SETTING ROUTER , MAVESP FIRMWARE AND PC NETWORK SETTINGS

FIRST PART:

To set up the network that will manage the fleet of drones that will be used, you will first need an access point that will be used to create a WiFi network to which the drones will connect via the ESP8266 or another device dedicated to this work.

As the drones will "preferably" have to have an IP address that corresponds to their number within the fleet, it must be set manually and must be STATIC. In this way the drones will connect to the network with a static ip address that corresponds to their id (i.e:ID=14,IP=192.168.1.14)

SET UP THE ROUTER OR ACCESS POINT :

- SSID AND PASSWORD

The router is the first device to be set up, as it will create the network to which the drones and other devices will connect.

To connect to the main network, the ESP8266 on the drone must know the SSID and PASSWORD of the main network.

These two settings can be found on the router's main settings page.
To access the main page :

1) Connect to the network created by the AP, with a PC or smartphone.
2) Open a browser and type in the search bar: "*192.168.1.1*" (This address is general for each router).
3) Once in the settings page, usually routers have the same structure and you will have to search for the default SSID and the default PASSWORD.
4)Now write down your SSID and PASSWORD and change them if necessary.

- DISABLE DHCP SERVER

As the drones connecting to the network will have a static IP address, we do not want the router to automatically assign the IP address to the drones connecting to the AP, as this would create a conflict of interest.

To do this, the router's DHCP SERVER, which is responsible for assigning IP addresses, must be **disabled**.

* *If your ROUTER does not have a DHCP server then you can skip to the SECOND PART.*

To disable your AP's DHCP server:

1)Navigate to settings **LAN->DHCP**
2) Search for a Checkbox for disabled the DHCP server
3) Once you have disabled the DHCP SERVER , apply and save the settings

All devices that want to connect to this network must now have a STATIC IP before connecting .

Let's see how to set it on drones and PCs!

SECOND PART:

SET UP ESP8266 ON EACH DRONE :

In this case, this example is based on a setup with ESP8266 where the mavesp8266 firmware is built on this:
(https://github.com/ArduPilot/mavesp8266)

If you use another setup, follow the various steps to set up the drones in the method which is most similar to your.

Normally the *esp8266* can works in 2 modes: AP (Access Point) and STA (Station Point):

AP: The ESP8266 creates a wifi network to which other devices can connect.

STA: The ESP8266 connects to a network whose SSID and PASSWORD it has saved.

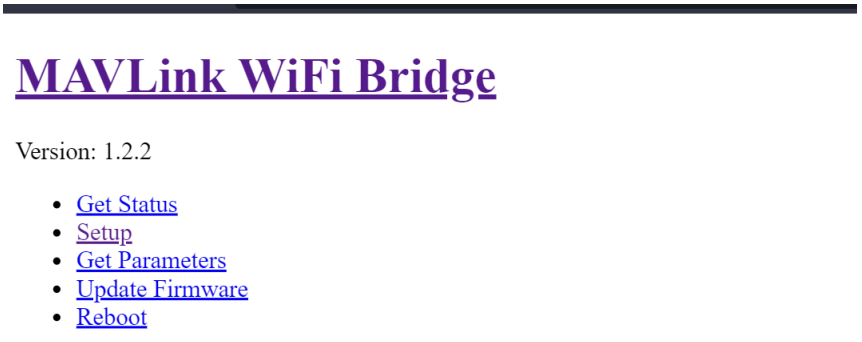
To initially set the ESP8266 settings, we should connect to the network created by the ESP8266 while it is in AP mode. Turn on the esp8266 and wait ~ 1 min . And then connect it to the wifi network which it has created

The mavesp8266 firmware by default creates an AP network that has a default SSID and password:

SSID -> "Ardupilot" , **Password** -> "ardupilot".

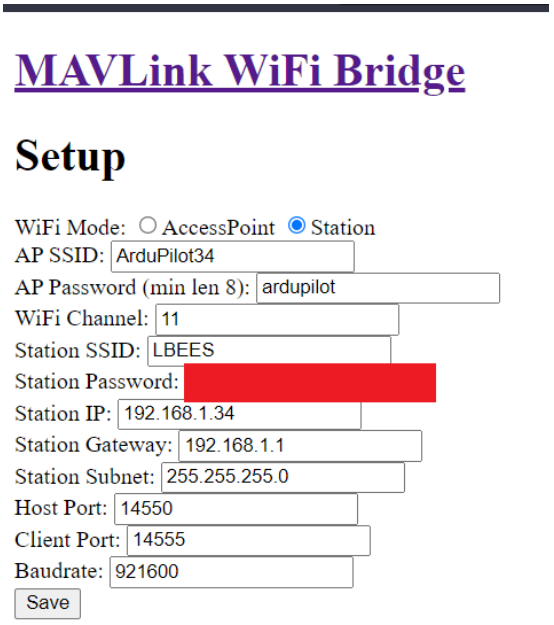
Once connected to the network, type in the browser's search bar: **192.168.4.1** (this is the default address for the AP mode of the mavesp8266 firmware).

A site similar to this one should be presented , this is the homepage :



From here, click on **Setup** and you will be taken to the *Mavlink setup page*. From here you can change many parameters:

AP SSID -> is the ssid of the ACCESS POINT (for you it will be “Ardupilot”) . *Set it as you like, preferably with a name that contains the drone id.In this case the drone was the number 34.*
AP Password -> is the password of the ACCESS POINT network (for you it will be “ardupilot”)
STATION SSID -> is the ssid of the network to which the esp8266 will connect when in Station mode.*It is important to set it to the SSID of YOUR network created by the router.*
STATION PASSWORD -> Is the password of the network to which the esp8266 will connect when in Station mode. *It is important to set it to the PASSWORD of YOUR network created by the router.*
STATION IP -> is the static IP address with which the drone will connect to the network created by the router.*This is really important. Set it according to your subnet, by default it will be 1 and as last value 1-255 set the id of your drone.* Ardupilot34 -> 192.168.1.34
STATION GATEWAY AND SUBNET -> These parameters are important to allow the esp8266 to connect to the network created by the router, the values set in the image are the ones you will need to enter

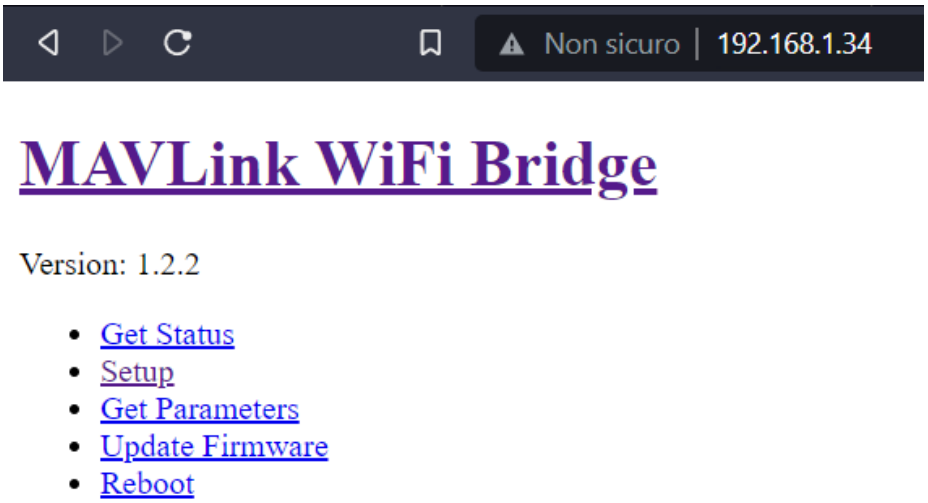


Good! After entering the values, change the radio button to : Station and click Save. The ESP8266 will have to be restarted and if the STATION network is available it will connect to it with the IP STATION, otherwise after about 1 minute it will create the AP network.

Check if the drone has connected to the network station:

To check that the drone has connected to the STATION network, connect to the STATION network and search in the browser's search bar:

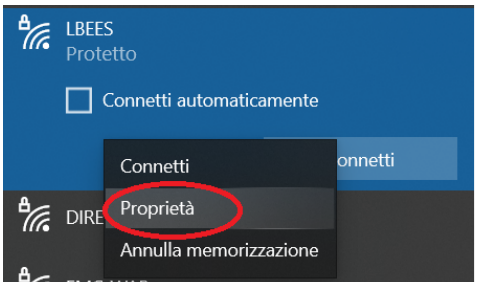
192.168.1.[**the id of your drone**].



The drone is connected to the network with the static address I had previously written!

SETTING A STATIC IP ADDRESS ON WINDOWS 10:

Right-click on the wifi network of the STATION network and click on "Settings".

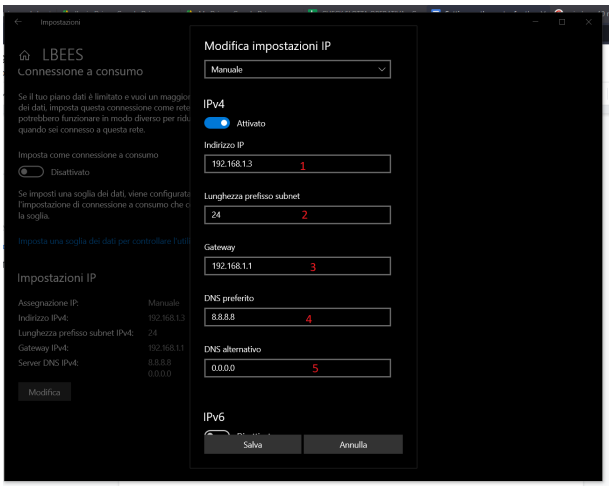


Once in the settings, click on the "**Edit**" button under "**IP settings**".

A window like the image below will open and you need to change from "**Automatic**" to "**Manual**".

1: is the static IP address to be assigned to your computer. Warning: assigning an IP address outside the range of the drones!
2:Is the subnet : 255.255.255.0 == 24 (In Windows 10 , you had to write 24 because 255.255.255.0 is not accepted)
3:Default Gateway : 192.168.1.1
4 and 5 : DNS (8.8.8.8 and 0.0.0.0). Not really important but must write

After changing values , save it and try reconnecting it to the NETWORK !



In this way, the computer (GCS) will connect to the network with a static address and will be able to communicate with all the drones in the network.

Thanks for your attention by Luminous Bees