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# **AdafruitADXL34x Library Documentation**

***Release 1.0***

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A CircuitPython driver for the ADXL34x family of accelerometers



# 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](#).

### 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-adxl34x
```

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

```
sudo pip3 install adafruit-circuitpython-adxl34x
```

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-adxl34x
```





## CHAPTER 2

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### Usage Example

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```
import time
import board
import busio
import adafruit_adxl34x
i2c = busio.I2C(board.SCL, board.SDA)
accelerometer = adafruit_adxl34x.ADXL345(i2c)
while True:
    print("%f %f %f"%accelerometer.acceleration)
    time.sleep(1)
```



## CHAPTER 3

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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 4

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### Documentation

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For information on building library documentation, please check out [this guide](#).



### 5.1 Simple test

Ensure your device works with this simple test.

Listing 1: examples/adxl34x\_simpletest.py

```
1  # SPDX-FileCopyrightText: 2021 ladyada for Adafruit Industries
2  # SPDX-License-Identifier: MIT
3
4  import time
5  import board
6  import busio
7  import adafruit_adxl34x
8
9  i2c = busio.I2C(board.SCL, board.SDA)
10
11  # For ADXL343
12  accelerometer = adafruit_adxl34x.ADXL343(i2c)
13  # For ADXL345
14  # accelerometer = adafruit_adxl34x.ADXL345(i2c)
15
16  while True:
17      print("%f %f %f" % accelerometer.acceleration)
18      time.sleep(0.2)
```

### 5.2 Motion detection

Use the accelerometer to detect motion.

Listing 2: examples/adxl34x\_motion\_detection\_test.py

```
1  # SPDX-FileCopyrightText: 2021 ladyada for Adafruit Industries
2  # SPDX-License-Identifier: MIT
3
4  import time
5  import board
6  import busio
7  import adafruit_adxl34x
8
9  i2c = busio.I2C(board.SCL, board.SDA)
10
11  # For ADXL343
12  accelerometer = adafruit_adxl34x.ADXL343(i2c)
13  # For ADXL345
14  # accelerometer = adafruit_adxl34x.ADXL345(i2c)
15
16  accelerometer.enable_motion_detection()
17  # alternatively you can specify the threshold when you enable motion detection for
18  # ↪ more control:
19  # accelerometer.enable_motion_detection(threshold=10)
20
21  while True:
22      print("%f %f %f" % accelerometer.acceleration)
23
24      print("Motion detected: %s" % accelerometer.events["motion"])
25      time.sleep(0.5)
```

## 5.3 Freefall detection

Use the accelerometer to detect when something is dropped.

Listing 3: examples/adxl34x\_freefall\_detection\_test.py

```
1  # SPDX-FileCopyrightText: 2021 ladyada for Adafruit Industries
2  # SPDX-License-Identifier: MIT
3
4  import time
5  import board
6  import busio
7  import adafruit_adxl34x
8
9  i2c = busio.I2C(board.SCL, board.SDA)
10
11  # For ADXL343
12  accelerometer = adafruit_adxl34x.ADXL343(i2c)
13  # For ADXL345
14  # accelerometer = adafruit_adxl34x.ADXL345(i2c)
15
16  accelerometer.enable_freefall_detection()
17  # alternatively you can specify attributes when you enable freefall detection for
18  # ↪ more control:
19  # accelerometer.enable_freefall_detection(threshold=10,time=25)
```

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```

20 while True:
21     print("%f %f %f" % accelerometer.acceleration)
22
23     print("Dropped: %s" % accelerometer.events["freefall"])
24     time.sleep(0.5)

```

## 5.4 Tap detection

The accelerometer can also be configured to detect taps.

Listing 4: examples/adx134x\_tap\_detection\_test.py

```

1  # SPDX-FileCopyrightText: 2021 ladyada for Adafruit Industries
2  # SPDX-License-Identifier: MIT
3
4  import time
5  import board
6  import busio
7  import adafruit_adxl34x
8
9  i2c = busio.I2C(board.SCL, board.SDA)
10
11  # For ADXL343
12  accelerometer = adafruit_adxl34x.ADXL343(i2c)
13  # For ADXL345
14  # accelerometer = adafruit_adxl34x.ADXL345(i2c)
15
16  accelerometer.enable_tap_detection()
17  # you can also configure the tap detection parameters when you enable tap detection:
18  # accelerometer.enable_tap_detection(tap_count=2, threshold=20, duration=50)
19
20 while True:
21     print("%f %f %f" % accelerometer.acceleration)
22
23     print("Tapped: %s" % accelerometer.events["tap"])
24     time.sleep(0.5)

```

## 5.5 adafruit\_adxl34x

A driver for the ADXL34x 3-axis accelerometer family

- Author(s): Bryan Siepert

Based on drivers by K. Townsend and Tony DiCola

### 5.5.1 Implementation Notes

**Hardware:** <https://www.adafruit.com/product/1231>

**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\_adxl34x.**ADXL343** (*i2c*, *address*=83)  
Stub class for the ADXL343 3-axis accelerometer

**class** adafruit\_adxl34x.**ADXL345** (*i2c*, *address*=83)  
Driver for the ADXL345 3 axis accelerometer

#### Parameters

- **i2c\_bus** (*I2C*) – The I2C bus the ADXL345 is connected to.
- **address** – The I2C device address for the sensor. Default is 0x53.

#### acceleration

The x, y, z acceleration values returned in a 3-tuple in  $m / s^2$ .

#### data\_rate

The data rate of the sensor.

#### disable\_freefall\_detection()

Disable freefall detection

#### disable\_motion\_detection()

Disable motion detection

#### disable\_tap\_detection()

Disable tap detection

#### enable\_freefall\_detection(\*, threshold=10, time=25)

Freefall detection parameters:

#### Parameters

- **threshold** (*int*) – The value that acceleration on all axes must be under to register as dropped. The scale factor is 62.5 mg/LSB.
- **time** (*int*) – The amount of time that acceleration on all axes must be less than **threshold** to register as dropped. The scale factor is 5 ms/LSB. Values between 100 ms and 350 ms (20 to 70) are recommended.

If you wish to set them yourself rather than using the defaults, you must use keyword arguments:

```
accelerometer.enable_freefall_detection(time=30)
```

#### enable\_motion\_detection(\*, threshold=18)

The activity detection parameters.

**Parameters threshold** (*int*) – The value that acceleration on any axis must exceed to register as active. The scale factor is 62.5 mg/LSB.

If you wish to set them yourself rather than using the defaults, you must use keyword arguments:

```
accelerometer.enable_motion_detection(threshold=20)
```

#### enable\_tap\_detection(\*, tap\_count=1, threshold=20, duration=50, latency=20, window=255)

The tap detection parameters.

#### Parameters

- **tap\_count** (*int*) – 1 to detect only single taps, and 2 to detect only double taps.
- **threshold** (*int*) – A threshold for the tap detection. The scale factor is 62.5 mg/LSB. The higher the value the less sensitive the detection.

- **duration** (*int*) – This caps the duration of the impulse above `threshold`. Anything above `duration` won't register as a tap. The scale factor is 625  $\mu$ s/LSB
- **latency(double tap only)** (*int*) – The length of time after the initial impulse falls below `threshold` to start the window looking for a second impulse. The scale factor is 1.25 ms/LSB.
- **window(double tap only)** (*int*) – The length of the window in which to look for a second tap. The scale factor is 1.25 ms/LSB

If you wish to set them yourself rather than using the defaults, you must use keyword arguments:

```
accelerometer.enable_tap_detection(duration=30, threshold=25)
```

### events

`events` will return a dictionary with a key for each event type that has been enabled. The possible keys are:

Key	Description
tap	True if a tap was detected recently. Whether it's looking for a single or double tap is determined by the <code>tap</code> param of <a href="#">enable_tap_detection</a>
motion	True if the sensor has seen acceleration above the threshold set with <a href="#">enable_motion_detection</a> .
freefall	True if the sensor was in freefall. Parameters are set when enabled with <a href="#">enable_freefall_detection</a>

### range

The measurement range of the sensor.

### class `adafruit_adxl34x.DataRate`

An enum-like class representing the possible data rates. Possible values are

- `DataRate.RATE_3200_HZ`
- `DataRate.RATE_1600_HZ`
- `DataRate.RATE_800_HZ`
- `DataRate.RATE_400_HZ`
- `DataRate.RATE_200_HZ`
- `DataRate.RATE_100_HZ`
- `DataRate.RATE_50_HZ`
- `DataRate.RATE_25_HZ`
- `DataRate.RATE_12_5_HZ`
- `DataRate.RATE_6_25_HZ`
- `DataRate.RATE_3_13_HZ`
- `DataRate.RATE_1_56_HZ`
- `DataRate.RATE_0_78_HZ`
- `DataRate.RATE_0_39_HZ`
- `DataRate.RATE_0_20_HZ`
- `DataRate.RATE_0_10_HZ`

**class** adafruit\_adxl34x.**Range**

An enum-like class representing the possible measurement ranges in +/- G.

Possible values are

- `Range.RANGE_16_G`
- `Range.RANGE_8_G`
- `Range.RANGE_4_G`
- `Range.RANGE_2_G`

## CHAPTER 6

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