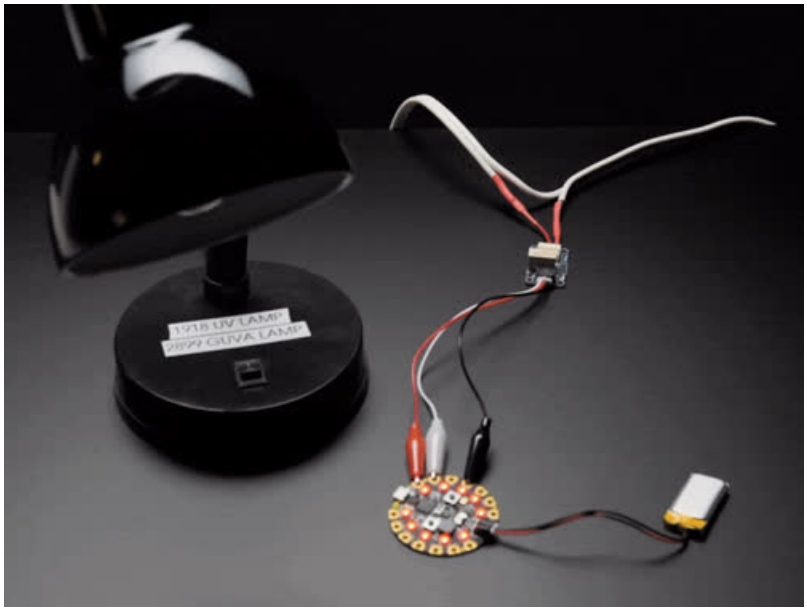
adafruit learning system

Adafruit STEMMA Non-Latching Mini Relay

Created by Kattni Rembor



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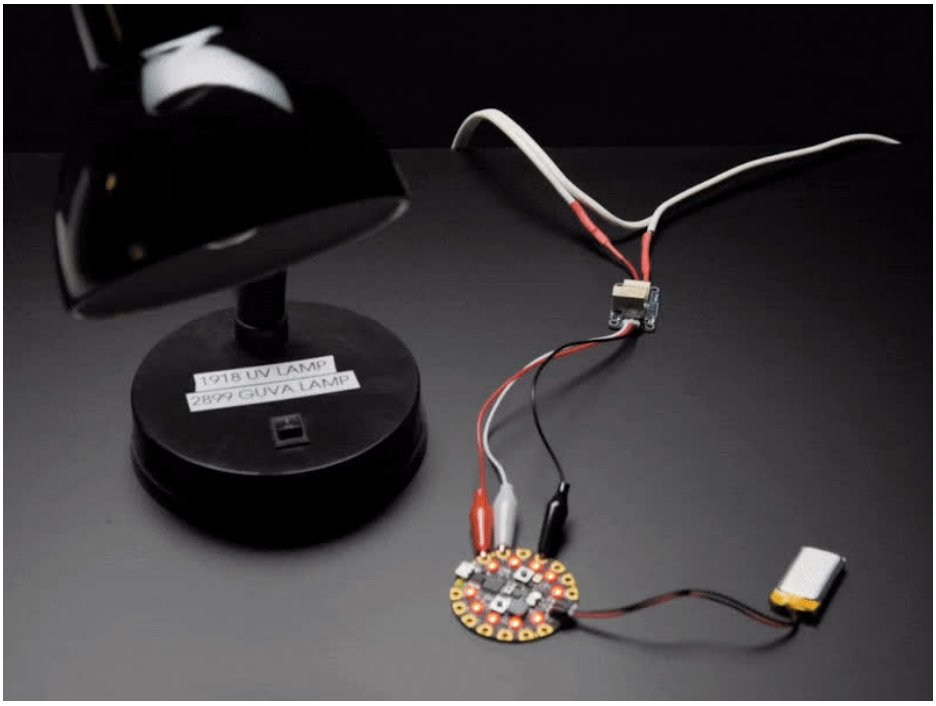
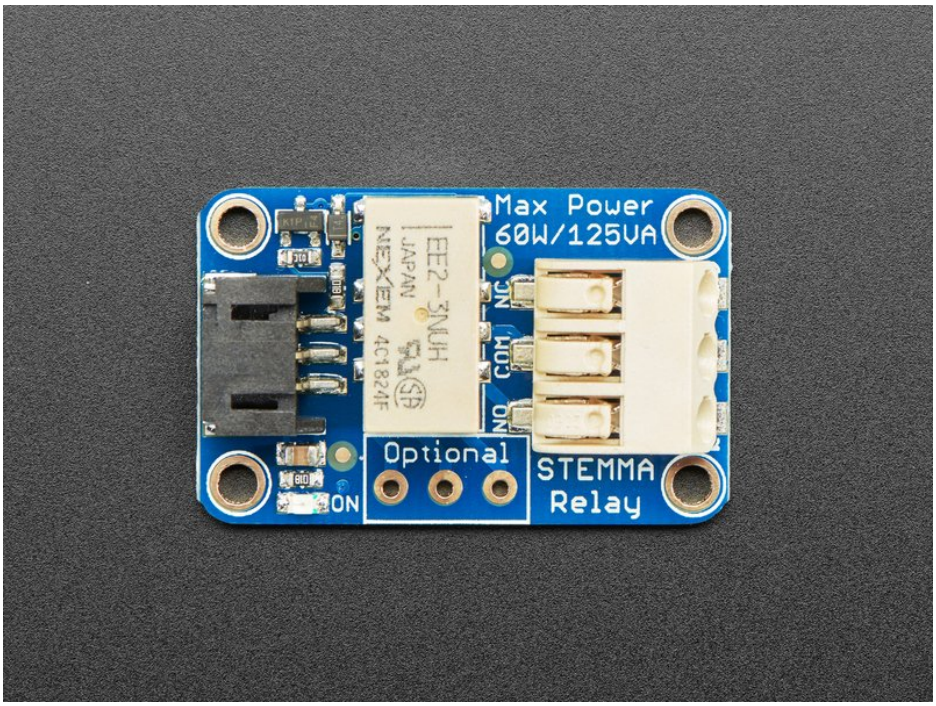
Overview

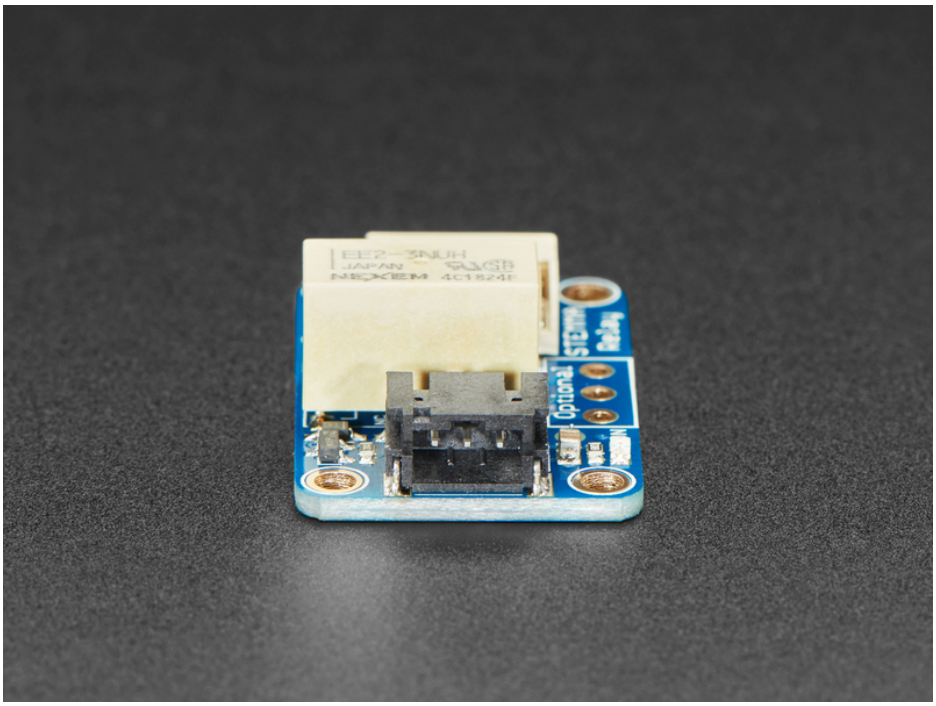


STEMMA plug-and-play parts make your next project solder-free! This is the **STEMMA Non-Latching Mini Relay**. It gives you power to control, and control over power. Put simply, you can now turn on and off lamps, fans, solenoids, and other small appliances that run on up to 250VAC or DC power using any microcontroller or microcomputer, with ease.

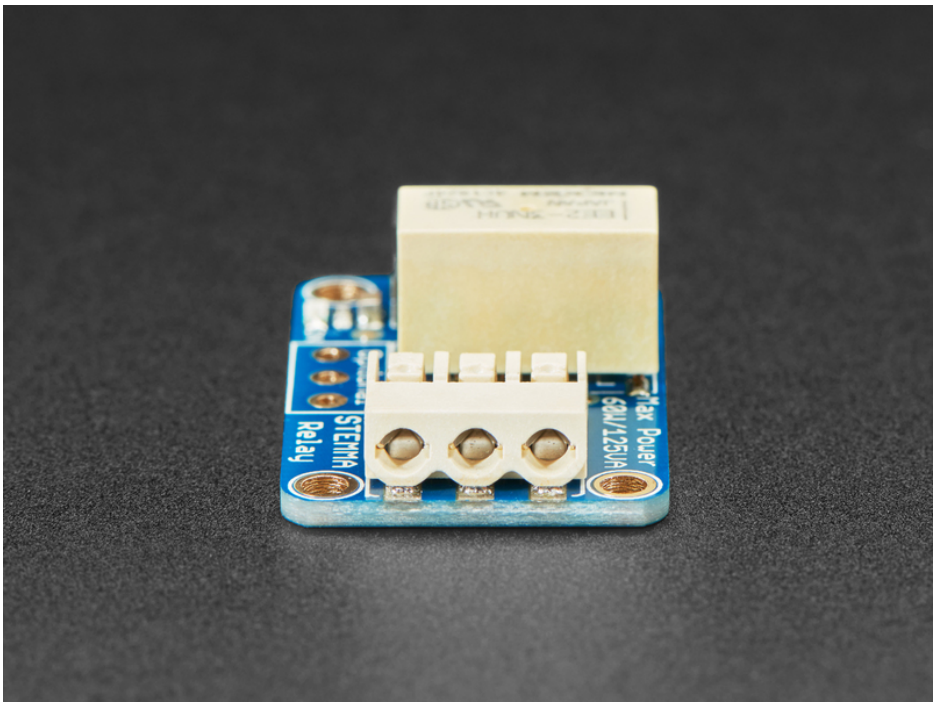


No worrying about flyback diodes, level shifting, pin protection. The STEMMA board takes care of all that for you. You can use it with any 3V or 5V microcontroller/microcomputer. To use with a breadboard, Raspberry Pi or

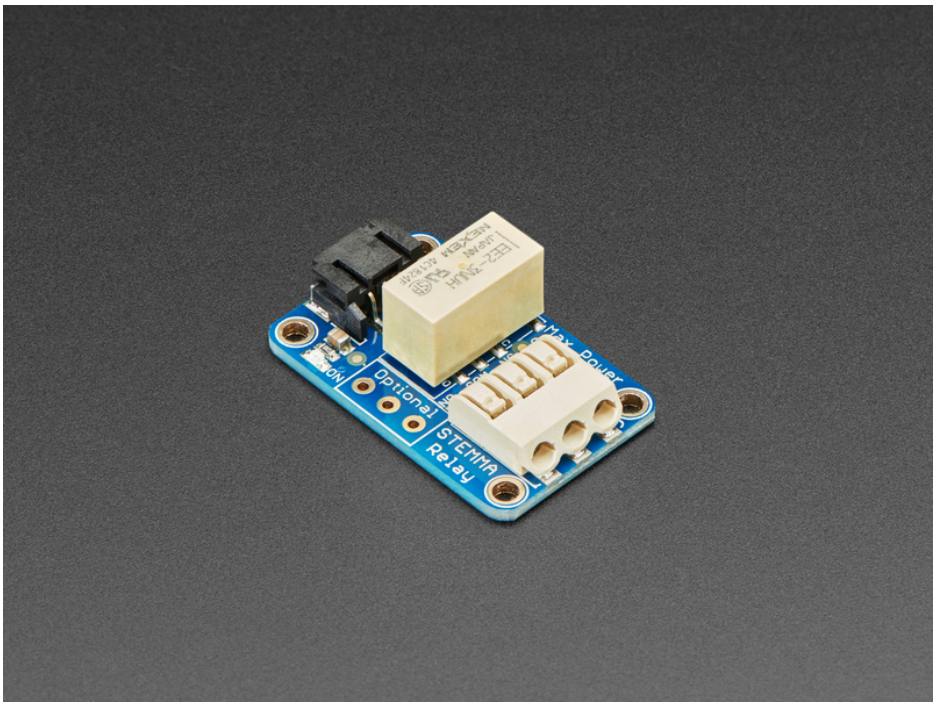
Arduino (https://adafru.it/GA2), pair with a JST 3-pin to breadboard cable. If you want to use with a Circuit Playground or micro:bit, we have a cable with alligator clips (https://adafru.it/FY7).



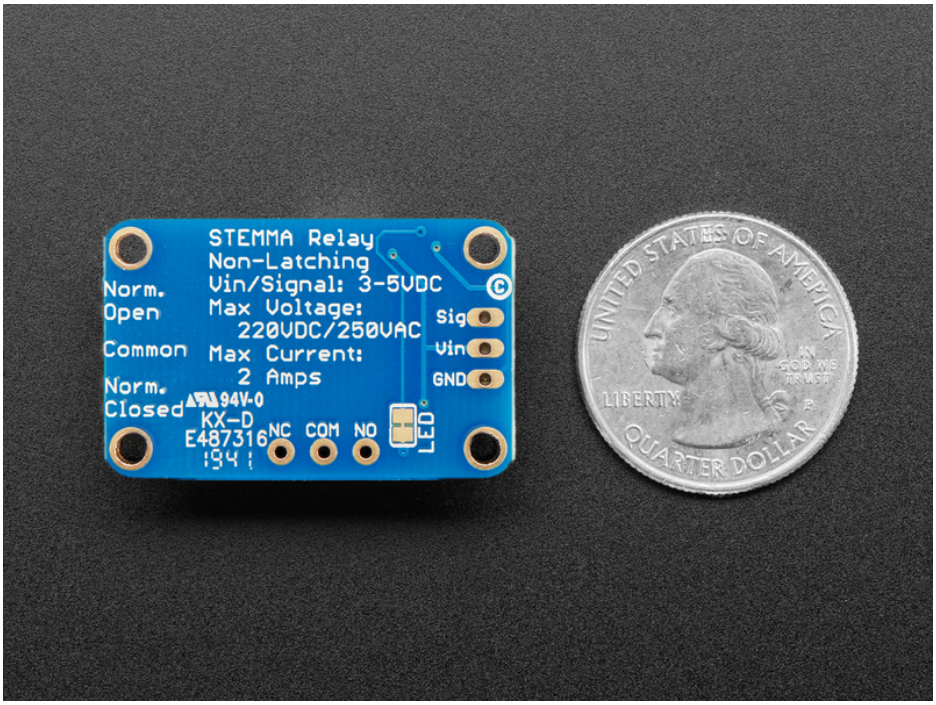
- This board has a single **Signal** pin (the white wire). Normally, the relay's **COM** pin is connected mechanically to the **NC** pin and the **NO** pin is disconnected.
- When the **Signal** pin is pulled high, the relay switches and the internal switch changes so that the **COM** pin is mechanically connected to the **NO** pin and **NC** is then disconnected
- When the relay is active, a red LED is lit, and about 50mA of current from the red power wire is used to keep the coil switched on. Note, if power is lost, the relay will go back 'open'.
- The connects for the relay are the white tubular thing at the far end of the PCB. You can poke wire into the holes, they will automatically grip onto wire that is 24AWG to 18AWG. Once you poke the wire in, give it a light pull to verify its clamped. To release the wire, use a thin screwdriver or pen to press on the button on the top while pulling the wire out.



You can switch up to 2A of resistive current at 30VDC or ~40VAC or lower. At 110VDC you can switch up to 0.6A, at 120VAC up to 0.5A, and at 250VAC you can switch up to 0.3A. Check the datasheet for the relay for the exact switching capacity, and of course, for reactive/inductive loads you will need to de-rate. This isn't a relay you can use to turn on and off your washer/dryer, stick to 60W or less.

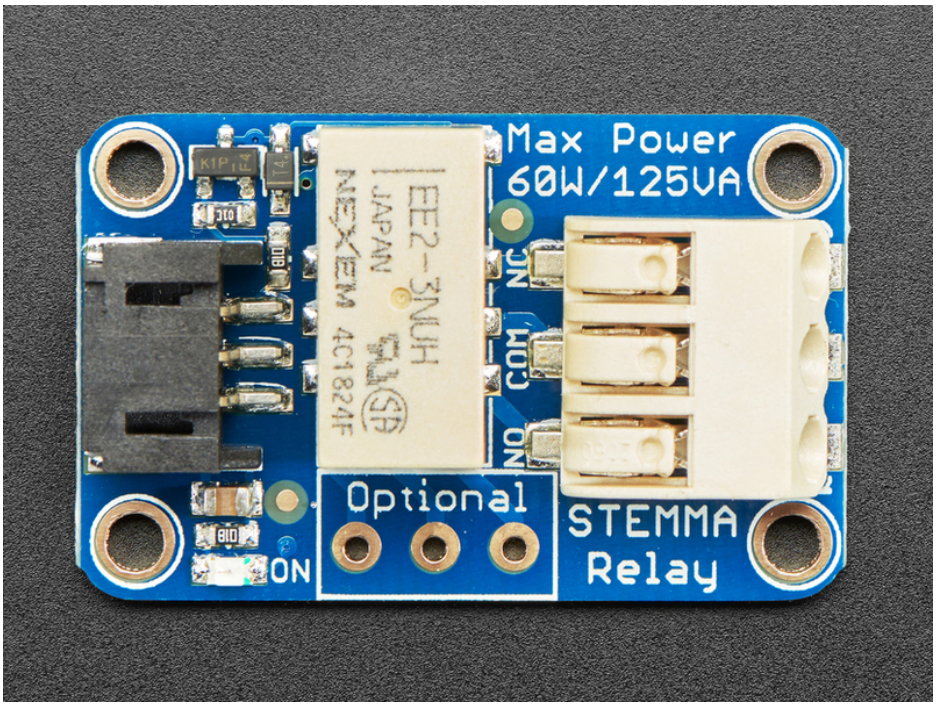


Each STEMMA board comes with a fully assembled and tested PCB but no cable. No soldering is required to use it. There's an optional second switch on the side of the PCB, if you get a 3-pin terminal block (https://adafru.it/GA3) you can solder that in place, but its optional.



Please note: If using with high voltages (> 24V) use care and common sense! High voltages require experience, and are only for use by engineers who are comfortable with guidelines and know how to use safely!

Pinouts



This board has two connectors, one on either side and a space for an optional third. Let's take a look!

- **STEMMA connector** - on the left side, the black connector is the STEMMA connector. Compatible with 3-pin JST STEMMA cables.

You can use any of these cables - they are JST PH 2.0mm connectors

- **Red** goes to 3 to 5V DC power (this is used to power the transistor that turns on the relay, *not* to the output of the relay)
- **Black** goes to power/signal ground on your microcontroller or device
- **White** goes to 3 to 5V signal. The signal is amplified on the relay board so it does not have to be a powerful pin

STEMMA JST PH 3-Pin to Male Header Cable - 200mm

$1.25
IN STOCK

Add To Cart

STEMMA JST PH 3-Pin to Female Socket Cable - 200mm

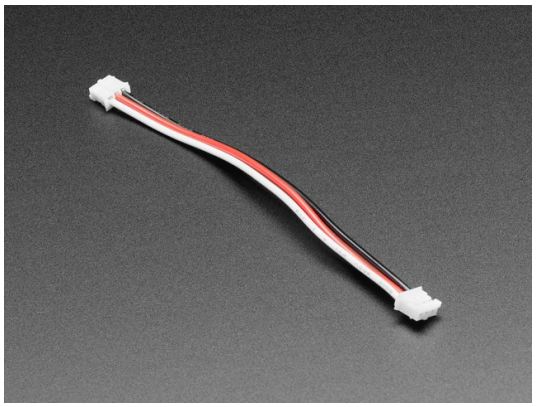
OUT OF STOCK

Out Of Stock

JST PH 3-pin Plug to Color Coded Alligator Clips Cable

OUT OF STOCK

Out Of Stock



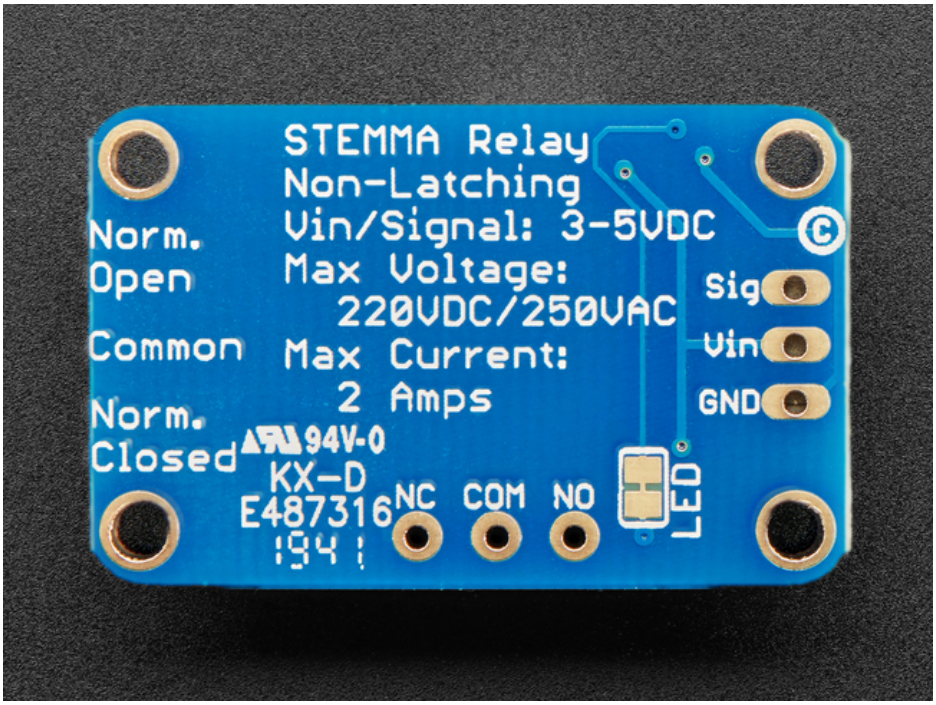
JST PH 3-pin Plug-Plug Cable - 100mm long

$0.75

IN STOCK

Add To Cart

- **Relay** - Located in the center of the board.
- **Terminal block** - The connects for the relay are the white tubular thing at the far end of the PCB. You can poke wire into the holes, they will automatically grip onto wire that is 24AWG to 18AWG. Once you poke the wire in, give it a light pull to verify its clamped. To release the wire, use a thin screwdriver or pen to press on the button on the top while pulling the wire out.



This board has a single **Signal** pin (the white wire). Normally, the relay's **COM** pin is connected mechanically to the **NC** pin and the **NO** pin is disconnected.

When the **Signal** pin is pulled high, the relay switches and the internal switch changes so that the **COM** pin is mechanically connected to the **NO** pin and **NC** is then disconnected

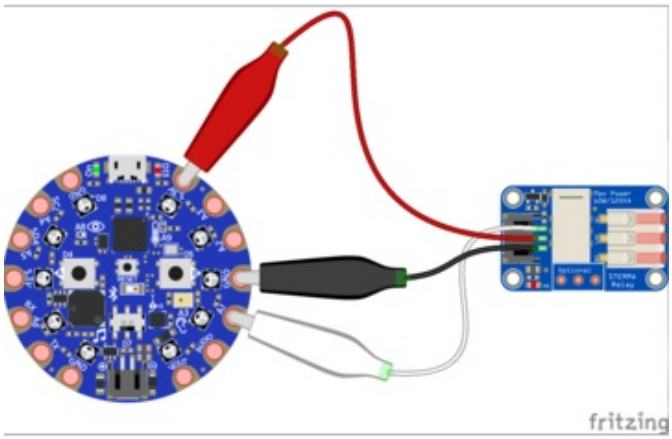
- **LED** - Status LED, located below the STEMMA connector.
- **Optional terminal block** - Connect a 3-pin terminal block to this optional spot to add another switch

Usage

It's easy to use the STEMMA Non-Latching Mini Relay to control power. This page will show you how to wire up the breakout board and use simple code to turn the relay on and off.

Wiring

Use a STEMMA cable to connect the relay board to you project. The following is an example of the relay board connected to a Circuit Playground Bluefruit using the STEMMA-to-alligator-clip cable (https://adafru.it/FY7).



- Plug the **3-pin JST to alligator clip cable** into the **3-pin JST connector** on the STEMMA Relay
- **Connect the white alligator clip** to **A1**
- **Connect the black alligator clip** to **GND**
- **Connect the red alligator clip** to **3.3v**

Circuit Playground Bluefruit Example

This example uses CircuitPython. If you're not already using CircuitPython, check out the Circuit Playground Bluefruit guide (https://adafru.it/GA4) for information on how to install and use CircuitPython on your device.

This example switches the relay once every second.

Save the following example as **code.py** on your **CIRCUITPY** drive:

```
import time
import board
import digitalio

relay = digitalio.DigitalInOut(board.A1)
relay.direction = digitalio.Direction.OUTPUT

while True:
    relay.value = True
    time.sleep(1)
    relay.value = False
    time.sleep(1)
```

Read the ratings on the relay for the maximum current values for a given voltage. Beware switching any voltage over 24 volts up to and including mains (110/220V AC) which could harm you if touched. Proper

insulation techniques are essential.

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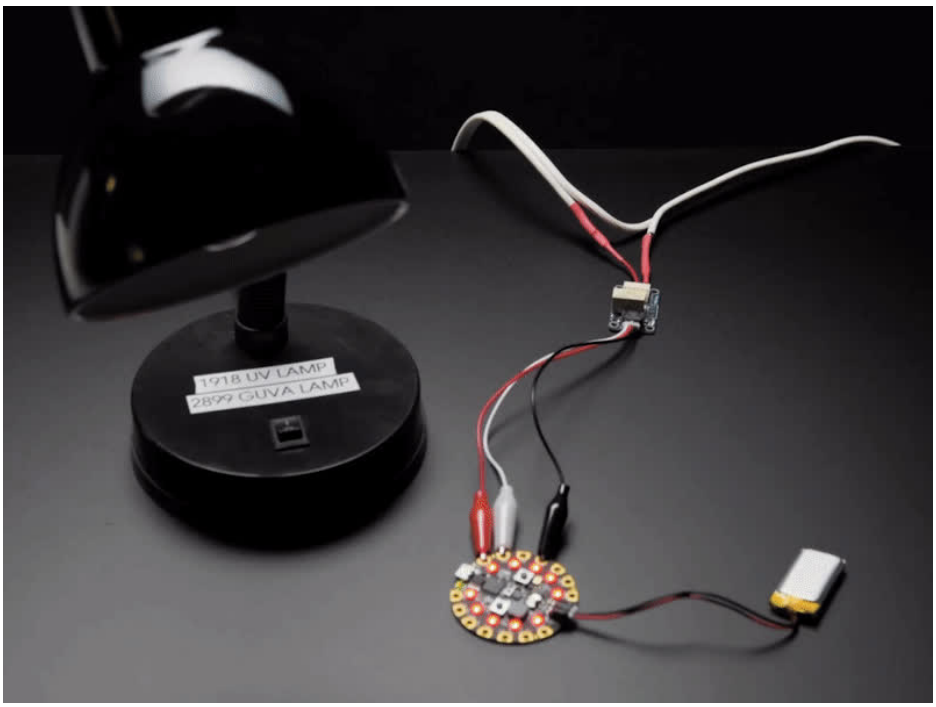
That's all there is to using the STEMMA non-latching mini relay with the Circuit Playground Bluefruit!

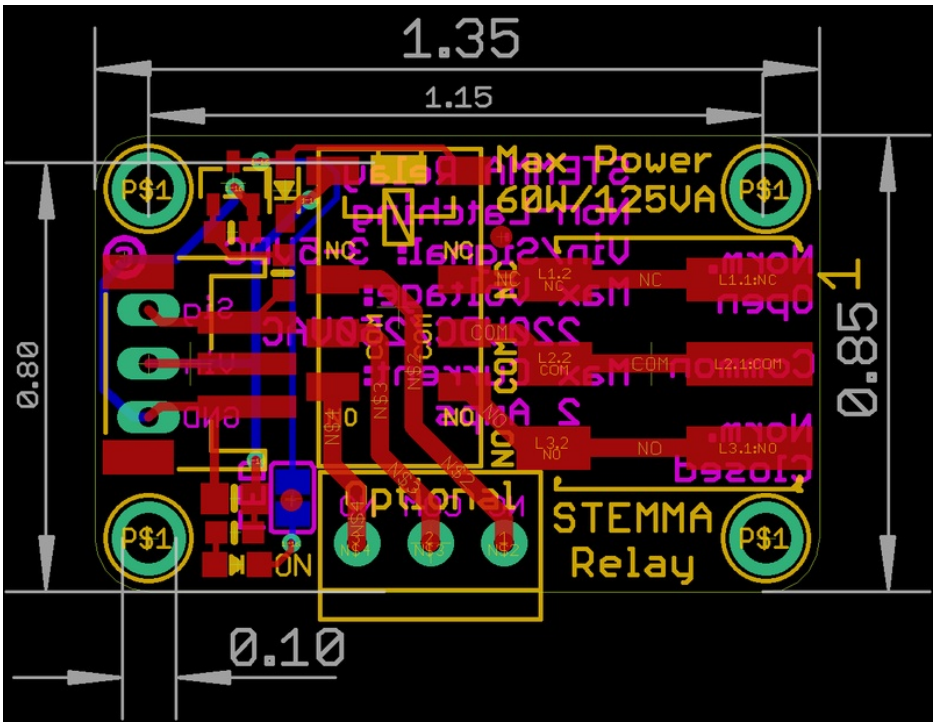


Downloads

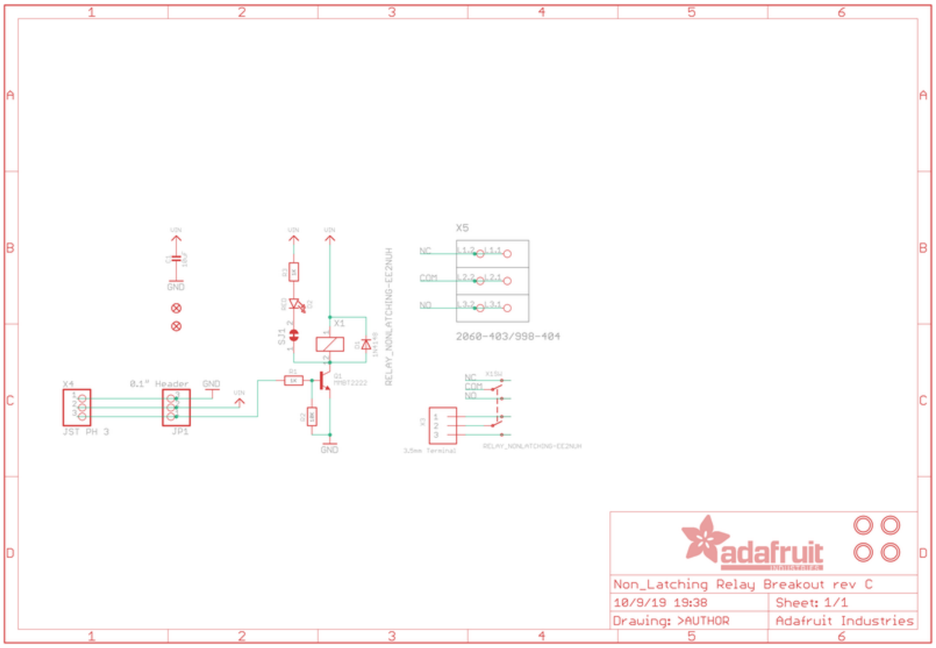
Files

- Nexem EE2 relay datasheet (https://adafru.it/GA5)
- EagleCAD PCB files on GitHub (https://adafru.it/GA6)
- Fritzing object in the Adafruit Fritzing Library (https://adafru.it/GA7)

Fab Print



Schematic


X5
NC
COM
NO
2060-403/998-404
X4
0.1" Header
GND
JST PH 3
JP1
SJ1
X1
GND
RELAY_NONLATCHING-EE2NUH
Non_Latching Relay Breakout rev C
10/9/19 19:38
Sheet: 1/1
Drawing: >AUTHOR
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