

AN071: Using the MAX14912PMB with TCM-0960-MotionPy

Document Revision V1.00 • 2021-July-08

This document introduces the usage of MAX14912PMB with the TCM-0960-MotionPy. The MAX14912 peripheral module provides the hardware to evaluate the MAX14912 octal digital output driver. The functionality and the implementation in the MicroPython environment are introduced.

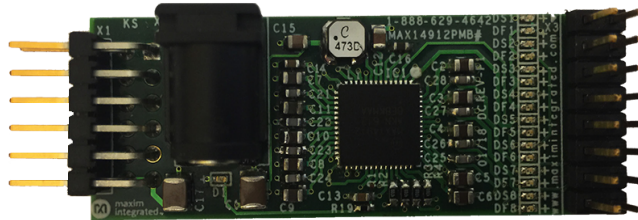


Figure 1: MAX14912PMB

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1 Introduction

The MAX14912PMB[1] provides the hardware to evaluate the MAX14912[2] octal digital output driver. It has eight 640mA smart highside switches that can also be configured as push-pull drivers for high-speed switching. For more information please refer to the MAX14912PMB[1] product page. The MAX14912PMB can be evaluated together with the TCM-0960-MotionPy V2.X[4]. Therefore, some basic functions have been implemented in Python to use this setup in a MicroPython environment. This document will give a brief introduction on how to start up the example and use the basic functions of the module.

2 Requirements

- Set up TCM-0960-MotionPy V2.X [4] as shown in AN061 [3]
- Terminal connection to TCM-0960-MotionPy board
- Wire up MAX14912PMB [1]
- 24V DC power supply

3 Connecting the PMOD board

In this implementation, the MAX14912[2] is addressed using command mode SPI. This is configured by pulling CMND and SRIAL to high on the MAX14912. On the MAX14912PMB[1] SRIAL is wired directly to Vdd so only CMND has to be set. There are multiple options to wire up the MAX14912PMB to the TCM-0960-MotionPy board. The default connection configuration is shown in Table 2 and corresponds to the PMOD-0 connector on the TCM-0960-MotionPy V2.X[4].

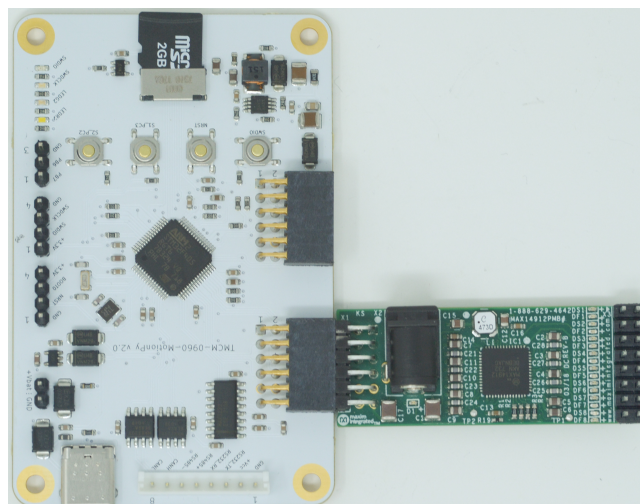


Figure 2: MAX14912PMB connected to TCM-0960-MotionPy V2.X



MAX14912PMB	Pin	Description
SCLK	SCLK(1)	Serial Clock
MISO	MISO(1)/SDI(1)	Serial data in
MOSI	MOSI(1)/SDO(1)	Serial data out
CS	A4	Chip Select
FLTR	C6	Glitch Filter Enable Input
CMD	C13	Command Mode SPI Input/IN2 Logic Input

Table 2: Standard wiring configuration

4 Structure and functions

The MAX14912[2] can be used in multiple communication modes. This implementation uses command mode spi in which the IC is configured and monitored by the corresponding registers. The communication, as well as some useful functions, have been implemented in the max14912.py[5] script. For more information about the TCM-0960-MotionPy and its filesystem have a look at AN061. To read and write the registers you can use the functions `write_register(register, value)` and `read_register(register, cl_fault_regs)`. If you want to set a specific output nr(0-7) to HIGH(1) or LOW(0) use the function `set_output(nr, value)`. For a full list of the registers and the corresponding functions have a look at the max14912 datasheet[7].

5 Running the example

To start you can use the example script max14912pmb.py[6]. Start by connecting the MAX14912PMB to the TCM-0960-MotionPy. Provide 24V power to the MAX14912PMB. Connect the TCM-0960-MotionPy to your PC and start a terminal connection. You can start the example script with the command:

```
1 exec(open("PyTrinamicMicro/platforms/motionpy2/examples/modules/max/
  ↳ max14912pmb.py").read())
```

Otherwise, open the example script and edit the pins. The script first switches the output one by one to HIGH state and then back to LOW state again. This will cycle till the script is terminated by the user. The script should now display :

```
1 MAX14912PMB example running
3 Switching everything to HIGH
  Switching everything to LOW
5 Switching everything to HIGH
...

```

Feel free to modify and play around with the example. Have fun exploring the features.

6 References

- [1] MAX14912PMB product page:
www.maximintegrated.com/en/products/power/mosfet-drivers-controllers/MAX14912PMB.html
- [2] MAX14912 product page:
www.maximintegrated.com/en/products/power/mosfet-drivers-controllers/MAX14912.html



- [3] Application Note AN061-TMCM_0960_Module:
www.trinamic.com/products/modules/details/tmcm-0960-motionpy/
- [4] TMCM-0960-MotionPy product page:
www.trinamic.com/products/modules/details/tmcm-0960-motionpy/
- [5] Path to max14912.py:
PyTrinamicMicro/platforms/motionpy2/modules/max/max14912.py
- [6] Path to max14912pmb.py:
PyTrinamicMicro/platforms/motionpy2/examples/modules/max14912pmb.py
- [7] MAX14912 datasheet:
datasheets.maximintegrated.com/en/ds/MAX14912-MAX14913.pdf



7 Supplemental Directives

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8 Revision History

Version	Date	Author	Description
V1.00	03.05.2021	JH	Initial release version

Table 3: Document Revision

