# Adafruit MAX31855 Library Documentation

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CircuitPython driver for the MAX31855 Thermocouple Amplifier Breakout

# 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.

# CHAPTER 2

# 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-max31855
```

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

```
sudo pip3 install adafruit-circuitpython-max31855
```

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-max31855
```

# CHAPTER 3

# Usage Example

Of course, you must import the library to use it:

```
import adafruit_max31855
```

You also need to create an SPI interface object, and a pin object for the chip select pin. You can use any pin for the CS, but we use D5 here:

```
from busio import SPI
from digitalio import DigitalInOut
import board

spi = SPI(clock=board.SCK, MISO=board.MISO, MOSI=board.MOSI)
cs = DigitalInOut(board.D5)
```

Next, just create the sensor object:

```
sensor = adafruit_max31855.MAX31855(spi, cs)
```

And you can start making measurements:

```
print(sensor.temperature)
```

The temperature is read in degrees Celsius (°C). You have to convert it to other units yourself, if you need it.

# CHAPTER 4

# Contributing

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

# CHAPTER 5

# Documentation

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

CHAPTER 6

# Table of Contents

## 6.1 Simple test

Ensure your device works with this simple test.

Listing 1: examples/max31855_simpletest.py

```
import time
import board
import busio
import digitalio
import adafruit_max31855

spi = busio.SPI(board.SCK, MOSI=board.MOSI, MISO=board.MISO)
cs = digitalio.DigitalInOut(board.D5)

max31855 = adafruit_max31855.MAX31855(spi, cs)
while True:
    tempC = max31855.temperature
    tempF = tempC * 9 / 5 + 32
    print("Temperature: {} C {} F ".format(tempC, tempF))
    time.sleep(2.0)
```

## 6.2 adafruit_max31855

This is a CircuitPython driver for the Maxim Integrated MAX31855 thermocouple amplifier module.

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### 6.2.1 Implementation Notes

**Hardware:**

- Adafruit MAX31855 Thermocouple Amplifier Breakout (Product ID: 269)

**Software and Dependencies:**

- Adafruit CircuitPython firmware for the ESP8622 and M0-based boards: https://github.com/adafruit/circuitpython/releases
- Adafruit's Bus Device library: https://github.com/adafruit/Adafruit_CircuitPython_BusDevice

**class** adafruit_max31855.**MAX31855**(*spi*, *cs*)

Driver for the MAX31855 thermocouple amplifier.

**reference_temperature**

Internal reference temperature in degrees Celsius.

**temperature**

Thermocouple temperature in degrees Celsius.

**temperature_NIST**

Thermocouple temperature in degrees Celsius, computed using raw voltages and NIST approximation for Type K, see: https://srdata.nist.gov/its90/download/type_k.tab

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