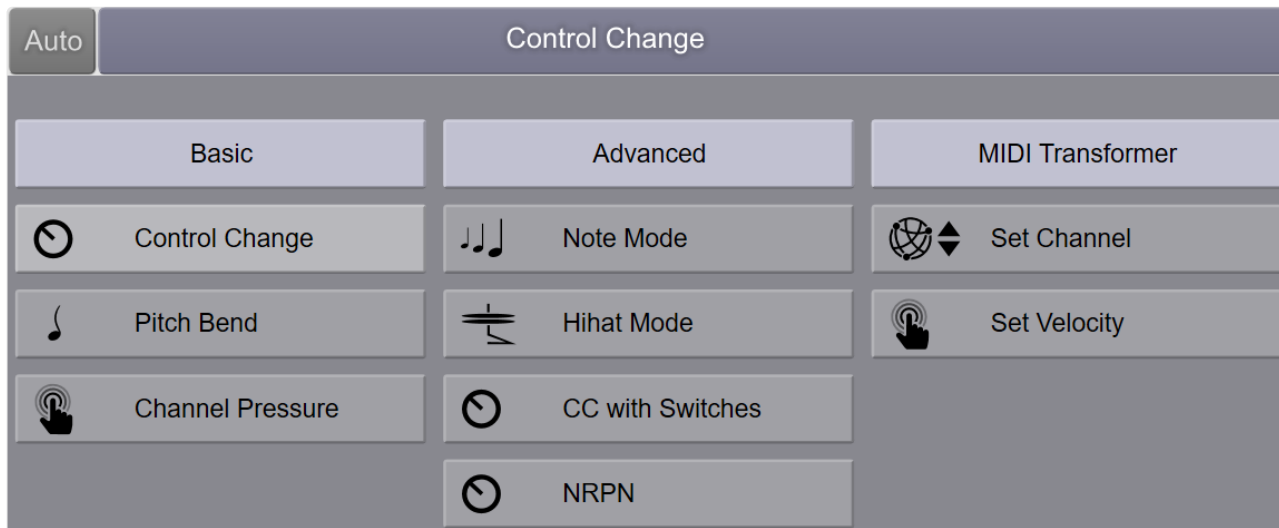
This control adjusts the amount of noise filtering applied to the pedal. Increasing this control will improve the responsiveness of the pedal to small movements, but setting it too high will cause the pedal send MIDI data even when it's not moving.

(J) Calibrate

If your pedal will not output values all the way down to zero or all the way up to 127, then you may need to calibrate. When calibrating, take the pedal through its full range of a motion, pressing it all the way up and down a few times. You can also adjust the range by dragging the sides with your mouse. After you are done, click the calibrate switch again to save.

Note: Watch out for pedals with adjustment knobs. For best performance, adjust to allow for the greatest range of values.

Modes for Expression and Hihat Pedals



By default, MIDI Expression devices are setup to send Control Change messages when used with expression pedals and Hihat mode when used with a hihat controller. However, they can be configured to run in different modes and produce many different types of MIDI messages.

The different modes are grouped into “Basic” and “Advanced” categories. The basic group is described below and the advanced group is described on the following page.

Basic Modes

Control Change

This is the standard type of message sent out by expression pedals. In this mode, the MIDI Expression sends out a MIDI Control Change value corresponding to the position of the pedal. This type of message is typically used to control knobs or faders.

There are some standardize control values that are useful to know. Some of the more important ones are listed below:

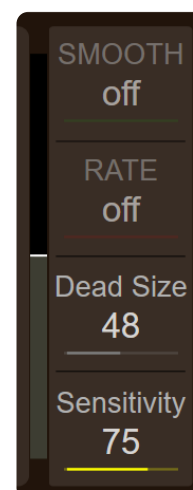
- CC1 Modulation
- CC2 Breath Controller
- CC7 Volume
- CC10 Pan
- CC11 Expression
- CC64 Damper

Pitch Bend

This mode is often used with synthesizers to slightly vary the tuning of a note. You can use the Dead Size control shown on the right to create a region in the middle of your pedal's range that will always be measures as exactly center, making it easy to stop the pedal precisely in the center position,

Channel Pressure

Sometimes called aftertouch, channel pressure is a type of MIDI message that some professional keyboards send after a note is played. If your keyboard doesn't support aftertouch, you can use this mode with an expression pedal to simulate it.

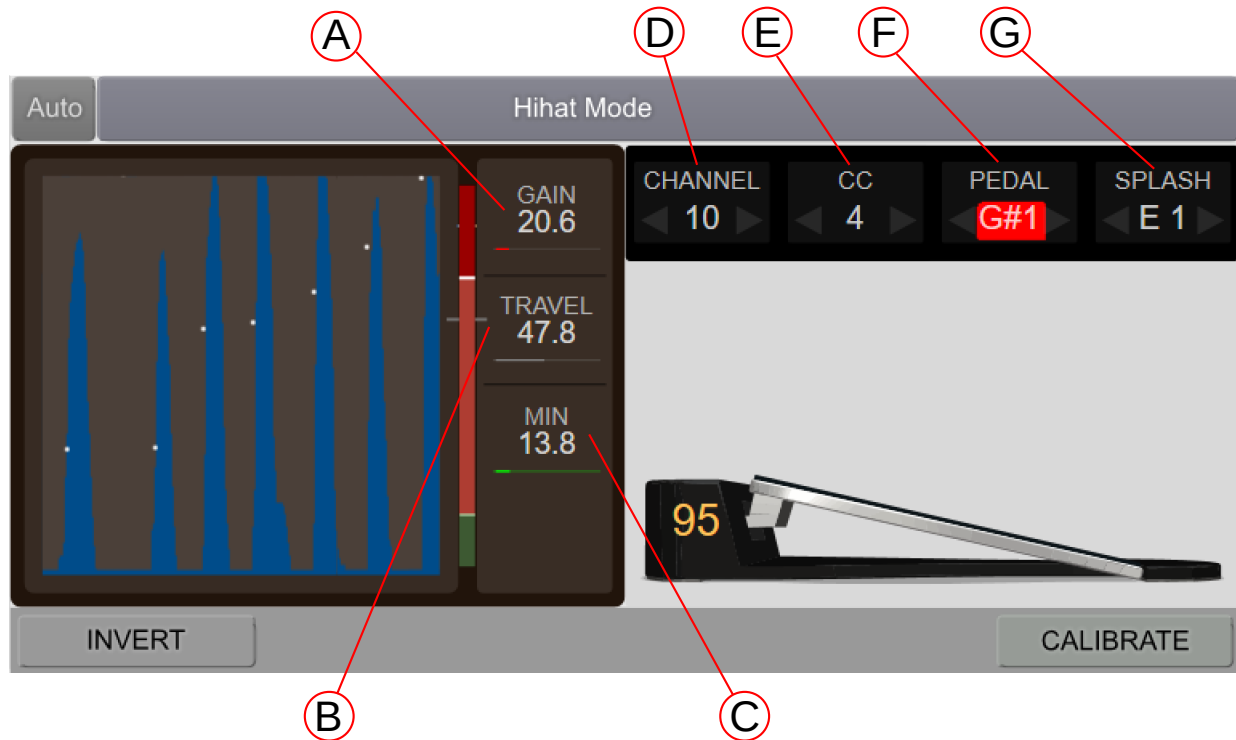


The Dead Size control creates an area in the middle of the pedal's travel that will always be exactly center.

Advanced Modes

🚫 Note and Hihat Modes

Note Mode and Hihat Mode allow you to trigger velocity sensitive MIDI notes. The two modes work the same except that Note Mode only generates MIDI Notes, while Hihat Mode also sends control change messages representing the position of the pedal.



Using Note and Hihat Mode

To make using these modes as easy as possible, MIDI Expression employs an automatic optimization routine to best support your pedal and playing style. To help it settle in on good settings, play your pedal as if it was a real kick drum pedal, being sure to play some hard fast notes so it knows the velocity range of your pedal. The device will reoptimize its settings any time the MIDI Expression is plugged in, a new pedal is plugged into the input, your pedal is calibrated, or you adjust the Scantime setting.

(A) Gain

Generally speaking, the faster your pedal can move, the lower you can set the Gain Control. Hihat controllers typically work best with a gain set to 14-20 ms. Expression type pedals work best with times closer to 65 ms.

(B) Travel

The travel control determines the point along a pedal's travel where a note will be generated.

(C) Min

The Min control allows you to filter out low velocity notes. If you find your pedal is triggering on low velocity notes when you don't want it to, try increasing the Min to filter them out.

(D) Channel

This is the MIDI Channel the Control Change values and Notes will be transmitted on.

(E) Control Change

This is the Control Change value that the pedal outputs as it moves. If you simply want to trigger notes, use Note Mode and these messages will not be transmitted. If however you want the pedal to function as a hihat controller, then you will likely need to set this to 4.

(F) Pedal Note

This is the note value that is output when the pedal is pressed down quickly.

(G) Splash Note

If you are using a hihat controller, you will also be able to trigger a second note by releasing the pedal very quickly after triggering a pedal note.

Non-Registered Parameter Numbers (NRPN)

NRPNs are a lot like Control Change messages, except that they can have a value between 0 and 16383 (14 bit resolution).

Although NRPNs support up to the 18363 different parameters, MIDI Expression only supports parameters 0-127.

CC with Gesture Switches

This mode allows an expression pedal activate switches when it moves quickly up or down.

As you move the pedal, the velocity and direction of motion are tracked and shown as the red indicator between the switches.

If the velocity is high enough, it'll activate the respective switch.

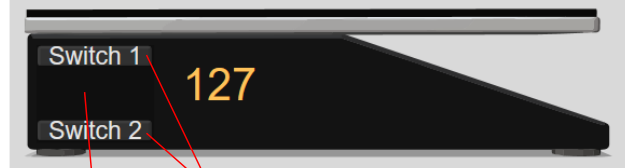
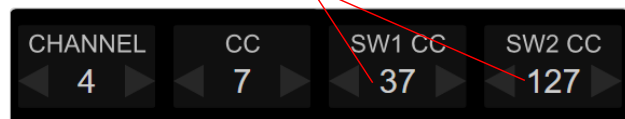
The switches can then be used to toggle effect in 3rd party application

You can drag the area between the two switches to set the amount of velocity required to activate the switches.

To assist with MIDI learn functionality in 3rd party applications, you can click on a switch and it will send out its assigned CC.

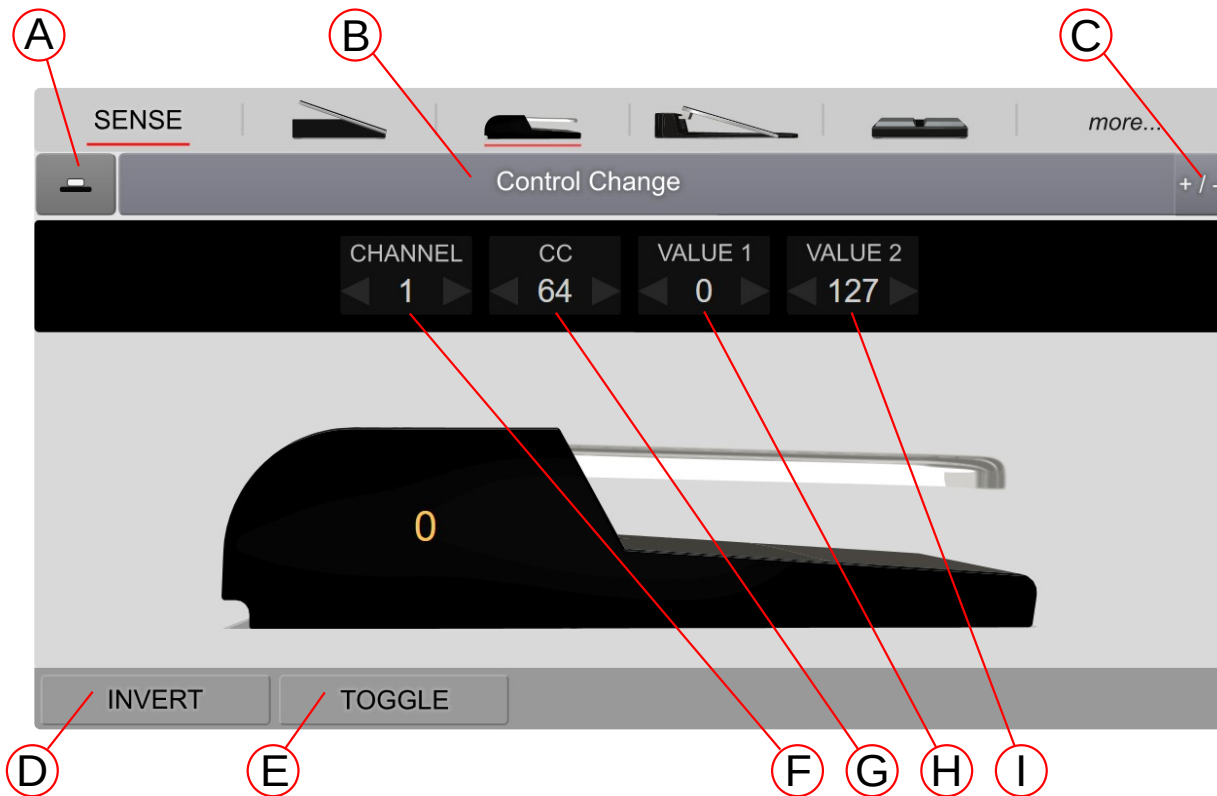


Assign CC numbers to the switches



Click a switch to send its CC
Drag up and down to adjust the amount of velocity needed to activate the switches.

Using Sustain Pedals



Controls for Sustain Pedals

(A) Input Type

This is used to tell MIDI Expression the type of switch your pedal uses. A latch style switch is one that alternates between two values, 'on' or 'off', every time it is pressed, much like a light switch in your home. A momentary switch, on the other hand, is like a button. It switches to 'on' when pressed, and back to the 'off' when released. Select the style to match your pedal.

(B) Mode Selector

Sustain pedals and footswitches are capable sending out several different kinds of messages and operating in different modes. Look [here](#) for more information about modes for sustain pedals.

(C) Inc / Dec

When the mode is set to Control Change or Program Change, the increment / decrement button is visible. When enabled, these modes allow you to cycle through a range of values. Short pressing the pedal increments the value and long pressing decrements the value.

(D) Invert

The invert control is pretty straight forward. If you get a value of 127 with the pedal pressed down and 0 with it up, checking INVERT will give 127 with the pedal up and 0 when pressed down.

Furthermore, If the INPUT TYPE is set to 'latching' or the MIDI Expression detects that an expression pedal is being used as sustain, then the INVERT control will also invert the motion of the pedal graphic in the Control Application.

(E) Toggle

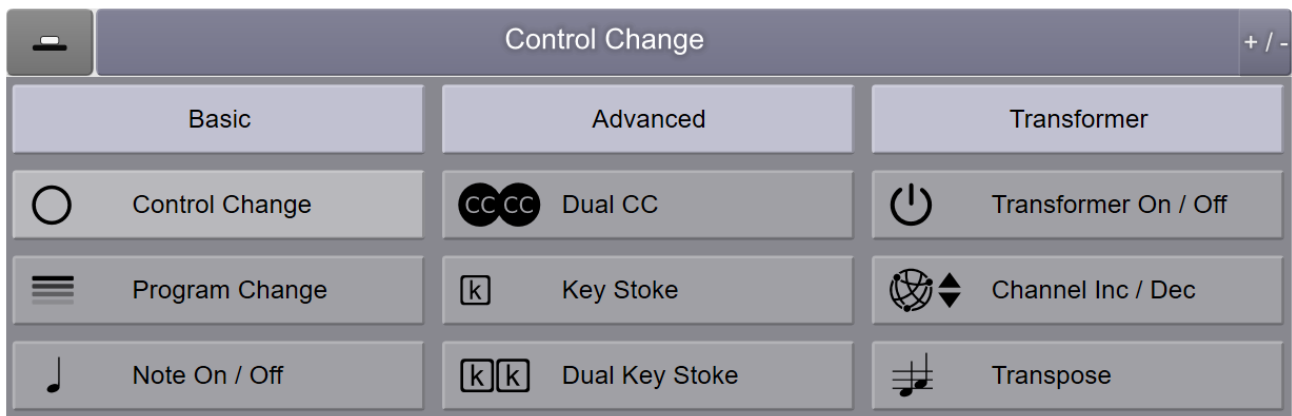
Using TOGGLE you can use a 'momentary' type switch to simulate a 'latching' style switch, which only sends out one value each time the pedal is pressed. The toggle mode is only available for sustain pedals and footswitches with INPUT TYPE set to 'momentary'.

(F-I) Channel and Control Change

The values in these boxes can be adjusted in a variety of ways.

- Drag the values up or down with your mouse. (hold down the SHIFT for precision)
- Use the arrows to incremented and decremented the value.
- Manually entered by double clicking on the value.

Modes for Sustain Pedals



The modes for sustain pedals are organized into three groups, Basic, Advanced, and MIDI Transformer. The modes for the MIDI Transformer are described in a separate section [here](#), and the rest of the modes are described below.

Basic Modes

Control Change

Control Change messages are useful for toggling On / Off parameters in DAWs and virtual instruments. If using momentary style switch, you'll likely want to use this in combination with the TOGGLE switch.

Program Change

Program Changes messages are typically used to swap between two different presets in a virtual instrument or plugin.

Note On / Off

Note On / Off messages can be used to trigger samples.

Dual CC Mode

Dual CC Mode works by sending out two different CC values depending on how long the pedal is pressed. Pressing the pedal quickly sends out one CC and pressing and holding for half a second sends out the other value.

ONLY SEND 127

Normally, the device will send two values for each CC. For example, during a short press, the device will send out CC1 with a value of 127, immediately followed by a value of 0. By enabling the 'Only 127' option, the device will not send the CC with a value of 0, which is often needed when mapping the CC to transport controls in a DAW for example.

TOGGLE

Dual CC Mode can also be used to toggle the values of two separate CC's between 0 and 127. When toggling is enabled, the value of the controller will respond to **parameter feedback**.

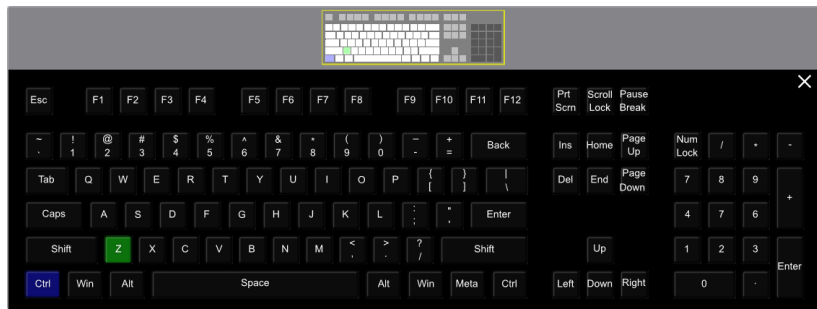
Keyboard Modes

Key Command

All current generation MIDI Expression devices support sending key commands. Legacy MIDI Expression devices with the mini-B USB connectors, however, do not.

This mode allows your pedal to function like a computer keyboard. Clicking on the keyboard icon brings up an onscreen keyboard that allows you to set your key command.

Your pedal can be set up to send a combination of a single regular key (green) and any number of modifiers (blue).



If your pedal is setup as a momentary type, the key command will start when the pedal is pressed and end when the pedal is released. Holding down the pedal will produce similar results to holding down the keys on a real keyboard. If however, your pedal is setup as a latch type, the key commands are sent and released immediately.

Dual Key Command

Dual key command mode allows a pedal to send out two different key commands depending on how long it is pressed.

A short press sends out the first key command, and a long press sends out the second.

Dual key command mode does not work with a latch type switch. If the dual key command mode is selected for a latch pedal, only the first of the two key commands will be sent.

Using Footswitches



A footswitch can be thought of as two sustain pedals patched into a single input. In fact, using a suitable adapter (HOSA YPP117, shown on the right), two sustain pedals can be ganged together into a single MIDI Expression input and function as a footswitch.



Because of the similarity to sustain pedals, the settings for footswitches are identical to those of sustain pedal, with the exception of two additional modes that are described below. Look [here](#) for a description of the settings for sustain and footswitch pedals.

Linked Modes for Footswitches

When the first switch is set to Control Change, Program Change or Transformer Channel Inc / Dec, the Link button is visible. By enabling the Link button, the two switches will work together

When the link button is enabled, these modes function similar to the INC / DEC modes for sustain pedals. One pedal increases a parameter and the other decreases it. The modes are called CC INC / DEC Linked and PC INC / DEC Linked and send Control Change and Program Change values respectively.

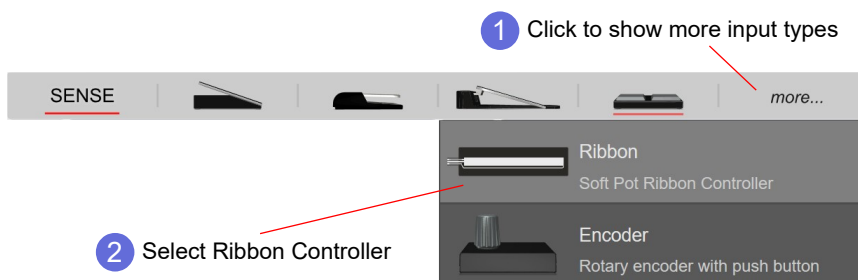
By pressing the first switch, the parameter is increased by 1 and by pressing the second switch, the value is decreased by one.

If the pedal you are using has momentary type switches, long pressing the first switch will increase the value by 10, and long pressing the second switch will decrease the value by 10. Be sure to have the input type set to momentary to take advantage of the long press functionality.

Using Ribbon Controllers

MIDI Expression devices allow you to connect a softpot membrane potentiometer to an input and use it as a ribbon controller. A ribbon controller is touch sensitive and detects position. They can be configured to send a variety of MIDI messages, but are typically used for pitchbend.

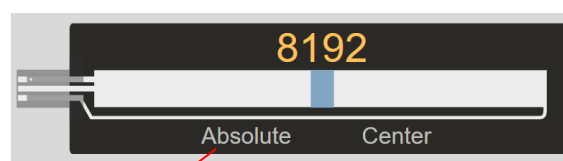
To use a ribbon controller, make sure it's wired correctly to a TRS jack, and then select the ribbon controller from the 'more' input types.



Position Tracking

The position can be set to 'absolute' or 'relative'. With absolute tracking, the position is determined by where you touch the softpot. With relative tracking, the position is adjusted by touching and swiping up or down.

With 'relative' position tracking and the ribbon controller set to send control change messages, the position value can be updated via **parameter feedback**.



Position Tracking
- absolute
- relative

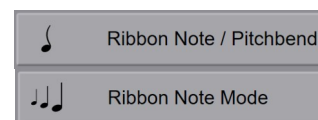
Release Behavior
- center
- hold

Release Behavior

When you lift your finger off the softpot, the default behavior is to 'hold' the current position. By setting the release behavior to 'center', the position will return to center. You can use the Rate and Smoothing controls to control how quickly the position returns to center.

Custom Modes

While ribbons controllers can send many different kinds of messages, there are two custom modes specifically for ribbon controllers. Ribbon Note / Pitchbend sends a fixed note when your finger touches the controller and then used pitchbend to adjust its pitch.

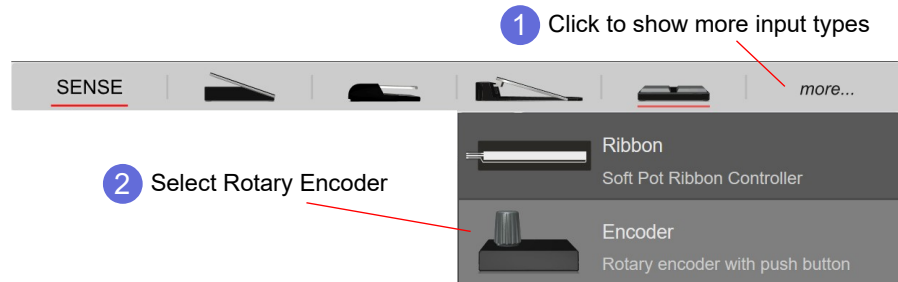


Ribbon Note Mode also sends a note when you touch the controller, but the velocity of the note is determined by where you touch the softpot.

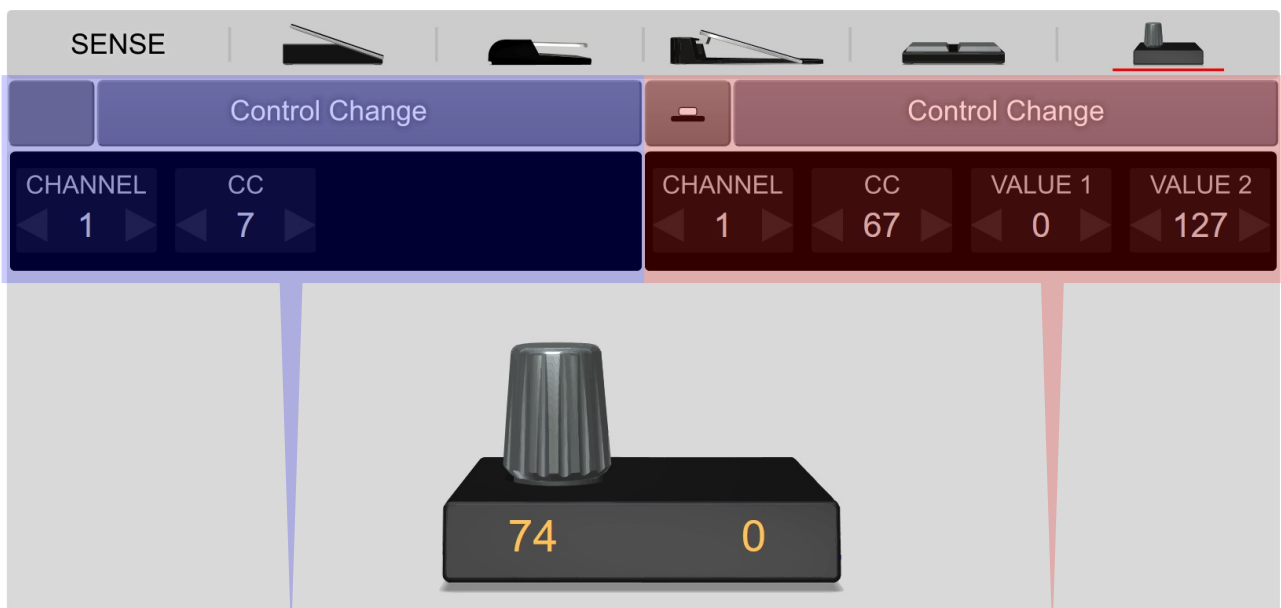
Using Endless Rotary Encoders

MIDI Expression inputs support rotary encoders with push button functionality. Check the [wiring diagrams](#) to see how to properly wire up a rotary encode.

To use a rotary encoder, make sure it's wired correctly to a TRS jack, and then select the Rotary Encoder from the 'more' input types.



Rotary encoders have two sets of settings. One for the rotation of the knob, and another for when you push the knob down (assuming your encode is 'push' encoder).



Settings for the rotation

Settings for the push

Settings for Rotation

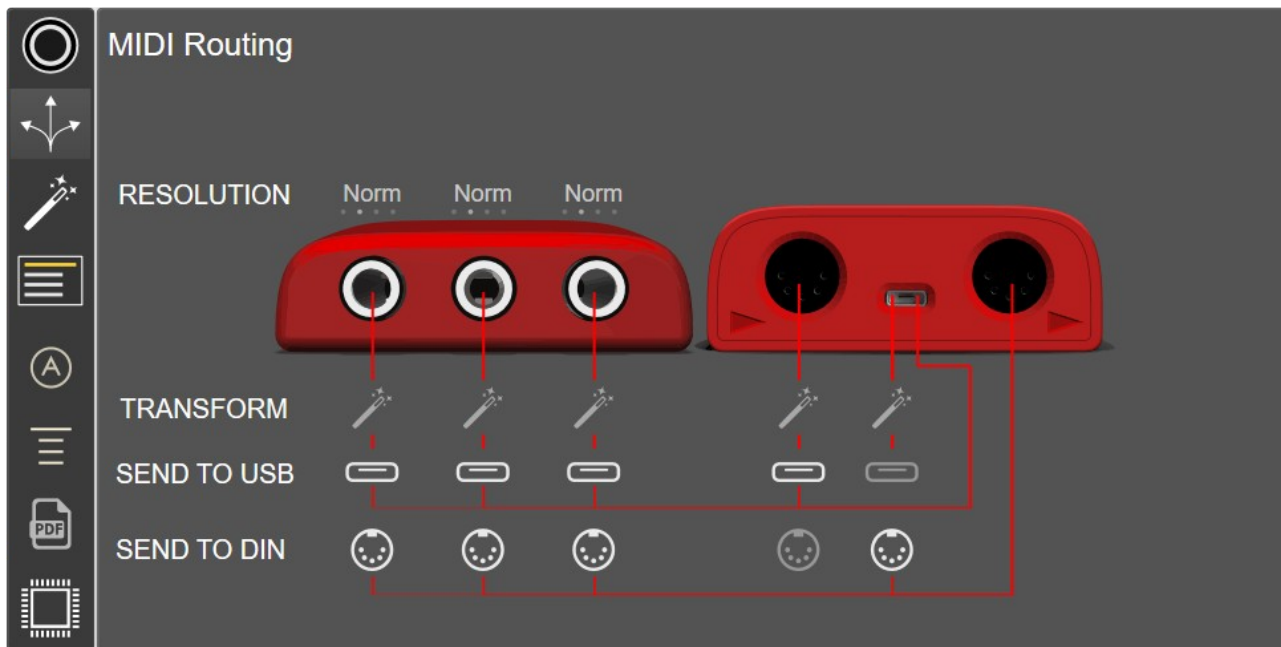
Rotary Encoders can send many of the same messages as an expression pedal, but one big difference is that rotary encoders can react to parameter feedback which allows their values to be updated by host automation software when configured to send control change messages. Look here more information about MIDI Expression [parameter feedback](#) capabilities.

Settings for Push

If your rotary encoder functions as a momentary switch when you press down the knob, you can configure that switch the same way you would a sustain pedal or footswitch. Please consult the [wiring diagram](#) to ensure you connect it correctly.

MIDI Routing

The Routing page looks different depending on the type of MIDI Expression you have connected.. The settings are organized in vertical columns. Each column represents a source of input. The MIDI Expression iO in pictured below has 3 pedal inputs, 1 MIDI DIN In, and 1 USB MIDI In, for a total of 5 sources of input.



Each source of input can be routed to the MIDI Transformer, to the USB Host, and the MIDI Din out by clicking on their respective toggle buttons. Note that only MIDI Expression iO devices will have the options to route MIDI Out Din.

NOTE: When the MIDI Expression iO is powered by a USB charger or DC Jack, it automatically goes into standalone mode. In standalone mode, the routing settings here have no effect. Instead, MIDI from the MIDI in DIN is automatically merged with the pedal inputs and sent out through the MIDI Out DIN.

USB MIDI Loopback ↻


This control is only available for the single input MIDI Expression and the Quattro which lack advanced routing. When this control is enabled, any MIDI entering the device via the USB connection is sent right back out over the USB. In this configuration the MIDI Expression is operating like an external MIDI effect. Used in combination with the MIDI Transformer, this feature allows you send MIDI Data from a host application, process it, and then return it to the host.

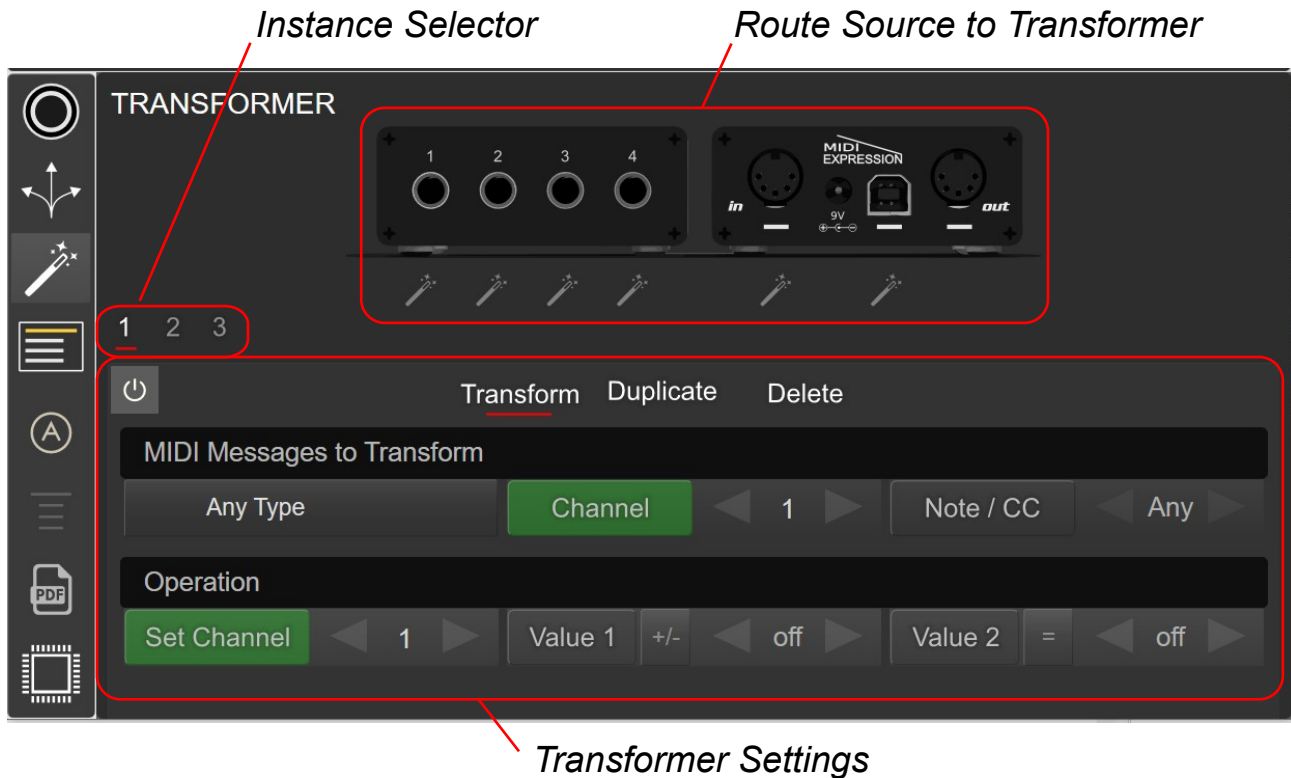
Resolution

You can adjust the maximum MIDI resolution of each pedal input. Low = 50 values / second, Norm = 125 values / second, High = 250 values / second, and Max = 500 values / second.

MIDI Transformer

The MIDI Transformer is a MIDI effect that lets you dynamically manipulate MIDI messages passing through your device in real-time. A typical application might be to allow a single expression pedal to control multiple parameters by changing it's MIDI channel of CC using a sustain or a footswitch.


You can open the routing page by clicking on the  icon in the page bar on the left.



The transformer is typically used by routing a source of MIDI, an expression pedal for example, though the Transformer, while another pedal, a sustain for example, is used to turn the Transformer on and off, or used to adjust how the transformer affects the MIDI.

Routing MIDI to the Transformer

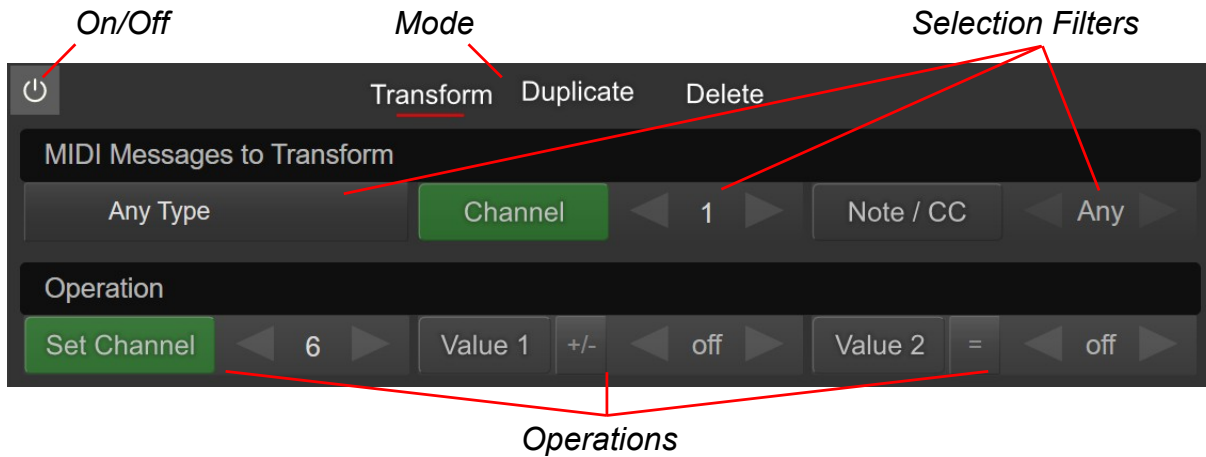
Each source of MIDI, including the pedal inputs, the MIDI In DIN, and the USB MIDI can be routed the transformer instance(s). The single input MIDI Expression only has one of these instances, while the Quattro and iO each have three.

Click on the  icon below a source of MIDI to route its MIDI. When the MIDI from a source is being affected by the Transformer, its icon will flash orange.

The MIDI Expression Quattro and iO each have three MIDI Transformer instances, You can switch between instances by clicking on the numbers in the Instance Selector. The single input MIDI Expression only has one instance.

Setting Up an Instance of the Transformer

Each Transformer instance can be set to transform a MIDI message, duplicate it, or delete it. When you transform a message, the original message is no longer sent. Using 'duplicate' mode, an additional message is sent along with the original allowing a pedal to send multiple messages.



On/Off Button

The power button enables / disables an instance of the transformer. These buttons can be toggled in real-time using a sustain or footswitch connected to the device. Look [here](#) for more information about assigning pedals to Transformer Controls.

Selection Filters

By default, an instance of the transformer will process any compatible MIDI messages, but you can filter the messages that will be processed by type, channel, or the value of the second MIDI byte.

Operations

When transforming or duplicating messages, you can adjust the MIDI Channel, Value 1, and Value 2 of a message. Each of these parameters can be enabled or disabled by clicking on its label. Labels with a green background are enabled. Like the power button, these parameters can be adjusted in real-time using pedals.

The Value 1 and Value 2 operators can each operate in two different modes. Click the Mode button to switch between modes.

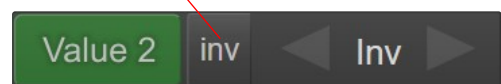
Value 1 Modes



Transpose the value

Set to specified value

Value 2 Modes

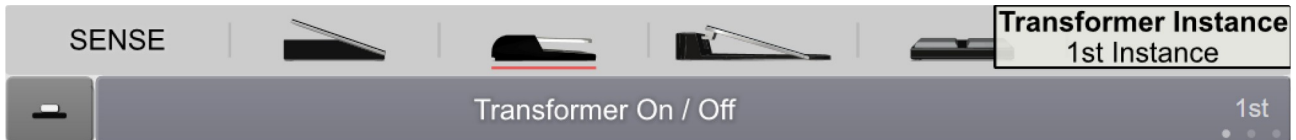


Set to specified value

Invert the value

Assigning Pedals to Transformer Settings

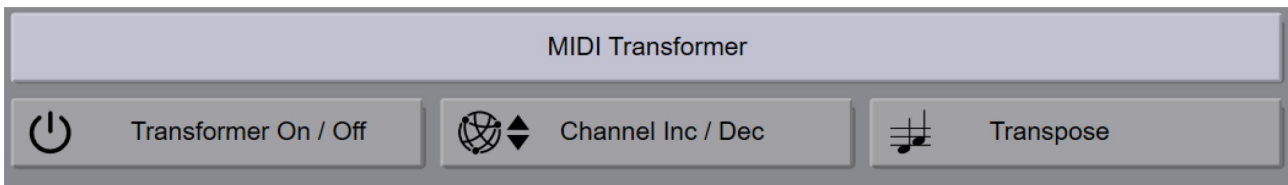
For each instance of the transformer, you can use pedals to dynamically change its settings. Assigning a transformer setting to a pedal is done by selecting a MIDI Transformer mode from the mode selector.



When you select a Transformer mode, it's automatically set to control the first Transformer instance. You can specify which instance to control by clicking on the Instance Selector control visible to the far right in the image above.

Transformer Modes for Switch Pedals

There are three Transformer settings you can control with switch type pedals.



Transformer On / Off

The Transformer On / Off mode allows you to enable / disable an instance of the transformer. An example of how you might use this would be with multi-timbral instruments. Imagine that you have a flute on MIDI Channel 1, and a bass guitar on Channel 2 and you want to access both instruments from your keyboard that's set to MIDI Channel 1. You might setup a transformer instance to transform the MIDI Channel to Channel 2 and transpose a few octaves. Then using this mode, you could have a sustain pedal toggle the transformer on and off allowing you to effectively switch between the two instruments.

Channel Inc / Dec

This mode allows you to increment and decrement the MIDI Transformer channel using a signal pedal. A quick press increments the channel value, and a long press decrements the value. For footswitch pedals, there's also a linked Channel Inc / Dec mode allowing you to use one switch to increment the channel and the other switch to decrement it.

Transpose

Designed for use with keyboards, the Transpose mode allows you to use a pedal to toggle learning a transpose value. When the pedal is pressed and held, the device monitors its USB MIDI In / MIDI In Din for a note message and uses that note to set the transpose value. If the pedal is released before the device 'sees' a note, the process is canceled.

The amount of transpose is set by comparing the value of the note to middle C (60). If the value to the note is middle C, the transpose value is set to 0. If the note value is C# (61), the transpose value is set to +1. If the note is the F above middle C (69) it'll see the transpose value to +5. The amount of transpose can be set between -60 and +64.

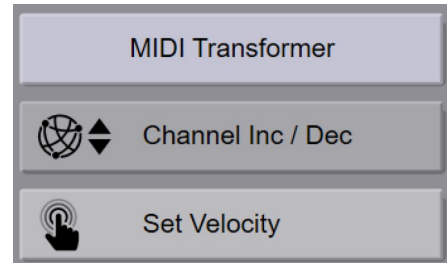
Modes for Expression Pedals

With an expression pedal or a hihat controller, there are two different transformer settings you can adjust.

Transform Channel

This mode will let you use the pedal to sweep between a range of MIDI Channels. This is great if you are controlling a Multi-Timbral instrument and would like to use an expression pedal to select which channel to transmit on.

You can use the Expression Curve to adjust the range of MIDI Channels the pedal will sweep through. Using an expression pedal to switch between 4 channels for example will be a lot more practical than trying to switch between 16.



Set Velocity

This mode lets you send the velocity (value 2) of MIDI Messages using the position of a pedal.

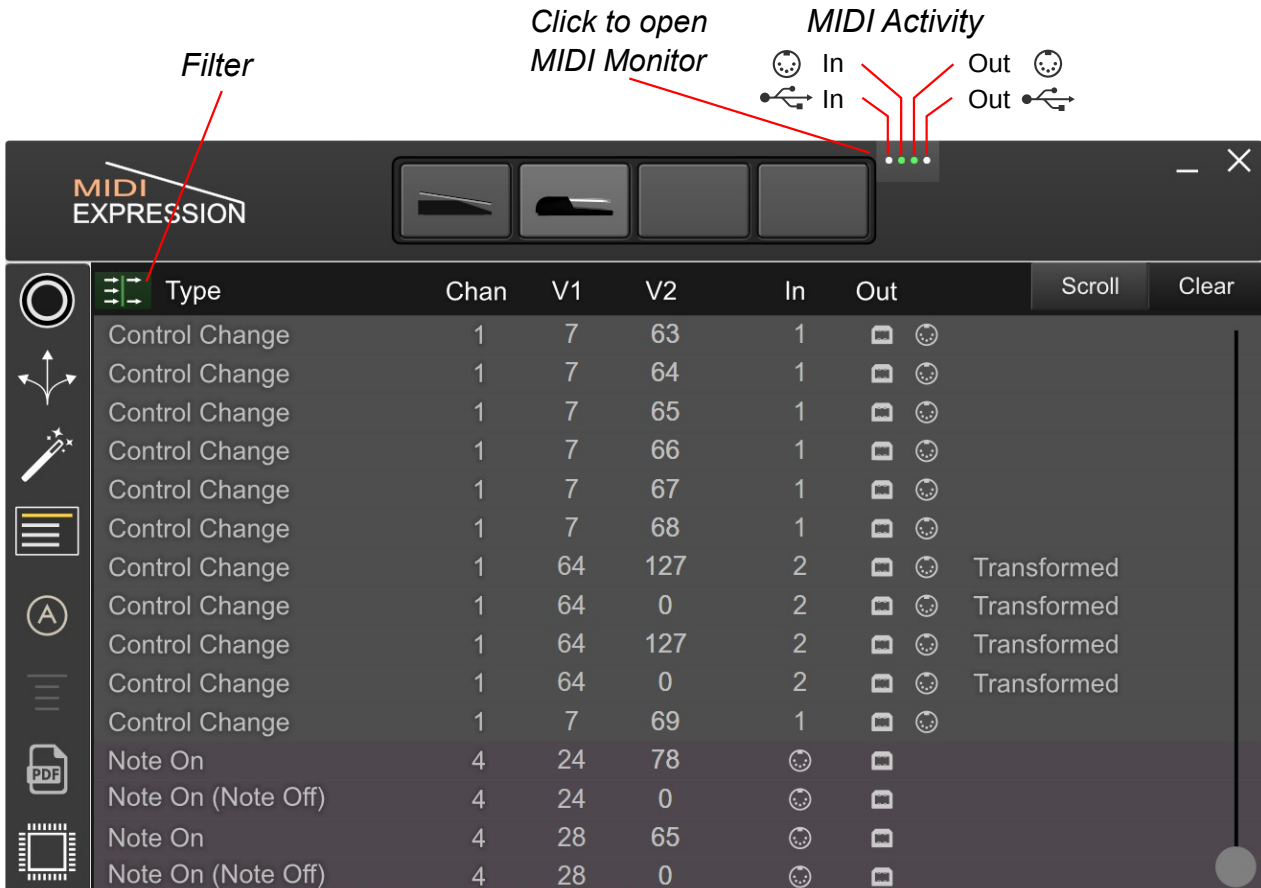
This might be useful if you have a keyboard for example that doesn't have velocity sensitive keys.

You could effectively use the expression pedal to encode the velocity of the notes.

MIDI Activity Monitor

The MIDI Activity Monitor gives you feedback about how MIDI is entering and leaving your device.

The four LED dots will light green indicating the presence of Active Sensing and MIDI clock messages, and red for all other messages. Click on the dots to reveal the complete MIDI Monitor.



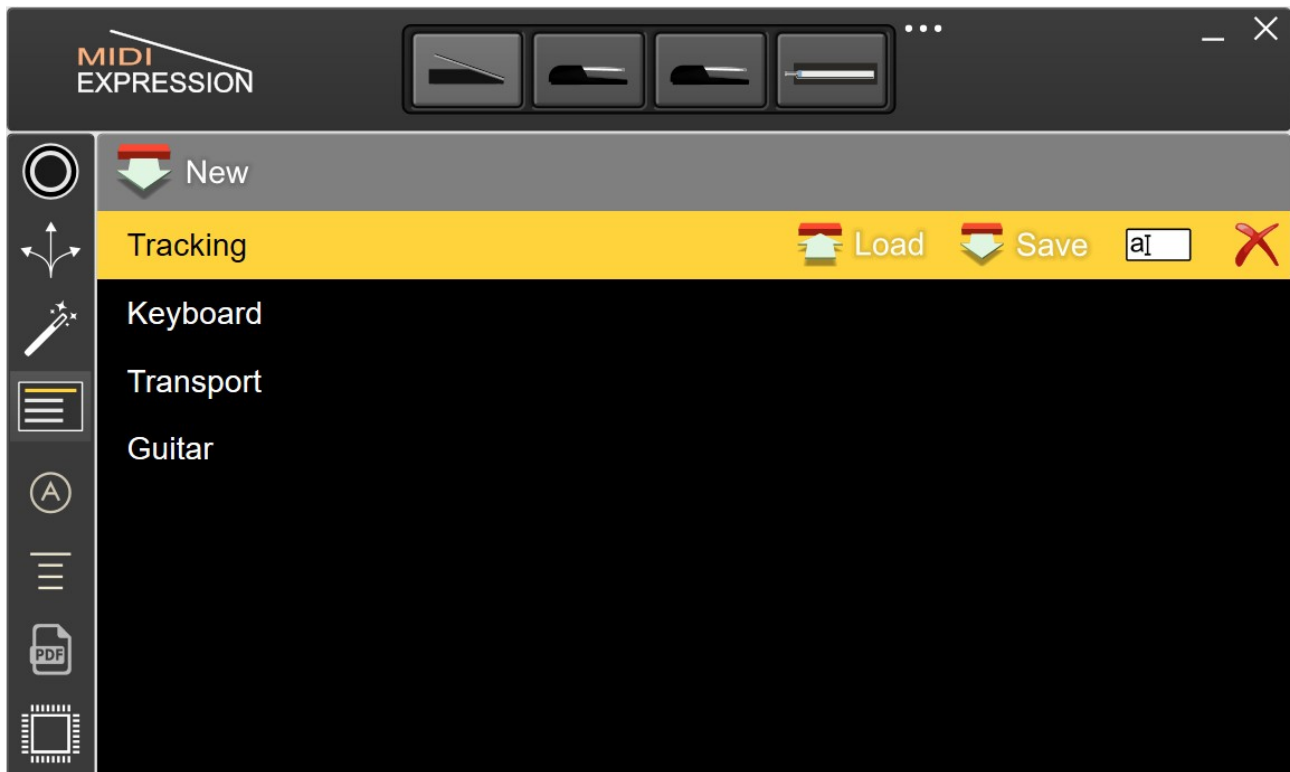
The MIDI Monitor has a buffer of 1000 events. Once the buffer is filled up completely, earlier events will be dropped to make room for new ones. To function efficiently, messages do not arrive in real-time. They are buffered and sent in packets and can arrive up to 100ms after the actual MIDI event.

For those familiar with MIDI message format, the MIDI Monitor layout will be very intuitive. The messages are tracked from their source (In) to their final destination (Out).

Filter

On by default, this filters out Active Sensing, MIDI Clock, and Note Off messages. The vertical bar in the middle of the icon will flash when MIDI messages are actively being filtered.

Snapshot Manager



The Snapshot Manager lets you save and load entire snapshots of a MIDI Expression device's internal memory to local storage. These snapshots can be used to quickly swap between different configurations of the device, to create a backup of your settings, or to copy the settings from one device to another.

Note: You can load a snapshot by clicking on the load icon. Alternatively, you can simply double click a snapshot to load it.

AU / VST Control Application

Using the plugin version of the Control Application allows you to save and load custom configurations for your MIDI Expression devices along with your projects in your audio sequencer. The plugin version of the control application is available in VST and AU formats for Windows and OSX.



If you haven't already read about the differences between the Standalone and Plugin versions of the control application, I recommend you read [this](#) first.

Why Would You Want to Use It?

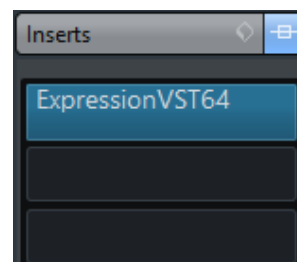
Most people will likely want to use the standalone Control Application, but here's a quick list of situations where you might want to consider the Plugin version.

- You want to temporarily change the function of a pedal for a particular project.
- You want to be able to store and recall complete configurations for all your MIDI Expression devices with a click of a button.
- You want to use host presets to quickly change the function of your pedal to suit aspects of your work flow.
- You use a INC / DEC mode and you want the current value of saved along with your project so it's not lost when you switch to a new project.

Adding the Plugin To Your Project

The plugin version of the Control Application is an audio effect and as such, you can insert it on an audio track much like you would any other audio effect.

The plugin does not actually change the audio passing through it, so you can safely insert it pretty much anywhere in your project, but you should probably avoid putting it on any track that you might freeze.



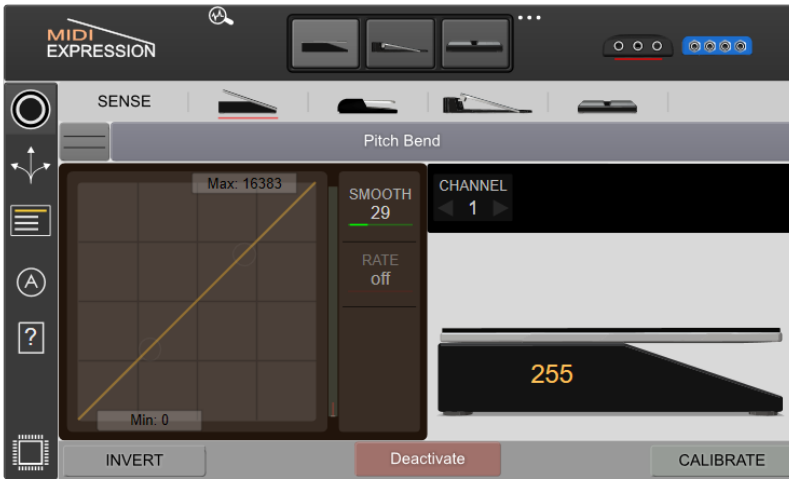
Activating and Deactivating inputs

The plugin version works by putting MIDI Expression inputs into 'plugin mode'. In this mode, settings for the inputs are managed by the plugin, and any changes you make to the presets are saved within the plugin itself.



Before the plugin takes control of a MIDI Expression input, the input needs to be activated first.

Any inputs that are not activated will not be managed by the plugin and their settings can still be adjusted using the regular control application.



You can deactivate an input an input by clicking on the red Deactivate icon at the bottom of the interface.

When an input is deactivated, the settings from the plugin are offloaded and the settings saved on the device itself are restored.

Activating and deactivating an input effectively lets you switch between using the settings stored in the plugin and the settings stored in the device.

Similarly, when the plugin is removed or the project is closed, all settings stored in the plugin will be offloaded and the settings stored on the devices themselves will be restored.

Toggling between activating and deactivating an input effectively lets you swap between two configurations for that input.

Using presets

Taking advantage of your host sequencer's preset system, you can load and save settings for any number of MIDI Expressions with a single mouse click.

iOS Control Application

The control application is available as an iOS app from the Apple App Store. Keep in mind that only devices using firmware version 2.6 or later are compatible.

Getting Connected

Because the iOS version of the Control Application communicates using System Exclusive MIDI messages, there are several way in which they can connect to one another: over USB MIDI using the camera connection kit, or Network MIDI, and even with MIDI cables connected to a 3rd party MIDI Interface (MIDI Expression iO only).

When the Control Application is opened, it sends out a sync request over all available MIDI ports. Any connected to devices will respond the this request automatically, so there is no MIDI setup that needs to be done inside the Control Application. When changes to the MIDI Setup on your iDevice occurs, the Control Application automatically resends sync requests. You can manually resync the connected device by clicking on the refresh icon.



Refresh

See below for details about the different ways you can connect your devices.

Camera Connection Kit

Using the Apple Camera Connection kit, you can connect a MIDI Expression directly to your iOS device. Using a USB hub is also supported, but if you plan to connect more than 2 MIDI Expression devices, it will likely need to be a powered hub.



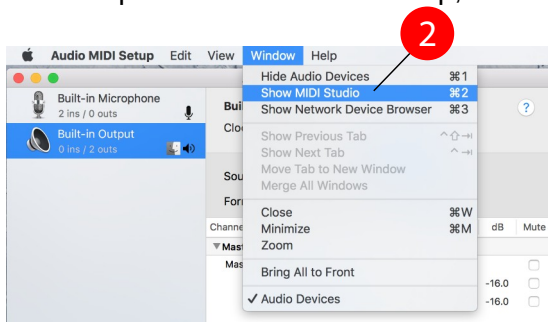
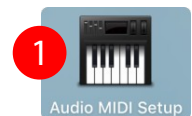
Simply plug in the devices and the Control Application should find them automatically.

Network MIDI

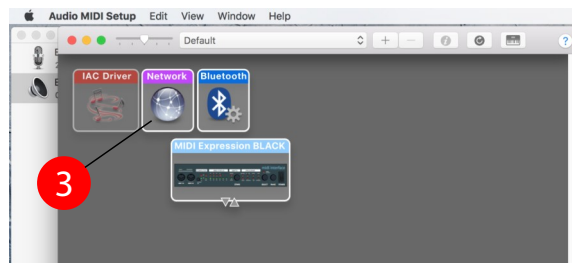
You can also use the iOS Version of the Control Application to remotely control MIDI Expression devices connected to a computer on your local network.

This is done using the Audio MIDI Setup

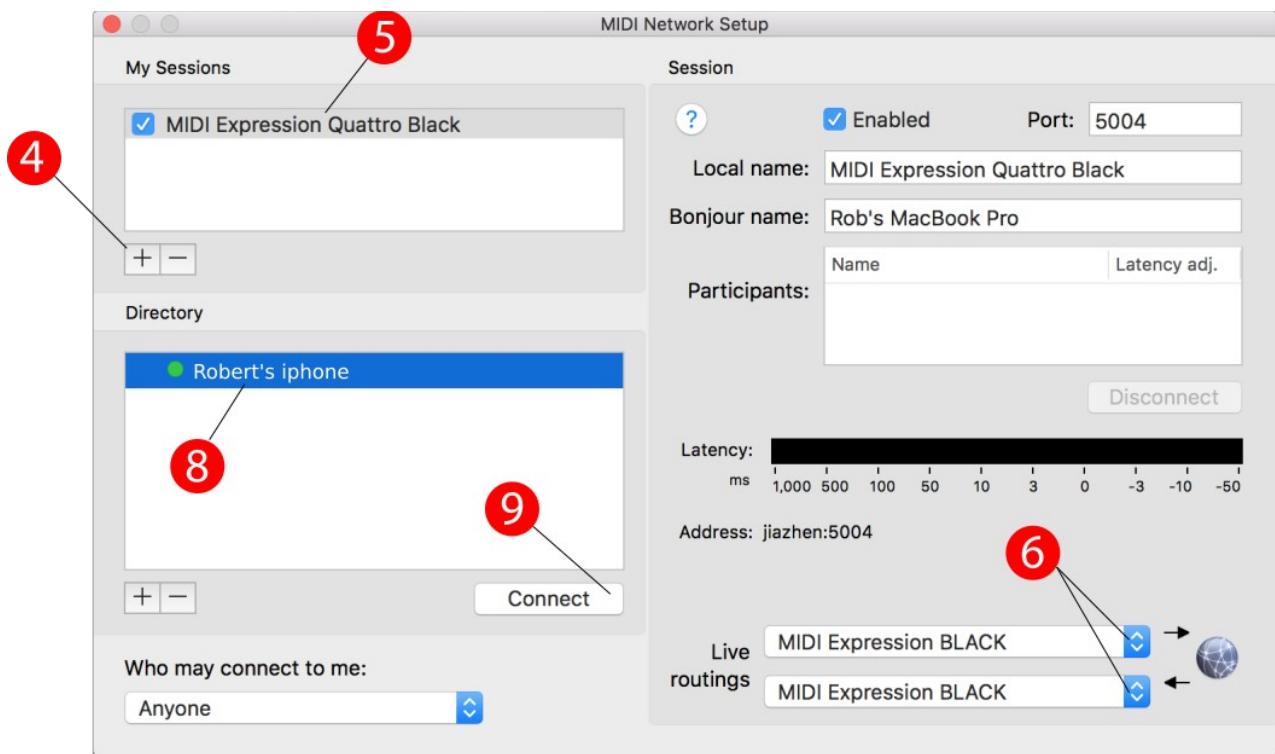
1. Open the Audio MIDI Setup, found in Utilities.



2. From the "Window" menu, select "Show MIDI Window".



3. Double click on the "Network" object.



4. Click on the + sign to create a new session.
5. Give it a meaningful name and check the checkbox to enable it.
6. Setup the Live Routings. Be careful to pick the right MIDI Inputs. Do not chose the 'Network' MIDI connections.
7. Open the Control Application on your iOS device.
8. Select your iPhone or iPad.
9. Click on the Connect button.

That's it. The Control Application should automatically find and connect to your MIDI Expression. You'll need to create and connect to a different session for each MIDI Expression device you want to connect to over the network.

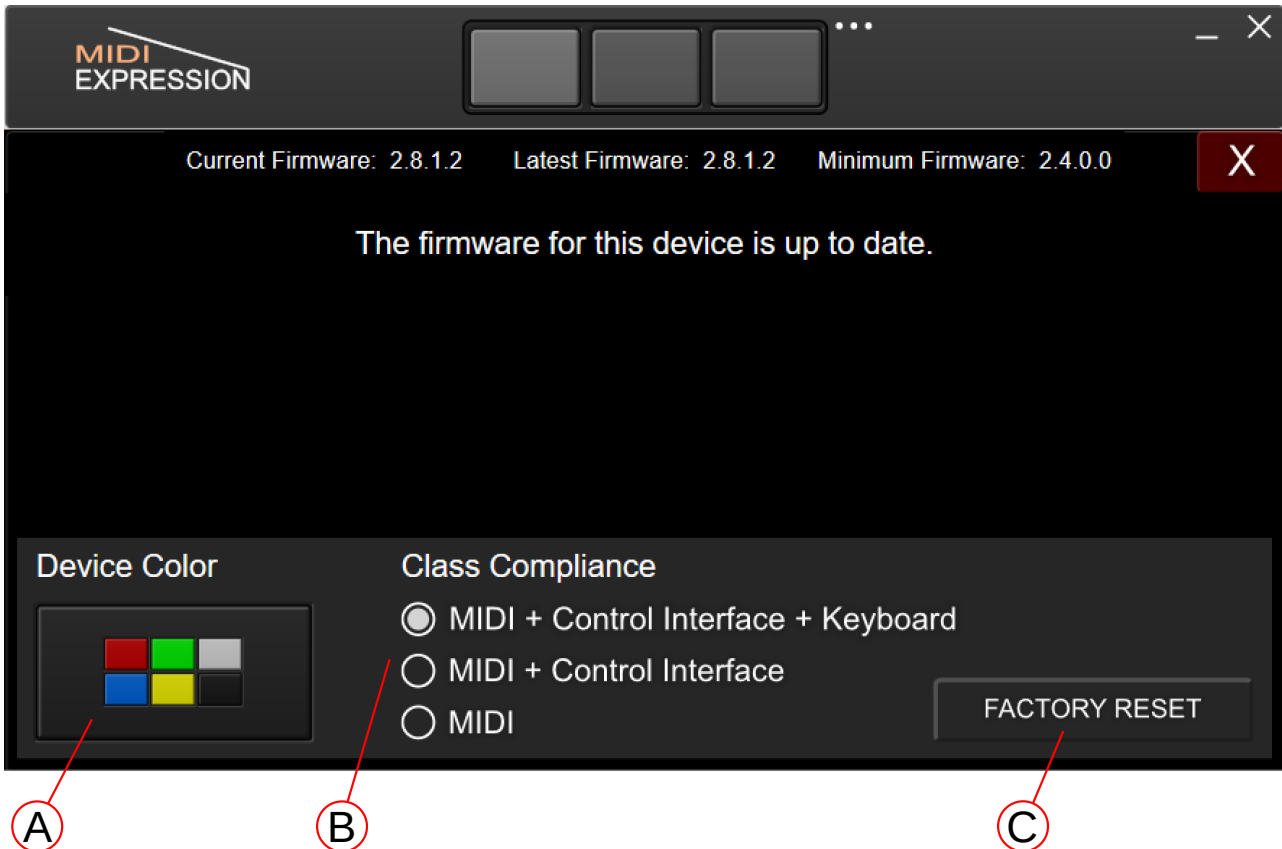
MIDI Cables (MIDI Expression iO)

If you have your MIDI Expression connected to a third party MIDI Interface, such as an iConnectMIDI4+, you can Control your MIDI Expression iO provided both MIDI In and MIDI Out cables are connected. When you start up the Control Application, it should automatically find any connected devices. If you connect your device after the Control Application is already open, click on the refresh icon start search for connected devices.



Updating the Firmware

The MIDI Expression firmware is periodically updated to add new features or fix bugs. The latest firmware for MIDI Expression devices is always included with the MIDI Expression Control application. The firmware can be updated or changed by clicking on the Firmware Update icon located at the bottom of the sidebar. Please note that the iOS version of the Control Application does not support updating device firmware, but does allow you to change the color and Class Compliance.



(A) Changing Colors

If you have more than one MIDI Expression of the same color connected to the same computer, you might want to change the 'color' of one of the devices in order to change the name of its MIDI port to prevent your host sequencer and yourself from getting the devices mixed up.

(B) Class Compliance

MIDI Expression devices combine several USB interfaces, including a USB MIDI Interface for sending MIDI, an HID for communication with the MIDI Expression Control Application, and a keyboard interface for sending key-commands.

To maintain maximum compatibility with 3rd party gear with USB Host ports, you can change the interfaces that are exposed. The various setups are described on the next page.

MIDI + Control Interface + Keyboard

This is the default and preferred setup when using the MIDI Expression connected to a PC or Macintosh computer.

MIDI + Control Interface

This setup removes the keyboard interface. This is the preferred setup when using the MIDI Expression with an iOS device and many 3rd party USB Host ports. On iOS devices, the keyboard interface can interfere with the iOS on-screen keyboard, so unless you really need to send key-commands to your iOS device, then you'll have a better experience using this setup.

If you are having trouble getting your MIDI Expression to work connected to a 3rd party USB Host port, then try using this setup before attempting to use the pure 'MIDI' setup described below.

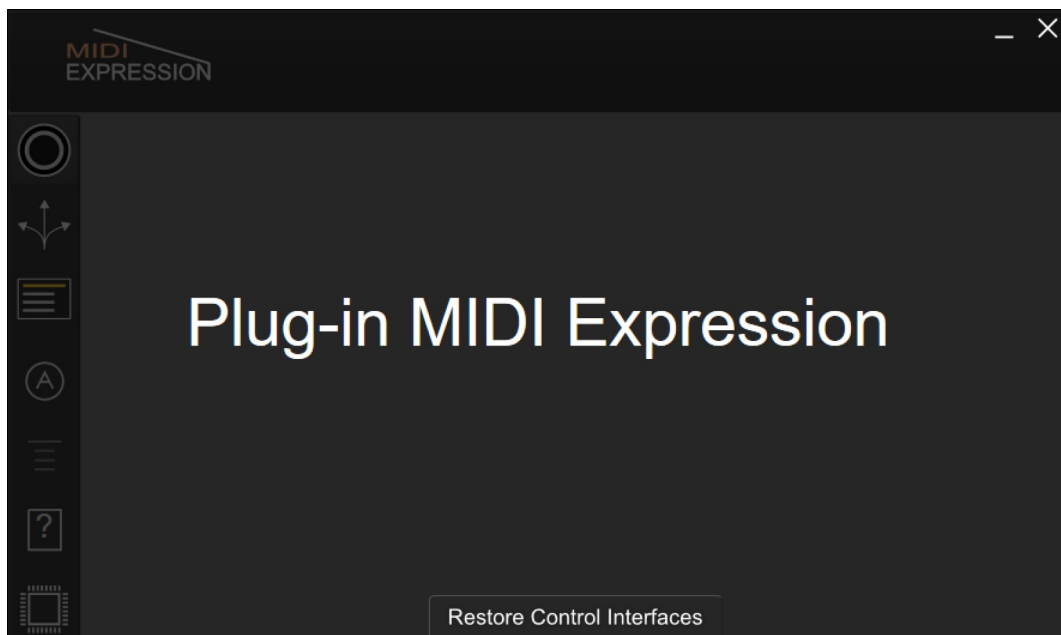
MIDI

If your device will not work connected to a 3rd party USB Host port using the MIDI + Control Interface, then you can try using this pure MIDI interface. Please keep in mind that the device settings cannot be edited using the Control Application with this setup, except using the iOS version of the Control Application. You can however restore the Control Interface using the MacOS or PC version of the Control Application.

Restoring the Control Interface

If you have put your MIDI Expression into the 'MIDI' only setup, you can easily restore the Control Interface using the Control Application.

When you plug-in your device and start the Control Application, any devices that are in the MIDI only setup can have their Control Interfaces restored by clicking on the 'Restore Control Interlaces' at the bottom of the screen. PC users should take care to ensure no applications are currently accessing the MIDI Expression MIDI port as this will prevent the Control Application from communicating with the device.



Using Parameter Feedback

Parameter Feedback allows pedals and controllers connected to a MIDI Expression to stay in sync with your music applications. Sustain pedal, footswitches, rotary encoders, and ribbon controllers are all capable of parameter feedback, depending on the types of messages they are configured to send. Expression pedals and hihat controllers are not.

Sync with Host Automation

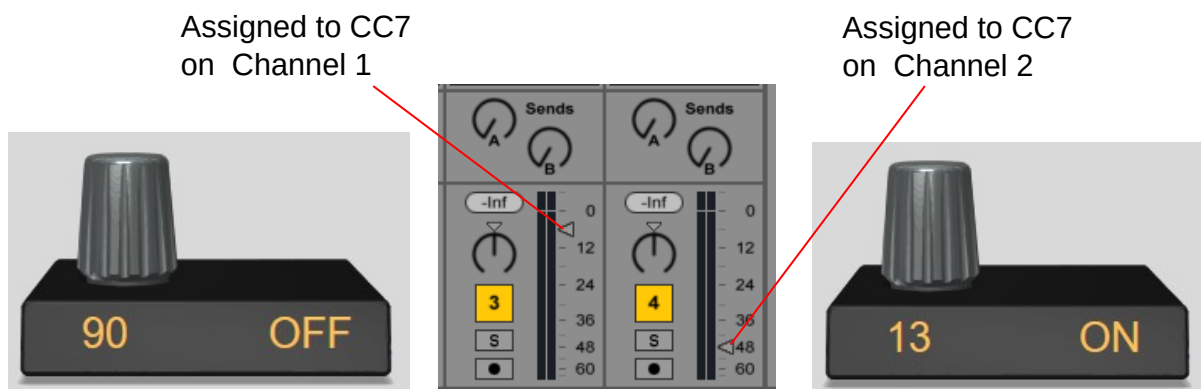
If you use host automation to control parameters in your DAW, when you move the control in the DAW, it will send MIDI feedback to the MIDI Expression allowing it to update its settings.

For example, if in Ableton you assign a rotary encoder to the volume fader of a track, when you move the fader in Ableton with your mouse, the value of the encoder stored in the MIDI Expression will be updated so the two stay in sync.

Sync with Transformer

In fact, the MIDI Expression remembers the value of all Control Change and NRPN messages for all channels. This allows the MIDI Expression to update its values even when changing control change assignments or when using the **MIDI Transformer** to dynamically modify MIDI messages.

For example, let's assume the knob of a rotary encoder is setup to send control change message 7 on channel 1, and the push button is used to dynamically transform the channel of the encoder between 1 and 2. If the volume of track 1 is assigned to CC7 on channel 1 and the volume of track 2 is assigned to CC7 on channel 2, then using the pushbutton to turn on or off the transformer will cause the value of the encoder to update maintaining synchronization.

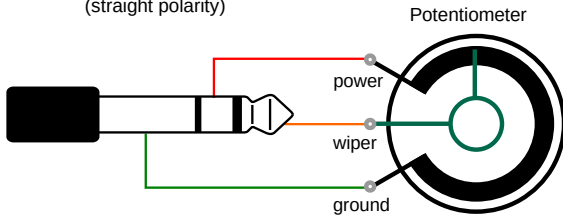


Using the push encoder to transform the knob's channel between 1 and 2 causes the knob's value to automatically update and maintain synchronization.

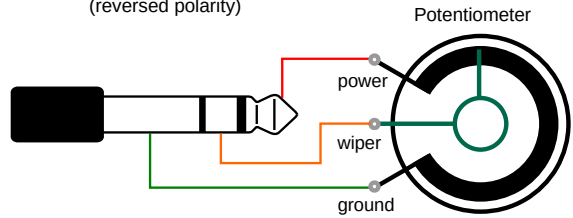
Wiring Diagrams

Most commercially available pedals should work fine with MIDI Expression. The wiring diagrams below are included for DIY enthusiasts who intend to build their own controllers.

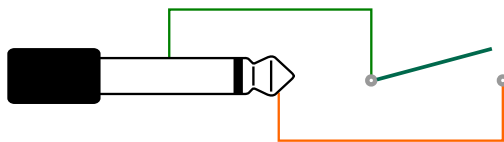
Expression Pedal (straight polarity)



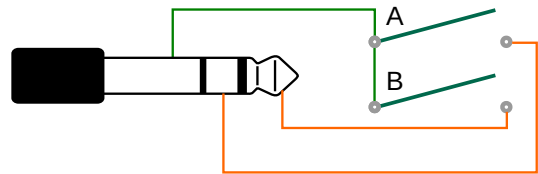
Expression Pedal (reversed polarity)



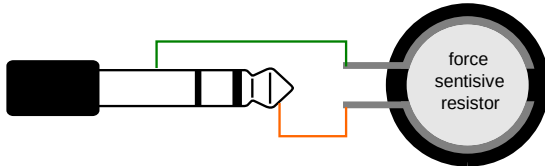
Sustain Pedal



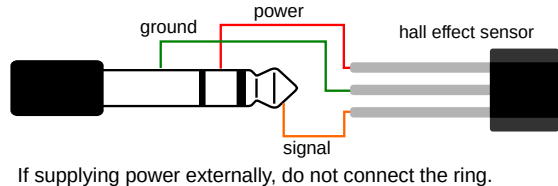
Dual Footswitch



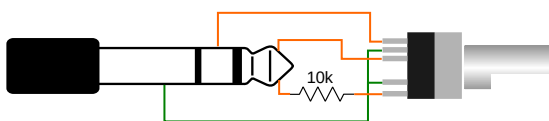
FSR Hihat Controller



Hall Sensor Hihat Controller



Rotary Encoder



Voltage on pedal inputs should be in the range of 0V to 3.3V. If externally powering a pedal input, you risk damaging the pedal input if the voltage goes outside of this range.

MIDI Implementation

MIDI Expression MIDI Implementation

Function	Transmit	Respond	Passthru	Remarks
Channel	1 - 16	1 - 16	1 - 16	Learn Note
Notes	0 - 127	0 - 127	0 - 127	Learn Note
Velocity	1 - 127	X	0 - 127	
Aftertouch	X	X	O	
PitchBend	O	X	O	14 bit
Control Change	0 - 127	0 - 127	0 - 127	Parameter Feedback
Program Change	0 - 127	X	0 - 127	
System Exclusive	O	O	O	Control, Display
System Real-Time	X	X	O	
System Common	X	X	O	
RPN	X	X	O	
NRPN	0 - 127	0-127	O	14 bit

Updated October 4th 2021

X - Not Used

O - Used