



Feather Guitar Hero Adapter

Created by John Park



<https://learn.adafruit.com/feather-guitar-hero-adapter>

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Overview

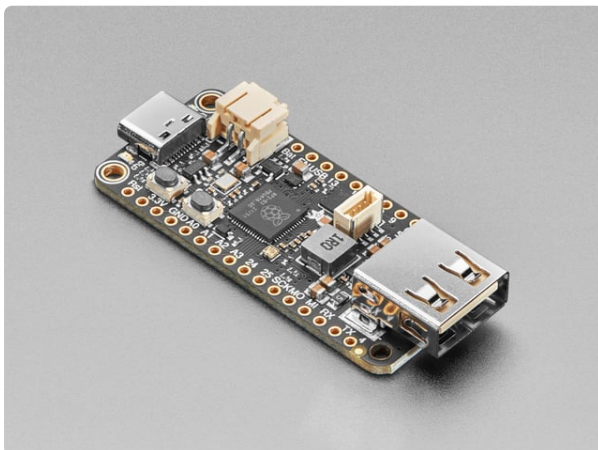


Want to shred lead guitar parts in **Clone Hero** or **Fortnite Festival** on that awesome old Guitar Hero controller you've got in the closet, but so sad that despite being a wired USB controller it just doesn't work? No fear, there's an easy, inexpensive solution that'll have your tapping and strumming sick licks!

Plug your USB guitar controller into the USB Host Feather RP2040 loaded with the Santroller firmware and you can configure it to play with modern games on your PC, Mac, and most consoles including Nintendo Switch, Xbox One, and PS2/3/4/5.



Parts



[Adafruit Feather RP2040 with USB Type A Host](https://www.adafruit.com/product/5723)

You're probably really used to microcontroller boards with USB, but what about a dev board with two? Two is more than one, so that makes it twice as good! And...

<https://www.adafruit.com/product/5723>



[Snap-on Enclosure for Adafruit Feather RP2040 USB Host](https://www.adafruit.com/product/6057)

Here is a cute and minimal enclosure for your Adafruit Feather RP2040 with USB Type A Host to keep it safe during use and...

<https://www.adafruit.com/product/6057>



[Pink and Purple Woven USB A to USB C Cable - 2 meters long](https://www.adafruit.com/product/5044)

This cable is not only super-fashionable, with a woven pink and purple Blinka-like pattern, it's also made for USB C for our modernized breakout boards, Feathers and more.

<https://www.adafruit.com/product/5044>



Guitar Controller

A guitar controller with wired USB cable, such as the RedOctane Gibson X-plorer for Xbox 360 shown in this guide.

Other compatible controllers include:

- Rock Band Fender Stratocaster RB1
- Rock Band Precision Bass

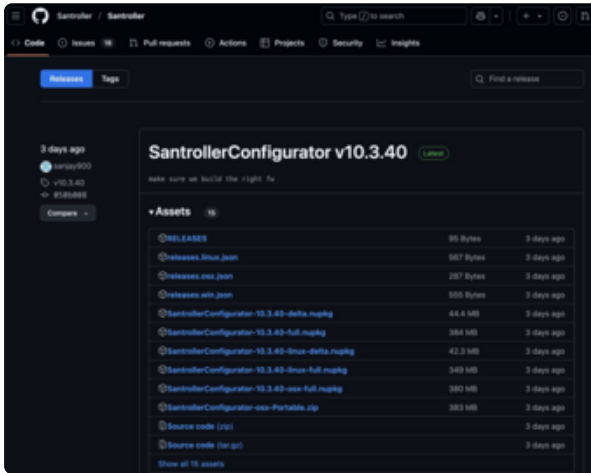


Santroller Configurator

You'll use the [latest release \(https://adafru.it/1ahN\)](https://adafru.it/1ahN) of the excellent [Santroller Configurator \(https://adafru.it/1ahO\)](https://adafru.it/1ahO) firmware for your operating system to set up the USB Host Feather RP2040.

We'll cover the details in this guide.

Guitar Host Setup and Use



SantrrollerConfigurator Download

Head to the [Santrroller GitHub releases page \(https://adafru.it/1ahN\)](https://adafru.it/1ahN) and download the latest release for your operating system. I chose the

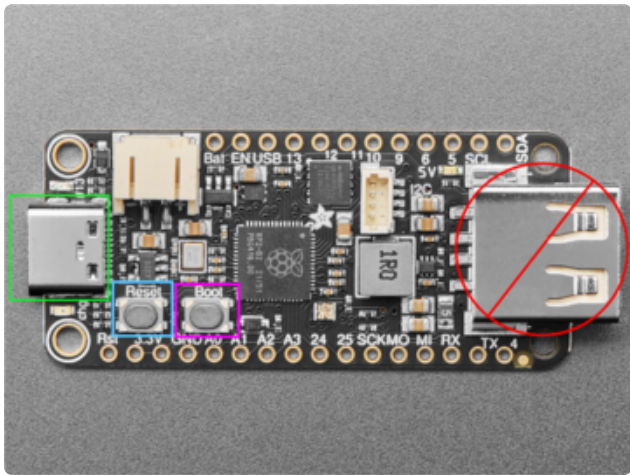
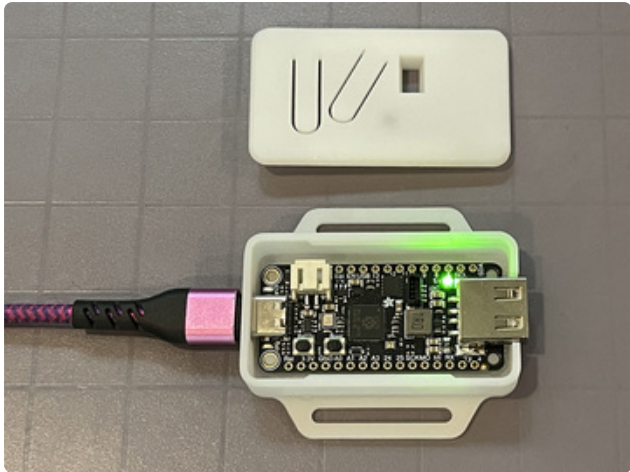
SantrrollerConfigurator-win-Setup.exe for Windows.

Once downloaded, install SantrrollerConfigurator.

Launch SantrrollerConfigurator

Launch the SantrrollerConfigurator and you'll see a window similar to this:





Feather Prep

Plug the USB Host Feather RP2040 into your computer using the USB C port on the Feather, and a known good USB data & power cable.

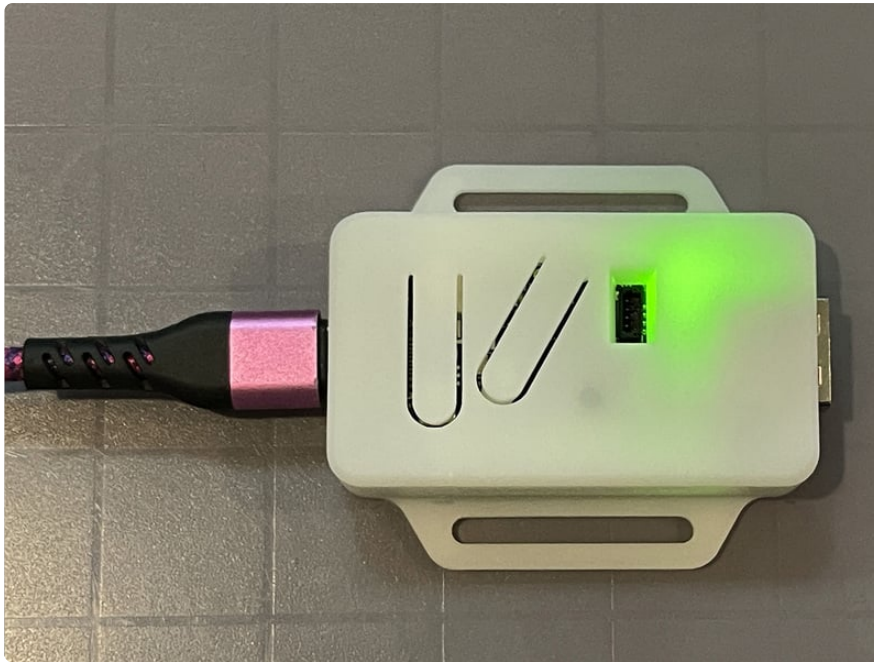
Put the Feather into bootloader mode:

while pressing and holding the **Boot** button down

press and release the **Reset** button

finally, release the **Boot** button

After a moment you should see the **RPI-RP2** drive appear on your computer.



Initial Configuration

With the Feather now in bootloader mode, the available choices in the SanrollerConfigurator will change. Select the following:

Device to program: Raspberry Pi Pico (/Volumes/RPI-RP2) or whatever path your computer shows for it

Connection Method: Adafruit Feather RP2040 USB Adapter

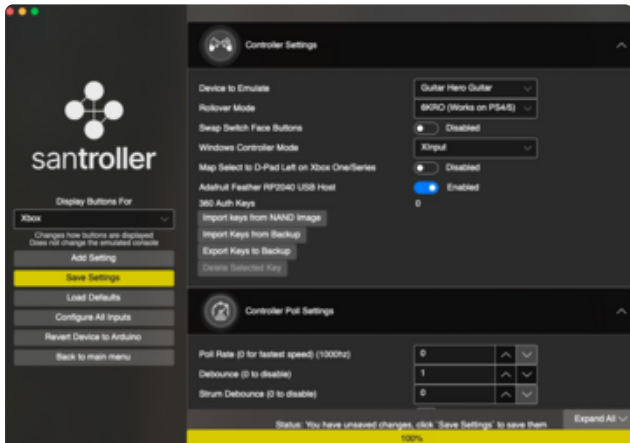
Device to Emulate: Guitar Hero Guitar

Enable Fortnite Festival Settings: check this on if you intend to play Fortnite Festival, otherwise leave unchecked for other games such as **Clone Hero**

Configuration Upload

Click the **Configure** button at the bottom to compile and then upload the firmware to the Feather.

When the progress bar reaches 100% (the text may be a bit confusing and still say "Programming initial configuration, please wait."), press the **Configure** button again to load the configuration screen.

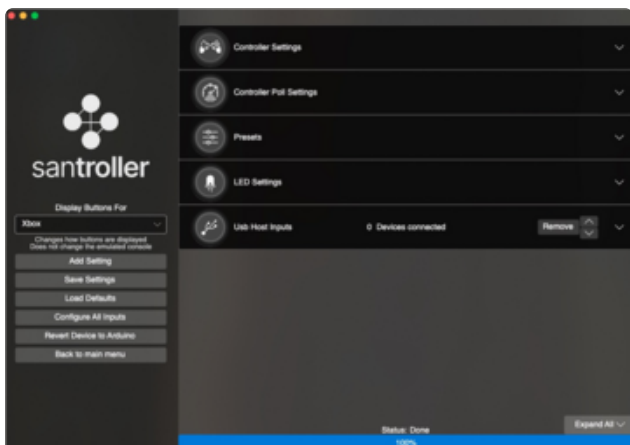


Configuration Screen Layout

When the configuration screen opens, you'll see a sidebar with buttons on the left for adding individual settings, saving your settings to the Feather, loading the defaults, and more.

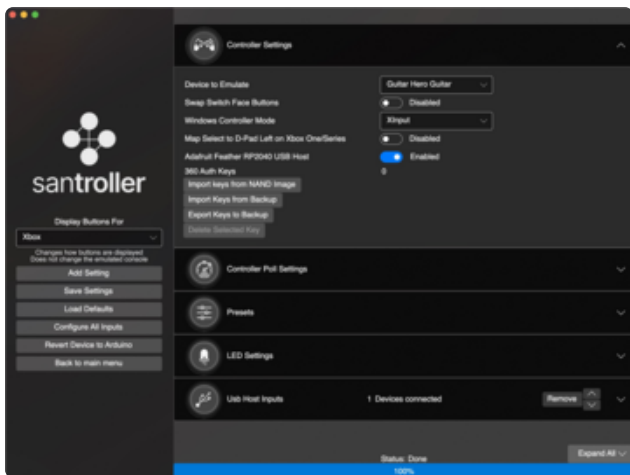
On the right are the current settings and options, which we'll look at in more detail below.

If you change any settings, the **Status** at the bottom will read "You have unsaved changes, click 'Save Settings' to save them". Click **Save Settings** on the left sidebar menu and the new updated firmware will be written to the Feather.



Detailed Configuration

Click the **Expand All/Collapse All** button a couple of times to minimize the info on screen. Then, click the down arrow to the right of a section to reveal detailed settings.

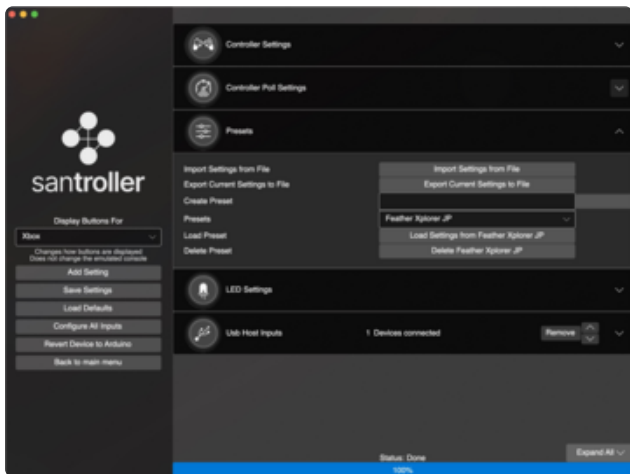


Controller Settings

Here you can pick different instrument controller to emulate, such as a **Guitar Hero Guitar** vs. **Rock Band Guitar**, the **XInput** vs **HID Controller** for Windows Controller Mode, and more.

For example, you can select **XInput** if you'll be playing on **Windows or HID Controller** for most other operating systems.

You should not need to adjust anything in **Controller Poll Settings** unless you have some specific, advanced needs.

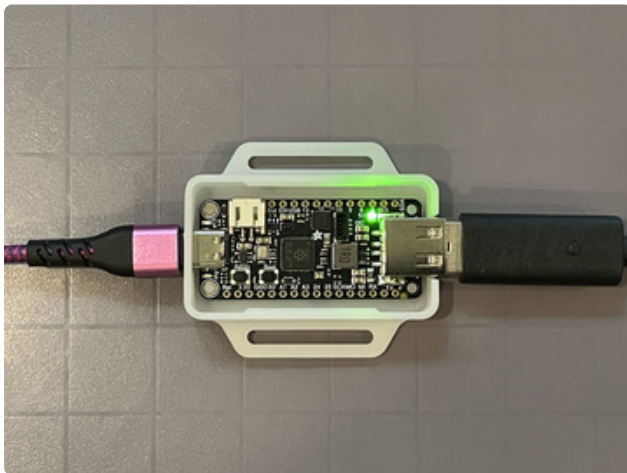
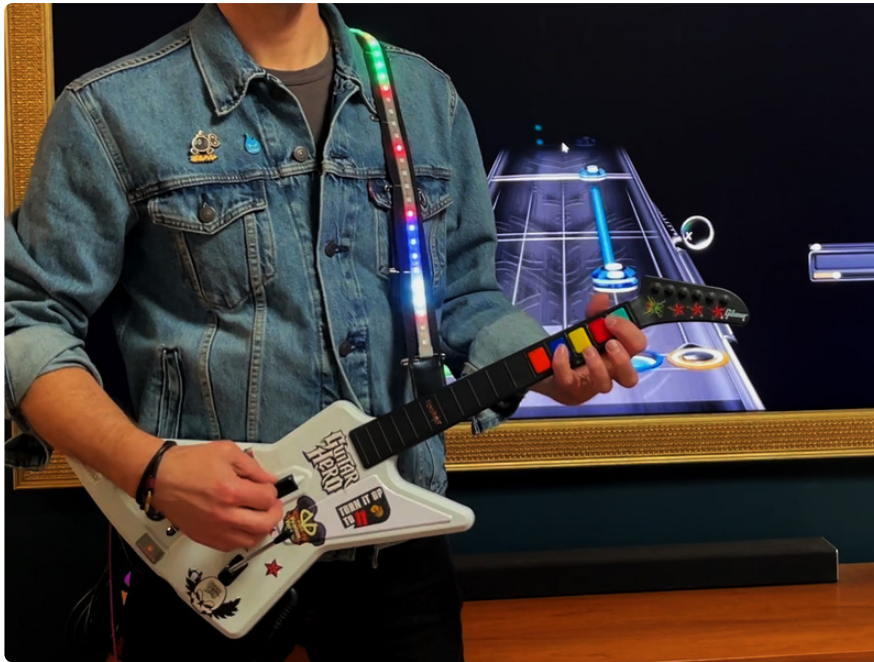


Presets

You can save your settings as a preset here, especially helpful if you're configuring multiple controllers. You can also download settings files created by community members to load here.

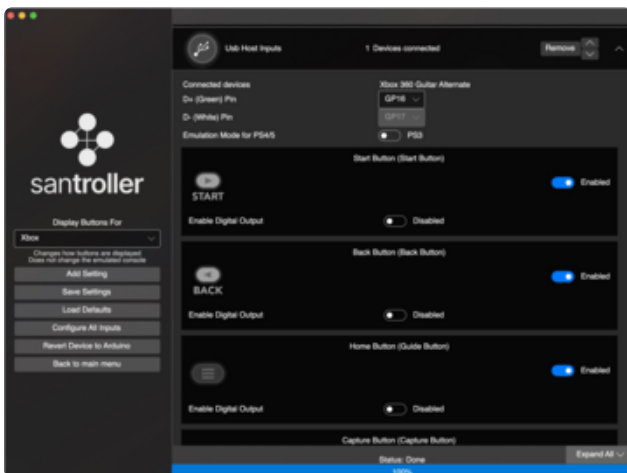
LED Settings

This is where you can configure Neopixels -- we'll skip **LED Settings** for now, even though it is very enticing... see the next page in the guide for more info.



USB Host Inputs

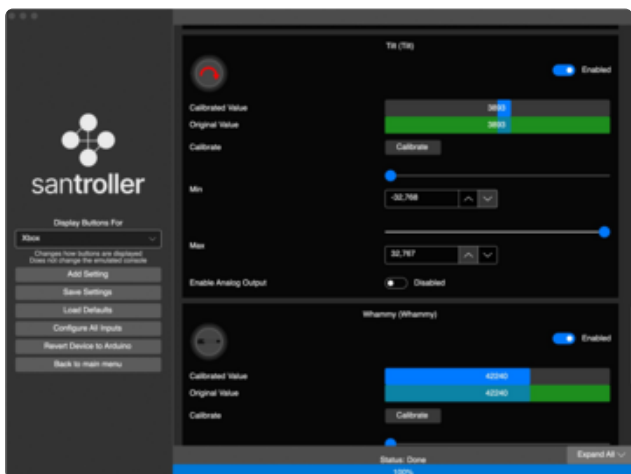
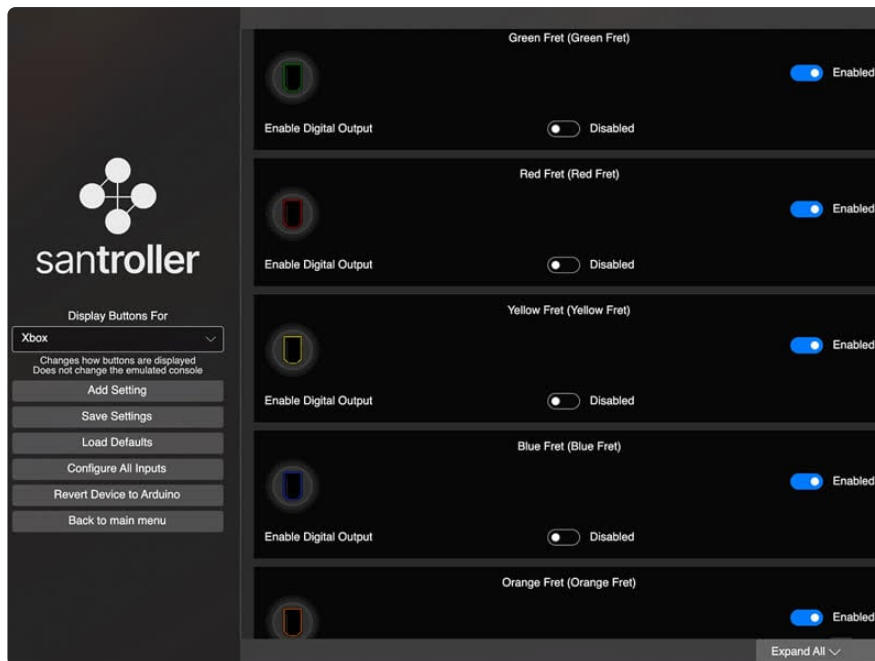
Plug your guitar controller into the Feather's USB A Host port. You'll see "1 Device connected" show up in the Santroller interface. Expand this section with the down arrow.



Input Testing

Check the button mapping now by pressing each button on the guitar controller. You'll see the corresponding entry in the Inputs section light up, such as **START**, **BACK**, **D-Pad** directions, and of course the all important **fret buttons** and **strum bar**.

Since we're using USB Host mode (and not wiring buttons to GPIO internally) mappings should "just work" and there aren't any settings to worry about here.



Sensor Calibration

You can also test and calibrate the tilt sensor that's built into the guitar and the whammy bar.

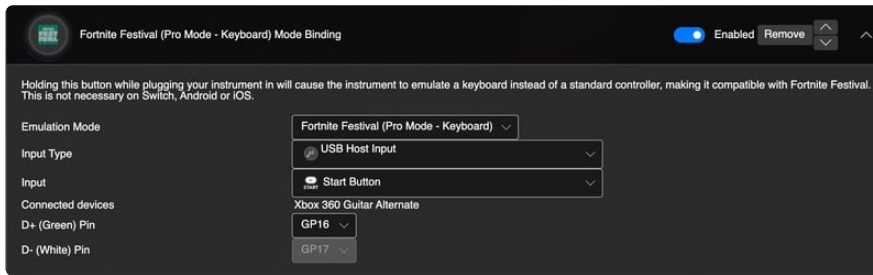
Press **Calibrate** on either to go through a guided calibration process, or manually adjust the values to change their min/max values and the whammy bar dead zone.

Fortnite Festival

If you change your mind and want to use the controller to play Fortnite Festival you can click **Add Settings** then select **Fortnite Festival (Pro Mode - Keyboard)** from the dropdown menu.

For **Input Type** chose **USB Host Input**, and then pick an Input such as **Start Button** as your mode select button.

Now, you can play **Clone Hero** as usual, but when you want to play **Fortnite Festival** simply hold down the **Start Button** on the guitar as you plug it in.



Play

Once configured, you are ready to play. Fire up **Clone Hero** and give it a play!

Additional Resources

Here are some sites with detailed information on specific configurations and features:

- [Santroller USB Host Inputs \(https://adafru.it/1ai4\)](https://adafru.it/1ai4)
- [MiloHax Riffmaster \(via Adafruit Feather\) Guitar \(https://adafru.it/1ai5\)](https://adafru.it/1ai5)
- [PlasticBand repo \(https://adafru.it/1ai6\)](https://adafru.it/1ai6)
- [Santroller Configuring Fortnite Festival \(https://adafru.it/1ai7\)](https://adafru.it/1ai7)
- [Santroller LED Setup \(https://adafru.it/1ai8\)](https://adafru.it/1ai8)

Light Up Guitar Strap



Wanna show off to your living room audience or livestream viewers while you shred wild licks on your guitar? Noice. You can put on an RGB color light show that shows which frets you're tapping, as well as other inputs such as strum bar direction, whammy bar level, and even tilt to engage star power!

Santroller has support for NeoPixels (WS2812) and DotStars (APA102) so you can mod your guitar with internal LEDs, or make a wearable light show with a flexible LED strip mounted to your guitar strap.

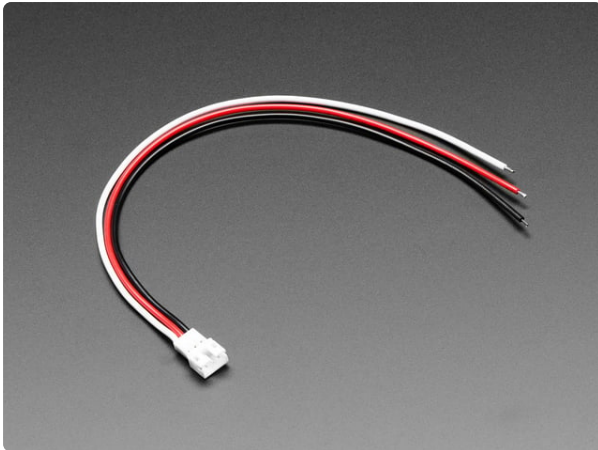
Parts



[Adafruit NeoPixel LED Strip with 3-pin JST PH 2mm Connector](https://www.adafruit.com/product/3919)

Plug in and glow, this Adafruit NeoPixel LED Strip with JST PH Connector has 30 total LEDs in a "60 LED per meter" spacing,...

<https://www.adafruit.com/product/3919>



[JST PH 2mm 3-Pin Socket to Color Coded Cable - 200mm](https://www.adafruit.com/product/4046)

This cable will let you turn a JST PH 3-pin cable socket into 3 individual tinned wires. These are great to match up with our JST 3-PH cables, for extending and connecting...

<https://www.adafruit.com/product/4046>

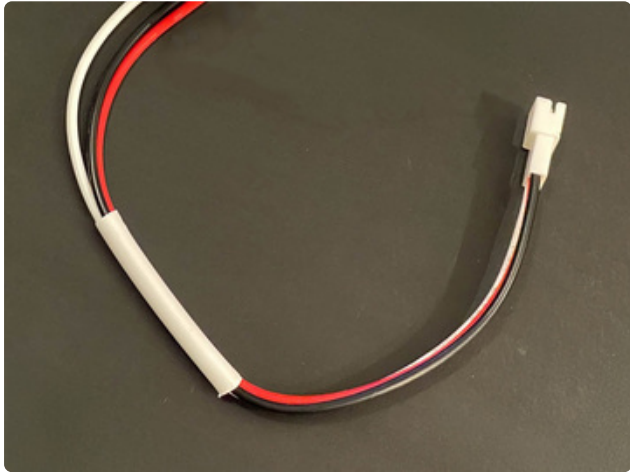


[Multi-Colored Heat Shrink Pack - 3/32" + 1/8" + 3/16" Diameters](https://www.adafruit.com/product/1649)

Heat shrink is the duct tape of electronics which I guess makes this heat shrink the colorful and exciting duct tape they sell at craft stores. This heat shrink comes in six...

<https://www.adafruit.com/product/1649>

Build It



Heat Shrink

You can slide a ~4cm length of heat shrink tubing over the JST PH socket cable's wires to keep them neat.



Solder Socket

You'll solder on a JST PH socket cable to the Feather RP2040 USB Host so that it's easy to plug and unplug the NeoPixel strip.

These are the connections:

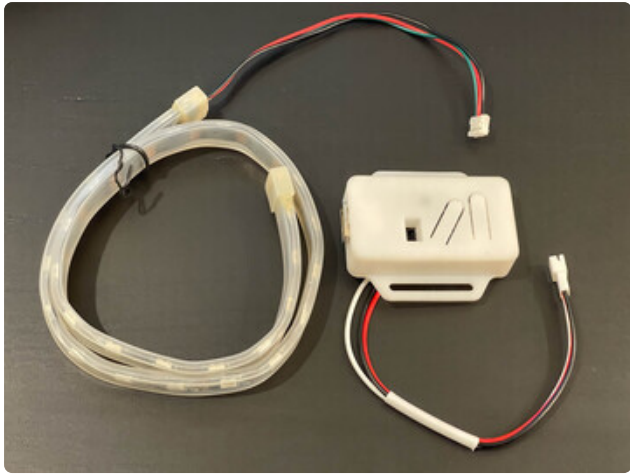
black wire to **GND**
red wire to **3V**
white wire to **SCK**



Encase It

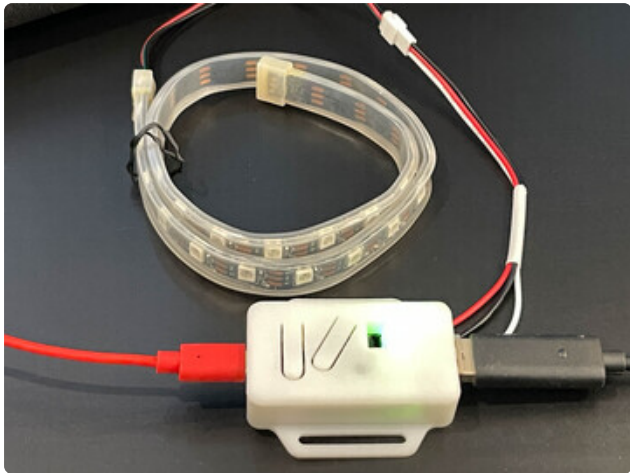
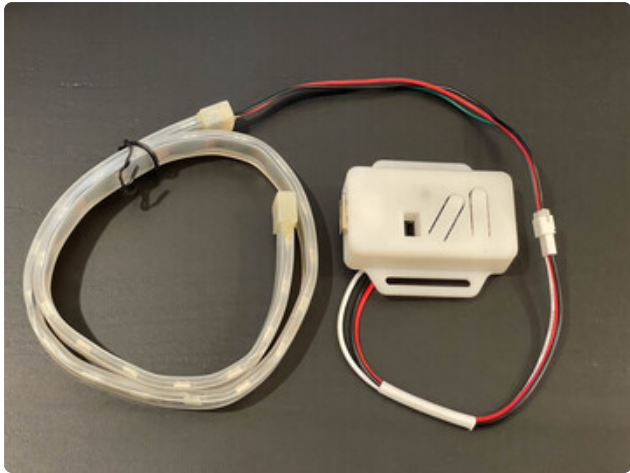
Feed the socket cable through the opening in the bottom of the snap-on enclosure for Feather RP2040 USB Host, then seat the Feather into place.

Snap on the lid and you're ready to plug in the NeoPixels.



NeoPixel Plug

Connect the NeoPixel strip JST PH plug to the Feather's JST PH socket.



USB Connection

Plug in the USB data/power cable to your computer and the Feather's USB C port so we can update the firmwares settings. Plug the guitar USB A cable into the Feather's host port.



Launch Santroller Configurator

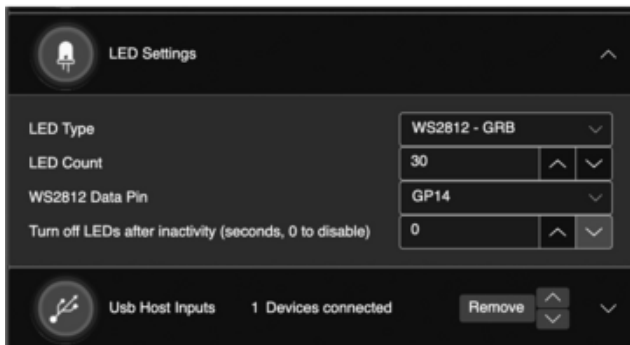
Launch **Santroller Configurator** and select the Feather from the **Device to program** drop-down menu. It should have the name "**Santroller -Raspberry PI Pico - Guitar Hero Guitar**".

Then, click the **Configure** button.

LED Settings

Expand the **LED Settings** section.

Use these settings:



LED Type is **WS2812 - GRB** (you can pick different pixel driver types and color orders if using different LEDs)

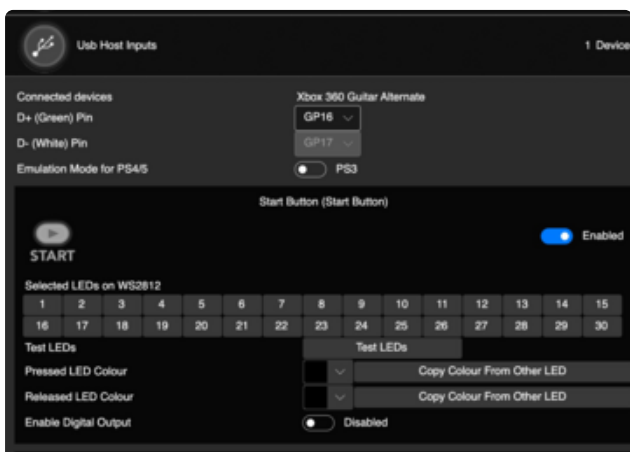
LED Count is **30**

WS2812 Data Pin is **GP14** (this pin is labelled **SCK** on the Feather board)

Turn off LEDs after inactivity leave this at 0 to disable

LED Mapping

Here's the really fun part -- mapping LED activity to inputs on the guitar controller.



Expand the **USB Host Inputs** section. Here you'll see all of the controller buttons (this is where we tested inputs before). You'll notice a new section that says "Selected LEDs on WS2812" and that there are now 30 buttons to represent the NeoPixels.

Fret Colors

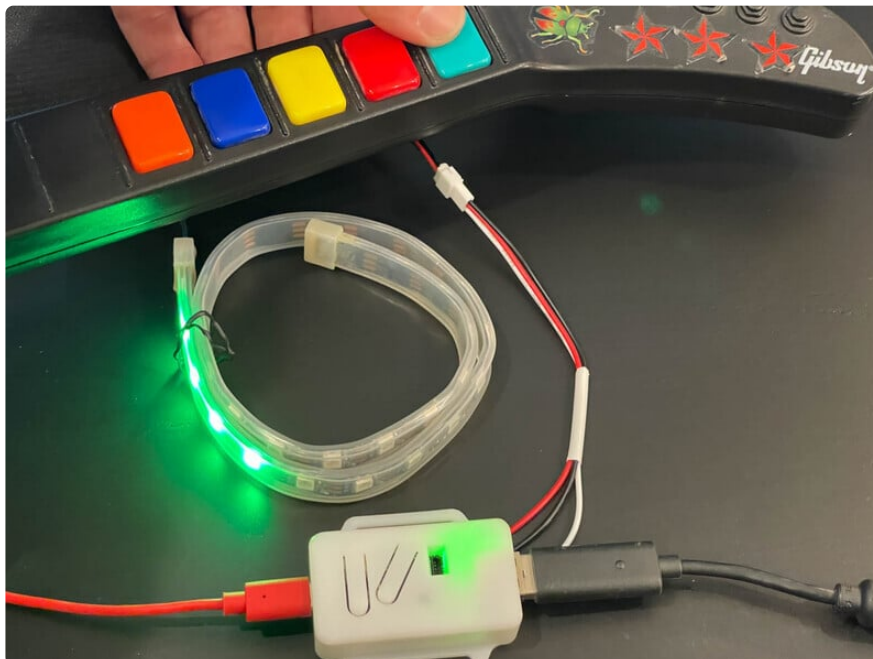
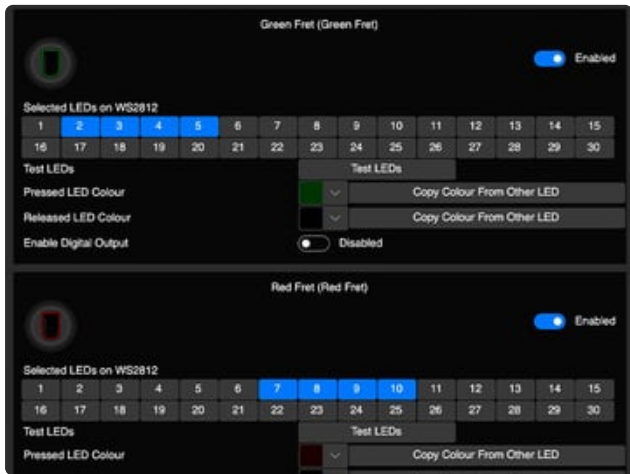
Scroll down to the **Green Fret** settings of **USB Host Inputs**.

Let's light up four NeoPixels as green when this button is pressed.

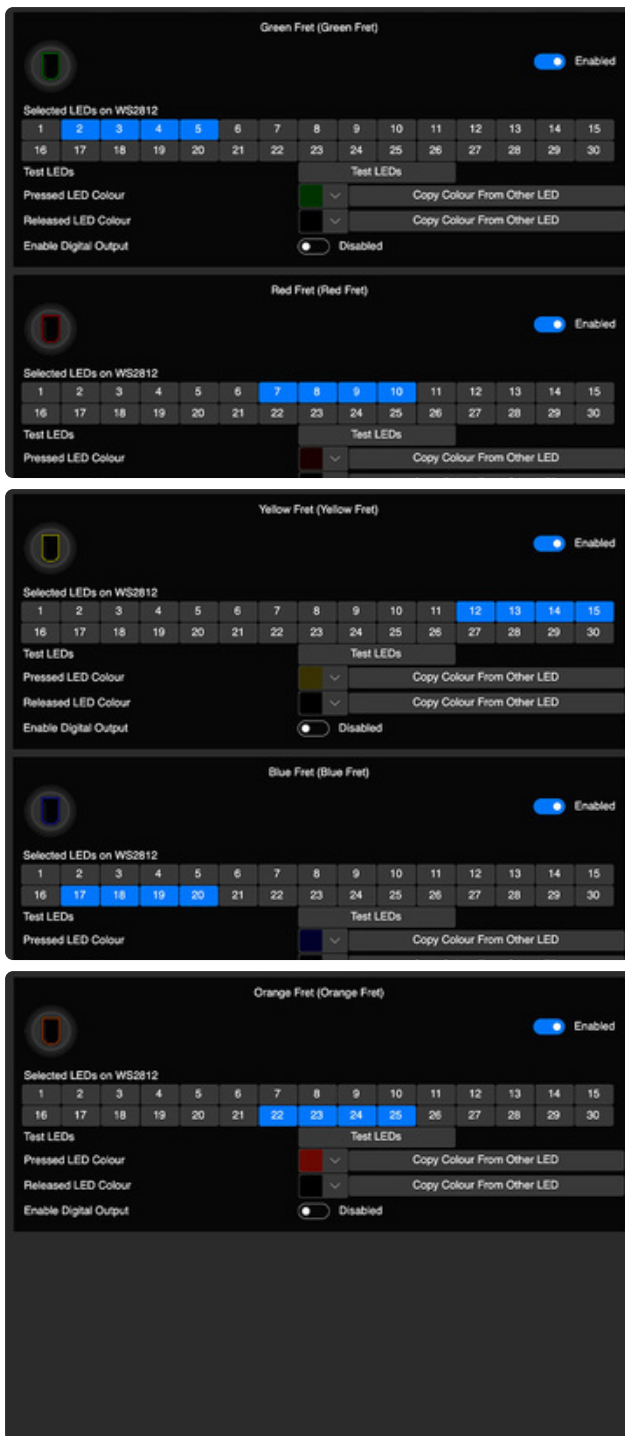
Click to toggle on **2, 3, 4, 5**.

Pick the color swatch for **Pressed LED** color and set it to a dark green color (this keeps the brightness at a reasonable, non-blinding level!).

To test it out the first time, click **Save Settings** to write the firmware to the Feather. Then, press the green fret and watch them light up!



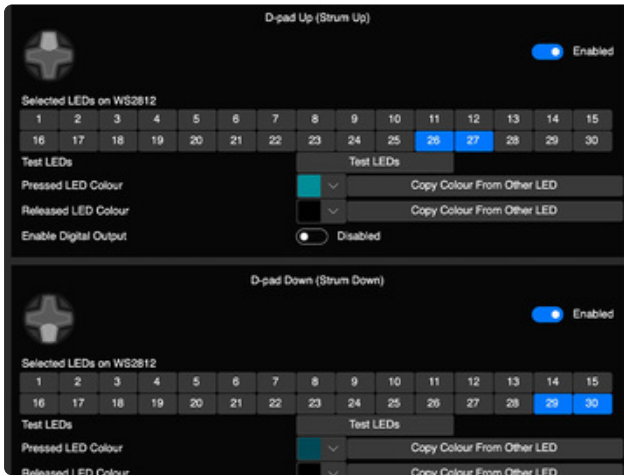
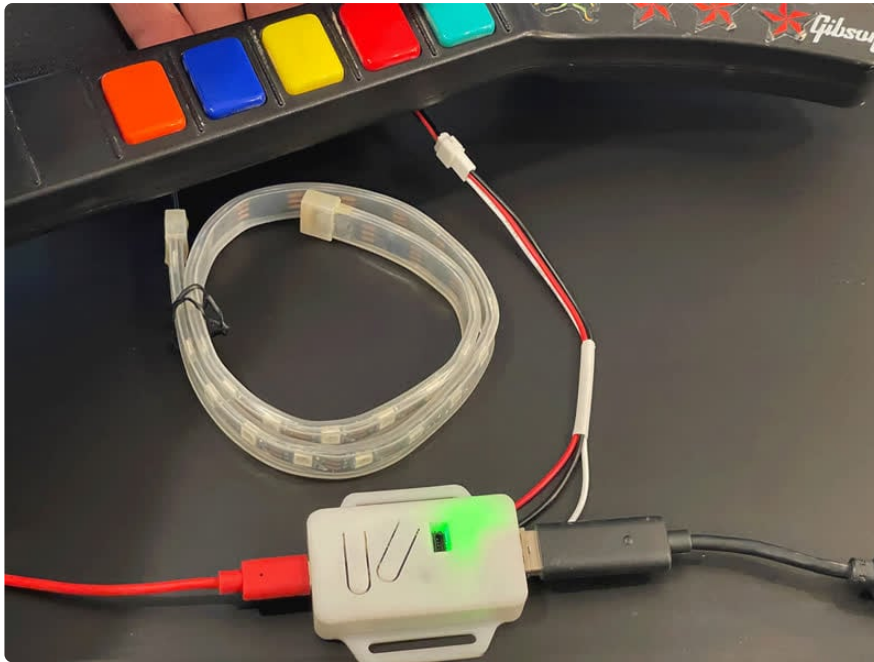
Remember to press **Save Settings** to write the firmware to the Feather when you make changes.



The Rest of the Frets (a free band name)

Set the rest of the frets to their numbers and colors as shown here.

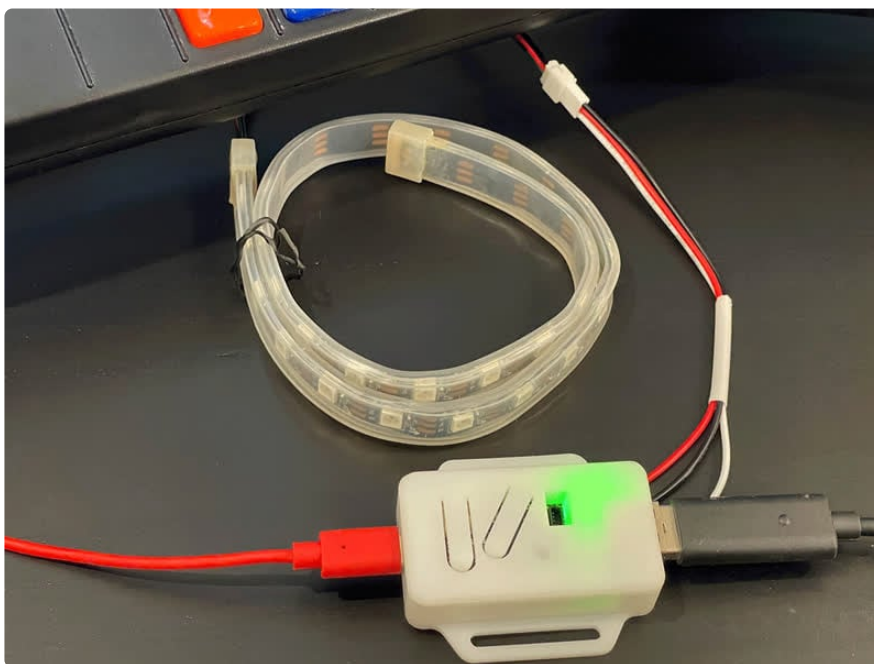
You can see we're skipping every fifth NeoPixel so we can assign those to the whammy bar later.

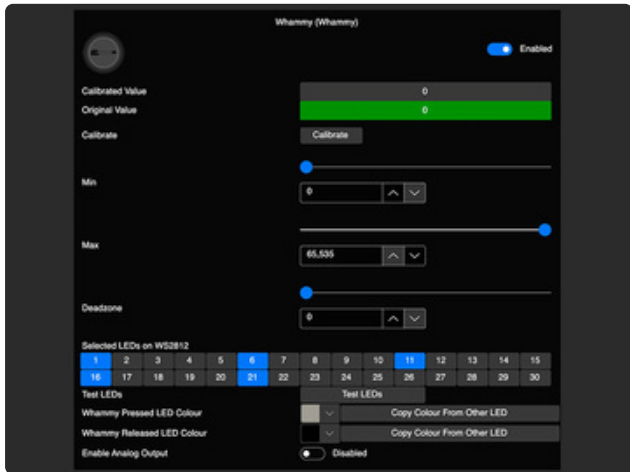


A Guy Walks Into a Strum Bar...

Set up the two strum bar directions the same way -- these are listed as **D-pad Up** and **D-pad Down**.

Set the up strum to NeoPixels **26** & **27** and down strum to **28** & **29**. All can be any color you like, I picked a cool teal.





Whammy Bar

Head to the Whammy Bar section and select these LEDs **1, 6, 11, 16, 21, 28** as these are the remaining NeoPixel positions that fill in the blanks.

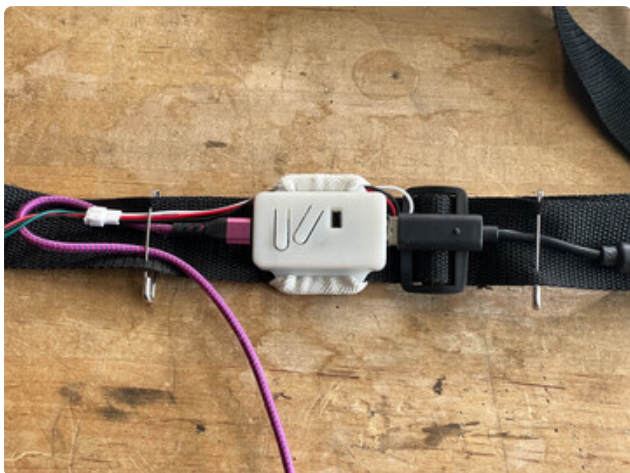
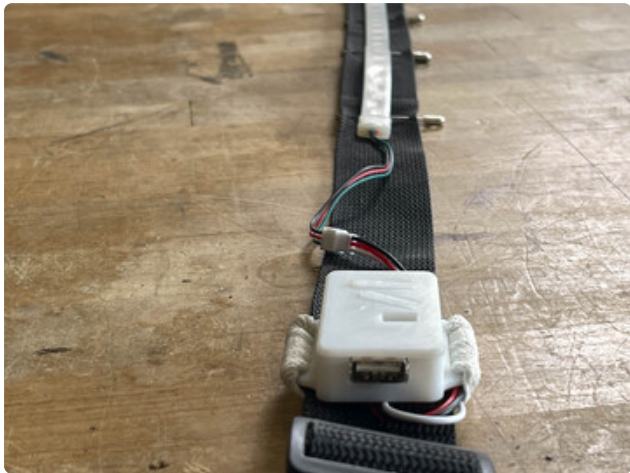
This one is an analog input and the NeoPixels will fade from the released color (black to begin with) to the pressed color (I picked white).

You can also set a different color for the Released position of any button or input so that some LEDs are always lit and just color shift when activated.



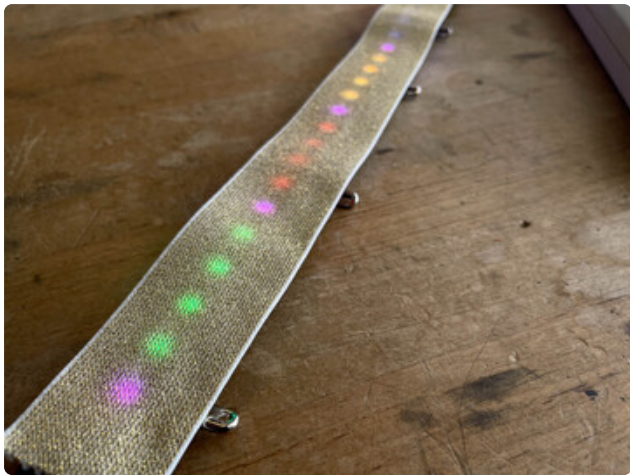
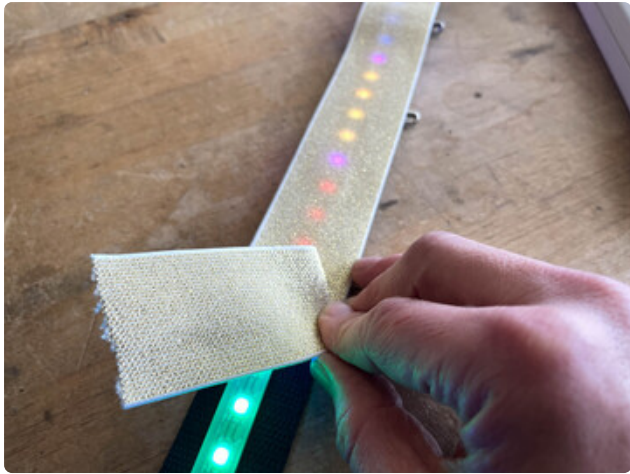
Light the Strap

We'll go punk rock here and use safety pins to connect the NeoPixel strip to the strap. The silicone sheath works great for this, just keep away from any contacts on the underside of the strip.



Feather Connection

You can strap the Feather case to the strap with some velcro or elastic waistband material seen here.



Fabulousness Option

You could get a bit fancy with it and cover the strip with a light permissive material! This 1-3/4" waistband elastic would work well. Stitch this to the strap and remove the safety pins if you want a more permanent solution.

