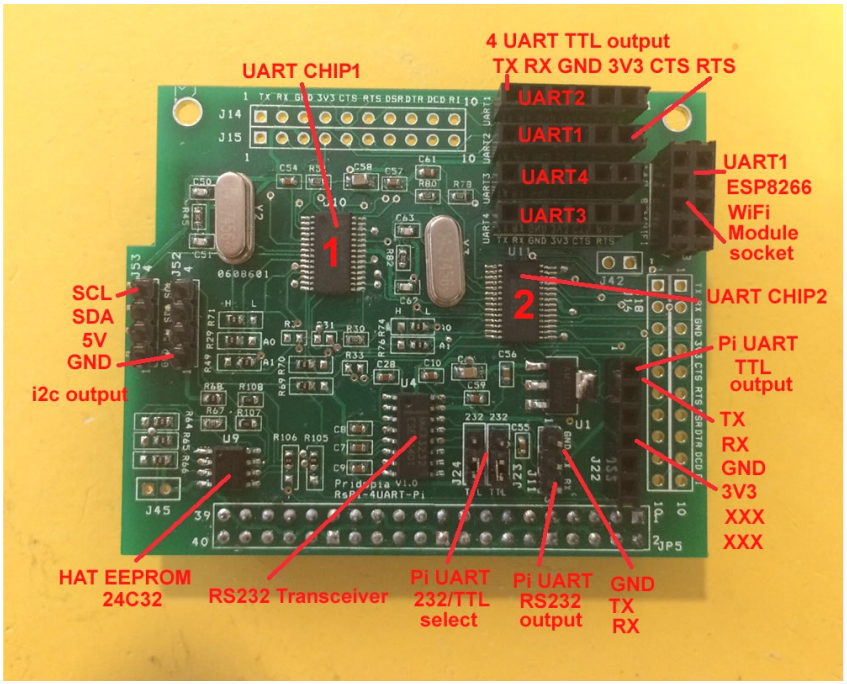
Raspberry Pi - extra 4 UART User Manual



1. provide extra 4 UART TTL output
- 4x UART TTL output TX,RX,GND,3V3,CTS,RTS

2. Pi UART can select TTL/232 output
- Pi UART RS232 output GND, TX, RX
- Pi UART TTL output TX,RX,GND,3V3,XX,XX

3. 2 set i2c signal out GND,5V,SDA,SCL for extend extra UART HAT
4. TTL UART1 support ESP8266 WiFi module socket
5. It provides an individual 3.3V power for UART & output port
6. Provide HAT EEPROM for future driver program update.

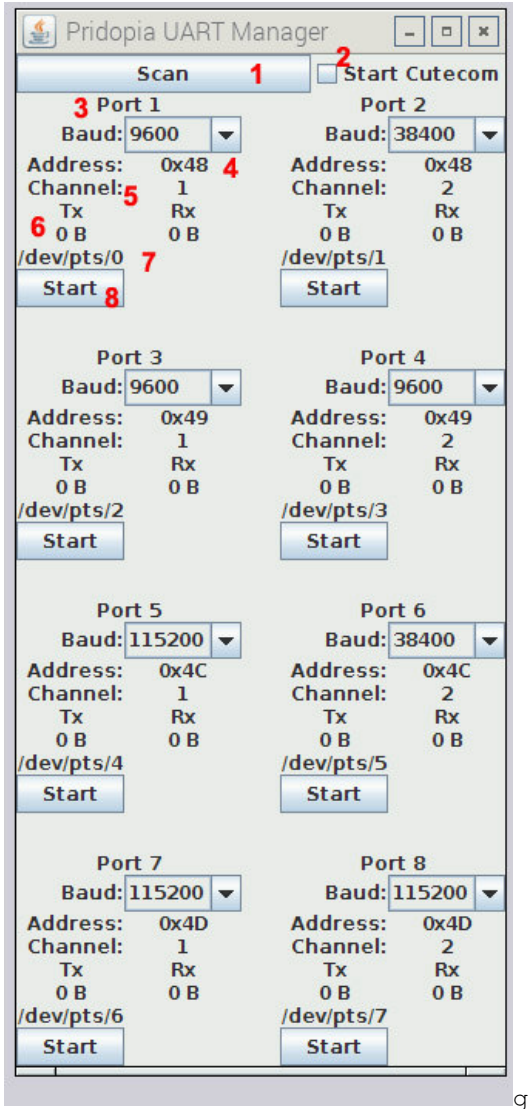
Configuration

There are two mini jumpers (0 ohm resister) to configure each chip for one of the following 7-bit I2C addresses:

0x48 A0 - H A1 - H 0X49 A0 - L A1 - H

0X4C A0 - H A1 - L 0X4D A0 - L A1 - L

GUI Java Base Serial port control panel



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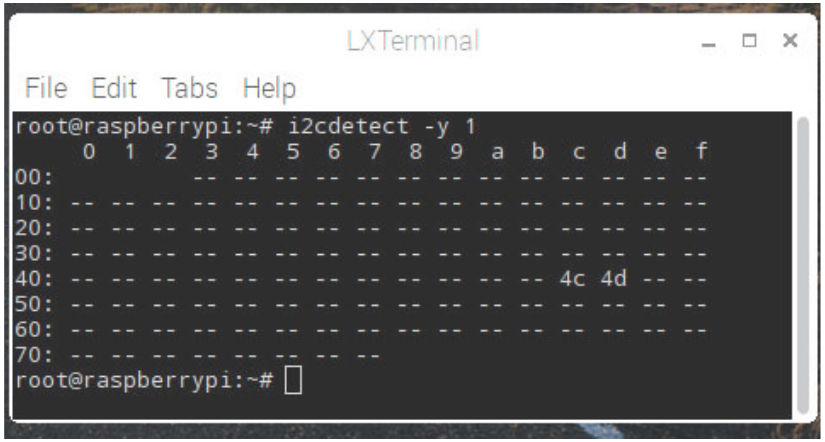
- 1. Scan: Scan for available UART devices.
- 2. Launch cutecom together when starting Serial Port.
- 3. Port number in system
- 4. Baud Rate choose
- 5.6.7. UART Port Information: Port Address 0x48,0x49, 0x4c, 0x4d
  Chip Address Location, Channel Number (1 / 2), TX and RX receive counter, and Serial port Location /dev/pts/X
- 8. Start : Start UART port

Provided is a terminal command mode to activate serial ports through a terminal / ssh.
You can also activate a serial port on boot up with the provided software.
Commands for starting the serial ports via command line;

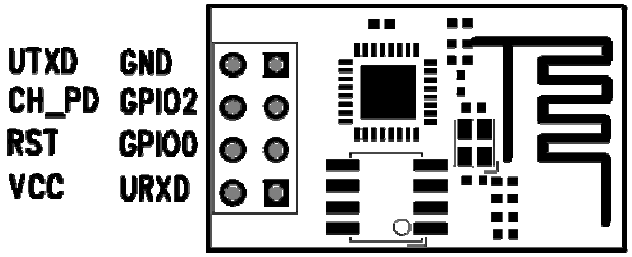
```
./Pi8s -a ADDR -c CHANNEL -b BAUD -s DEVPTS
ADDR = Address of Serial Port e.g. 0x48, 0x49, 0x4C,
and 0x4D
CHANNEL = Channel of serial Port ( 1 / 2 )
BAUD = Baud Rate for the Serial Port
DEVPTS = PICOM Service Number ( Will direct the
filename to /dev/picomX where X = your number )
```

For example, To start a serial port from 0x49, on channel 2 with 115200 Baud run the following;

```
./Pi8s -a 0x49 -c 2 -b 115200 -s 1
This will activate the serial port and then set
/dev/picom1 to your serial port location /dev/pts/X
```

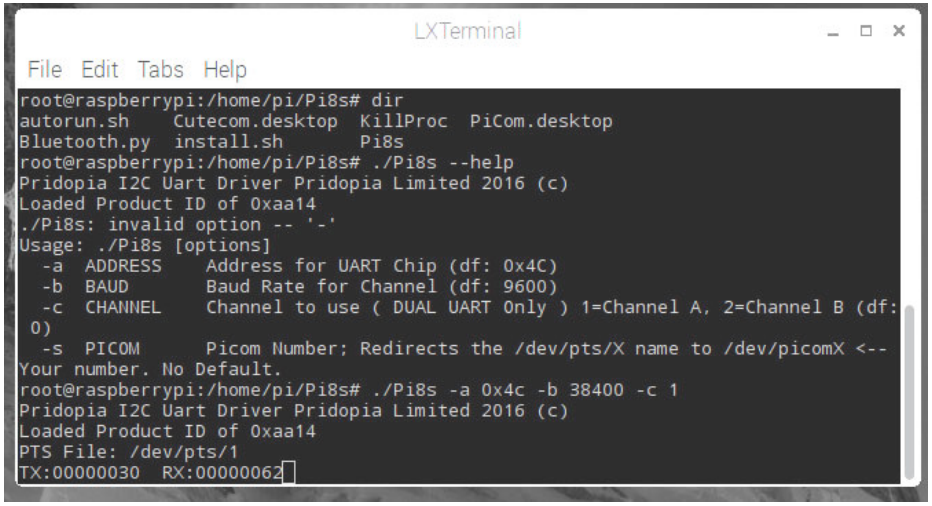


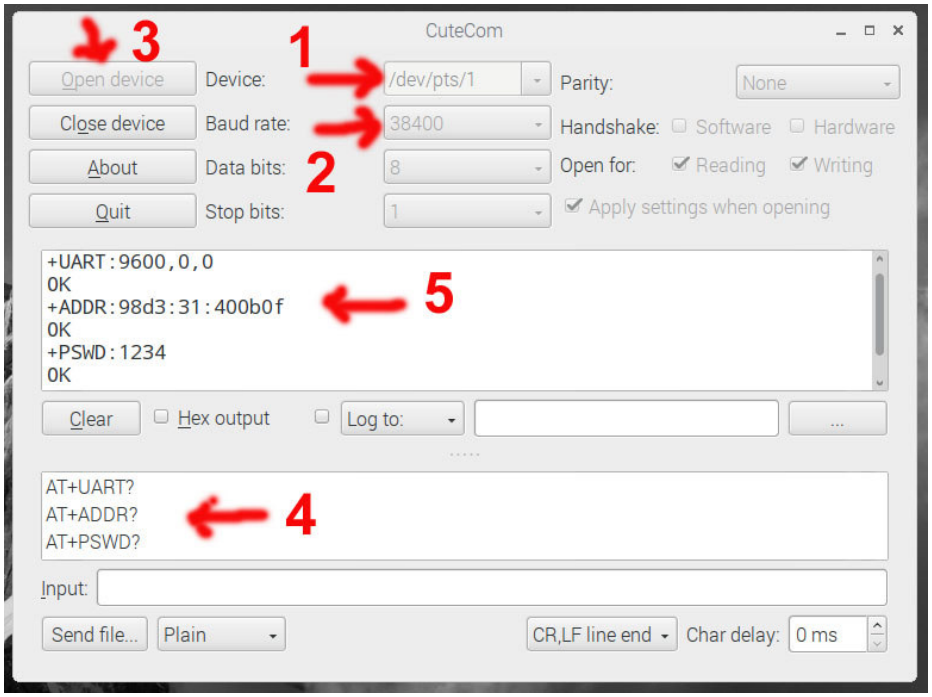
Use i2cdetect check the 4xUART address



J42 pin1 GPIO0, pin2 GPIO2

ESP8622 SOCKET PINOUT





1. device -> /dev/pts/1 2 . Baud rate → 38400
3. click Open device
4. input AT command (HC-05 blutetooth module)
5. screen will show Bluetooth module response

To begin using the external UART ports on the 1xUART, 2xUART, and 4xUART. A few details are to be noted;

* All UART Locations are marked in /dev/picomX where X is 1, 2, 3, or 4 depending on the amount of UARTs available.
* /dev/picom1 for example is for the 1st UART, if you have 2xUART you can find your ports at /dev/picom1, and /dev/picom2 and so on so forth for 4xUART
* /dev/picom is only a file to store the location of the actual Port NOT the UART port location. /dev/picom1 will output the location e.g. /dev/pts/9
* When a UART port is closed or has an error which causes it to restart / reboot the port the location MIGHT change
* Poll your /dev/picom numbers when you come across an error, or are opening up a new UART Port.
* The pts numbers are usually /dev/pts1, /dev/pts2, /dev/pts/3 etc.

Starting your UART Ports: (SKIP if using GUI)

To start up the UART port, You need to know which board you have (1, 2, or 4xUART). Once you know this you can check the table below for information about the ports.
You should have a program called "Pi8s" somewhere in the folder provided. You need to install this as this communicates with the board to perform serial functions.
To install the software, you need to run the command script ./install.sh to install the necessary software. After this is complete you can use the software straight away
but you might want to run the autorun.sh script as this will automatically start the Pi8s software on boot. It will ask a few questions about what board (to get the addresses
right), and once that is complete it will auto-launch the Pi8s software for all your ports. After a reboot you will be able to find the UART port locations at;

Port 1: /dev/picom1
Port 2: /dev/picom2
Port 3: /dev/picom3
Port 4: /dev/picom4

1xUART = Port 1.
2xUART = Port 1 & Port 2.
4xUART = Port 1, 2, 3, and 4.

Starting the GUI:

There are multiple ways to start the GUI for the Pi8s software. Below are the different ways you can achieve this;

1) Go to the folder JavaUART and launch Launch.sh by running "./Launch.sh" (Without quotes)
2) This will start up the GUI for you, Done.

A) Go to the folder JavaUART, enter the folder "jar"
B) Run command "java PiCom"
C) Done, GUI will run

I) Run the Desktop shortcut called JavaUART.
II) This will also run the GUI very simply.

------ UART Board Specifications ------

UART Board Selection : Addresses : Channels :
1xUART : 0x48 : 1 : 2xUART : 0x49 : 2 :
4xUART : 0x4C, 0x4D : 2 :

**** increase i2c bus speed to prevent data lost

sudo nano /boot/config.txt
add a line in end of file
dtparam=i2c1_baudrate=1000000

(you can test the value from 400000 to 1000000 in your system.

Communicating with the UART ports:

Once you've started up the Pi8s Software, ran the GUI, or auto-started the software using the ./autorun.sh command, You should be ready to go.
You can poll the file /dev/picom1 to check if you have a /dev/ptsx address. If not this means that your UART has failed to start, the software isn't running or the HAT hasn't been recognised. We recommend making sure the board is plugged in, check "ps aux" to see if the command "Pi8s" is running.
Once you have confirmed you have a /dev/ptsx location then you can open cutecom or any other serial read/write software and open that /dev/ptsx location.
For instance if your /dev/picom1 file has the location "/dev/pts9" inside the file you will use that to open the Serial port on cutecom.

F.A.Q:

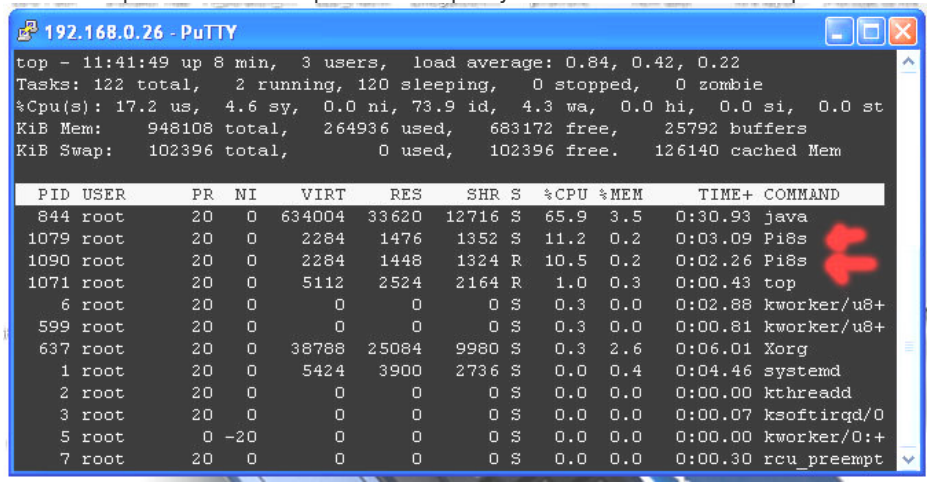
Q: I Keep getting the error [bash: ./Command.sh: Permission Denied]:
A: Run chmod on the file in question, if the file is called "Command.sh" run the following
chmod +x Command.sh
You should be able to run the command now.

Q: The output from the UART port is jibberish / data isn't ASCII / English:
A: You may have the incorrect Baud Rate set up, the default is 9600, but you may get a baud rate of 115200 / 19200 / 57600 for most devices.
If your baud rate is correct, make sure your serial device connected is properly grounded and is transmitting normal UART 8bit bytes at no parity, 1 stop bit (Default 8n1 setting)

Q: My Serial software keeps telling me /dev/picom1 isn't a serial port:
A: /dev/picomX isn't a serial port, its a file that stores the location of the serial port as a link. such as **/dev/pts/5**

Q: Can I have the source code for my own project?
A: No.

Q: How can I check Pi8s enable already ?
A: in Treminal windows , type **top** then press enter. If you enable a port you will find Pi8s run in process. for example enable 2port you will found 2 Pi8s run in processes.



Package Content

1x **4xUART HAT Board** 1x **Manual**

UART Driver download
http://www.pridopia.co.uk/UartDownload.html
Product information
http://www.pridopia.co.uk/rs-pi-i2c-4uart.html
http://www.pridopia.co.uk/rs-pi-i2c-uart-autoload.html

Auto Load Pi8s when Pi Boot
Example : 2UART 0x49
sudo crontab -e

add 2 line in the end of file

```
@reboot /usr/bin/./Pi8s -a 0x49 -c 1 -b 38400 -s 1
@reboot /usr/bin/./Pi8s -a 0x49 -c 2 -b 38400 -s 2
```

when load minicom also open port1
minicom -D $(cat /dev/picom1)