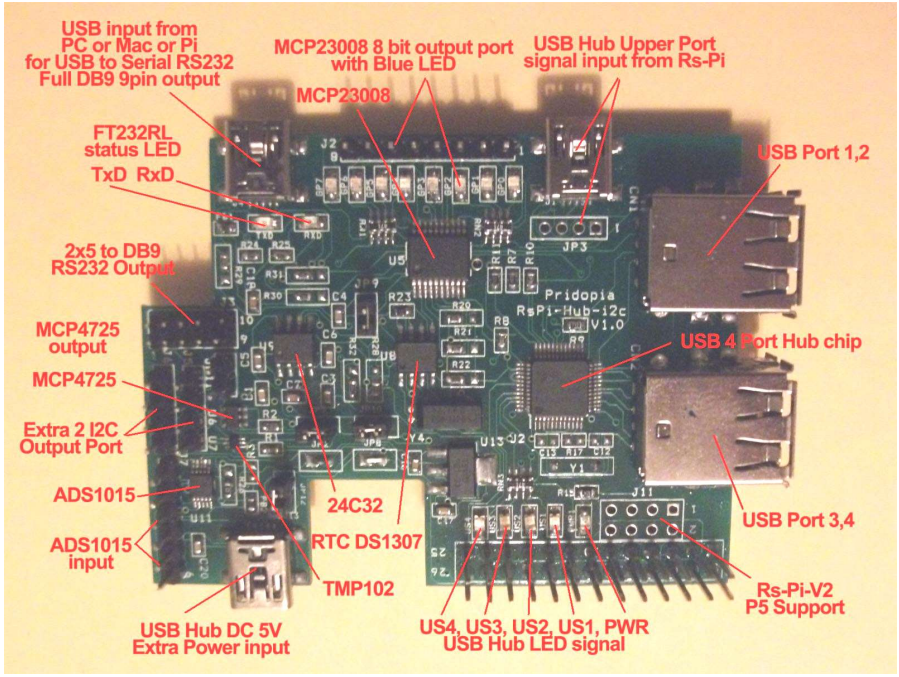
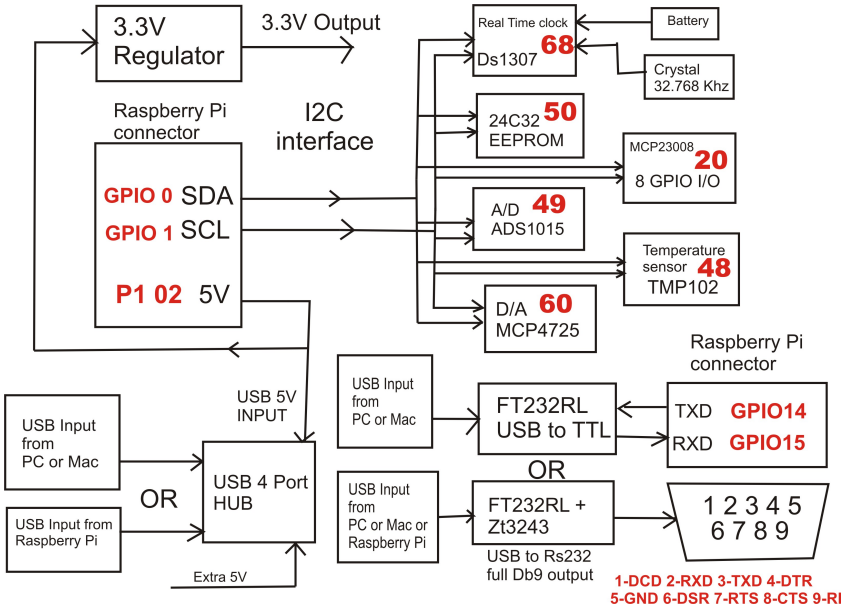
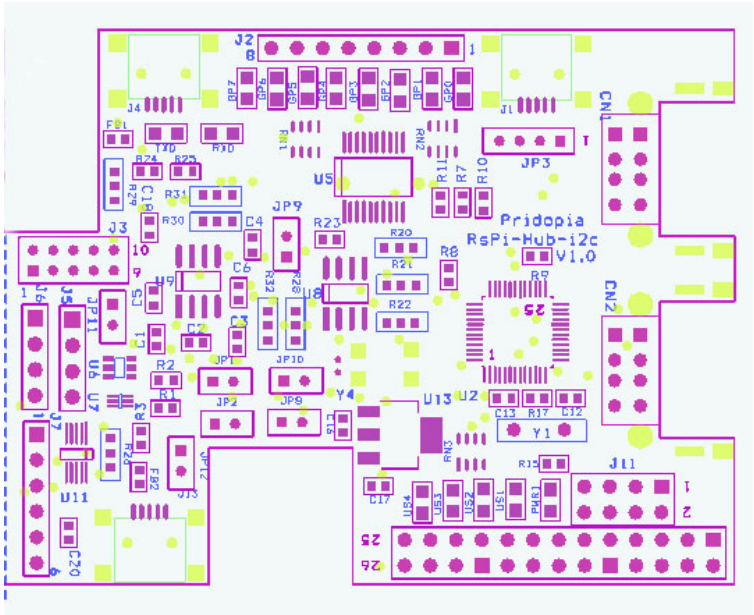
Rs-Pi USB- 4 Hub & I2C –RS232 User Manual







1. U5 **MCP23008 8 GPIO output**

J2 (GP0 ~ GP7) OUTPUT & GP0,GP1,GP2,GP3,GP,GP5,GP6,GP7 (8 LED OUTPUT) R20,R21,R22 (A0,A1,A2) address select

JP9 Disable Jumper

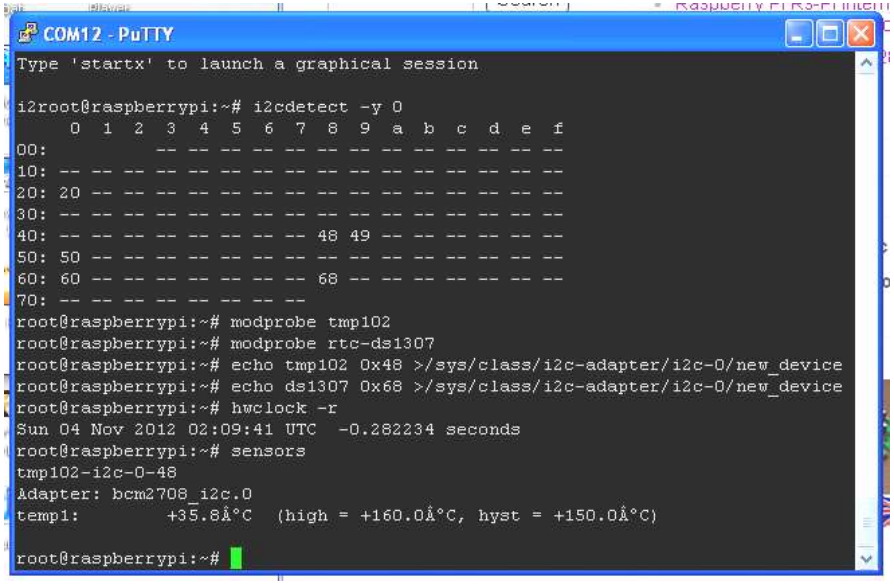
2. U8 RTC **DS1307** with CR1220 Battery
3. U7 **TMP102** Temperature Sensor
4. U9 24C32 32Kbit EEPROM **JP10** Disable Jumper
5. U6 **MCP4725** 12bit Digital-to-Analog Converter , JP11 (AOUT, GND) **JP1** Disable Jumper
6. U11 **ADS1015** 12bit Analog-to-Digital Converter ,

J7 INPUT (AIN0, AIN1,AIN2,AIN3,GND,3V3) **JP12** Disable Jumper

7, J5 (5V, GND,SCL,SDL) J6(3v3,GND,SCL,SDL) I2C output
8. U2 - USB 4 Ports HUB chipset

J1 (JP3) USB HUB upper port signal input from Rs-Pi

9. J13 Mini USB 5V input for USB HUB, you don't need plug 5V , the HUB already use 5V from Raspberry Pi, if your use USB device need more power, then you can plug-in 5V in this port.



i2c bus device detect status and active TMP102 & RTC DS1307

48 -> tmp102 50 -> 24c32 60 -> MCP4725 68 -> RTC DS1307

49 -> ads1015 20 -> 23008

10. U10 **FT232RL** & U12 **ZR3243** J4 USB input from PC or Mac or RS-Pi for USB to RS232 COM port, just connect a cable (5pin mini USB-B to A USB) then you have DB9 full 9pin RS232 function.

U12 **ZR3243** RS232 Transceiver Driver , You can have DB9 full 9pin RS232 output for PC or Mac or RS-Pi USB cable input .

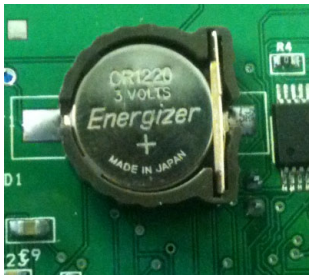
11. J11 for RS-Pi V2 GPIO connector (got 4 more GPIO pin)

First Install battery for RTC , " + " mark on top

RTC DS1307 - 68 in i2cdetect –y 0 or i2cdetect –y 1 for Rs-Pi V2 you will see

68 in the screen 68 -> RTC DS1307

48 -> tmp102



This requires a Raspberry Pi running a kernel with the RTC module and DS1307 module included. This is not true of the "Wheezy" distros

or Occidentalis v0.1. This is for use with Occidentalis v0.2 or greater

then, load up the RTC module by running

sudo modprobe rtc-ds1307

Then, as root (type in **sudo bash**) run

echo ds1307 0x68 > /sys/class/i2c-adapter/i2c-0/new_device (if you have a rev 1 Pi)

echo ds1307 0x68 > /sys/class/i2c-adapter/i2c-1/new_device (if you have a rev 2 Pi)

hwclock –r **read time**

hwclock –w **write time to RTC**

*TMP102 information

modprobe tmp102

echo tmp102 0x48 > /sys/class/i2c-adapter/i2c-0/new_device

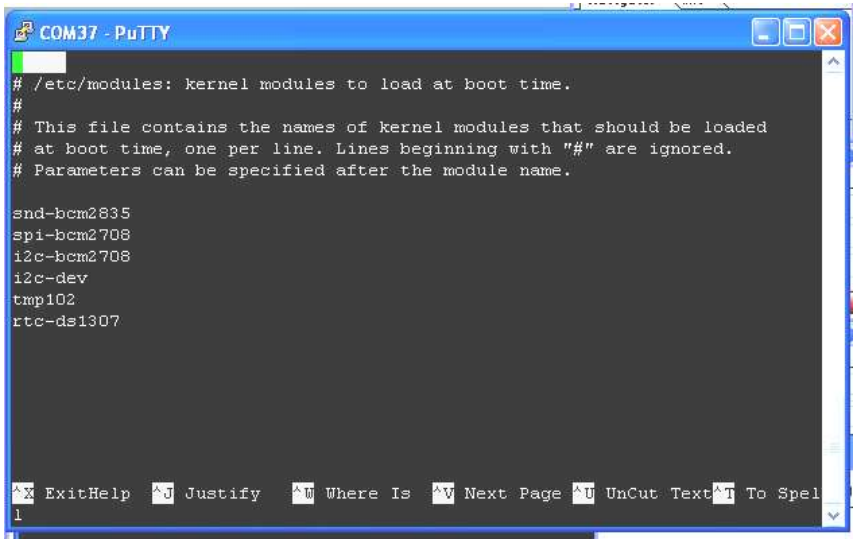
(if you have a rev 1 Pi)

echo tmp102 0x48 > /sys/class/i2c-adapter/i2c-1/new_device

(if you have a rev 2 Pi)

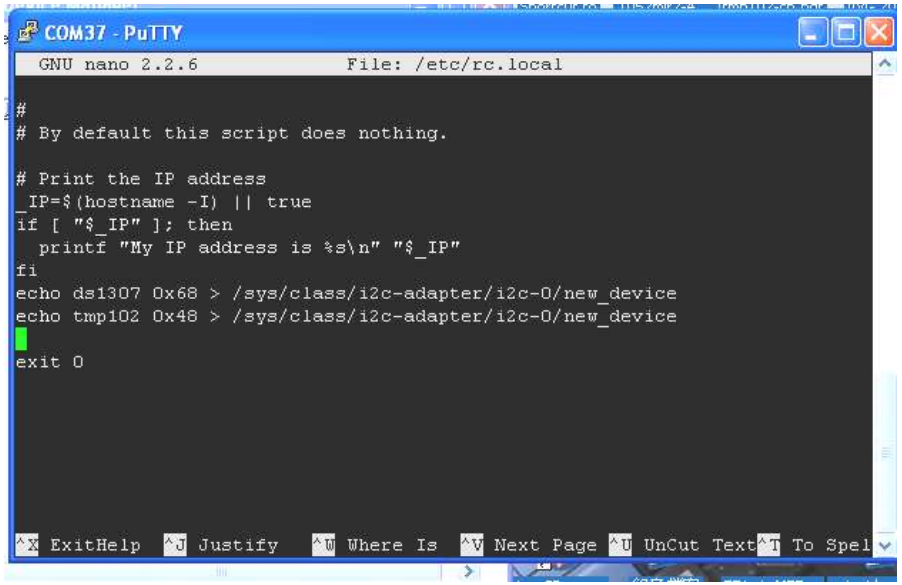
sensors **show the temp**

you'll want to add the RTC kernel module & temp tmp102 to the /etc/modules list, so its loaded when the machine boots. Run **sudo nano /etc/modules** and add **rtc-ds1307 & tmp102** at the end of the file



Then you'll want to create the DS1307 device creation at boot, edit /etc/rc.local by running
sudo nano /etc/rc.local

and add **echo ds1307 0x68 > /sys/class/i2c-adapter/i2c-0/new_device** before **exit 0**



* Adafruit **Occidentalis v0.2** image support the TMP102 and RTC DS1307 if you need this driver, you can choose this.

The image can be download from
http://learn.adafruit.com/adafruit-raspberry-pi-educational-linux-distro/occidentalis-v0-dot-2

tmp102 information

http://www.element14.com/community/groups/raspberry-pi/blog/2012/07/26/is-it-done-yet-temperature-sensing-with-the-raspberry-pi#comment-16249

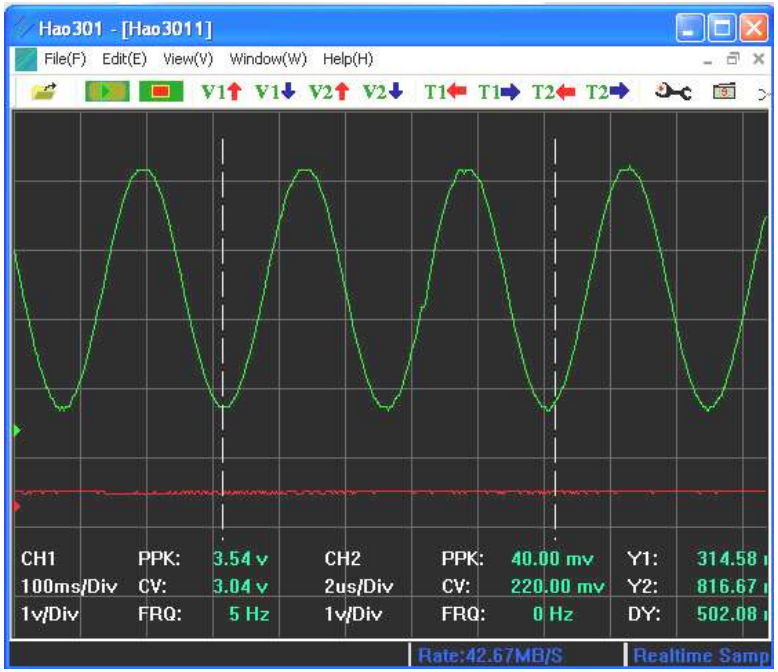
http://www.agilart.com/blog/tmp102-raspberry-pi

http://donalmorrissey.blogspot.co.uk/2012/09/raspberry-pi-i2c-tutorial.html

* MCP4725 Digital to Analog Converter but our address are “60” all the sample can Download from our web site.

http://learn.adafruit.com/mcp4725-12-bit-dac-with-raspberry-pi

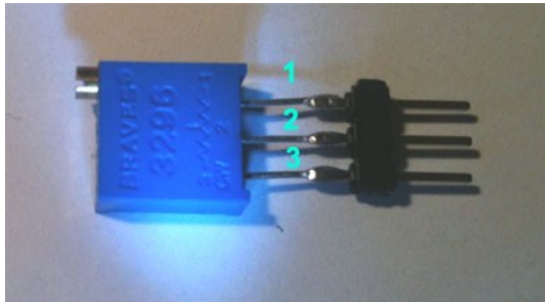
JP11 for analog output JP11 pin 1,2 (AOUT, GND)

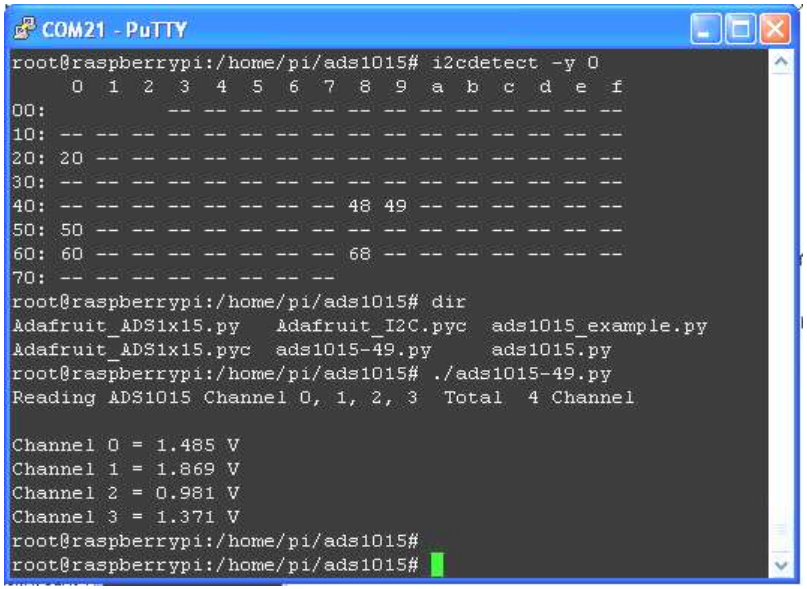


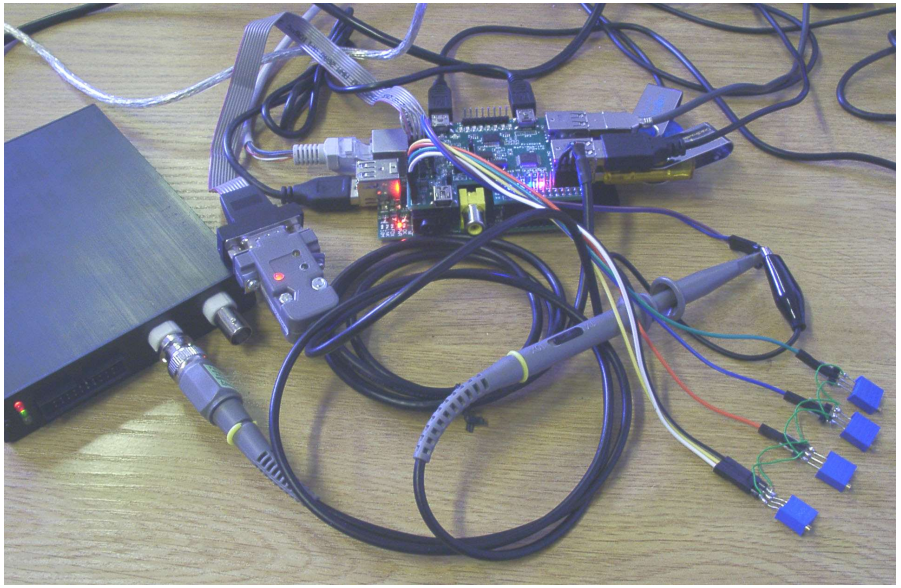
*** ADS1015 12bit Analog-to-Digital Converter**
demo 12 bit 4 channel input ads1015-49.py at address "49"

J7 INPUT (AIN0, AIN1,AIN2,AIN3,GND,3V3)

AIN0, AIN1, AIN2, AIN3 connect to **trimpot 10K OHM pin 2**
pin1 3v3 pin3 GND

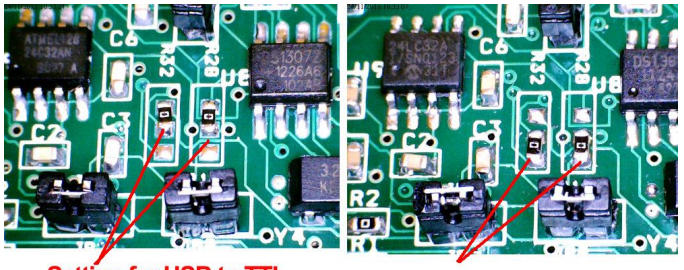






ADS1015 use 4 trimpot 10K OHM for 4 channel Analog input
MCP4725 output to USB Digital Oscilloscope

*** FT232RL the driver for USB to TTL can download from our web site, use this function , you need plug –in USB cable install driver first, then plug-in Rs-Pi hub board to Rs-pi board. * the USB to RS232 you can choose USB from PC or Mac or Rs-Pi, then your PC or Mac or Rs-Pi can have RS232 port full 9pin DB9**



Change R28 ,R32 you can change USB-TTL or USB-RS232 function

*** USB-TTL console function, access you Rs-Pi by a normal USB A to USB Mini B cable**
*** USB-RS232 make your PC or Mac or Rs-Pi have full function 9 pin RS232 Port**

For PC or Mac if you need driver you can download from our web site in number 19 FT232RL chipset

http://www.pridopia.co.uk/support.html

also the all the information for FT232RL
http://www.ftdichip.com/Products/ICs/FT232R.htm

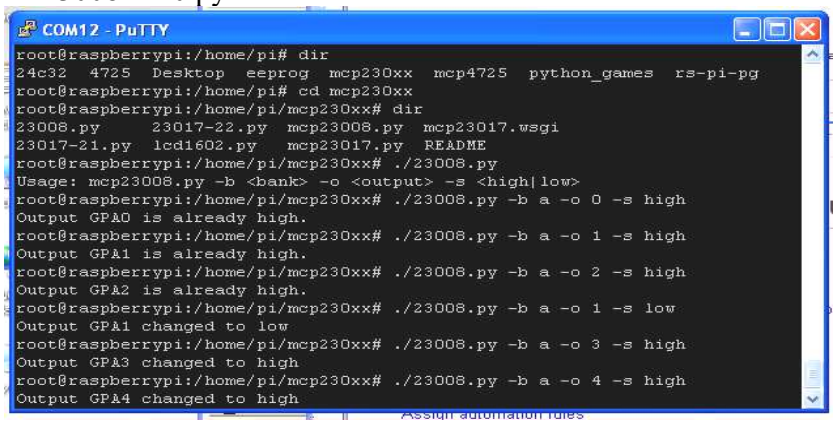
Driver for PC or Mac from FTDI web site
http://www.ftdichip.com/FTDrivers.htm

- **23008 23008 8 bit GPIO**

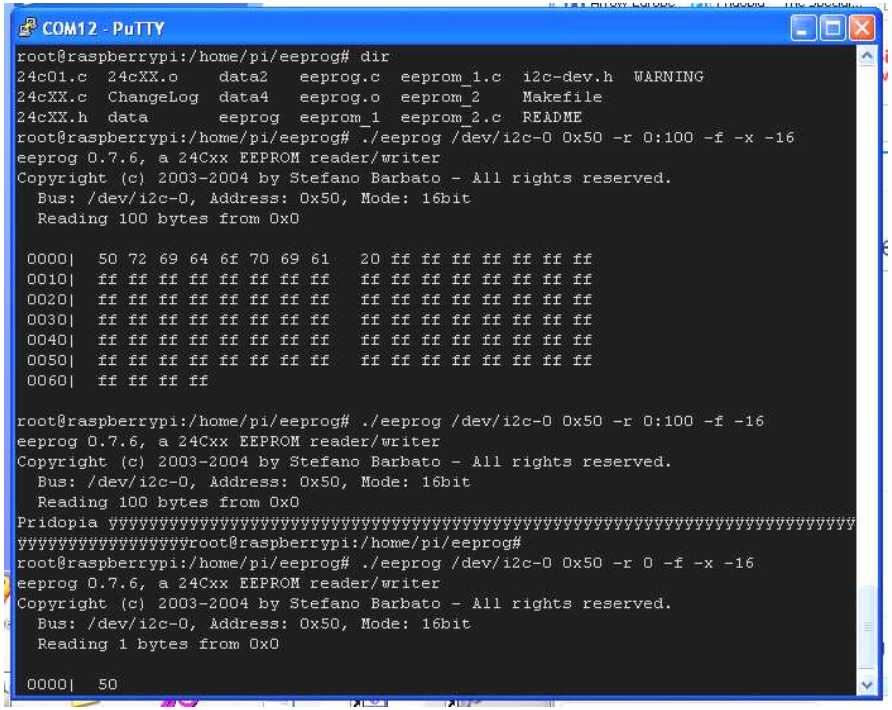
use 23008.py can set each bit output high or low

use 23008-20.py LED chaser program for Rs-Pi V1

use 23008-1-20.py for Rs-Pi V2



- **24c32 EEPROM**



use eeprog 0.7.6 can read/write for 24c32 or 24cxx

The Program can be download from

http://www.codesink.org/eeprog.html

To keep Rs-Pi USB Hub board working properly, you need make sure the Vcc input for Rs-Pi above 4.75V,
JP3 pin 1 Vcc, pin4 GND

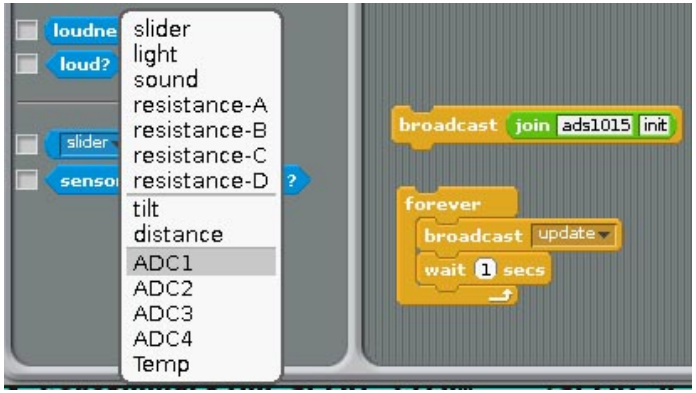
Package Content

1x Rs-Pi USB Hub & I2C AD/DA & FT232RL-R1 board
2x USB to MINI USB hub input cable (for USB Hub input & Power input)
1x 2.0mm pitch 2x5 to DB9 com port cable with 30cm length
1x CR1220 3V Battery
1x Manual

New Pridopia scratch interface software you can download from our web site
http://www.pridopia.co.uk/rs-pi-set-scratch.html

(1) i2c address 49 adc ads1015 4 channel input test

i2c adc ads1015 12bit Analog-to-Digital Converter



1. command "ads1015init" initial ADS1015
2.after broadcast "Update" in Sensing --> Slider , you will see the ADC1, ADC2,ADC3, ADC4 in the list

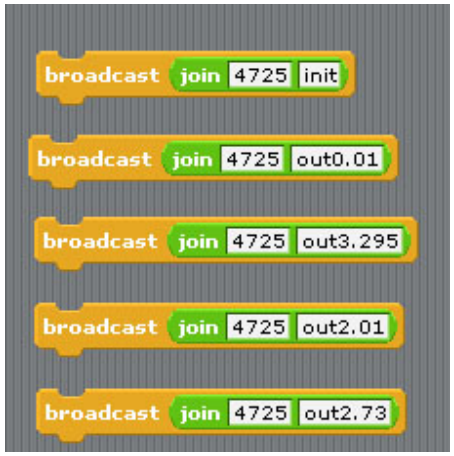
(2) EEPROM i2c address 50 24c32 read/write

command "EEP" + start address x, start address y + " message"
--> EEP 0x00 0x00 pridopia eeprom test
The System will open a new screen for EEPROM editor , need waiting about 10 seconds

(3) DAC MCP4725 12bit Digital-to-Analog Converter

JP11 (AOUT, GND) i2c address 60

demo our 4Hub/7Hub AD/DA board , AD/DA module board




```
Command "4725init" initial  DAC mcp4725
Command "4725out" + "voltage"
 voltage range "DC 0.01V to DC 3.29V"
command "4725out2.73"   DC output 2.73V
```