

Cedar Mini Joystick

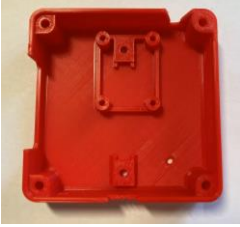

ASSEMBLY GUIDE

Required Components

1	Joystick Unit	QTY 1	2	USB-C cable	QTY 1	3	Adafruit QT Py SAMD21 board	QTY 1
								
4	3.5mm mono jack, panel mount	QTY 3	5	Slide Switch	QTY 1	6	Right angle 5 pin female header	QTY 1
								
7	Female header, 7 pin	QTY 2	8	#4-3/8" Sheet metal screw, self threading	QTY 4	9	24AWG solid core wire, multiple colours	Length: 2 feet
								
10	4" cable tie	QTY 1	11	M3 hex nuts	QTY 2	12	3D PCB	QTY 1
								

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13	3D Printed Enclosure Bottom	QTY 1	14	3D Printed Enclosure Top	QTY 1	15	3D Printed Slide Switch	QTY 1
								

Required Tools

- Flush Cutters
- Wire Strippers
- Soldering Iron
- Philips Head Screwdriver
- Computer with USB port and Arduino IDE (or ability to install it)

Required Personal Protective Equipment (PPE)

- Safety Goggles

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Assembly Instructions

Step 1

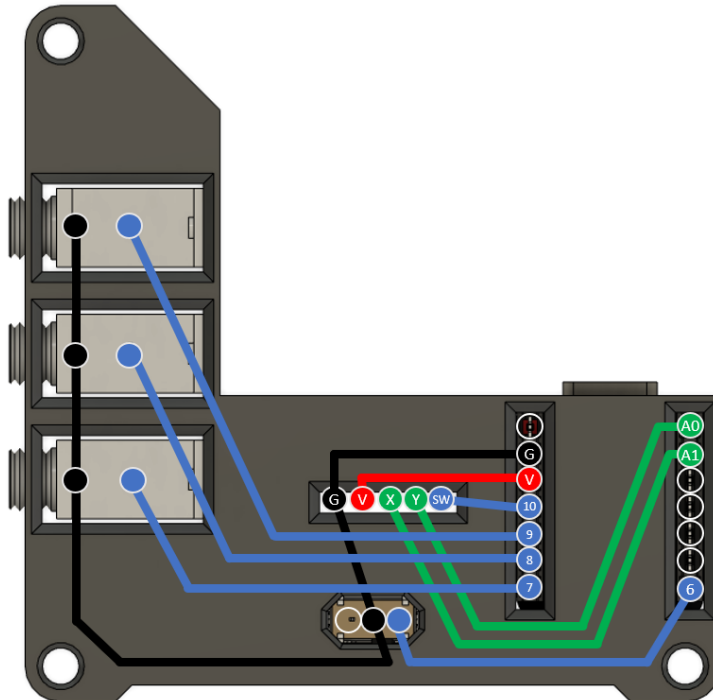
Insert components into 3D PCB:

- Press fit both 7 pin female headers so the tops are flush with the 3D print
- Press fit slide switch so top is flush with 3D print
- If possible, use pliers to bend the two outer mounting legs outwards to secure the slide switch
- Snap fit right angle 5 pin female header with pins through hole
- Press in the mono jacks so the tops are flush with the 3D print and install nuts to secure them.



Wiring

For the next steps, the following picture is the wiring diagram.



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Step 2

Solder as shown. It is easiest to pre-tin wires and pins.

Ground pins (yellow) are:

- First pin on mono jack (closest to jack)
- Middle pin on slide switch
- Left pin on joystick header
- 2nd pin from top left on QT Py header

Other connections:

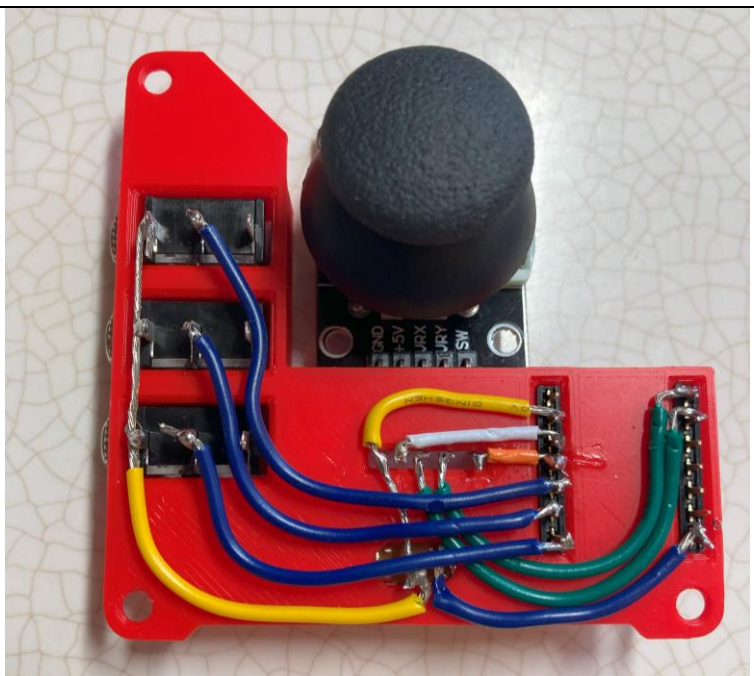
- Joystick 5V to QT Py 3V3
- Joystick X to QT Py A1
- Joystick Y to QT Py A0



Step 3

Solder remaining connections.

- Joystick switch to QT Py D10
- Top mono jack middle pin to QT Py pin 9
- Middle mono jack middle pin to QT Py pin 8
- Bottom mono jack middle pin to QT Py pin 7
- Slide switch right pin to QT Py pin 6



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Step 4

Inspect the board and check that none of the connections are shorted.

There should be no bridges/connections between adjacent pins.

If you have a multimeter, you can use it to double check continuity.

WARNING: If pins are shorted they may damage the USB port on your computer.



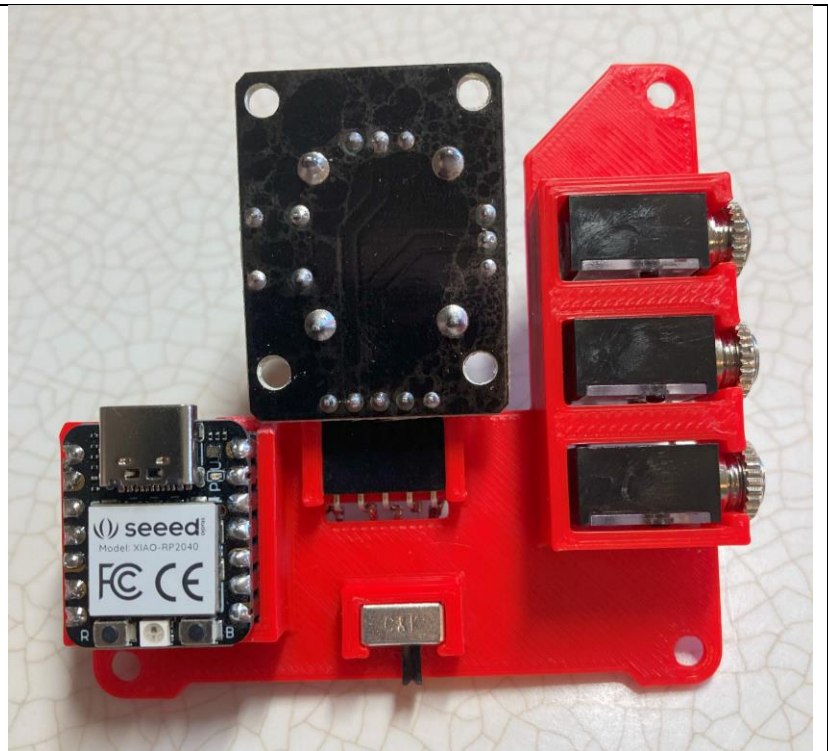
Step 5

Solder male headers to Adafruit QT Py SAMD21 board.

Insert Adafruit QT Py board and joystick.

Make sure the USB port on the QT Py board is facing towards the joystick.

All components should be “upside down” when joystick is upright.



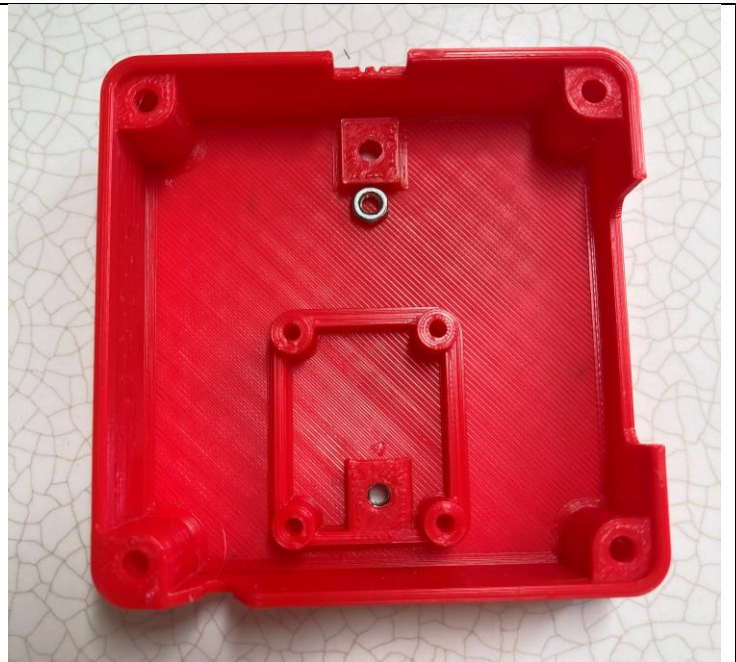
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Step 6

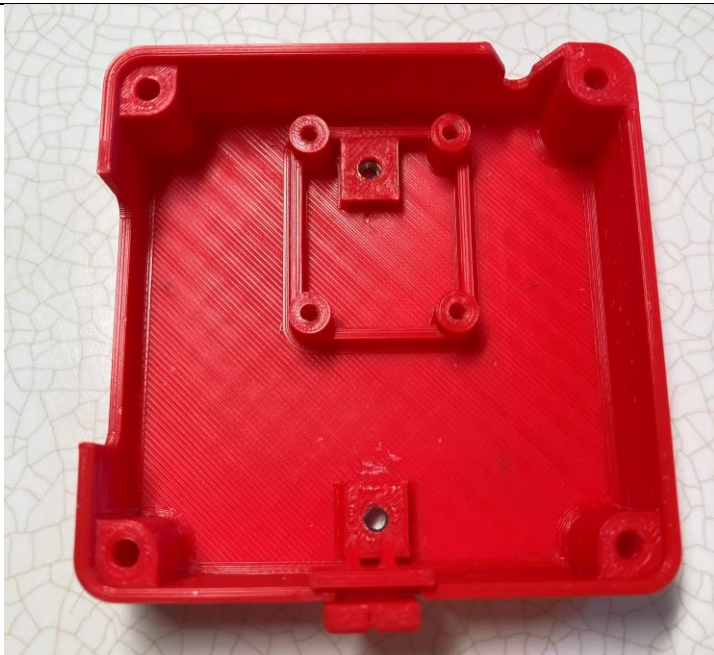
Insert M3 nuts into captive nut slots.

You might need to use pliers to push the nuts in.



Step 7

Place the slide switch cover in the slot with the taller side/slot up.



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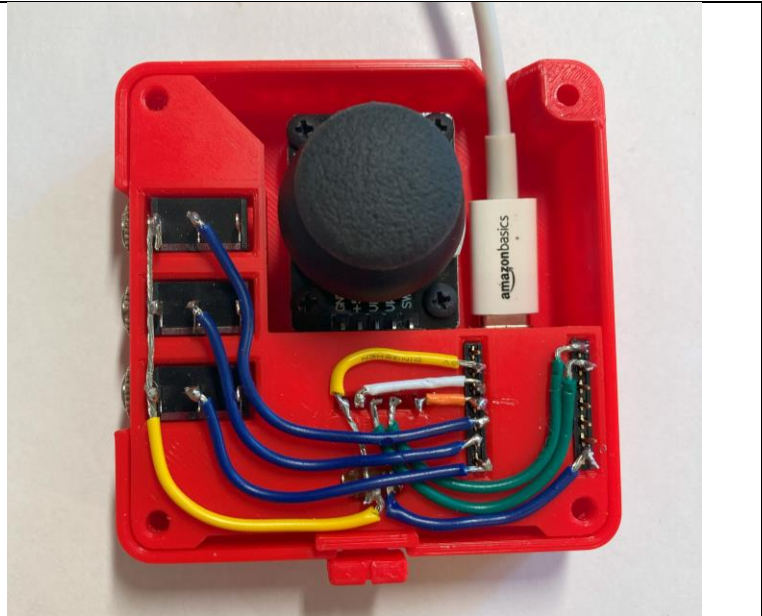
Step 8

Plug the USB-C cable into the Adafruit QT Py board.

Insert the 3D PCB into bottom of enclosure, the joystick should sit on the 4 posts.

You may need to move the slide switch cover so that it lines up with the slide switch and fits onto it.

Insert screws into the joystick board's 4 screw holes.



Step 9

Place the top onto the enclosure.

Screw in all 4 screws from the bottom.



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Programming Instructions

1. Setup Arduino IDE
 - 1.1. Download Arduino IDE for your operating system at <https://www.arduino.cc/en/software>
 - 1.2. Install Arduino IDE
2. Setup Core
 - 2.1. Open Arduino IDE
 - 2.2. Click on **File -> Preferences**
 - 2.3. Locate the text field that says **Additional Boards Manager URLs** beside it.
 - 2.4. Copy and paste the following link into the field as a new line:
https://adafruit.github.io/arduino-board-index/package_adafruit_index.json
 - 2.5. Click on **OK**
 - 2.6. Restart the Arduino IDE
 - 2.7. Open the **Boards Manager** option from the **Tools-> Board-> Boards Manager...**, search for “Adafruit SAMD” and select “Adafruit SAMD Boards” by Adafruit
3. Install Libraries
 - 3.1. Go to https://github.com/cyborg5/TinyUSB_Mouse_and_Keyboard and go to Code -> Download ZIP and then rename this ZIP folder “TinyUSB_Mouse_and_Keyboard”
 - 3.2. In the Arduino IDE, go to **Sketch -> Include Library -> Add .ZIP library** and then select the “TinyUSB_Mouse_and_Keyboard” ZIP folder (likely found in your Downloads)
 - 3.3. Go to **Tools -> Manage Libraries...**, search for “Flash Storage” and install the library “FlashStorage” by Arduino
4. Upload the Code to the joystick
 - 4.1. Open OpenAT_Joystick_Mouse_M0_Software_Cedar.ino with Open Arduino IDE.
 - 4.2. Select **Adafruit QT Py M0 (SAMD21)** from **Tools -> Board -> Adafruit SAMD Boards**
 - 4.3. Click on **Tools -> USB Stack** and select **Adafruit TinyUSB**
 - 4.4. Connect the joystick using the USB cable to the computer.
 - 4.5. Select the correct port from **Tools -> Port** menu.
 - 4.6. Verify and upload the code.

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Testing

1. Slide the mode switch to Joystick mode.
2. Connect the joystick using the USB C cable to the computer.
3. If using Windows, open “Set up USB Game Controllers” from the Control Panel. You can find this by searching your computer in the search bar next to the Windows icon.
4. Ensure that the joystick is registered as a game controller and select your joystick from the list and go to “Properties”.
5. Move your joystick and observe the movement of the cross hatch in the “Axes” window. Ensure it moves in the proper directions when you move the joystick (the arrow points in the up direction). If not, open the joystick and check your connections.
6. Using assistive switches plugged into each mono jack, activate each switch, and ensure that one of buttons 1-4 light up when you press the switch, and stops when you release the switch. If not, open the joystick and check your connections.