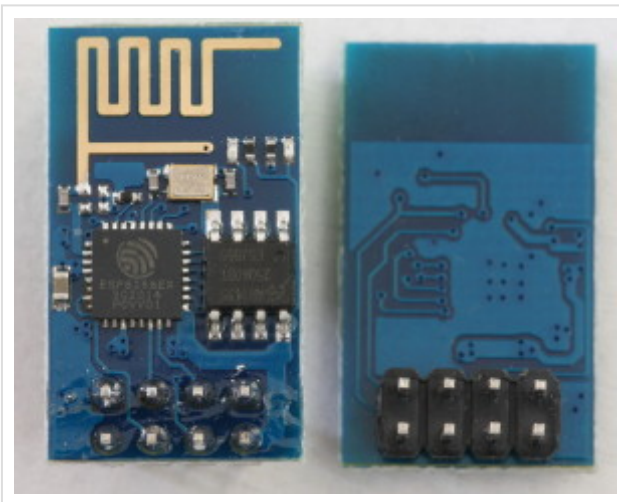# Martyn Currey

Mostly Arduino stuff

FTDI + ESP8266

Posted on **December 31, 2014**

Just started to play with the ESP8266-01 modules. Purchased from Taobao.

These, I believe, are version 2 and have the LEDs near the antenna. When first started they identify themselves as [Vendor:www.ai-

thinker.com Version:0.9.2.4] and are version 018000902-AI03. This is a custom firmware from ai-thinker.
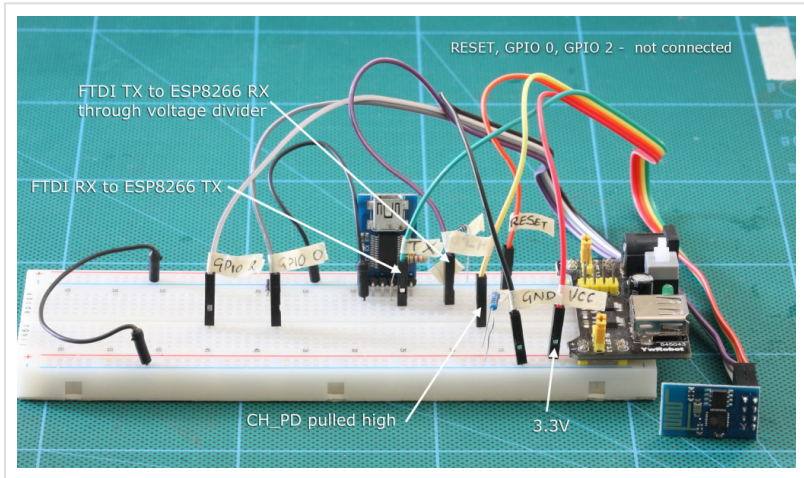
There seems to be quite a few different versions of similar modules. And the same module could have one of several firmwares.

Initially had trouble getting them to work. A lot of the guides online are a bit sparse and many have conflicting information. Most current guides say the baud rate is 115200 or 57600 (mine are 9600) and they fail to mention you need to pull CH_PD HIGH (10K resistor to 3.3V). This meant I went through a lot of trial and error.
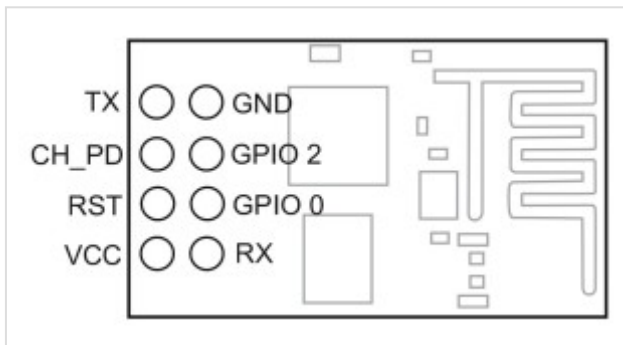
Default Settings
The defaults for the devices I purchased are:
– ID = [Vendor:www.ai-thinker.com Version:0.9.2.4]
– Software version = 0018000902-AI03
– SSID = ESP_xxxxx (will be a hexadecimal number)
– CWMODE =2 (functions as an access point and therefore broadcasts on start)
– Baud rate 9600

RESET, GPIO 0, GPIO 2 - not connected

FTDI TX to ESP8266 RX through voltage divider

FTDI RX to ESP8266 TX

RESET

GPIO 2 GPIO 0

GND VCC

CH_PD pulled high

3.3V

Pins


```
TX    ○ ○  GND
CH_PD ○ ○  GPIO 2
RST   ○ ○  GPIO 0
VCC   ○ ○  RX
```
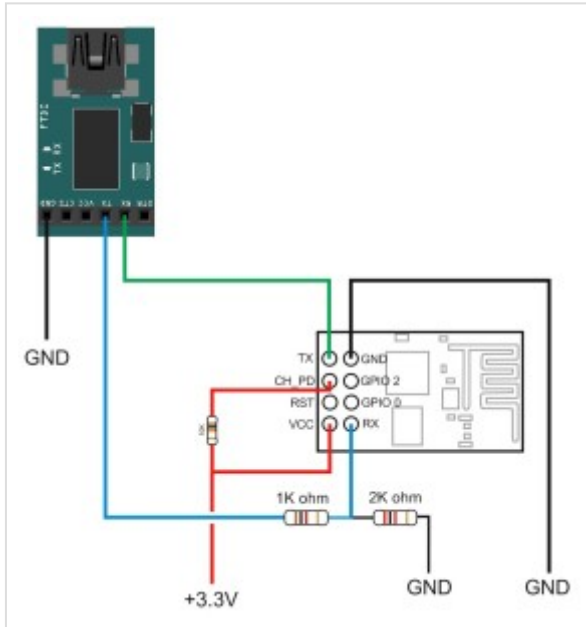
Connections

I have used an Arduino and also an FTDI serial adaptor to talk to the ESP8266. Both worked the same. For details on connecting an Arduino see Arduino to ESP8266 By Serial Communication. Sending commands is the same for both methods.

FTDI RX to ESP8266 TX
FTDI TX to voltage divider then to ESP8266 RX
FTDI GND to GND
FTDI CP_PD to 10K ohm resistor and then to vcc 3.3v
ESP8266 GND to GND
ESP8266 Vcc to +3.3V

FTDI TX is 5V which needs bringing down to 3.3v. This is done with
a voltage divider.
FTDI RX can be connected to ESP8266 TX directly. The FTDI will
accept the 3.3v signal from the ESP8266 as HIGH.

A lot of people are using the 3.3v out on the Arduino to power the
ESP8266 but the Arduino cannot really provide enough power and

may damage something. I have a habit of destroying things and I now try to be more careful and since I have a breadboard power supply that can give 3.3v I am using it.

Plug the FTDI adaptor in to a usb port on your computer and power up the ESP8266. The power LED on the ESP8266 should come on.

To check if there is a signal I used the Android app Wifi Analyzer, available here. This app scans all available wireless networks and displays their signal strength.
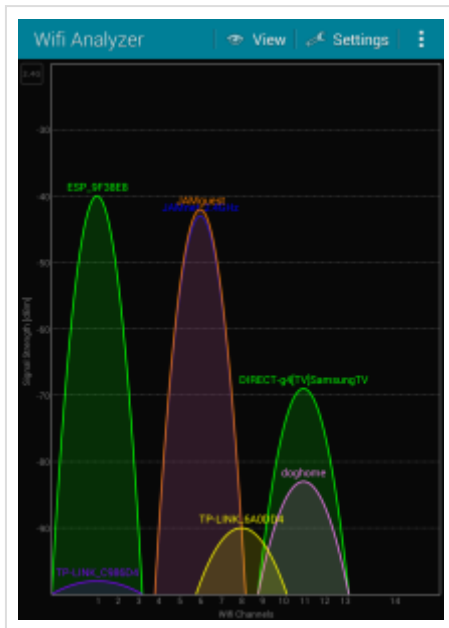
It should show up as ESP_xxxxxx. If it doesn't then check your connections and restart.

Serial Communication With The ESP8266

Once you have confirmed it is working and transmiting you can try to connect by serial. There are many serial terminal programs and one of the easiest ways is to use the serial monitor in the Arduino IDE. Fire up the IDE, select the com port and open the serial monitor.

At the bottom of the window select 9600 baud rate and also "Both NL & CR". This adds a new line and carriage return to what ever you enter. The ESP8266 needs these characters.
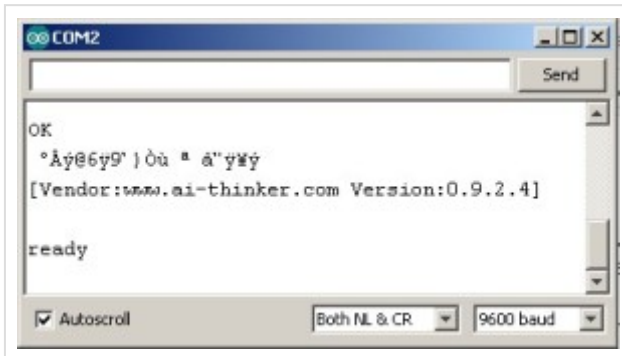

Now enter AT and hit send and hopefully you should receive an "OK". If you do not then try all the different baud rates.

The AT command is a simple test to confirm the ESP8266 is communicating. There are many more commands which are used to interrogate the chip and to make changes to the settings.

To find out what firmware version you have enter AT+GMR


```
AT

OK
AT+GMR
0018000902-AI03

OK
```

AT+RST resets the chip. On restart the chip will identify itself


```
OK
 °Àÿ@6ÿ9'}Òù ª á"ÿ¥ÿ
[Vendor:www.ai-thinker.com Version:0.9.2.4]

ready
```

Join a Network
AT – Confirm that the esp8266 is communicating.
Response is OK

AT+CWMODE=1 – Set the chip to a client (you can also set as an
access point or both)
Response should be OK.

AT+CWLAP – List available networks

Response will be a list of local networks:

```
+CWLAP:(3,"Eye3",-77,"e2:ca:94:56:bf:33",1)
+CWLAP:(4,"little",-90,"64:70:02:8e:e8:88",3)
+CWLAP:(2,"HKBN_876238",-89,"00:0c:43:87:62:38",
+CWLAP:(4,"JAMnet_2.4GHz",-34,"08:86:3b:8c:24:74"
+CWLAP:(1,"JAMguest",-32,"08:86:3b:8c:24:75",6)
+CWLAP:(4,"stedward",-89,"c0:c5:20:20:f6:e9",6)
+CWLAP:(3,"wah",-96,"10:c3:7b:cc:6e:24",6)
+CWLAP:(3,"TP-LINK_6A0DD4",-81,"e8:94:f6:6a:0d:d
+CWLAP:(4,"sandy",-93,"d8:fe:e3:81:74:36",9)
+CWLAP:(3,"DIRECT-g4[TV]SamsungTV",-63,"5e:a3:9d
+CWLAP:(4,"Raymond Fung 2.4GHZ",-90,"70:62:b8:6d
```

AT+CWJAP – Join a network

AT+CWJAP="ssid","password" – use your own SSID and password

AT+CWJAP="JAMguest","12345678"

Response is OK

AT+CWJAP? – Check the name of the connected network.

Should give you the SSID , in my case it returns

+CWJAP:"JAMguest"

AT+CIFSR – Check the ip address of the chip

Replies with the ip address. I got 192.168.169.14

This is the ip address assigned by your router

```
COM12                                                    _ |□| x|
[                                                    ] [ Send ]
AT

OK
AT+CWMODE=1

OK
AT+CWLAP
+CWLAP:(3,"Eye3",-77,"e2:ca:94:56:bf:33",1]
+CWLAP:(4,"little",-90,"64:70:02:8e:e8:88",3)
+CWLAP:(2,"BRSN_876238",-89,"80:0c:43:87:62:38",1]
+CWLAP:(4,"JAMnet_2.4GHz",-34,"08:86:3b:8c:24:74",6)
+CWLAP:(1,"JAMguest",-32,"08:86:3b:8c:24:75",6)
+CWLAP:(4,"steduard",-88,"c0:a5:20:20:f6:e9",6)
+CWLAP:(3,"umh",-96,"10:c3:7b:cc:6e:24",6]
+CWLAP:(3,"TP-LINK_GA0184",-81,"e8:94:f6:6a:0d:d4",8)
+CWLAP:(4,"sandy",-90,"d8:fe:e3:81:74:36",9]
+CWLAP:(3,"DIRECT-g4[TV]SamsungTV",-63,"5e:a0:9d:1c:24:ba",11]
+CWLAP:(4,"Raymond Fung 2.4GH2",-90,"70:62:b8:6d:b9:dc",11)

OK
AT+CWJAP="JAMguest","12345678"

OK

+CWJAP:"JAMguest"

OK
AT+CIFSR
192.168.169.14

OK

[✓] Autoscroll            [Both NL & CR ▼] [9600 baud ▼]
```

A list of AT commands, as well as a lot of other information, can be found on the Electrodragon site
The unofficial ESP8266 site is http://www.esp8266.com

Trouble Shooting
Set CP_PD to HIGH. Without this the unit will power on but will not broadcast a signal.
Try to get it broadcasting a signal before you try connecting with a serial terminal.
However, if it is not broadcasting you may need to change the mode to AP (AT+CWMODE=2).
If you cannot talk to it (over serial), try different baud rates. Not all modules have the same baud rate as default. Mine were 9500 but

115200 is also common.

Remember it expects to have newlines and carriage returns on the end of the commands (NL&CR)

This entry was posted in **Arduino**, **ESP8266** and tagged **arduino**, **ESP8266** by **Martyn**. Bookmark the **permalink [http://www.martyncurrey.com/arduino-esp8266/]** .

16 THOUGHTS ON "FTDI + ESP8266"

arendst

on **February 13, 2015 at 2:54 pm** said:

Very helpful! Especially the 10k resistor on CH_PD and the Android tool. Mine had the same firmware level.

Now on to nodeMCU with MQTT…

Pingback: ESP8266 | Pearltrees

Pingback: ESP8266 | Pearltrees

Henk van Beek
on **February 28, 2015 at 7:51 am** said:

WiFi Analyzer and NL+CR were crucial to me.

arduinolover
on **March 15, 2015 at 2:04 pm** said:

How to do if no FTDI adaptor?

Martyn
on **March 16, 2015 at 6:36 am** said:

Take a look at http://www.martyncurrey.com/arduino-to-esp8266-serial-commincation which uses an Arduino rather than an FTDI adaptor.

Pingback: Arduino to ESP8266 By Serial Communication | Martyn Currey

Peter

Hi, the FTDI in your picture is looks the same i have…
Can you use the solderbridge on the back to set it to 3.3V
and forget about the voltage divider resistors?

Martyn

Yes you can. Just make sure you don't join the 5V
pad….

It would be a good idea to check the voltages to
make sure it is 3.3v before using it.

Here is a close up photo of the module I used for the
above example
https://d3s5r33r268y59.cloudfront.net/5132/products/
thumbs/2014-06-24T01:17:19.246Z-
uart_hi_res.jpg.2560x2560_q85.jpg
This shows the solders pads very clearly.

I also have some adaptors that have a physical
switch. These are more convenient to use.

MickyB

on **November 7, 2015 at 12:52 pm** said:

Obviously not quite THE site i need, but It's nearest I've
found after a month of intermittent searching, so here goes.
On a whim I purchased a NODEMCU DEVKIT V0.9 a few
months ago.
It pops up on 2.4GHz as AI-THINKER_9B1D01 on channel
1.
and that is as fare as I can get, 'cos I can't find any further
info.
It has a micro USB socket, and I use that the power it.
Can you point me in a sourc of further information please –
pretty please.
TIA
MickyB

> **Martyn**
> on **November 8, 2015 at 2:44 am** said:
>
> I haven't used the ESP8266 modules for a while and
> never with Lua or nodemcu, however, there is help
> on the internet. Rather than searching for the board
> you should search for nodemcu.

http://www.guillier.org/blog/tag/esp8266.html may be a good place to start.

JOHN HARDMAN
on **November 7, 2015 at 3:03 pm** said:

my esp had i think node mcu software. i tried to interrogate it with the serial monitor and various commands at, at+rst all in uppercase with various baude rate settings. but all that came out was gobadaldy gook . any ideas please
regards
jh

Martyn
on **November 8, 2015 at 2:47 am** said:

I can't personally help but have a look at http://www.guillier.org/blog/tag/esp8266.html and the esp8266 forum
http://www.esp8266.com/viewforum.php?f=17

antara

on **January 20, 2016 at 4:38 am** said:

Hi

I am connecting the ESP8266 01 module to FDTI and to computer in the same way. My ESP is getting reset again and again printing garbage
▓RS▓fJ[▓fJ[▓fJ▓▓vf▓fV▓S▓▓▓▓▓c (when I use FTDI as power source).
If I use external power source It is unable to come to the ready state after powered on. if I manually reset by grounding the RST pin, only one line of the garbage prints.

please suggest what might be wrong

regards
Antara

Martyn
on **January 20, 2016 at 5:03 am** said:

The constant resetting is usually a sign of insufficient power.

The one line of garbage may be the welcome message which is sent at a different baud rate than used for regular communication. However, you should get further messages. For example, in the above, I get one line of garbage followed by the vendor + firmware ID. There are many different versions now though.

If all you are only getting is the garbage it may be that you have the wrong baud rate. The ESP8266 modules come with a variety of default baud rates. The most common seem to be 9600, 38400 and 115200. If these do not work try other rates.

Please be aware that this guide was written a while ago and the ESP8266 (and especially the firmware) have moved on a lot since.
If you continue to have problems join the ESP8266 forum and ask for help there. The ESP8266 forum has many very helpful people with the latest information.

Pingback: esp8266 | Gert Wijsman