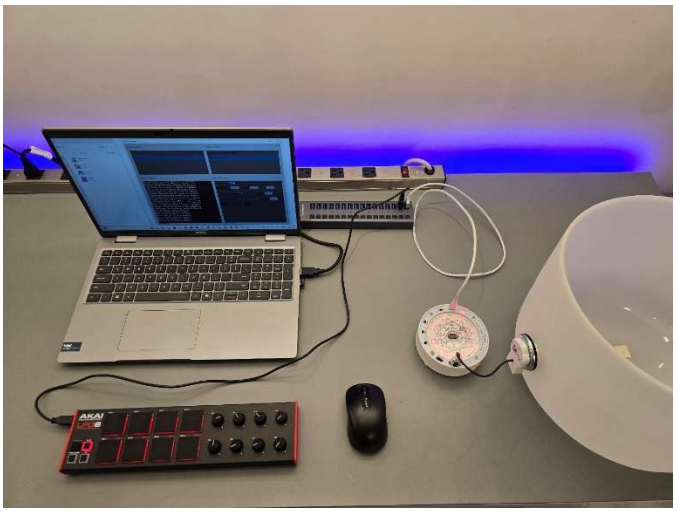
IMPORTANT NOTE

Due to some recent major updates to the Windows MIDI drivers, you MUST first update the firmware on your Musical Mushroom to 0.3.3 or higher and on your Whisperer to 1.0.6 or higher, or they will NOT work. Please visit our technical support page for instructions on how to update your firmware (www.musicalmushroom.com/support).

WHAT IS MIDI?

MIDI stands for **M**usical **I**nstrument **D**igital **I**nterface. It is a standard for connecting musical gear to a computer or to another MIDI device. MIDI over USB is the modern standard which replaces the bulky 5-pin legacy cables of the past with a USB cable, allowing your computer to talk to your instrument. MIDI over USB does not transmit audio. It sends digital data—essentially a high-speed stream of instructions—telling your instrument exactly how and when to play a sound.

Each Musical Mushroom has a built-in USB port which supports the MIDI over USB protocol as an output device. This allows MIDI instructions sent to it by a computer to control the ON/OFF state of the bowl as well as its volume in real-time for more complex wave-like modulation effects. The same USB cable also powers the Musical Mushroom (or Whisperer) keeping its internal battery fully charged during a performance.



The Whisperer wireless remote control is an optional add-on accessory which also supports MIDI over USB and acts as a transparent wireless bridge broadcasting all the MIDI traffic it receives to all its paired Musical Mushrooms. Although the Whisperer allows you to eliminate the physical wires going to the Mushrooms, **bandwidth limitations apply**. For best overall system performance and reliability, it is recommended to directly connect all your Musical Mushrooms to a computer instead of wirelessly through a Whisperer.

DIGITAL AUDIO WORKSTATION

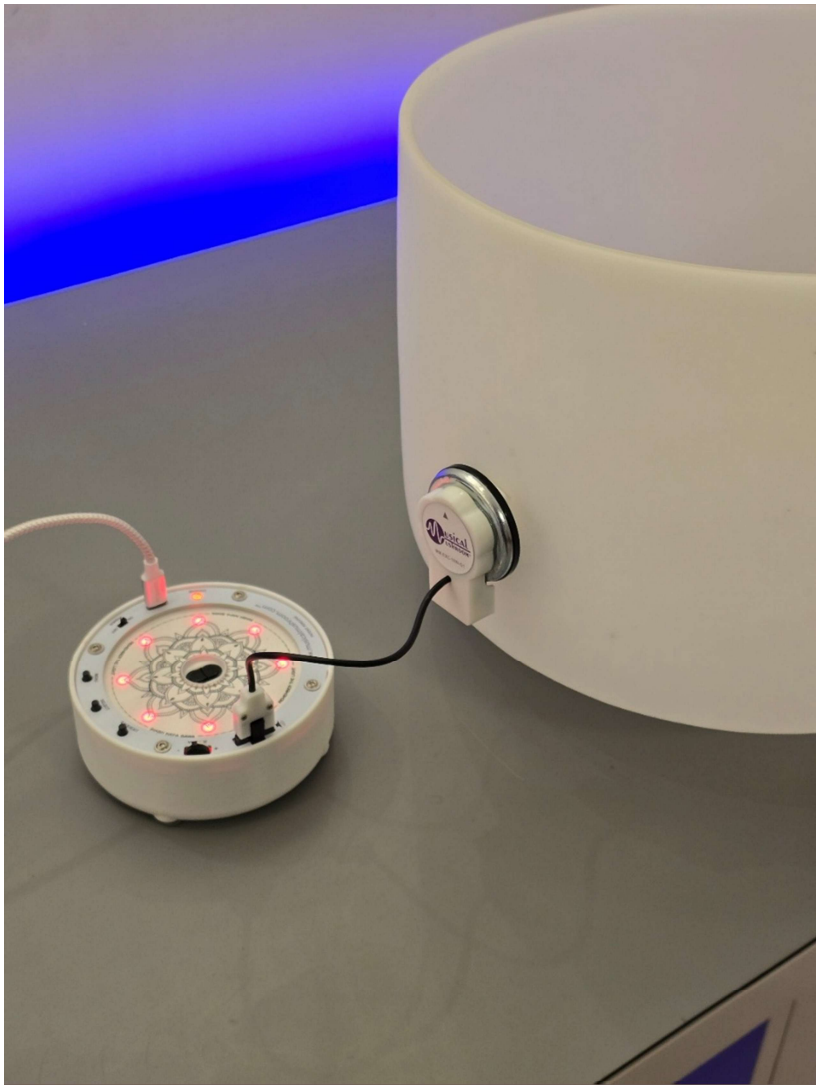
A Digital Audio Workstation (DAW) is software used to create, record, edit, and produce music or audio on a computer. It lets you work with both audio recordings (like vocals or instruments) and MIDI data (digital notes that trigger virtual instruments), all arranged on a timeline like a digital studio. In a DAW, you can layer tracks, apply effects, mix sounds, and export a finished song or project. Popular DAWs include FL Studio, Ableton Live, and Logic Pro, each offering tools tailored for different music styles and workflows.

PHYSICALLY CONNECTING THE MUSICAL MUSHROOM TO YOUR COMPUTER

You must connect the Musical Mushroom to your computer using a USB cable (potentially through a USB hub if multiple USB ports are needed). Most USB MIDI devices like the Musical Mushroom are "plug-and-play." USB class compliant. Your computer recognizes them as a standard musical peripheral immediately, no custom drivers are required.

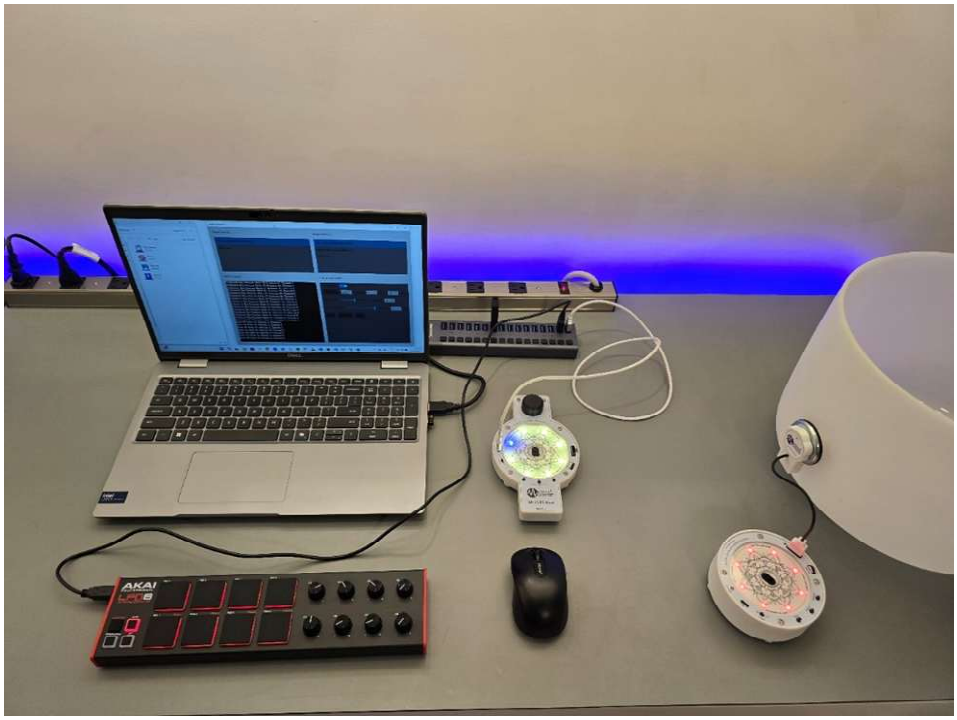
When connecting a USB cable to a Musical Mushroom inside a singing bowl, it is important to understand that the USB cable needs to be routed around the bowl so that it doesn't touch the vibrating bowl. The cable will need to be suspended in the air in some way to avoid this. A simpler approach to get around this issue altogether is to simply glue the mounting plate and exciter on the OUTSIDE surface of the bowl, between 1/3 and halfway up as shown in the picture below.

The Mushroom can then be setup next to the bowl, being careful that the rim of the bowl doesn't trip its inverted cone shaped laser sensor by placing it as far away as possible (if you are planning to only use MIDI and not the hand gesture sensor at all, you should disable the hand gesture sensor completely in the config.txt file as explained in the configuration section below).



OPTIONAL WHISPERER SETUP

If you don't want to use USB cables and are only going to send infrequent lightweight MIDI messages, you can use a Whisperer unit to wirelessly bridge MIDI messages to all its connected Musical Mushrooms. The Whisperer itself must be connected to your PC and will enumerate as a "Musical Mushroom Whisperer" device. It needs no configuration because it broadcasts ALL messages to its endpoint Musical Mushroom devices transparently. However, each Musical Mushroom still needs to be configured as if it were directly connected to a PC as per instructions in the following sections.



VIRTUALLY CONNECTING A MUSICAL MUSHROOM TO A DAW

To send commands to a Musical Mushroom unit, you first must setup your DAW to virtually connect to the Musical Mushroom MIDI device. Each DAW has a different process to do this (**please note that we cannot offer technical support on the operation of DAW software**), but in general, you have a MIDI devices setup menu and should see "Musical Mushroom" or "Musical Mushroom Whisperer" in the MIDI devices list. Select and enable it as an OUTPUT device. The factory default of the Musical Mushroom is to respond to NOTE #60 (Middle C, or C4) and to also respond to CC (control change) message #20 and MIDI channel number 1. This can be changed later. If you happen to connect multiple Mushrooms to your PC all in the same factory default state, please note that they will ALL respond to the same note by default! You need to change this default assignment to independently control each Mushroom with different MIDI notes.

MIDI MESSAGE TYPES

When you press a key or pad on your computer using MIDI DAW software, the device sends a MIDI packet of data over USB to the selected output device. A connected Musical Mushroom will receive this packet of data containing the following information:

> ***MIDI Note Number*** *(aka NOTE ON and NOTE OFF message):* Which note was played (0-127). If the note number matches the programmed note number which the Musical Mushroom is set to respond to, then it will vibrate the bowl ON at the last set volume (100% by default) or it will turn it OFF depending on whether the message is a note ON / OFF respectively. After receiving a NOTE ON message, the bowl keeps vibrating at the same volume indefinitely until a NOTE OFF message is received. While ON, any number of CC messages will change its volume dynamically. For example, a MIDI keyboard whose note is mapped to the programmed note will make the bowl vibrate while the key is pressed (NOTE ON) and stop it while released (NOTE OFF).
>
> ***MIDI Note Velocity***: How quickly the note was hit (0–127). In some instruments, the information about how quickly the note was hit is used to modulate the sounds to make it louder, etc… The Musical Mushroom currently ignores this velocity information. One exception is when a NOTE ON message velocity is set to 0, that is equivalent to a NOTE OFF message per MIDI convention.
>
> ***MIDI Channel***: Which of the 16 available "lanes" the data is traveling on (1-16). The factory default channel number is set to 1. The only way to change this is using the config.txt file described below in the Musical Mushroom. The Whisperer, by contrast simply re-broadcasts ALL messages to the Mushrooms, regardless of the channel.

SETUP OF MIDI PARAMETERS

For a Musical Mushroom to know which note to react to in the MIDI stream, an initial setup must be performed. This doesn't apply to the Whisperer since it is simply a transparent bridge and broadcasts all MIDI messages to end devices. By contrast, each Musical Mushroom end device would typically respond to a different MIDI NOTE. There are currently two different ways to setup the MIDI parameters: by using the menu buttons or by manually editing the Musical Mushroom's configuration file.

OPTION #1: MENU-BASED MIDI SETUP

For convenience, both the NOTE and CC messages can be programmed in the Musical Mushroom using its menu button and the vocal interface. The idea is to place the unit is MIDI SETUP mode. The very next NOTE or CC message it receives will be set at the programmed note. The Musical Mushroom knows the difference between a NOTE and a CC message, so you can repeat the same procedure for each one using the same menu item.

1. Make sure the Musical Mushroom is physically connected to your computer and also that your DAW is virtually connected to the Musical Mushroom as an OUTPUT device.
2. On the Musical Mushroom, press the MENU button repeatedly until you hear "SELECT MIDI NOTE"

3. Press the SELECT button
4. On your DAW, press the button you wish to associate with the Mushroom. The Mushroom will detect it and save it. Wait to hear "CONFIGURATION SAVED".
5. Repeat the process above, but this time rotate the knob or slider (sending a CC command) to program the CC value. Same menu options. The Musical Mushroom will automatically detect the different message.

After this, the Musical Mushroom should respond to these notes until a new configuration is performed to overwrite the last one or a factory reset is performed.

A caveat is that this menu-based method doesn't allow you to change the MIDI channel. The default value of channel 1 is assumed (or whichever value is currently setup in the **config.txt** file). To change the channel, you need to manually edit the **config.txt** file as described below.

This method also doesn't allow you to disable the hand gesture sensor, which might be desirable because the Musical Mushroom will by default continue to respond to gestures at the same time as executing MIDI commands. To avoid this, disable the hand gesture sensor in the **config.txt** file as indicated below.

OPTION #2: MANUAL CONFIG FILE SETUP

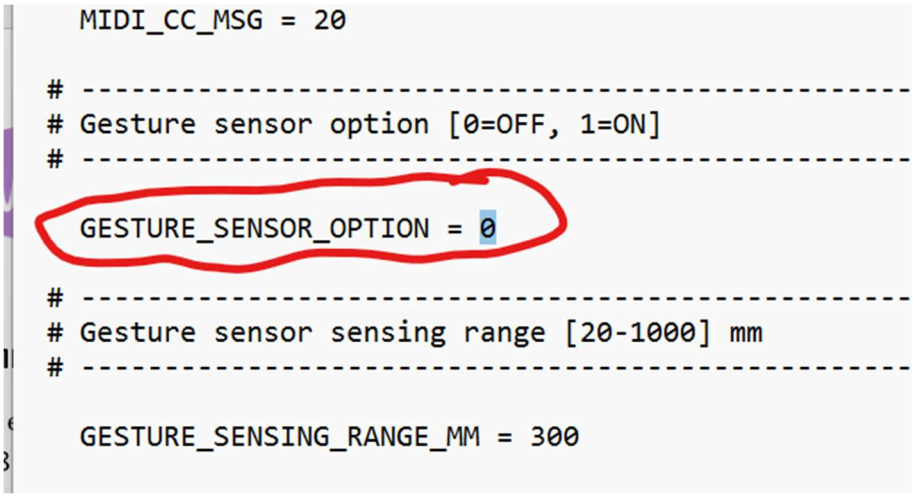
The most flexible way to customize the setup of the Musical Mushroom parameters is to manually edit the **config.txt** file manually. This file contains all the various parameter settings of the Musical Mushroom. Any time the Mushrooms' menu buttons are used, it simply changes the settings inside this file, so ALL its configurable parameters are found here.

> **WARNING**: When editing this configuration file, be careful not to add any extra characters or whitespaces as every character is counted and extra spaces may cause unintended behaviours. Should mistakes happen, you can always do a factory reset to regenerate the standard config file.
>
> **Factory reset procedure**: Power OFF. Hold down the three buttons MENU/SELECT/SAVE&EXIT at the same time. While holding them, switch ON and keep holding until WHITE LED's. That will cause a factory reset and clear all the settings.

To access the **config.txt** file, first switch OFF the Musical Mushroom or Whisperer. Connect the USB port to your computer using a cable. Hold down the MENU button. While holding down this button, switch ON the power and wait until the LED's are blue. At that point, you can let go the button. On the computer, you will see a drive letter explorer window pop-up with the **config.txt** file inside it. Open this text file with a standard text editor such as Notepad on a Windows PC and scroll down to the following sections.

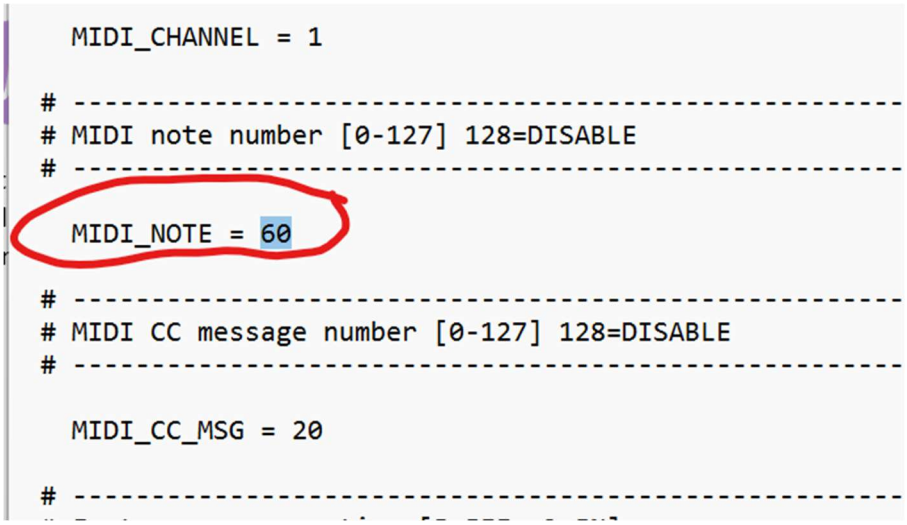
First, you can disable the hand gesture sensor if you don't want it to erroneously active the Musical Mushroom while you are using the MIDI interface. To do this, change the **GESTURE_SENSOR_OPTION** parameter to be 0.

* Should you wish to play the Musical Mushroom normally with hand gestures later, remember to reverse this setting to a 1 or simply do a factory reset.



Secondly, find the **MIDI_NOTE** parameter and set the desired MIDI note number (0-127) which the Mushroom will respond to. It is possible for multiple mushrooms to respond to the same note number if desired, but generally we want each mushroom to have its own note. Note number can be assigned arbitrarily and don't need to match the note of the bowl. It is a matter of personal preference.

Use the special code 128 to disable this feature.



Thirdly, find the **MIDI_CC_MSG** label and set the CC note number (0-127) which will be used to change the volume of the Mushroom. This part is optional. If you only want the Mushroom to be 100% ON / 0% OFF, then you don't need a CC note number and can disable this feature by setting it to 128.

```
# ------------------------------------------------
# MIDI note number [0-127] 128=DISABLE
# ------------------------------------------------

  MIDI_NOTE = 60

# ------------------------------------------------
# MIDI CC message number [0-127] 128=DISABLE
# ------------------------------------------------

  MIDI_CC_MSG = 20

# ------------------------------------------------
# Gesture sensor option [0=OFF, 1=ON]
# ------------------------------------------------

  GESTURE_SENSOR_OPTION = 0
```

Finally, find the **MIDI_CHANNEL** label to set the MIDI channel (1-16). 1 is the default.

```
# ----------------------------------------
# WIFI channel number [1-14]
# ----------------------------------------

  WIFI_CHANNEL = 6

# ----------------------------------------
# MIDI channel number [1-16]
# ----------------------------------------

  MIDI_CHANNEL = 1

# ----------------------------------------
# MIDI note number [0-127] 128=DISABLE
# ----------------------------------------
```

Once completed, save the config.txt file by using your text editing software File->Save function. Once saved, switch OFF the Musical Mushroom. Wait a second and switch it back ON. It should now be programmed with the MIDI notes selected!

Repeat this entire procedure for every Musical Mushroom connected to your system.

TEST CONNECTIVITY

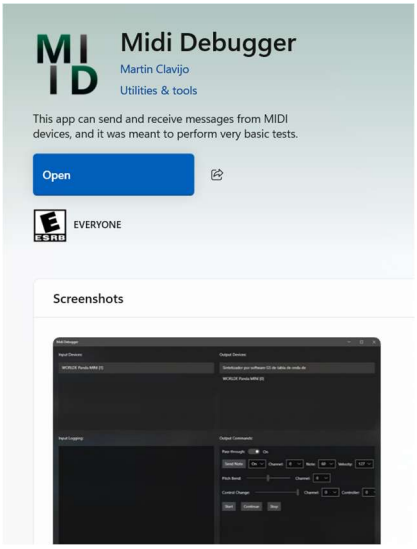
Now that the Musical Mushrooms are all setup, connect them to your computer physically as well as virtually to your DAW software as output devices. Pressing the buttons programmed in your DAW should trigger their sound ON/OFF and allow you to control their volume using the volume sliders/pots.

EXAMPLE SETUP - WINDOWS PC AND AKAI LPD8 MIDI CONTROLLER

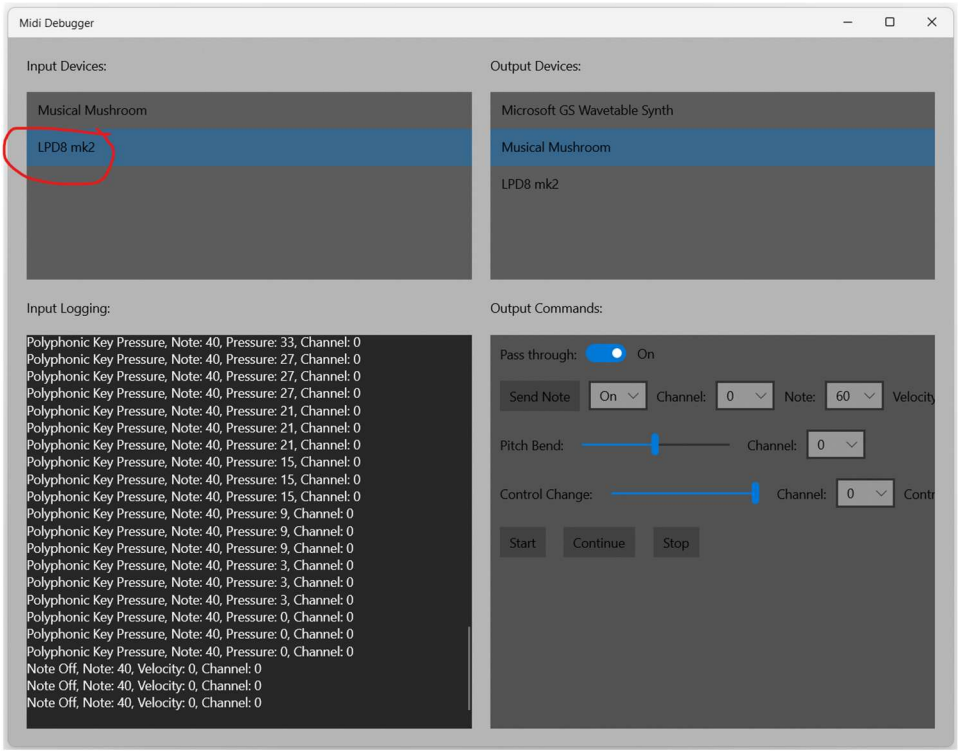
As an example, here is a setup which has been tested between an off-the-shelf **AKAI LPD8** MIDI controller with 8 buttons and 8 volume controls and a Musical Mushroom both connected to a Windows PC. A free MIDI testing app was used to virtually connect both devices together and relay their messages. Please note that DAW software will often have virtual keyboards and pads that can be exercised with mouse clicks, so it is not necessary to purchase physical MIDI hardware. However, since this AKAI LPD8 device happens to have 8 pads and 8 volume controls, it was convenient to use for the example.

1. First, connect the AKAI LPD8 device and Musical Mushroom to your Windows PC via a USB hub.

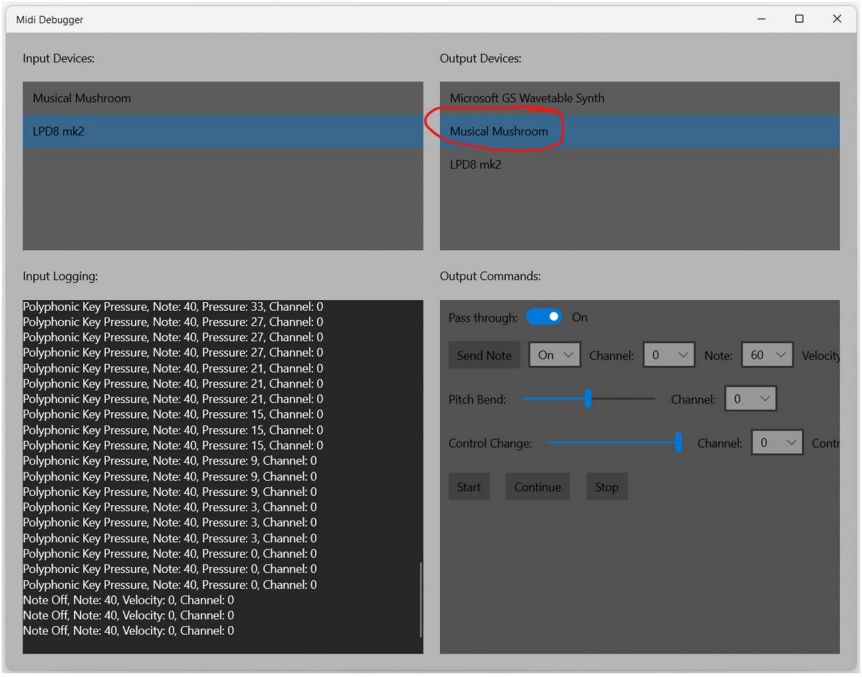
2. Download and install the free utility called "**MIDI Debugger**" on the Microsoft Store. Launch it.



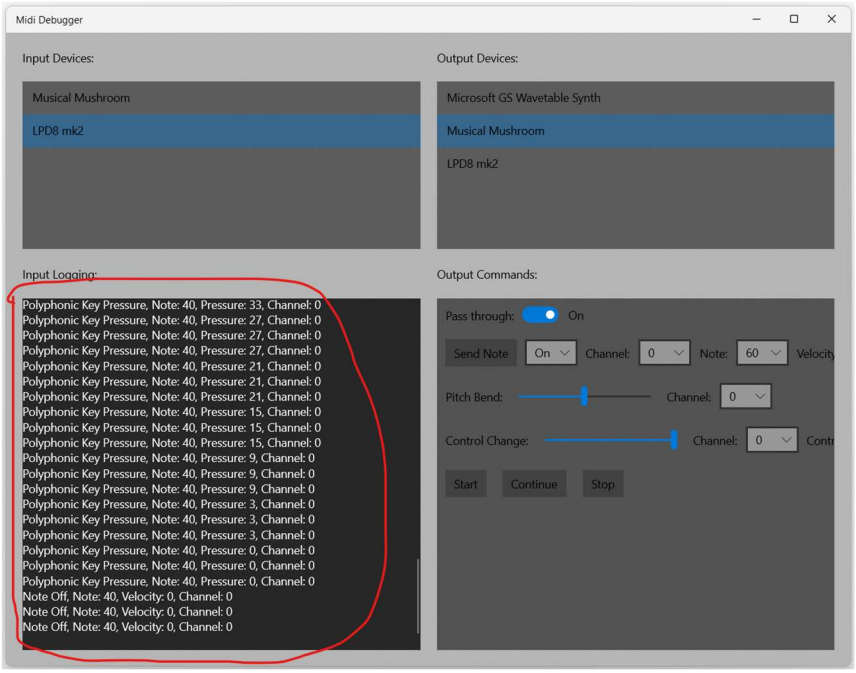
3. On the left input device, click on LPD8 mk2 as the INPUT MIDI device.



4. On the right output device, click on Musical Mushroom as the OUTPUT MIDI device.

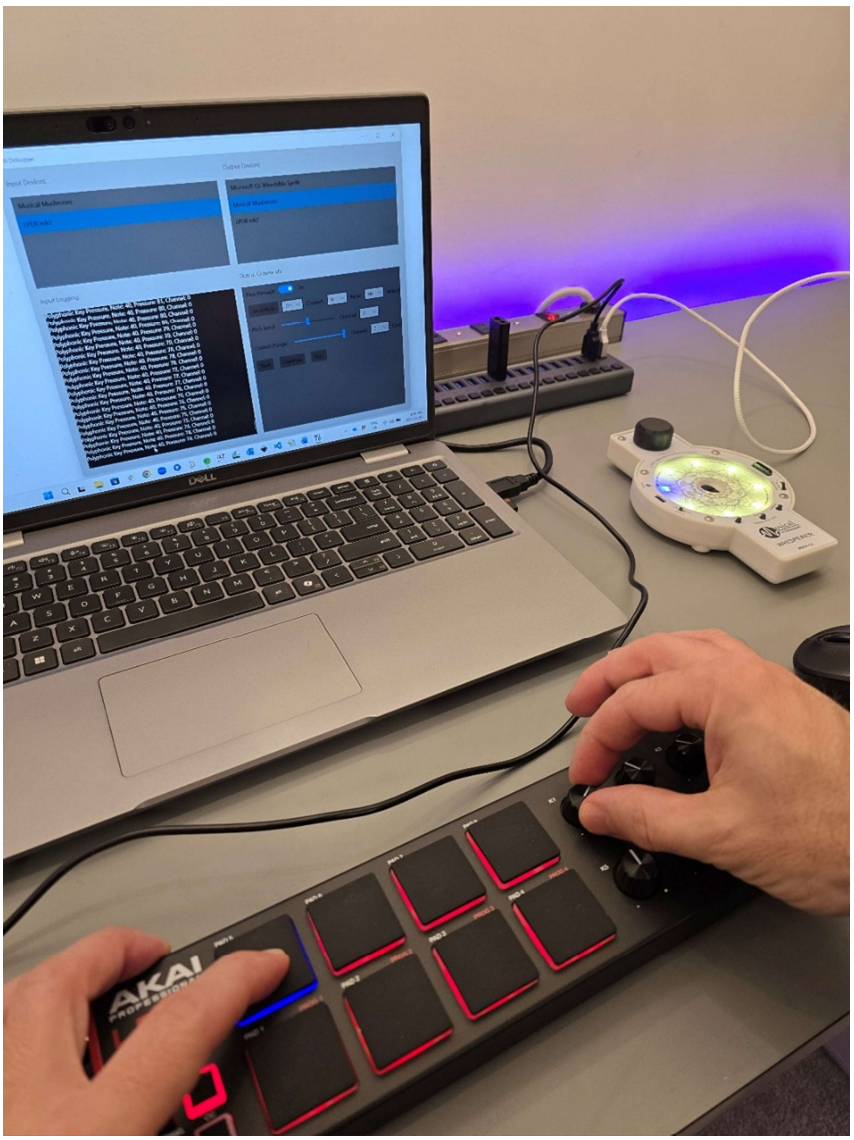


5. Tapping on the pads, you should see messages scrolling on the screen.



6. On the Musical Mushroom keypad, press MENU repeatedly until you hear “SELECT MIDI NOTE” and press the SELECT button. Tap the MIDI pad you want to use on the AKAI LPD8. Wait until you hear “CONFIGURATION SAVED”. Again, press the MENU until you hear “SELECT MIDI NOTE” and press the SELECT button. Rotate the MIDI knob you want to use. Wait until you hear “CONFIGURATION SAVED”.

7. Now, the Mushroom should respond to the selected AKAI LPD8 pad press and volume button rotation. Hold down the pad to turn ON the Musical Mushroom sound. Release to stop. When holding down the pad, rotate the volume knob to modulate the volume.



To use the Whisperer instead, first make sure the Whisperer is paired to the Mushroom wirelessly. Then connect the Whisperer (instead of the Musical Mushroom) to your computer using the USB cable. Repeat all the steps above. The only difference is the device will be listed as “Musical Mushroom Whisperer” in the devices list. Go ahead and program the MIDI notes as described above on each Musical Mushroom. The only difference is that it is now done over a wireless link instead of a USB cable. Repeat the setup for all the Musical Mushrooms paired to the Whisperer.

See our website for latest information, videos and user forums

www.musicalmushroom.com