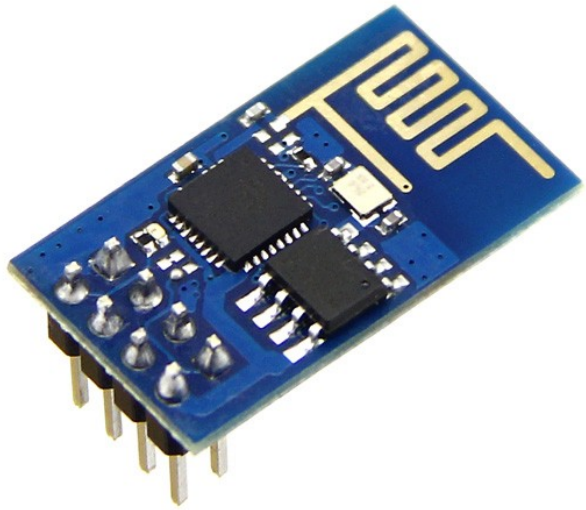
TENET TECHNETRONICS

2016

Interfacing ESP8266 (Wi-Fi module) with Arduino UNO



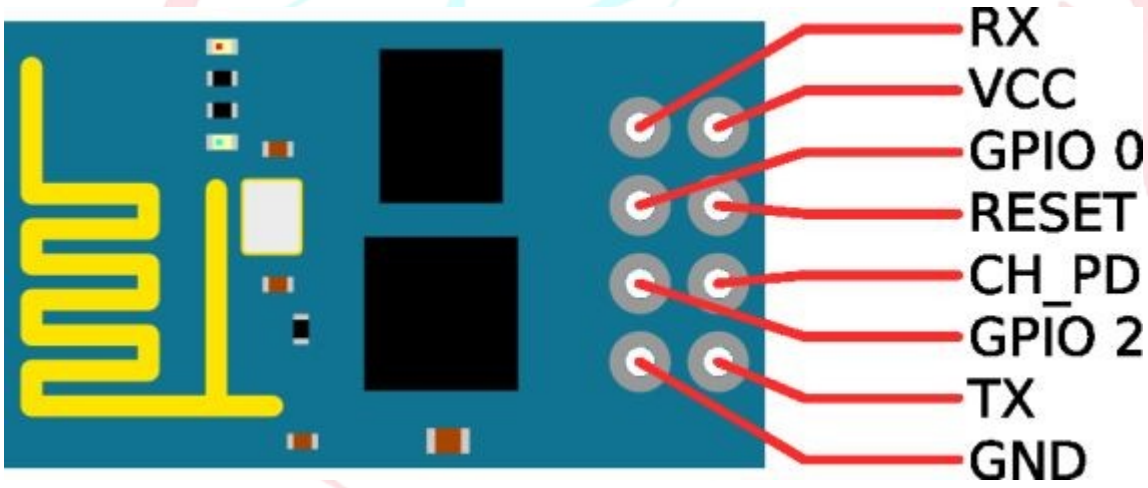
Author: Gurudatta Palankar

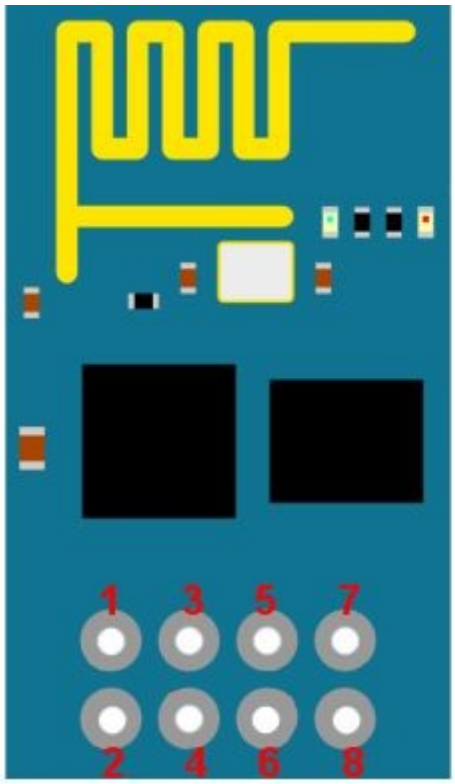
Version: 1.0

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

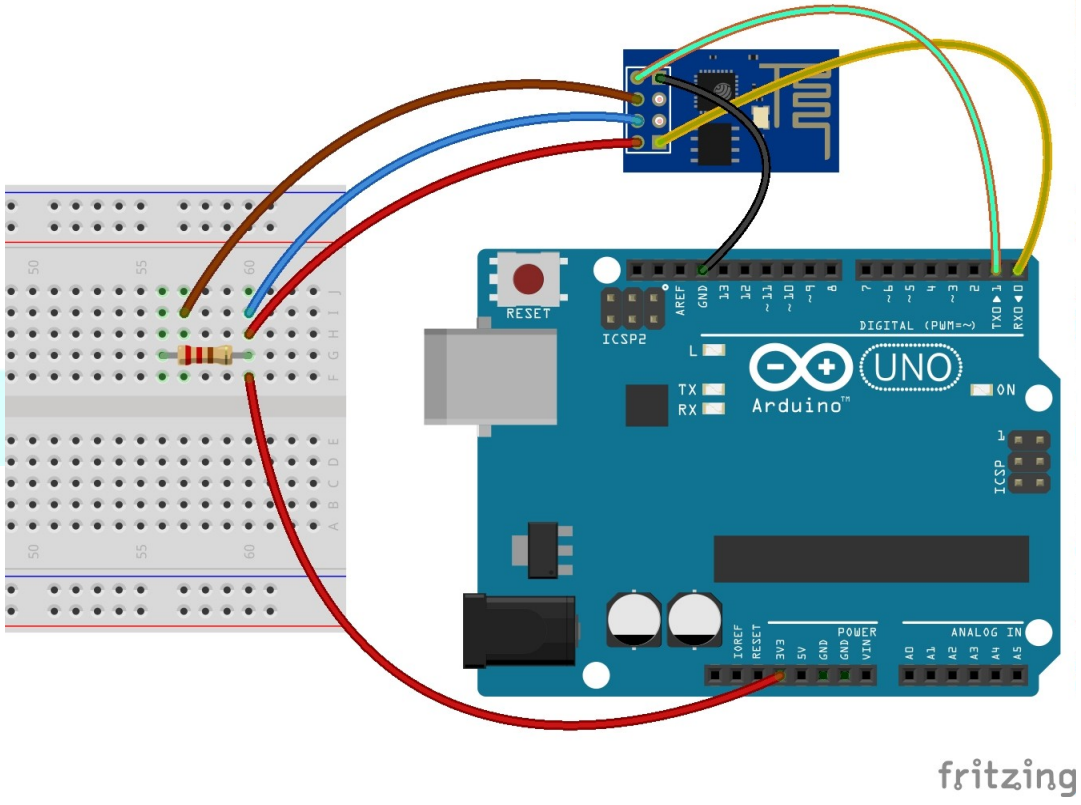




ESP8266 Pins

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



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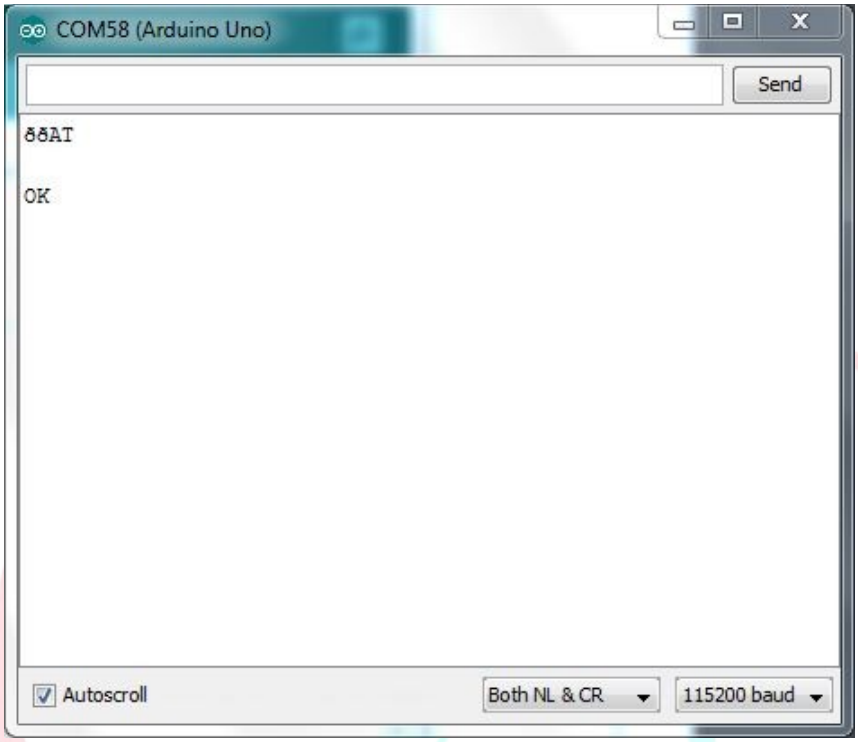
Note: ***Connect a resistor of resistance between 1K to 10K before tyeing CH_PD (Chip enable) to 3.3V.***

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

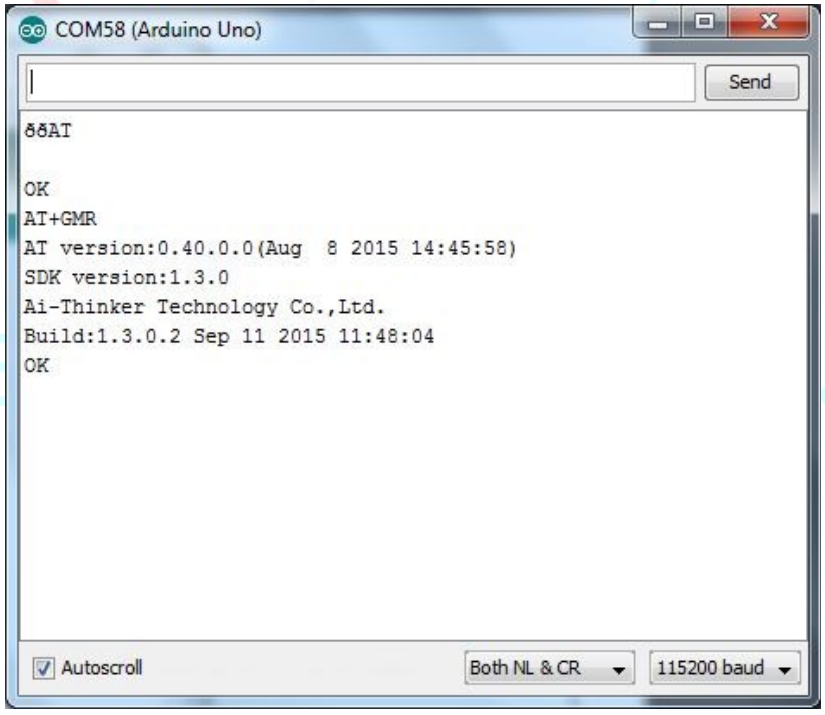
Note: ***Upload a blank sketch in Arduino before executing ESP8266 AT commands in Serial monitor.***

AT Commands

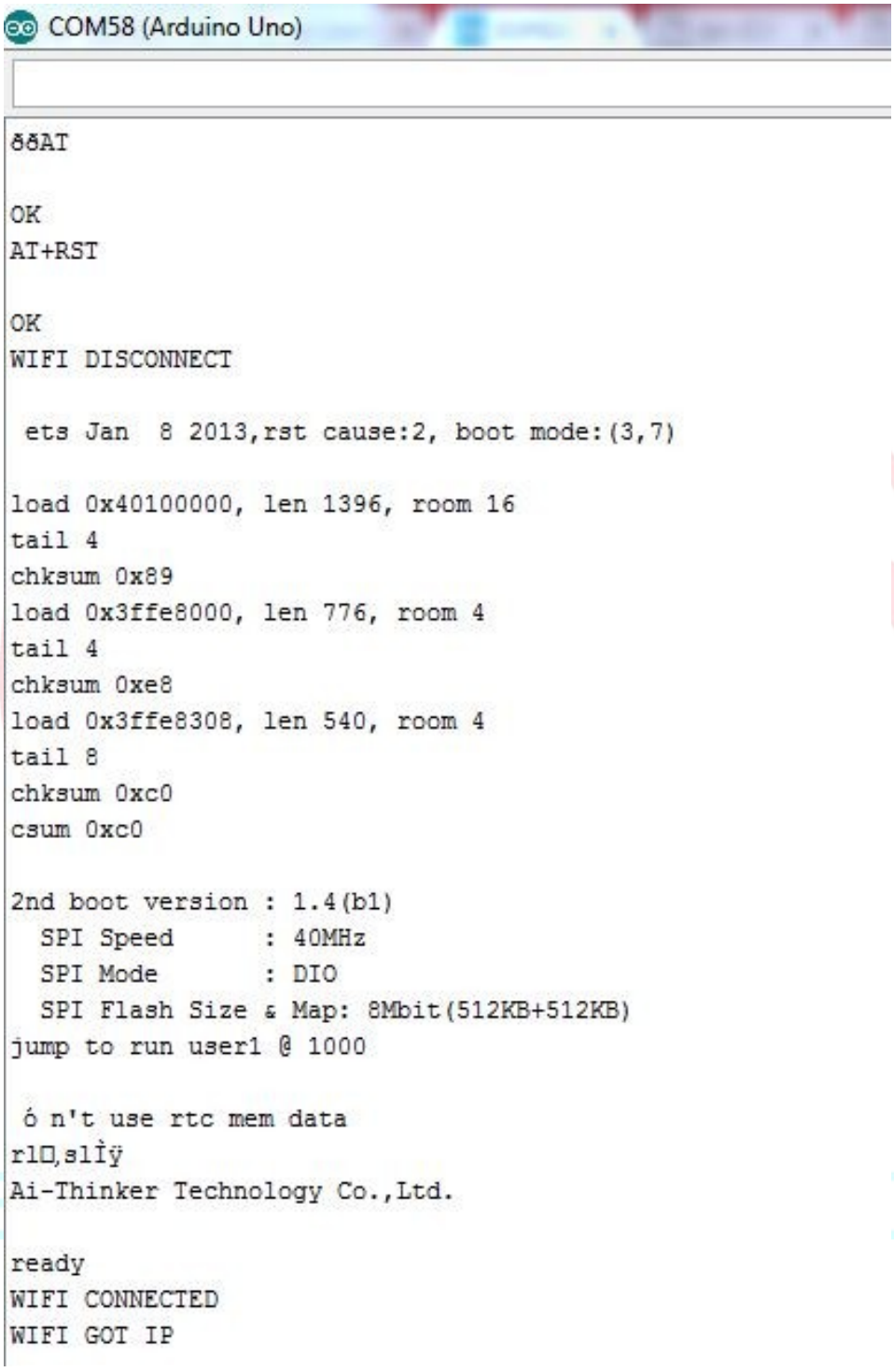
1. AT – Test AT startup



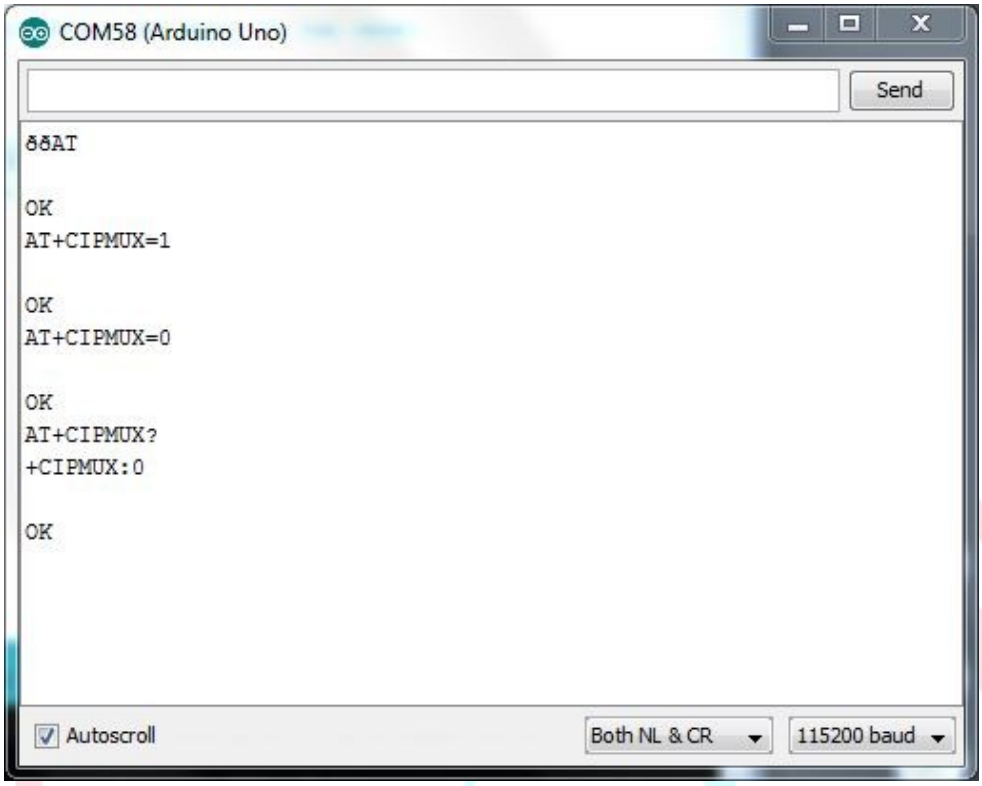
2. AT+GMR – View version info



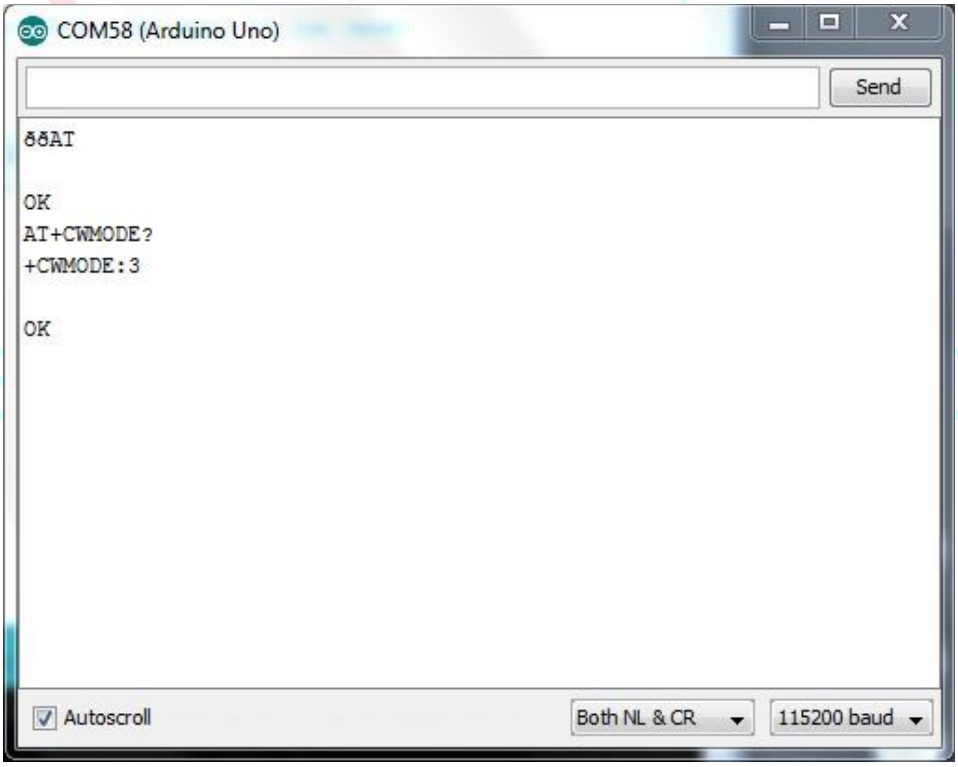
3. AT+RST – Restart module

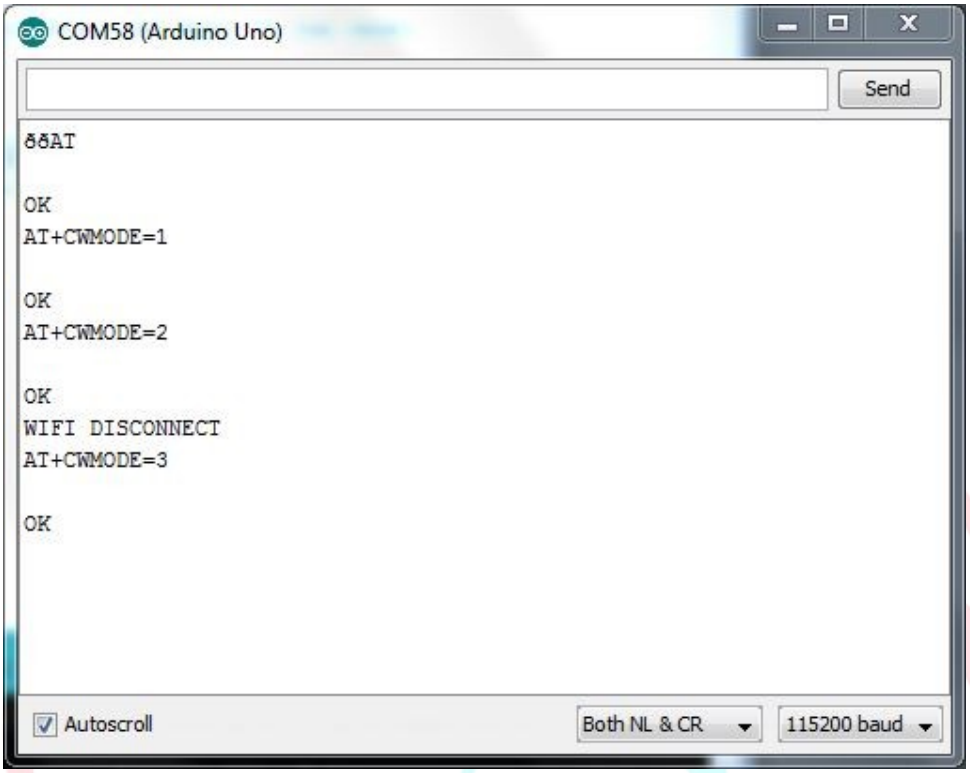


4. AT+CIPMUX – Enable multiple connections

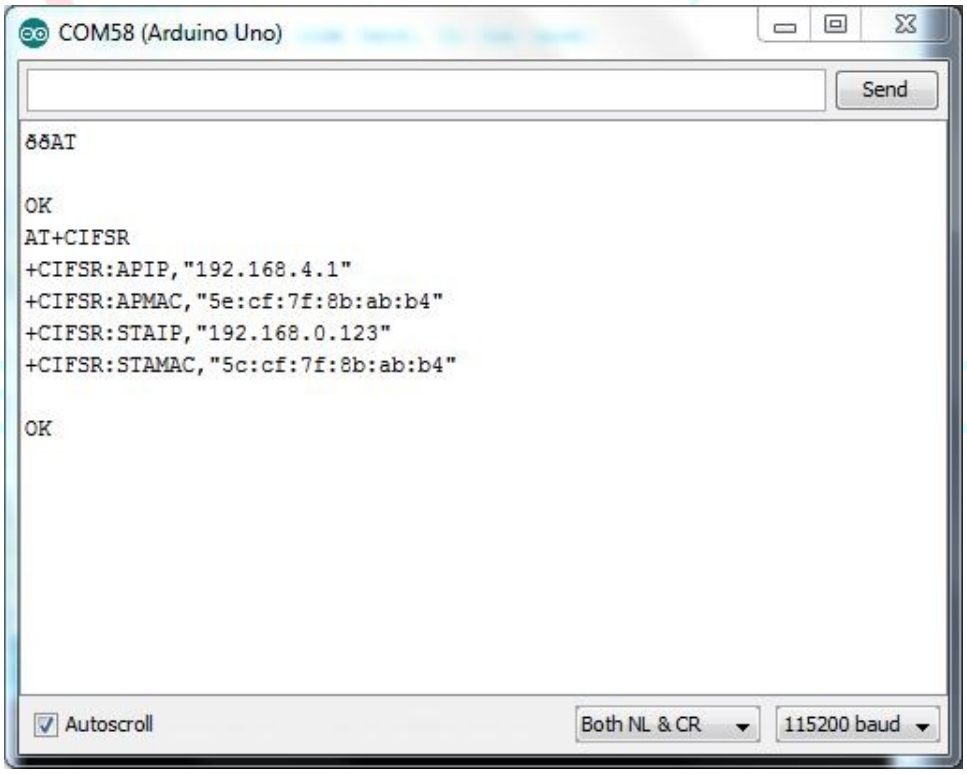


5. AT+CWMODE – Wi-Fi mode

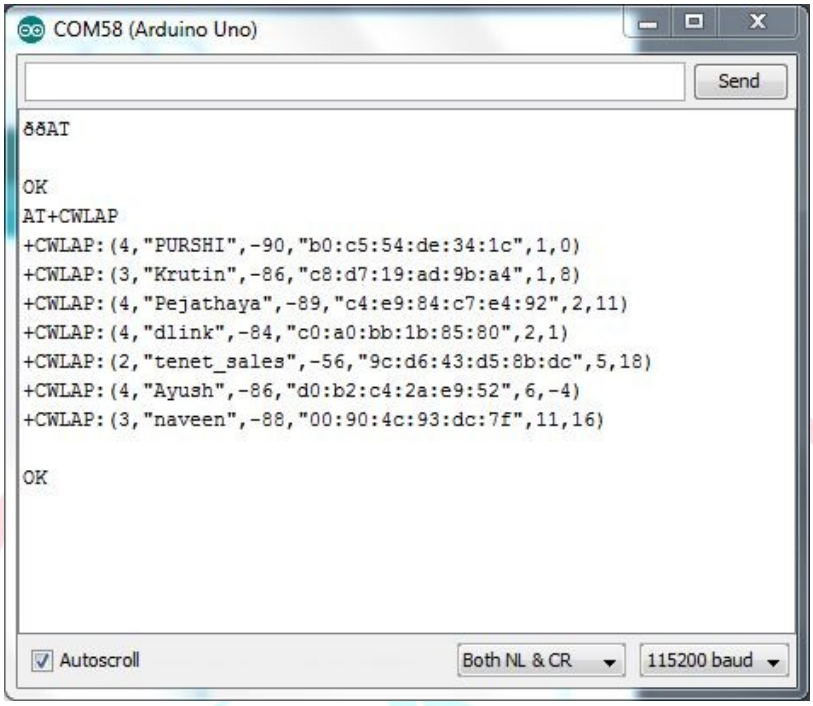




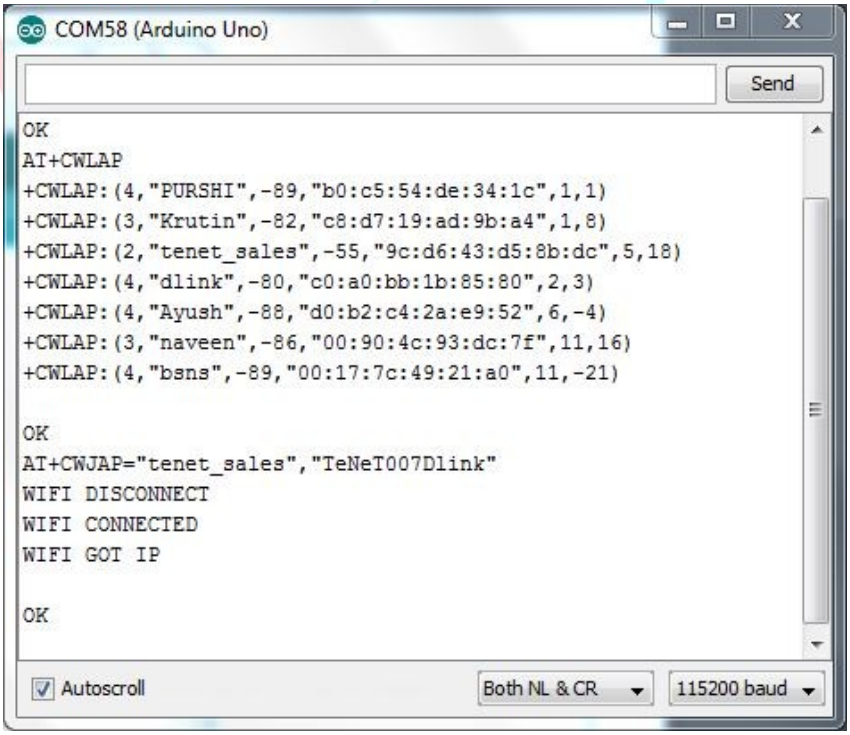
6. AT+CIFSR – Get local IP address

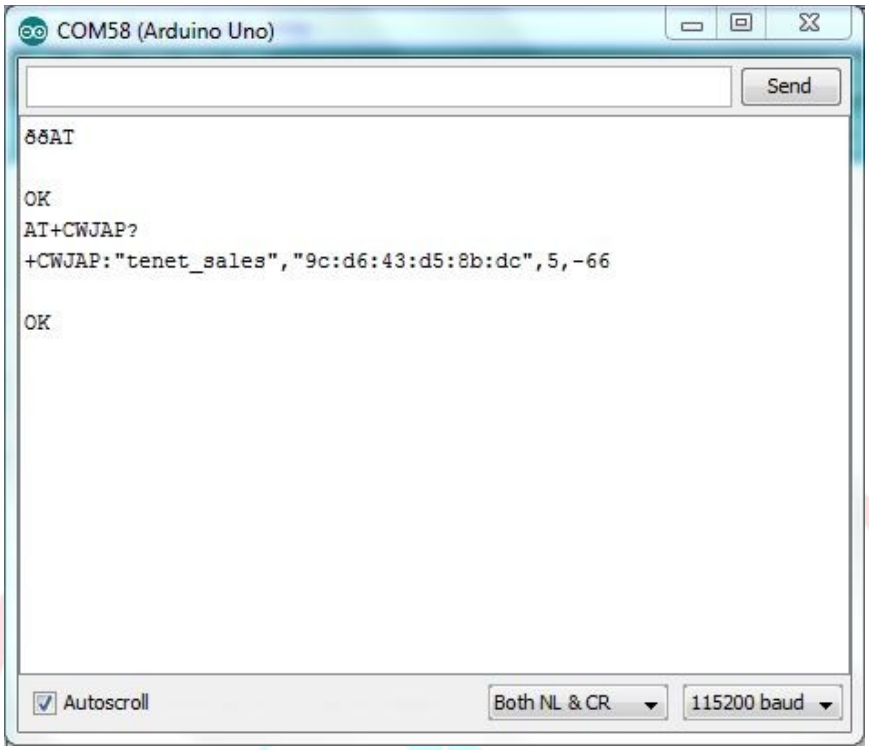


7. AT+CWLAP – List available APs

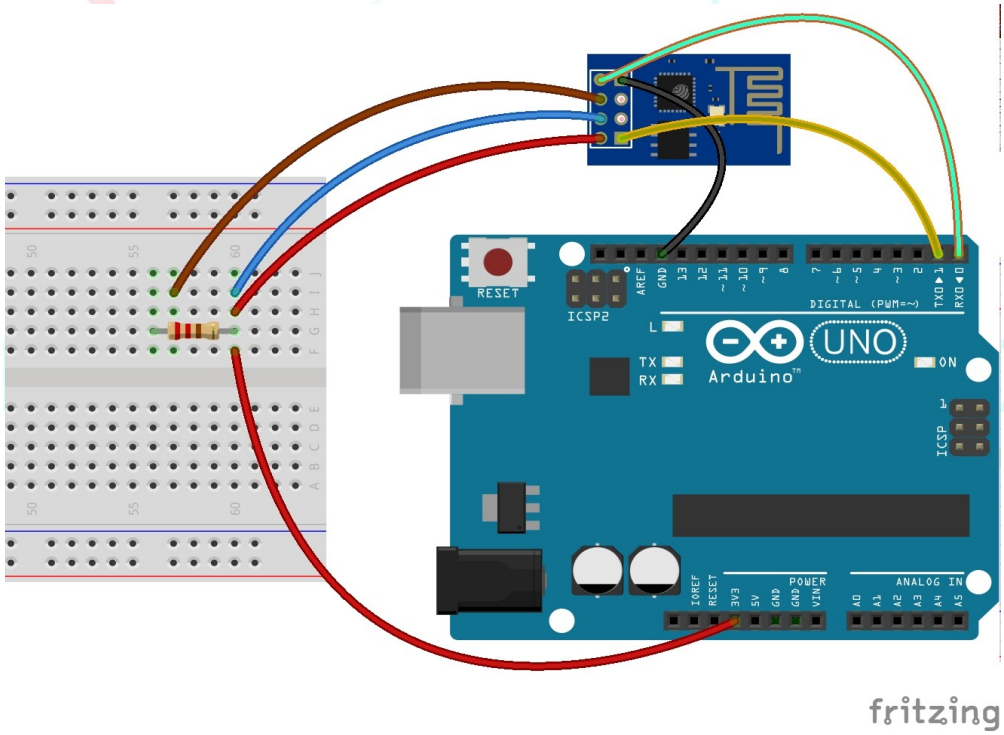


8. AT+CWJAP – Connect to AP





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);
```

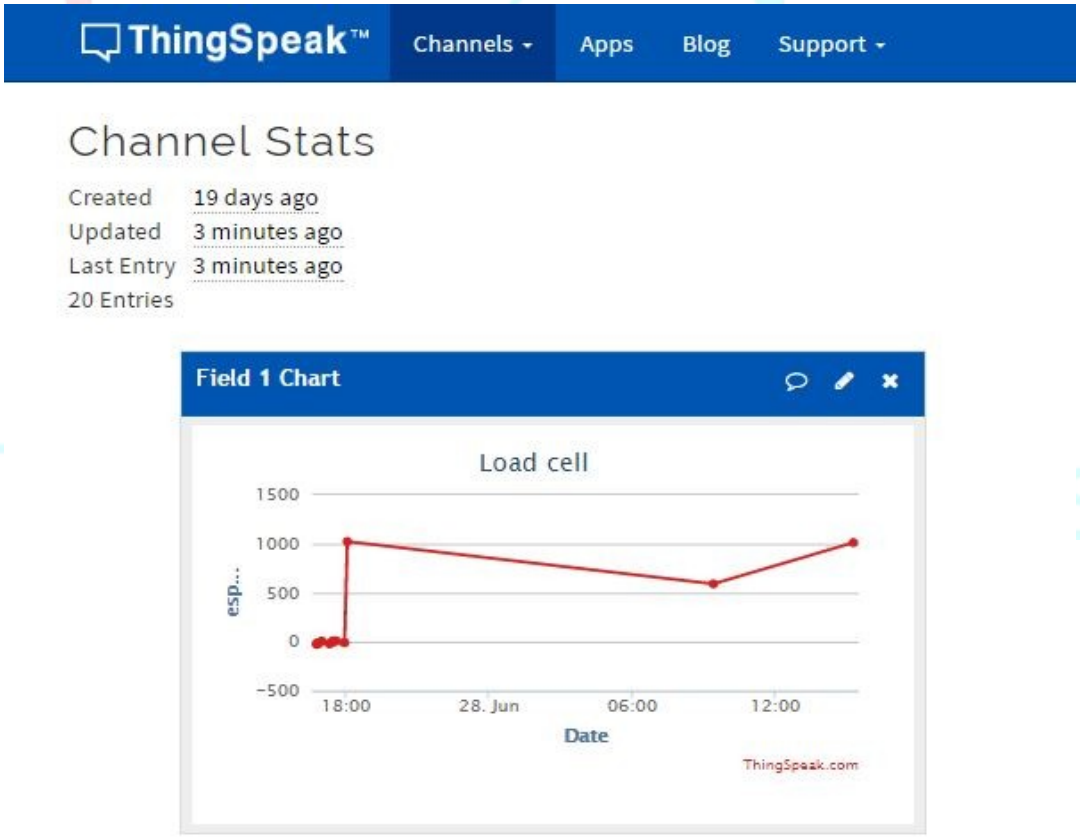
```
    String ciplength = "AT+CIPSEND=" + String(postStr.length()) + "\r\n";
    Serial.print(ciplength);
    delay(3000);

    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



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