OVERVIEW

The ESP8266 module is a very popular WiFi module with serial interface. However, using it requires a number of circuits to implement externally:

- A regulated 3.3V power source that can deliver the require current for normal operation
- A level shifting circuit to allow 5V microcontrollers (e.g. Arduino Uno/Nano/Mega etc) to safely interact with the WiFi module
- A switch to temporarily allow flashing or firmware update

The Kimat ESP-8266 Adaptor module implements all of the above making the WiFi module readily interfaceable with microcontroller boards including Arduino boards.

The Kimat ESP-8266 Adaptor module is part of Layad Circuits' Kimat series of rapid-prototyping products.

FEATURE SUMMARY

- 3.3V Regulator Circuit up to 800mA
- Level shifter circuit

- Onboard firmware update switch
- Support for ESP-01 and ESP-12 and their variants
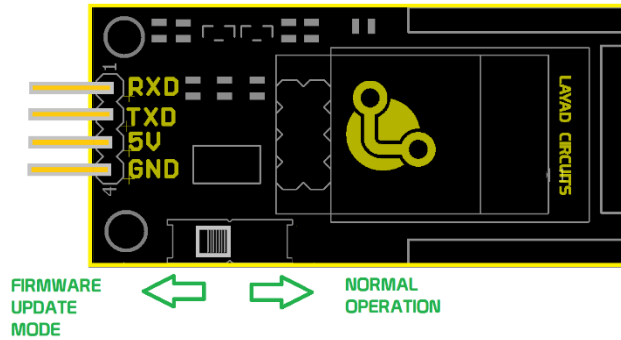- Arduino/Breadboard friendly 2.54mm pin headers

PIN FUNCTIONS

Pin Labels	Functions
GND	Ground.
5V	Input power pin. Connect to 5V source with a recommended current rating or 500mA or more. Depending on the total load, this may be connected to the Arduino 5V pin
TXD	Transmit data pin of the WiFi module. Connect this to the Receive pin of the host microcontroller.
RXD	Receive data pin of the WiFi module. Connect this to the Transmit pin of the host microcontroller.

Slide Switch

When in normal operation, slide the switch towards the capacitor position.

If a firmware update is desired, slide the switch towards the mounting hole position and then apply power. After this is done, the ESP8266 should enter firmware upload mode. See figure below.

The switch disconnects or connects the GPIO 0 to ground. GPIO 0 is internally pulled up in the adaptor.

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FIRMWARE UPDATE MODE ⇐ ⇒ NORMAL OPERATION

Pins Pulled Up/Down

The table summarized the pins with pullup/pulldown resistors within the adaptor board:

ESP8266 RST	Pulled Up
ESP8266 CH_PD	Pulled Up
ESP8266 GPIO 0	Pulled Up
ESP8266 GPIO 15	Pulled Down

Example Wiring:

Arduino / Any 5V microcontroller

Kimat ESP8266 Adaptor with either ESP01 or ESP12

RXD — TXD
TXD — RXD
5V — 5V
GND — GND

Hardware Serial (recommended)
Software Serial may be used at lower baud rates (e.g. 9600)

- Ideally, use a free hardware serial port/UART
- The Arduino's software serial implementation may be used but user is advised to lower the baud rate of the WiFi module to 9600 first. Most ESP8266 AT command firmware are defaulted at 115200 baud.

Test Code:

If using an Arduino Mega 2560 and an ESP8266 module with an AT firmware installed, and with the adaptor module connected to Serial 1:

Adaptor TXD – Arduino Mega RXD1
Adaptor RXD – Arduino Mega TXD1

then the following code may be used to test AT commands.

```
void setup() {
  Serial.begin(115200);
  Serial1.begin(115200);
}

void loop() {
  if(Serial.available())
Serial1.write(Serial.read());
  if(Serial1.available())
Serial.write(Serial1.read());
}
```
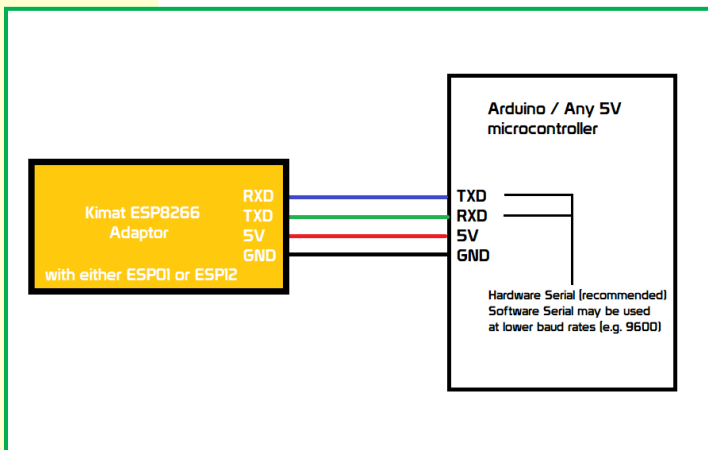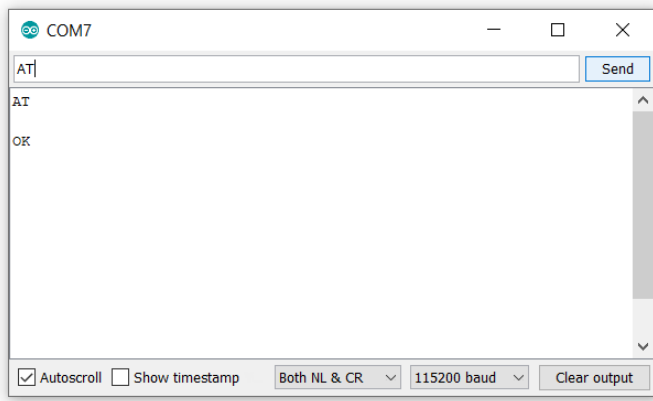
The test procedure for the adaptor module may be summarized below:

- Ensure the wiring is correct and the ESP8266 is installed correctly on the adaptor board
- Upload the code
- Open the serial monitor at Tools>Serial Monitor
- Set baud rate to 115200 or to the baud rate of your ESP8266 module.
- Select "Both NL & CR"
- Type AT on the send field and click send
- You should get an "OK" response from the ESP8266

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