
AdafruitMCP4728 Library Documentation

Release 1.0

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Jan 14, 2020

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Helper library for the MCP4728 I2C 12-bit Quad DAC

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-mcp4728
```

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

```
sudo pip3 install adafruit-circuitpython-mcp4728
```

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-mcp4728
```


CHAPTER 3

Usage Example

```
import board
import busio
import adafruit_mcp4728

i2c = busio.I2C(board.SCL, board.SDA)
mcp4728 = adafruit_mcp4728.MCP4728(i2c)

mcp4728.channel_a.value = 65535 # Voltage = VDD
mcp4728.channel_b.value = int(65535/2) # VDD/2
mcp4728.channel_c.value = int(65535/4) # VDD/4
mcp4728.channel_d.value = 0 # 0V

mcp4728.save_settings() # save the current values to the eeprom, making them the
↳ default on power up
```


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](#).

6.1 Simple test

Ensure your device works with this simple test.

Listing 1: examples/mcp4728_simpletest.py

```
1 import board
2 import busio
3 import adafruit_mcp4728
4
5 i2c = busio.I2C(board.SCL, board.SDA)
6 mcp4728 = adafruit_mcp4728.MCP4728(i2c)
7
8 mcp4728.channel_a.value = 65535 # Voltage = VDD
9 mcp4728.channel_b.value = int(65535/2) # VDD/2
10 mcp4728.channel_c.value = int(65535/4) # VDD/4
11 mcp4728.channel_d.value = 0 # 0V
```

6.2 adafruit_mcp4728

Helper library for the Microchip MCP4728 I2C 12-bit Quad DAC

- Author(s): Bryan Siepert

6.2.1 Implementation Notes

Hardware:

- Adafruit's MCP4728 Breakout: <https://adafruit.com/product/44XX>

Software and Dependencies:

- Adafruit CircuitPython firmware for the supported boards: <https://circuitpython.org/downloads>
- Adafruit's Bus Device library: https://github.com/adafruit/Adafruit_CircuitPython_BusDevice
- Adafruit's Register library: https://github.com/adafruit/Adafruit_CircuitPython_Register

class `adafruit_mcp4728.CV`

struct helper

classmethod `add_values (value_tuples)`

creates CV entires

classmethod `is_valid (value)`

Returns true if the given value is a member of the CV

class `adafruit_mcp4728.Channel (dac_instance, cache_page, index)`

An instance of a single channel for a multi-channel DAC.

All available channels are created automatically and should not be created by the user

gain

Sets the gain of the channel if the Vref for the channel is `Vref.INTERNAL`. **The gain setting has no effect if the Vref for the channel is 'Vref.VDD'.**

With gain set to 1, the output voltage goes from 0v to 2.048V. If a channe's gain is set to 2, the voltage goes from 0v to 4.096V. *gain* Must be 1 or 2

normalized_value

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

raw_value

The native 12-bit value used by the DAC

value

The 16-bit scaled current value for the channel. Note that the MCP4728 is a 12-bit piece so quantization errors will occur

vref

Sets the DAC's voltage reference source. Must be a `VREF`

class `adafruit_mcp4728.MCP4728 (i2c_bus, address=96)`

Helper library for the Microchip MCP4728 I2C 12-bit Quad DAC.

Parameters

- **i2c_bus** (*I2C*) – The I2C bus the MCP4728 is connected to.
- **address** – The I2C slave address of the sensor

save_settings ()

Saves the currently selected values, Vref, and gain selections for each channel to the EEPROM, setting them as defaults on power up

sync_gains ()

Syncs the driver's gain state with the DAC

sync_vrefs ()

Syncs the driver's vref state with the DAC

class `adafruit_mcp4728.Vref`

Options for vref

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