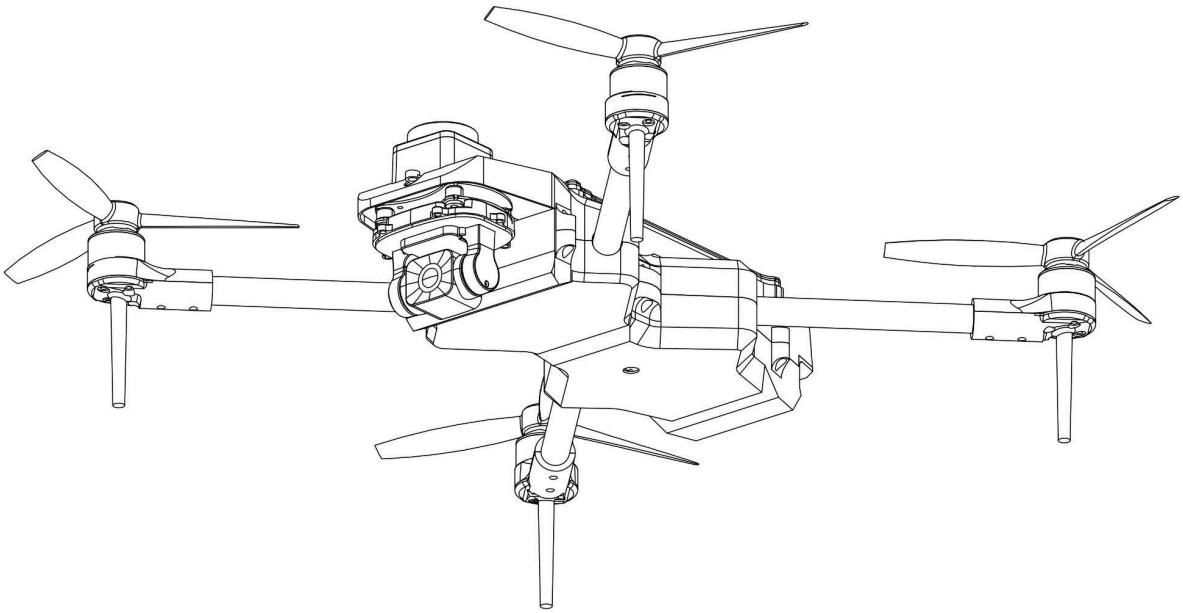
Suparna C2 Manual

Command and Control

v1.0 *May 16, 2024*

iDronam



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SOLUTIONS

💡 **Searching for Keywords**
Search for keywords such as “battery” and “install” to find a topic. Press Ctrl+F on Windows or Command+F on Mac to begin a search.

💡 **Printing this Document**
This document supports high resolution printing.

Revision Notes		
v1.0	16-May-2024	Initial Version

Using this Manual

Legend

🛑Warning ❗ Important 💡Hints and Tips 📘Reference

Read Before the First Flight

Read the following documents before using the **Suparna**:

1. Disclaimer and Safety Guidelines
2. Quick Start Guide
3. User Manual

❗ It is recommended to watch all tutorial videos on the official Menthosa website and read the disclaimer and safety guidelines before using for the first time. Prepare for your first flight by reviewing the quick start guide and refer to this user manual for more information

🛑 The operating temperature of this product is 0° to 40° C. It does not meet the standard operating temperature for military grade application (-55° to 125° C), which is required to endure greater environmental variability. Operate the product appropriately and only for applications that meet the operating temperature range requirements of that grade.

Content

Connection Modes

This section tells you about the various Connection modes of Suparna

Connection Modes

Suparna has 3 Connection Modes by which the C2 (Command and Control) link can be established between the drone and Ground Control Station (GCS). Suparna can be flown in both outdoor (GPS available) as well as indoor (GPS denied) environments. But due to the nature of data being transmitted in both environments the bandwidth requirements change.

- For **Indoor Environment,** drone is constantly mapping the environment and using the Vision systems for localization. The bandwidth required is in the range of - **30 Mbps** and some peaks of up to **50 Mbps.**
- For **Outdoor Environment,** the drone has GPS for its localization and no mapping is being done. So bandwidth reduces to **2 Mbps** with peaks up to **5 Mbps.**

💡 The drone telemetry data which includes only critical information required for drone flight is being transmitted on a very light weight protocol hence the bandwidth requirements for it is in range of **100 kbps**.

5G Mode

On board the drone there is a 5G module, which supports all the sub 6 Ghz 5G bands available in India. The module supports 5G nano sim which is inserted into the drone via the insertion slot present at the back of the drone.
Connecting to the drone -

1. Before powering on the drone, insert the 5G nano sim card into the drone.
2. Power ON the drone.
3. For public 5G use -
    a. Log into '**idronam.com**' now you can connect to your drone via selecting the drone alias at Dashboard.
4. For private 5G use -
    a. Open the '**iDronam Enterprise**' software. If you have previously added the drone you can simply select the connect button on the device dashboard.
    b. If you are using the drone for the 1st time. Please add the drone to the database and then continue.
5. Upon successful connection you will be able to see the drone telemetry data and live feed.

Hurray! Your drone is now connected via a *5G network*. Enjoy Flying.

📘 For adding the drone, please refer to the Suparna Flight Manual.

❗ For the private use cases such as the 100 5G labs, the 5G module is locked at n78 band and only private 5G sims will work.

🛑 Sim Hot swapping is not supported.

Hotspot Mode

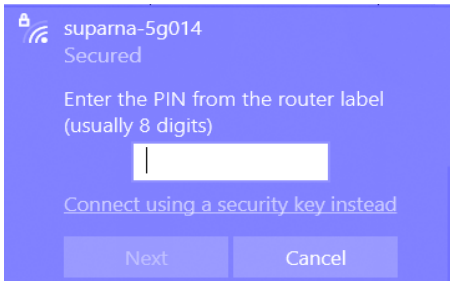
The drone has a 2.4/5Ghz wifi module onboard for quick and easy connections. This can also be used to connect to the drone. By default, the drone is in Hotspot or AP (Access Point) mode and broadcasting in 2.4Ghz band.
Connecting to the drone -

1. Power ON the drone.
2. Connect to the Hotspot. The SSID of the drone's hotspot is unique. It is the drone's serial no. - '**suparna-5gXXX'**. Password for the hotspot is - **'Suparna5Gdrone'.**
3. Open the **'iDronam Enterprise'** software. Go to the dashboard.
4. If the drone is added, connect to the drone.

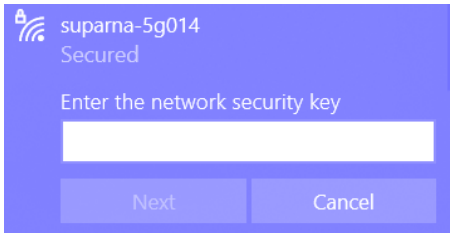
🛑 Although the drone supports 5Ghz band, it is not recommended to fly using this as the range is very limited due to the power limitations of drone. For optimal performance use the 2.4Ghz band.

❗ The drone hotspot connection is tested up to a distance of ~150 meters in 2.4Ghz band. No video was being transmitted, only the drone C2 link was established.

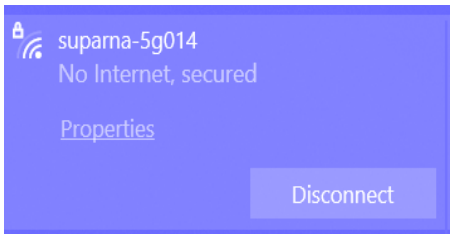
💡 If you have a 5G sim onboard drone which has internet connection/backhaul. The drone also has an internet connection and by extension the system connected to the drone Hotspot can also access the internet. This only works if IPv4 addresses are used.



In **Windows 10/11** the Hotspot is shown as in image and if a password is entered here the connection will not be established. So, in order to connect, select the link below the text box called - **'Connect using a security key instead'.**



After selecting the link, this input box will open. Now, enter the password mentioned above here.

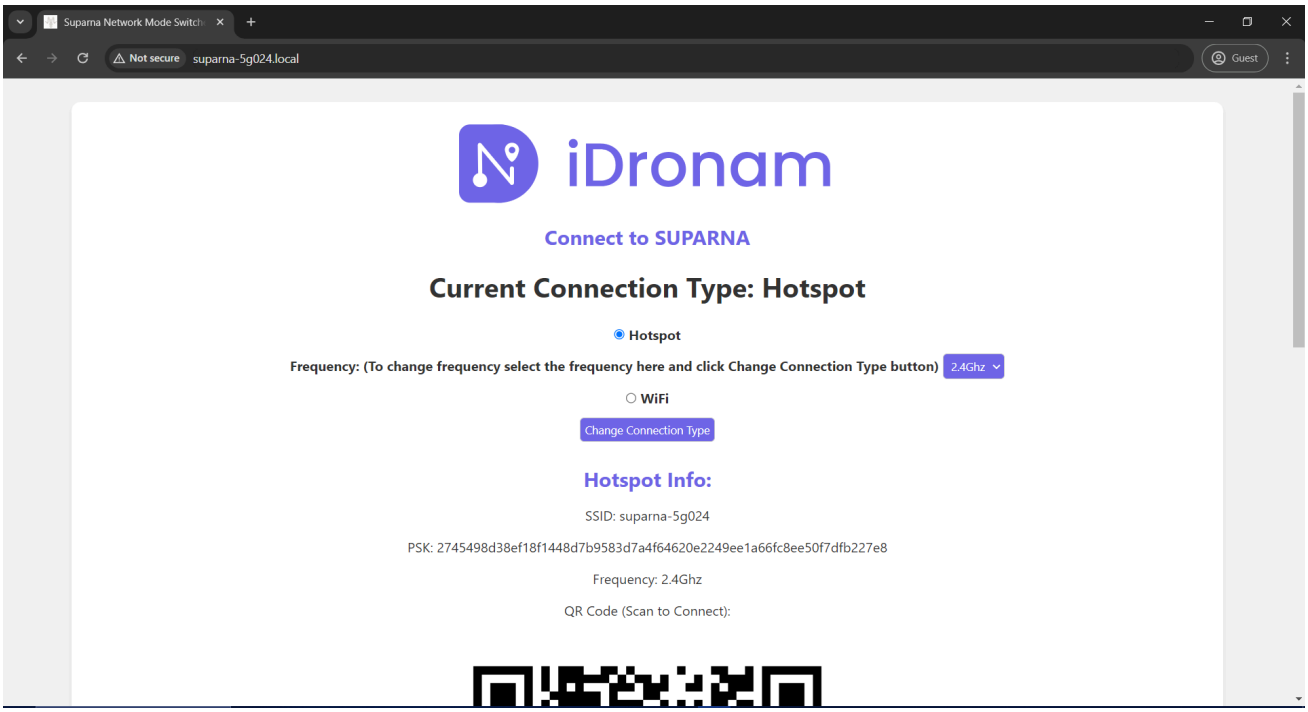


Windows shows loading even when connection is done. Just click somewhere else and then check wifi connections, if successful the connection will be established and it can be seen as shown in the image.

WiFi Mode

When in wifi mode, the drone can be connected to any 2.4/5Ghz wifi network. As the drone comes in Hotspot mode by default, we need to switch it to wifi mode, which can be done by the network mode switch webpage hosted inside the drone. The steps for connecting to the webpage are -

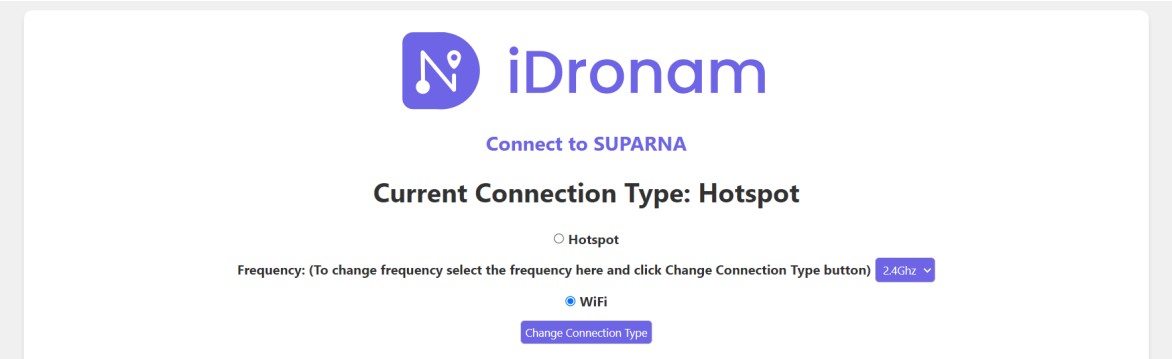
1. Connect to the hotspot of the drone.
2. Open any browser and enter the link of the webpage - **'suparna-5gXXX.local'**, where suparna-5gXXX is the ID of the drone and can be checked from the SSID of the hotspot.
   If you are facing issues you can also navigate to the webpage by entering the drone's IP - **'10.42.0.1'**. This is the same for all the drones.
3. Upon successful connection a webpage will be opened as shown in the image below-



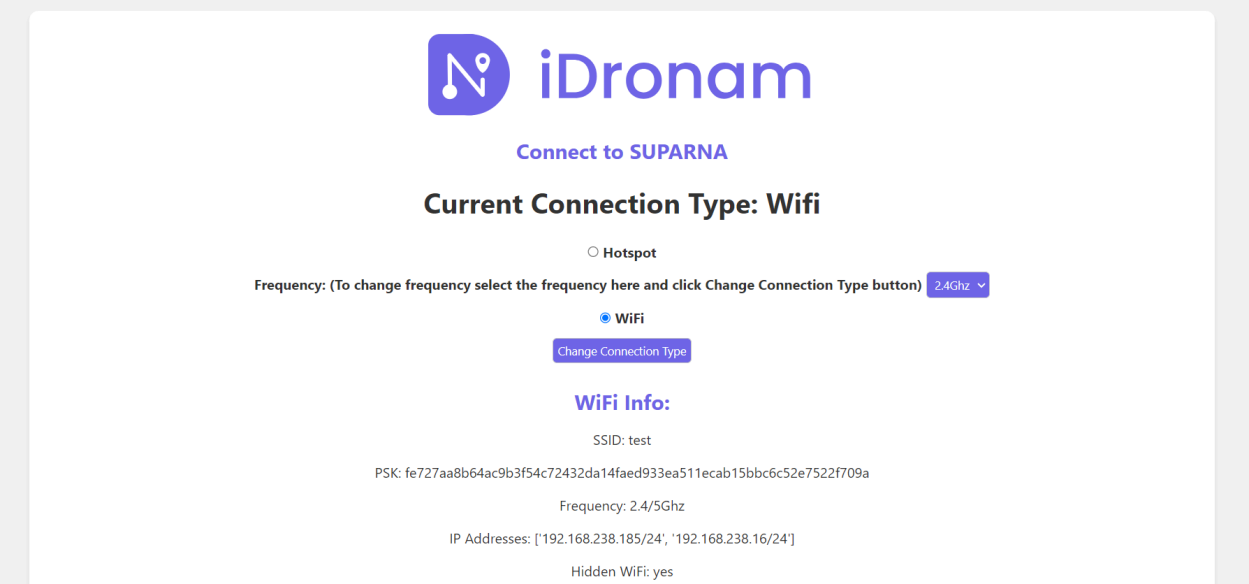
4. This will be the first time for a drone's wifi mode connection. Navigate to the bottom of the page where the **'Add New WiFi'** section is present. Here, enter the wifi details - 'SSID' and 'password'. Please enter the password carefully, you can view password text by clicking the Show button.

💡 If the WiFi is hidden, you can check the Hidden Wifi box and drone will be able to connect to it.

5. After entering the details and verifying the password. Click on the **'Connect'** button. A warning will pop up; click ok. Now the page will refresh. This means that the wifi details are added into the drone.
6. Now to connect to the WiFi navigate to the top of the webpage, here select the **'WiFi'** radio button and click on **'Change connection type'**. A warning message will come, click on ok and the page will start loading.



7. Now, the drone's Hotspot will be disabled and the drone will connect to the entered WiFi.
8. In order to connect to the drone via the WiFi, connect the GCS system to the same WiFi as the drone.
9. Now you will need the IP address assigned to the drone. This can be obtained via your WiFi router where you will be able to see the drone's ID connected to the WiFi.
10. If your router does not have this functionality or you are unable to retrieve the IP address. You can open the network mode switch web page by going to the link - **'suparna-5gXXX.local'**. Here you will be able to see the IP addresses assigned to the drone.



> 💡 If the webpage is unable to open by showing a DNS problem. Please close the browser tab and wait for 30 seconds. Then, try again.

11. Now, add this IP in the **'iDronam Enterprise'** via the **'Add devices'** and you can connect to the drone.

Network Mode Switch

This section explains how to switch the drone's network mode.

Network Mode Switch

The drone has a single wifi module on board. Hence, at a time the drone can be in either hotspot mode or wifi mode. So, how to switch from one mode to another, this can be done by a webpage hosted in the drone itself.

> 💡No impact is done on 5G mode it is always ON.

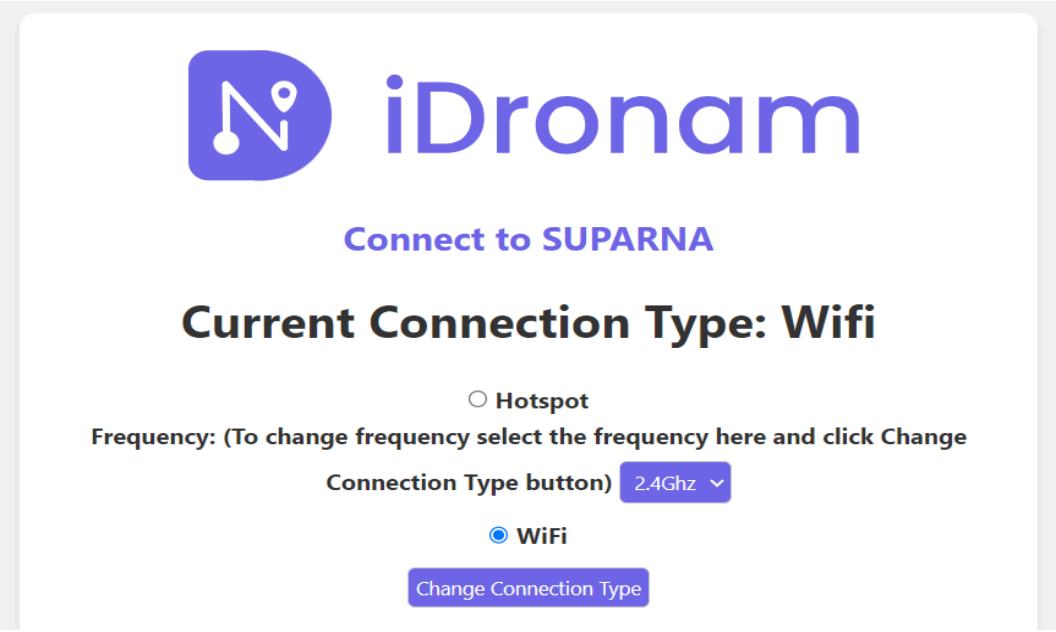
Network mode switch webpage

This is a central webpage for Switching and Monitoring the Networks of the Drone. Currently, Wifi and Hotspot modes can be configured from this page.

> 💡To get the IP address assigned to the 5G SIM of drone, Please check the 5G system as the drone does not tells the 5G IP. Once the 5G sim is inserted the drone sends the request for the IP address automatically, no commands are required.

There are 3 sections to the webpage -

1. **Current Connection Type :** It shows in what connection mode the drone currently is in. There are 2 radio buttons showing the connection modes, and the current mode is already selected. Along With these there is a frequency selection list. This is used when a drone is to be used in Hotspot mode. There are 2 options - 2.4 and 5Ghz.



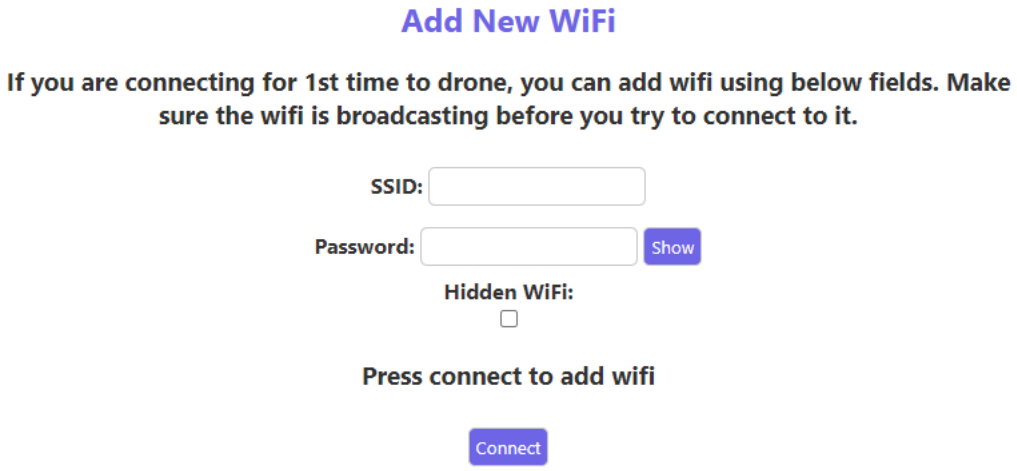
2. **WiFi / Hotspot Info :** This section changes with respect to the drone's network mode.
    a. WiFi Info - This displays the current SSID, Password(PSK), Frequency, IP Addresses and Hidden WiFi Status of the wifi to which the drone is connected.

> 💡The password displayed is in encrypted form. Along with this a QR Code is also shown which can be used to connect to the same wifi as the drone.

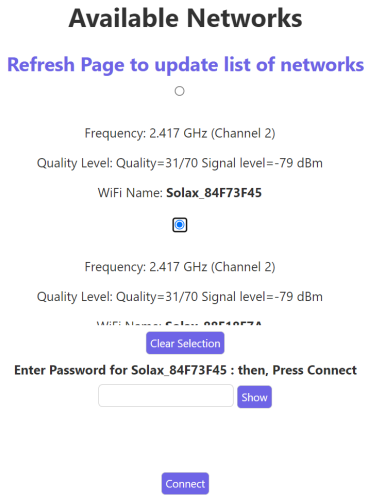
b. Hotspot Info - This displays the SSID, Password and Frequency of the drone's Hotspot.

> 💡The password displayed is in encrypted form. Along with this a QR Code is also shown which can be used to connect to the drone's Hotspot.

3. **Add New WiFi :** This section is used when you are switching to the WiFi mode for the first time. Also, it can be used when you want the drone to connect to hidden wifi.



4. **Available Networks :** This section only shows in Wifi mode and is used to change the wifi network of the drone. Once you select the wifi network from the list, the password text will show up. Once entered click on connect to change drone WiFi.



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