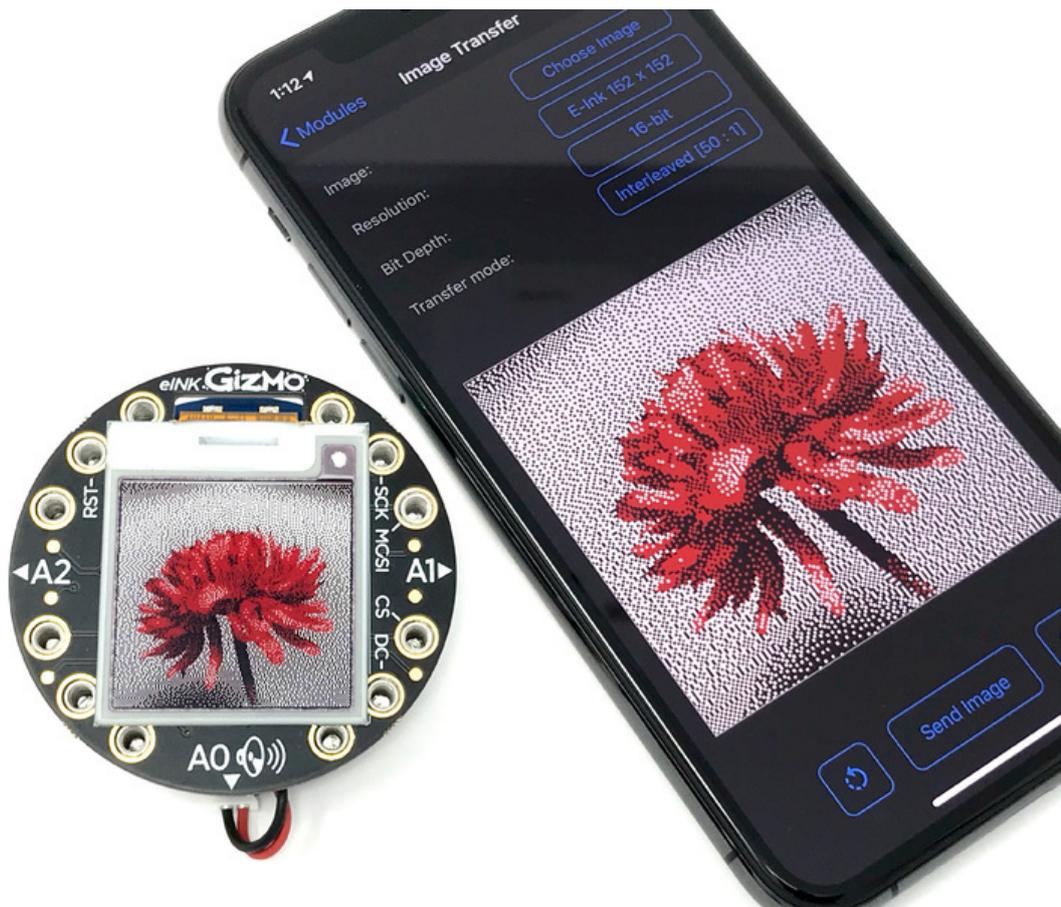




# Wireless Image Transfer with Circuit Playground Bluefruit and E-Ink Gizmo

Created by Collin Cunningham



<https://learn.adafruit.com/wireless-image-transfer-with-circuit-playground-bluetooth-and-eink-gizmo>

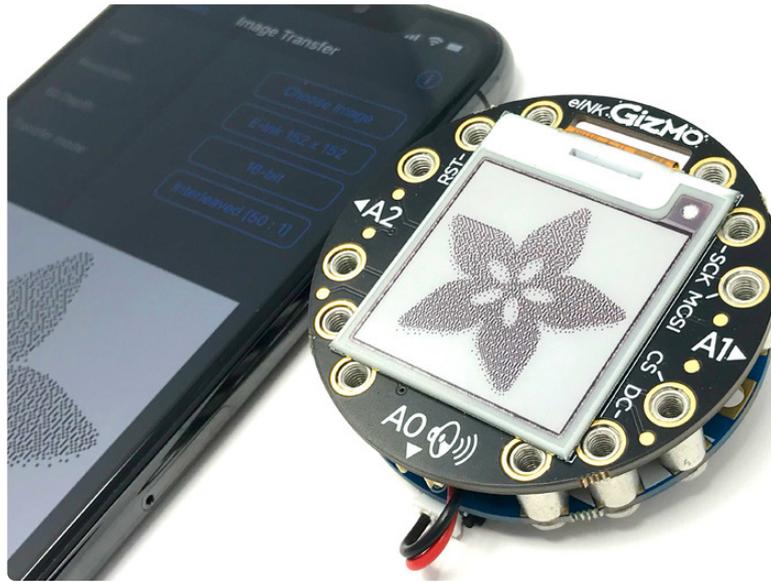
Last updated on 2024-03-08 03:36:49 PM EST

# Table of Contents

<b>Overview</b>	<b>3</b>
<ul style="list-style-type: none"><li>• <a href="#">Parts</a></li><li>• <a href="#">iOS or Android device</a></li></ul>	
<b>Assembly</b>	<b>5</b>
<b>Bluefruit LE Connect</b>	<b>8</b>
<ul style="list-style-type: none"><li>• <a href="#">Install Bluefruit LE</a></li><li>• <a href="#">Enable Bluetooth</a></li><li>• <a href="#">Enable Location Services</a></li><li>• <a href="#">Scan for Devices</a></li><li>• <a href="#">Connect</a></li><li>• <a href="#">Controller Module</a></li><li>• <a href="#">Color Picker</a></li></ul>	
<b>Transfer Images</b>	<b>13</b>
<ul style="list-style-type: none"><li>• <a href="#">Load Firmware</a></li><li>• <a href="#">Connect App to CPB</a></li><li>• <a href="#">Send a Test Image</a></li><li>• <a href="#">Send Your Own Image</a></li><li>• <a href="#">Learn More</a></li></ul>	

---

# Overview

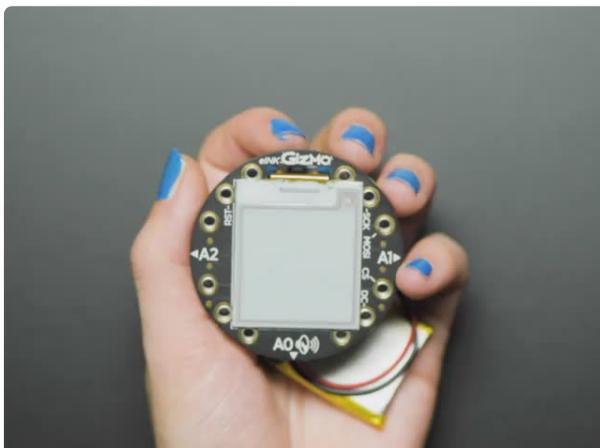


The **Tri-Color E-Ink Gizmo** gives **Circuit Playground Bluefruit** the ability to display images on a bold black, white, & red **e-ink** screen. And since it's e-ink, the image can still be seen even after power has been turned off. Even better – you can now display images on E-Ink Gizmo by sending them wirelessly from your **phone** or **tablet** using the **Bluefruit LE Connect** app for **iOS** or **Android**.

This guide shows you how to:

- Assemble your E-Ink Gizmo & Circuit Playground Bluefruit
- Install the Bluefruit LE Connect app
- Transfer images wirelessly to your E-Ink Gizmo & Circuit Playground Bluefruit

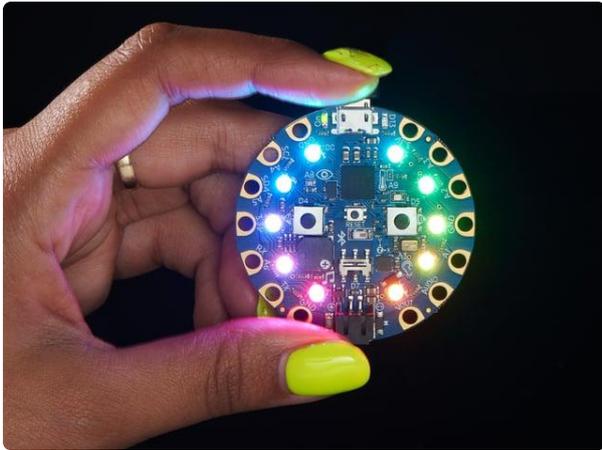
## Parts



[Circuit Playground 152x152 Tri-Color E-Ink Gizmo](https://www.adafruit.com/product/4428)

Discontinued - you can grab Circuit Playground 200x200 Tri-Color E-Ink Gizmo instead! Extend and...

<https://www.adafruit.com/product/4428>



### [Circuit Playground Bluefruit - Bluetooth Low Energy](https://www.adafruit.com/product/4333)

Circuit Playground Bluefruit is our third board in the Circuit Playground series, another step towards a perfect introduction to electronics and programming. We've...

<https://www.adafruit.com/product/4333>



### [USB cable - USB A to Micro-B](https://www.adafruit.com/product/592)

This here is your standard A to micro-B USB cable, for USB 1.1 or 2.0. Perfect for connecting a PC to your Metro, Feather, Raspberry Pi or other dev-board or...

<https://www.adafruit.com/product/592>



### [Lithium Ion Polymer Battery with Short Cable - 3.7V 350mAh](https://www.adafruit.com/product/4237)

Lithium-ion polymer (also known as 'lipo' or 'lipoly') batteries are thin, light, and powerful. The output ranges from 4.2V when completely charged to 3.7V. This...

<https://www.adafruit.com/product/4237>

## iOS or Android device

You'll also need a device to run the Bluefruit LE Connect app, which we'll use to send images over the air:

- [Bluefruit LE Connect for iOS](https://adafru.it/FxK) (<https://adafru.it/FxK>) works with iPhones or iPads running iOS 11.3 or later

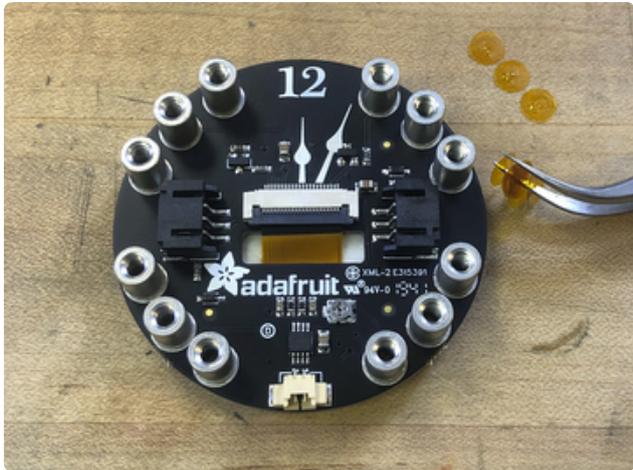
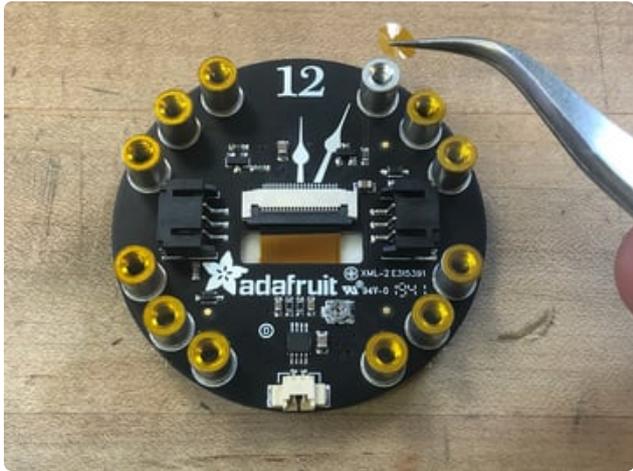
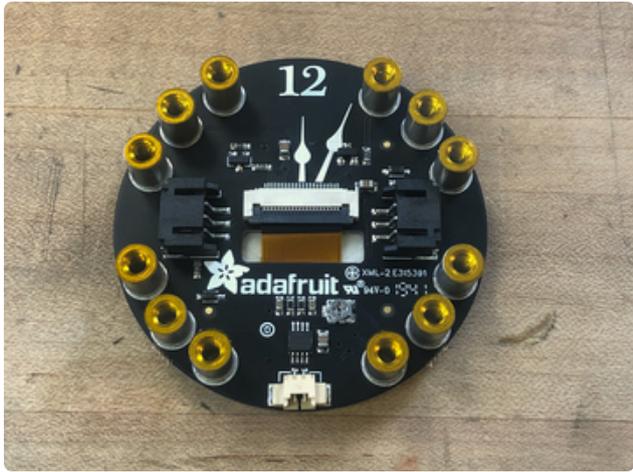
- [Bluefruit LE Connect Android \(https://adafru.it/f4G\)](https://adafru.it/f4G) works with most Bluetooth LE capable Android devices
- 

## Assembly

This page shows assembling the Circuit Playground TFT Gizmo, but the process is identical for the E-Ink Gizmo.

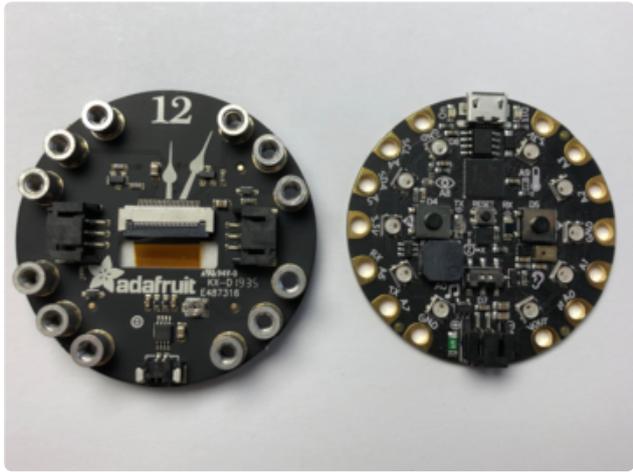
Placing the Circuit Playground TFT Gizmo on the Circuit Playground Express or Circuit Playground Bluefruit is pretty straightforward. All you need is a #2 Phillips screwdriver.

There may be plastic covers over the screw holes on the TFT Gizmo, which you will need to remove before assembly.

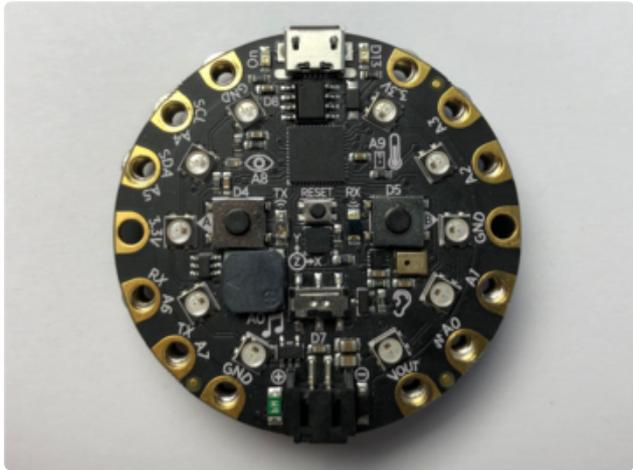


The amber colored Kapton tape dots must be removed from each of the twelve standoffs before assembling the boards. These are electrically insulating and will prevent the Gizmo from working properly if left in place.

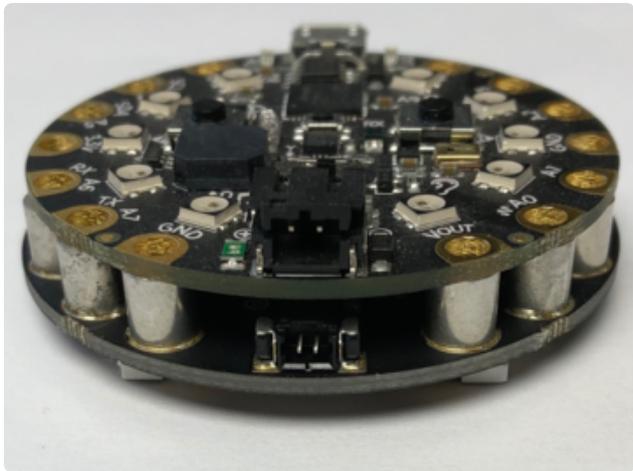
You can use your fingernails or some tweezers or a pin to poke and lift each dot as shown here.

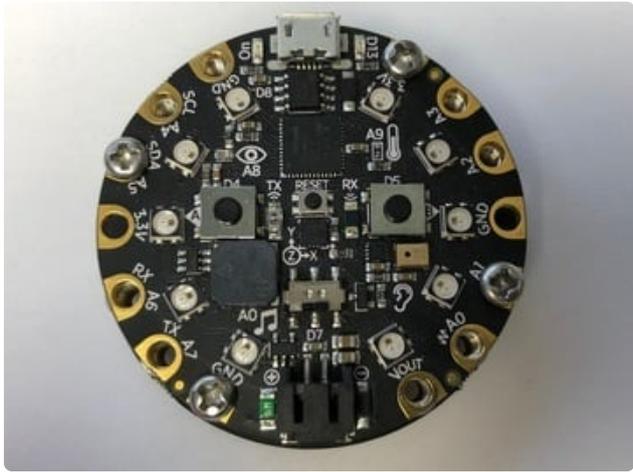


Start by aligning the two boards side by side like in the photo with the black plastic speaker connector and battery connectors pointing in the same direction.

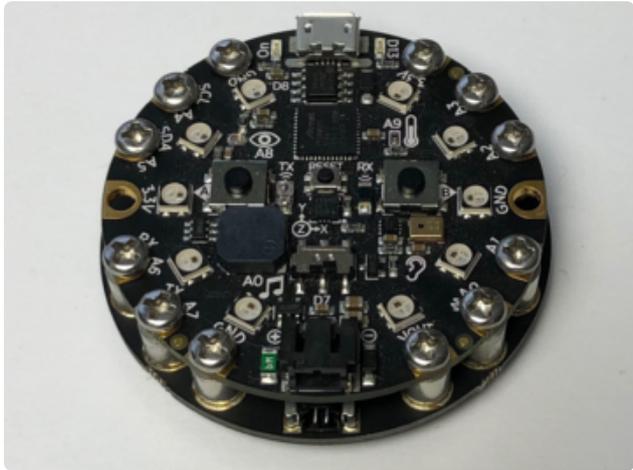


Place the Circuit Playground board on top of the Gizmo being sure that the connectors mentioned in the previous step are still aligned.





Install a few screws loosely, so that all of the holes are still aligned, before tightening them down.



Finish installing the remaining screws. After that, you're done!

## Bluefruit LE Connect



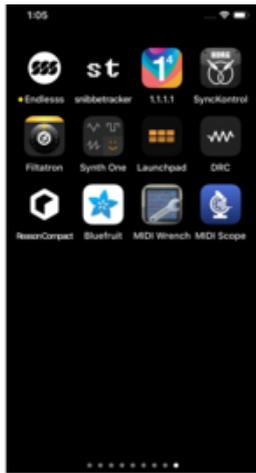
**Adafruit Bluefruit LE Connect** 4.4  
Adafruit Industries  
★★★★ 4.1, 8 Ratings  
Free

Screenshots [iPhone](#) [iPad](#) [Apple Watch](#)



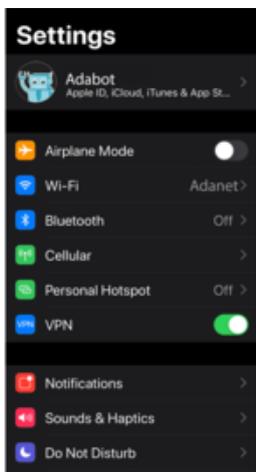
The **Bluefruit LE Connect** app provides iOS devices with a variety of tools to communicate with Bluefruit LE devices, such as the **Circuit Playground Bluefruit!** These tools cover basic communication and info reporting as well as more project specific uses such as remote button control and a NeoPixel color picker.

The iOS app is a [free download from Apple's App Store \(https://adafru.it/ddu\)](https://adafru.it/ddu). As of this writing, it requires iOS 11.3 or later and works on the **iPhone**, **iPad**, and **iPod Touch**.



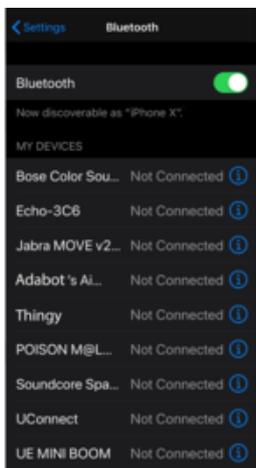
## Install Bluefruit LE

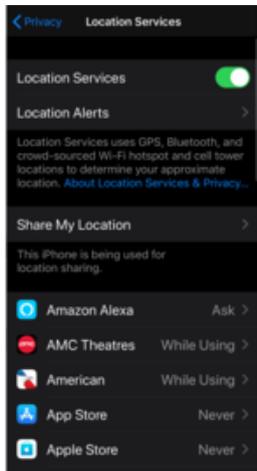
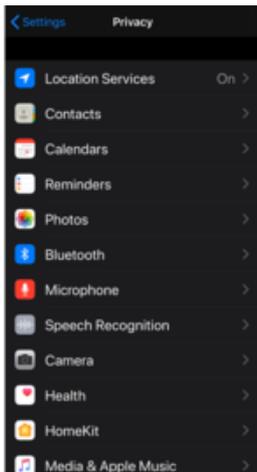
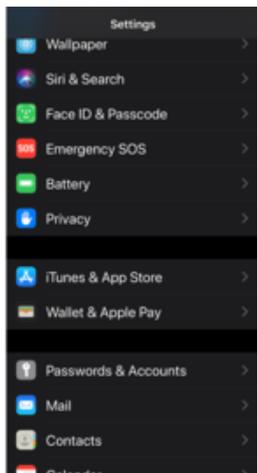
The first step is to install the app on your device.



## Enable Bluetooth

If Bluetooth is disabled on your device, enable it by going to **Setting > Bluetooth** on your iOS device and then turning it on.





## Enable Location Services

If you plan to use the app to send location/GPS data to Bluefruit LE, enable Location Services. Enable it on iOS using **Settings->Privacy->Location Services**.

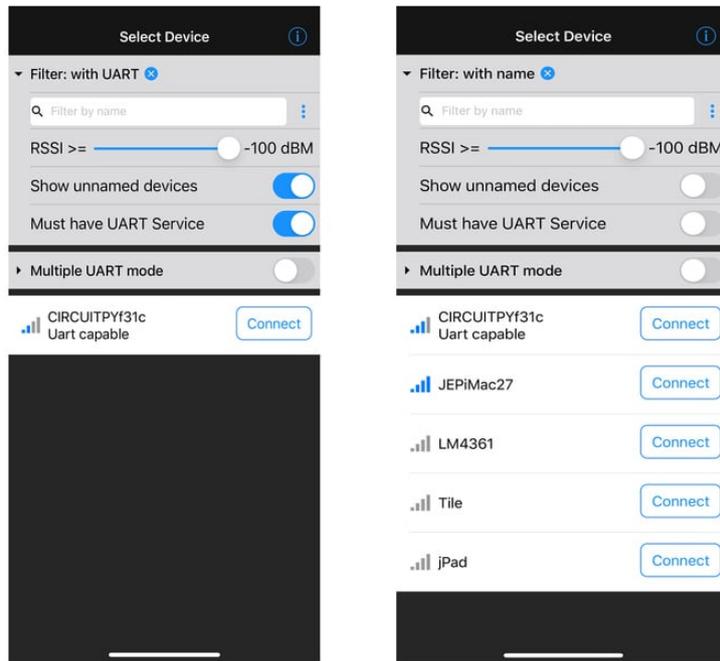
## Scan for Devices

Launch the app now -- it will automatically begin to scan the airwaves for Bluetooth LE devices. These are presented in a list at the bottom of the page.

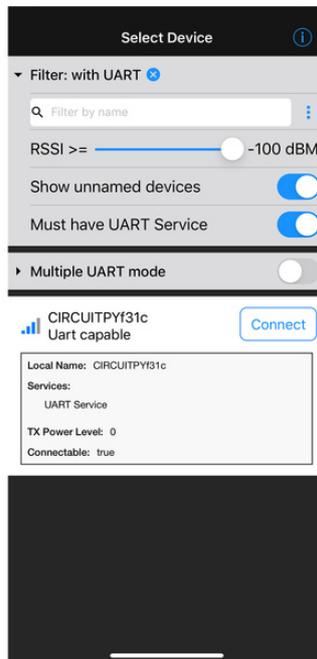
Notice, you can use the **Must have UART Service** filter to prevent BLE devices from showing up that can't work with the app.

- To refresh the list and start a new scan, simply swipe down on the current list.

- Each device's signal strength is displayed in the left side of its row.

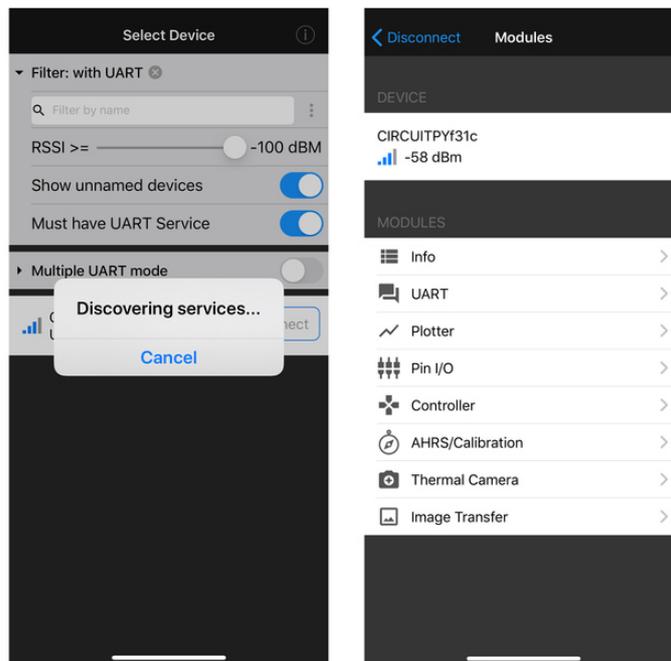


If you tap on the device entry (not on **Connect**), you'll see more detail about a particular device:



## Connect

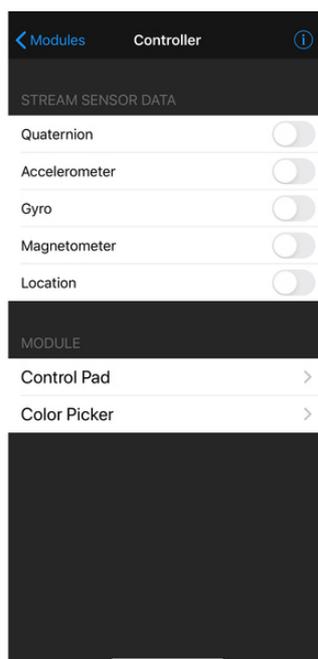
Tap the **Connect** button on the UART capable device you wish to use. The app will connect to the Circuit Playground Bluefruit! Now, you'll be presented with the Device name and signal strength, and a number of different Modules you can use.



## Controller Module

Click on the **Controller** module. You'll see a number of different sensor data streaming options. Enabling these will allow you to send data from your phone, such as the **Accelerometer** data or **Location** data, directly to your Circuit Playground Bluefruit!

The two modules on this page that can send data to the Circuit Playground Bluefruit are the **Control Pad** and **Color Picker**.

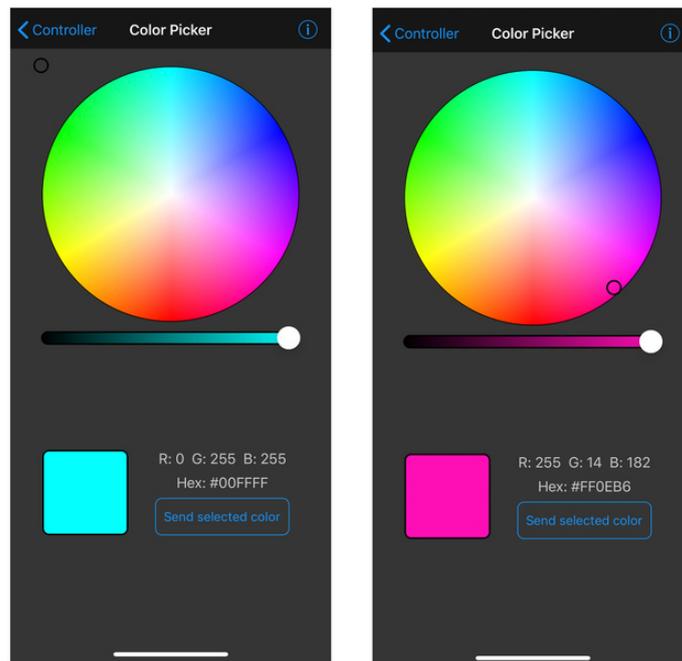


## Color Picker

Click on the **Color Picker**. Now, you can dial in the hue, saturation, and value of a color using the color wheel and value slider.

Follow this page (<https://adafru.it/GcO>) for setting up the CPB with the color picker code.

Press the **Send selected color** button and your color values will be sent to the Circuit Playground Bluefruit to adjust its NeoPixels!



The app provides many other features with the additional modules. Have a look at the [Bluefruit LE Connect for iOS and Android standalone guide \(https://adafru.it/GcP\)](https://adafru.it/GcP) for an explanation of each feature.

---

## Transfer Images

Setting up Circuit Playground Bluefruit (aka CPB) + E-Ink Gizmo for use with Bluefruit LE Connect is simple & only requires loading one new firmware file.

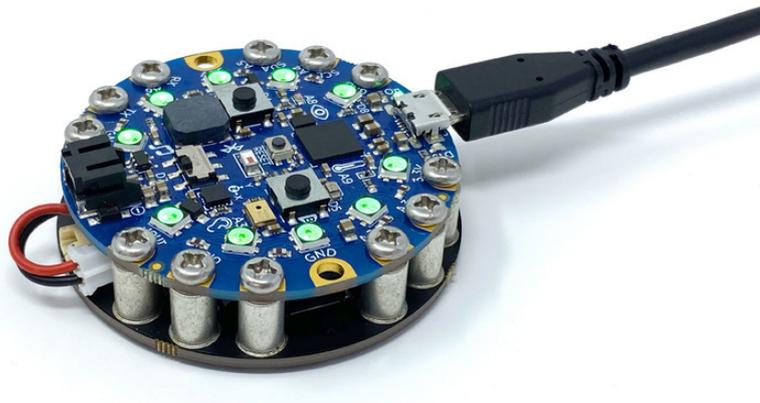
### Load Firmware

Click the button below to download the UF2 firmware file.

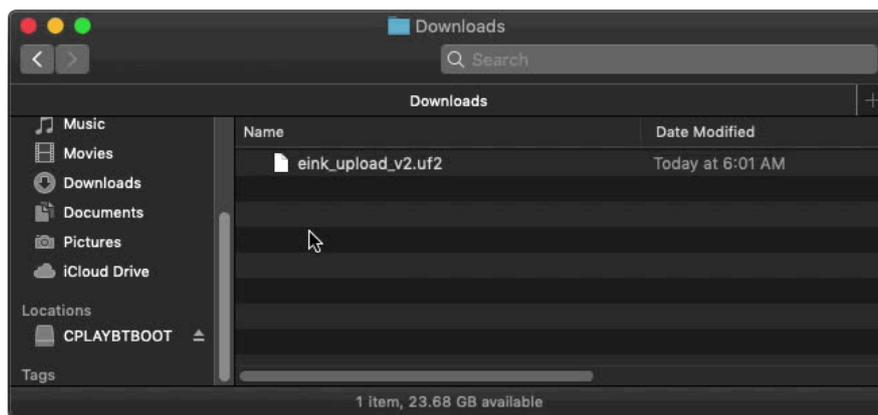
[eink\\_upload\\_v3.uf2](#)

<https://adafru.it/Jre>

Connect your CPB + E-Ink Gizmo to your computer using a micro USB cable.



Double click the **Reset** button at the center of the CPB. You should see the CPB's NeoPixels turn **green**, then a new drive named **CPLAYBTBOOT** appear on your computer.

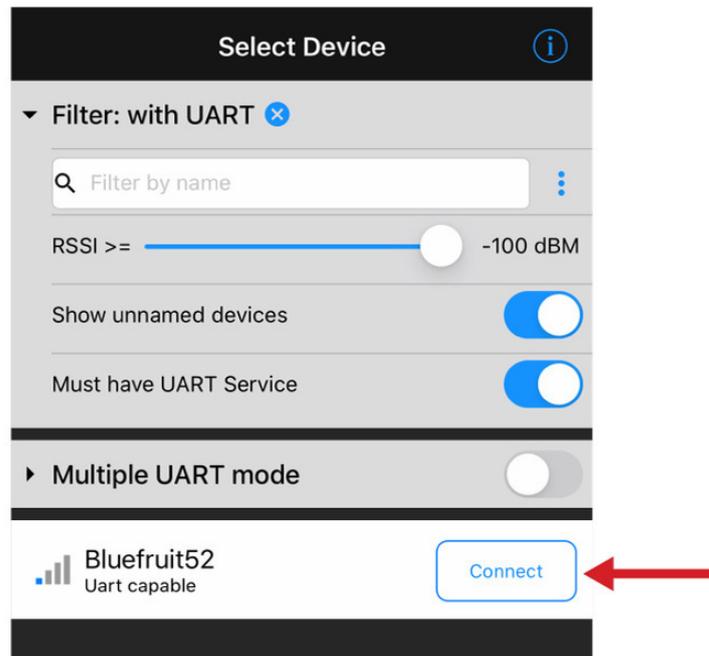


Drag the `image_eink_upload_V3.uf2` file onto the **CPLAYBTBOOT** drive. When the file is finished copying, the CPB will reboot and its NeoPixels will turn off.

## Connect App to CPB

Make sure your iOS or Android device has Bluetooth enabled, then **open** the **Bluefruit LE Connect** app.

On startup, the app will begin **scanning** for nearby Bluetooth LE enabled devices.

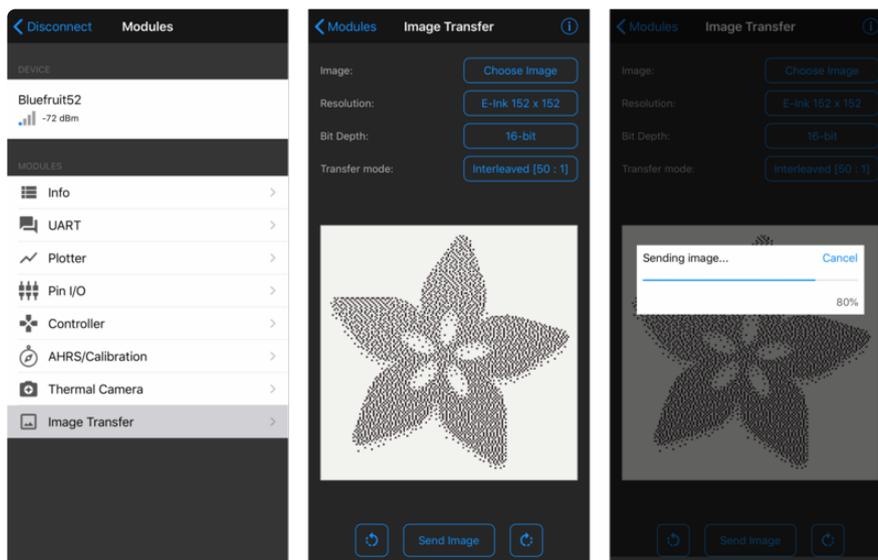


When the app detects the CPB, it will be displayed in the list of detected devices as **Bluefruit52**. Tap the **Connect** button to the right of the Bluefruit52 label.

## Send a Test Image

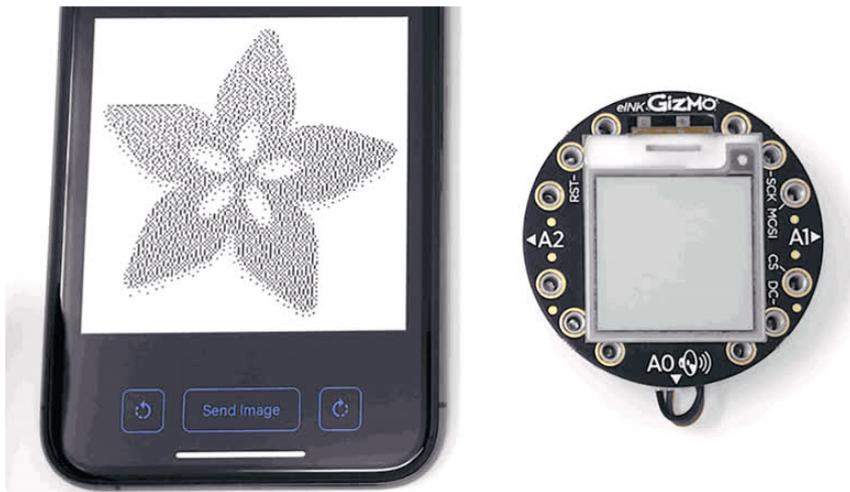
After connecting, the app will display a list of **modules** to choose from.

Tap the row labelled **Image Transfer**.



The Image Transfer module starts with the Adafruit logo as a default image. Above the logo, you'll see a list of controls for formatting image data. The most important control is **Resolution** – it should be set to **E-Ink: 152 x 152**. If it's not, tap the resolution button to change it.

Tap the **Send** button at the bottom of the screen to transfer the image to your CPB + E-Ink Gizmo.



After the transfer has completed, the E-Ink Gizmo's display will blink several times and the image will fade into view as the e-ink renders.

## Send Your Own Image



Next, try sending one of **your own images**:

1. Tap the **Choose Image** button
2. Select a picture from your device's **photo library**
3. Use a pinch gesture to resize the image as needed
4. Tap **Done**
5. Tap the **Send** button at the bottom to transfer your image.



The app converts your photo to **red, white, & black** pixels suitable for tricolor e-ink displays. This super simple palette and dithering give all the images a clean & very novel look – it's **e-ink chic**

## Learn More



- If you're interested in customizing the **e-ink upload firmware**, you can find the [Arduino source code here \(https://adafru.it/IOd\)](https://adafru.it/IOd)
- To learn more about the **Bluefruit Connect** app's **Image Transfer** feature and the format it uses for image data, check out [Image Transfer \(https://adafru.it/Gjc\)](https://adafru.it/Gjc) section of the [Bluefruit LE Connect guide \(https://adafru.it/GLc\)](https://adafru.it/GLc).
- To learn all about the **E-Ink Gizmo**, check out the full [Adafruit Circuit Playground Tri-Color E-Ink Gizmo \(https://adafru.it/IMc\)](https://adafru.it/IMc) guide.