



ENABLED-CONTROLLER- MINI INSTRUCTIONS MANUAL

An accessible switch adapter box for gaming

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<https://github.com/milador/Enabled-Controller-Mini>

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Components List

1. ADAFRUIT QT PY - SAMD21 DEV BOARD **x 1**
2. 7 POSITION HEADER **x 2**
3. CONN JACK STEREO 3.5MM R/A **x 4**
4. CONN JACK 4COND 3.5MM **x 1**
5. ANALOG 2-AXIS THUMB JOYSTICK WIT **(Optional) x 1**
6. HEX NUT 0.245" STEEL 6-32 **x 4**
7. MACH SCREW PAN HEAD SLOTTED 6-32 **x 4**

The bill of materials can also be downloaded from GitHub repository under main directory.

https://github.com/milador/Enabled-Controller-Mini/blob/master/Components/Enabled_Controller_Mini_BOM.csv

Software

The Enabled-Controller-Mini software can be downloaded from the GitHub repository under software directory.

<https://github.com/milador/Enabled-Controller-Mini/tree/master/Software/Arduino/>

There are two flavors of Enabled-Controller-Mini and each one requires different hardware. The Enabled-Controller-Mini software is offered in the following flavors:

1. USB Keyboard/Mouse Version
2. Joystick Version

Installing Arduino IDE

The Arduino IDE is required to compile and upload the source code to the MCU in your Adafruit QT Py board. You can download and install the Arduino from official Arduino website that you can find using following link:

<https://www.arduino.cc/en/software>

Installing Arduino Libraries

The following instructions on how to install additional Arduino libraries helps you to get started with setting up Arduino IDE with required libraries and dependencies.

<https://www.arduino.cc/en/guide/libraries>

USB Version

Board Support Packages

You can find the official instructions to install Board Support Packages on Adafruit website using following link:

<https://learn.adafruit.com/adafruit-qt-py/arduino-ide-setup>

Alternatively, you can perform following instructions to install Board Support Packages:

1. Open and start the Arduino IDE
2. Go to **File > Preferences**
3. Add following link as a new line under **Additional Board Manager URLs**
 - https://www.adafruit.com/package_adafruit_index.json
4. Restart the Arduino IDE
5. Open the Boards Manager option from the **Tools > Board** menu and install **Adafruit SAMD Boards by Adafruit**
6. Wait until the IDE finishes installing the cross-compiling toolchain and tools associated with Board Support Package. This may take few minutes.
7. That's it! The installation of Board Support Packages is finished.

Required Software and libraries

The USB version of the software requires the following files and libraries:

- [StopWatch.h](#)
- [Adafruit_NeoPixel.h](#)
- [Enabled_Controller_Mini_USB_Software.ino](#)

StopWatch library helps to calculate the reaction time and timeout in the morse code interface.

Enabled-Controller-Mini is using Adafruit_NeoPixel library to provide visual feedback using RGB LED.

Uploading Software

Note: Make sure all files are included in your local copy of Software directory before uploading it to the Adafruit QT Py M0 board. The libraries can be installed in Arduino libraries.

You can go ahead and upload the downloaded **.ino** code to Adafruit QT Py board using Arduino IDE once all the necessary libraries are installed.

1. Start the Arduino IDE
2. Open **Enabled_Controller_Mini_USB_Software.ino**
3. Select the Board under **Tools > Board** as **Adafruit QT Py M0**
4. Select the correct port number under **Tools > Port** which should show **COM XX (Adafruit QT Py M0 Express)**

Note: It's very important to make sure the correct Board and port number are selected as selecting the wrong board may result problems with bootloader of Adafruit QT Py M0 board.

5. Press the Verify button to make sure there is no problem with the software and libraries
6. Press Upload button

You can now go ahead and upload the software. Arduino IDE will show you a **Done Uploading** message indicating the software is uploaded to your Enabled-Controller-Mini.

The LED on the QT Py M0 board blinks two times in **teal** to indicate the start of initialization process has been started and it will blink again two times in green to indicate end of the initialization process.

You can also open the Serial Monitor in Arduino IDE on 115200 baud-rate to read initialization information about the version of software.

Joystick Version

Board Support Packages

The Joystick version of the software requires the following files and libraries:

- [StopWatch.h](#)
- [Joystick.h](#)
- [Adafruit_NeoPixel.h](#)
- [Enabled_Controller_Mini_Joystick_Software.ino](#)

StopWatch library helps to calculate the reaction time and timeout in the morse code interface.

The joystick library is used to turn Enabled-Controller-Mini into a joystick USB HID device.

Enabled-Controller-Mini is using Adafruit_NeoPixel library to provide visual feedback using RGB LED.

Uploading Software

Note: Make sure all files are included in your local copy of Software directory before uploading it to the Adafruit QT Py M0 board. The libraries can be installed in Arduino libraries.

You can go ahead and upload the downloaded **.ino** code to Adafruit QT Py board using Arduino IDE once all the necessary libraries are installed.

7. Start the Arduino IDE
8. Open **Enabled_Controller_Joystick_USB_Software.ino**
9. Select the Board under **Tools > Board** as **Adafruit QT Py M0**
10. Select the correct port number under **Tools > Port** which should show **COM XX (Adafruit QT Py M0 Express)**

Note: It's very important to make sure the correct Board and port number are selected as selecting the wrong board may result problems with bootloader of Adafruit QT Py M0 board.

11. Press the Verify button to make sure there is no problem with the software and libraries
12. Press Upload button

You can now go ahead and upload the software. Arduino IDE will show you a **Done Uploading** message indicating the software is uploaded to your Enabled-Controller-Mini.

The LED on the QT Py M0 board blinks two times in **teal** to indicate the start of initialization process has been started and it will blink again two times in green to indicate end of the initialization process.

You can also open the Serial Monitor in Arduino IDE on 115200 baud-rate to read initialization information about the version of software.

Hardware Assembly

Printed circuit Board design

The printed circuit boards (PCB) can be downloaded from GitHub repository under Hardware directory.

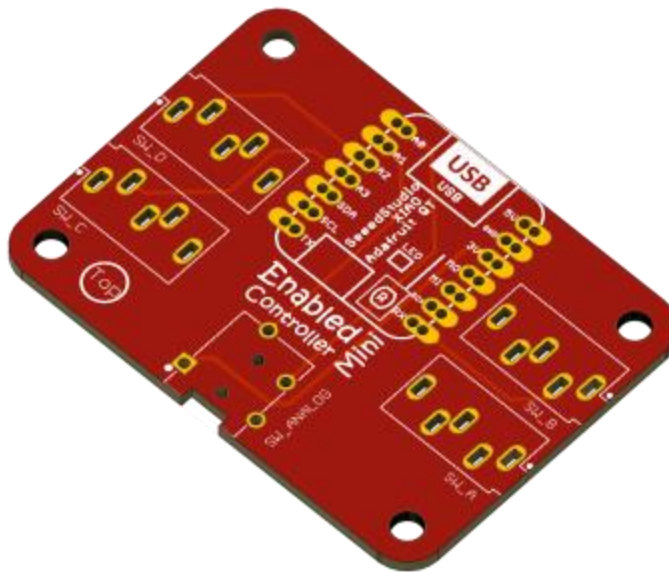
<https://github.com/milador/Enabled-Controller-Mini/tree/master/Hardware/PCB>

Enclosure design

The enclosure/housing files in STL format can be downloaded from GitHub repository under Hardware directory.

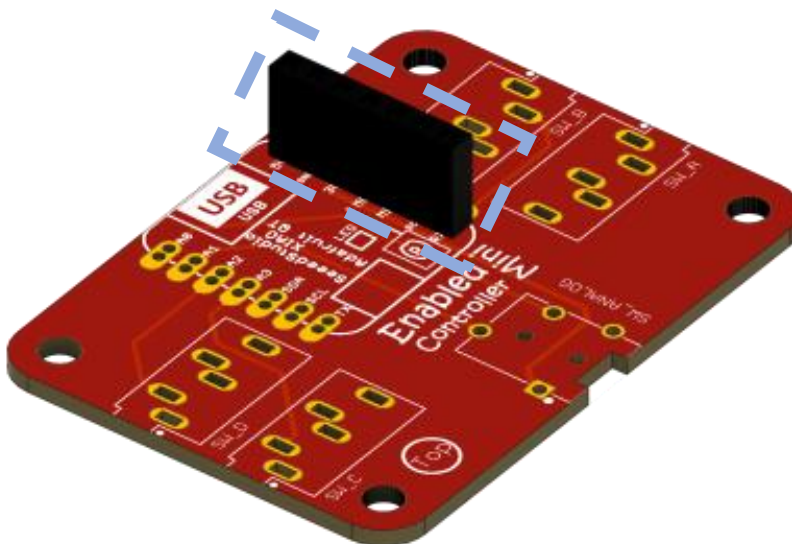
<https://github.com/milador/Enabled-Controller-Mini/tree/master/Hardware/Enclosure>

Assembly Instructions



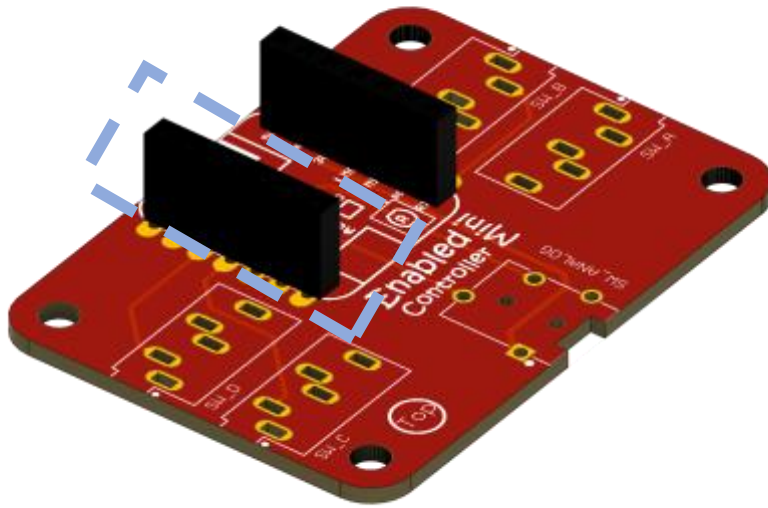
1

Step 1: Enabled-Controller-Mini board x 1



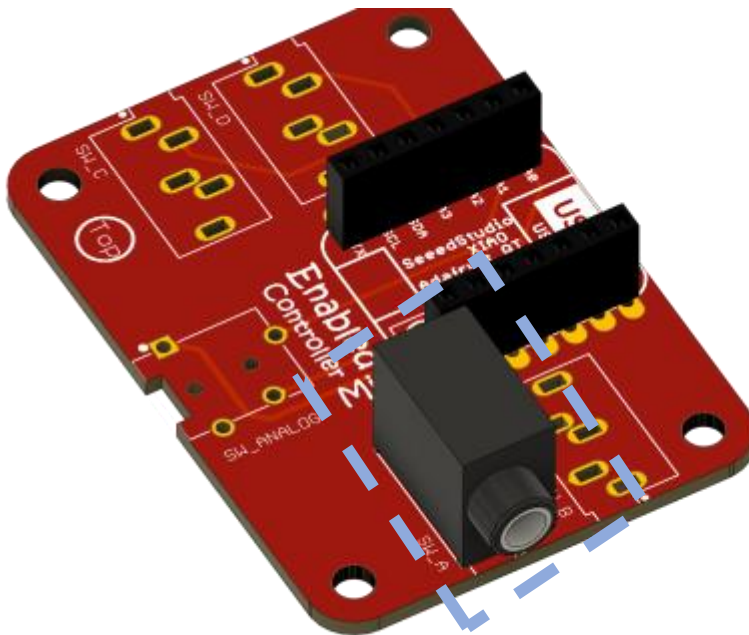
2

Step 2: Solder the first 7 position female headers over the Enabled-Controller-Mini board



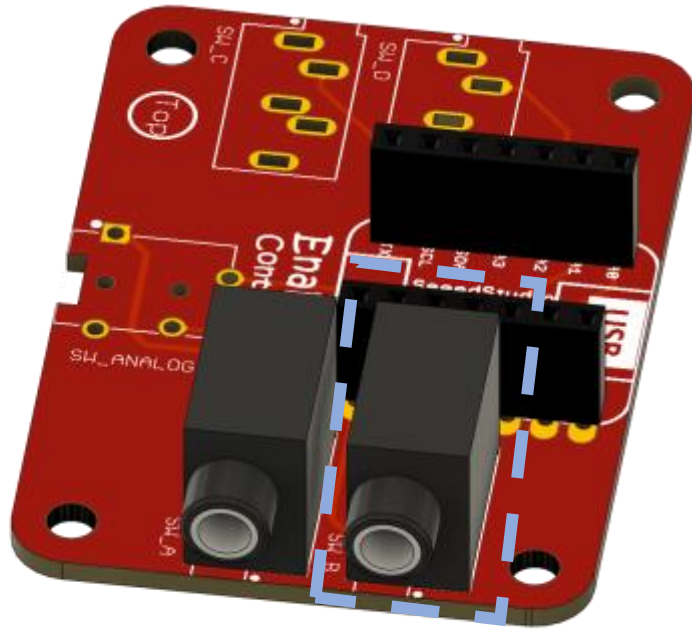
3

Step 3: Solder the second 7 position female headers over the Enabled-Controller-Mini board



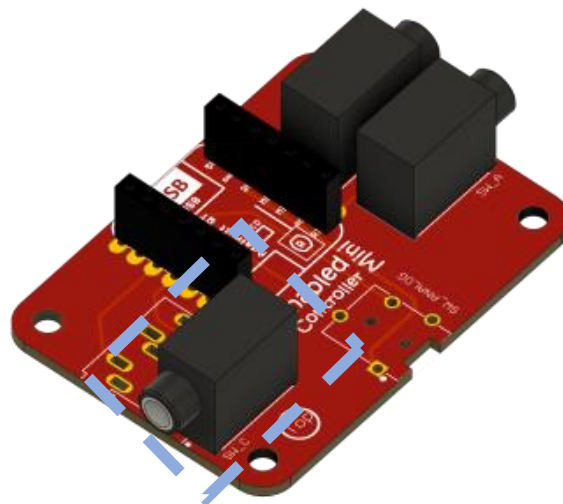
4

Step 4: Position a 3.5mm jack on the A switch outline and solder the pins x 1



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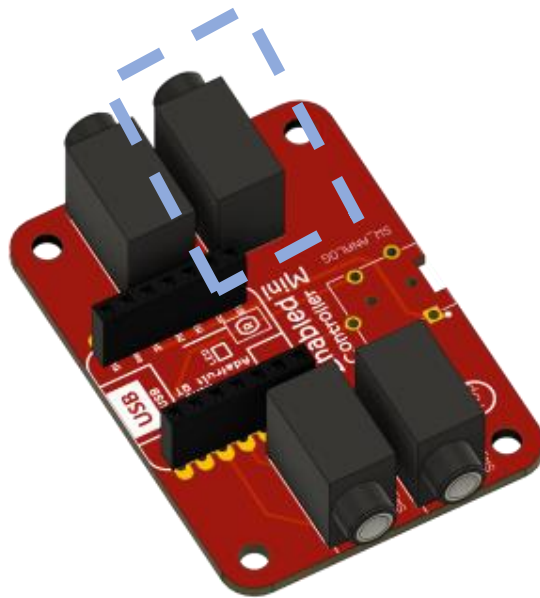
Step 5: Position a 3.5mm jack on the B switch outline and solder the pins x 1



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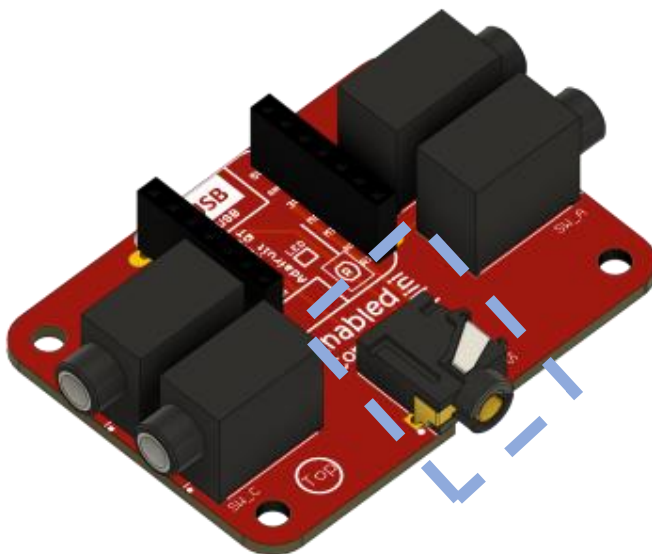
Step 6: Position a 3.5mm jack on the C switch outline and solder the pins x 1

9



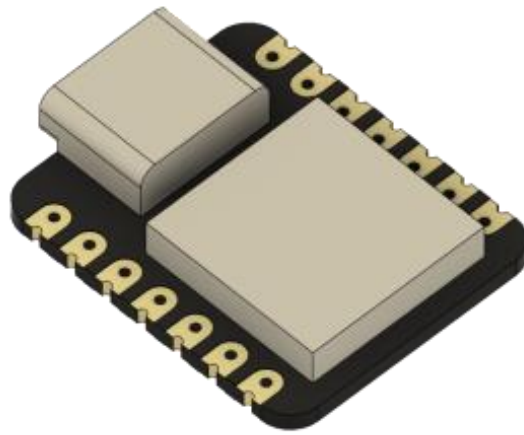
7

Step 7: Position a 3.5mm jack on the D switch outline and solder the pins x 1



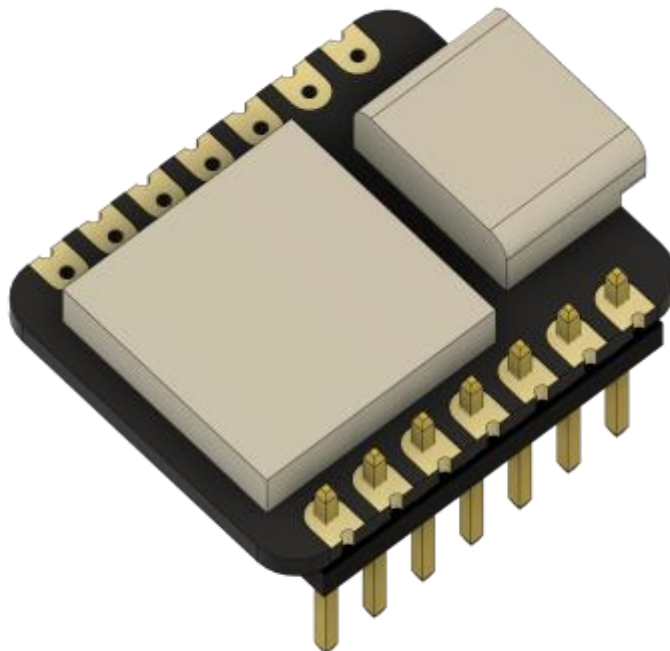
8

Step 8: Position a 4 Conductor 3.5mm jack on the AN switch outline and solder the pins x 1



9

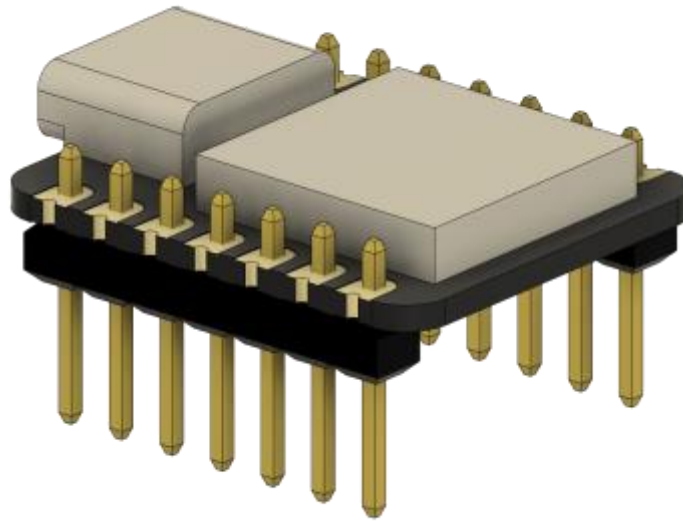
Step 9: Position the QT Py on a breadboard or prepare it for soldering x 1



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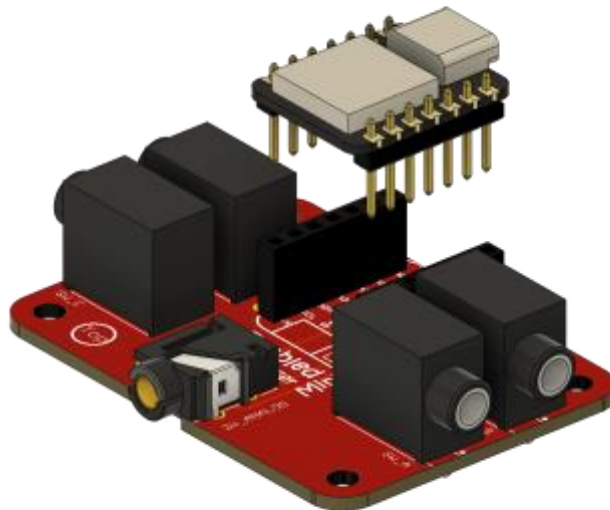
Step 10: Position and solder the first 7 position male header connector under QT Py board x 1

11



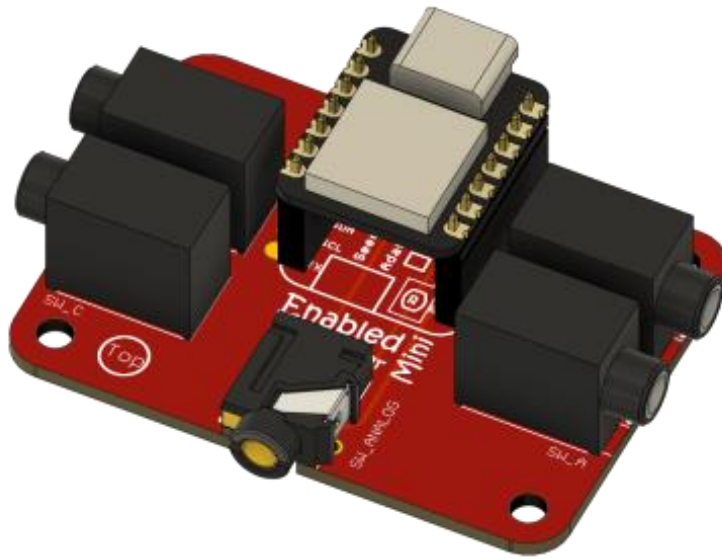
11

**Step 11: Position and solder the second 7 position male header connector under QT Py board
x 1**



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Step 12: Position the soldered QT Py board over Enabled-Controller-Mini board



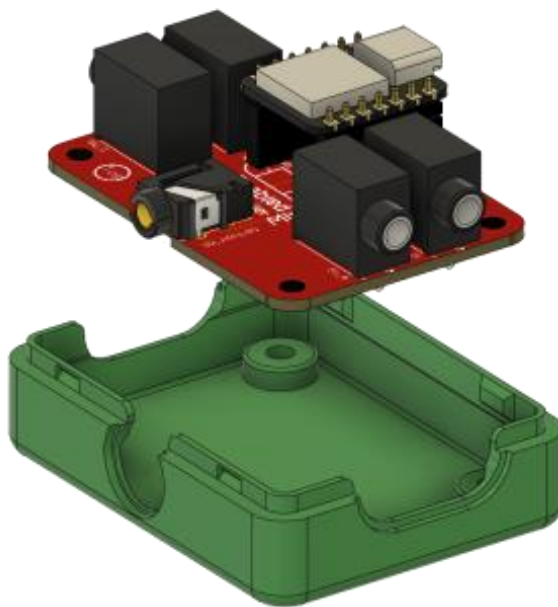
13

Step 13: Stack the soldered QT Py board over Enabled-Controller-Mini board



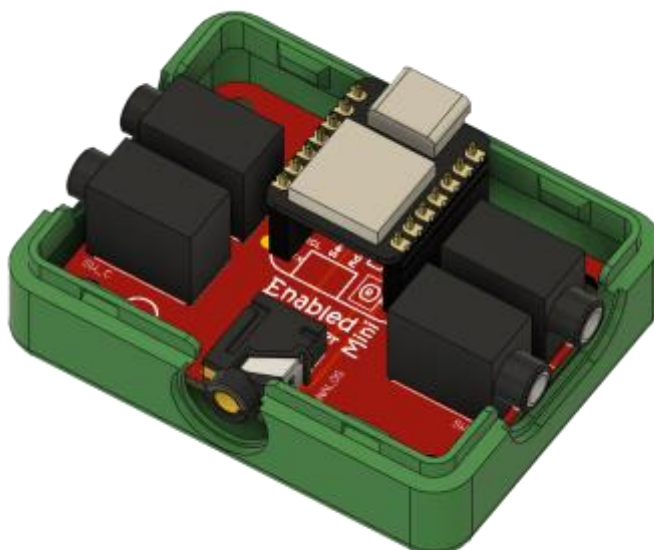
14

Step 14: Take the bottom part of Enabled-Controller-Mini enclosure



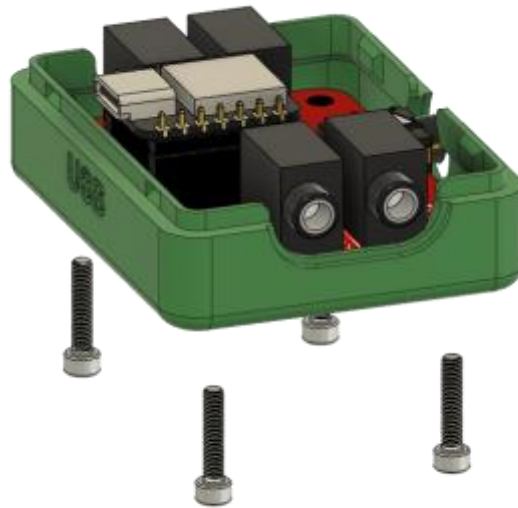
15

Step 15: Position the assembled Enabled-Controller-Mini board in the bottom enclosure part



16

Step 16: Position the 6-32 screws under the bottom enclosure x 4



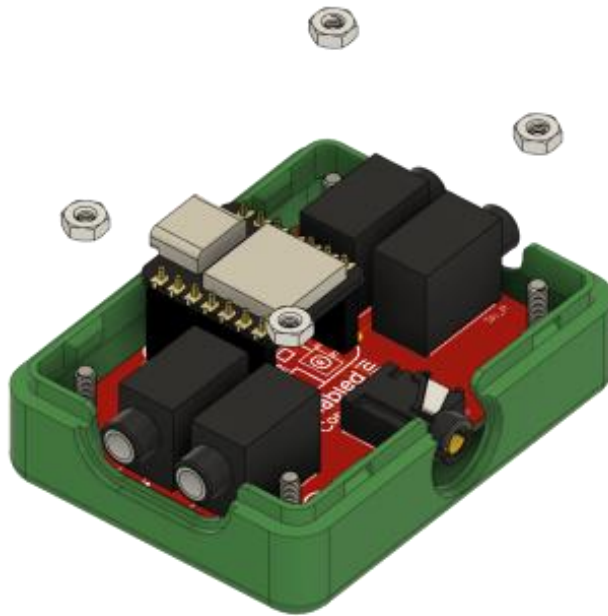
17

Step 17: Position the 6-32 screws under the bottom enclosure part x 4



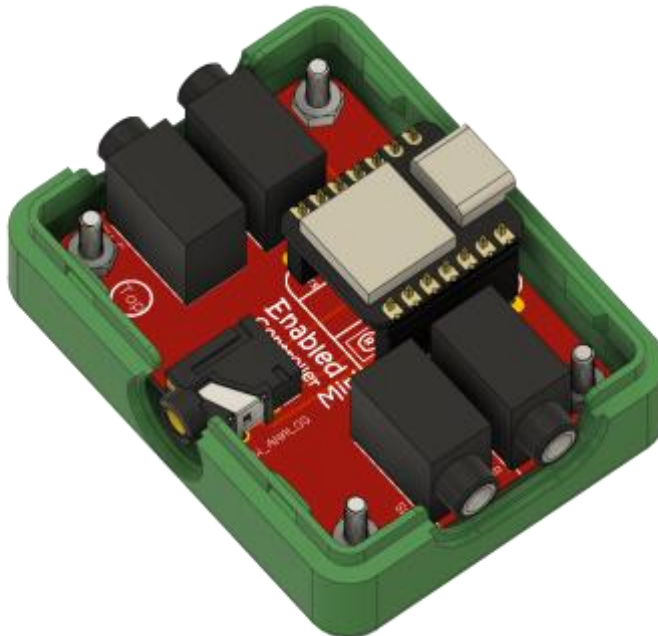
18

Step 18: Insert the 6-32 screws and push them until they pass Enabled-Controller-Mini drill holes x 4



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Step 19: Insert the 6-32 screw nuts x 4



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Step 20: Make sure the 6-32 screws hold the Enabled-Controller-Mini board by tightening the nuts



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Step 21: Enabled-Controller-Mini top enclosure x 1



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Step 22: Insert the top enclosure part over the bottom enclosure and snap them together



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Step 23 – That's it! Your Enabled-Controller-Mini is fully assembled and ready to use.
ready to use.