MC-EX-AQ4 Expansion Module

Analog Output

Startup Guide

Startup Guide

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Introduction

SensOper MC-EX-AQ4 expansion module is an Analog Output module can be use with CPU module.

This Analog Output module was implemented for convert digital signal analog format and send to load by a 13 bit DAC.

SPI interface enable communication with CPU module.

DIP switches were integrated for change the chip selection address.

This module internal operation power is 24V DC / 30mA.

The 40 pin board to board connectors were included for make connection between CPU module or other expansion modules.

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1. Connecting with Power and Output Terminals

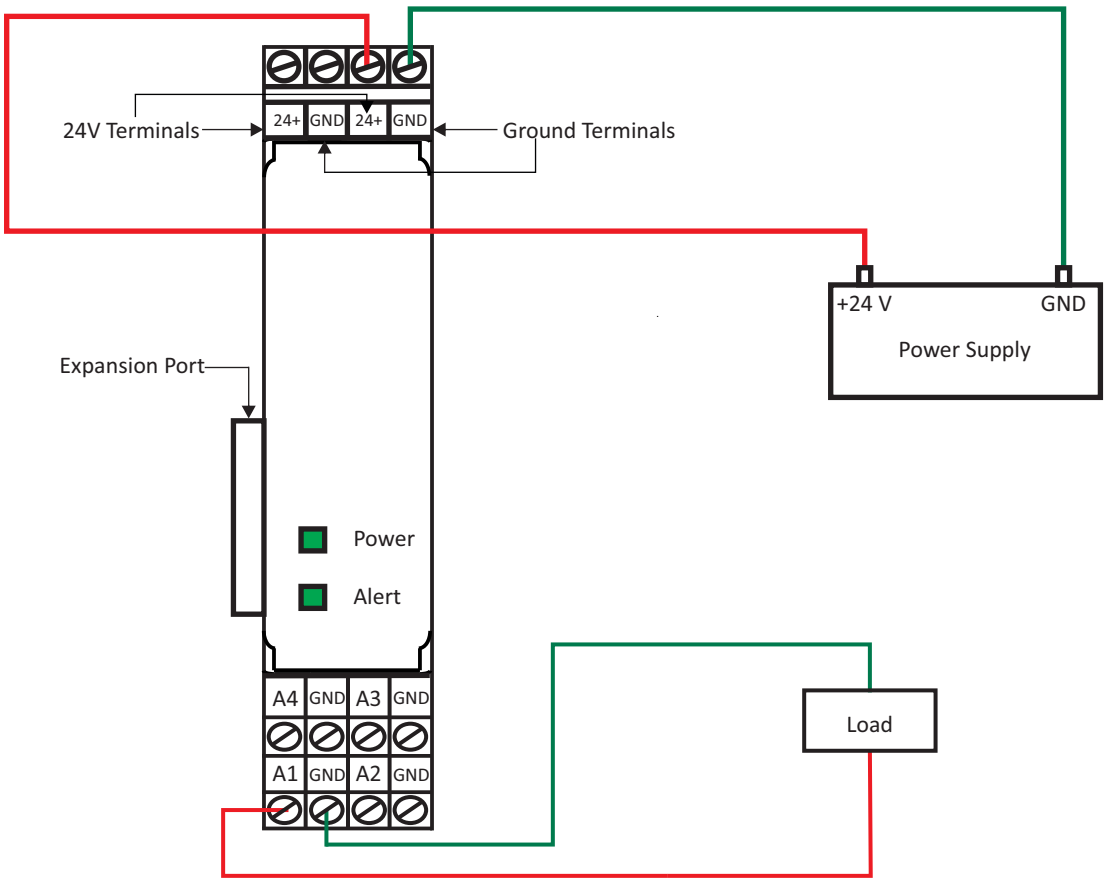

Figure 1(a): Analog Output Expansion module power up and output terminals wiring.

***Make sure not turn on all DIP switches at same time.**

CPU Module and Expansion Module GPIO Connection Diagram

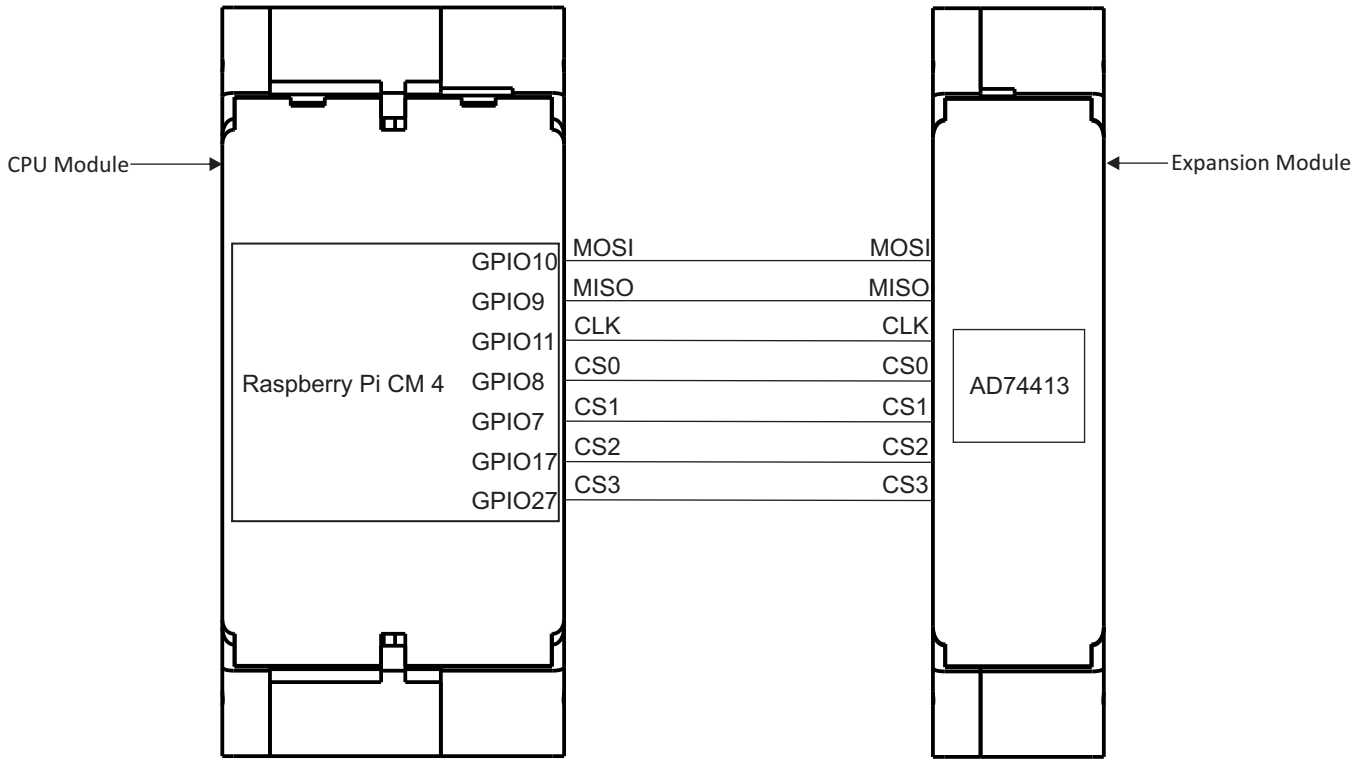

Figure 1(b): The GPIO connection with CPU module and Expansion Module.

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Table 1: Chip Select GPIO pins

Chip Selection GPIO	DIP Switches			
	1	2	3	4
GPIO 17	OFF	OFF	OFF	ON
GPIO 27	OFF	OFF	ON	OFF
GPIO 8	OFF	ON	OFF	OFF
GPIO 7	ON	OFF	OFF	OFF

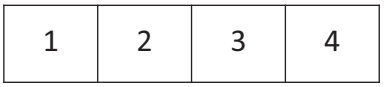

Figure 2: DIP Switches Arrangement

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2. Run Example Program

1. After following Figure 1(a),(b) diagram instructions in previous sections 1 . Connect a Analog Output Expansion module in to the 40 pin board to board connector in CPU Module (Explained in MC-CPU-CM4-Gx datasheet).
2. Change the DIP switches for select a chip according to Table 1.
3. Follow the **File Manager > Pi > Rpi_Moduler_test** path, then open **Rpi_Moduler_test** folder.
4. In **Rpi_Moduler_test** folder include example program for every expansion module.
5. Select the **MC_EX_Aout_10volt.py** example program that matches with the Analog Outputs expansion module shown in Figure 3.

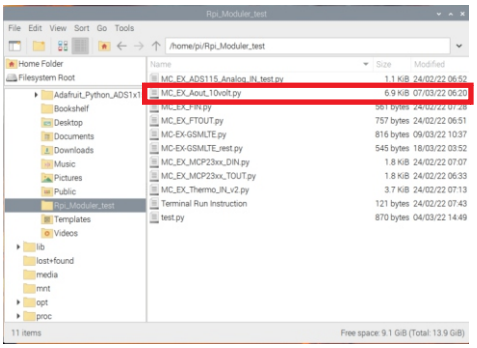

Figure 3: The example programs for expansion modules.

6. Change the GPIO pin number in **MC_EX_Aout_10volt.py** file line 85 according to selected chip according to Figure 4 shows below (Refer Table 1 for get GPIO pin number).

```
def read_reg(register_add,d_in):

    if ((register_add>0x2F  and register_add < 0x3C)or (register_add == 0x42) or (register_add > 0x46)):

        time.sleep(0.2)

    GPIO.output(8, GPIO.LOW) #chip1 select

    #print(hex(register_add))

    p = register_add
    q = (d_in >> 8) & 0xFF
    r = d_in & 0xFF
    #print(p,q,r)

    trandata = np.array([p,q,r])
```

Figure 4: Chip Select GPIO .

7. The python program will open on default Thonny Python IDE. Click RUN for start the program shown in Figure 5.

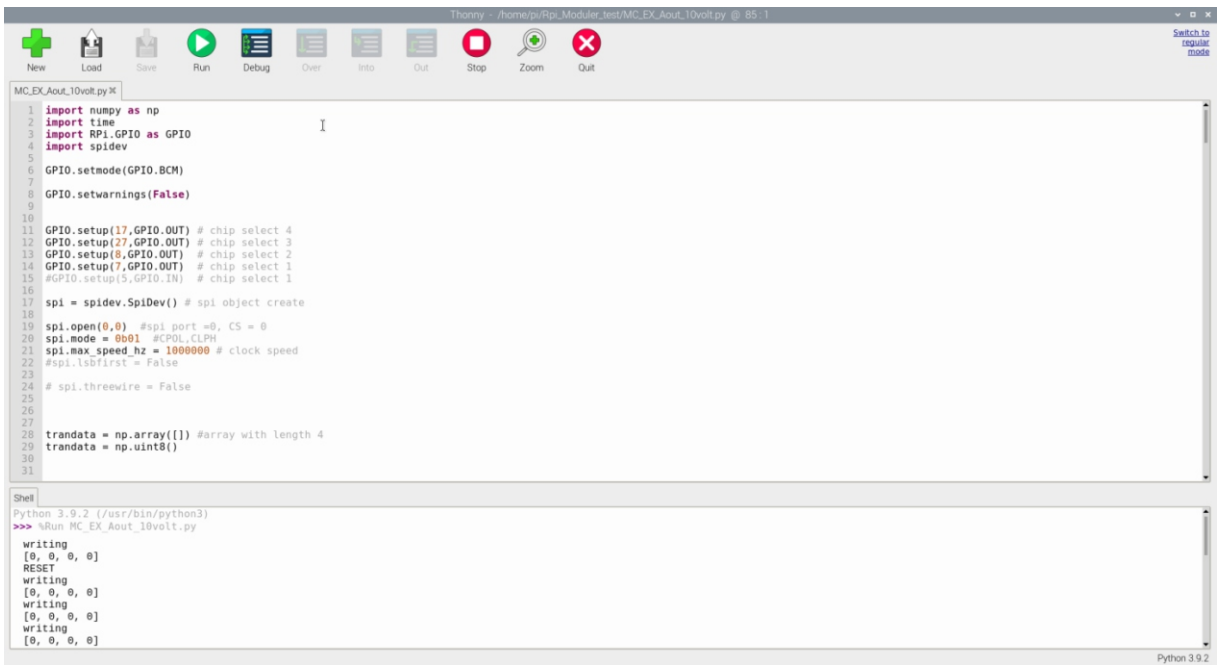

Figure 5: Analog Output example code run on Thonny Python IDE.

Table 1: The DIP switch setup

CHIP Select	DIP Switch			
	1	2	3	4
GPIO17	OFF	OFF	OFF	ON
GPIO27	OFF	OFF	ON	OFF
GPIO8	OFF	ON	OFF	OFF
GPIO7	ON	OFF	OFF	OFF

DIP Switch Arrangement

1	2	3	4

INPUT 1 - 4

***Read the Product label for more details about DIP switch configuration.**

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3. Revision History .

The table shown below include the revision history of this document.

Revision Number	Date	Substantial Changes
0	18/3/2022	First Edition of Startup guide
1	-	-

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