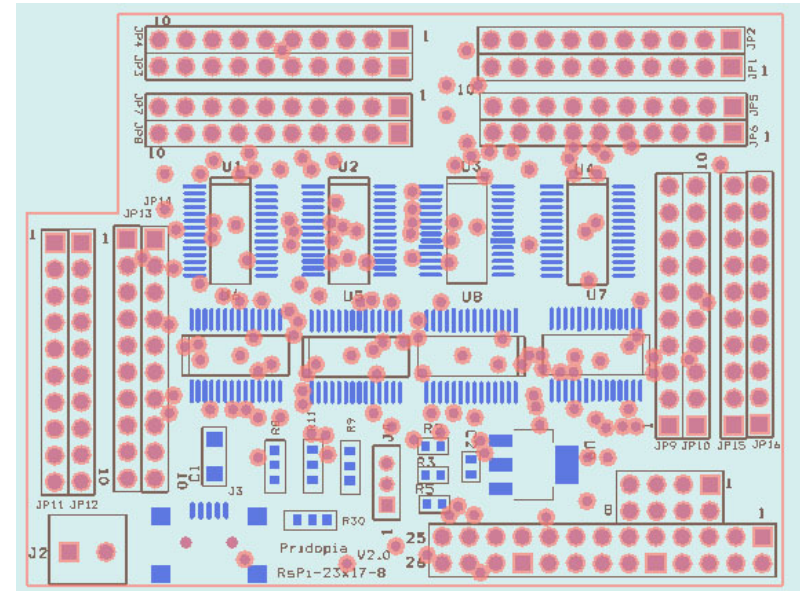
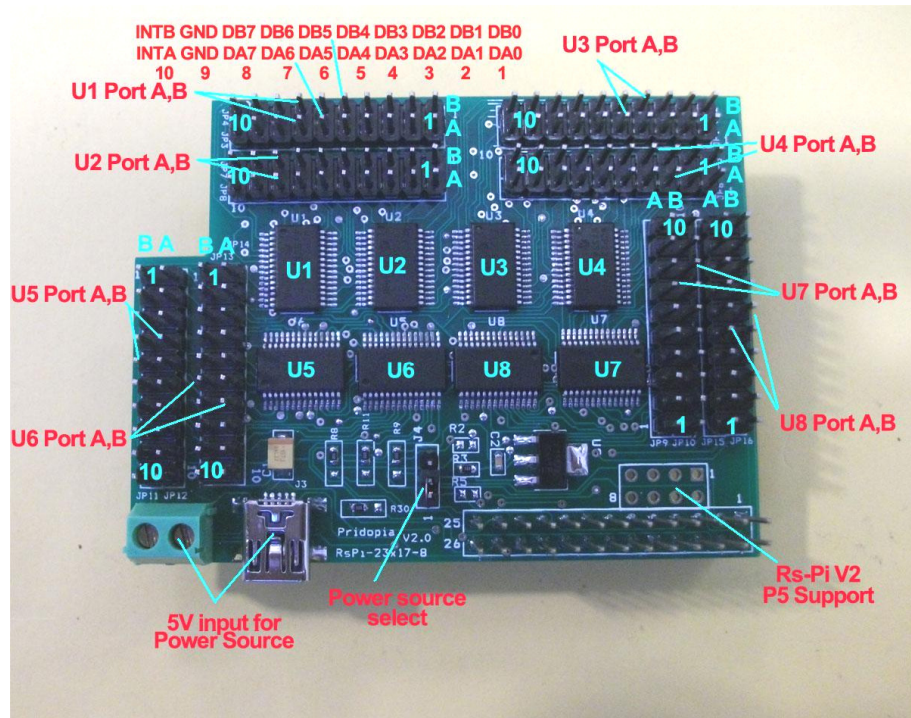


# Rs-Pi – I2C 23017-8 v2.0 User Manual



1. Make sure you I2C driver are enable

To enable it all you need to do is comment out a line by putting # in front

`sudo nano /etc/modprobe.d/raspi-blacklist.conf`

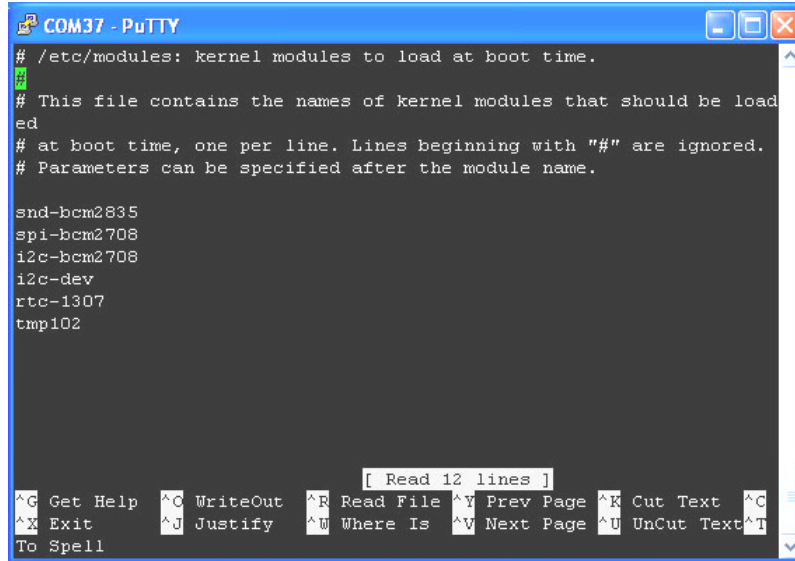
1. J16 Mini USB 5V input for board Power source
2. J3 2P Treminal Block 5V input for board Power source
3. J4 jumper select Power source from Raspberry Pi P1 or External
4. 1.6A Polyswitch Fuse for 5V V+ protect
5. JP4 - U1 Port A, JP3 - U1 Port B, JP7 - U2 Port A, JP8 - U2 Port B
6. JP2 - U3 Port A, JP1 - U3 Port B, JP5 - U4 Port A, JP6 - U4 Port B
7. JP11- U5 Port A, JP12 - U5 Port B, JP13 - U6 Port A, JP14 - U6 Port B
8. JP16 - U7 Port A, JP15 - U7 Port B, JP10 - U8 Port A, JP9 - U8 Port B
9. U1 (20) 23017 -1 Port A,B U2 (21) 23017-2 Port A,B
10. U3 (22) 23017 -3 Port A,B U4 (23) 23017-4 Port A,B
11. U5 (24) 23017 -1 Port A,B U6 (25) 23017-2 Port A,B
12. U7 (26) 23017 -3 Port A,B U8 (27) 23017-4 Port A,B
13. J18 Rs-Pi V2 GPIO output

```

COM37 - PuTTY
# blacklist spi and i2c by default (many users don't need them)
#blacklist spi-bcm2708
#blacklist i2c-bcm2708

[ Read 4 lines ]
^G Get Help ^O WriteOut ^R Read File ^Y Prev Page ^K Cut Text ^C
^X Exit ^J Justify ^W Where Is ^V Next Page ^U UnCut Text ^T
To Spell
    
```

2. Add i2c-dev in /etc/modules by use  
sudo nano /etc/modules

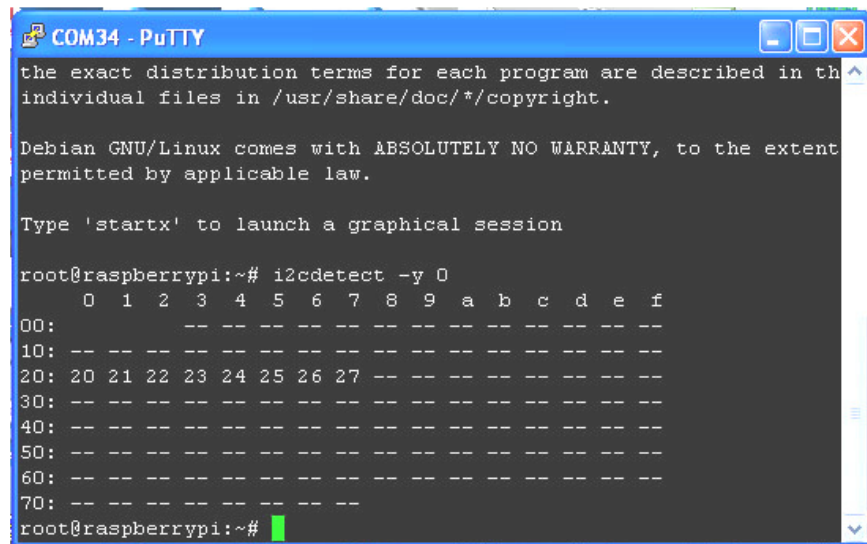


```
# /etc/modules: kernel modules to load at boot time.
#
# This file contains the names of kernel modules that should be load
ed
# at boot time, one per line. Lines beginning with "#" are ignored.
# Parameters can be specified after the module name.

snd-bcm2835
spi-bcm2708
i2c-bcm2708
i2c-dev
rtc-1307
tmp102
```

If you already install I2c driver , then

```
i2cdetect -y 0          i2cdetect -y 1
if Rs-Pi-v2 you need change 0 to 1
```



```
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

Debian GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent
permitted by applicable law.

Type 'startx' to launch a graphical session

root@raspberrypi:~# i2cdetect -y 0
 00: -- -- -- -- -- -- -- -- -- -- -- -- -- -- -- --
 10: -- -- -- -- -- -- -- -- -- -- -- -- -- -- -- --
 20: 20 21 22 23 24 25 26 27 -- -- -- -- -- -- -- --
 30: -- -- -- -- -- -- -- -- -- -- -- -- -- -- -- --
 40: -- -- -- -- -- -- -- -- -- -- -- -- -- -- -- --
 50: -- -- -- -- -- -- -- -- -- -- -- -- -- -- -- --
 60: -- -- -- -- -- -- -- -- -- -- -- -- -- -- -- --
 70: -- -- -- -- -- -- -- -- -- -- -- -- -- -- -- --
root@raspberrypi:~#
```

20, 21, 22 ,23,24,25,26 & 27 -> 23017 x8

Next install the python-smbus python module:

```
sudo apt-get install python-smbus
sudo apt-get install i2c-tools
```

Now you are ready to use the i2c with python.

### Some 23017 program information

<http://nathan.chantrell.net/20120524/python-tools-for-the-mcp23017-io-expander/>

<http://nathan.chantrell.net/20120602/raspberry-pi-io-expander-board>

<http://learn.adafruit.com/mcp230xx-gpio-expander-on-the-raspberry-pi/hooksing-it-all-up>

Download test program on our web site Python & C

Python

<http://www.pridopia.co.uk/pi-23017-8-lp.html>

C code

<http://www.pridopia.co.uk/pi-i2c-23017x2-2803x2.html>

<https://pypi.python.org/pypi/RPi.GPIO> GPIO library

GPIO library - RPi.GPIO-0.5.3a.tar.gz

### Install python , library and run the test program

```
# sudo apt-get install python-dev
```

```
# wget http://www.pridopia.co.uk/pi-pgm/RPi.GPIO-0.5.3a.tar.gz
```

```
# gunzip RPi.GPIO-0.5.3a.tar.gz
```

```
# tar -xvf RPi.GPIO-0.5.3a.tar
```

```
# cd RPi.GPIO-0.5.3a
```

```
# sudo python setup.py install
```

```
# sudo python xxx.py ( xxx is your python program name)
```

```

COM22 - PuTTY
Output test for MCP23017-8 128 GPIO
 8  7  6  5  4  3  2  1
A1 [0] [0] [0] [0] [0] [0] [0] [0]
A2 [1] [0] [0] [0] [0] [0] [0] [1]
B1 [0] [0] [0] [0] [0] [0] [1] [1]
B2 [1] [0] [0] [0] [0] [0] [0] [0]
C1 [0] [0] [0] [0] [0] [0] [0] [0]
C2 [1] [0] [0] [0] [0] [0] [0] [0]
D1 [0] [0] [0] [0] [0] [0] [0] [0]
D2 [1] [0] [0] [0] [0] [0] [0] [0]
E1 [0] [0] [0] [0] [0] [0] [0] [0]
E2 [0] [1] [0] [0] [0] [0] [0] [0]
F1 [1] [0] [0] [0] [0] [0] [0] [1]
F2 [0] [0] [0] [0] [0] [0] [0] [0]
G1 [0] [0] [0] [0] [0] [0] [0] [0]
G2 [0] [0] [0] [0] [0] [0] [0] [0]
H1 [0] [1] [0] [0] [0] [0] [0] [0]
H2 [0] [0] [0] [0] [0] [0] [0] [0]

Enter the Bank ( A-H ), Port ( 1-2 ) and LED number ( 1-8 ).
Type RES to Reset.
Example "A21" or "a21" will Toggle Bank A, Port 2, LED 1.
>

```

Our test program 23017-8port-s-v103.py

**Enter "RES" can reset and quit**  
**Enter "a21" u1, port b, bit 1 "ON"**

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

Command "i2"+"address(20-27)" + "a" +"bit(1 to 8)" for Port A  
 Command "i2"+"address(20-27)" + "b" +"bit(1 to 8)" for Port B  
 Command "bit"+"address(20-27)" + "a" +"bit(8 to 1)" for Port A  
 Command "bit"+"address(20-27)" + "b" +"bit(8 to 1)" for Port B

i221a1 --> i2c address 21 Port A bit 1 ON/OFF  
 i222b4 --> i2c address 22 Port B bit 4 ON/OFF

bit22b01010101 --> address 22 port B from bit 8 to 1  
 output --> 01010101  
 bit21a01010101 --> address 21 port A from bit 8 to 1  
 output --> 01010101  
 bit21aoff --> address 21 Port A all OFF/clear  
 bit21boff --> address 21 Port B all OFF/clear  
 bit22aoff --> address 22 Port A all OFF/clear



U1 to U2 i2c 23017 address 21,22