

# Ivy Nunchuck Joystick Adapter

## MAKER GUIDE

## Overview

This document contains the necessary information to build the device.

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### Maker Checklist

This list provides an overview of the steps required to build and deliver the device.

### Maker To Do List

- ☐ Read through the Assembly Guide to become familiar with required components, tools, supplies, and safety gear and overall assembly steps.
- ☐ Talk to User about customization options (e.g., color, any special requests, etc.)
- ☐ Order hardware components
- ☐ Gather tools, supplies, and safety equipment.
- ☐ Assemble the device
- ☐ Test device
- ☐ Print “User Guide”

### Items to Give to User

- ☐ Assembled, tested device
- ☐ “User Guide”

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### Tool List

Computer with Arduino IDE for programming microcontroller

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### Customization Guide

The enclosure can be printed in the user's desired colour.

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### 3D Printing Guide

#### 3D Printing Summary

Metrics	Single Unit
Total Print Time (min)	1h58m
Total Number of Components	3
Typical Total Mass (g)	13
Typical Number of Print Setups	1

#### 3D Printing Settings

Print File Name	Qty	Total Print Time (hr:min)	Mass (g)	Infill (%)	Support(Y/N)	Layer Height/ Nozzle Diameter(mm)	Notes
Enclosure Top	1	1:21	13	15	N	0.2/0.4	
Enclosure Bottom	1	0:36	6	15	N	0.2/0.4	
USB C Cover	1	0:01	1	15	N	0.2/0.4	

#### Post-Processing

- Remove any stringing or blobs

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### Assembly Guide

#### Required Components

	<ol style="list-style-type: none"> <li>1. BOM</li> <li>2. <a href="#">Adafruit QT PY - SAMD21</a></li> <li>3. <a href="#">Adafruit Wii Nunchuck Breakout</a></li> <li>4. <a href="#">Qwiic Cable - 50 mm</a></li> <li>5. <a href="#">6 ft USB C – USB A Cable</a></li> <li>6. Enclosure Top</li> <li>7. Enclosure Bottom</li> <li>8. USB C Cover</li> <li>9. <a href="#">Nunchuck Controller</a></li> </ol>
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#### Required Tools

- Computer with Arduino IDE to program microcontroller.

#### Required Personal Protective Equipment (PPE)

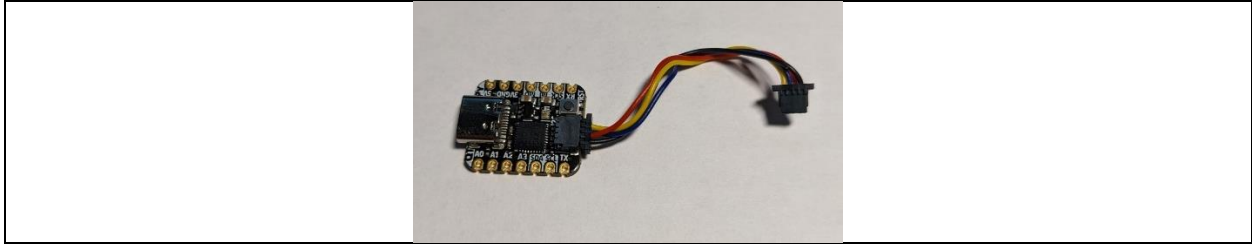
- None required.

#### Step 1: Attach STEMMA QT Cable to Microcontroller

Attach one end of the STEMMA QT cable to the STEMMA QT connector on the Adafruit QT Py microcontroller.

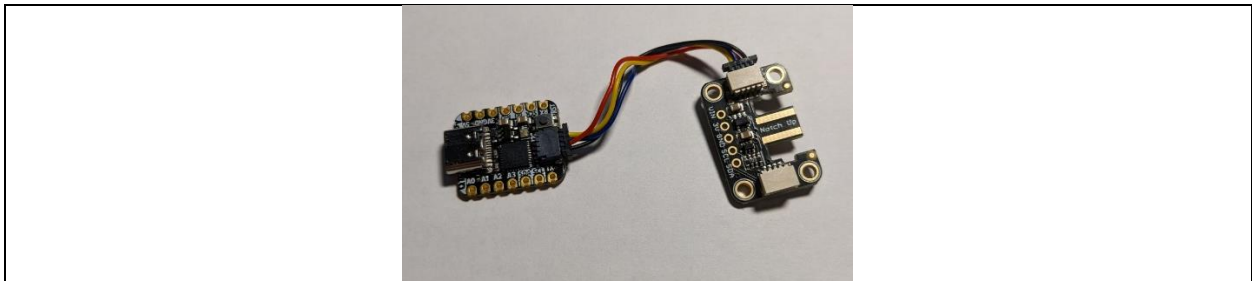
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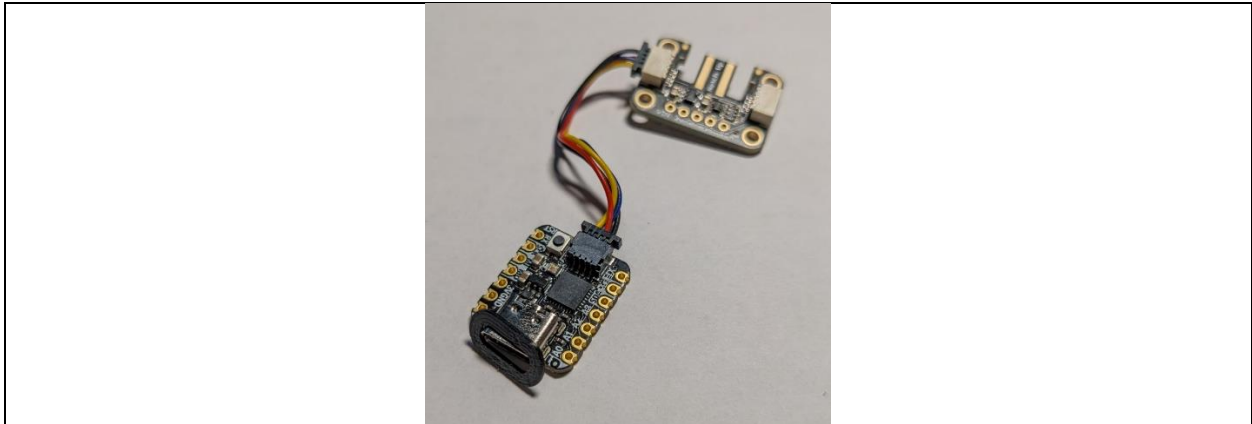


### Step 2: Attach STEMMA QT Cable to Nunchuck Breakout Board

Attach the other end of the STEMMA QT cable to one of the STEMMA QT connectors on Nunchuck Breakout board.



### Step 3: Add USB-C Cover to QtPy USB C Connector



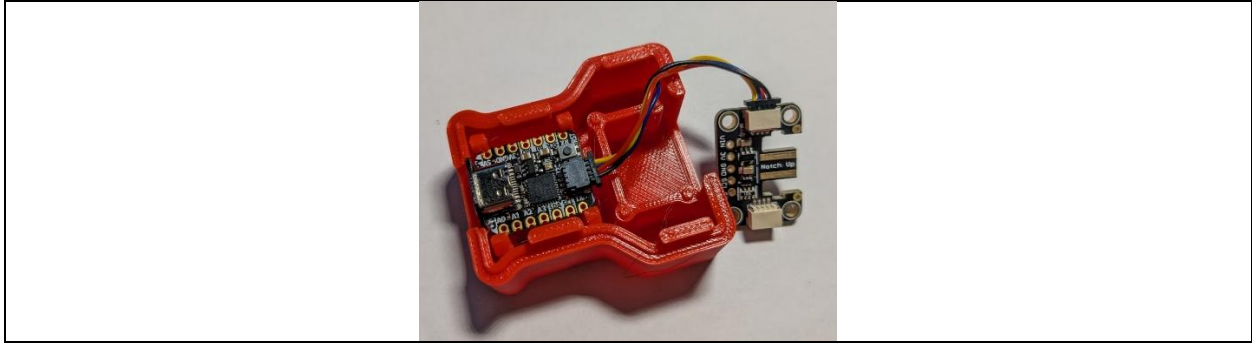
### Step 4: Insert Qt Py into Bottom Enclosure

Align the Qt Py USB connector into the corresponding opening. Gently press on the board to lock it into place.



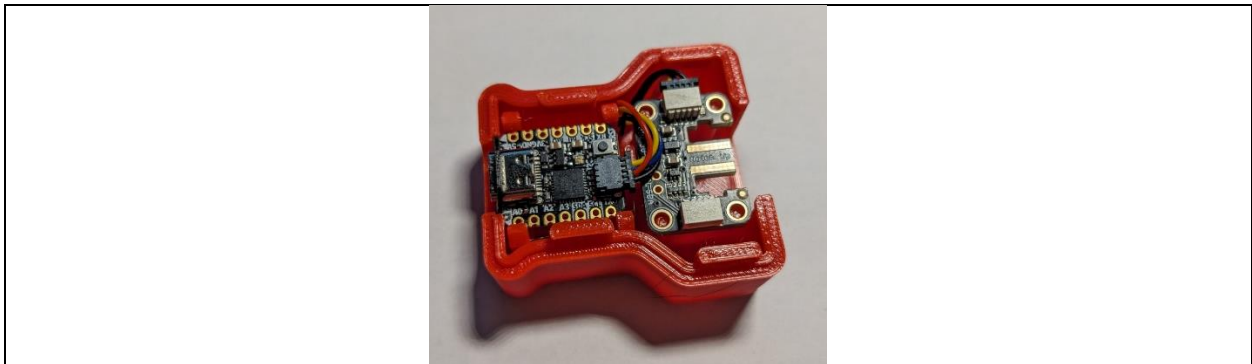
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### Step 5: Insert Nunchuck Breakout Board into Bottom Enclosure

Position the Nunchuck Breakout Board so the mounting holes align with the posts. Tuck the STEMMA QT Cable down into the enclosure.



### Step 6: Connect Top Enclosure to Bottom Enclosure

Position the Top Enclosure over top of the Bottom Enclosure and press down to engage the snap fit.



### Step 7: Insert the Light Pipe

Insert the **Light Pipe** into the hole in the top of the enclosure.

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### Software Installation

1. Setup Arduino IDE
  - a. Download Arduino IDE for your operating system at <https://www.arduino.cc/en/software>
  - b. Install Arduino IDE
2. Setup Board
  - a. Open Arduino IDE.
  - b. Click on **File -> Preferences**
  - c. Locate the text field that says **Additional Boards Manager URLs** beside it.
  - d. Copy and paste the following link into the field as a new line:  
[https://adafruit.github.io/arduino-board-index/package\\_adafruit\\_index.json](https://adafruit.github.io/arduino-board-index/package_adafruit_index.json)
  - e. Click on **OK**
  - f. Restart the Arduino IDE
  - g. Open the **Boards Manager** option from the **Tools-> Board-> Boards Manager...**, search for “Adafruit SAMD” and select “Adafruit SAMD Boards” by Adafruit.
  - h. Click **Install** to install the board.
3. Install Libraries
  - a. In a web browser, go to [https://github.com/cyborg5/TinyUSB\\_Mouse\\_and\\_Keyboard](https://github.com/cyborg5/TinyUSB_Mouse_and_Keyboard) and go to Code -> Download ZIP.
  - b. In Arduino IDE, click **Sketch -> Include Library -> Add .ZIP Library**
  - c. Navigate to the ZIP file downloaded above. Click OK.
  - d. Go to **Tools -> Manage Libraries...**, search for “Flash Storage” and install the library “FlashStorage” by Arduino
  - e. Go to **Tools -> Manage Libraries...**, search for “WiiChuck” and install the library “WiiChuck”.

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- f. Go to **Tools -> Manage Libraries...**, search for “Adafruit\_Neopixel” and install the library “Adafruit\_Neopixel”.
4. Upload the Code to the microcontroller.

Mouse Code:

- a. Open Ivy\_Nunchuck\_Adapter\_Mouse.ino with Arduino IDE.
- b. Select **Adafruit QT Py M0 (SAMD21)** from **Tools -> Board -> Adafruit SAMD Boards**
- c. Click on **Tools -> USB Stack** and select **Adafruit TinyUSB**
- d. Connect the adapter using the USB cable to the computer.
- e. Select the correct port from **Tools -> Port** menu.
- f. Verify and upload the code.

Gamepad Code:

- g. Open Ivy\_Nunchuck\_Adapter\_Gamepad.ino with Arduino IDE.
- h. Select **Adafruit QT Py M0 (SAMD21)** from **Tools -> Board -> Adafruit SAMD Boards**
- i. Click on **Tools -> USB Stack** and select **Adafruit TinyUSB**
- j. Connect the adapter using the USB cable to the computer.
- k. Select the correct port from **Tools -> Port** menu.
- l. Verify and upload the code.

## Testing

Connect the Nunchuck Controller to the adapter.

### Mouse

Test the device by plugging it into a USB port of a host device. Confirm that the joystick responds when the thumbstick is moved or the buttons are pressed.

### Gamepad

#### Testing the Completed Joystick

1. Make sure the code has been flashed in Gamepad Mode
2. Connect the joystick using the USB C cable to the computer.

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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.