# AdafruitVL6180X Library Documentation

***Release 1.0***

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# Contents

CircuitPython module for the VL6180X distance sensor. See examples/vl6180x_simpletest.py for a demo of the usage.

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/vl6180x_simpletest.py for a demo 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-vl6180x --
↪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.

## 4.2 Sphinx documentation

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# CHAPTER 5

# Table of Contents

## 5.1 Simple test

Ensure your device works with this simple test.

Listing 1: examples/vl6180x_simpletest.py

```
# Demo of reading the range and lux from the VL6180x distance sensor and
# printing it every second.
# Author: Tony DiCola
import time

import board
import busio

import adafruit_vl6180x


# Create I2C bus.
i2c = busio.I2C(board.SCL, board.SDA)

# Create sensor instance.
sensor = adafruit_vl6180x.VL6180X(i2c)

# Main loop prints the range and lux every second:
while True:
    # Read the range in millimeters and print it.
    range_mm = sensor.range
    print('Range: {0}mm'.format(range_mm))
    # Read the light, note this requires specifying a gain value:
    # - adafruit_vl6180x.ALS_GAIN_1 = 1x
    # - adafruit_vl6180x.ALS_GAIN_1_25 = 1.25x
    # - adafruit_vl6180x.ALS_GAIN_1_67 = 1.67x
    # - adafruit_vl6180x.ALS_GAIN_2_5 = 2.5x
```

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```
    # - adafruit_vl6180x.ALS_GAIN_5 = 5x
    # - adafruit_vl6180x.ALS_GAIN_10 = 10x
    # - adafruit_vl6180x.ALS_GAIN_20 = 20x
    # - adafruit_vl6180x.ALS_GAIN_40 = 40x
    light_lux = sensor.read_lux(adafruit_vl6180x.ALS_GAIN_1)
    print('Light (1x gain): {0}lux'.format(light_lux))
    # Delay for a second.
    time.sleep(1.0)
```

## 5.2 adafruit_vl6180x

CircuitPython module for the VL6180X distance sensor. See examples/simpletest.py for a demo of the usage.

- Author(s): Tony DiCola

### 5.2.1 Implementation Notes

**Hardware:**

- Adafruit VL6180X Time of Flight Distance Ranging Sensor (VL6180) (Product ID: 3316)

**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_vl6180x.**VL6180X**(*i2c*, *address=41*)

Create an instance of the VL6180X distance sensor. You must pass in the following parameters:

**Parameters** **i2c** – An instance of the I2C bus connected to the sensor.

Optionally you can specify:

**Parameters** **address** – The I2C address of the sensor. If not specified the sensor's default value will be assumed.

**range**

Read the range of an object in front of sensor and return it in mm.

**range_status**

Retrieve the status/error from a previous range read. This will return a constant value such as:

- ERROR_NONE - No error
- ERROR_SYSERR_1 - System error 1 (see datasheet)
- ERROR_SYSERR_5 - System error 5 (see datasheet)
- ERROR_ECEFAIL - ECE failure
- ERROR_NOCONVERGE - No convergence
- ERROR_RANGEIGNORE - Outside range ignored
- ERROR_SNR - Too much noise
- ERROR_RAWUFLOW - Raw value underflow

- ERROR_RAWOFLOW - Raw value overflow
- ERROR_RANGEUFLOW - Range underflow
- ERROR_RANGEOFLOW - Range overflow

**read_lux**(*gain*)

Read the lux (light value) from the sensor and return it. Must specify the gain value to use for the lux reading: - ALS_GAIN_1 = 1x - ALS_GAIN_1_25 = 1.25x - ALS_GAIN_1_67 = 1.67x - ALS_GAIN_2_5 = 2.5x - ALS_GAIN_5 = 5x - ALS_GAIN_10 = 10x - ALS_GAIN_20 = 20x - ALS_GAIN_40 = 40x

CHAPTER 6

# Indices and tables

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# Python Module Index

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