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# **AdafruitVCNL4010 Library Documentation**

***Release 1.0***

**Tony DiCola**

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CircuitPython module for the VCNL4010 proximity and light sensor.



# CHAPTER 1

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## Dependencies

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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

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### Installing from PyPI

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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-vcnl4010
```

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

```
sudo pip3 install adafruit-circuitpython-vcnl4010
```

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-vcnl4010
```



## CHAPTER 3

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### Usage Example

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See `examples/vcnl4010_simpletest.py` for an example of the usage.



## CHAPTER 4

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### Contributing

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



## CHAPTER 5

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### Documentation

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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/vcnl4010\_simpletest.py

```
1  # Simple demo of the VCNL4010 proximity and light sensor.
2  # Will print the proximity and ambient light every second.
3  # Author: Tony DiCola
4  import time
5
6  import board
7  import busio
8
9  import adafruit_vcnl4010
10
11
12  # Initialize I2C bus and VCNL4010 module.
13  i2c = busio.I2C(board.SCL, board.SDA)
14  sensor = adafruit_vcnl4010.VCNL4010(i2c)
15
16  # You can optionally adjust the sensor LED current. The default is 200mA
17  # which is the maximum value. Note this is only set in 10mA increments.
18  # sensor.led_current_mA = 120 # Set 120 mA LED current
19
20  # You can also adjust the measurement frequency for the sensor. The default
21  # is 390.625 khz, but these values are possible to set too:
22  # - FREQUENCY_3M125: 3.125 Mhz
23  # - FREQUENCY_1M5625: 1.5625 Mhz
24  # - FREQUENCY_781K25: 781.25 Khz
25  # - FREQUENCY_390K625: 390.625 Khz (default)
26  # sensor.frequency = adafruit_vcnl4010.FREQUENCY_3M125 # 3.125 Mhz
27
```

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```
28 # Main loop runs forever printing the proximity and light level.
29 while True:
30     proximity = sensor.proximity # Proximity has no units and is a 16-bit
31     # value. The LOWER the value the further
32     # an object from the sensor (up to ~200mm).
33     print("Proximity: {}".format(proximity))
34     ambient_lux = sensor.ambient_lux
35     print("Ambient light: {} lux".format(ambient_lux))
36     time.sleep(1.0)
```

## 6.2 adafruit\_vcnl4010

CircuitPython module for the VCNL4010 proximity and light sensor. See `examples/vcnl4010_simpletest.py` for an example of the usage.

- Author(s): Tony DiCola

### 6.2.1 Implementation Notes

#### Hardware:

- Adafruit [VCNL4010 Proximity/Light sensor breakout](#) (Product ID: 466)

#### 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](https://github.com/adafruit/Adafruit_CircuitPython_BusDevice)

**class** `adafruit_vcnl4010.VCNL4010` (*i2c*, *address=19*)

Vishay VCNL4010 proximity and ambient light sensor.

#### **ambient**

The detected ambient light in front of the sensor. This is a unit-less unsigned 16-bit value (0-65535) with higher values for more detected light. See the `ambient_lux` property for a value in lux.

#### **ambient\_lux**

The detected ambient light in front of the sensor as a value in lux.

#### **frequency**

The frequency of proximity measurements. Must be a value of:

- `FREQUENCY_3M125`: 3.125 Mhz
- `FREQUENCY_1M5625`: 1.5625 Mhz
- `FREQUENCY_781K25`: 781.25 Khz
- `FREQUENCY_390K625`: 390.625 Khz (default)

See the datasheet for how frequency changes the proximity detection accuracy.

#### **led\_current**

The current of the LED. The value is in units of 10mA and can only be set to 0 (0mA/off) to 20 (200mA). See the datasheet for how LED current impacts proximity measurements. The default is 200mA.

**led\_current\_mA**

The current of the LED in milli-amps. The value here is specified in a milliamps from 0-200. Note that this value will be quantized down to a smaller less-accurate value as the chip only supports current changes in 10mA increments, i.e. a value of 123 mA will actually use 120 mA. See the datasheet for how the LED current impacts proximity measurements, and the `led_current` property to explicitly set values without quantization or unit conversion.

**proximity**

The detected proximity of an object in front of the sensor. This is a unit-less unsigned 16-bit value (0-65535) INVERSELY proportional to the distance of an object in front of the sensor (up to a max of ~200mm). For example a value of 10 is an object farther away than a value of 1000. Note there is no conversion from this value to absolute distance possible, you can only make relative comparisons.



## CHAPTER 7

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### Indices and tables

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