




SA116

User's Guide

-  CHARGE.
-  CONNECT.
-  CONTROL.
-  CUSTOMIZE.



Welcome

Thank you for purchasing a Hot Hand USB Wireless MIDI Controller. Hot Hand USB is the latest innovation in music motion control from Source Audio. Hot Hand USB consists of a small wireless 3-axis motion and tilt-sensing Ring and a USB Receiver. The Receiver installs without drivers and appears as a MIDI device to your Windows or Mac PC. The MIDI output from the Receiver can be assigned to control an infinite number of parameters in your DAW (digital audio workstation) or live performance audio software to help you bring dynamic motion control to your music.

Demo Projects

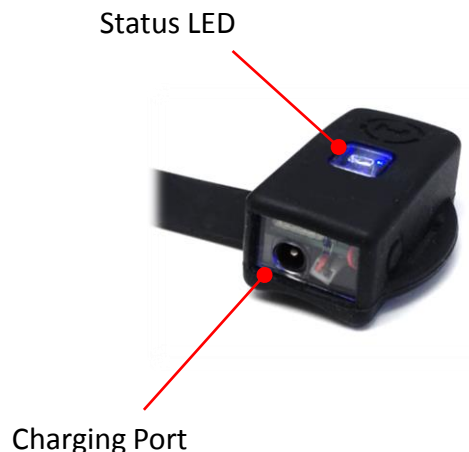
As a starting point, we have created sample projects and songs for a variety of software packages using Hot Hand to control various parameters. The project files can be downloaded from the Hot Hand USB product page:

http://www.sourceaudio.net/products/hotand/hotand_usb.php

Getting Started

Charging

To get started using Hot Hand, first you need to charge your Hot Hand Ring. The Ring can be charged by connecting the included AC adapter power supply to the charging jack on the back of the Ring. The Ring features a fast-charging and high performance Li-ion battery. When the charger is connected, the blue LED on the Ring will blink quickly. When the charge is complete, the LED will turn off. Charging time is around 1.5 hours. On a full charge, the Ring can be used for around 6 hours.



Connections and Wireless Linking

Connect the Hot Hand USB Receiver to any open USB port on your Windows or Mac PC. Drivers will install automatically. The Hot Hand USB uses built-in drivers on your computer for MIDI and requires no custom driver installation. Once the Receiver is installed on your computer, the blue status LED on the Receiver will begin to blink slowly. A slow blink means that the Receiver is ready to pair with a Ring.



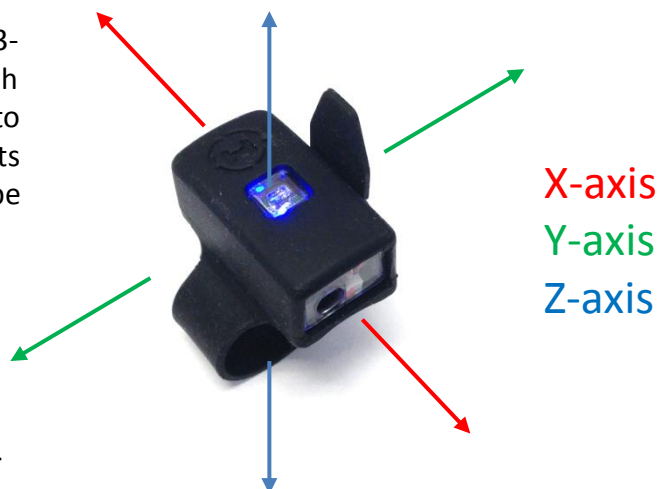
Holding the Ring close to the Receiver, press the small ON/OFF button on the side of the Ring to start the wireless link. Both LEDs on the Ring and the Receiver should turn solid blue indicating that the link is complete. The Ring is now sending motion control data to the Receiver and is ready for use. Note that the Ring should be turned off when not in use to conserve battery life. Up to four Hot Hand Ring/Receiver pairs can be used in one area at the same time. This includes Hot Hand 3 devices as well (see sourceaudio.net for more information on the Hot Hand 3). The Hot Hand USB Receiver has four LEDs to indicate which of the four channels is currently being used.

If multiple devices are in use, take care to link rings and receivers one at a time, holding the rings close to the desired receiver when making the initial connection. Once a Ring/Receiver pair has been established, you can turn rings on and off as needed and the link will remember the correct channels and Ring/Receiver pairs. The Ring and Receiver will stay paired until the Receiver is unplugged or a “Radio Reset” is performed from the Hot Hand USB Editor software.

Controlling

The primary sensor on the Hot Hand USB Ring is a 3-axis accelerometer. Accelerometers can detect both motion and “tilt” (the position of the Ring relative to the ground). Moving the Ring quickly or changing its position slowly will create control signals that can be used to control a variety of audio effects. For example, bass wobbles, filter sweeps, delay times, modulation effects, and beat repeats can all be control dynamically with the motion of your hand.

The 3 axes of the motion sensor are arranged as shown in the diagram. Any motion along an axis or any change in tilt will create a changing control signal that can be used to create a MIDI output.



To understand the basics of Hot Hand motion control, it's helpful to know how to move or position the Ring to get the most reliable signal output. The following photos illustrate the direction of motion and hand positions for each sensor axis of the Hot Hand Ring:

Motion map:



Tilt Positions:

X neutral



X maximum



X minimum



Y neutral



Y maximum



Y minimum



Z neutral



Z maximum



Z minimum



Controlling continued...

The motion data from the Ring is sent to the Receiver where it is processed and converted into MIDI signals. MIDI is a very common means of sending control information from audio hardware to audio software or vice versa. MIDI is even used for a number of non-music purposes since it is very simple to use and implement. Most Digital Audio Workstation (DAW) software, soft synths, or virtual instruments will allow users to assign MIDI controls to a variety of parameters. Some examples of popular software packages are Ableton Live, Native Instruments Traktor, Propellorheads Reason, Apple Logic and Mainstage.

By default and out of the box, the Hot Hand USB will output three different MIDI messages using the three-axis data from the Ring. These are:

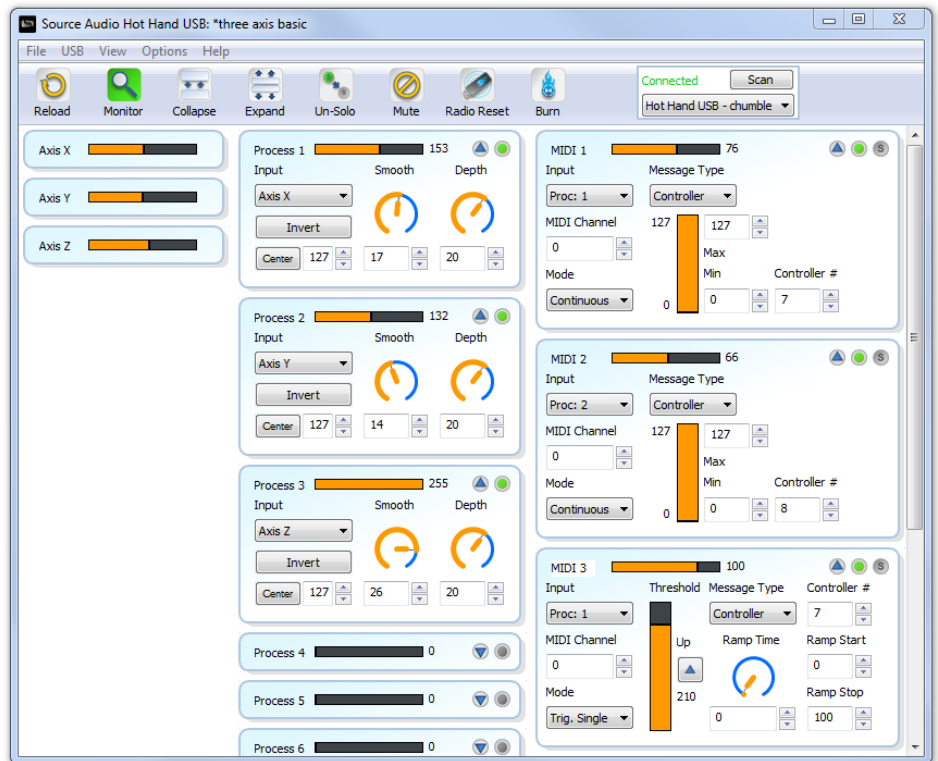
- X-axis - MIDI Continuous Controller (CC) 7
- Y-axis - MIDI Continuous Controller (CC) 8
- Z-axis - MIDI Continuous Controller (CC) 9

Continuous Controller (CC) messages are commonly used to control knob based parameters in audio software and hardware. Other MIDI message types are used for Note ON/OFF, Pitch Bend, and Aftertouch. It's important to note that the response of the Ring, MIDI Message types, controller numbers, and channels can all be easily changed using the Hot Hand USB Editor software.

Customizing with the Editor Application

Once you have a basic understanding of Hot Hand, you'll likely need to tweak the signals and MIDI messages to suit your needs. This can be done with the Hot Hand USB Editor, a software tool that can be downloaded from the Hot Hand USB product page.

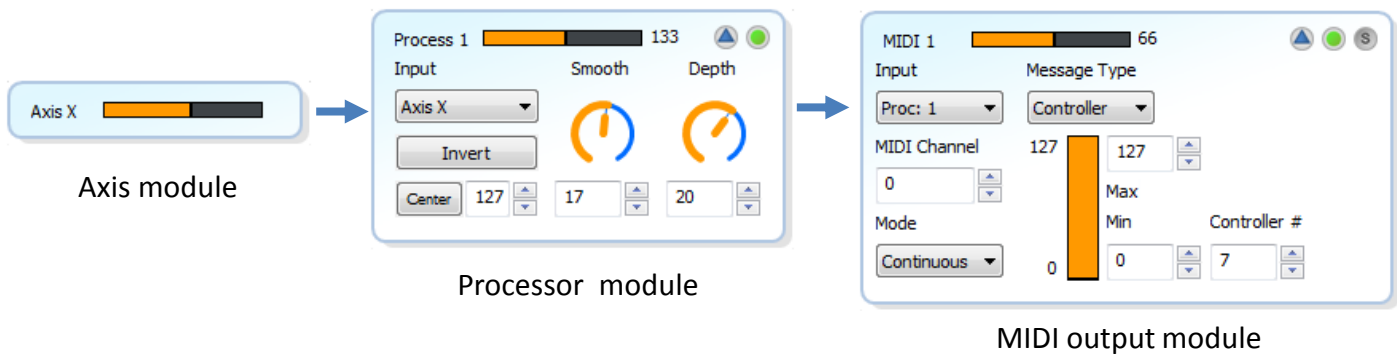
The application is available for both Windows and Mac. Simply download and run the installer packages to install the software on your computer.



Hot Hand USB Editor screenshot

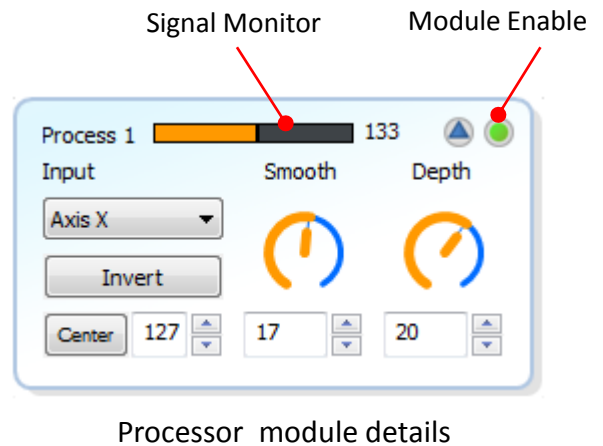
When you first start the software editor it will connect automatically to the USB Receiver and load a 3-axis basic preset that matches the default configuration which was preloaded on the USB Receiver. You can use the application to edit, save, load, and burn presets to the USB Receiver. Once a preset is burned, it will be automatically loaded when the USB Receiver is connected to the computer without having to open the software editor.

The software interface is arranged in modules as a “signal flow” from left to right. Starting on the left side, you have the raw signals from the Ring for each axis. The raw X, Y, and Z signals can feed into any of the six processor modules. The processor modules are used to amplify and smooth out the raw signals from the Ring. The processor modules then feed the ten MIDI output modules which use the processed signal to create a MIDI message.



The Processor signal varies from 0 to 255 which allows for more range than a 0 to 127 signal. The Processor modules feature useful controls for working the raw outputs into usable control signals:

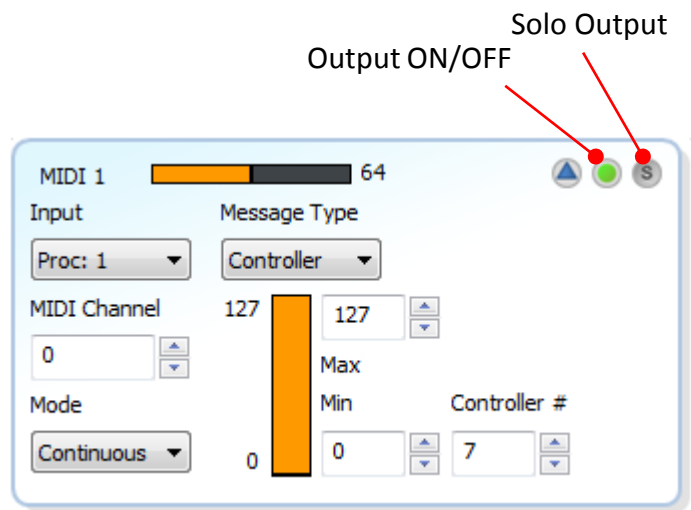
- The **Input** control selects which of the three axis signals will be used for the processor. The same raw axis signal can be used for multiple processor modules.
- **Invert** will flip the incoming raw data to invert the signal.
- **Center** sets the center point for the processor signal. By moving the center value up or down, you can create “dead zones” where there will be little or no signal output for certain hand positions. The value can be set manually or by pressing the center button, the current position of the Ring axis will be used. The default value is 127 which is the middle of the 0 to 255 range.
- **Smooth** adjusts the amount of filtering applied to the Hot Hand signal. More filtering will smooth out the response and make it less jittery. In some cases, it will be more useful to have less filtering for a faster and more responsive output.
- **Depth** applies gain (amplifies) the incoming signal for greater range. Reduce the Depth to reduce the overall signal range.



The MIDI modules take the output from the processor modules and converts it into a MIDI message. The MIDI modules can also be used to edit MIDI parameters, limit values or set up trigger events based on the input signal.

The basic controls of the MIDI modules are:

- **Input** selects which processor block output will be used as the input to the MIDI module. Any of the six processor modules can be used.
- **MIDI Channel** selects which MIDI Channel will be used for the MIDI output message. Numbers are 0 to 15 (called 1 to 16 in some MIDI systems).
- **Mode** dropdown menu will set the type of MIDI output to be used. Currently there are three choices: **Continuous, Trigger Single, Trigger Double**
- **Output ON/OFF** button enables or disables the MIDI output
- **Solo** button will enable only the selected output and disable all other outputs. This is a very important feature for mapping MIDI messages in any software that uses a MIDI learn approach to mapping external MIDI controls to knobs and parameters.



MIDI Module Continuous Mode

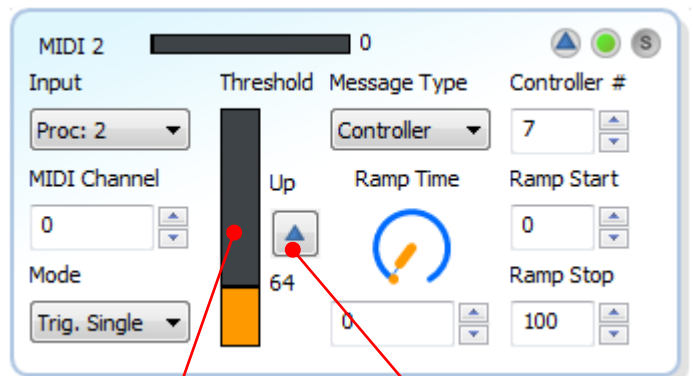
In **Continuous mode**, the MIDI output will be a constantly varying value depending on the position and motion of the Ring. This mode is useful for controlling things like filters, stereo panning, pitch shifting, beat repeaters, etc. In this mode you can edit:

- **Message Type** selects the type of MIDI output message: Continuous Controller (CC), Pitch Bend, or Aftertouch.
- **Minimum and Maximum** set the limits for high and low values of the MIDI output.
- **Controller Number** to be used, there are 128 (0 to 127) controller numbers available.

In **Single and Double Trigger** modes, the MIDI output value will jump between two predefined start and stop values. You can set a threshold and when the input to the MIDI module crosses the Threshold value, the output will ramp back and forth from Start to Stop.

The Trigger modes are handy when you want to turn an effect on or off depending on your hand position or by triggering the ramp with a quick motion of your hand. You can also use the **Ramp Time** to set how long it takes to get from the **Start** value to the **Stop** value.

Single Trigger mode will only start an output ramp when the input crosses the threshold value in one direction. This will “toggle” the output. Double Trigger will start a ramp when the threshold is crossed going up or down. The Double Trigger controls are identical to Single Trigger mode.



Threshold Control

Trigger Direction

Additional Software Features

Toolbar Controls:



Reload – refreshes the current settings from the Editor to the USB Receiver. This function will NOT burn settings to the flash memory.



Monitor ON/OFF – Enables or disables the monitor graph for each module. The graphical updates require a small amount of CPU cycles so you might want to turn them off in some cases.



Collapse – shrinks all open modules down to their minimum size. The monitor graphs are still visible.



Expand – Expands all enabled modules to their maximum graphical size.



Un-Solo – Turns off the solo function for all MIDI outputs.



Mute – Disables (Mutes) all MIDI output.



Radio Reset – Tells the Receiver to cancel the link with the currently used Hot Hand Ring and begin searching for a new Ring.



Burn – Writes the current software settings to the flash memory of the USB Receiver. Burning can be done to 128 possible memory locations. Select a memory slot to use when Burn is pressed. ***See MIDI Control Section**



Hardware Info block – Displays information about Hot Hand USB receivers that are currently connected to the computer. Use the “Scan” function to refresh the list of connected hardware. Use the drop down menu to select which USB Receiver you would like to connect to and edit. Up to four receivers can be used at a time.

File Menu: Here’s a brief description of the extra functions found in the File menu.

- **Rename** writes a name to the flash on the USB Receiver. Making it easier to tell one Receiver from another.
- **Identify** In case multiple receivers are being used this will blink the LEDs on the current receiver so that you can see which is currently in use.
- **Firmware Update** In the case that we have made changes or feature improvements to the firmware on the USB Receiver, you can update the firmware using this function. You can view the current version of firmware on your Receiver and check the web for a new version or load a specific file instead.

Advanced Features - MIDI Control

In addition to creating MIDI output, the Hot Hand USB Receiver can also receive MIDI messages from the computer. These incoming MIDI messages can be used to automate settings for a performance by enabling or disabling any of the 10 MIDI output modules or by recalling an entirely different preset from the onboard flash memory.

The Receiver will respond to two types of MIDI message inputs:

- Continuous Controllers (CC)
- Program Changes (PC)

Continuous Controller messages can be used to disable or enable any of the ten MIDI modules. Disabling the modules will “mute” the MIDI output.

Continuous Controller #	Value < 64	Value >=64
CC 0	Disable Module 1	Enable Module 1
CC 1	Disable Module 2	Enable Module 2
CC 2	Disable Module 3	Enable Module 3
CC 3	Disable Module 4	Enable Module 4
CC 4	Disable Module 5	Enable Module 5
CC 5	Disable Module 6	Enable Module 6
CC 6	Disable Module 7	Enable Module 7
CC 7	Disable Module 8	Enable Module 8
CC 8	Disable Module 9	Enable Module 9
CC 9	Disable Module 10	Enable Module 10
CC 10	Disable All Modules	Enable All Modules

MIDI Program Change messages can be used to recall “burned” presets from the Receiver without opening the Hot Hand USB Editor application at all. This way, it’s not necessary to have the software running and you can instantly recall up to 128 presets from the flash memory. There is a one to one relationship between stored presets and incoming Program Change messages:

Program Change #	
PC 1	Recall Preset from memory slot 1
PC 2	Recall Preset from memory slot 2
PC...	Recall Preset from memory slot ...

Note: The preset burned to memory slot 1 will automatically be recalled when the USB Receiver is connect to the computer.

Specifications

Radio Frequency: 2.4 GHz, ISM Band

Battery Capacity: 45mAh, 6 hours usage time

Ring Charger Power Supply: 5 Volts, 50mA, Center Positive

Limited Warranty

Source Audio, LLC (hereinafter “Source Audio”) warrants that your new Source Audio Hot Hand USB Wireless MIDI Controller, when purchased at an authorized Source Audio dealer in the United States of America (“USA”), shall be free from defects in materials and workmanship under normal use for a period of one (1) year from the date of purchase by the original purchaser. This Limited Warranty does not extend to the batteries which are purchased as is. Please contact your dealer for information on warranty and service outside of the USA.

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