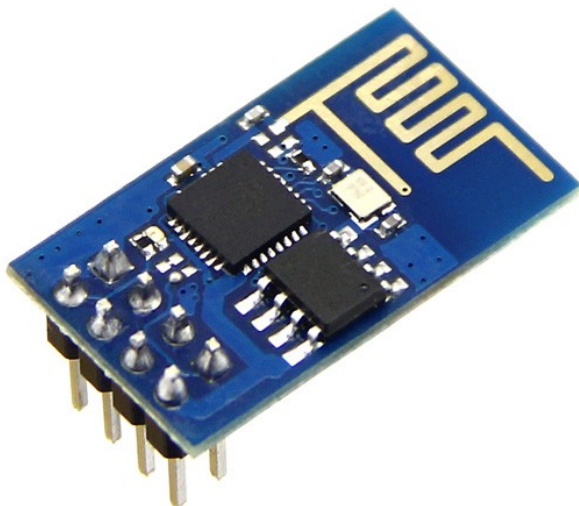




2016

***Interfacing
ESP8266 (Wi-Fi module)
with
Arduino UNO***



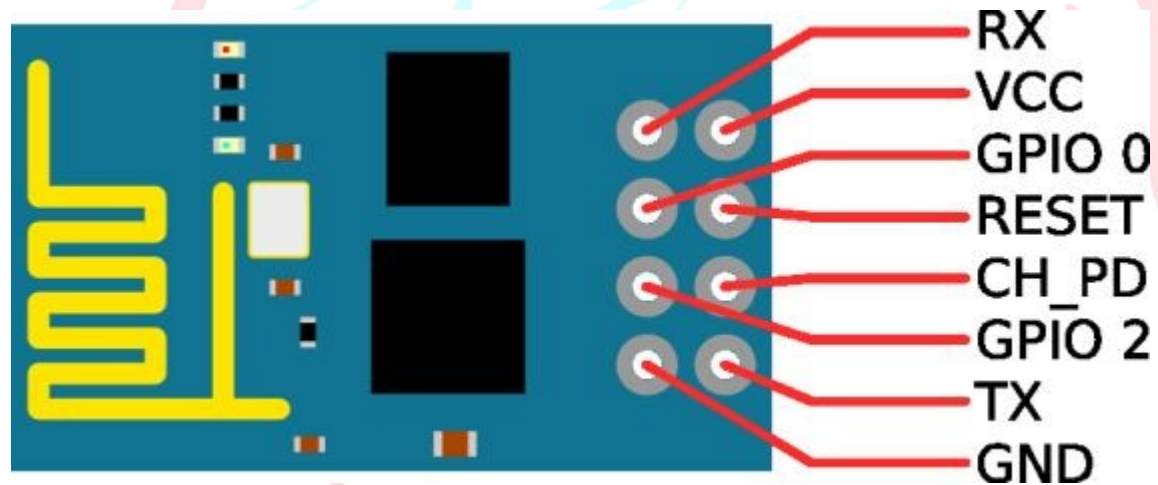
Author: Gurudatta Palankar

Version: 1.0

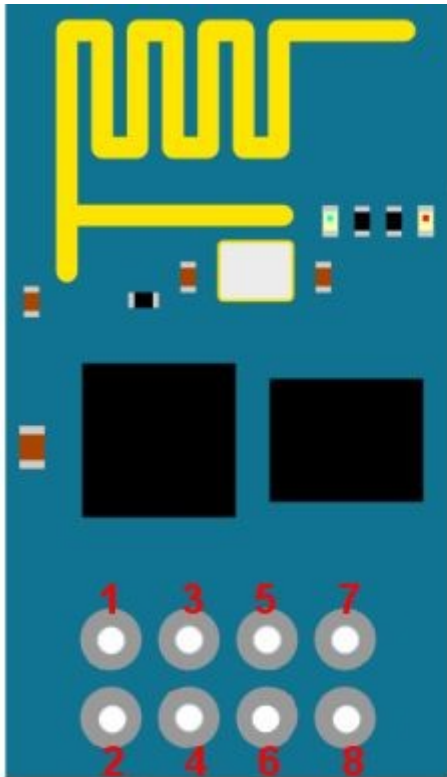
Introduction

The ESP8266 Wi-Fi Module is a self contained SOC with integrated TCP/IP protocol stack that can give any micro-controller access to your WiFi network. The ESP8266 is capable of either hosting an application or offloading all Wi-Fi networking functions from another application processor. Each ESP8266 module comes pre-programmed with an AT command set firmware, meaning, you can simply hook this up to your Arduino device and get about as much Wi-Fi ability as a Wi-Fi Shield offers (and that's just out of the box)! The ESP8266 module is an extremely cost effective board with a huge, and ever growing, community.

ESP8266 Pin Description



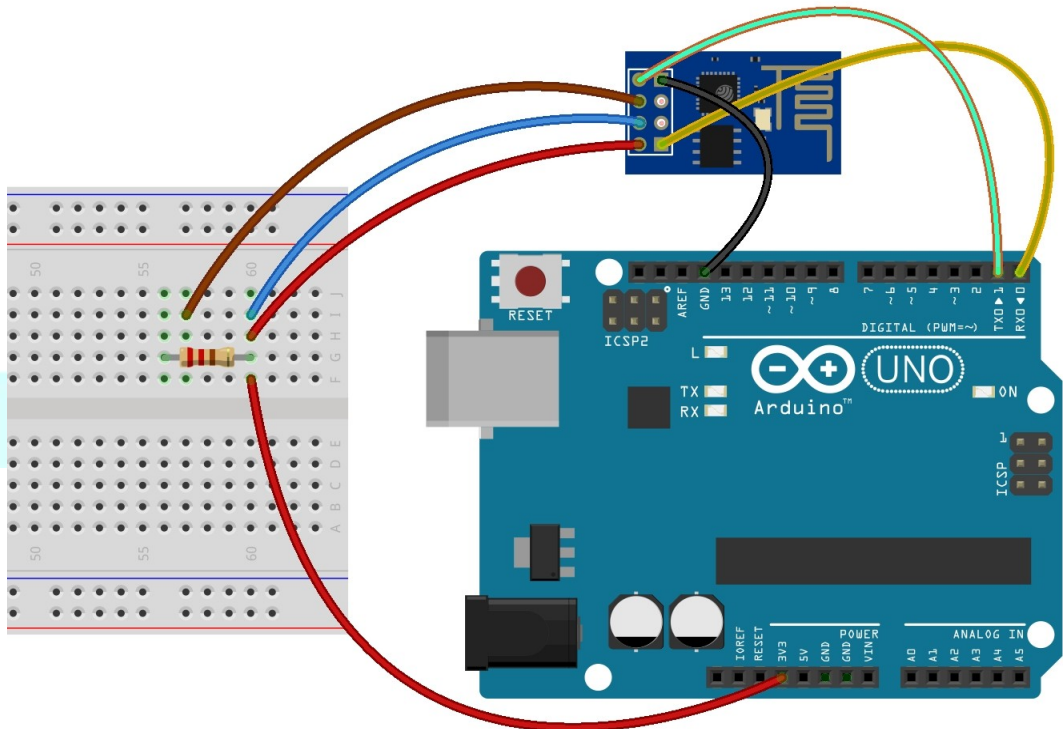
TENET
TECHNETRONICS



ESP8266 Pins

1. GND - Circuit Ground
2. TX - UART0 Transmit
3. GPIO2 - General Purpose I/O
4. CH_EN - Chip Enable, Active High
5. GPIO0 - General Purpose I/O
6. RESET - Reset, Active Low
7. RX - UART0 Receive
8. VCC - Circuit Power = +3.3V DC

Interfacing ESP8266 with Arduino UNO

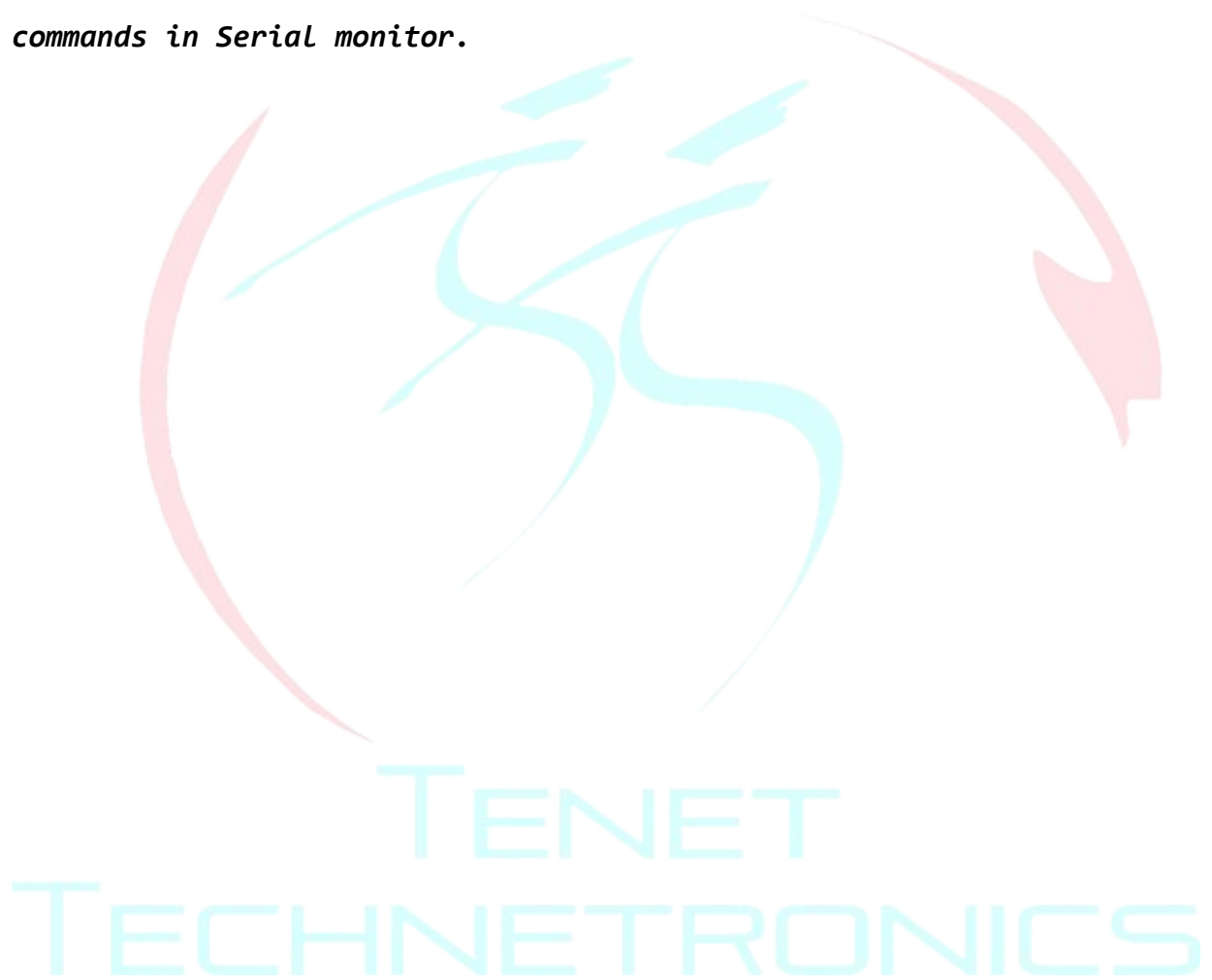


fritzing

Note: Connect a resistor of resistance between 1K to 10K before tying CH_PD (Chip enable) to 3.3V.

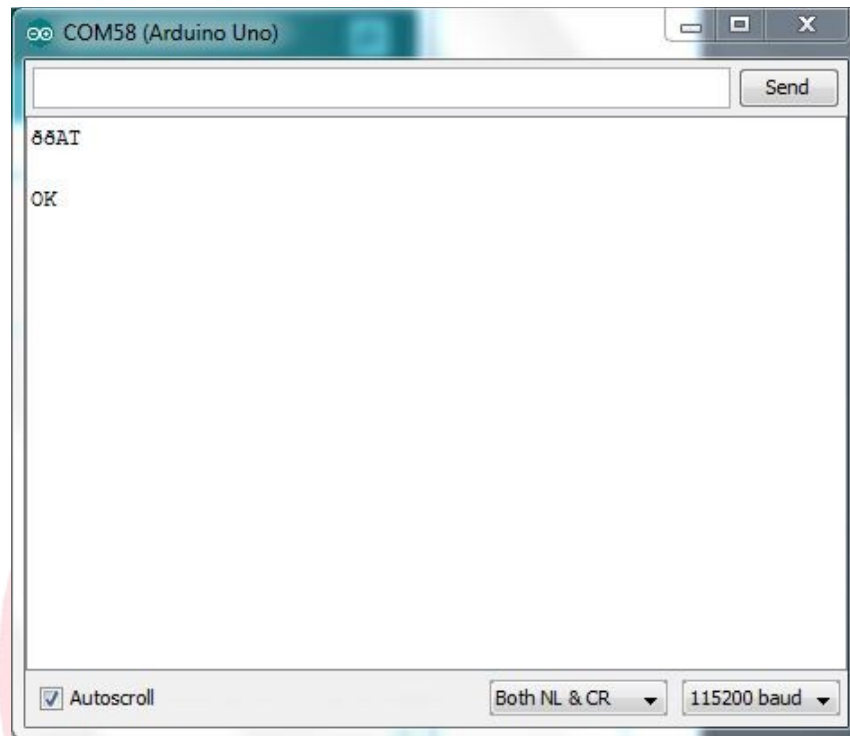
Note: Connect Tx of Arduino to Tx of ESP8266 and Rx of Arduino to Rx of ESP8266.

Note: Upload a blank sketch in Arduino before executing ESP8266 AT commands in Serial monitor.

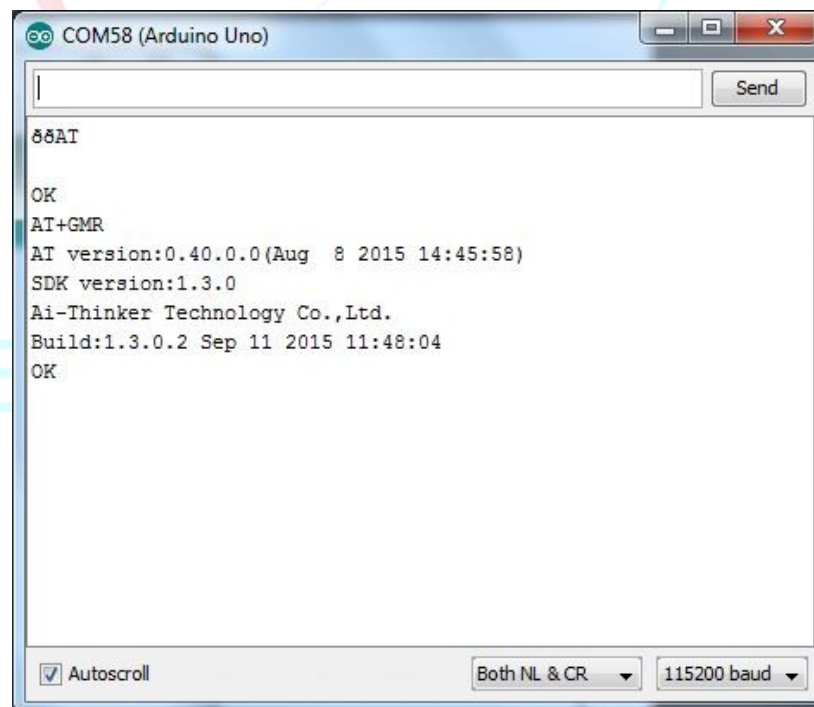


AT Commands

1. AT – Test AT startup



2. AT+GMR – View version info



3. AT+RST – Restart module

```
COM58 (Arduino Uno)

88AT

OK
AT+RST

OK
WIFI DISCONNECT

ets Jan  8 2013,rst cause:2, boot mode:(3,7)

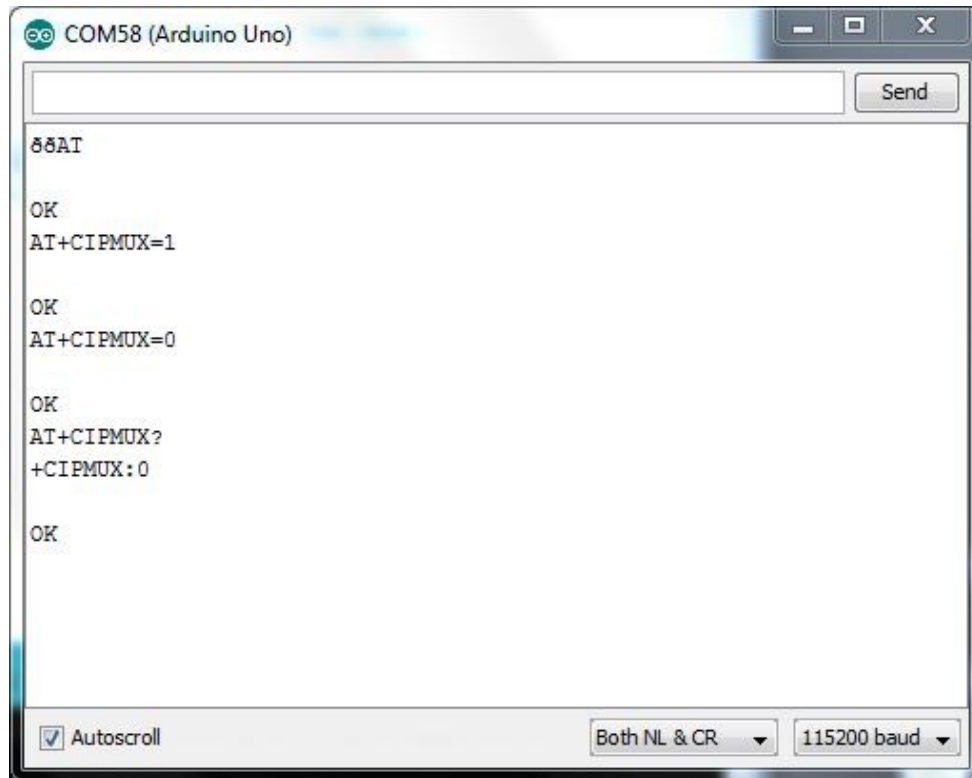
load 0x40100000, len 1396, room 16
tail 4
chksum 0x89
load 0x3ffe8000, len 776, room 4
tail 4
chksum 0xe8
load 0x3ffe8308, len 540, room 4
tail 8
chksum 0xc0
csum 0xc0

2nd boot version : 1.4(b1)
  SPI Speed      : 40MHz
  SPI Mode       : DIO
  SPI Flash Size & Map: 8Mbit(512KB+512KB)
jump to run user1 @ 1000

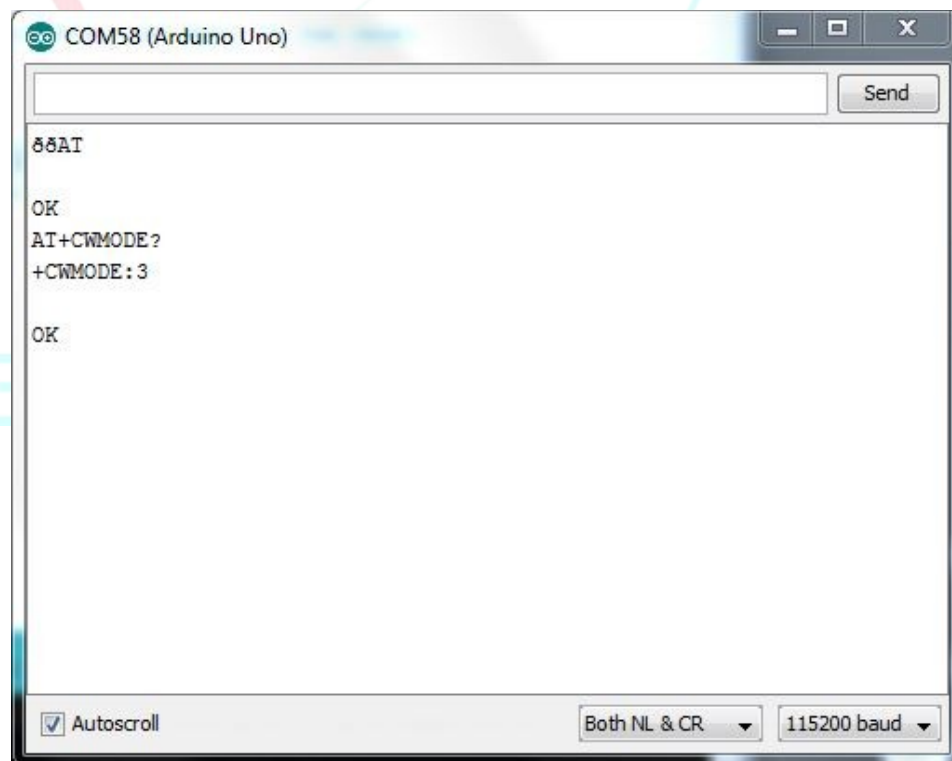
ó n't use rtc mem data
r10,sl1ÿ
Ai-Thinker Technology Co.,Ltd.

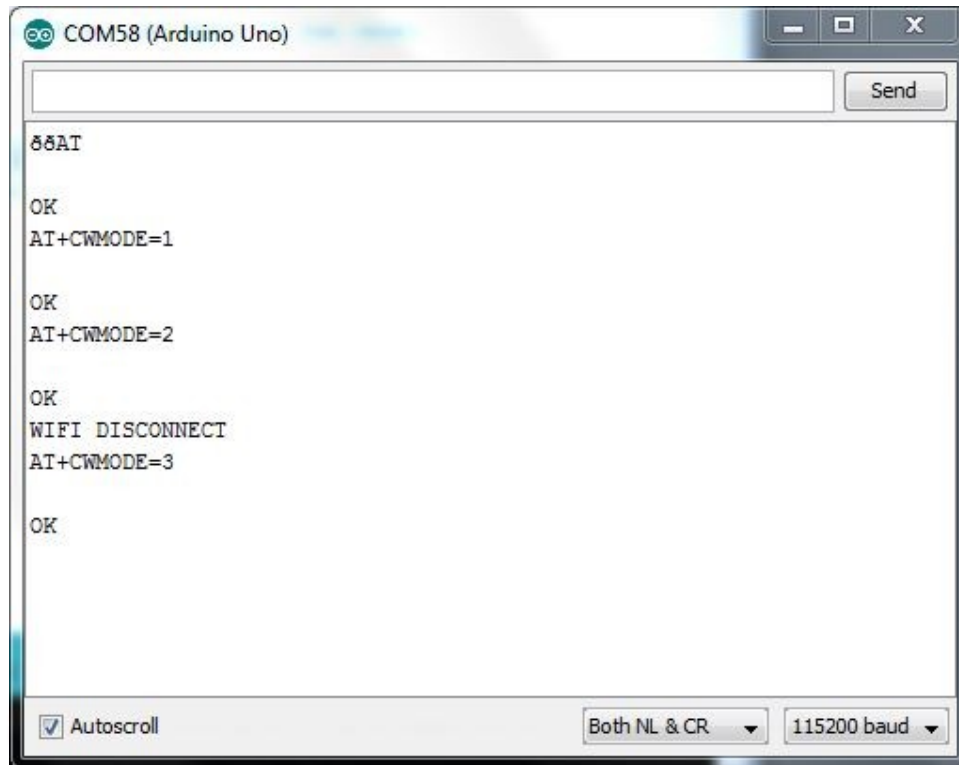
ready
WIFI CONNECTED
WIFI GOT IP
```

4. AT+CIPMUX – Enable multiple connections

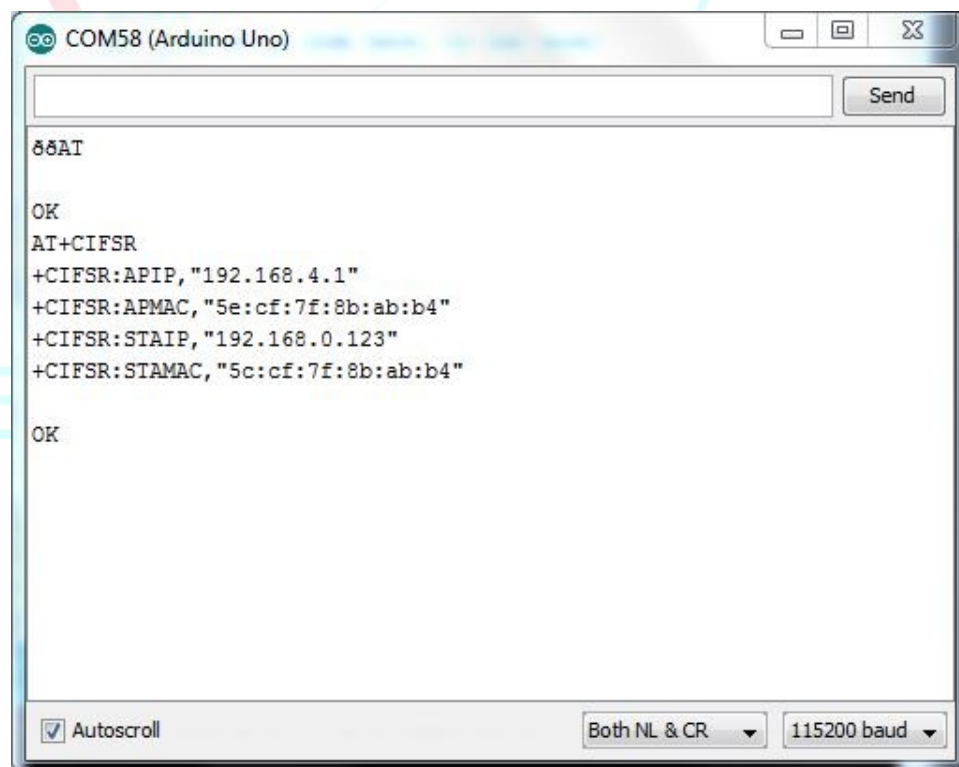


5. AT+CWMODE – Wi-Fi mode

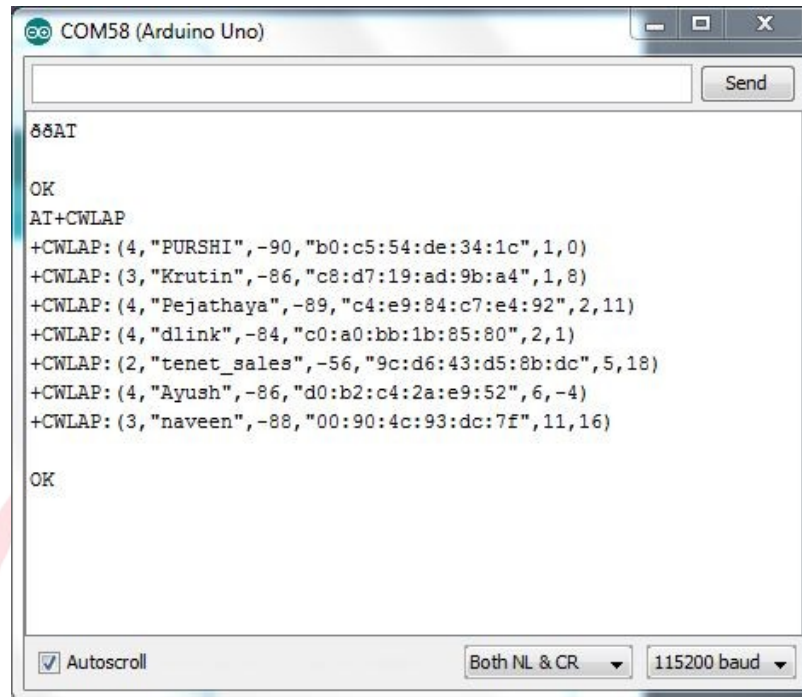




6. AT+CIFSR – Get local IP address



7. AT+CWLAP – List available APs



```
COM58 (Arduino Uno)

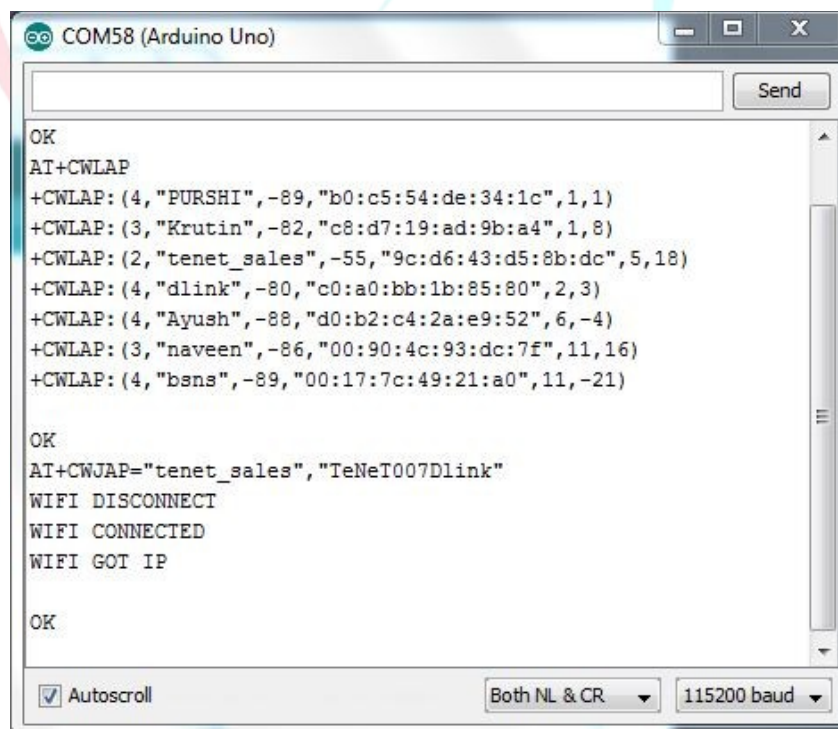
88AT

OK
AT+CWLAP
+CWLAP: (4, "PURSHI", -90, "b0:c5:54:de:34:1c", 1, 0)
+CWLAP: (3, "Krutin", -86, "c8:d7:19:ad:9b:a4", 1, 8)
+CWLAP: (4, "Pejathaya", -89, "c4:e9:84:c7:e4:92", 2, 11)
+CWLAP: (4, "dlink", -84, "c0:a0:bb:1b:85:80", 2, 1)
+CWLAP: (2, "tenet_sales", -56, "9c:d6:43:d5:8b:dc", 5, 18)
+CWLAP: (4, "Ayush", -86, "d0:b2:c4:2a:e9:52", 6, -4)
+CWLAP: (3, "naveen", -88, "00:90:4c:93:dc:7f", 11, 16)

OK

Autoscroll Both NL & CR 115200 baud
```

8. AT+CWJAP – Connect to AP



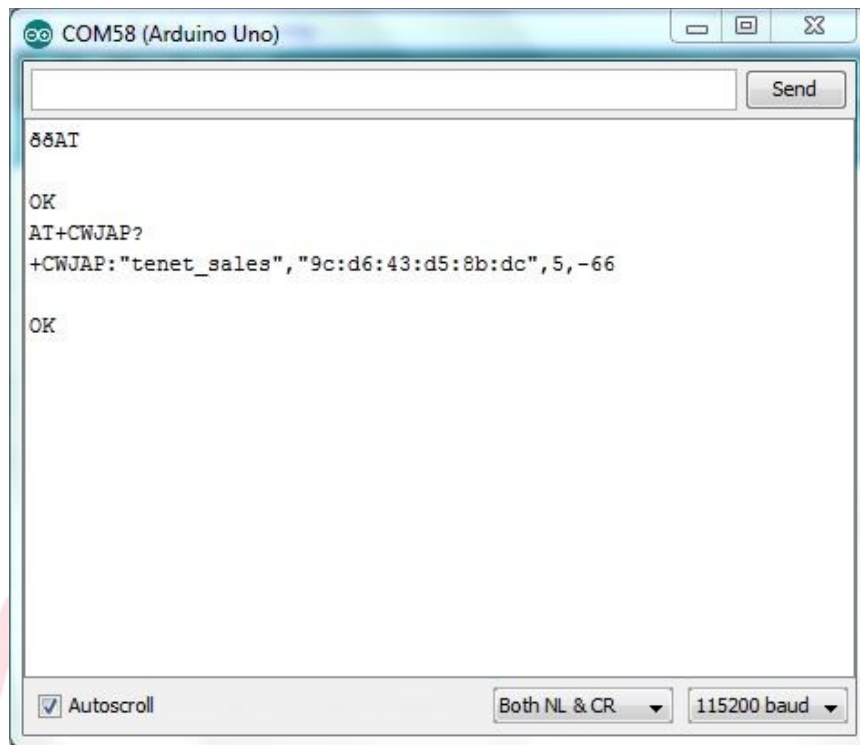
```
COM58 (Arduino Uno)

OK
AT+CWJAP
+CWLAP: (4, "PURSHI", -89, "b0:c5:54:de:34:1c", 1, 1)
+CWLAP: (3, "Krutin", -82, "c8:d7:19:ad:9b:a4", 1, 8)
+CWLAP: (2, "tenet_sales", -55, "9c:d6:43:d5:8b:dc", 5, 18)
+CWLAP: (4, "dlink", -80, "c0:a0:bb:1b:85:80", 2, 3)
+CWLAP: (4, "Ayush", -88, "d0:b2:c4:2a:e9:52", 6, -4)
+CWLAP: (3, "naveen", -86, "00:90:4c:93:dc:7f", 11, 16)
+CWLAP: (4, "bsns", -89, "00:17:7c:49:21:a0", 11, -21)

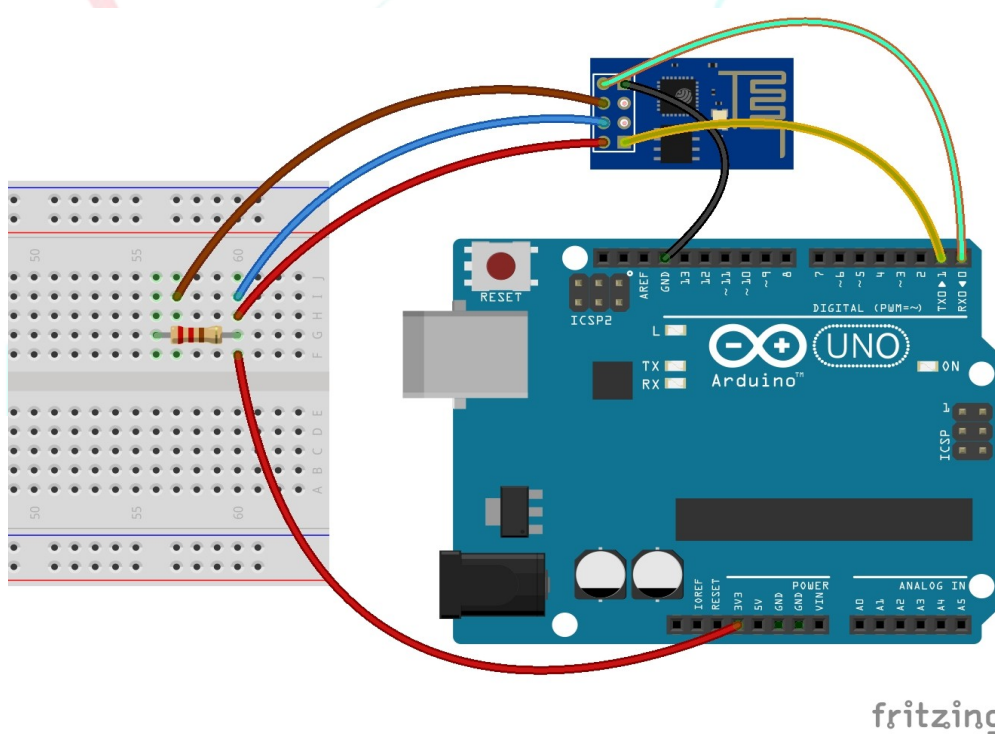
OK
AT+CWJAP="tenet_sales","TeNeT007Dlink"
WIFI DISCONNECT
WIFI CONNECTED
WIFI GOT IP

OK

Autoscroll Both NL & CR 115200 baud
```



Note: Now interchange Tx and Rx connections of Arduino and ESP8266. Connect Tx of Arduino to Rx of ESP8266 and Rx of Arduino to Tx of ESP8266



Arduino Code Explanation

Reading an analog sensors i.e. Potentiometer connected to analog pin A0 of Arduino UNO and posting those data to ThingSpeak cloud.

CODE:

```
int pot = A0;
float voltage;

String A = "GET /update?api_key=F805VOHZACCDGQRK&field1=";
String Z = " HTTP/1.1 \nHOST: api.thingspeak.com \r\n\r\n"; //web link

void setup()
{
  Serial.begin(115200);
}

void loop()
{
  /* VOLTAGE */
  voltage = analogRead(pot);
  voltage = (voltage / 1024.0) * 5.0;
  char voltage_buff[16];
  String voltageX = dtostrf(voltage, 4, 1, voltage_buff);

  String postStr = A + voltageX + Z;

  /****** Uploading to ThinkSpeak Cloud *****/
  /****** Sending AT Commands to ESP8266 *****/

  Serial.println("AT");
  delay(2000);

  Serial.print("AT+CIPSTART=\"TCP\", \"api.thingspeak.com\", 80\r\n");
  delay(3000);
```

```
String ciplength = "AT+CIPSEND=" + String(postStr.length()) + "\r\n";
Serial.print(ciplength);
delay(3000);

Serial.print(postStr);
delay(3000);

Serial.print("AT+RST\r\n");
delay(3000);
}
```

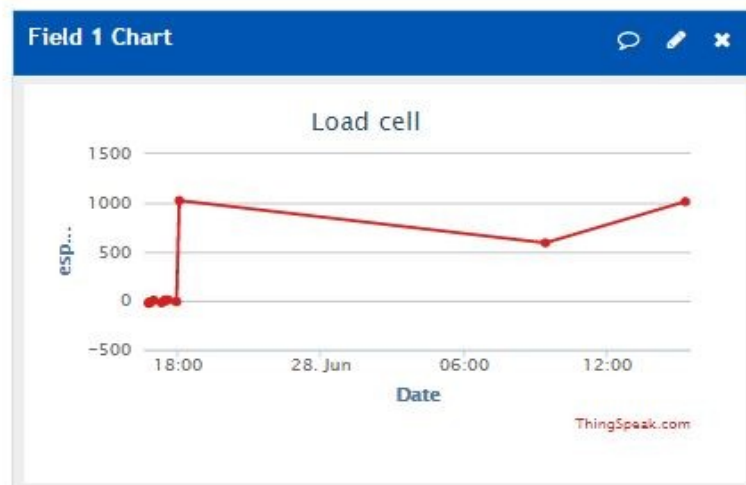
Note: Create an account in www.thingSpeak.com. Create a New channel. Copy API key of the channel and paste the API key in the code.

Things Speak Cloud



Channel Stats

Created 19 days ago
 Updated 3 minutes ago
 Last Entry 3 minutes ago
 20 Entries



For product link:

1. <http://www.tenettech.com/product/1548/lpc1769-lpcxpresso-board>
2. <http://tenettech.com/product/6655/universal-gpio-board>

For more information please visit: www.tenettech.com

For technical query please send an e-mail: info@tenettech.com

