
Adafruit MPR121 Library Documentation

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Adafruit CircuitPython module for the MPR121 capacitive touch breakout board.

CHAPTER 1

Dependencies

This driver depends on:

- [Adafruit CircuitPython](#)
- [Bus Device](#)

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-mpu121
```

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

```
sudo pip3 install adafruit-circuitpython-mpu121
```

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-mpu121
```


CHAPTER 3

Usage Example

See usage in the `examples/mpr121_simpletest.py` file.

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/mpr121_simpletest.py

```
1  # Simple test of the MPR121 capacitive touch sensor library.
2  # Will print out a message when any of the 12 capacitive touch inputs of the
3  # board are touched. Open the serial REPL after running to see the output.
4  # Author: Tony DiCola
5  import time
6  import board
7  import busio
8
9  # Import MPR121 module.
10 import adafruit_mpr121
11
12 # Create I2C bus.
13 i2c = busio.I2C(board.SCL, board.SDA)
14
15 # Create MPR121 object.
16 mpr121 = adafruit_mpr121.MPR121(i2c)
17
18 # Note you can optionally change the address of the device:
19 # mpr121 = adafruit_mpr121.MPR121(i2c, address=0x91)
20
21 # Loop forever testing each input and printing when they're touched.
22 while True:
23     # Loop through all 12 inputs (0-11).
24     for i in range(12):
25         # Call is_touched and pass it then number of the input. If it's touched
26         # it will return True, otherwise it will return False.
27         if mpr121[i].value:
```

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```
28     print("Input {} touched!".format(i))
29     time.sleep(0.25)  # Small delay to keep from spamming output messages.
```

Listing 2: examples/mpr121_piano.py

```
1  # MPR121 piano demo.
2  # Listens to the first 7 inputs of the MPR121 and plays a middle scale note
3  # when an input is touched. Note only one note is played at a time!
4  # For use with microcontrollers or computers with PWM support only!
5  # Author: Tony DiCola
6  # Modified by: Carter Nelson
7
8  import board
9  import busio
10 import pulseio
11
12 # Import MPR121 module.
13 import adafruit_mpr121
14
15
16 # Configure PWM buzzer and other state:
17 BUZZER_PIN = board.D9
18 TONE_ON_DUTY = 2 ** 15  # Duty cycle of tone when turned on, a square wave.
19 TONE_OFF_DUTY = 0  # Duty cycle of tone when turned off, 0 or no signal.
20 NOTE_FREQS = [
21     261,  # Input 0 = 261 hz = middle C
22     294,  # Input 1 = middle D
23     329,  # Input 2 = middle E
24     349,  # Input 3 = middle F
25     392,  # Input 4 = middle G
26     440,  # Input 5 = middle A
27     493,  # Input 6 = middle B
28     0,    # Input 7 = nothing (set to a frequency in hertz!)
29     0,    # Input 8
30     0,    # Input 9
31     0,    # Input 10
32     0,
33 ]  # Input 11
34
35
36 # Create I2C bus.
37 i2c = busio.I2C(board.SCL, board.SDA)
38
39 # Create MPR121 class.
40 mpr121 = adafruit_mpr121.MPR121(i2c)
41 # Note you can optionally change the address of the device:
42 # mpr121 = adafruit_mpr121.MPR121(i2c, address=0x91)
43
44 # pylint: disable-msg=no-member
45 # Setup buzzer PWM output.
46 buzzer = pulseio.PWMOut(
47     BUZZER_PIN, duty_cycle=TONE_OFF_DUTY, frequency=440, variable_frequency=True
48 )
49 # pylint: disable-msg=no-member
50
51 last_note = None
```

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```

52 while True:
53     # Get touched state for all pins
54     touched = mpr121.touched_pins
55     # If no pins are touched, be quiet
56     if True not in touched:
57         last_note = None
58         buzzer.duty_cycle = TONE_OFF_DUTY
59         continue
60     # Get index of touched pin
61     note = touched.index(True)
62     # Play note if pin is different and has a defined note
63     if note != last_note and NOTE_FREQS[note] != 0:
64         last_note = note
65         buzzer.frequency = NOTE_FREQS[note]
66         buzzer.duty_cycle = TONE_ON_DUTY

```

6.2 adafruit_mpr121

CircuitPython driver for the MPR121 capacitive touch breakout board.

See usage in the examples/simpletest.py file.

- Author(s): Tony DiCola

6.2.1 Implementation Notes

Hardware:

- Adafruit 12-Key Capacitive Touch Sensor Breakout - MPR121 (Product ID: 1982)
- Adafruit 12 x Capacitive Touch Shield for Arduino - MPR121 (Product ID: 2024)

Software and Dependencies:

- Adafruit CircuitPython firmware for the ESP8622 and M0-based boards: <https://github.com/adafruit/circuitpython/releases>
- Adafruit's Bus Device library: https://github.com/adafruit/Adafruit_CircuitPython_BusDevice

class adafruit_mpr121.MPR121(*i2c*, *address=90*)

Driver for the MPR121 capacitive touch breakout board.

baseline_data(*pin*)

Return baseline data register value for the provided pin (0-11). Useful for debugging.

filtered_data(*pin*)

Return filtered data register value for the provided pin (0-11). Useful for debugging.

is_touched(*pin*)

Return True if the specified pin is being touched, otherwise returns False.

reset()

Reset the MPR121 into a default state ready to detect touch inputs.

touched()

Return touch state of all pins as a 12-bit value where each bit represents a pin, with a value of 1 being touched and 0 not being touched.

touched_pins

A tuple of touched state for all pins.

class adafruit_mpr121.**MPR121_Channel** (*mpr121, channel*)

Helper class to represent a touch channel on the MPR121. Not meant to be used directly.

raw_value

The raw touch measurement.

release_threshold

The release threshold.

threshold

The touch threshold.

value

Whether the touch pad is being touched or not.

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