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# Adafruit WAVEFORM Library Documentation

*Release 1.0*

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**Jun 07, 2021**



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This library generates simple waveforms that can be used to generate different type of audio signals.



# CHAPTER 1

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## Dependencies

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This driver depends on:

- [Adafruit CircuitPython](#)

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-waveform
```

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

```
sudo pip3 install adafruit-circuitpython-waveform
```

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-waveform
```



## CHAPTER 3

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### Usage Example

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This example generates one wavelength of a 440hz sine wave when played at 16 kilosamples per second:

```
from adafruit_waveform import sine
wave = sine.sine_wave(16000, 440)
```



## 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](#).





## 6.1 Simple tests

Ensure your device works with these simple tests.

Listing 1: examples/waveform\_sine\_simpletest.py

```
1 # SPDX-FileCopyrightText: 2021 ladyada for Adafruit Industries
2 # SPDX-License-Identifier: MIT
3
4 """
5 'sine_demo.py'.
6
7 =====
8 toggles the builtin LED using a sine wave
9 """
10 import time
11 import board
12 import digitalio
13 from adafruit_waveform import sine
14
15 LED = digitalio.DigitalInOut(board.D13)
16 LED.switch_to_output()
17
18 SINE_SAMPLE = sine.sine_wave(150, 50)
19
20 while True:
21     for i in range(len(SINE_SAMPLE)):
22         LED.value = i
23         print(LED.value)
24         time.sleep(0.50)
```

Listing 2: examples/waveform\_square\_simpletest.py

```

1 # SPDX-FileCopyrightText: 2021 ladyada for Adafruit Industries
2 # SPDX-License-Identifier: MIT
3
4 """
5 'square_demo.py'.
6
7 =====
8 toggles the builtin LED using a square wave
9 """
10 import time
11 import digitalio
12 import board
13 from adafruit_waveform import square
14
15 LED = digitalio.DigitalInOut(board.D13)
16 LED.switch_to_output()
17 SAMPLE_SQUARE = square.square_wave(2)
18
19 while True:
20     for i in range(len(SAMPLE_SQUARE)):
21         LED.value = i
22         print(LED.value)
23         time.sleep(0.5)

```

## 6.2 adafruit\_waveform.sine

This library generates sine waveforms that can be used to generate sine audio signals.

- Author(s): Scott Shawcroft

adafruit\_waveform.sine.**sine\_wave** (*sample\_frequency*, *pitch*)

Generate a single sine wave cycle at the given sampling frequency and pitch.

## 6.3 adafruit\_waveform.square

This library generates square waveforms that can be used to generate square audio signals.

- Author(s): Scott Shawcroft, BrentRu

adafruit\_waveform.square.**square\_wave** (*sample\_length=2*)

Generate a single square wave of *sample\_length* size

## CHAPTER 7

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### Indices and tables

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