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# **Adafruit FXOS8700 Library Documentation**

***Release 1.0***

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CircuitPython module for the NXP FXOS8700 accelerometer and magnetometer.



# 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-fxos8700
```

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

```
sudo pip3 install adafruit-circuitpython-fxos8700
```

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-fxos8700
```



## CHAPTER 3

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### Usage Example

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```
import time
import board
import adafruit_fxos8700

i2c = board.I2C()
sensor = adafruit_fxos8700.FXOS8700(i2c)

while True:
    accel_x, accel_y, accel_z = sensor.accelerometer
    mag_x, mag_y, mag_z = sensor.magnetometer
    print('Acceleration (m/s^2): ({0:0.3f}, {1:0.3f}, {2:0.3f})'.format(accel_x,
↪ accel_y, accel_z))
    print('Magnetometer (uTesla): ({0:0.3f}, {1:0.3f}, {2:0.3f})'.format(mag_x, mag_y,
↪ mag_z))
    time.sleep(1.0)
```



## 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](#).





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### 6.1 Simple test

Ensure your device works with this simple test.

Listing 1: examples/fxos8700\_simpletest.py

```
1  # SPDX-FileCopyrightText: 2021 ladyada for Adafruit Industries
2  # SPDX-License-Identifier: MIT
3
4  # Simple demo of the FXOS8700 accelerometer and magnetometer.
5  # Will print the acceleration and magnetometer values every second.
6  import time
7  import board
8  import adafruit_fxos8700
9
10
11 # Create sensor object, communicating over the board's default I2C bus
12 i2c = board.I2C()
13 sensor = adafruit_fxos8700.FXOS8700(i2c)
14 # Optionally create the sensor with a different accelerometer range (the
15 # default is 2G, but you can use 4G or 8G values):
16 # sensor = adafruit_fxos8700.FXOS8700(i2c, accel_range=adafruit_fxos8700.ACCEL_RANGE_
17 #   ↳ 4G)
18 # sensor = adafruit_fxos8700.FXOS8700(i2c, accel_range=adafruit_fxos8700.ACCEL_RANGE_
19 #   ↳ 8G)
20
21 # Main loop will read the acceleration and magnetometer values every second
22 # and print them out.
23 while True:
24     # Read acceleration & magnetometer.
25     accel_x, accel_y, accel_z = sensor.accelerometer
26     mag_x, mag_y, mag_z = sensor.magnetometer
27     # Print values.
```

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```

26     print(
27         "Acceleration (m/s^2): ({0:0.3f}, {1:0.3f}, {2:0.3f})".format(
28             accel_x, accel_y, accel_z
29         )
30     )
31     print(
32         "Magnetometer (uTesla): ({0:0.3f}, {1:0.3f}, {2:0.3f})".format(
33             mag_x, mag_y, mag_z
34         )
35     )
36     # Delay for a second.
37     time.sleep(1.0)

```

## 6.2 adafruit\_fxos8700

CircuitPython module for the NXP FXOS8700 accelerometer and magnetometer. Based on the driver from: [https://github.com/adafruit/Adafruit\\_FXOS8700](https://github.com/adafruit/Adafruit_FXOS8700)

See examples/simpletest.py for a demo of the usage.

- Author(s): Tony DiCola

### 6.2.1 Implementation Notes

#### Hardware:

- Adafruit Precision NXP 9-DOF Breakout Board - FXOS8700 + FXAS21002 (Product ID: 3463)

#### Software and Dependencies:

- Adafruit CircuitPython firmware for the supported boards: <https://circuitpython.org/downloads>
- Adafruit's Bus Device library: [https://github.com/adafruit/Adafruit\\_CircuitPython\\_BusDevice](https://github.com/adafruit/Adafruit_CircuitPython_BusDevice)

**class** `adafruit_fxos8700.FXOS8700` (*i2c*, *address=31*, *accel\_range=0*)

Driver for the NXP FXOS8700 accelerometer and magnetometer.

#### Parameters

- **i2c** (*I2C*) – The I2C bus the device is connected to
- **address** (*int*) – The I2C device address. Defaults to 0x1F
- **accel\_range** (*int*) – Device range. Defaults to 0x00.

#### Quickstart: Importing and using the device

Here is an example of using the `FXOS8700` class. First you will need to import the libraries to use the sensor

```

import board
import adafruit_fxos8700

```

Once this is done you can define your `board.I2C` object and define your sensor object

```

i2c = board.I2C() # uses board.SCL and board.SDA
sensor = adafruit_fxos8700.FXOS8700(i2c)

```

Now you have access to the *accelerometer* and *magnetometer* attributes

```
accel_x, accel_y, accel_z = sensor.accelerometer
mag_x, mag_y, mag_z = sensor.magnetometer
```

**accelerometer**

Read the acceleration from the accelerometer and return its X, Y, Z axis values as a 3-tuple in  $m/s^2$ .

**magnetometer**

Read the magnetometer values and return its X, Y, Z axis values as a 3-tuple in  $\mu$ Teslas.

**read\_raw\_accel\_mag()**

Read the raw accelerometer and magnetometer readings. Returns a 2-tuple of 3-tuples:

- Accelerometer X, Y, Z axis 14-bit signed raw values
- Magnetometer X, Y, Z axis 16-bit signed raw values

If you want the acceleration or magnetometer values in friendly units consider using the *accelerometer* and *magnetometer* properties!



## CHAPTER 7

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### Indices and tables

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