SPH ENGINEERING
SMART PLANES & HELICOPTERS

UGCS DDC

ESP WiFi Module configuration and connection for UDP Protocol

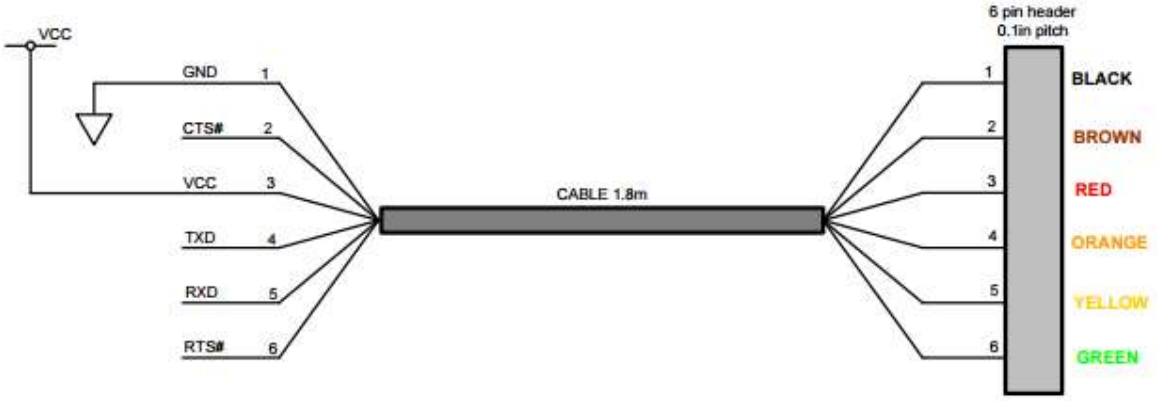
This manual explains how to flash ESP-07 modules with firmware for use with UDP protocol and how to configure connection settings in **UgCS**.

Preparing for firmware update

- Download custom firmware: https://github.com/ugcs/ddc/blob/master/WiFi/firmware_UDP_2016-12-05.bin
- 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**

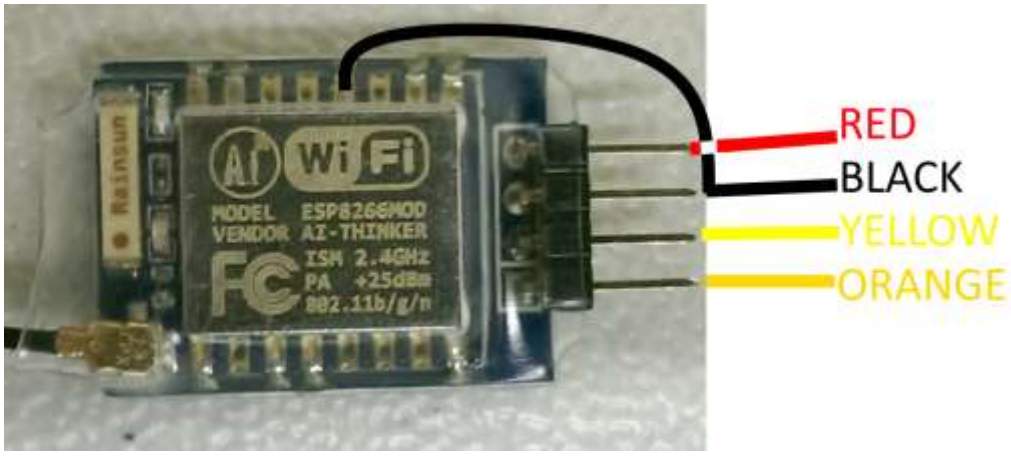
Manual: http://www.ftdichip.com/Support/Documents/DataSheets/Cables/DS_TTL-232R_CABLES.pdf



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

Connection diagram:

Image displaying the colored wire connection from UART to ESP module during flashing.



NOTE: to initialize flash mode for the ESP-07 module, it is necessary to ground pin GPIO0 (see picture above) during powering on the module and recommended to leave grounded throughout the flashing.

Flashing the firmware

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

Configuring the modules

After successfully flashing and power cycling the module, a new wireless network should be avaliable: 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:

connection.udp_in.1.local_port = 14561

To add additional modules, just add the same line and edit like this, for example:

connection.udp_in.2.local_port = 14562

connection.udp_in.3.local_port = 14563

Notice how only the port number and number after *udp_in*. changes.