

---

# **Adafruit FXAS21002C Library Documentation**

***Release 1.0***

**Tony DiCola**

**Aug 25, 2018**



---

## Contents

---

<b>1</b>	<b>Dependencies</b>	<b>3</b>
<b>2</b>	<b>Usage Example</b>	<b>5</b>
<b>3</b>	<b>Contributing</b>	<b>7</b>
<b>4</b>	<b>Building locally</b>	<b>9</b>
4.1	Sphinx documentation . . . . .	9
<b>5</b>	<b>Table of Contents</b>	<b>11</b>
5.1	Simple test . . . . .	11
5.2	adafruit_fxas21002c . . . . .	12
5.2.1	Implementation Notes . . . . .	12
<b>6</b>	<b>Indices and tables</b>	<b>13</b>
	<b>Python Module Index</b>	<b>15</b>



CircuitPython module for the NXP FXAS21002C gyroscope.



# 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/simpletest.py` for an example 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-fxac21002c --
↳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 test

Ensure your device works with this simple test.

Listing 1: examples/fxas21002c\_simpletest.py

```
1  # Simple demo of the FXAS21002C gyroscope.
2  # Will print the gyroscope values every second.
3  import time
4
5  import board
6  import busio
7
8  import adafruit_fxas21002c
9
10
11 # Initialize I2C bus and device.
12 i2c = busio.I2C(board.SCL, board.SDA)
13 sensor = adafruit_fxas21002c.FXAS21002C(i2c)
14 # Optionally create the sensor with a different gyroscope range (the
15 # default is 250 DPS, but you can use 500, 1000, or 2000 DPS values):
16 #sensor = adafruit_fxas21002c.FXAS21002C(i2c, gyro_range=adafruit_fxas21002c.GYRO_
    ↳RANGE_500DPS)
17 #sensor = adafruit_fxas21002c.FXAS21002C(i2c, gyro_range=adafruit_fxas21002c.GYRO_
    ↳RANGE_1000DPS)
18 #sensor = adafruit_fxas21002c.FXAS21002C(i2c, gyro_range=adafruit_fxas21002c.GYRO_
    ↳RANGE_2000DPS)
19
20 # Main loop will read the gyroscope values every second and print them out.
21 while True:
22     # Read gyroscope.
23     gyro_x, gyro_y, gyro_z = sensor.gyroscope
24     # Print values.
```

(continues on next page)

(continued from previous page)

```
25     print('Gyroscope (radians/s): ({0:0.3f}, {1:0.3f}, {2:0.3f})'.format(gyro_x, ↵
↵ gyro_y, gyro_z))
26     # Delay for a second.
27     time.sleep(1.0)
```

## 5.2 adafruit\_fxas21002c

CircuitPython module for the NXP FXAS21002C gyroscope. Based on the driver from: [https://github.com/adafruit/Adafruit\\_FXAS21002C](https://github.com/adafruit/Adafruit_FXAS21002C)

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

- Author(s): Tony DiCola

### 5.2.1 Implementation Notes

#### Hardware:

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

#### Software and Dependencies:

- Adafruit CircuitPython firmware (2.2.0+) 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](https://github.com/adafruit/Adafruit_CircuitPython_BusDevice)

**class** `adafruit_fxas21002c.FXAS21002C` (*i2c*, *address=33*, *gyro\_range=250*)

Driver for the NXP FXAS21002C gyroscope.

#### **gyroscope**

Read the gyroscope value and return its X, Y, Z axis values as a 3-tuple in radians/second.

#### **read\_raw()**

Read the raw gyroscope readings. Returns a 3-tuple of X, Y, Z axis 16-bit signed values. If you want the gyroscope values in friendly units consider using the `gyroscope` property!



## CHAPTER 6

---

### Indices and tables

---

- `genindex`
- `modindex`
- `search`



### a

adafruit\_fxas21002c, [12](#)



### A

`adafruit_fxas21002c` (module), [12](#)

### F

`FXAS21002C` (class in `adafruit_fxas21002c`), [12](#)

### G

`gyroscope` (`adafruit_fxas21002c.FXAS21002C` attribute),  
[12](#)

### R

`read_raw()` (`adafruit_fxas21002c.FXAS21002C` method),  
[12](#)