Raspberry Pi Stack Exchange is a question and answer site for users and developers of hardware and software for Raspberry Pi. It's 100% free, no registration required.

Take the 2-minute tour   ×

How to get an SPI Analog-to-Digital (MCP3204) working with the GPIO?

I have an MCP3204 12-bit Analog-to-Digital Converter (ADC), and a Raspberrypi.
Does anyone know what I need to plug where to get them to communicate?
Is there an SPI python library I can use?
O am looking to use the onboard GPIO spi which is faster than bit-bangging.

Schematic of MCP3204

Pin Diagram of The PI:

3.3V	1	2	5V
I2C0 SDA	3	4	DNC
I2C0 SCL	5	6	GROUND
GPIO4	7	8	UART TXD
DNC	9	10	UART RXD
GPIO 17	11	12	GPIO 18
GPIO 21	13	14	DNC
GPIO 22	15	16	GPIO 23
DNC	17	18	GPIO 24
SP10 MOSI	19	20	DNC
SP10 MISO	21	22	GPIO 25
SP10 SCLK	23	24	SP10 CE0 N
DNC	25	26	SP10 CE1 N

gpio   python   sensor   electronics   analog-to-digital

edited Jun 4 '13 at 9:08

asked Jun 3 '13 at 15:49

GuySoft
387   2   14

2 Answers

Ok, It seems like I found a way.

First, make sure the spi module is enabled. In the file `/etc/modprobe.d/raspi-blacklist.conf` comment out the line:

```
#blacklist spi-bcm2708
```

There is a project called webiopi. The project has a python lib that supports a couple ADCs. The supported ADCs are listed in this page and include the MCP3204. To install just the python library I used:

```
wget https://webiopi.googlecode.com/files/WebIOPi-0.6.0.tar.gz
tar xzvf WebIOPi-0.6.0.tar.gz
cd WebIOPi-0.6.0/python
sudo python setup.py install
```

(though I used a virtualenv).

Then I could pull data from the PI using this script, **run as SUDO**:

```
from webiopi.devices.analog import MCP3004, MCP3008, MCP3204, MCP3208

# Setup a MCP3204 on SPI CE0
mcp0 = MCP3204()
print mcp0.analogReadAllVolt()
```

The wiring is as follows (from ADC to Pi):

1. Vcc and Vref to +3.3
2. Analog Ground to Ground
3. SCLK to SP10 SCLK
4. CS/SHDN to SP10 CE0 N
5. CH0 to some resistor (or what you want to measure)
6. Digital ground to ground
7. Din to SPI MOSI
8. Dout to SPI MISO

Here is a diagram showing a similar connection I made once to an an AVR to show the pinout of the MCP3204:
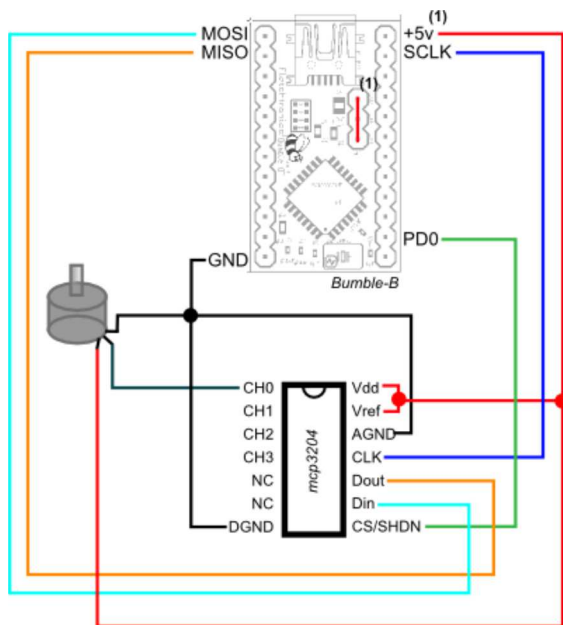
Would love to hear your comments.

edited Jun 28 '13 at 8:35   answered Jun 28 '13 at 1:32
                                    GuySoft
                                    387   2   14

Try WiringPi2-Python from here: https://github.com/Gadgetoid/WiringPi2-Python

You will need to download and build WiringPi first:

```
git clone git://git.drogon.net/wiringPi && cd wiringPi && sudo ./build
```

Then try something like this:

```
import wiringpi2 as wpi
wpi.wiringPiSetup()
wpi.mcp3002Setup(70,SPI_CHANNEL)
value = wpi.analogRead(70)
```

answered Jun 4 '13 at 11:14
Phil Howard
11   1

I saw plenty of articles about the mcp3002, just to make sure - the interface to them is Identical? because they have different bit sizes (12bit vs 10bit). – GuySoft Jun 4 '13 at 12:34

Ok, got WiringPi2-Python, but it does not work. The source shows its specific to mcp3002. Can anyone confirm this? – GuySoft Jun 27 '13 at 23:52