
AdafruitLSM303 Library Documentation

Release 1.0

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Oct 12, 2018

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Adafruit CircuitPython module for the LSM303 6-DoF with 3-axis accelerometer and magnetometer

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

```
import time
import board
import busio

import adafruit_lsm303

i2c = busio.I2C(board.SCL, board.SDA)
sensor = adafruit_lsm303.LSM303(i2c)

while True:
    raw_accel_x, raw_accel_y, raw_accel_z = sensor.raw_acceleration
    accel_x, accel_y, accel_z = sensor.acceleration
    raw_mag_x, raw_mag_y, raw_mag_z = sensor.raw_magnetic
    mag_x, mag_y, mag_z = sensor.magnetic

    print('Acceleration raw: ({0:6d}, {1:6d}, {2:6d}), (m/s^2): ({3:10.3f}, {4:10.
↪3f}, {5:10.3f})'.format(raw_accel_x, raw_accel_y, raw_accel_z, accel_x, accel_y,
↪accel_z))
    print('Magnetometer raw: ({0:6d}, {1:6d}, {2:6d}), (gauss): ({3:10.3f}, {4:10.
↪3f}, {5:10.3f})'.format(raw_mag_x, raw_mag_y, raw_mag_z, mag_x, mag_y, mag_z))
    print('')
    time.sleep(1.0)
```


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-lsm303 --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.

5.1 Simple tests

Ensure your device works with these simple tests.

Listing 1: examples/lsm303_simpletest.py

```
1  """ Display both accelerometer and magnetometer data once per second """
2
3  import time
4  import board
5  import busio
6  import adafruit_lsm303
7
8  i2c = busio.I2C(board.SCL, board.SDA)
9  sensor = adafruit_lsm303.LSM303(i2c)
10
11 while True:
12     acc_x, acc_y, acc_z = sensor.acceleration
13     mag_x, mag_y, mag_z = sensor.magnetic
14
15     print('Acceleration (m/s^2): ({0:10.3f}, {1:10.3f}, {2:10.3f})'.format(acc_x, acc_
→y, acc_z))
16     print('Magnetometer (gauss): ({0:10.3f}, {1:10.3f}, {2:10.3f})'.format(mag_x, mag_
→y, mag_z))
17     print('')
18     time.sleep(1.0)
```

Listing 2: examples/fast_accel/fast_accel.py

```
1  """ Read data from the accelerometer and print it out, ASAP! """
2
3  import board
4  import busio
```

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```

5
6 import adafruit_lsm303
7
8 i2c = busio.I2C(board.SCL, board.SDA)
9 sensor = adafruit_lsm303.LSM303(i2c)
10
11 while True:
12     accel_x, accel_y, accel_z = sensor.acceleration
13     print('{0:10.3f} {1:10.3f} {2:10.3f}'.format(accel_x, accel_y, accel_z))

```

Listing 3: examples/fast_mag/fast_mag.py

```

1 """ Read data from the magnetometer and print it out, ASAP! """
2
3 import board
4 import busio
5 import adafruit_lsm303
6
7 i2c = busio.I2C(board.SCL, board.SDA)
8 sensor = adafruit_lsm303.LSM303(i2c)
9
10 while True:
11     mag_x, mag_y, mag_z = sensor.magnetic
12     print('{0:10.3f} {1:10.3f} {2:10.3f}'.format(mag_x, mag_y, mag_z))

```

Listing 4: examples/raw_and_cooked/raw_and_cooked.py

```

1 """ Display both accelerometer and magnetometer data once per second """
2
3 import time
4 import board
5 import busio
6
7 import adafruit_lsm303
8
9 i2c = busio.I2C(board.SCL, board.SDA)
10 sensor = adafruit_lsm303.LSM303(i2c)
11
12 while True:
13     raw_accel_x, raw_accel_y, raw_accel_z = sensor.raw_acceleration
14     accel_x, accel_y, accel_z = sensor.acceleration
15     raw_mag_x, raw_mag_y, raw_mag_z = sensor.raw_magnetic
16     mag_x, mag_y, mag_z = sensor.magnetic
17
18     print('Acceleration raw: ({0:6d}, {1:6d}, {2:6d}), (m/s^2): ({3:10.3f}, {4:10.3f},
19 ↪ {5:10.3f})'
20         .format(raw_accel_x, raw_accel_y, raw_accel_z, accel_x, accel_y, accel_z))
21     print('Magnetometer raw: ({0:6d}, {1:6d}, {2:6d}), (gauss): ({3:10.3f}, {4:10.3f},
22 ↪ {5:10.3f})'
23         .format(raw_mag_x, raw_mag_y, raw_mag_z, mag_x, mag_y, mag_z))
24     print('')
25     time.sleep(1.0)

```


5.2 adafruit_lsm303

CircuitPython driver for the LSM303 accelerometer + magnetometer.

- Author(s): Dave Astels

5.2.1 Implementation Notes

Hardware:

- Adafruit Triple-axis Accelerometer+Magnetometer (Compass) Board - LSM303 (Product ID: 1120)
- Adafruit FLORA Accelerometer/Compass Sensor - LSM303 - v1.0 (Product ID: 1247)

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_lsm303.LSM303` (*i2c*)

Driver for the LSM303 accelerometer/magnetometer.

acceleration

The processed accelerometer sensor values. A 3-tuple of X, Y, Z axis values in meters per second squared that are signed floats.

mag_gain

The magnetometer's gain.

mag_rate

The magnetometer update rate.

magnetic

The processed magnetometer sensor values. A 3-tuple of X, Y, Z axis values in microteslas that are signed floats.

raw_acceleration

The raw accelerometer sensor values. A 3-tuple of X, Y, Z axis values that are 16-bit signed integers.

raw_magnetic

The raw magnetometer sensor values. A 3-tuple of X, Y, Z axis values that are 16-bit signed integers.

CHAPTER 6

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