

Driving APA102 (Dotstar) LED strips with Pico

The [Dotstar LEDs](#) (APA102) are similar to the [NeoPixels](#) but with less timing requirements and other issues. You control them with two pins instead of one, and they seem to be a bit less widely used probably because they're more expensive than the Neopixel ones.

For a quick test we cobbled together a series of scripts that get some light effects out of a Dotstar strip, starting out from CircuitPython. You will need the `adafruit_dotstar` library that you can find here: <https://circuitpython.org/libraries> (make sure you download the right library version for your version of circuitpython).

More info on Dotstar strips and matrices [here](#), by Adafruit. Page 39 and on concerns Circuitpython.

Setup

Make sure your Pico has Circuitpython installed. Once you've done that, copy `adafruit_dotstar` to the lib folder and this [effects.py](#) to your Pico. Connect the pins of the Dotstar strip to your Pico: power to power (preferably external power, [see also here](#)), CI (usually yellow) to pin 18 and DI (usually green) to pin 19.

Run the `effects.py` and your strip should light up, cycling through a couple of lighting effects.

effects.py

`effects.py` has a couple of settings on the top of the program.

- `num_pixels` is the number of LEDs on your strip that you want lit. The program starts at the LED closest to the connection wires and then counts up.
- `sleepy_time` is the time each LED is lit for some of the effects. Short wait times lead to quick blinking or more fluent lighting effects.
- `auto_write` is set to `False`. When set to `True`, the program will wait until all leds are set before updating the entire strip at once. When set to `False`, each LED is updated individually. Which mode you need will depend on your use case, we set it to `False` to allow for faster lighting effects with longer strips. For strips up to ~10 LEDs you will hardly notice the difference.

Lines 23-115 define functions for the lighting effects, which are called in the main loop at 136.



Shiji Lighting
Shiji-led.com



Revision #16

Created 2023-12-21 10:56:19 UTC by mikal

Updated 2024-01-25 12:17:55 UTC by mikal