
Adafruit IS31FL3731 Library Documentation

Release 1.0

Radomir Dopieralski

Apr 21, 2021

Contents

1	Dependencies	3
2	Installing from PyPI	5
3	Usage Example	7
4	Contributing	9
5	Documentation	11
6	Table of Contents	13
6.1	Simple test	13
6.2	Matrix Examples	14
6.3	Pillow Examples	18
6.4	Led Shim Example	21
6.5	adafruit_is31fl3731	22
6.5.1	Implementation Notes	22
6.6	adafruit_is31fl3731.charlie_bonnet	24
6.6.1	Implementation Notes	24
6.7	adafruit_is31fl3731.charlie_wing	24
6.7.1	Implementation Notes	24
6.8	adafruit_is31fl3731.matrix	25
6.8.1	Implementation Notes	25
6.9	adafruit_is31fl3731.scroll_phat_hd	25
6.9.1	Implementation Notes	25
6.10	adafruit_is31fl3731.led_shim	26
6.10.1	Implementation Notes	26
7	Indices and tables	27
	Python Module Index	29
	Index	31

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](#)
- [Adafruit 16x8 CharliePlex LED Matrix Bonnets](#)
- [Pimoroni 17x7 Scroll pHAT HD](#)
- [Pimoroni 28x3 \(r,g,b\) Led Shim](#)
- [Pimoroni Keybow 2040 with 4x4 matrix of RGB LEDs](#)

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

Installing from PyPI

On supported GNU/Linux systems like the Raspberry Pi, you can install the driver locally [from PyPI](#). To install for current user:

```
pip3 install adafruit-circuitpython-is31fl3731
```

To install system-wide (this may be required in some cases):

```
sudo pip3 install adafruit-circuitpython-is31fl3731
```

To install in a virtual environment in your current project:

```
mkdir project-name && cd project-name
python3 -m venv .env
source .env/bin/activate
pip3 install adafruit-circuitpython-is31fl3731
```


CHAPTER 3

Usage Example

Matrix:

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

Charlie Wing:

```
from adafruit_is31fl3731.charlie_wing import CharlieWing
import board
import busio
with busio.I2C(board.SCL, board.SDA) as i2c:
    display = 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 4

Contributing

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

CHAPTER 5

Documentation

For information on building library documentation, please check out [this guide](#).

6.1 Simple test

Ensure your device works with this simple test.

Listing 1: examples/is31fl3731_simpletest.py

```
1  # SPDX-FileCopyrightText: 2021 ladyada for Adafruit Industries
2  # SPDX-License-Identifier: MIT
3
4  import board
5  import busio
6
7  # uncomment next line if you are using Feather CharlieWing LED 15 x 7
8  from adafruit_is31fl3731.charlie_wing import CharlieWing as Display
9
10 # uncomment next line if you are using Adafruit 16x9 Charlieplexed PWM LED Matrix
11 # from adafruit_is31fl3731.matrix import Matrix as Display
12 # uncomment next line if you are using Adafruit 16x8 Charlieplexed Bonnet
13 # from adafruit_is31fl3731.charlie_bonnet import CharlieBonnet as Display
14 # uncomment next line if you are using Pimoroni Scroll Phat HD LED 17 x 7
15 # from adafruit_is31fl3731.scroll_phat_hd import ScrollPhatHD as Display
16 # uncomment next line if you are using Pimoroni 11x7 LED Matrix Breakout
17 # from adafruit_is31fl3731.matrix_11x7 import Matrix11x7 as Display
18
19 # uncomment this line if you use a Pico, here with SCL=GP21 and SDA=GP20.
20 # i2c = busio.I2C(board.GP21, board.GP20)
21
22 i2c = busio.I2C(board.SCL, board.SDA)
23
24 display = Display(i2c)
25
26 # draw a box on the display
27 # first draw the top and bottom edges
```

(continues on next page)

(continued from previous page)

```

28 for x in range(display.width):
29     display.pixel(x, 0, 50)
30     display.pixel(x, display.height - 1, 50)
31 # now draw the left and right edges
32 for y in range(display.height):
33     display.pixel(0, y, 50)
34     display.pixel(display.width - 1, y, 50)

```

6.2 Matrix Examples

Other examples working on matrix display.

Listing 2: examples/is31fl3731_blink_example.py

```

1  # SPDX-FileCopyrightText: 2021 ladyada for Adafruit Industries
2  # SPDX-License-Identifier: MIT
3
4  import board
5  import busio
6
7  # uncomment next line if you are using Feather CharlieWing LED 15 x 7
8  from adafruit_is31fl3731.charlie_wing import CharlieWing as Display
9
10 # uncomment next line if you are using Adafruit 16x9 Charlieplexed PWM LED Matrix
11 # from adafruit_is31fl3731.matrix import Matrix as Display
12 # uncomment next line if you are using Adafruit 16x8 Charlieplexed Bonnet
13 # from adafruit_is31fl3731.charlie_bonnet import CharlieBonnet as Display
14 # uncomment next line if you are using Pimoroni Scroll Phat HD LED 17 x 7
15 # from adafruit_is31fl3731.scroll_phat_hd import ScrollPhatHD as Display
16 # uncomment next line if you are using Pimoroni 11x7 LED Matrix Breakout
17 # from adafruit_is31fl3731.matrix_11x7 import Matrix11x7 as Display
18
19 # uncomment this line if you use a Pico, here with SCL=GP21 and SDA=GP20.
20 # i2c = busio.I2C(board.GP21, board.GP20)
21
22 i2c = busio.I2C(board.SCL, board.SDA)
23
24 # array pattern in bits; top row-> bottom row, 8 bits in each row
25 an_arrow = bytearray((0x08, 0x0C, 0xFE, 0xFF, 0xFE, 0x0C, 0x08, 0x00, 0x00))
26
27 display = Display(i2c)
28
29 offset = (display.width - 8) // 2
30
31 # first load the frame with the arrows; moves the an_arrow to the right in each
32 # frame
33 display.sleep(True) # turn display off while updating blink bits
34 display.fill(0)
35 for y in range(display.height):
36     row = an_arrow[y]
37     for x in range(8):
38         bit = 1 << (7 - x) & row
39         if bit:
40             display.pixel(x + offset, y, 50, blink=True)

```

(continues on next page)

(continued from previous page)

```

41 display.blink(1000)  # ranges from 270 to 2159; smaller the number to faster blink
42 display.sleep(False) # turn display on
43

```

Listing 3: examples/is31fl3731_frame_example.py

```

1  # SPDX-FileCopyrightText: 2021 ladyada for Adafruit Industries
2  # SPDX-License-Identifier: MIT
3
4  import time
5  import board
6  import busio
7
8  # uncomment next line if you are using Feather CharlieWing LED 15 x 7
9  from adafruit_is31fl3731.charlie_wing import CharlieWing as Display
10
11 # uncomment next line if you are using Adafruit 16x9 Charlieplexed PWM LED Matrix
12 # from adafruit_is31fl3731.matrix import Matrix as Display
13 # uncomment next line if you are using Adafruit 16x8 Charlieplexed Bonnet
14 # from adafruit_is31fl3731.charlie_bonnet import CharlieBonnet as Display
15 # uncomment next line if you are using Pimoroni Scroll Phat HD LED 17 x 7
16 # from adafruit_is31fl3731.scroll_phat_hd import ScrollPhatHD as Display
17 # uncomment next line if you are using Pimoroni 11x7 LED Matrix Breakout
18 # from adafruit_is31fl3731.matrix_11x7 import Matrix11x7 as Display
19
20 # uncomment this line if you use a Pico, here with SCL=GP21 and SDA=GP20.
21 # i2c = busio.I2C(board.GP21, board.GP20)
22
23 i2c = busio.I2C(board.SCL, board.SDA)
24
25 # arrow pattern in bits; top row-> bottom row, 8 bits in each row
26 arrow = bytearray((0x08, 0x0C, 0xFE, 0xFF, 0xFE, 0x0C, 0x08, 0x00, 0x00))
27
28 display = Display(i2c)
29
30 # first load the frame with the arrows; moves the arrow to the right in each
31 # frame
32 display.sleep(True) # turn display off while frames are updated
33 for frame in range(display.width - 8):
34     display.frame(frame, show=False)
35     display.fill(0)
36     for y in range(display.height):
37         row = arrow[y]
38         for x in range(8):
39             bit = 1 << (7 - x) & row
40             # display the pixel into selected frame with varying intensity
41             if bit:
42                 display.pixel(x + frame, y, frame * 2 + 1)
43 display.sleep(False)
44 # now tell the display to show the frame one at time
45 while True:
46     for frame in range(8):
47         display.frame(frame)
48         time.sleep(0.1)

```

Listing 4: examples/is31fl3731_text_example.py

```

1  # SPDX-FileCopyrightText: 2021 ladyada for Adafruit Industries
2  # SPDX-License-Identifier: MIT
3
4  import board
5  import busio
6  import adafruit_framebuf
7
8  # uncomment next line if you are using Feather CharlieWing LED 15 x 7
9  # from adafruit_is31fl3731.charlie_wing import CharlieWing as Display
10 # uncomment next line if you are using Adafruit 16x9 Charlieplexed PWM LED Matrix
11 # from adafruit_is31fl3731.matrix import Matrix as Display
12 # uncomment next line if you are using Adafruit 16x8 Charlieplexed Bonnet
13 from adafruit_is31fl3731.charlie_bonnet import CharlieBonnet as Display
14
15 # uncomment next line if you are using Pimoroni Scroll Phat HD LED 17 x 7
16 # from adafruit_is31fl3731.scroll_phat_hd import ScrollPhatHD as Display
17 # uncomment next line if you are using Pimoroni 11x7 LED Matrix Breakout
18 # from adafruit_is31fl3731.matrix_11x7 import Matrix11x7 as Display
19
20 # uncomment this line if you use a Pico, here with SCL=GP21 and SDA=GP20.
21 # i2c = busio.I2C(board.GP21, board.GP20)
22
23 i2c = busio.I2C(board.SCL, board.SDA)
24
25 display = Display(i2c)
26
27 text_to_show = "Adafruit!!"
28
29 # Create a framebuffer for our display
30 buf = bytearray(32) # 2 bytes tall x 16 wide = 32 bytes (9 bits is 2 bytes)
31 fb = adafruit_framebuf.FrameBuffer(
32     buf, display.width, display.height, adafruit_framebuf.MVLSB
33 )
34
35
36 frame = 0 # start with frame 0
37 while True:
38     for i in range(len(text_to_show) * 9):
39         fb.fill(0)
40         fb.text(text_to_show, -i + display.width, 0, color=1)
41
42         # to improve the display flicker we can use two frame
43         # fill the next frame with scrolling text, then
44         # show it.
45         display.frame(frame, show=False)
46         # turn all LEDs off
47         display.fill(0)
48         for x in range(display.width):
49             # using the FrameBuffer text result
50             bite = buf[x]
51             for y in range(display.height):
52                 bit = 1 << y & bite
53                 # if bit > 0 then set the pixel brightness
54                 if bit:
55                     display.pixel(x, y, 50)

```

(continues on next page)

(continued from previous page)

```

56
57     # now that the frame is filled, show it.
58     display.frame(frame, show=True)
59     frame = 0 if frame else 1

```

Listing 5: examples/is31fl3731_wave_example.py

```

1  # SPDX-FileCopyrightText: 2021 ladyada for Adafruit Industries
2  # SPDX-License-Identifier: MIT
3
4  import board
5  import busio
6
7  # uncomment next line if you are using Feather CharlieWing LED 15 x 7
8  from adafruit_is31fl3731.charlie_wing import CharlieWing as Display
9
10 # uncomment next line if you are using Adafruit 16x9 Charlieplexed PWM LED Matrix
11 # from adafruit_is31fl3731.matrix import Matrix as Display
12 # uncomment next line if you are using Adafruit 16x8 Charlieplexed Bonnet
13 # from adafruit_is31fl3731.charlie_bonnet import CharlieBonnet as Display
14 # uncomment next line if you are using Pimoroni Scroll Phat HD LED 17 x 7
15 # from adafruit_is31fl3731.scroll_phat_hd import ScrollPhatHD as Display
16 # uncomment next line if you are using Pimoroni 11x7 LED Matrix Breakout
17 # from adafruit_is31fl3731.matrix_11x7 import Matrix11x7 as Display
18
19 # uncomment this line if you use a Pico, here with SCL=GP21 and SDA=GP20.
20 # i2c = busio.I2C(board.GP21, board.GP20)
21
22 i2c = busio.I2C(board.SCL, board.SDA)
23
24 # fmt: off
25 sweep = [ 1, 2, 3, 4, 6, 8, 10, 15, 20, 30, 40, 60,
26           60, 40, 30, 20, 15, 10, 8, 6, 4, 3, 2, 1, ]
27 # fmt: on
28
29 frame = 0
30
31 display = Display(i2c)
32
33 while True:
34     for incr in range(24):
35         # to reduce update flicker, use two frames
36         # make a frame active, don't show it yet
37         display.frame(frame, show=False)
38         # fill the display with the next frame
39         for x in range(display.width):
40             for y in range(display.height):
41                 display.pixel(x, y, sweep[(x + y + incr) % 24])
42         # show the next frame
43         display.frame(frame, show=True)
44         if frame:
45             frame = 0
46         else:
47             frame = 1

```

6.3 Pillow Examples

Examples that utilize the Python Imaging Library (Pillow) for use on (Linux) computers that are using CPython with Adafruit Blinka to support CircuitPython libraries. CircuitPython does not support PIL/pillow (python imaging library)!

Listing 6: examples/is31fl3731_pillow_animated_gif.py

```

1  # SPDX-FileCopyrightText: 2021 ladyada for Adafruit Industries
2  # SPDX-License-Identifier: MIT
3
4  """
5  Example to extract the frames and other parameters from an animated gif
6  and then run the animation on the display.
7
8  Usage:
9  python3 is31fl3731_pillow_animated_gif.py animated.gif
10
11  This example is for use on (Linux) computers that are using CPython with
12  Adafruit Blinka to support CircuitPython libraries. CircuitPython does
13  not support PIL/pillow (python imaging library)!
14
15  Author(s): Melissa LeBlanc-Williams for Adafruit Industries
16  """
17
18  import sys
19  import board
20  from PIL import Image
21
22  # uncomment next line if you are using Adafruit 16x9 Charlieplexed PWM LED Matrix
23  # from adafruit_is31fl3731.matrix import Matrix as Display
24  # uncomment next line if you are using Adafruit 16x8 Charlieplexed Bonnet
25  from adafruit_is31fl3731.charlie_bonnet import CharlieBonnet as Display
26
27  # uncomment next line if you are using Pimoroni Scroll Phat HD LED 17 x 7
28  # from adafruit_is31fl3731.scroll_phat_hd import ScrollPhatHD as Display
29
30  i2c = board.I2C()
31
32  display = Display(i2c)
33
34
35  # Open the gif
36  if len(sys.argv) < 2:
37      print("No image file specified")
38      print("Usage: python3 is31fl3731_pillow_animated_gif.py animated.gif")
39      sys.exit()
40
41  image = Image.open(sys.argv[1])
42
43  # Make sure it's animated
44  if not image.is_animated:
45      print("Specified image is not animated")
46      sys.exit()
47
48  # Get the autoplay information from the gif
49  delay = image.info["duration"]

```

(continues on next page)

(continued from previous page)

```

50
51 # Figure out the correct loop count
52 if "loop" in image.info:
53     loops = image.info["loop"]
54     if loops > 0:
55         loops += 1
56 else:
57     loops = 1
58
59 # IS31FL3731 only supports 0-7
60 if loops > 7:
61     loops = 7
62
63 # Get the frame count (maximum 8 frames)
64 frame_count = image.n_frames
65 if frame_count > 8:
66     frame_count = 8
67
68 # Load each frame of the gif onto the Matrix
69 for frame in range(frame_count):
70     image.seek(frame)
71     frame_image = Image.new("L", (display.width, display.height))
72     frame_image.paste(
73         image.convert("L"),
74         (
75             display.width // 2 - image.width // 2,
76             display.height // 2 - image.height // 2,
77         ),
78     )
79     display.image(frame_image, frame=frame)
80
81 display.autoplay(delay=delay, loops=loops)

```

Listing 7: examples/is31fl3731_pillow_marquee.py

```

1 # SPDX-FileCopyrightText: 2021 ladyada for Adafruit Industries
2 # SPDX-License-Identifier: MIT
3
4 """
5 Example to scroll some text as a marquee
6
7 This example is for use on (Linux) computers that are using CPython with
8 Adafruit Blinka to support CircuitPython libraries. CircuitPython does
9 not support PIL/pillow (python imaging library)!
10
11 Author(s): Melissa LeBlanc-Williams for Adafruit Industries
12 """
13
14 import board
15 from PIL import Image, ImageDraw, ImageFont
16
17 # uncomment next line if you are using Adafruit 16x9 Charlieplexed PWM LED Matrix
18 # from adafruit_is31fl3731.matrix import Matrix as Display
19 # uncomment next line if you are using Adafruit 16x8 Charlieplexed Bonnet
20 from adafruit_is31fl3731.charlie_bonnet import CharlieBonnet as Display
21

```

(continues on next page)

(continued from previous page)

```

22 # uncomment next line if you are using Pimoroni Scroll Phat HD LED 17 x 7
23 # from adafruit_is31fl3731.scroll_phat_hd import ScrollPhatHD as Display
24
25 SCROLLING_TEXT = "You can display a personal message here..."
26 BRIGHTNESS = 64 # Brightness can be between 0-255
27
28 i2c = board.I2C()
29
30 display = Display(i2c)
31
32 # Load a font
33 font = ImageFont.truetype("/usr/share/fonts/truetype/dejavu/DejaVuSans.ttf", 8)
34
35 # Create an image that contains the text
36 text_width, text_height = font.getsize(SCROLLING_TEXT)
37 text_image = Image.new("L", (text_width, text_height))
38 text_draw = ImageDraw.Draw(text_image)
39 text_draw.text((0, 0), SCROLLING_TEXT, font=font, fill=BRIGHTNESS)
40
41 # Create an image for the display
42 image = Image.new("L", (display.width, display.height))
43 draw = ImageDraw.Draw(image)
44
45 # Load the text in each frame
46 while True:
47     for x in range(text_width + display.width):
48         draw.rectangle((0, 0, display.width, display.height), outline=0, fill=0)
49         image.paste(
50             text_image, (display.width - x, display.height // 2 - text_height // 2 -
51 ↪ 1)
52             )
53         display.image(image)

```

Listing 8: examples/is31fl3731_pillow_numbers.py

```

1 # SPDX-FileCopyrightText: 2021 ladyada for Adafruit Industries
2 # SPDX-License-Identifier: MIT
3
4 """
5 Example to utilize the Python Imaging Library (Pillow) and draw bitmapped text
6 to 8 frames and then run autoplay on those frames.
7
8 This example is for use on (Linux) computers that are using CPython with
9 Adafruit Blinka to support CircuitPython libraries. CircuitPython does
10 not support PIL/pillow (python imaging library)!
11
12 Author(s): Melissa LeBlanc-Williams for Adafruit Industries
13 """
14
15 import board
16 from PIL import Image, ImageDraw, ImageFont
17
18 # uncomment next line if you are using Adafruit 16x9 Charlieplexed PWM LED Matrix
19 # from adafruit_is31fl3731.matrix import Matrix as Display
20 # uncomment next line if you are using Adafruit 16x8 Charlieplexed Bonnet
21 from adafruit_is31fl3731.charlie_bonnet import CharlieBonnet as Display

```

(continues on next page)

(continued from previous page)

```

22
23 # uncomment next line if you are using Pimoroni Scroll Phat HD LED 17 x 7
24 # from adafruit_is31fl3731.scroll_phat_hd import ScrollPhatHD as Display
25
26 BRIGHTNESS = 32 # Brightness can be between 0-255
27
28 i2c = board.I2C()
29
30 display = Display(i2c)
31
32 display.fill(0)
33
34 # 256 Color Grayscale Mode
35 image = Image.new("L", (display.width, display.height))
36 draw = ImageDraw.Draw(image)
37
38 # Load a font in 2 different sizes.
39 font = ImageFont.truetype("/usr/share/fonts/truetype/dejavu/DejaVuSans.ttf", 10)
40
41 # Load the text in each frame
42 for x in range(8):
43     draw.rectangle((0, 0, display.width, display.height), outline=0, fill=0)
44     draw.text((x + 1, -2), str(x + 1), font=font, fill=BRIGHTNESS)
45     display.image(image, frame=x)
46
47 display.autoplay(delay=500)

```

6.4 Led Shim Example

Example that work on the RGB Led Shim.

Listing 9: examples/is31fl3731_ledshim_rainbow.py

```

1 # SPDX-FileCopyrightText: 2021 ladyada for Adafruit Industries
2 # SPDX-License-Identifier: MIT
3
4 import time
5 import board
6 import busio
7 from adafruit_is31fl3731.led_shim import LedShim as Display
8
9 i2c = busio.I2C(board.SCL, board.SDA)
10
11 # initial display if you are using Pimoroni LED SHIM
12 display = Display(i2c)
13
14 # fmt: off
15 # This list 28 colors from a rainbow...
16 rainbow = [
17     (255, 0, 0), (255, 54, 0), (255, 109, 0), (255, 163, 0),
18     (255, 218, 0), (236, 255, 0), (182, 255, 0), (127, 255, 0),
19     (72, 255, 0), (18, 255, 0), (0, 255, 36), (0, 255, 91),
20     (0, 255, 145), (0, 255, 200), (0, 255, 255), (0, 200, 255),
21     (0, 145, 255), (0, 91, 255), (0, 36, 255), (18, 0, 255),

```

(continues on next page)

(continued from previous page)

```

22     (72, 0, 255), (127, 0, 255), (182, 0, 255), (236, 0, 255),
23     (255, 0, 218), (255, 0, 163), (255, 0, 109), (255, 0, 54),
24 ]
25 # fmt: on
26
27
28 for y in range(3):
29     for x in range(28):
30         display.pixel(x, y, 255)
31         time.sleep(0.1)
32         display.pixel(x, y, 0)
33
34 while True:
35     for offset in range(28):
36         for x in range(28):
37             r, g, b = rainbow[(x + offset) % 28]
38             display.pixelrgb(x, r, g, b)

```

6.5 adafruit_is31fl3731

CircuitPython driver for the IS31FL3731 charlieplex IC.

Base library.

- Author(s): Tony DiCola, Melissa LeBlanc-Williams, David Glaude

6.5.1 Implementation Notes

Hardware:

- Adafruit 16x9 Charlieplexed PWM LED Matrix Driver - IS31FL3731
- Adafruit 15x7 CharliePlex LED Matrix Display FeatherWings
- Adafruit 16x8 CharliePlex LED Matrix Bonnets
- Pimoroni 17x7 Scroll pHAT HD
- Pimoroni 28x3 (r,g,b) Led Shim
- Pimoroni LED SHIM
- Pimoroni Keybow 2040
- Pimoroni 11x7 LED Matrix Breakout

Software and Dependencies:

- Adafruit CircuitPython firmware for the supported boards: <https://github.com/adafruit/circuitpython/releases>

class `adafruit_is31fl3731.IS31FL3731` (*i2c*, *address=116*)

The IS31FL3731 is an abstract class contain the main function related to this chip. Each board needs to define width, height and pixel_addr.

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.

image (*img, blink=None, frame=None*)

Set buffer to value of Python Imaging Library image. The image should be in 8-bit mode (L) and a size equal to the display size.

Parameters

- **img** – Python Imaging Library image
- **blink** – True to blink
- **frame** – the frame to set the image

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

6.6 adafruit_is31fl3731.charlie_bonnet

CircuitPython driver for the IS31FL3731 charlieplex IC.

- Author(s): Tony DiCola, Melissa LeBlanc-Williams

6.6.1 Implementation Notes

Hardware:

- [Adafruit 16x8 CharliePlex LED Matrix Bonnets](#)

Software and Dependencies:

- Adafruit CircuitPython firmware for the supported boards: <https://github.com/adafruit/circuitpython/releases>

class adafruit_is31fl3731.charlie_bonnet.**CharlieBonnet** (*i2c*, *address=116*)

Supports the Charlieplexed bonnet

static pixel_addr (*x*, *y*)

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

6.7 adafruit_is31fl3731.charlie_wing

CircuitPython driver for the IS31FL3731 charlieplex IC.

- Author(s): Tony DiCola, Melissa LeBlanc-Williams

6.7.1 Implementation Notes

Hardware:

- [Adafruit 15x7 CharliePlex LED Matrix Display FeatherWings](#)

Software and Dependencies:

- Adafruit CircuitPython firmware for the supported boards: <https://github.com/adafruit/circuitpython/releases>

```
class adafruit_is31fl3731.charlie_wing.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
```

6.8 adafruit_is31fl3731.matrix

CircuitPython driver for the IS31FL3731 charlieplex IC.

- Author(s): Tony DiCola, Melissa LeBlanc-Williams

6.8.1 Implementation Notes

Hardware:

- [Adafruit 16x9 Charlieplexed PWM LED Matrix Driver - IS31FL3731](#)

Software and Dependencies:

- Adafruit CircuitPython firmware for the supported boards: <https://github.com/adafruit/circuitpython/releases>

```
class adafruit_is31fl3731.matrix.Matrix (i2c, address=116)
    Supports the Charlieplexed feather wing

    static pixel_addr (x, y)
        Calculate the offset into the device array for x,y pixel
```

6.9 adafruit_is31fl3731.scroll_phat_hd

CircuitPython driver for the Pimoroni 17x7 Scroll pHAT HD.

- Author: David Glaude

6.9.1 Implementation Notes

Hardware:

- [Pimoroni 17x7 Scroll pHAT HD](#)

Software and Dependencies:

- Adafruit CircuitPython firmware for the supported boards: <https://github.com/adafruit/circuitpython/releases>

```
class adafruit_is31fl3731.scroll_phat_hd.ScrollPhatHD (i2c, address=116)
    Supports the Scroll pHAT HD by Pimoroni

    static pixel_addr (x, y)
        Translate an x,y coordinate to a pixel index.
```

6.10 adafruit_is31fl3731.led_shim

CircuitPython driver for the IS31FL3731 charlieplex IC.

- Author: David Glaude

6.10.1 Implementation Notes

Hardware:

- [Pimoroni 28 RGB Led Shim](#)

Software and Dependencies:

- Adafruit CircuitPython firmware for the supported boards: <https://github.com/adafruit/circuitpython/releases>

class `adafruit_is31fl3731.led_shim.LedShim` (*i2c*, *address=117*)

Supports the LED SHIM by Pimoroni

static pixel_addr (*x*, *y*)

Translate an x,y coordinate to a pixel index.

pixelrgb (*x*, *r*, *g*, *b*, *blink=None*, *frame=None*)

Blink or brightness for x-pixel

Parameters

- **x** – horizontal pixel position
- **r** – red brightness value 0->255
- **g** – green brightness value 0->255
- **b** – blue brightness value 0->255
- **blink** – True to blink
- **frame** – the frame to set the pixel

CHAPTER 7

Indices and tables

- `genindex`
- `modindex`
- `search`

a

`adafruit_is31fl3731`, [22](#)
`adafruit_is31fl3731.charlie_bonnet`, [24](#)
`adafruit_is31fl3731.charlie_wing`, [24](#)
`adafruit_is31fl3731.led_shim`, [25](#)
`adafruit_is31fl3731.matrix`, [25](#)
`adafruit_is31fl3731.scroll_phat_hd`, [25](#)

A

adafruit_is31fl3731 (*module*), 22
adafruit_is31fl3731.charlie_bonnet (*module*), 24
adafruit_is31fl3731.charlie_wing (*module*), 24
adafruit_is31fl3731.led_shim (*module*), 25
adafruit_is31fl3731.matrix (*module*), 25
adafruit_is31fl3731.scroll_phat_hd (*module*), 25
audio_play() (*adafruit_is31fl3731.IS31FL3731 method*), 22
audio_sync() (*adafruit_is31fl3731.IS31FL3731 method*), 23
autoplay() (*adafruit_is31fl3731.IS31FL3731 method*), 23

B

blink() (*adafruit_is31fl3731.IS31FL3731 method*), 23

C

CharlieBonnet (*class* *adafruit_is31fl3731.charlie_bonnet*), 24
CharlieWing (*class* *adafruit_is31fl3731.charlie_wing*), 24

F

fade() (*adafruit_is31fl3731.IS31FL3731 method*), 23
fill() (*adafruit_is31fl3731.IS31FL3731 method*), 23
frame() (*adafruit_is31fl3731.IS31FL3731 method*), 23

I

image() (*adafruit_is31fl3731.IS31FL3731 method*), 23
IS31FL3731 (*class in adafruit_is31fl3731*), 22

L

LedShim (*class in adafruit_is31fl3731.led_shim*), 26

M

Matrix (*class in adafruit_is31fl3731.matrix*), 25

P

pixel() (*adafruit_is31fl3731.IS31FL3731 method*), 23
pixel_addr() (*adafruit_is31fl3731.charlie_bonnet.CharlieBonnet static method*), 24
pixel_addr() (*adafruit_is31fl3731.charlie_wing.CharlieWing static method*), 25
pixel_addr() (*adafruit_is31fl3731.IS31FL3731 static method*), 24
pixel_addr() (*adafruit_is31fl3731.led_shim.LedShim static method*), 26
pixel_addr() (*adafruit_is31fl3731.matrix.Matrix static method*), 25
pixel_addr() (*adafruit_is31fl3731.scroll_phat_hd.ScrollPhatHD static method*), 25
pixelrgb() (*adafruit_is31fl3731.led_shim.LedShim method*), 26

R

in reset() (*adafruit_is31fl3731.IS31FL3731 method*), 24

S

ScrollPhatHD (*class* *adafruit_is31fl3731.scroll_phat_hd*), 25
sleep() (*adafruit_is31fl3731.IS31FL3731 method*), 24