
Adafruit IS31FL3731 Library Documentation

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CircuitPython driver for the IS31FL3731 charlieplex IC.

This driver supports the following hardware:

- [Adafruit 16x9 Charlieplexed PWM LED Matrix Driver - IS31FL3731](#)
- [Adafruit 15x7 CharliePlex LED Matrix Display FeatherWings](#)

CHAPTER 1

Dependencies

This driver depends on:

- [Adafruit CircuitPython](#)

Please ensure all dependencies are available on the CircuitPython filesystem. This is easily achieved by downloading the [Adafruit library and driver bundle](#).

CHAPTER 2

Usage Example

Matrix:

```
import adafruit_is31fl3731
import board
import busio
with busio.I2C(board.SCL, board.SDA) as i2c:
    display = adafruit_is31fl3731.Matrix(i2c)
    display.fill(127)
```

Charlie Wing:

```
import adafruit_is31fl3731
import board
import busio
with busio.I2C(board.SCL, board.SDA) as i2c:
    display = adafruit_is31fl3731.CharlieWing(i2c)
    display.fill(127)

    # Turn off pixel 4,4, change its brightness and turn it back on
    display.pixel(4, 4, 0)    # Turn off.
    display.pixel(4, 4, 50)   # Low brightness (50)
    display.pixel(4, 4, 192)  # Higher brightness (192)
```


CHAPTER 3

Contributing

Contributions are welcome! Please read our [Code of Conduct](#) before contributing to help this project stay welcoming.

CHAPTER 4

Building locally

To build this library locally you'll need to install the `circuitpython-build-tools` package.

```
python3 -m venv .env
source .env/bin/activate
pip install circuitpython-build-tools
```

Once installed, make sure you are in the virtual environment:

```
source .env/bin/activate
```

Then run the build:

```
circuitpython-build-bundles --filename_prefix adafruit-circuitpython-is31fl3731 --
↳library_location .
```

4.1 Sphinx documentation

Sphinx is used to build the documentation based on rST files and comments in the code. First, install dependencies (feel free to reuse the virtual environment from above):

```
python3 -m venv .env
source .env/bin/activate
pip install Sphinx sphinx-rtd-theme
```

Now, once you have the virtual environment activated:

```
cd docs
sphinx-build -E -W -b html . _build/html
```

This will output the documentation to `docs/_build/html`. Open the `index.html` in your browser to view them. It will also (due to `-W`) error out on any warning like Travis will. This is a good way to locally verify it will pass.

5.1 Simple test

Ensure your device works with this simple test.

Listing 1: examples/is31fl3731_simpletest.py

```
1 import board
2 import busio
3 import adafruit_is31fl3731
4
5
6 with busio.I2C(board.SCL, board.SDA) as i2c:
7     # initialize display using Feather CharlieWing LED 15 x 7
8     display = adafruit_is31fl3731.CharlieWing(i2c)
9     # uncomment next line if you are using Adafruit 16x9 Charlieplexed PWM LED Matrix
10    #display = adafruit_is31fl3731.Matrix(i2c)
11
12    # draw a box on the display
13    # first draw the top and bottom edges
14    for x in range(display.width):
15        display.pixel(x, 0, 50)
16        display.pixel(x, display.height - 1, 50)
17    # now draw the left and right edges
18    for y in range(display.height):
19        display.pixel(0, y, 50)
20        display.pixel(display.width - 1, y, 50)
```

For other examples, see the GitHub [examples folder](#).

5.2 adafruit_is31fl3731

CircuitPython driver for the IS31FL3731 charlieplex IC.

- Author(s): Tony DiCola

5.2.1 Implementation Notes

Hardware:

- [Adafruit 16x9 Charlieplexed PWM LED Matrix Driver - IS31FL3731](#)
- [Adafruit 15x7 CharliePlex LED Matrix Display FeatherWings](#)

Software and Dependencies:

- Adafruit CircuitPython firmware (2.2.0+) for the ESP8622 and M0-based boards: <https://github.com/adafruit/circuitpython/releases>

class `adafruit_is31fl3731.CharlieWing` (*i2c*, *address=116*)

Supports the Charlieplexed feather wing

static pixel_addr (*x*, *y*)

Calculate the offset into the device array for x,y pixel

class `adafruit_is31fl3731.Matrix` (*i2c*, *address=116*)

The Matrix class support the main function for driving the 16x9 matrix Display

Parameters

- **i2c_device** (*i2c_device*) – the connected i2c bus i2c_device
- **address** – the device address; defaults to 0x74

audio_play (*sample_rate*, *audio_gain=0*, *agc_enable=False*, *agc_fast=False*)

Controls the audio play feature

audio_sync (*value=None*)

Set the audio sync feature register

autoplay (*delay=0*, *loops=0*, *frames=0*)

Start autoplay

Parameters

- **delay** – in ms
- **loops** – number of loops - 0->7
- **frames** – number of frames: 0->7

blink (*rate=None*)

Updates the blink register

fade (*fade_in=None*, *fade_out=None*, *pause=0*)

Start and stop the fade feature. If both `fade_in` and `fade_out` are `None` (the default), the breath feature is used for fading. if `fade_in` is `None`, then `fade_in` = `fade_out`. If `fade_out` is `None`, then `fade_out` = `fade_in`

Parameters

- **fade_in** – positive number; 0->100
- **fade-out** – positive number; 0->100
- **pause** – breath register 2 pause value

fill (*color=None*, *blink=None*, *frame=None*)

Fill the display with a brightness level

Parameters

- **color** – brightness 0->255
- **blink** – True if blinking is required
- **frame** – which frame to fill 0->7

frame (*frame=None, show=True*)

Set the current frame

Parameters

- **frame** – frame number; 0-7 or None. If None function returns current frame
- **show** – True to show the frame; False to not show.

pixel (*x, y, color=None, blink=None, frame=None*)

Blink or brightness for x-, y-pixel

Parameters

- **x** – horizontal pixel position
- **y** – vertical pixel position
- **color** – brightness value 0->255
- **blink** – True to blink
- **frame** – the frame to set the pixel

static pixel_addr (*x, y*)

Calculate the offset into the device array for x,y pixel

reset ()

Kill the display for 10MS

sleep (*value*)

Set the Software Shutdown Register bit

Parameters **value** – True to set software shutdown bit; False unset

CHAPTER 6

Indices and tables

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