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# Adafruit BME680 Library Documentation

*Release 1.0*

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CircuitPython driver for BME680 sensor over I2C



# 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-bme680
```

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

```
sudo pip3 install adafruit-circuitpython-bme680
```

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-bme680
```



## CHAPTER 3

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### Usage Example

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```
from busio import I2C
import adafruit_bme680
import time
import board

# Create library object using our Bus I2C port
i2c = I2C(board.SCL, board.SDA)
bme680 = adafruit_bme680.Adafruit_BME680_I2C(i2c)

# change this to match the location's pressure (hPa) at sea level
bme680.sea_level_pressure = 1013.25

while True:
    print("\nTemperature: %0.1f C" % bme680.temperature)
    print("Gas: %d ohm" % bme680.gas)
    print("Humidity: %0.1f %" % bme680.humidity)
    print("Pressure: %0.3f hPa" % bme680.pressure)
    print("Altitude = %0.2f meters" % bme680.altitude)

    time.sleep(2)
```



## 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/bme680\_simpletest.py

```
1 import time
2 import board
3 from busio import I2C
4 import adafruit_bme680
5
6 # Create library object using our Bus I2C port
7 i2c = I2C(board.SCL, board.SDA)
8 bme680 = adafruit_bme680.Adafruit_BME680_I2C(i2c, debug=False)
9
10 # change this to match the location's pressure (hPa) at sea level
11 bme680.sea_level_pressure = 1013.25
12
13 while True:
14     print("\nTemperature: %0.1f C" % bme680.temperature)
15     print("Gas: %d ohm" % bme680.gas)
16     print("Humidity: %0.1f %" % bme680.humidity)
17     print("Pressure: %0.3f hPa" % bme680.pressure)
18     print("Altitude = %0.2f meters" % bme680.altitude)
19
20     time.sleep(1)
```

## 6.2 adafruit\_bme680

CircuitPython library for BME680 temperature, pressure and humidity sensor.

- Author(s): Limor Fried

## 6.2.1 Implementation Notes

### Hardware:

- Adafruit BME680 Temp, Humidity, Pressure and Gas Sensor

### 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](https://github.com/adafruit/Adafruit_CircuitPython_BusDevice)

**class** adafruit\_bme680.**Adafruit\_BME680** (\*, refresh\_rate=10)

Driver from BME680 air quality sensor

**Parameters** **refresh\_rate** (*int*) – Maximum number of readings per second. Faster property reads will be from the previous reading.

**altitude**

The altitude based on current pressure vs the sea level pressure (sea\_level\_pressure) - which you must enter ahead of time)

**filter\_size**

The filter size for the built in IIR filter

**gas**

The gas resistance in ohms

**humidity**

The relative humidity in RH %

**humidity\_oversample**

The oversampling for humidity sensor

**pressure**

The barometric pressure in hectoPascals

**pressure\_oversample**

The oversampling for pressure sensor

**sea\_level\_pressure = None**

Pressure in hectoPascals at sea level. Used to calibrate altitude.

**temperature**

The compensated temperature in degrees celsius.

**temperature\_oversample**

The oversampling for temperature sensor

**class** adafruit\_bme680.**Adafruit\_BME680\_I2C** (i2c, address=119, debug=False, \*, refresh\_rate=10)

Driver for I2C connected BME680.

**Parameters**

- **address** (*int*) – I2C device address
- **debug** (*bool*) – Print debug statements when True.
- **refresh\_rate** (*int*) – Maximum number of readings per second. Faster property reads will be from the previous reading.

**class** adafruit\_bme680.**Adafruit\_BME680\_SPI** (spi, cs, baudrate=100000, debug=False, \*, refresh\_rate=10)

Driver for SPI connected BME680.

**Parameters**

- **spi** (*busio.SPI*) – SPI device
- **cs** (*digitalio.DigitalInOut*) – Chip Select
- **debug** (*bool*) – Print debug statements when True.
- **baudrate** (*int*) – Clock rate, default is 100000
- **refresh\_rate** (*int*) – Maximum number of readings per second. Faster property reads will be from the previous reading.



## CHAPTER 7

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### Indices and tables

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temperature\_oversample

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