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# **Adafruit MCP4725 Library Documentation**

*Release 1.0*

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CircuitPython module for the MCP4725 digital to analog converter.



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-mcp4725
```

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

```
sudo pip3 install adafruit-circuitpython-mcp4725
```

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-mcp4725
```





## CHAPTER 2

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### Usage Example

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See `examples/max4725_simpletest.py` for a demo of the usage.



## 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/mcp4725\_simpletest.py

```
1  # SPDX-FileCopyrightText: 2018 Tony DiCola for Adafruit Industries
2  # SPDX-License-Identifier: MIT
3
4  # Simple demo of setting the DAC value up and down through its entire range
5  # of values.
6  import board
7  import busio
8
9  import adafruit_mcp4725
10
11
12 # Initialize I2C bus.
13 i2c = busio.I2C(board.SCL, board.SDA)
14
15 # Initialize MCP4725.
16 dac = adafruit_mcp4725.MCP4725(i2c)
17 # Optionally you can specify a different address if you override the A0 pin.
18 # amp = adafruit_max9744.MAX9744(i2c, address=0x63)
19
20 # There are a three ways to set the DAC output, you can use any of these:
21 dac.value = 65535 # Use the value property with a 16-bit number just like
22 # the AnalogOut class. Note the MCP4725 is only a 12-bit
23 # DAC so quantization errors will occur. The range of
24 # values is 0 (minimum/ground) to 65535 (maximum/Vout).
25
26 dac.raw_value = 4095 # Use the raw_value property to directly read and write
27 # the 12-bit DAC value. The range of values is
```

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```

28 # 0 (minimum/ground) to 4095 (maximum/Vout).
29
30 dac.normalized_value = 1.0 # Use the normalized_value property to set the
31 # output with a floating point value in the range
32 # 0 to 1.0 where 0 is minimum/ground and 1.0 is
33 # maximum/Vout.
34
35 # Main loop will go up and down through the range of DAC values forever.
36 while True:
37     # Go up the 12-bit raw range.
38     print("Going up 0-3.3V...")
39     for i in range(4095):
40         dac.raw_value = i
41     # Go back down the 12-bit raw range.
42     print("Going down 3.3-0V...")
43     for i in range(4095, -1, -1):
44         dac.raw_value = i

```

## 5.2 adafruit\_mcp4725 - MCP4725 digital to analog converter

CircuitPython module for the MCP4725 digital to analog converter. See `examples/mcp4725_simpletest.py` for a demo of the usage.

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### 5.2.1 Implementation Notes

#### Hardware:

- Adafruit MCP4725 Breakout Board - 12-Bit DAC w/I2C Interface (Product ID: 935)

#### Software and Dependencies:

- Adafruit CircuitPython firmware for the ESP8622 and M0-based boards: <https://github.com/adafruit/circuitpython/releases>

**class** `adafruit_mcp4725.MCP4725` (*i2c*, \*, *address=98*)

MCP4725 12-bit digital to analog converter. This class has a similar interface as the CircuitPython `AnalogOut` class and can be used in place of that module.

#### Parameters

- **i2c** (*I2C*) – The I2C bus.
- **address** (*int*) – The address of the device if set differently from the default.

#### **normalized\_value**

The DAC value as a floating point number in the range 0.0 to 1.0.

#### **raw\_value**

The DAC value as a 12-bit unsigned value. This is the the true resolution of the DAC and will never perform scaling or run into quantization error.

#### **save\_to\_eeprom()**

Store the current DAC value in EEPROM.



**value**

The DAC value as a 16-bit unsigned value compatible with the `AnalogOut` class.

Note that the MCP4725 is still just a 12-bit device so quantization will occur. If you'd like to instead deal with the raw 12-bit value use the `raw_value` property, or the `normalized_value` property to deal with a 0...1 float value.



## CHAPTER 6

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