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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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### 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/vcml4010_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  # SPDX-FileCopyrightText: 2017 Tony DiCola for Adafruit Industries
2  # SPDX-License-Identifier: MIT
3
4  # Simple demo of the VCNL4010 proximity and light sensor.
5  # Will print the proximity and ambient light every second.
6  import time
7  import board
8  import adafruit_vcnl4010
9
10
11 i2c = board.I2C()
12 sensor = adafruit_vcnl4010.VCNL4010(i2c)
13
14 # You can optionally adjust the sensor LED current. The default is 200mA
15 # which is the maximum value. Note this is only set in 10mA increments.
16 # sensor.led_current_mA = 120 # Set 120 mA LED current
17
18 # You can also adjust the measurement frequency for the sensor. The default
19 # is 390.625 khz, but these values are possible to set too:
20 # - FREQUENCY_3M125: 3.125 Mhz
21 # - FREQUENCY_1M5625: 1.5625 Mhz
22 # - FREQUENCY_781K25: 781.25 Khz
23 # - FREQUENCY_390K625: 390.625 Khz (default)
24 # sensor.frequency = adafruit_vcnl4010.FREQUENCY_3M125 # 3.125 Mhz
25
26 # Main loop runs forever printing the proximity and light level.
27 while True:
```

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```

28 proximity = sensor.proximity # Proximity has no units and is a 16-bit
29 # value. The LOWER the value the further
30 # an object from the sensor (up to ~200mm).
31 print("Proximity: {}".format(proximity))
32 ambient_lux = sensor.ambient_lux
33 print("Ambient light: {} lux".format(ambient_lux))
34 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 supported boards: <https://circuitpython.org/downloads>
- 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.

#### Parameters

- **i2c** (*I2C*) – The I2C bus the VCNL4010 is connected to
- **address** (*int*) – (optional) The I2C address of the device. Defaults to 0x13

#### Quickstart: Importing and using the VCNL4010

Here is an example of using the `VCNL4010` class. First you will need to import the libraries to use the sensor

```

import board
import adafruit_vcnl4010

```

Once this is done you can define your `board.I2C` object and define your sensor object

```

i2c = board.I2C() # uses board.SCL and board.SDA
sensor = adafruit_vcnl4010.VCNL4010(i2c)

```

Now you have access to the `sensor.proximity` and `ambient_lux` attributes

```

proximity = sensor.proximity
ambient_lux = sensor.ambient_lux

```

#### 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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