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**Adafruit**  
**CIRCUITPYTHON***ADS1X15LibraryDocumentation*  
**Release 1.0**

**Carter Nelson**

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Support for the ADS1x15 series of analog-to-digital converters. Available in 12-bit (ADS1015) and 16-bit (ADS1115) versions.



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## Installation & Dependencies

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This driver depends on:

- [Adafruit CircuitPython](#)
- [Bus Device](#)

Please ensure all dependencies are available on the CircuitPython filesystem. This can be most easily achieved by downloading and installing [the Adafruit library and driver bundle](#) on your device.

### 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-ads1x15
```

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

```
sudo pip3 install adafruit-circuitpython-ads1x15
```

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-ads1x15
```





### 2.1 Single Ended

```
import time
import board
import busio
import adafruit_ads1x15.ads1015 as ADS
from adafruit_ads1x15.analog_in import AnalogIn

# Create the I2C bus
i2c = busio.I2C(board.SCL, board.SDA)

# Create the ADC object using the I2C bus
ads = ADS.ADS1015(i2c)

# Create single-ended input on channel 0
chan = AnalogIn(ads, ADS.P0)

# Create differential input between channel 0 and 1
#chan = AnalogIn(ads, ADS.P0, ADS.P1)

print("{:>5}\t{:>5}".format('raw', 'v'))

while True:
    print("{:>5}\t{:>5.3f}".format(chan.value, chan.voltage))
    time.sleep(0.5)
```



## 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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### Building locally

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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-ads1x15 --
↪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/ads1015\_simpletest.py

```
1 import time
2 import board
3 import busio
4 import adafruit_ads1x15.ads1015 as ADS
5 from adafruit_ads1x15.analog_in import AnalogIn
6
7 # Create the I2C bus
8 i2c = busio.I2C(board.SCL, board.SDA)
9
10 # Create the ADC object using the I2C bus
11 ads = ADS.ADS1015(i2c)
12
13 # Create single-ended input on channel 0
14 chan = AnalogIn(ads, ADS.P0)
15
16 # Create differential input between channel 0 and 1
17 #chan = AnalogIn(ads, ADS.P0, ADS.P1)
18
19 print("{:>5}\t{:>5}".format('raw', 'v'))
20
21 while True:
22     print("{:>5}\t{:>5.3f}".format(chan.value, chan.voltage))
23     time.sleep(0.5)
```

Listing 2: examples/ads1115\_simpletest.py

```

1 import time
2 import board
3 import busio
4 import adafruit_ads1x15.ads1115 as ADS
5 from adafruit_ads1x15.analog_in import AnalogIn
6
7 # Create the I2C bus
8 i2c = busio.I2C(board.SCL, board.SDA)
9
10 # Create the ADC object using the I2C bus
11 ads = ADS.ADS1115(i2c)
12
13 # Create single-ended input on channel 0
14 chan = AnalogIn(ads, ADS.P0)
15
16 # Create differential input between channel 0 and 1
17 #chan = AnalogIn(ads, ADS.P0, ADS.P1)
18
19 print("{:>5}\t{:>5}".format('raw', 'v'))
20
21 while True:
22     print("{:>5}\t{:>5.3f}".format(chan.value, chan.voltage))
23     time.sleep(0.5)

```

## 5.2 ads1x15

CircuitPython base class driver for ADS1015/1115 ADCs.

- Author(s): Carter Nelson

**class** adafruit\_ads1x15.ads1x15.**ADS1x15**(i2c, gain=1, data\_rate=None, mode=256, address=72)

Base functionality for ADS1x15 analog to digital converters.

**data\_rate**

The data rate for ADC conversion in samples per second.

**gain**

The ADC gain.

**gains**

Possible gain settings.

**get\_last\_result()**

Read the last conversion result when in continuous conversion mode. Will return a signed integer value.

**mode**

The ADC conversion mode.

**rate\_config**

Rate configuration masks.

**rates**

Possible data rate settings.



**read** (*pin*, *is\_differential=False*)

I2C Interface for ADS1x15-based ADCs reads.

**params:**

**param pin** individual or differential pin.

**param bool is\_differential** single-ended or differential read.

## 5.3 ads1015

CircuitPython driver for ADS1015 ADCs.

- Author(s): Carter Nelson

**class** adafruit\_ads1x15.ads1015.**ADS1015** (*i2c*, *gain=1*, *data\_rate=None*, *mode=256*, *address=72*)

Class for the ADS1015 12 bit ADC.

**bits**

The ADC bit resolution.

**rate\_config**

Rate configuration masks.

**rates**

Possible data rate settings.

## 5.4 ads1115

CircuitPython driver for 1115 ADCs.

- Author(s): Carter Nelson

**class** adafruit\_ads1x15.ads1115.**ADS1115** (*i2c*, *gain=1*, *data\_rate=None*, *mode=256*, *address=72*)

Class for the ADS1115 16 bit ADC.

**bits**

The ADC bit resolution.

**rate\_config**

Rate configuration masks.

**rates**

Possible data rate settings.

## 5.5 analog\_in

AnalogIn for single-ended and differential ADC readings.

- Author(s): Carter Nelson, adapted from MCP3xxx original by Brent Rubell

**class** adafruit\_ads1x15.analog\_in.**AnalogIn** (*ads*, *positive\_pin*, *negative\_pin=None*)

AnalogIn Mock Implementation for ADC Reads.

**value**

Returns the value of an ADC pin as an integer.

**voltage**

Returns the voltage from the ADC pin as a floating point value.

## CHAPTER 6

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### Indices and tables

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