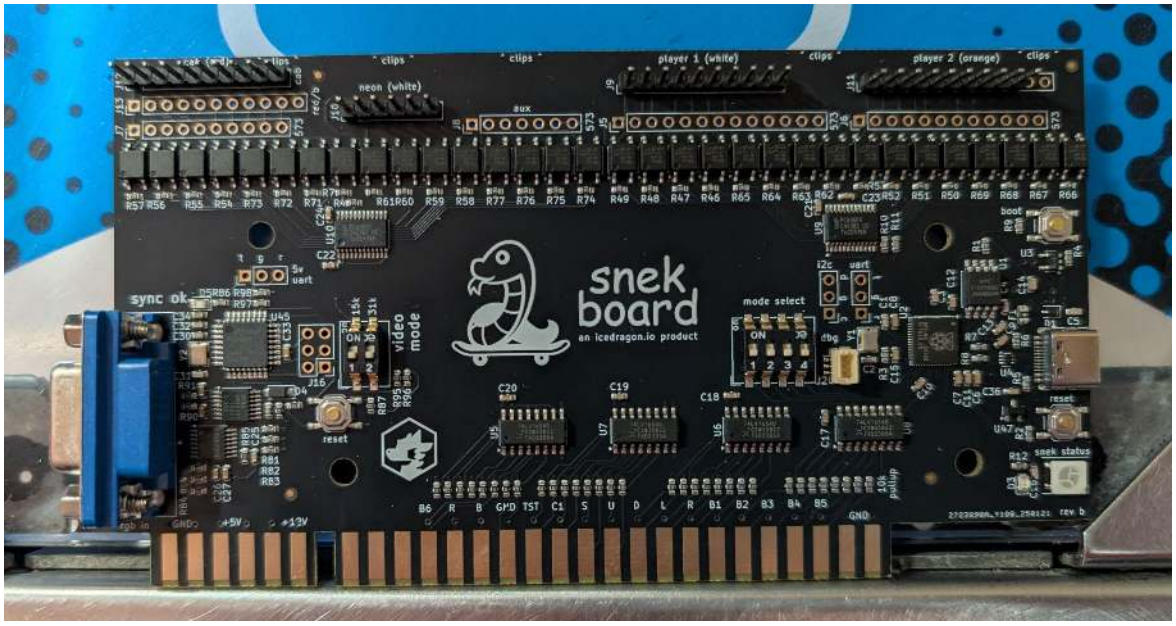
Snek Board



Thank you for purchasing the Snek Board, your new all-in-one JAMMA to USB solution for 573 era rhythm games!

This manual will guide you through the hardware and software setup required for installation of the Snek Board to your arcade cabinet.

Features:

- JAMMA standard input containing Player 1&2 UDLR, Start, Coin 1&2, and Buttons 1-6
- Fast 1kHz polling and interrupt based USB Endpoints
- Lighting Output on all SD Konami 573 cabinets, including Betson models
- Built-in CRT VGA Amp
- CRT Sync Safety Check
- Reactive lighting for non-gameplay controlled lighting
- Gameplay Controlled Lights
- Standard HID Gamepad and HID Lighting
- Emulated Python2 IO support with EXTIO
- Individual Dance Pad Sensor support with custom computer software
- Upgradable Firmware
- Cross Platform PC Configuration Utility for testing inputs and outputs

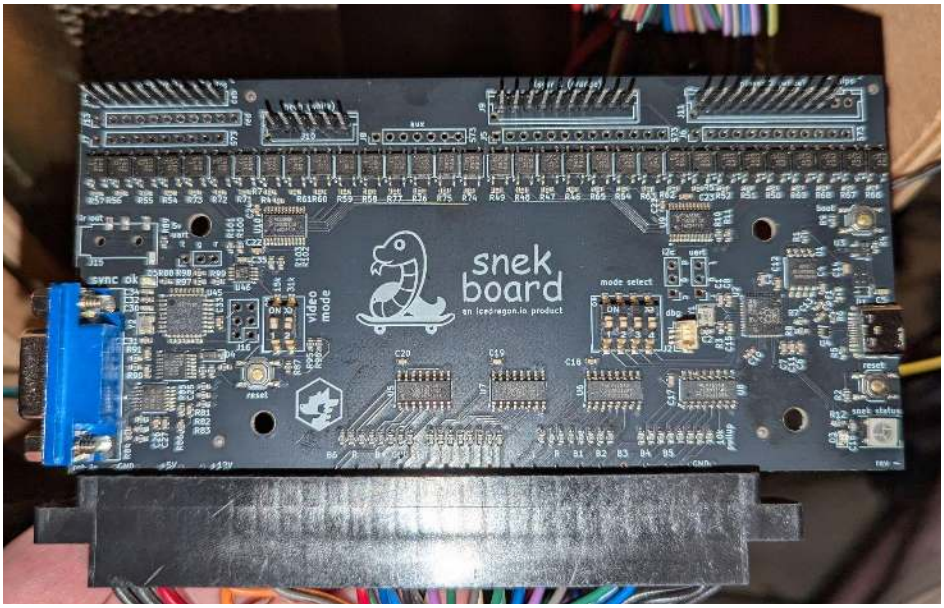
Hardware Installation

The Snek Board is specifically engineered to be plug and play with the majority of 573 era rhythm game cabinets, providing a no cut, no solder installation experience.

WARNING your arcade cabinet contains very high voltage systems inside, be careful when performing any maintenance and ensure the cabinet is properly unplugged and turned off before proceeding.

NOTE this procedure may differ slightly from photos depending on your specific cabinet and its specific production date. The following directions were written for a Japanese made DDR Doubles cab.

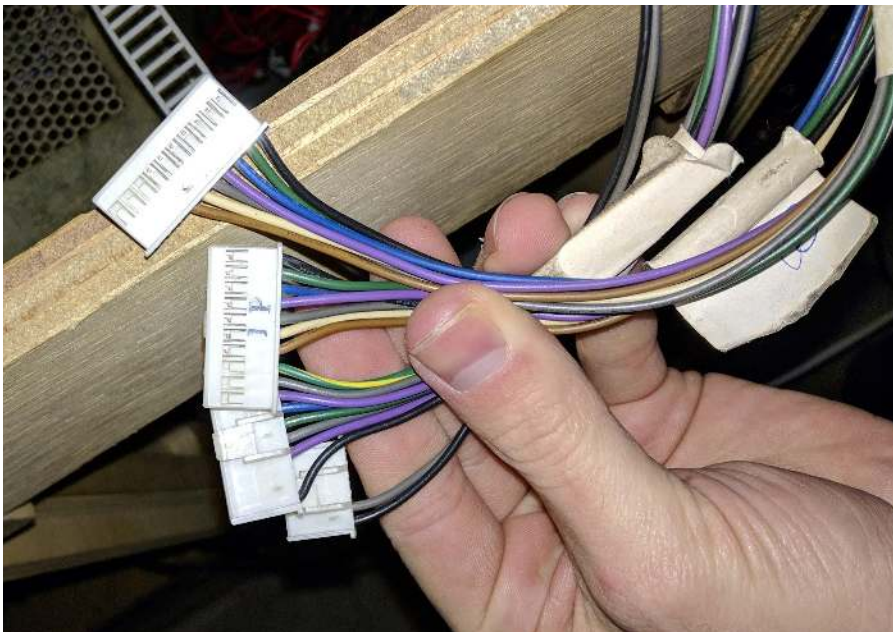
1. Ensure both your computer, cabinet, and monitor are switched off and unplugged from power.
2. Unwrap the Snek Board board from the protective anti-static bag.
3. Remove the back from your arcade cabinet.
4. Locate the JAMMA harness, the large edge connector containing multiple wires
   a. 
5. If it is currently plugged into a game, then unplug it by grabbing both edges of the connector and gently pulling the connector loose
6. Take the Snek Board and insert the bottom into the JAMMA harness

a. 

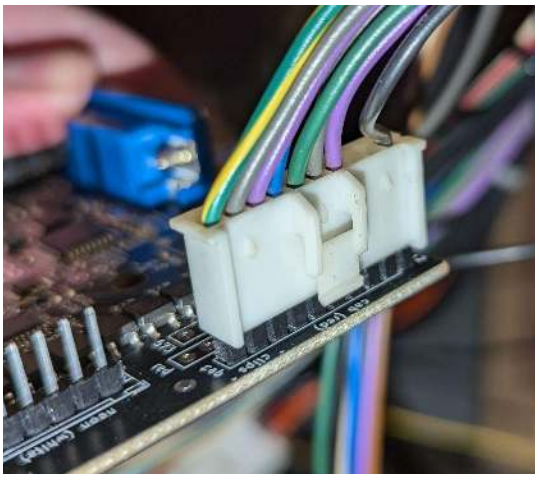
7. Locate the four lighting headers that originally plugged into the game
    a. NOTE: The color and styling of these can vary depending on model
    b. NOTE: For **<u>Betson</u>** or **<u>Red</u>** cabinets three of these connectors are located on the EXTIO, which is located above the power supply section of the cabinet.

i. 

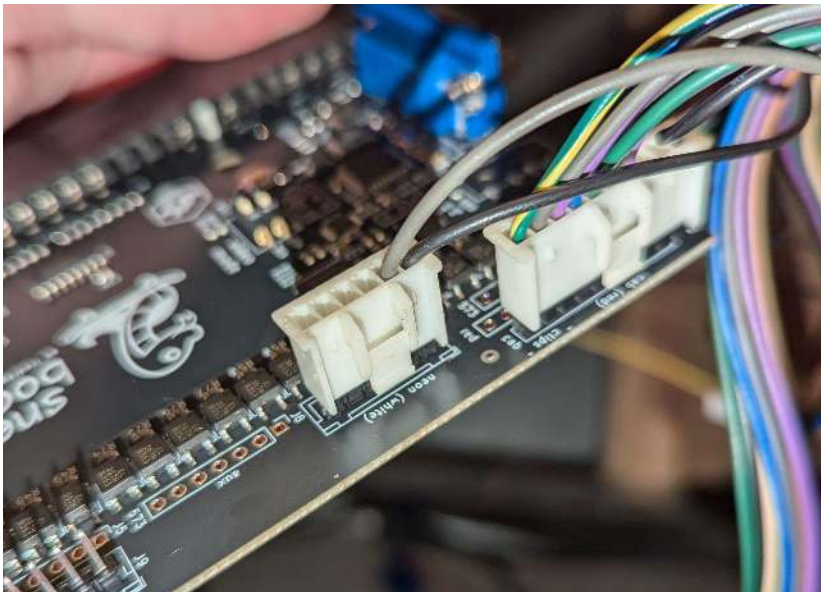
c. NOTE: To properly unplug these connectors simply place pressure with your thumb in the middle of the connector where the latch is located and pull outward.

d. 

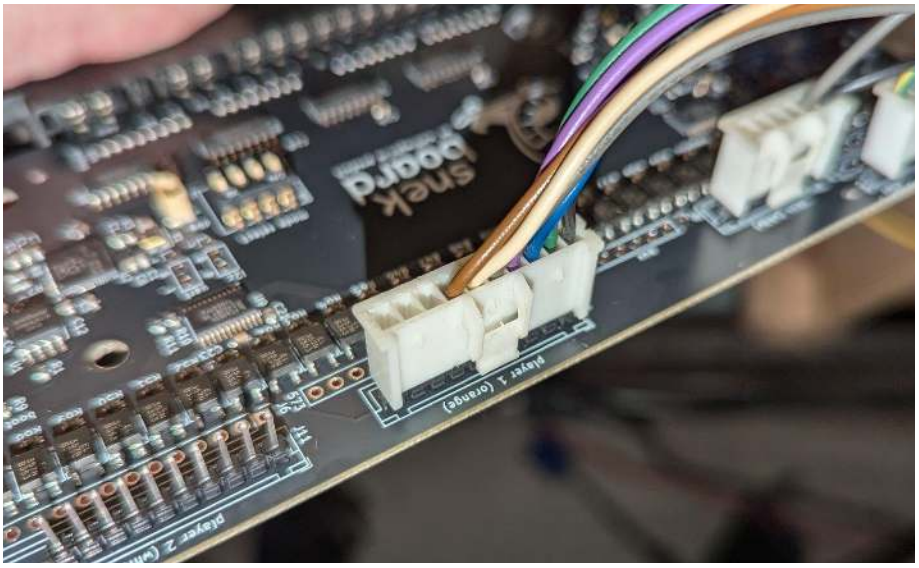
8. Take the white or red connector often labeled “CAB” for the cabinet and plug it into the left most connector labeled “cab (red)” ensuring the latch is facing away from the board as shown.

a. 

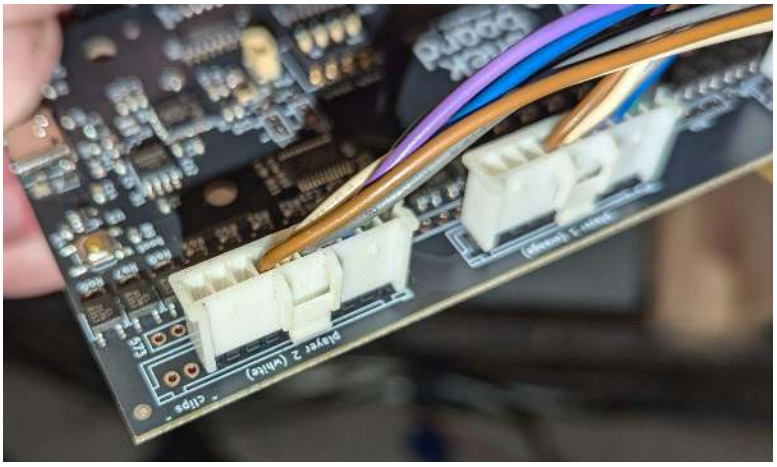
9. Take the smallest white connector, referred to as the neon connector, and plug it into the connector labeled “neon (white)” on the snek board ensuring the latch is facing away from the board as shown.

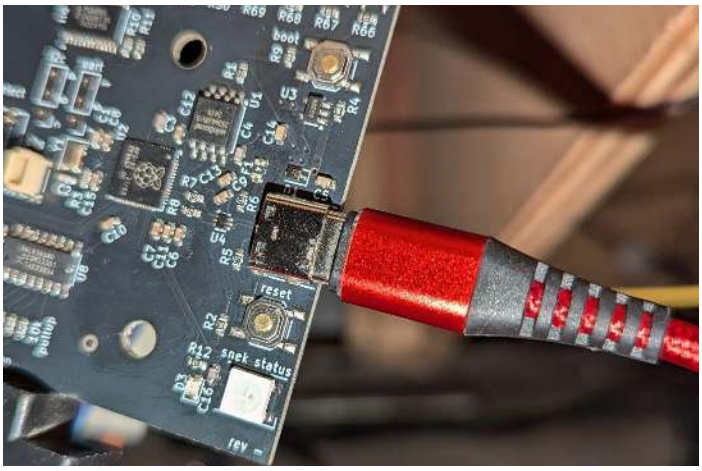
a. 

10. Take the red or “1P” connector for Player 1 and plug it into the “player 1 (orange)” header on the snek board ensuring the latch is facing away from the board as shown.

a. 

11. Take the last orange connector or the “2P” for Player 2 and plug it into the “player 2 (white)” header on the snek board ensuring the latch is facing away from the board as shown.

a. 

12. Using your USB Type C cable, plug the Type C end into the Type C connector on the right hand side of the board
a. 

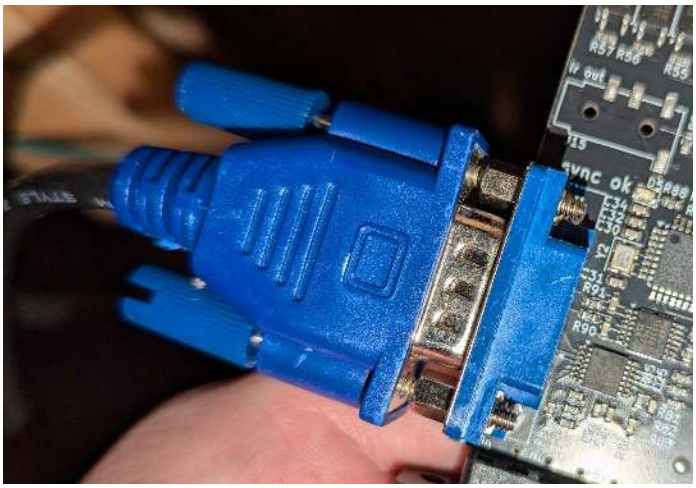
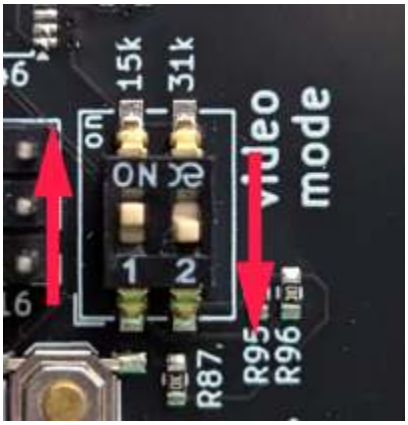
13. Plug the other end of the cable into your computer's USB Type A port.
14. Congratulations, you have successfully set up your Snek Board for input and output

JAMMA Video Installation

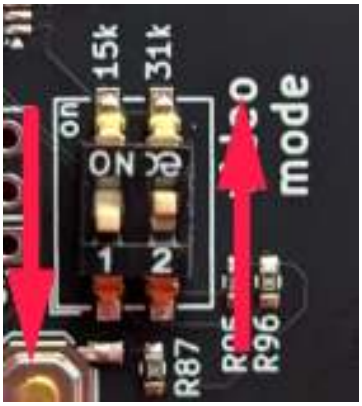
Snek Board also supports amplifying properly configured video over a DB15/VGA connector into JAMMA video with proper composite sync.

If you are using an LCD or modern monitor on your installation, then you can skip this step entirely.

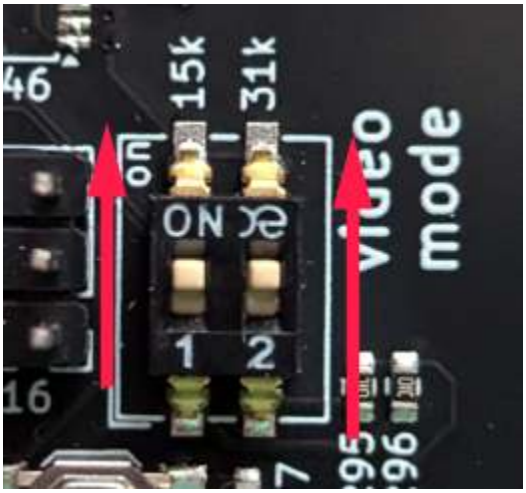
Snek Board requires a standard VGA cable to connect your PC to the Snek Board, which is not included with the purchase.

1. Ensure both your computer, cabinet, and monitor are switched off and unplugged from power.
2. Connect a VGA cable from your video card or video source into the Snek Board
    a. 
3. Select the proper DIP Switch setting for your CRT
    a. If your CRT supports **<u>ONLY</u>** 15khz then place DIP 1 to the ON position and DIP 2 to the OFF position
        i. 

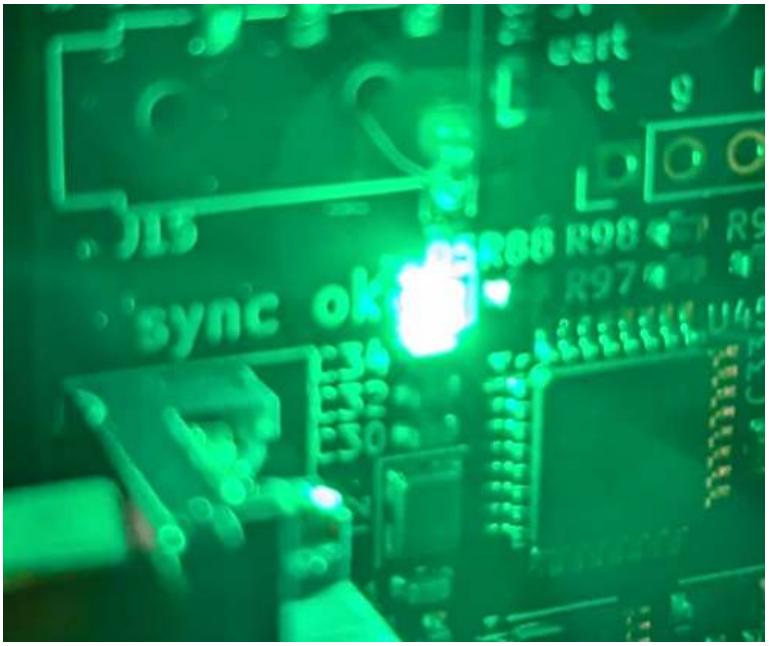
    b. If your CRT supports **<u>ONLY</u>** 31khz then place DIP 1 to the OFF position and DIP 2 to the ON position

i. 

c. If your CRT is trisync or supports **BOTH** 15khz and 31khz, then place both DIP 1 and DIP 2 to the ON position

i. 

4. Properly configure your computer/video source to output your supported resolution
5. When receiving properly formatted video for the DIP switch setting, the “sync ok” light will illuminate green and you are ready to go!

a. 

Video Scaling Consoles for CRTs

Snek Board does not do any sort of video scaling, modification, nor frame buffering, it is simply an amplifier for the video coming into the system. As a result if you wish to use video sources like game consoles, you need to “scale” or transcode the video for the proper resolution of your monitor before it gets to the Snek Board. For the CRTs that originally shipped in these machines, this is often referred to as “15khz”.

There are hundreds of different devices on the market available for retro video game scaling and there are a variety of opinions on what is the “best” way to scale the video. This manual **will cover only a few of many possible solutions**.

If you are looking for additional advice or ways to scale your console to your display, I highly recommend reading articles by RetroRGB, the video series RGB Master Class by My Life in Gaming, and researching modern products such as the RetroTink or the Electron series by Electron Shephard.

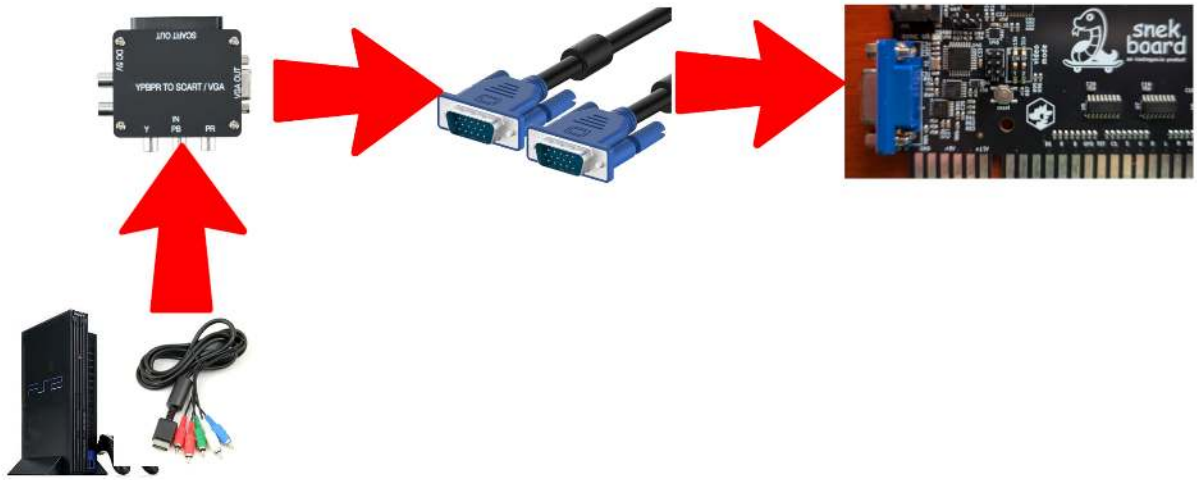
Option 1: Component (YPbPr) to VGA Adapters

This concept is taking the YPbPr signal from a game console and adapting it to a VGA connector without going digital in the middle. This is inherently a lagless process as it does not scale the image in any way.

These devices are powered by the game console via a micro USB connector, can plug into the snek board directly, and support 15khz if your console is currently outputting 240p/480i.

They can be found on market sites by using keywords such as “VGA Component Transcoder” or “YPbPr to VGA Converter”

In total the setup would consist of:



Option 2: HDMI to VGA Adapters

The concept of this is using lagless HDMI adapters for use with video game consoles, converting them back into the analog domain to a VGA signal. This can introduce subframe delay, but it is negligible considering the number of steps.

I have tested Electron Shepherd's line of products and they work quite well with known lagless HDMI to VGA adapters.

If you are using an LCD and it supports 240p/480i, this is also a valid option.

Option 3: OSSC

This option is using a scaler which is designed to alter the size of the video frame. This can introduce lag if done improperly, but we are using the OSSC in passthrough mode which should not introduce any lag to the process.

This also offers the ability to line double the picture if your CRT supports 31kHz and the game you are trying to play is only 15kHz.

Required Devices:

- Video Game console of Choice
    - PS2, Wii, Original Xbox, etc.
- Component Video Cable for the video game console
    - YPbPr cable, the “Red Green Blue” one.

- 
- Open Source Scan Converter
  - 
  - This is the device that will take the signal from your video game console and digitize it. It is overkill for this solution, but it provides a lot of features which allows the easiest setup process for this solution.
- HDMI to VGA adapter.
  - These are lagless adapters that will take the digital signal from the OSSC and convert it back to analog for the Snek Board
  - 

- VGA cable
    - This will connect from the HDMI to VGA adapter to the Snek Board
- RCA Coupler and RCA cables
    - This will allow you to hook the audio coming from the console into your arcade machine's amplifier.

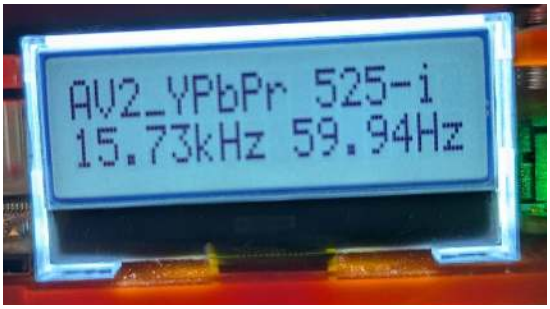
So in total the connection will look like this:

Setting up the OSSC

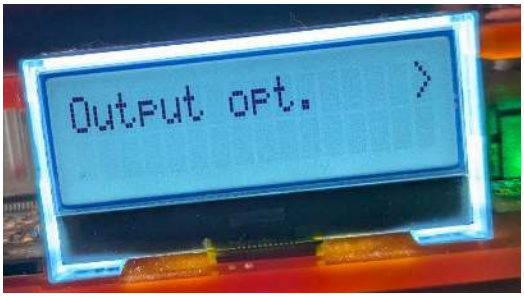
Power off all devices and ensure you are taking precaution around high voltage systems like the CRT and your arcade machine.

Ensure you have the output of the console connected to the AV2 port of the OSSC, the HDMI to VGA adapter plugged into the HDMI-OUT of the OSSC, and the VGA cable attached to the Snek Board.

1. Power on the game console and let it boot.
2. Power on the OSSC and let it boot.
3. Power on your arcade machine.
4. Ensure you are in AV2_YPbPr mode by pressing BTN0 until the screen displays AV2_YPbPr

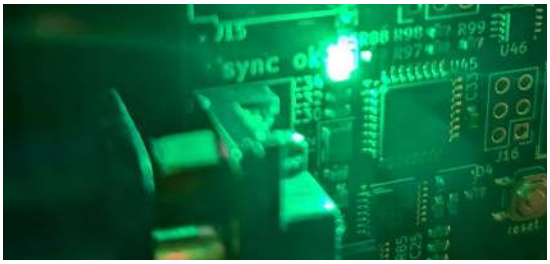
    a. You can also Press the “2” button on the IR Remote.
5. If your Game Console is outputting, then you should see some signal information including the target “15khz” number.
    a. 

6. Using the IR Remote, press Menu
    a. 

7. Press the Down button on the remote until you see the option “Output opt.”
    a. 

8. Press OK
9. Press the Down button on the remote until you see “480i/576i proc”
10. Press the Left button on the remote until you see “Passthu”
    a. 

11. Ensure that the Snek Board is properly setup to accept 15khz video by turning the DIP switch to the proper position (see “JAMMA Video Installation”)
12. Ensure that the Snek Board’s “sync ok” light is illuminated green on the left side of the board.

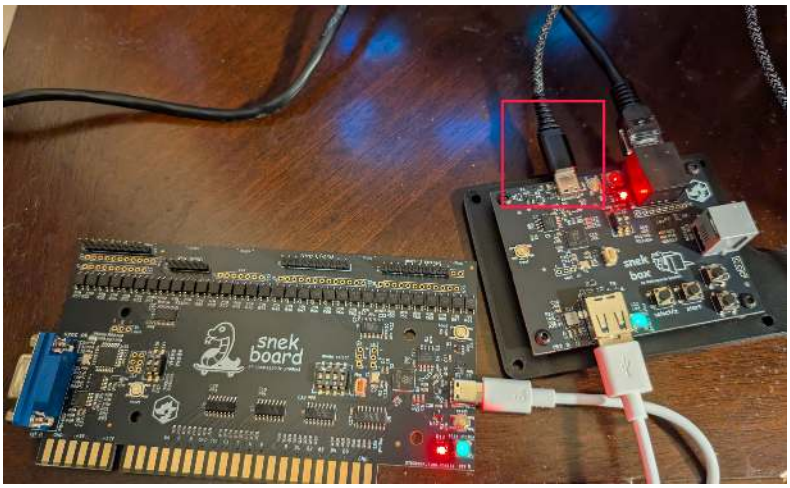
a. 

13. Enjoy your game!
14. If you wish to save your settings for the next boot of the OSSC:
    a. Press Menu
    b. Press Down until you see “Settings Opt”
    c. Scroll down to “Save Profile”
    d. Click OK

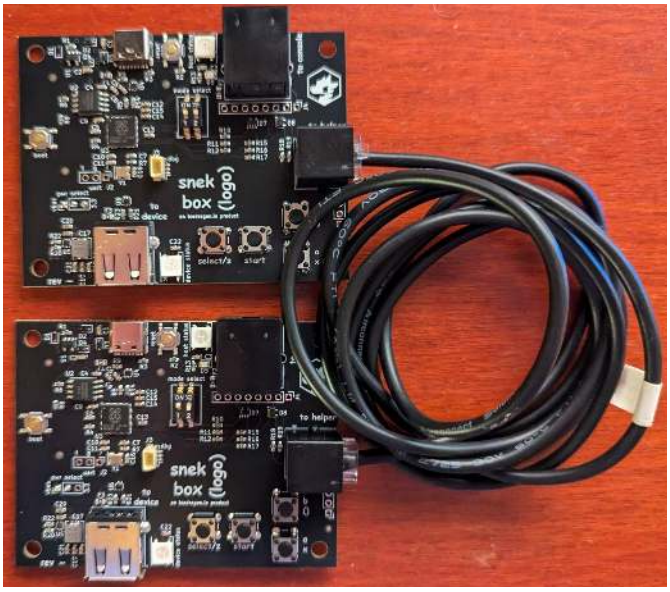
Snek Box Usage

Snek Board and Snek Box were engineered to work together to provide gameplay for consoles on your arcade cabinet.

PLEASE NOTE: Certain game consoles do not output enough current over the controller port to power the Snek Board. To fix this, simply connect a USB Type C cable to the Type C port on Snek Box to any 5V power source, such as a USB port on the console (if applicable) or an AC power adapter.

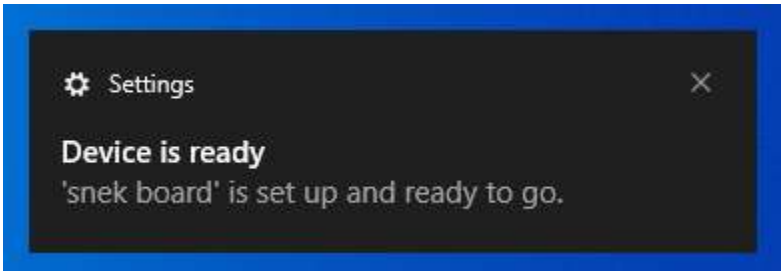


If you are wishing to have both players supported for Snek play, then simply follow the Snek Box manual section labeled “Helper Mode” to connect the RJ11 cable between the two units.



Software Installation

For Windows XP SP3 and above as well as modern Linux systems, Snek Board is a **plug and play** driverless installation.



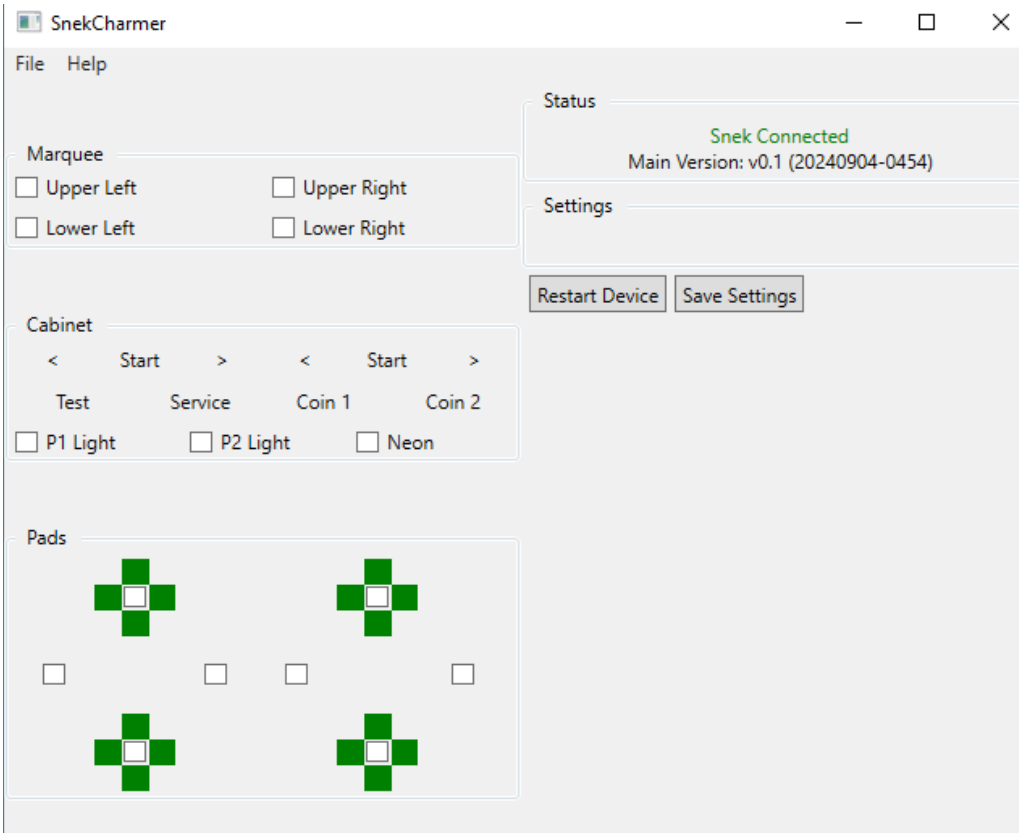
To connect Snek Board lighting to the game you would like to play it takes some additional steps which are simple to follow. The following pages will walk you through the process.

To download the latest up to date software package please visit https://icedragon.io/snek

Testing and Configuration Utility

Snek Board contains a configuration utility for testing each individual sensor in a DDR Doubles cabinet.

To launch, open up the “Config Program” folder in the software package and launch “SnekCharmerEto.Wpf.exe”



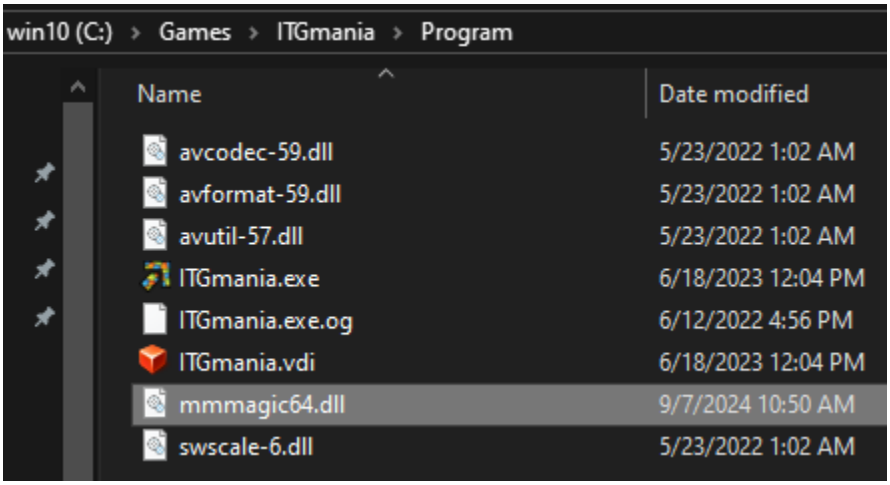
When a button is pressed, it will highlight in green to show that it has been pressed successfully.

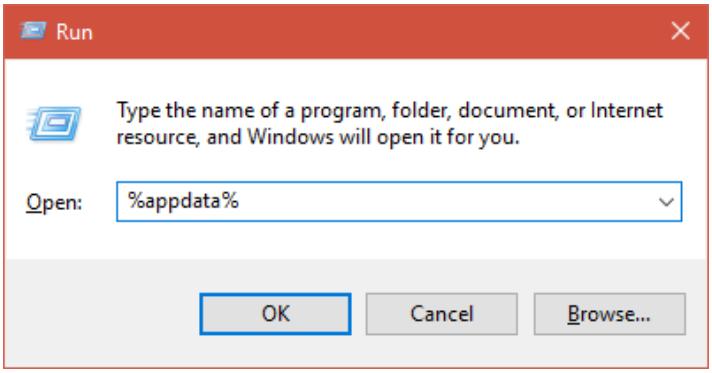
Each sensor is shown in a grid pattern indicating which of the four sensors is pressed in green.

To test a light click the check box next to its name and it will illuminate.

Lighting Setup

Windows ITGmania setup

1. Open up a new Windows Explorer window.
2. Open your ITGMania installation folder directory
    a. By default this is “C:\Games\ITGMania”
3. Copy the “mmmagic64.dll” from the ITGMania support package folder file into this folder like so:
    a. If the file already exists, proceed to overwrite it.
    b. 

4. Open a new Windows Explorer window.
5. Navigate to your ITGmania Data Directory
    a. For ITGmania this is located in your AppData folder.
        i. Open up the Run dialog box pressing the Windows key and R at the same time.
        ii. Type “%appdata%” as shown:
            1. 

        iii. Click the ITGmania folder
        iv. Click the Save folder
6. Open up “Preferences.ini” using Notepad.
7. Scroll down to the section labeled “LightsDriver”
8. Next to “LightsDriver=” type “Win32Minimaid” as shown.

a.

```
LifeDifficultyScale=1.000000
LightsAheadSeconds=0.050000
LightsComPort=COM54
LightsDriver=Win32Minimaid
LightsFalloffSeconds=0.100000
LightsStepsDifficulty=hard,medium
LockCourseDifficulties=0
LogCheckpoints=0
```

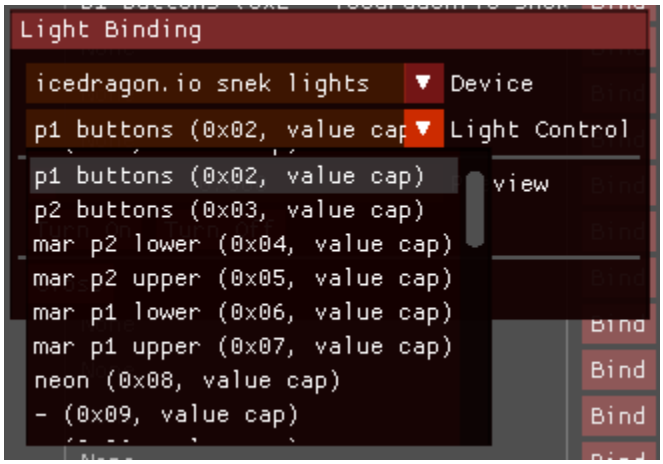
9. Save the file.
10. Close Notepad.

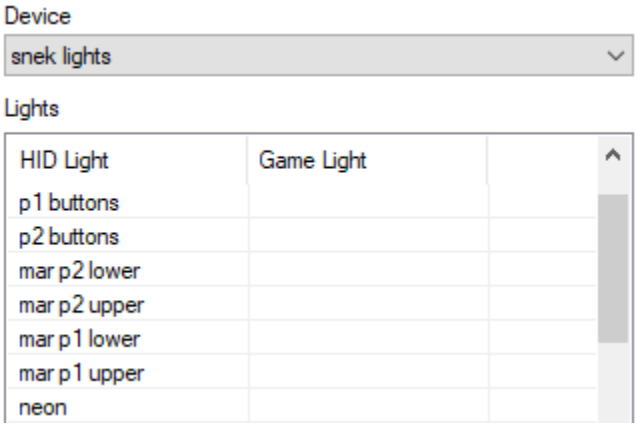
Launch ITGmania and enjoy your lights!

Windows HID Setup

The Snek Board is an HID lighting compatible device and as such can be mapped with HID compatible games.

To set up the lights, simply open up your configuration utility, select the “snek lights” option, and go through the process of mapping all of the lights for your application.



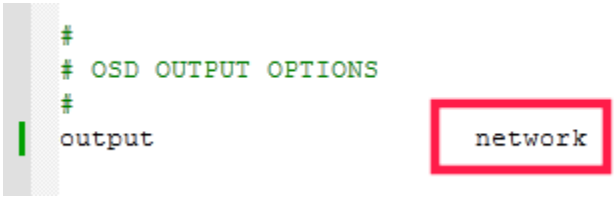


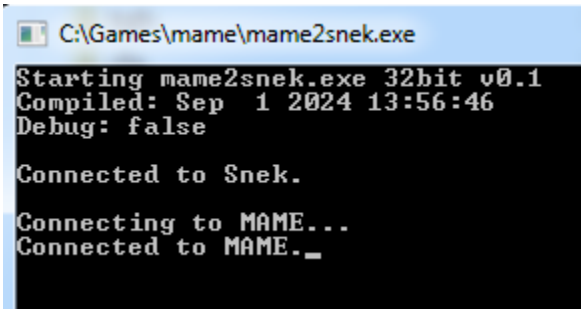
Windows MAME Setup

Please note that setting up MAME specific to your application can vary as many rhythm games need additional timing adjustments, mods, or plugins to support your specific setup for optimal delay. Please refer to the MAME documentation or your fork's documentation on how best to set up your game for optimal play.

This guide will help you to set up the lighting component of the installation as this is unique to the Snek Board.

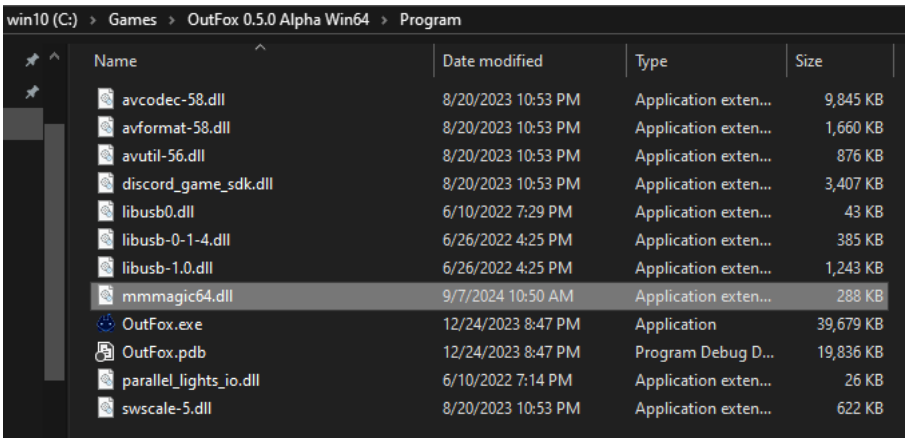
1. Download and extract all of MAME's installation files and your fork's files properly (if you have them)
2. If you do not have a mame.ini file then you can ask MAME to make one on the command line.
    a. Open a command line and change directories to your MAME installation
    b. Use the command line `mame.exe -createconfig` like so
    c. 

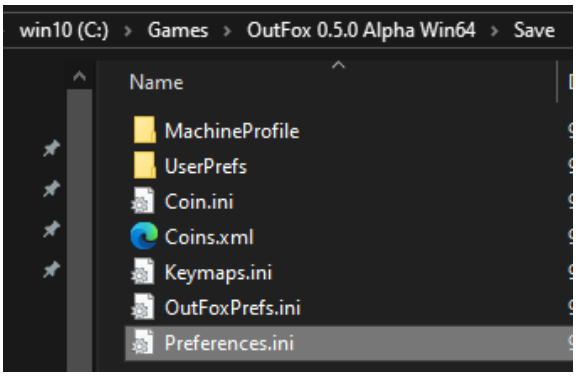
3. Open your mame.ini file with your favorite text editor.
4. Locate the `output` location of the ini file and change the `auto` to `network` like shown
    a. 

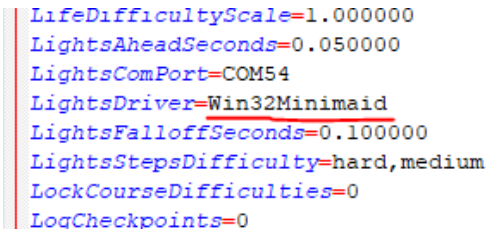
5. Save and close the file.
6. In the software package, launch the program in the mame folder called `mame2snek.exe`
7. Confirm that the program is connected to Snek
8. Launch MAME
    a. If prompted, allow MAME through the firewall
9. Ensure that mame2snek has found both your Snek Board and the MAME installation
    a. 

10. Enjoy your lights!

Windows OutFox setup

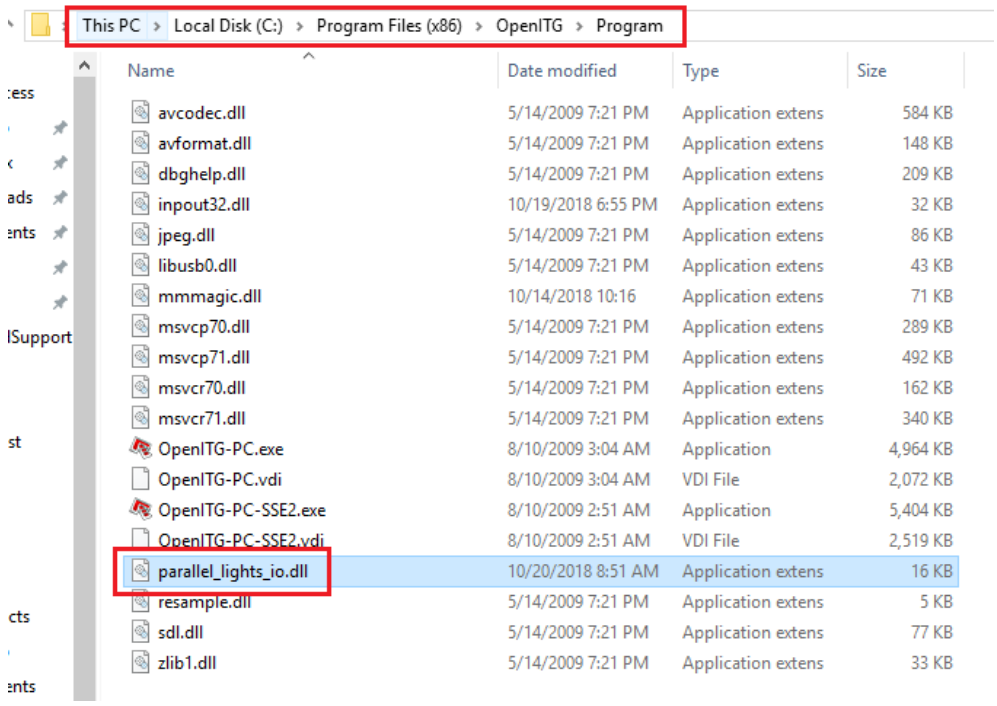
1. Open up a new Windows Explorer window.
2. Open your OutFox installation folder directory
    a. By default this is “C:\Games\OutFox <version>\Program”
3. Copy the “mmmagic64.dll” from the Outfox support package folder file into this folder like so:
    a. If the file already exists, proceed to overwrite it.
    b. 

4. Navigate to your OutFox Data Directory
    a. For OutFox this is located in the C:\Games\Outfox <version>\Save folder.
5. Open up “Preferences.ini” using Notepad.
    a. 

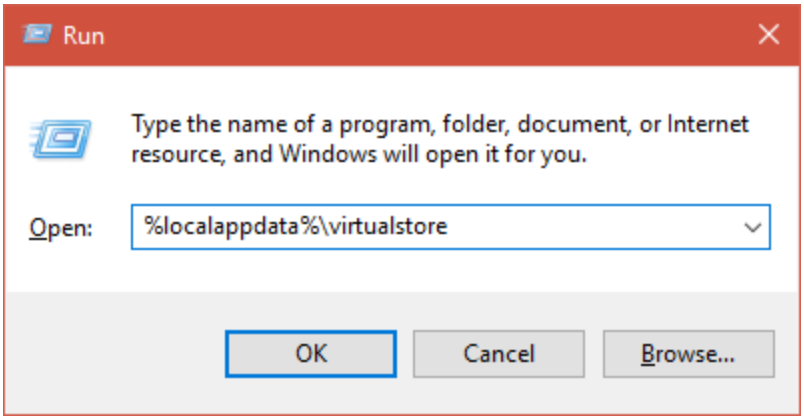
6. Scroll down to the section labeled “LightsDriver”
7. Next to “LightsDriver=” type “Win32Minimaid” as shown.
    a. 
```
LifeDifficultyScale=1.000000
LightsAheadSeconds=0.050000
LightsComPort=COM54
LightsDriver=Win32Minimaid
LightsFalloffSeconds=0.100000
LightsStepsDifficulty=hard,medium
LockCourseDifficulties=0
LogCheckpoints=0
```
8. Save the file.
9. Close Notepad.

Launch OutFox and enjoy your lights!

Windows OpenITG/NotITG setup

1. Open up a new Windows Explorer window.
2. Navigate to your OpenITG/NotITG program directory
    a. For OpenITG this is located in “C:\Program Files (x86)\OpenITG\Program”
    b. For NotITG, this is located wherever you downloaded the setup package.
3. Copy the “parallel_lights_io.dll” file from the OpenITG support package folder into this folder like so:
    a. If the file already exists, proceed to overwrite it.
    b. 

4. Open a new Windows Explorer window.
5. Navigate to your OpenITG/NotITG Data Directory
    a. For OpenITG, this is located in “C:\Program Files (x86)\OpenITG\Data”
        i. Please note when using versions of Windows past XP, Windows will store these files in the “virtual store”.
        ii. To access this, open up the Run Dialog like before and type “%localappdata%\virtualstore”

1. 

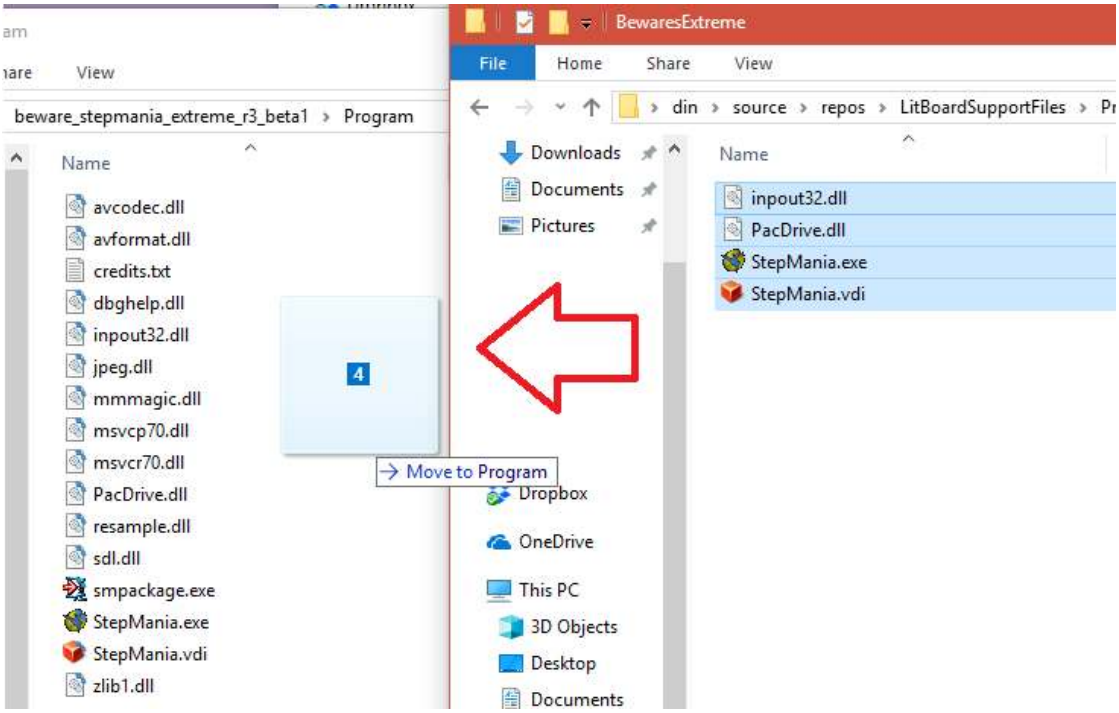
   iii. Open up “Program Files (x86)\OpenITG\Data”

6. Open up “StepMania.ini” using Notepad.
7. Scroll down to the section labeled “LightsDriver”
8. Next to “LightsDriver=” type “Parallel” as shown.

```
LightsAheadSeconds=0.050000
LightsChartsInMenus=0
LightsDriver=Parallel
LightsFalloffSeconds=0.100000
LightsStepsDifficulty=hard,medium
LockCourseDifficulties=0
```

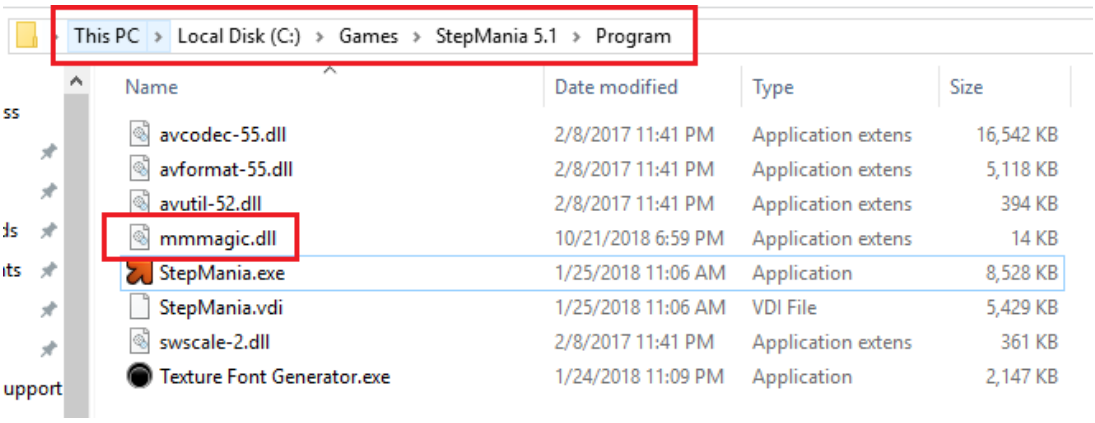
   a.
9. Save the file.
10. Close Notepad.
11. Launch OpenITG/NotITG and enjoy your lights!

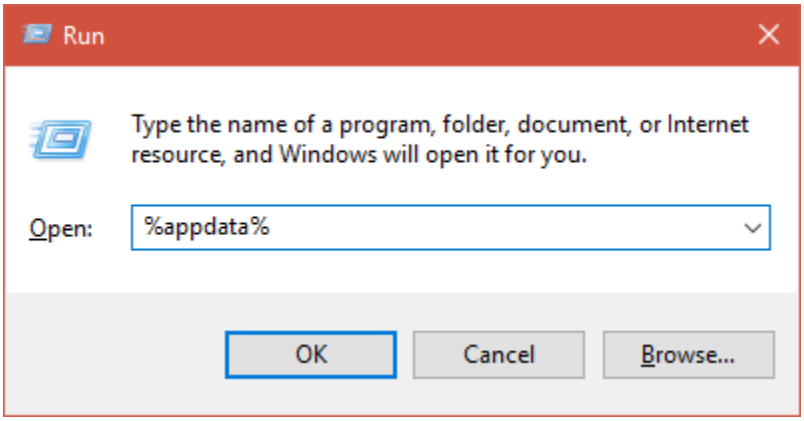
Windows Beware's Extreme setup

1. Open up a new Windows Explorer window.
2. Navigate to your Beware's Extreme program directory
    a. As this was a ZIPed download, this would be wherever you have it downloaded.
3. Copy the all the files from the Beware's Extreme support package folder into the Program folder like so:
    a. 

4. Navigate to the Data Directory in the beware's extreme folder
5. Open up "StepMania.ini" using Notepad.
6. Scroll down to the section labeled "LightsDriver"
7. Next to "LightsDriver=" type "Parallel" as shown.
    a.
```
LightsAheadSeconds=0.050000
LightsChartsInMenus=0
LightsDriver=Parallel
LightsFalloffSeconds=0.100000
LightsStepsDifficulty=hard,medium
LockCourseDifficulties=0
```
8. Save the file.
9. Close Notepad.
10. Launch Beware's Extreme and enjoy your lights!

Windows StepMania 5.0.12 setup

1. Open up a new Windows Explorer window.
2. Navigate to your Stepmania 5.0.12 program directory
    a. By default this is located in "C:\Games\StepMania 5\Program"
3. Copy the “mmmagic.dll” from the Stepmania 5.0.12 support package folder file into this folder like so:
    a. If the file already exists, proceed to overwrite it.
    b. 

4. Open a new Windows Explorer window.
5. Navigate to your StepMania Data Directory
    a. For StepMania 5+ this is located in your AppData folder.
        i. Open up the Run dialog box pressing the Windows key and R at the same time.
        ii. Type “%appdata%” as shown:
        1. 

        iii. Click the StepMania 5 or StepMania 5.1 folder
        iv. Click the Save folder
6. Open up “Preferences.ini” using Notepad.
7. Scroll down to the section labeled “LightsDriver”
8. Next to “LightsDriver=” type “Win32Minimaid” as shown.

a.

```
LifeDifficultyScale=1.000000
LightsAheadSeconds=0.050000
LightsDriver=Win32Minimaid
LightsFalloffSeconds=0.100000
LightsStepsDifficulty=medium
LockCourseDifficulties=1
```

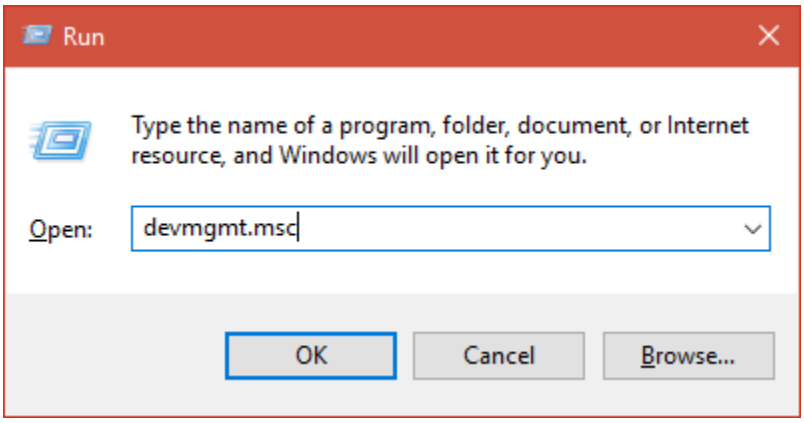
9. Save the file.
10. Close Notepad.
11. Launch StepMania and enjoy your lights!

Windows LIT Board/Sextet Compatibility

Snek Board contains backwards compatibility with all software intended for the LIT Board, including SextetStream supported software.

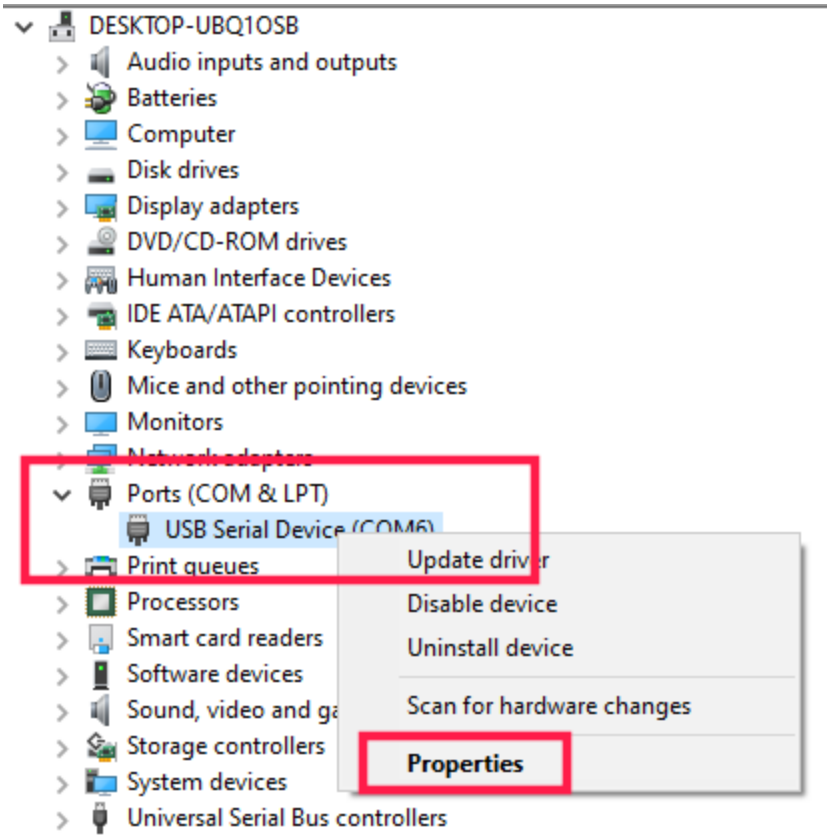
If you find yourself needing to use a program which needs to be set to COM54 then you can use the following directions to set it to COM54 and your existing installation programs will connect to it automatically.

This is an entirely optional step and is only for backwards compatibility reasons. Follow these steps if the previous setup functions do not support your program.

1. Open up Device Manager
    a. Using your keyboard open the run dialog window by pressing the WINDOWS key and the R key together.
    b. Type “devmgmt.msc” into the dialog like so.
    c. 

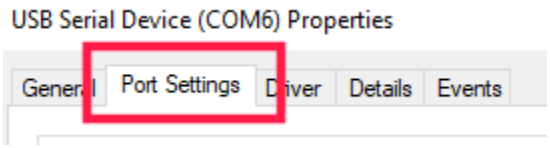
2. Look for the section labeled “Ports (COM & LPT)”
3. Expand the section using the arrow to the left.
4. Right click the “USB Serial Device” device that is shown and select Properties

a.

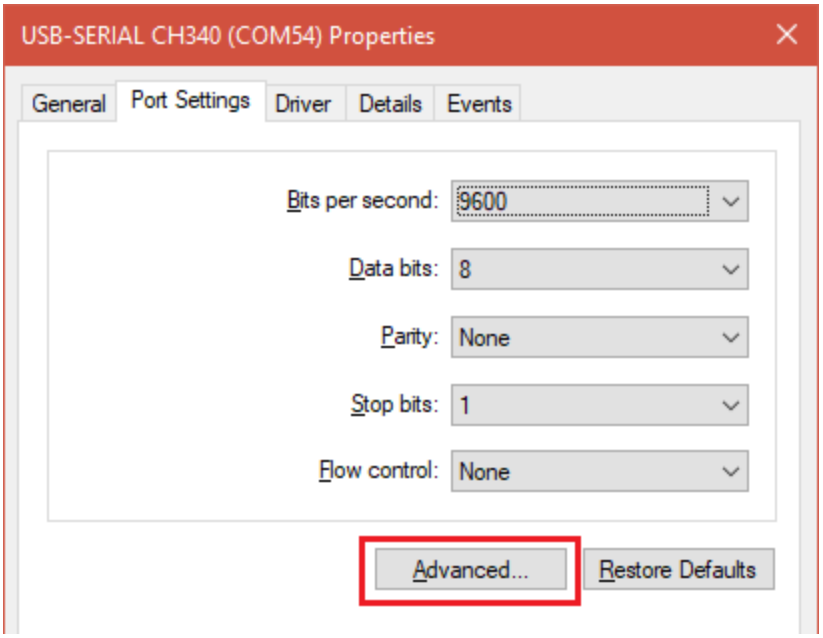


5. Click the “Port Settings” tab at the top of the window.

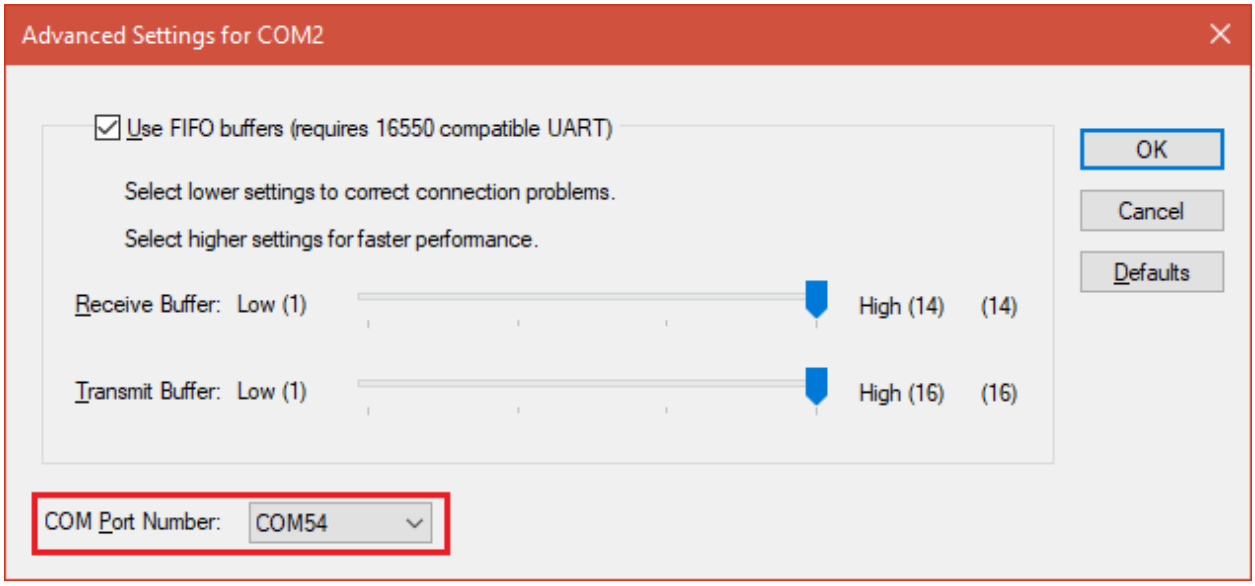
a.



6. Click the “Advanced” button on the bottom left hand row of the “Port Settings” tab.

a. 

7. Using the drop down menu next to “COM Port Number” select “COM54”.

8. 

9. Leave all other settings stock.
10. Click “OK”
11. Close all Device Manager windows.

12. <u>Restart Windows to save your settings.</u>

Linux ITGMania Setup

If you are looking for a turnkey solution for linux for ITGMania for arcade use, please check out the following operating system image: https://dinsfire.com/itgimage. It has full support for the Snek Board.

If you are rolling your own ITGMania solution, then the ultimate goal is to create a fifo, set ITGMania to write to that fifo, and export that fifo with socat.

With these Linux directions I am under the assumption that you are comfortable with the terminal. If you need more assistance, let me know!

These directions are based on the original documentation located here, which I highly recommend you read as well.

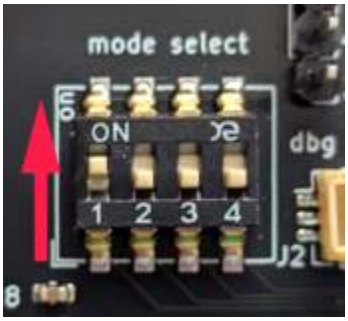
Note: Ensure your user has proper serial rights before proceeding. For example in Arch this means your user is part of the "uucp" and "lock" groups. Please check with your distribution's documentation on serial access.

1. Navigate to your ITGMania program directory in your terminal emulator of choice
    a. On Arch, the package is created in /opt/itgmania for example.
    b. Or if you are using the precompiled binary, navigate to it.
2. Make the FIFO file that StepMania will write to
    a. `mkfifo "Save/StepMania-Lights-SextetStream.out"`
    b. Ensure this fifo has the proper read/write permissions as the same account running ITGMania
3. Navigate to your ITGMania Save folder
    a. In most cases it will be located in your home directory, with the name `.itgmania`
4. Open "Preferences.ini"
5. Change the LightsDriver to be "SextetStreamToFile"
6. Change the SextetStreamOutputFilename to "**Save**/StepMania-Lights-SextetStream.out"
7. Save "Preferences.ini"
8. Ensure that socat is installed from your package manager.
9. Start outputting the fifo using socat using a command like this:
    a. `socat "~/.itgmania/Save/StepMania-Lights-SextetStream.out" /dev/ttyACM0,raw,echo=0,b115200`
10. Keep socat running in a different terminal window, or run it in the background by applying & to the command.
    a. For example: `socat "~/.itgmania/Save/StepMania-Lights-SextetStream.out" /dev/ttyACM0,raw,echo=0,b115200 &`
11. Start ITGMania and enjoy your lights!
    a. Please note with the way that ITGMania is currently written, the program will halt on load if socat is not running and emptying the fifo. So be sure to always have it running before you launch ITGMania!

Python 2 Mode

Snek Board is a Python 2 compatible device. You can use it to replace a broken or malfunctioning Python 2 for games like SuperNova 1 & 2.

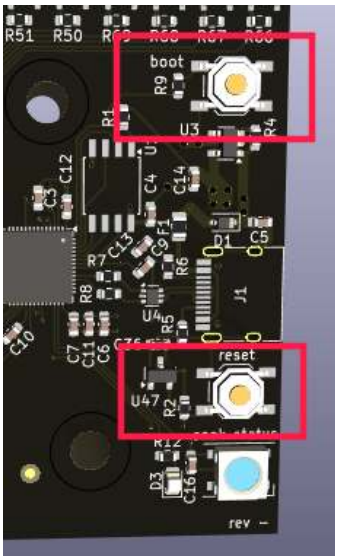
To enable Python 2 Mode:

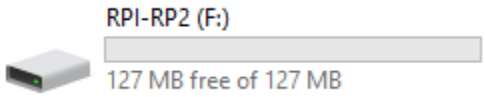
1. Turn off the host PlayStation 2 and unplug the existing Python 2 from the USB port from the front port.
2. Turn off your arcade hardware and ensure that it is unplugged from the wall for safety.
3. Plug the Snek Board using a Type C to Type A cable to the front of the PlayStation 2 (either port is fine)
4. Locate DIP Switch 1 on the “mode select” and turn it to the ON position
    a. 

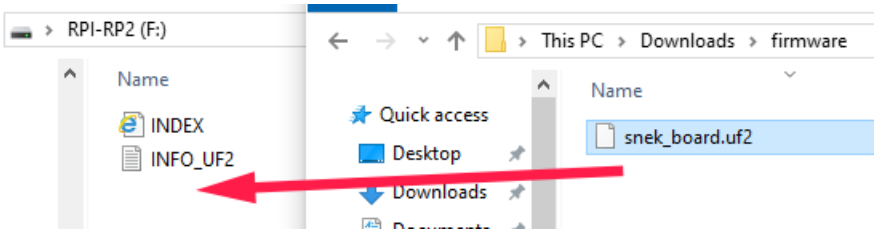
5. Power your arcade cabinet back on
6. Power on your PlayStation 2
7. Ensure the snek status light has illuminated blue, indicating Python 2 mode
8. Allow the PlayStation to boot past the BIOS splash screen and the blue network update screen. If the system check is listed, then it has successfully recognized the snek board as a Python 2.

Firmware Upgrades

Upgrading the Snek Board is very simple. It uses the RP2040's bootloader to show up like a flash drive and you simply drag and drop the new firmware onto it!

1. For safety of the high voltage systems in your arcade cabinet, disconnect the snek board from all JAMMA adapters, vga connectors, and lighting harnesses.
2. Connect the snek board to your computer using a usb type c cable.
3. Locate the two buttons on the right hand side of the board labeled "reset" and "boot"
   a. 

4. Press and hold the reset button
5. While the reset button is being held, press and hold the boot button
6. While continuing to hold the boot button, release the reset button
7. If successful, a new flash drive called RP1-RP2 should appear in My Computer.
   a. 

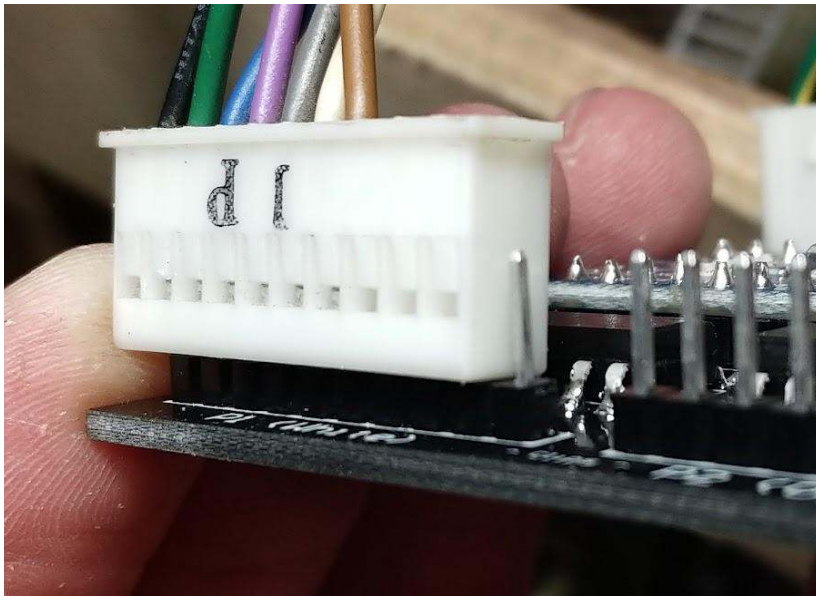
8. Take the new UF2 firmware file and copy it to the new flash drive that has appeared.
   a. 

9. Wait for the snek board to reboot
10. Congratulations you have updated your snek board!

Troubleshooting

Some of the lights are working, but a pad or two isn't, and up and right don't work!

Check to see if you have any exposed pins on Snek Board. All pins need to be plugged in the right spot for everything to be working as expected. Try reseating all connectors and checking that no pins are showing like this picture:



*This is what you *don't* want.*

I'm trying to use Snek Board with Snek Box, but it is acting weird or not lighting up?

This can happen depending on the console! Make sure you connect extra power to the Snek Box in Player 1's port with an extra USB Type C cable. You can use any 5V USB power source, such as the ports on the PS2 or Wii or an external AC power brick.