AdafruitVCNL4040 Library Documentation

Release 1.0

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Contents

A CircuitPython library for the VCNL4040 proximity and ambient light sensor.

CHAPTER 1

Dependencies

This driver depends on:

- Adafruit CircuitPython
- Bus Device
- Register

Please ensure all dependencies are available on the CircuitPython filesystem. This is easily achieved by downloading the Adafruit library and driver bundle.

1.1 Installing from PyPI

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-vcnl4040
```

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

```
sudo pip3 install adafruit-circuitpython-vcnl4040
```

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-vcnl4040
```

CHAPTER 2

Usage Example

```
import time
import board
import busio
import adafruit_vcnl4040

i2c = busio.I2C(board.SCL, board.SDA)
sensor = adafruit_vcnl4040.VCNL4040(i2c)

while True:
    print("Proximity:", sensor.proximity)
    print("Light:", sensor.light)
    print("White:", sensor.white)
    time.sleep(0.3)
```

CHAPTER 3

Contributing

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

CHAPTER 4

Documentation

For information on building library documentation, please check out this guide.

CHAPTER 5

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5.1 Simple test

Ensure your device works with this simple test.

Listing 1: examples/vcnl4040_simpletest.py

```
import time
import board
import busio
import adafruit_vcnl4040

i2c = busio.I2C(board.SCL, board.SDA)
sensor = adafruit_vcnl4040.VCNL4040(i2c)

while True:
    print("Proximity:", sensor.proximity)
    print("Light: %d lux" % sensor.lux)
    time.sleep(1.0)
```

5.2 adafruit_vcnl4040

A CircuitPython library for the VCNL4040 proximity and ambient light sensor.

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5.2.1 Implementation Notes

Hardware:

Software and Dependencies:

- Adafruit CircuitPython firmware for the supported boards: https://github.com/adafruit/circuitpython/releases
- Adafruit's Bus Device library: https://github.com/adafruit/Adafruit_CircuitPython_BusDevice
- Adafruit's Register library: https://github.com/adafruit/Adafruit_CircuitPython_Register

class adafruit_vcnl4040.**VCNL4040**(*i2c*, *address=96*)

Driver for the VCNL4040 proximity and ambient light sensor.

Parameters **i2c_bus** (*busio.I2C*) – The I2C bus the VCNL4040 is connected to.

led_current

LED current selection setting, in mA. Options are LED_50MA, LED_75MA, LED_100MA, LED_120MA, LED_140MA, LED_160MA, LED_180MA, LED_200MA.

led_duty_cycle

Proximity sensor LED duty ratio setting. Ratios are 1/40, 1/80, 1/160, and 1/320. Options are: LED_1_40, LED_1_80, LED_1_160, LED_1_320.

light

Raw ambient light data. The raw ambient light data which will change with integration time and gain settings changes. Use `lux` to get the correctly scaled value for the current integration time and gain settings

light_high_interrupt

High interrupt event. Triggered when ambient light value exceeds high threshold.

light_high_threshold

Ambient light interrupt high threshold.

light_integration_time

Ambient light sensor integration time setting. Longer time has higher sensitivity. Can be: ALS_80MS, ALS_160MS, ALS_320MS or ALS_640MS.

This example sets the ambient light integration time to 640ms and prints the ambient light sensor data.

```
import time
import board
import busio
import adafruit_vcnl4040

i2c = busio.I2C(board.SCL, board.SDA)
sensor = adafruit_vcnl4040.VCNL4040(i2c)

sensor.light_integration_time = sensor.ALS_640MS

while True:
    print("Ambient light:", sensor.light)
```

light_interrupt

Ambient light sensor interrupt enable. `True` to enable, and `False` to disable.

light_low_interrupt

Low interrupt event. Triggered when ambient light value drops below low threshold.

light_low_threshold

Ambient light interrupt low threshold.

light_shutdown

Ambient light sensor shutdown. When `True`, ambient light data is disabled.

lux

Ambient light data in lux. Represents the raw sensor data scaled according to the current integration time and gain settings.

This example prints the ambient light data. Cover the sensor to see the values change.

```
import time
import board
import busio
import adafruit_vcnl4040

i2c = busio.I2C(board.SCL, board.SDA)
sensor = adafruit_vcnl4040.VCNL4040(i2c)

while True:
    print("Ambient light: %.2f lux"%sensor.lux)
    time.sleep(0.1)
```

proximity

Proximity data.

This example prints the proximity data. Move your hand towards the sensor to see the values change.

```
import time
import board
import busio
import adafruit_vcnl4040

i2c = busio.I2C(board.SCL, board.SDA)
sensor = adafruit_vcnl4040.VCNL4040(i2c)

while True:
    print("Proximity:", sensor.proximity)
    time.sleep(0.1)
```

proximity_bits

Proximity data output setting. `0` when proximity sensor output is 12 bits, `1` when proximity sensor output is 16 bits.

proximity_high_interrupt

If interrupt is set to `PS_INT_CLOSE` or `PS_INT_CLOSE_AWAY`, trigger event when proximity rises above high threshold interrupt.

proximity_high_threshold

Proximity sensor interrupt high threshold setting.

proximity_integration_time

Proximity sensor integration time setting. Integration times are 1T, 1.5T, 2T, 2.5T, 3T, 3.5T, 4T, and 8T. Options are: PS_1T, PS_1_5T, PS_2T, PS_2_5T, PS_3T, PS_3_5T, PS_4T, PS_8T.

proximity_interrupt

Interrupt enable. Interrupt setting are close, away, close and away, or disabled. Options are: PS_INT_DISABLE, PS_INT_CLOSE, PS_INT_AWAY, PS_INT_CLOSE_AWAY.

proximity_low_interrupt

If interrupt is set to `PS_INT_AWAY` or `PS_INT_CLOSE_AWAY`, trigger event when proximity drops below low threshold.

proximity_low_threshold

Proximity sensor interrupt low threshold setting.

proximity_shutdown
Proximity sensor shutdown. When `True`, proximity data is disabled.

white
White light data scaled according to the current integration time and gain settings.

This example prints the white light data. Cover the sensor to see the values change.

```
import time
import board
import busio
import adafruit_vcnl4040

i2c = busio.I2C(board.SCL, board.SDA)
sensor = adafruit_vcnl4040.VCNL4040(i2c)

while True:
    print("White light:", sensor.white)
    time.sleep(0.1)
```

white_shutdown
White light channel shutdown. When `True`, white light data is disabled.

CHAPTER 6

Indices and tables

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