Adafruit IO

Thomas Trickel

Adafruit IO

Internet of Things (IoT)

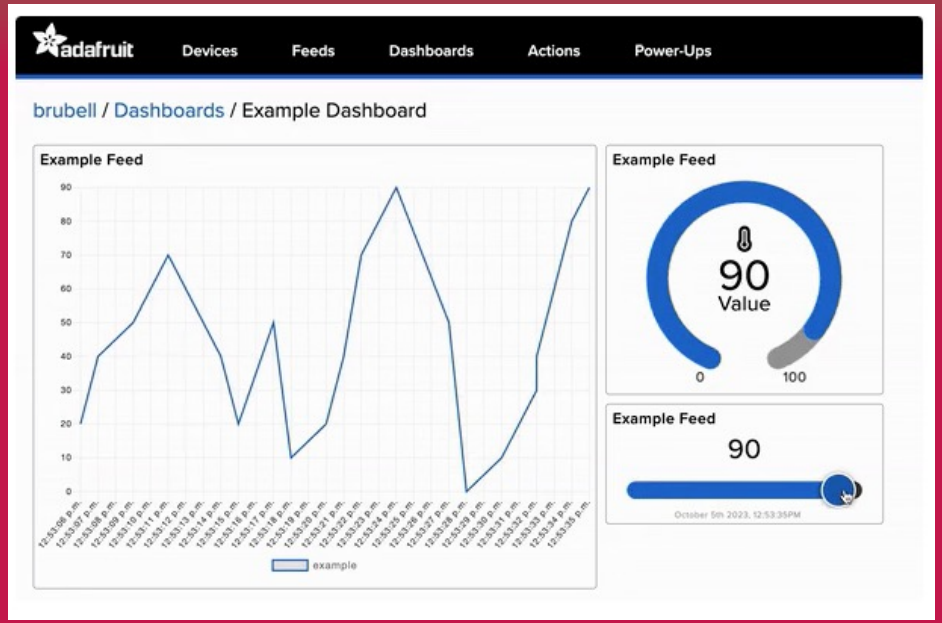
Feeds and Dashboards

Control LED from AIO (digital output)

Send Data to AIO (digital input)

…

Send CO2 data to AIO (analog input)



Control LED from AIO

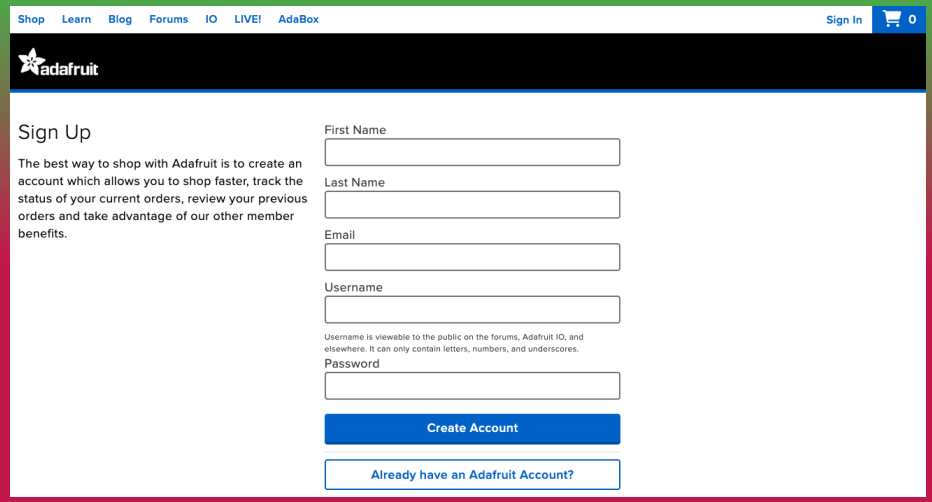
- Sign up to Adafruit
- Hardware
- Create Feed
- Create Dashboard
- Write Python Code

Setup AIO Account

Sign Up

https://accounts.adafruit.com/users/sign_up

Two factor authentication



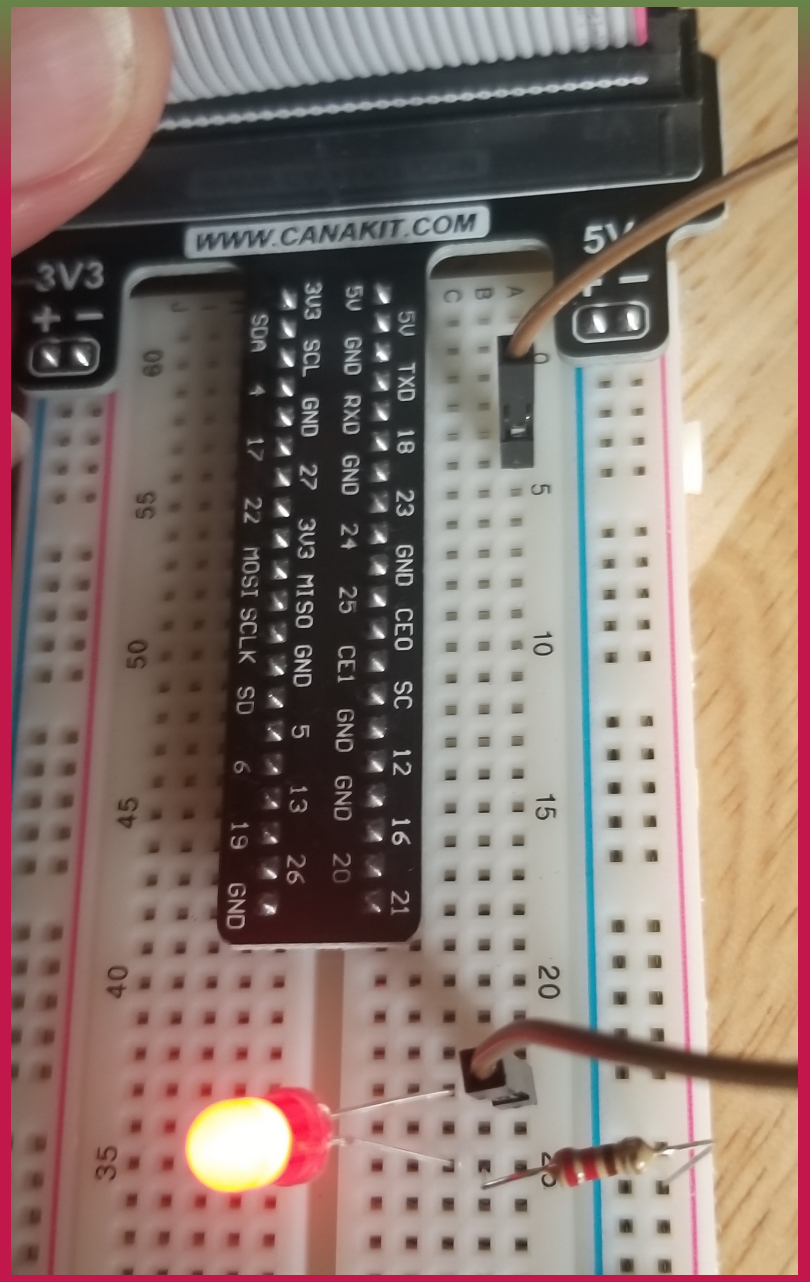
Feeds & Dashboards

- Think of a Feed as property of an IoT device
  - Feeds are Features of an IoT device
    - Weather Station – temperature, humidity, wind speed, etc
    - Thermostat – set temperature, on/off
    - Door Lock
- Data is sent to and comes from Feeds
- Dashboards are used to
  - Display Feed data
  - Send data to a Feed

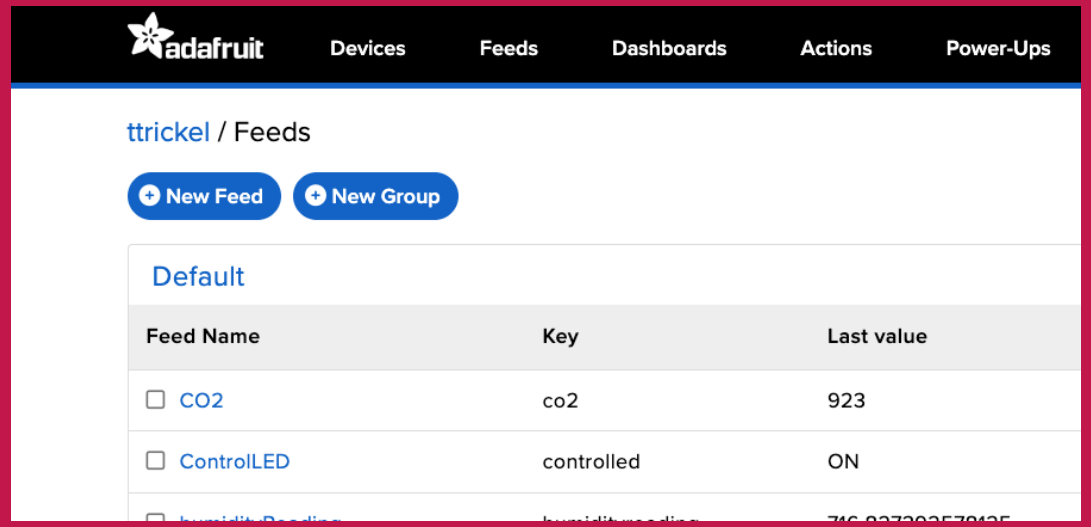
Hardware

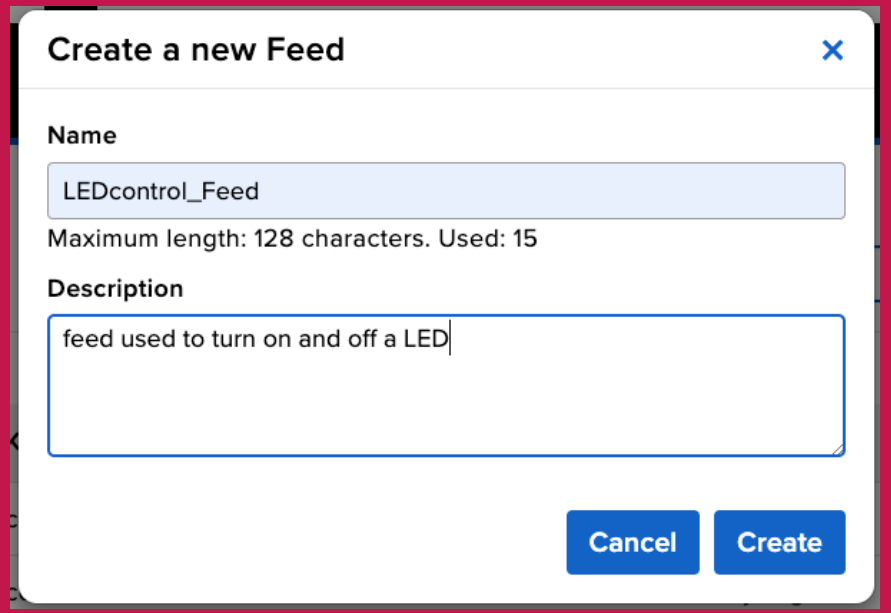
- Digital Output

- Polarity matters on LED
  - Short leg is Cathode, connect to – (GND)
- Resistor 220Ω (Red Red Brown)
- Wire
  - LED Anode to GPIO 18

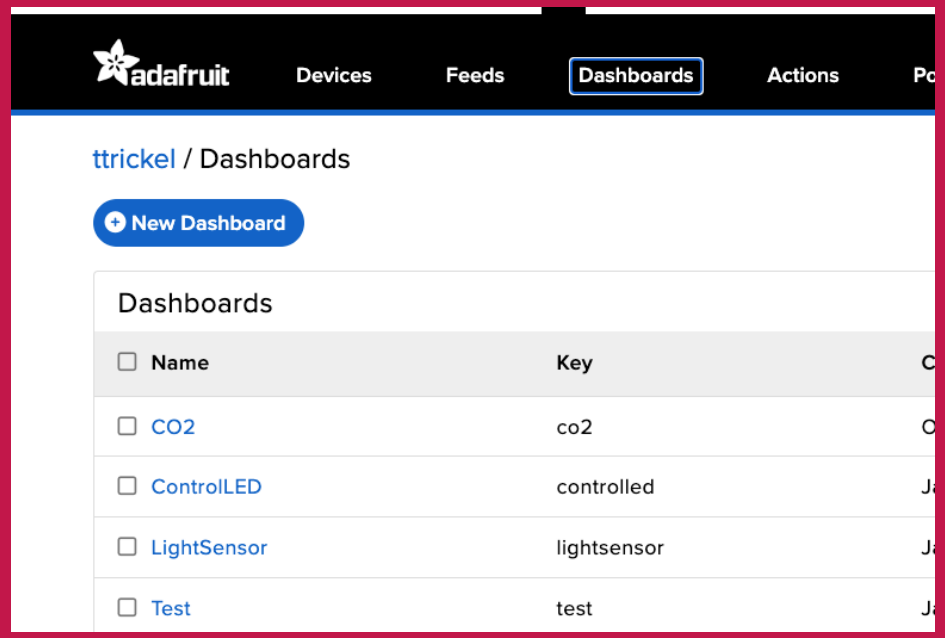


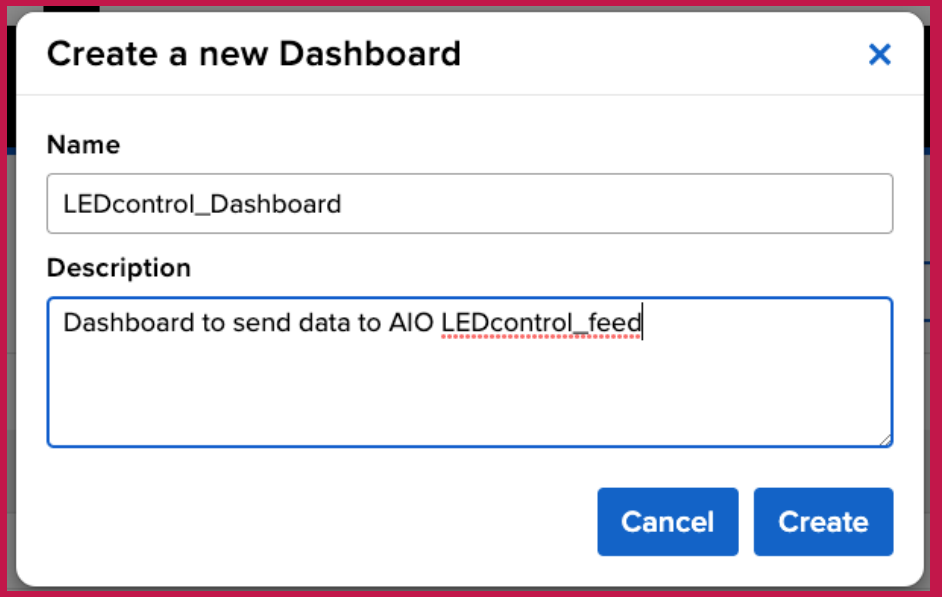
Create AIO Feed



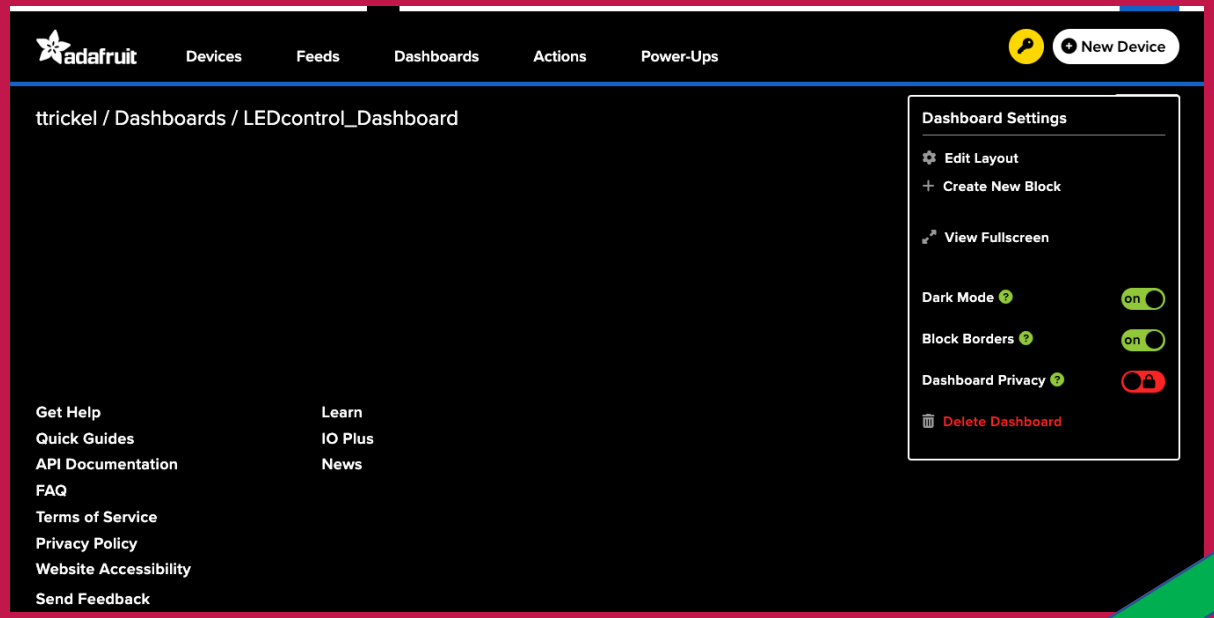


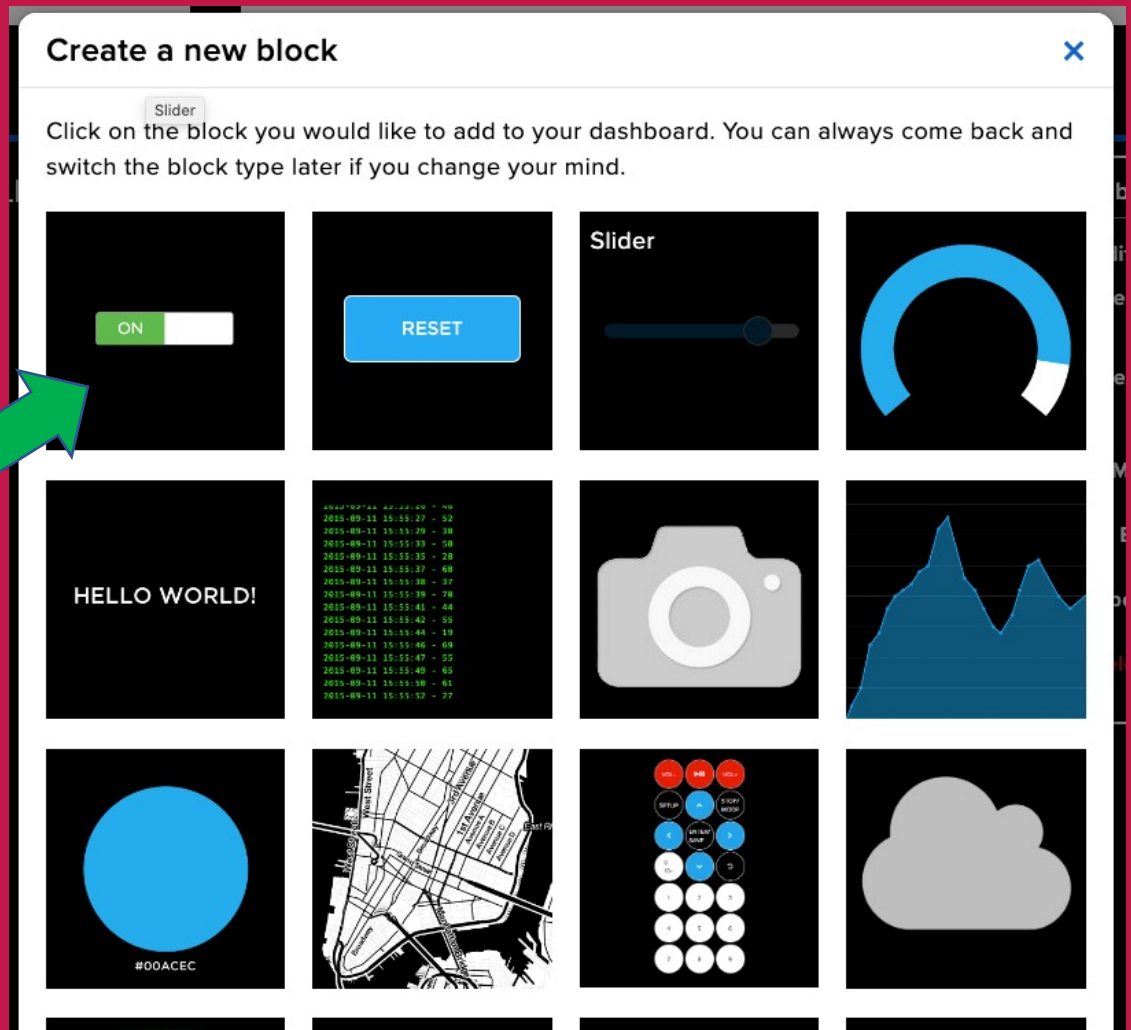
Create AIO Dashboard



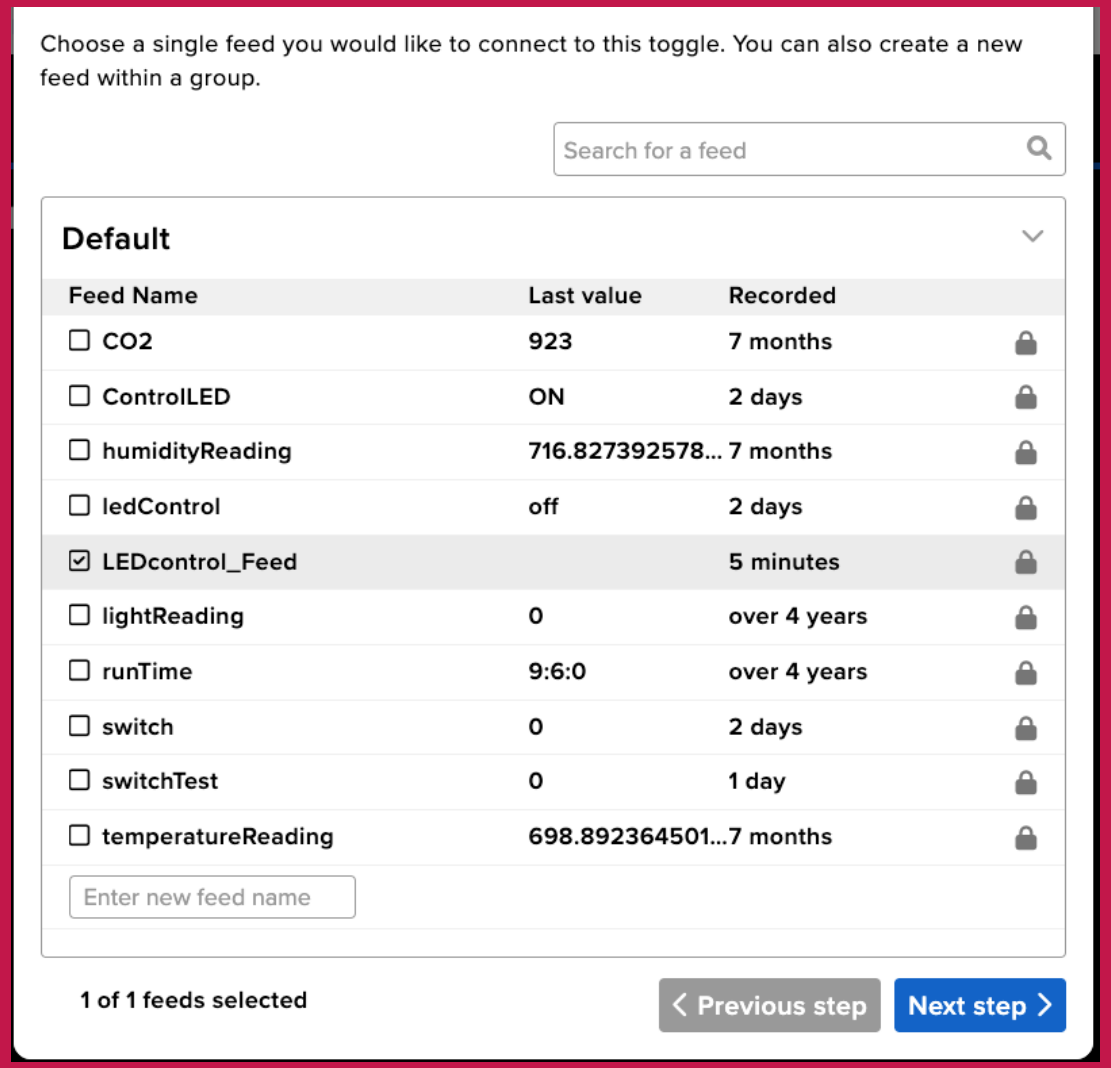


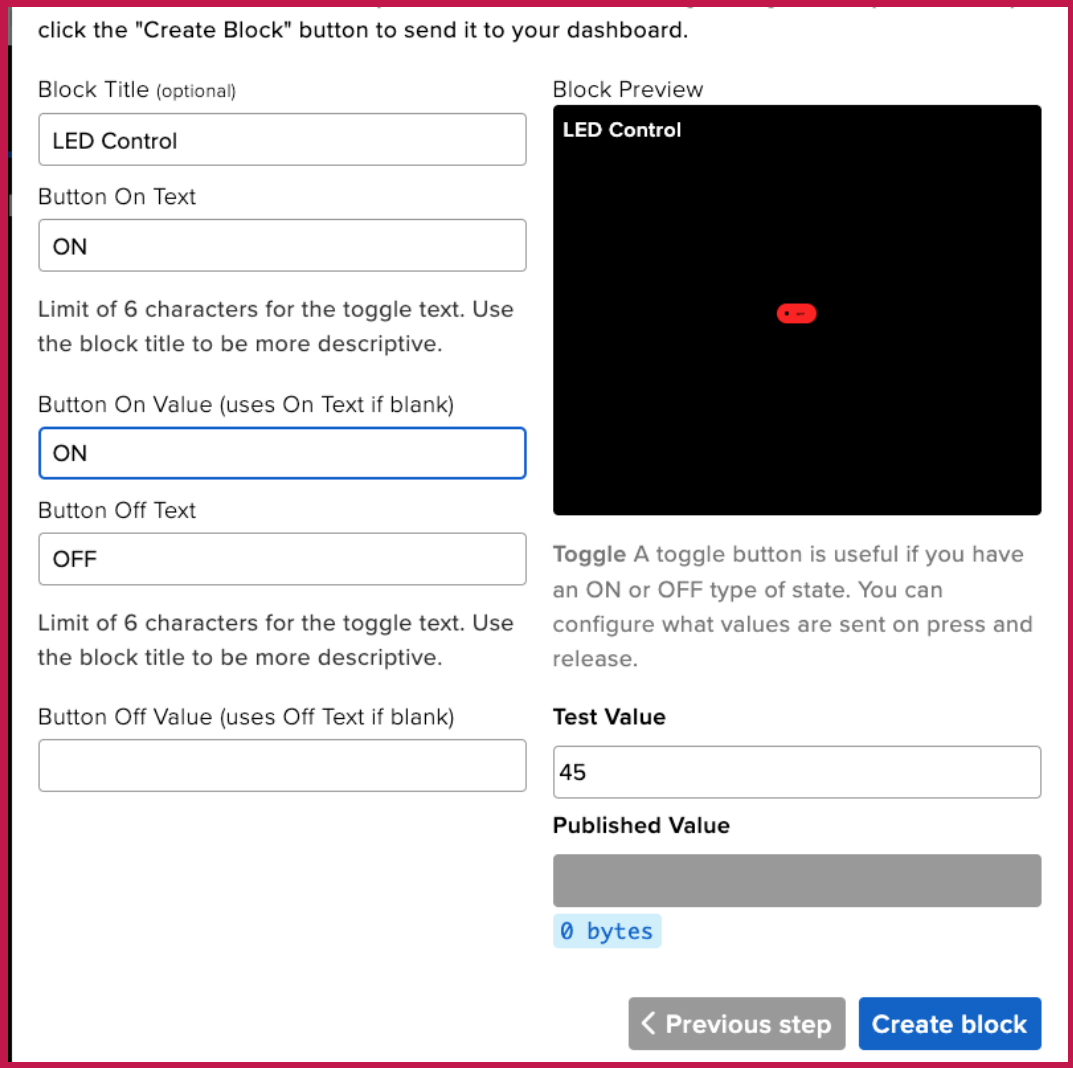
Create AIO Dashboard continued



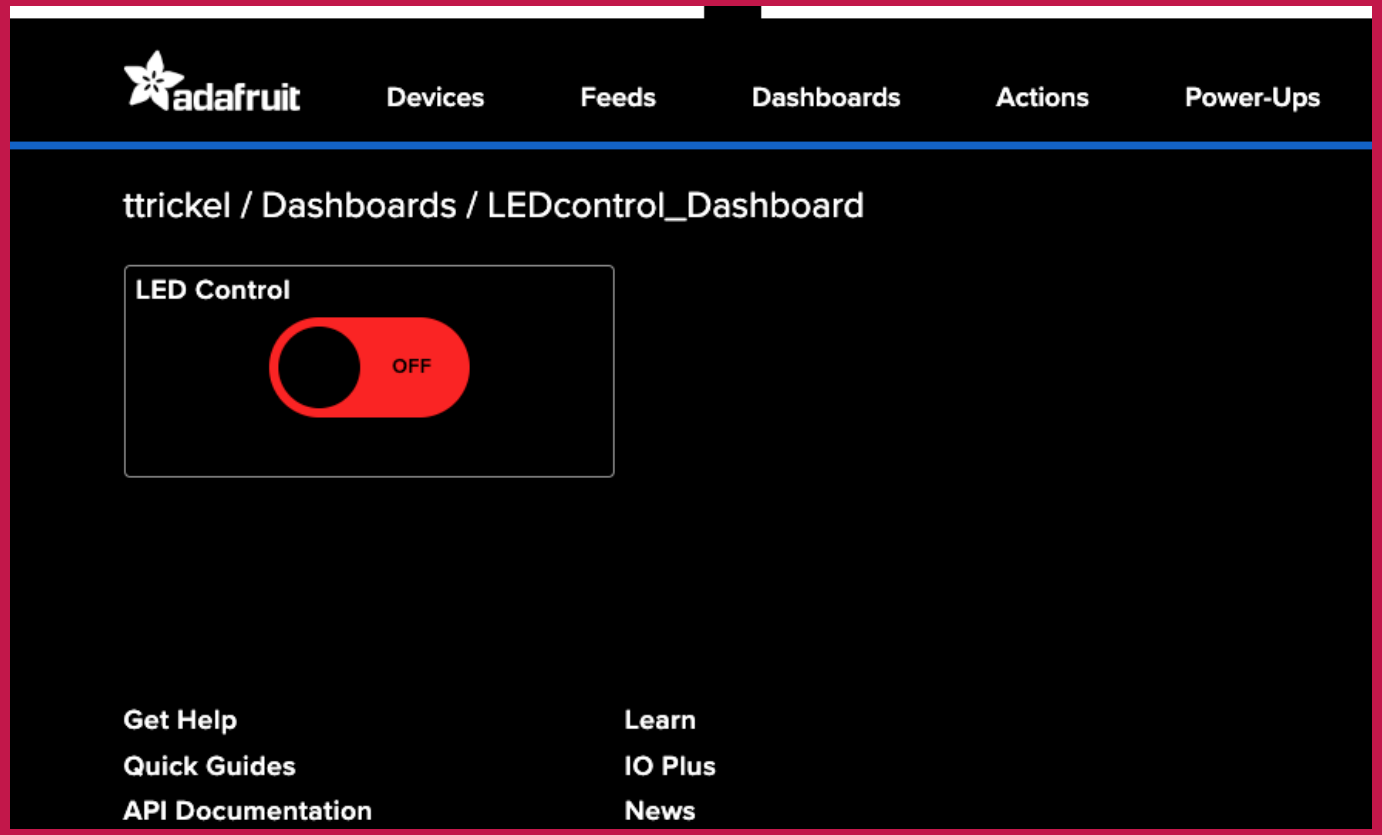


Create AIO Dashboard continued





Create AIO Dashboard continued



Control LED from AIO Python Code

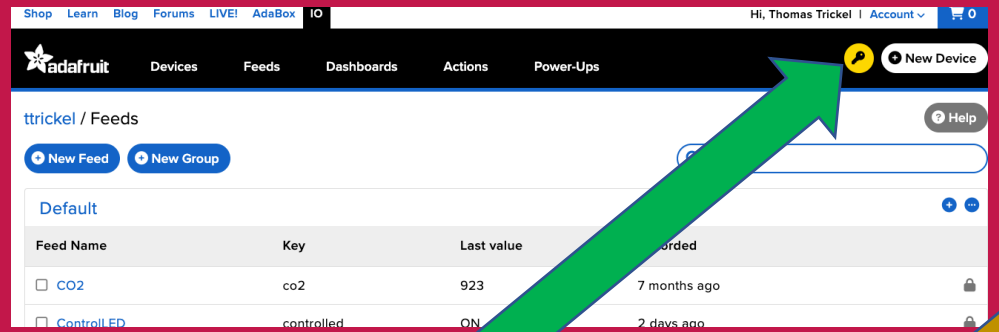
change

YOUR_AIO_KEY

YOUR_AIO_USERNAME

```
"""
'digital_out.py'
==================================
Example of turning on and off a LED
from the Adafruit IO Python Client
Author(s): Brent Rubell, Todd Treece
           with modifications by Thomas Trickel
"""
# Import standard python modules
import time
import RPi.GPIO as GPIO

# import Adafruit IO REST client.
from Adafruit_IO import Client, Feed, RequestError

# setup GPIO
GPIO.setwarnings(False)
GPIO.setmode(GPIO.BCM)
GPIO.setup(18, GPIO.OUT)


# Set to your Adafruit IO key.
# Remember, your key is a secret,
# so make sure not to publish it when you publish this code!
ADAFRUIT_IO_KEY = 'YOUR_AIO_KEY'

# Set to your Adafruit IO username.
# (go to https://accounts.adafruit.com to find your username)
ADAFRUIT_IO_USERNAME = 'YOUR_AIO_USERNAME"

# Create an instance of the REST client.
aio = Client(ADAFRUIT_IO_USERNAME, ADAFRUIT_IO_KEY)

try: # if we have a 'digital' feed
    digital = aio.feeds('ledcontrol-feed')
except RequestError: # create a digital feed
    feed = Feed(name="ledcontrol-feed")
    digital = aio.create_feed(feed)

while True:
    data = aio.receive(digital.key)
    if data.value == "ON":
        print('received <- ON\n')
        GPIO.output(18, True)
    elif data.value == "OFF":
        print('received <- OFF\n')
        GPIO.output(18, False)

# timeout so we dont flood adafruit-io with requests
    time.sleep(0.5)

```

AIO KEY & USERNAME



YOUR ADAFRUIT IO KEY

Your Adafruit IO Key should be kept in a safe place and treated with the same care as your Adafruit username and password. People who have access to your Adafruit IO Key can view all of your data, create new feeds for your account, and manipulate your active feeds.

If you need to regenerate a new Adafruit IO Key, all of your existing programs and scripts will need to be manually changed to the new key.

Username [redacted]

Active Key [redacted] REGENERATE KEY

Hide Code Samples

Arduino

```
#define IO_USERNAME  "ttrickel"
#define IO_KEY       "a0da523dfa16502494a70e61e1f683ba8
a0b32f4"
```

Linux Shell

```
export IO_USERNAME="ttrickel"
export IO_KEY="a0da523dfa16502494a70e61e1f683ba8a0b32f
4"
```

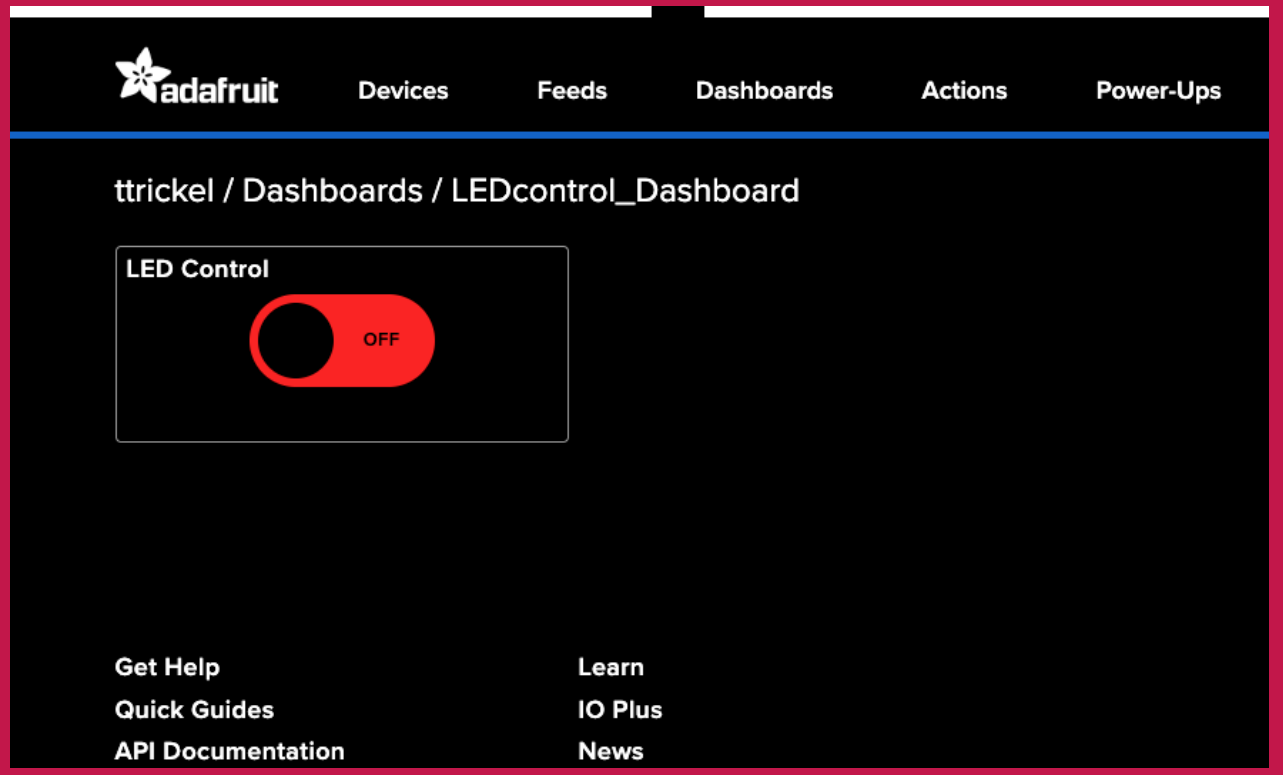
Scripting

```
ADAFRUIT_IO_USERNAME = "ttrickel"
ADAFRUIT_IO_KEY = "a0da523dfa16502494a70e61e1f683ba8a0b
32f4"
```

Test It

Run Python Code

Click on LED Control icon



Smashingly Excellent!

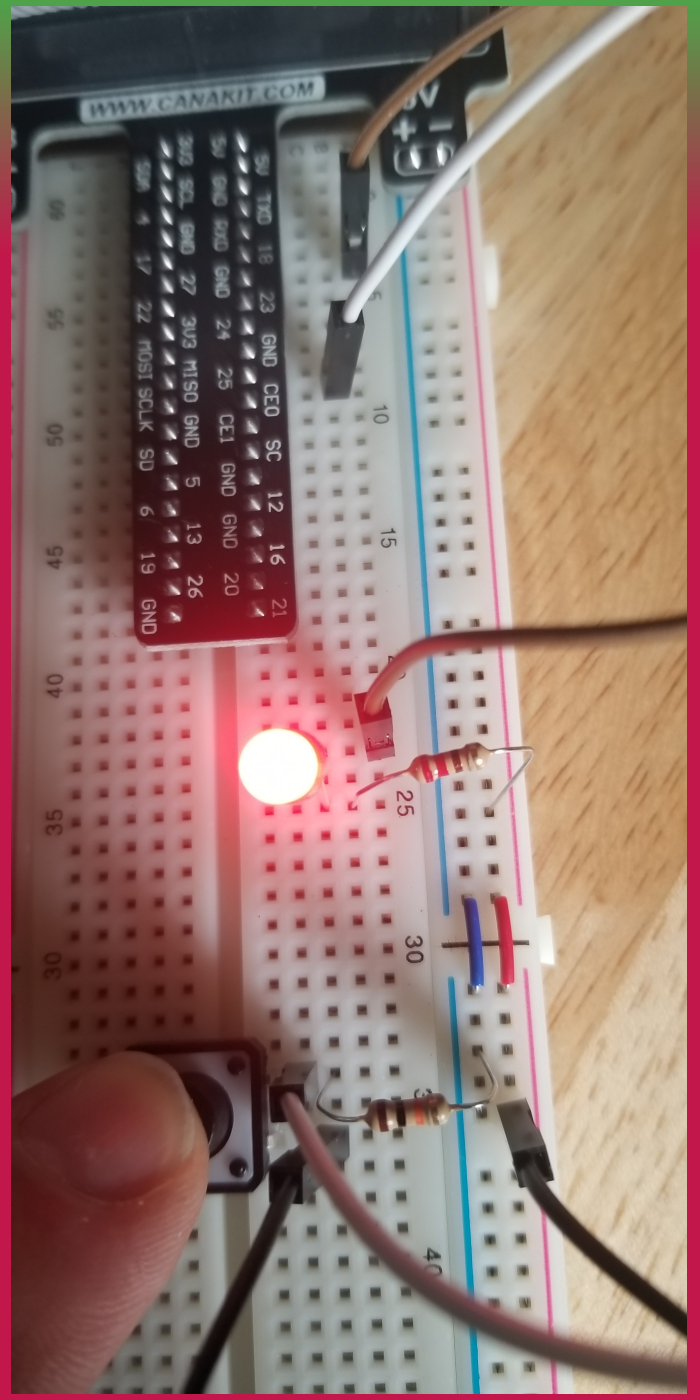
Send Switch Data to AIO

- Hardware
- Create Feed
- Create Dashboard
- Write Python Code

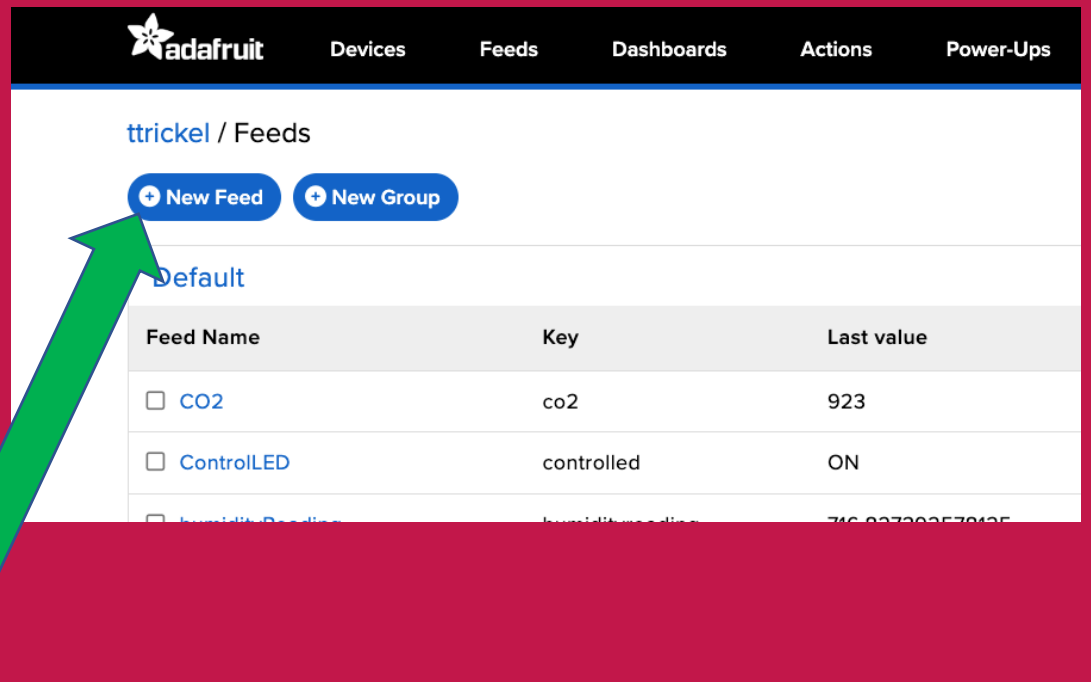
Hardware

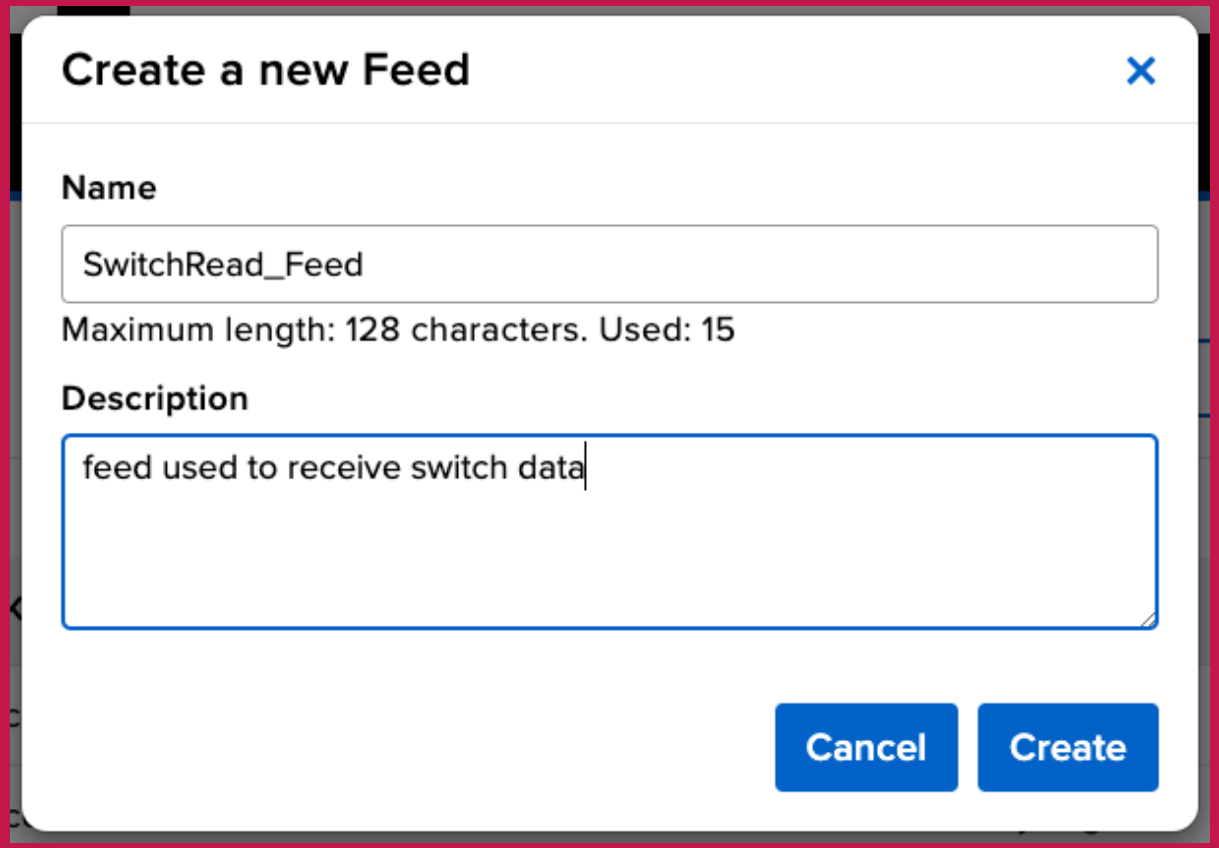
- Digital Input

- Resistor 10kΩ (Orange Black Brown)
- Wire
  - Switch to GPIO 25

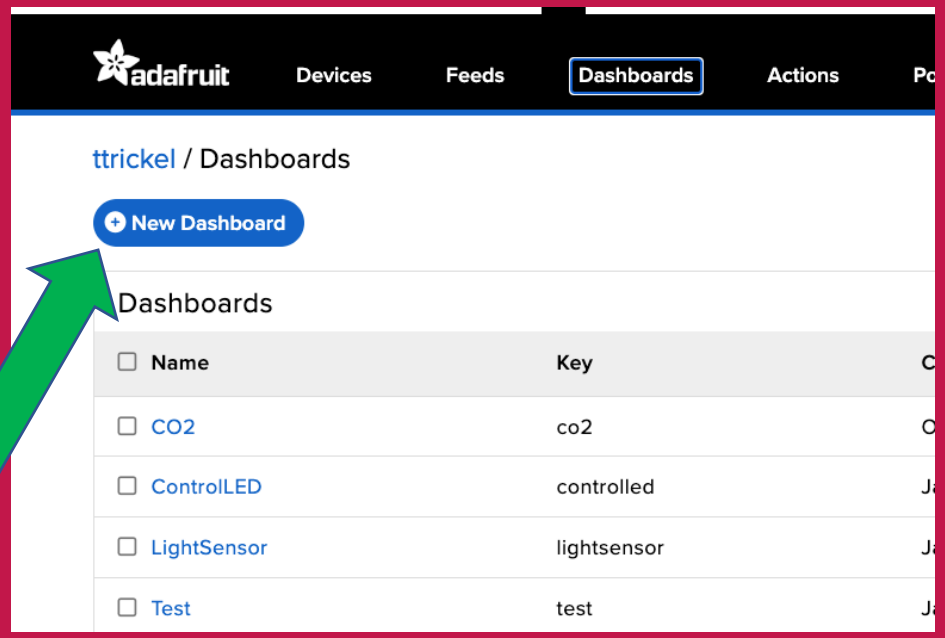


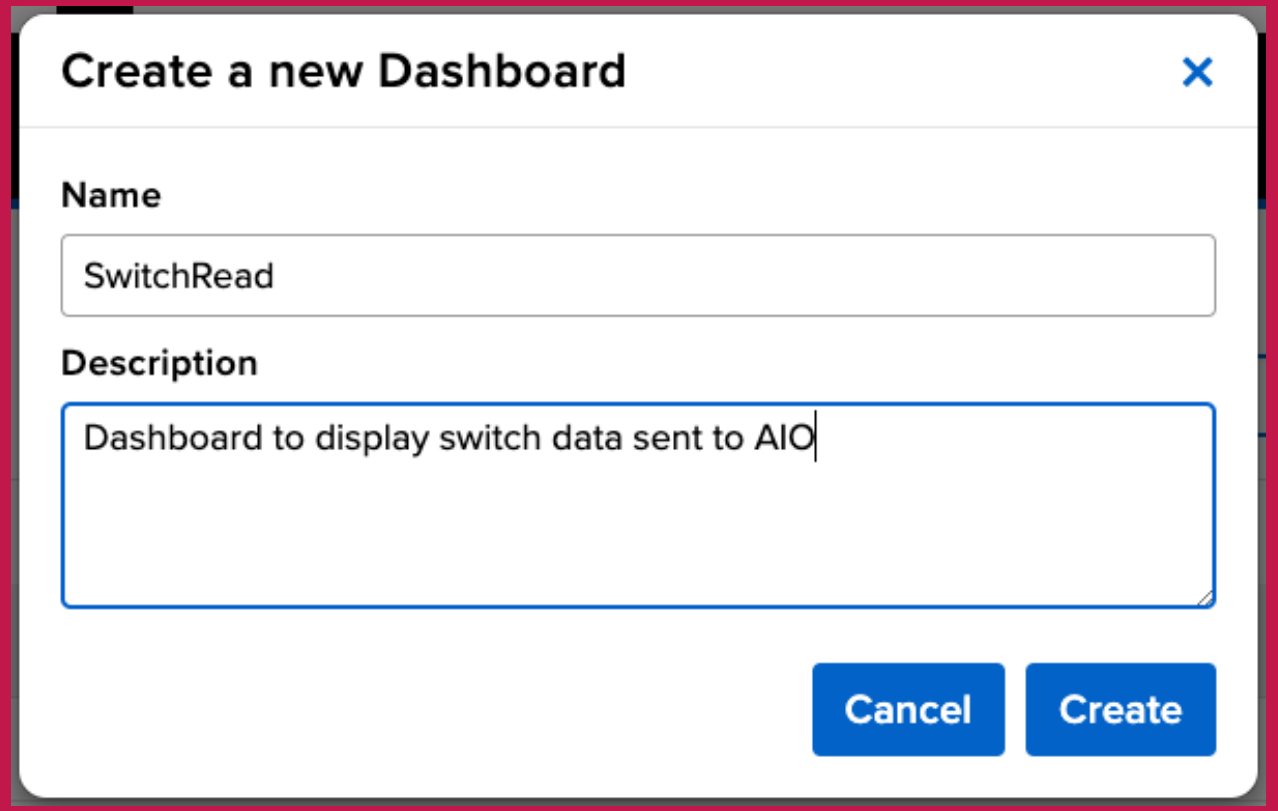
Create AIO Feed



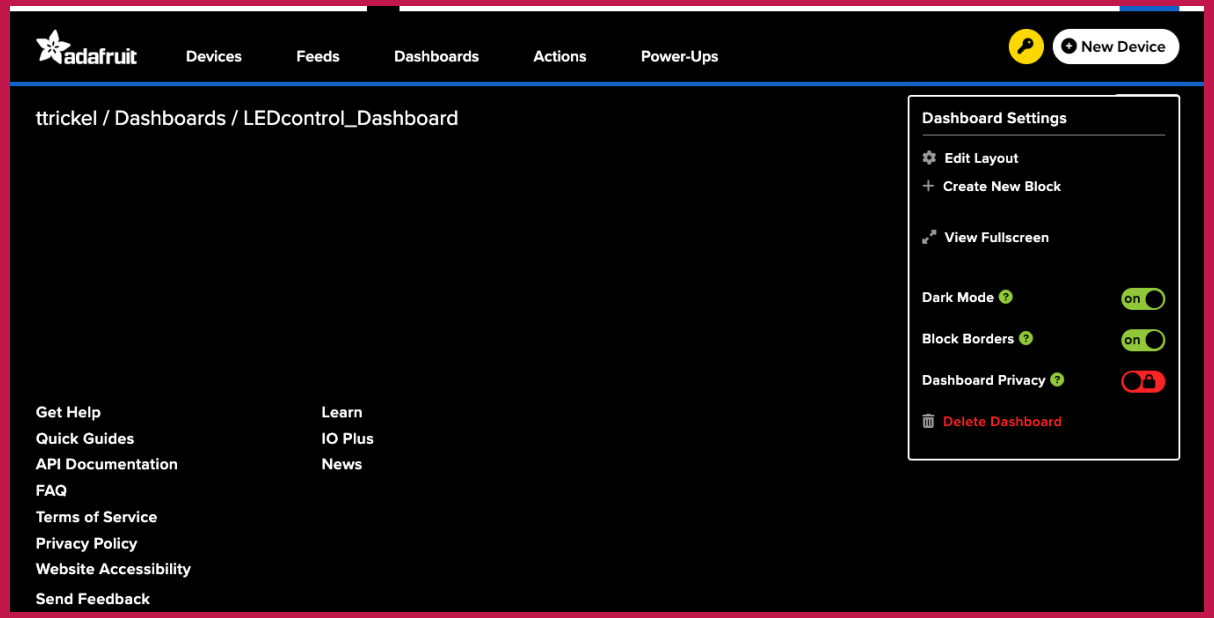


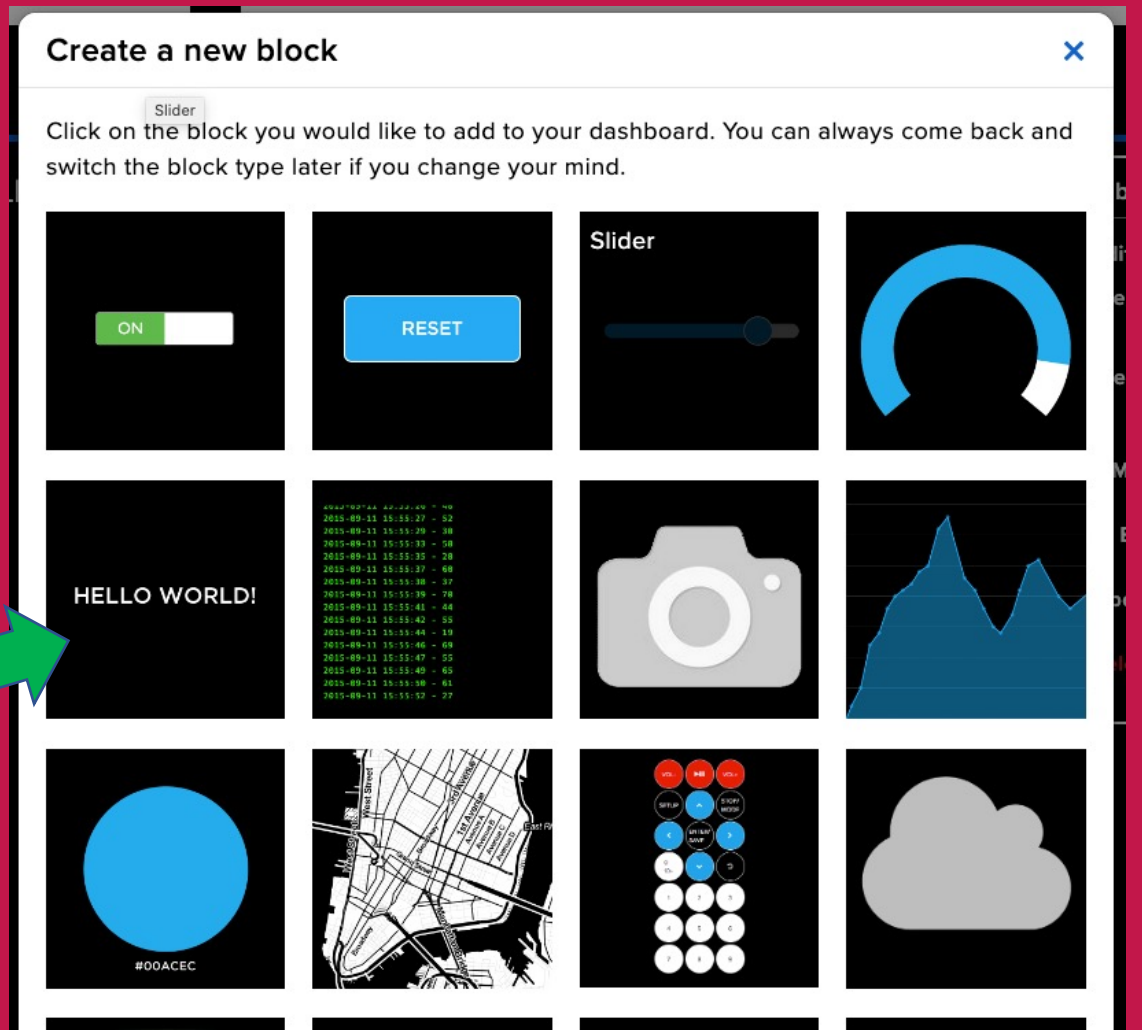
Create AIO Dashboard



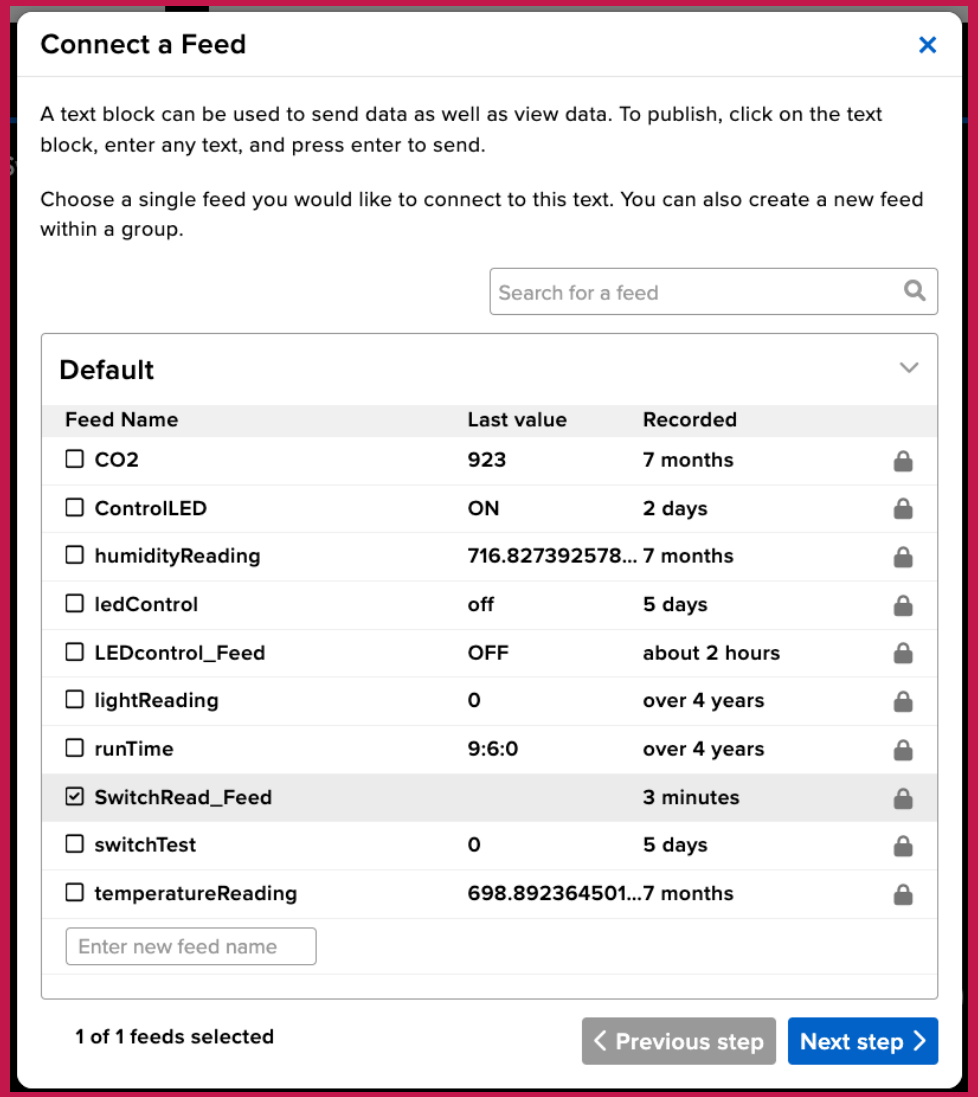


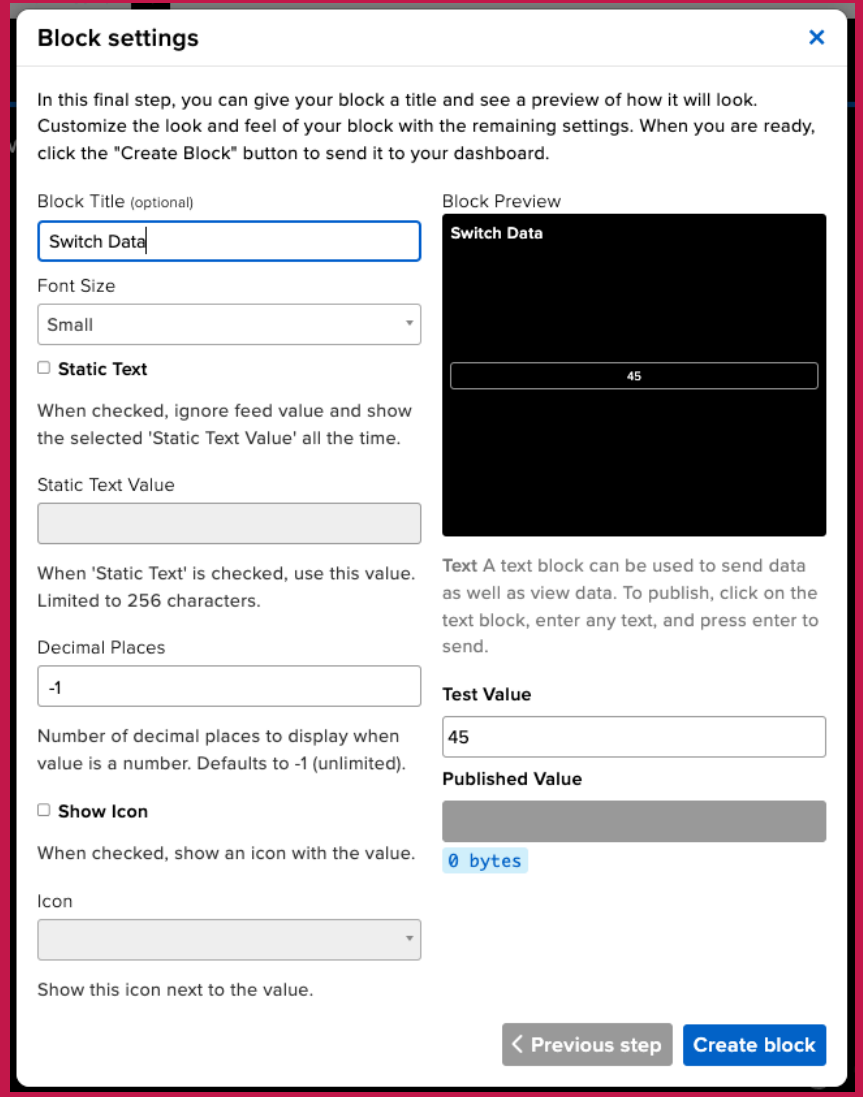
Create AIO Dashboard continued



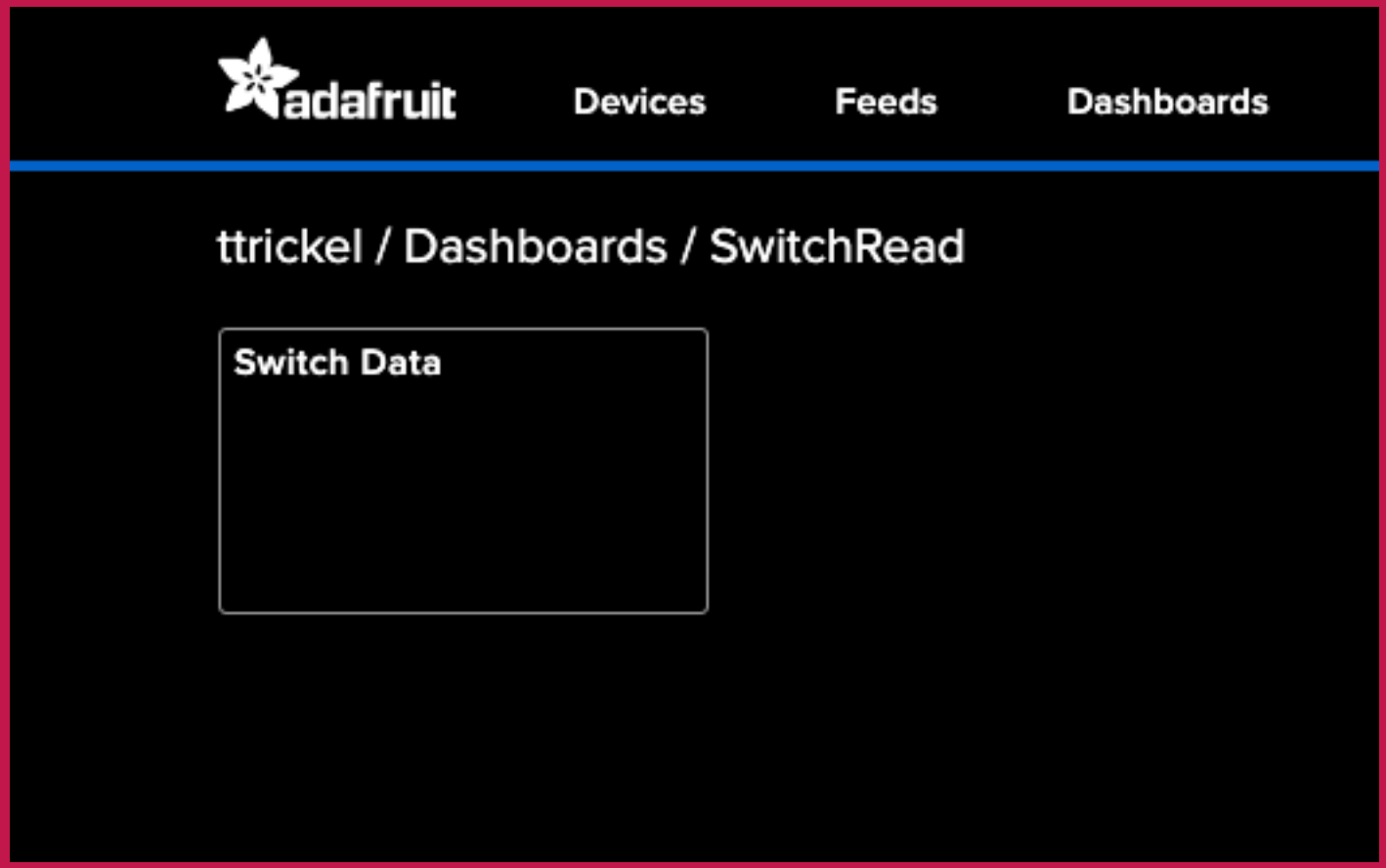


Create AIO Dashboard continued





Create AIO Dashboard continued



Send Switch Data to AIO Python Code

change

YOUR_AIO_KEY

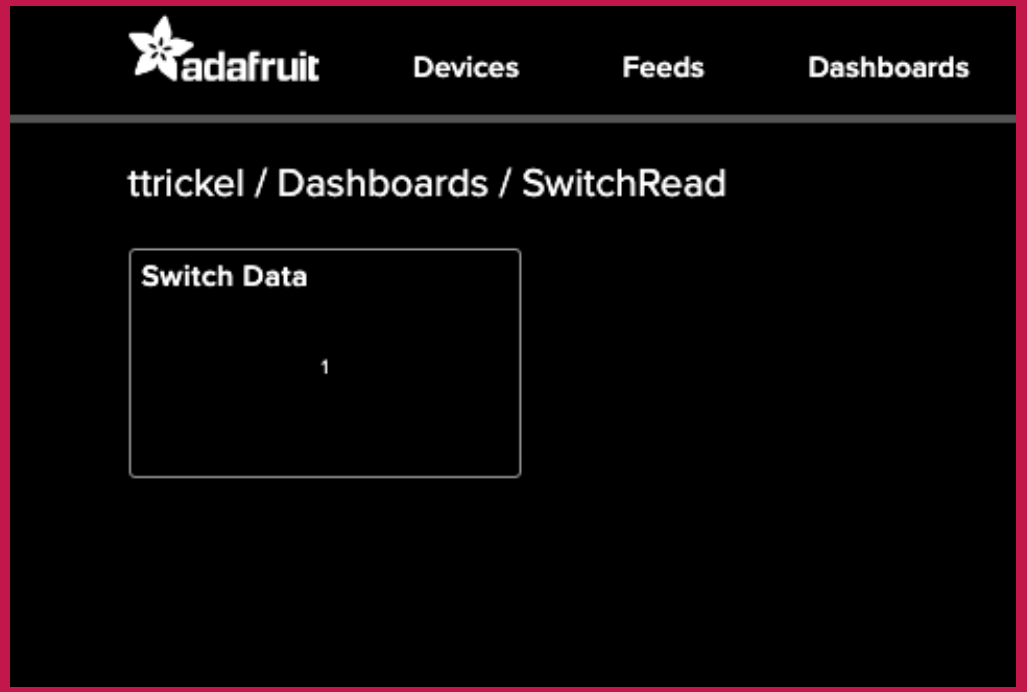
YOUR_AIO_USERNAME

```
"""
'digitalIn.py'
==================================
Example of sending the status of a
switch to the Adafruit IO Python Client
"""
# Import standard python modules
import time
import RPi.GPIO as GPIO

# import Adafruit IO REST client.
from Adafruit_IO import Client, Feed, RequestError

# setup GPIO
GPIO.setwarnings(False)
GPIO.setmode(GPIO.BCM)
GPIO.setup(25, GPIO.IN)

# Set to your Adafruit IO key.
# Remember, your key is a secret,
# so make sure not to publish it when you publish this code!
ADAFRUIT_IO_KEY = 'YOUR_AIO_KEY'

# Set to your Adafruit IO username.
# (go to https://accounts.adafruit.com to find your username)
ADAFRUIT_IO_USERNAME = 'YOUR_AIO_USERNAME'

# Create an instance of the REST client.
aio = Client(ADAFRUIT_IO_USERNAME, ADAFRUIT_IO_KEY)

try: # if we have a 'digital' feed
    digital = aio.feeds('switchread-feed')
except RequestError: # create a digital feed
    feed = Feed(name="switchread-feed")
    digital = aio.create_feed(feed)

while True:
    if GPIO.input(25):
        aio.send(digital.key, 0)
    else:
        aio.send(digital.key, 1)

# timeout so we dont flood adafruit-io with requests
    time.sleep(0.5)

```

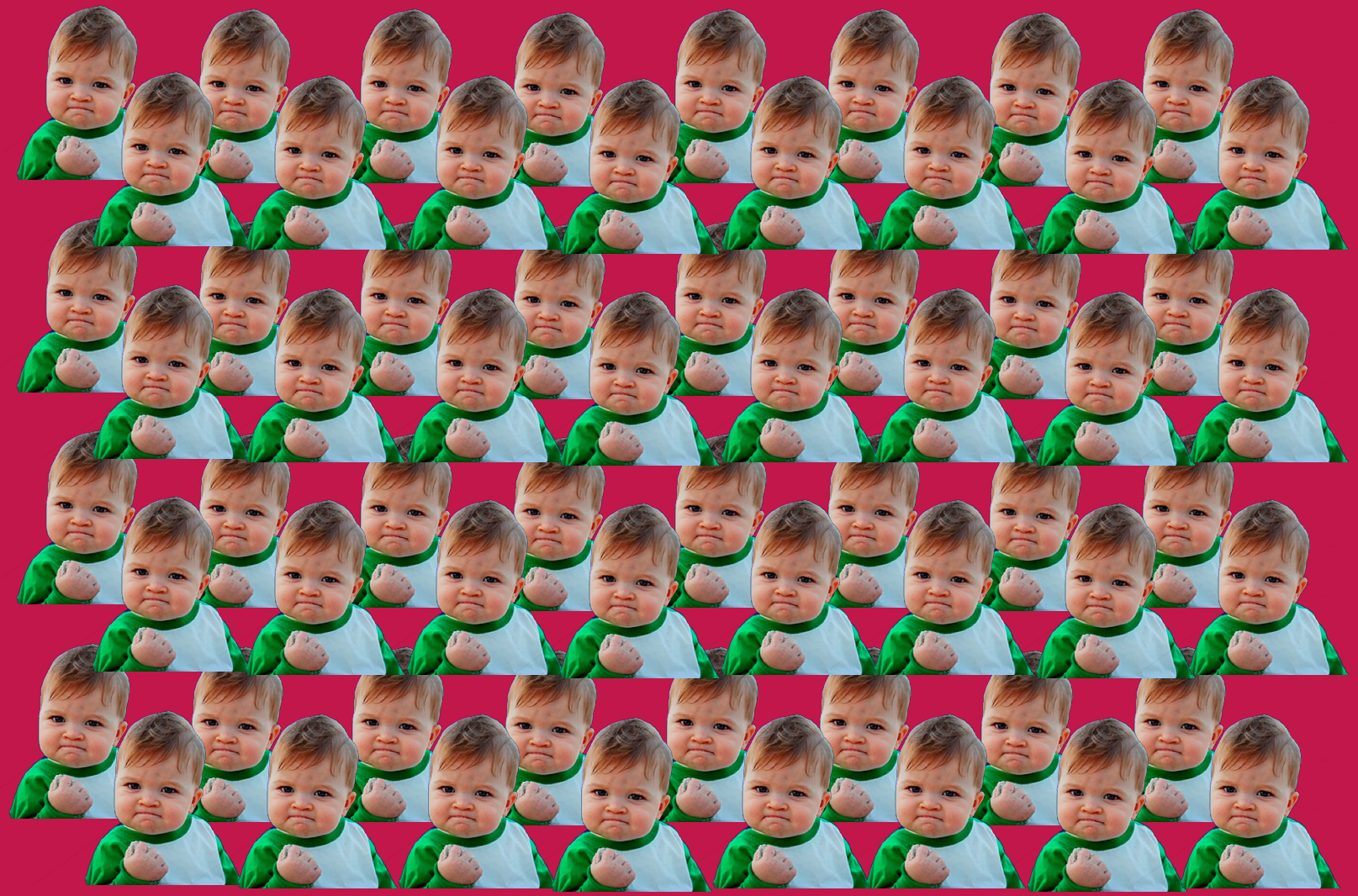
Test It

Run Python Code

Press Switch on Breadboard



Unbelievably Excellent!



2025 Summer Tech Internship

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