# ESP WiFi Module configuration and connection for UDP Protocol

This manual explains how to flash ESP-07 modules with firmware for use with UDP protocol and how to configure connection settings in U|g|CS.

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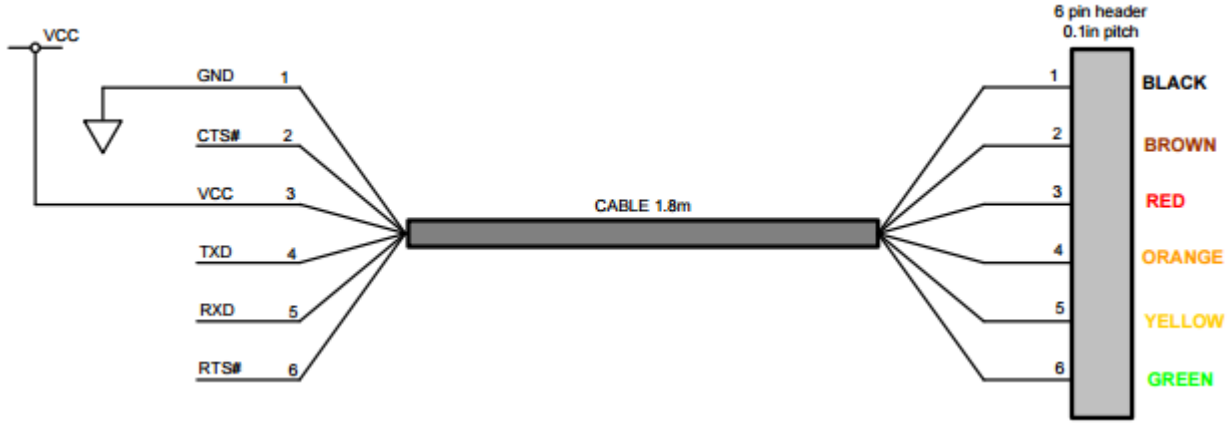
# Preparing for firmware update

- Download custom firmware from our server: http://www.sph.engineering/download/firmware_fixed.zip
- Download firmware flashing utility ESP8266Flasher: https://github.com/nodemcu/nodemcu-flasher/raw/master/Win32/Release/ESP8266Flasher.exe

Connect ESP-07 to PC via any appropriate USB-UART adapter like **TTL-232R-3V3**

Manual: http://www.ftdichip.com/Support/Documents/DataSheets/Cables/DS_TTL-232R_CABLES.pdf




Connection diagram:

| TTL-232R-3V3 | ESP-07 |
|---|---|
| 5V | 5V/3V |
| GND | GND |
| TXD | RXD |
| RXD | TXD |

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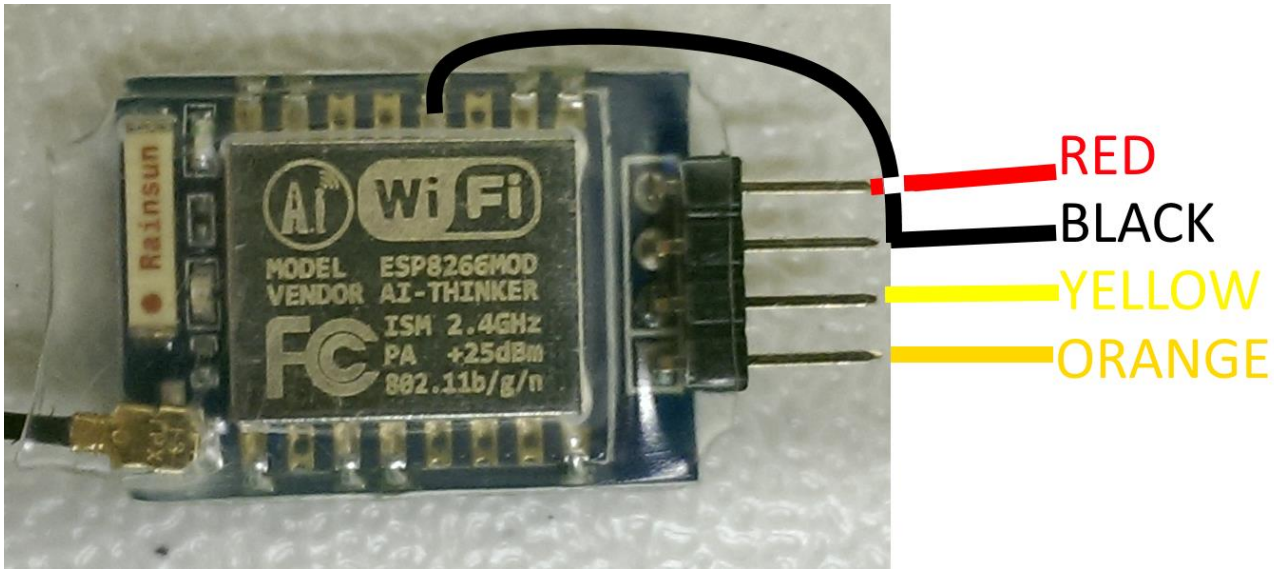
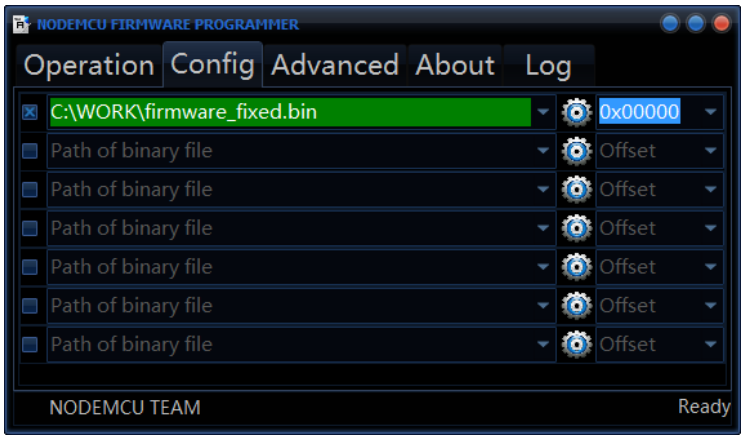
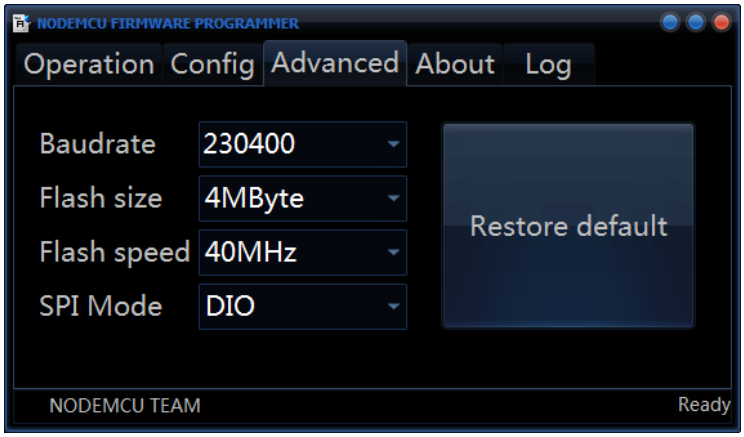



## Flashing the firmware

Run ESP8266Flasher as administrator and use following settings (**Config** and **Advanced** tabs):

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# Configuring the modules

After successfully flashing and power cycling a module, a new wireless network should appear – PixRacer.

Connect to the network and enter “pixracer” as password.

**SSID: PixRacer**
**Key: pixracer**

Now to configure each module, a network address must be followed while connected to the PixRacer network.

For example this: http://192.168.4.1/setparameters?hport=14560&mode=1&ssidsta=DRONE-DANCE&pwdsta=1234567890&gatewaysta=192.168.0.1&subnetsta=255.255.255.0&ipsta=192.168.0.10&baud=57600

In this link there are the following important parameters:

- *hport=14560* this sets the UDP port of the module, each module must have an unique port, it is recommended to use increasing port numbers starting from 14560, t.i. 14561, 14562…
- *ipsta=192.168.0.10* sets the IP address of module, each module must have an unique address according to subnet mask

  *The following parameters will remain the same for all modules:*
  - *ssidsta=DRONE-DANCE* sets the SSID or network name
  - *pwdsta=1234567890* sets the network key (password)
  - *gatewaysta=192.168.0.1* sets the default gateway
  - *subnetsta=255.255.255.0* sets the subnet mask
  - *baud=57600* sets the connection baud rate

As an example, the first module of the swarm would have the configuration mentioned above, but second would have the following:
http://192.168.4.1/setparameters?hport=14561&mode=1&ssidsta=DRONE-DANCE&pwdsta=1234567890&gatewaysta=192.168.0.1&subnetsta=255.255.255.0&ipsta=192.168.0.20&baud=57600

Notice that only *hport* and *ipsta* parameters change.

After setting the parameters (following link), it is recommended to restart the module and check if the parameters were correctly set, by following this link:

http://192.168.4.1/setparameters?reboot=1

Now a list of parameters should appear on screen, two can be checked to confirm successful settings change:

WIFI_UDP_HPORT 14560
UART_BAUDRATE 57600

## Configuring Ardupilot VSM to connect to modules

After successfully configuring modules, it is necessary to configure *vsm-ardupilot.conf* file accordingly. The following example shows how the settings for one module must look:

```
vehicle.ardupilot.udp.1.udp_local_port = 14560
vehicle.ardupilot.udp.1.udp_address = 192.168.0.10
vehicle.ardupilot.udp.1.udp_port = 14555
```

To add a second module, just add the same three lines and edit like this, for example:

```
vehicle.ardupilot.udp.2.udp_local_port = 14561
vehicle.ardupilot.udp.2.udp_address = 192.168.0.11
vehicle.ardupilot.udp.2.udp_port = 14555
```

Notice how only the first two parameters and number after *udp.* changes.