AdafruitADXL34x Library Documentation

Release 1.0

Bryan Siepert

Feb 10, 2021

Contents

A CircuitPython driver for the ADXL34x family of accelerometers

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.

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

Usage Example

```
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

Contributing

Contributions are welcome! Please read our Code of Conduct before contributing to help this project stay welcoming.

CHAPTER 4

Documentation

For information on building library documentation, please check out this guide.

CHAPTER 5

Table of Contents

5.1 Simple test

Ensure your device works with this simple test.

Listing 1: examples/adxl34x_simpletest.py

```
# SPDX-FileCopyrightText: 2021 ladyada for Adafruit Industries
# SPDX-License-Identifier: MIT

import time
import board
import busio
import adafruit_adxl34x

i2c = busio.I2C(board.SCL, board.SDA)

# For ADXL343
accelerometer = adafruit_adxl34x.ADXL343(i2c)
# For ADXL345
# accelerometer = adafruit_adxl34x.ADXL345(i2c)

while True:
    print("%f %f %f" % accelerometer.acceleration)
    time.sleep(0.2)
```

5.2 Motion detection

Use the accelerometer to detect motion.

Listing 2: examples/adxl34x_motion_detection_test.py

```
# SPDX-FileCopyrightText: 2021 ladyada for Adafruit Industries
# SPDX-License-Identifier: MIT

import time
import board
import busio
import adafruit_adxl34x

i2c = busio.I2C(board.SCL, board.SDA)

# For ADXL343
accelerometer = adafruit_adxl34x.ADXL343(i2c)
# For ADXL345
# accelerometer = adafruit_adxl34x.ADXL345(i2c)

accelerometer.enable_motion_detection()
# alternatively you can specify the threshold when you enable motion detection for more control:
# accelerometer.enable_motion_detection(threshold=10)

while True:
    print("%f %f %f" % accelerometer.acceleration)

    print("Motion detected: %s" % accelerometer.events["motion"])
    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

```
# SPDX-FileCopyrightText: 2021 ladyada for Adafruit Industries
# SPDX-License-Identifier: MIT

import time
import board
import busio
import adafruit_adxl34x

i2c = busio.I2C(board.SCL, board.SDA)

# For ADXL343
accelerometer = adafruit_adxl34x.ADXL343(i2c)
# For ADXL345
# accelerometer = adafruit_adxl34x.ADXL345(i2c)

accelerometer.enable_freefall_detection()
# alternatively you can specify attributes when you enable freefall detection for more control:
# accelerometer.enable_freefall_detection(threshold=10,time=25)

```

(continues on next page)

(continued from previous page)

```
while True:
    print("%f %f %f" % accelerometer.acceleration)

    print("Dropped: %s" % accelerometer.events["freefall"])
    time.sleep(0.5)
```

5.4 Tap detection

The accelerometer can also be configured to detect taps.

Listing 4: examples/adxl34x_tap_detection_test.py

```
# SPDX-FileCopyrightText: 2021 ladyada for Adafruit Industries
# SPDX-License-Identifier: MIT

import time
import board
import busio
import adafruit_adxl34x

i2c = busio.I2C(board.SCL, board.SDA)

# For ADXL343
accelerometer = adafruit_adxl34x.ADXL343(i2c)
# For ADXL345
# accelerometer = adafruit_adxl34x.ADXL345(i2c)

accelerometer.enable_tap_detection()
# you can also configure the tap detection parameters when you enable tap detection:
# accelerometer.enable_tap_detection(tap_count=2,threshold=20, duration=50)

while True:
    print("%f %f %f" % accelerometer.acceleration)

    print("Tapped: %s" % accelerometer.events["tap"])
    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

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 `threshhold` 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 `threshhold`. Anything above `duration` won't register as a tap. The scale factor is 625 µs/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 tap param of *enable_tap_detection*
`motion`	True if the sensor has seen acceleration above the threshold set with *enable_motion_detection*.
`freefall`	True if the sensor was in freefall. Parameters are set when enabled with *enable_freefall_detection*

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_25HZ`
- `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

Indices and tables

- genindex
- modindex
- search

Python Module Index

a

Index