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# **AdafruitVCNL4010 Library Documentation**

***Release 1.0***

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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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### Usage Example

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



## CHAPTER 3

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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 4

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### Building locally

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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-vcn14010 --
↳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/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: {0}'.format(proximity))
34     ambient_lux = sensor.ambient_lux
35     print('Ambient light: {0} lux'.format(ambient_lux))
36     time.sleep(1.0)
```

## 5.2 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

### 5.2.1 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 6

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### Indices and tables

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



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### A

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