AdafruitVCNL4010 Library Documentation

Release 1.0

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Contents

CircuitPython module for the VCNL4010 proximity and light sensor.

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

Usage Example

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

CHAPTER 3

Contributing

Contributions are welcome! Please read our Code of Conduct before contributing to help this project stay welcoming.

CHAPTER 4

Building locally

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-vcnl4010 --
↪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.

CHAPTER 5

Table of Contents

5.1 Simple test

Ensure your device works with this simple test.

Listing 1: examples/vcnl4010_simpletest.py

```
# Simple demo of the VCNL4010 proximity and light sensor.
# Will print the proximity and ambient light every second.
# Author: Tony DiCola
import time

import board
import busio

import adafruit_vcnl4010


# Initialize I2C bus and VCNL4010 module.
i2c = busio.I2C(board.SCL, board.SDA)
sensor = adafruit_vcnl4010.VCNL4010(i2c)

# You can optionally adjust the sensor LED current.  The default is 200mA
# which is the maximum value.  Note this is only set in 10mA increments.
#sensor.led_current_mA = 120  # Set 120 mA LED current

# You can also adjust the measurement frequency for the sensor.  The default
# is 390.625 khz, but these values are possible to set too:
# - FREQUENCY_3M125: 3.125 Mhz
# - FREQUENCY_1M5625: 1.5625 Mhz
# - FREQUENCY_781K25: 781.25 Khz
# - FREQUENCY_390K625: 390.625 Khz (default)
#sensor.frequency = adafruit_vcnl4010.FREQUENCY_3M125  # 3.125 Mhz

```

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```
# Main loop runs forever printing the proximity and light level.
while True:
    proximity = sensor.proximity  # Proximity has no units and is a 16-bit
                                  # value.  The LOWER the value the further
                                  # an object from the sensor (up to ~200mm).
    print('Proximity: {0}'.format(proximity))
    ambient_lux = sensor.ambient_lux
    print('Ambient light: {0} lux'.format(ambient_lux))
    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

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 quanitization 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

Indices and tables

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- modindex
- search

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