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

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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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### 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/ads1x15\_ads1015\_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_ads1x15.ads1015 as ADS
8  from adafruit_ads1x15.analog_in import AnalogIn
9
10 # Create the I2C bus
11 i2c = busio.I2C(board.SCL, board.SDA)
12
13 # Create the ADC object using the I2C bus
14 ads = ADS.ADS1015(i2c)
15
16 # Create single-ended input on channel 0
17 chan = AnalogIn(ads, ADS.P0)
18
19 # Create differential input between channel 0 and 1
20 # chan = AnalogIn(ads, ADS.P0, ADS.P1)
21
22 print("{:>5}\t{:>5}".format("raw", "v"))
23
24 while True:
25     print("{:>5}\t{:>5.3f}".format(chan.value, chan.voltage))
26     time.sleep(0.5)
```

Listing 2: examples/ads1x15\_ads1115\_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_ads1x15.ads1115 as ADS
8  from adafruit_ads1x15.analog_in import AnalogIn
9
10 # Create the I2C bus
11 i2c = busio.I2C(board.SCL, board.SDA)
12
13 # Create the ADC object using the I2C bus
14 ads = ADS.ADS1115(i2c)
15 # you can specify an I2C address instead of the default 0x48
16 # ads = ADS.ADS1115(i2c, address=0x49)
17
18 # Create single-ended input on channel 0
19 chan = AnalogIn(ads, ADS.P0)
20
21 # Create differential input between channel 0 and 1
22 # chan = AnalogIn(ads, ADS.P0, ADS.P1)
23
24 print("{:>5}\t{:>5}".format("raw", "v"))
25
26 while True:
27     print("{:>5}\t{:>5.3f}".format(chan.value, chan.voltage))
28     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** (fast=False)

Read the last conversion result when in continuous conversion mode. Will return a signed integer value. If fast is True, the register pointer is not updated as part of the read. This reduces I2C traffic and increases possible read rate.

**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.

**class** adafruit\_ads1x15.ads1x15.**Mode**

An enum-like class representing possible ADC operating modes.

## 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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