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DJI M600 PREPARATION FOR HOVERMAP OPERATION

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Using this manual

Hovermap is a powerful system that can be used as a Lidar mapping payload but also as an advanced autopilot for drones. It is therefore recommended to read the user manual thoroughly to make use of all its capabilities in a safe and productive way.

Disclaimer and safety guidelines

This product is not a toy and must not be used by any person under the age of 18. It must be operated with caution, common sense, and in accordance with the instructions in the user manual. Failure to operate it in a safe and responsible manner could result in product loss or injury.

By using this product, you hereby agree that you are solely responsible for your own conduct while using it, and for any consequences thereof. You also agree to use this product only for purposes that are in accordance with all applicable laws, rules and regulations.

The use of Remotely Piloted Aircraft Systems (RPAS) may result in serious injury, death, or property damage if operated without proper training and due care. Before using an RPAS, you must ensure that you are suitably qualified, have received all necessary training, and read all relevant instructions, including the user manual. When using an RPAS, you must adopt safe practices and procedures at all times.

Warnings

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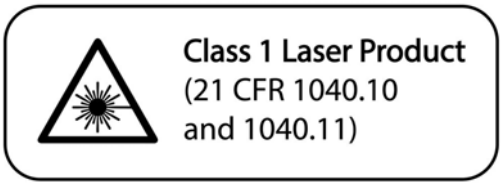
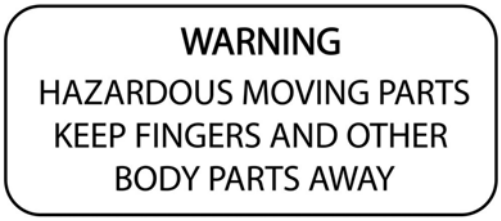
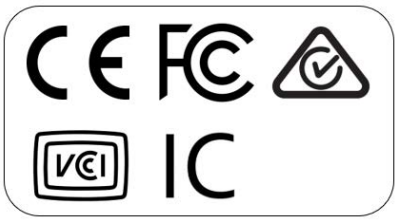
- Always be aware of moving objects that may cause serious injury, such as spinning propellers or other components. *Never* approach a drone while the propellers are spinning or attempt to catch an airborne drone.







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1. DJI M600 Aircraft Configuration

This instruction shows how to set up a DJI M600 to enable it to carry Hovermap and to send autonomy data and receive GPS data through the Hovremap serial cable. The key steps are:

1. Mount Hovermap using a custom carbon fiber basket
2. Update and configure the DJI software development kit (SDK)

As of Hovermap firmware version 1.4.5, Hovermap is automatically configured for the purchased autonomy level. This means that if Hovermap is purchased in Mapping mode, it can be mounted and connected to the supported drone via the supplied serial cable and the GPS information from the drone will be automatically embedded into the scan data. In Pilot Assist mode and Autonomous Waypoint mode, the system behavior is unchanged.

For information on how to use DJI GPS data to georeference and automatically merge your scans, please see the Emesent Processing Software user manual.

> **Note**
> GPS data must be present in all scans to be automatically merged. Walking or driving scans without GPS data can be merged with flight scans using the rough align merging process. Refer to the Emesent Processing Software user manual for more information.

1.1 DJI M600 Hovermap mounting

On purchase, Emesent can provide mounting hardware and cables that are customized for the DJI M600. Follow these steps to mount Hovermap to your DJI M600:

Figure 1 DJI M600 mount assembly

1. Mount the supplied mounting plate to the DJI M600 12 mm rails by placing the arms over the top and screwing the provided clamps closed tight around the rails. Make sure that the dovetail is oriented in the right direction, as shown in the following figures.

Figure 2 M600 Mounting assembly orientation: Front view

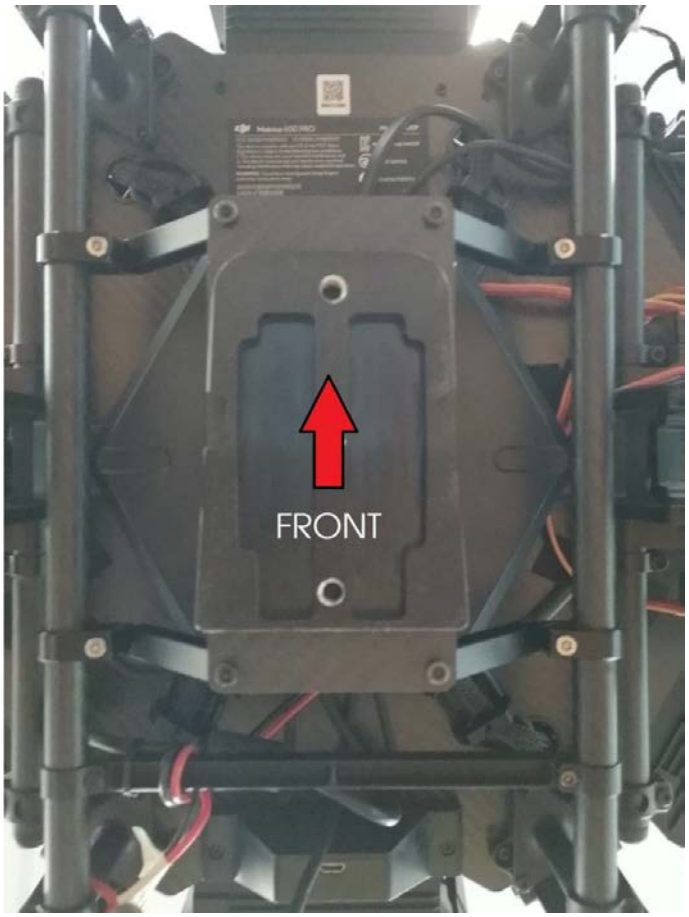

Figure 3 M600 Mounting assembly orientation: Bottom view

2. Open the DJI M600 top cover and connect the supplied serial/API cable to the A3 Pro API port, as shown in the following figure.

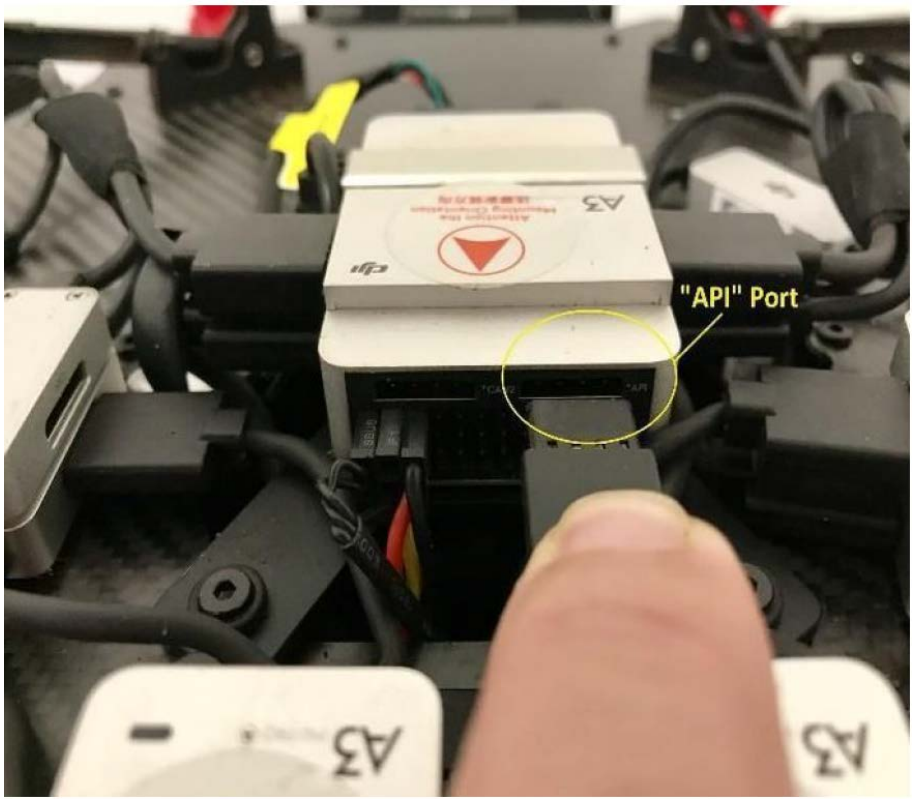

Figure 4 A3 Pro API port

3. To power Hovermap from the drone, connect the supplied power cable to the power port, as shown in the following figure (left). Otherwise, Hovermap can also be powered from a 12 to 54V external battery that can be attached to it (right).

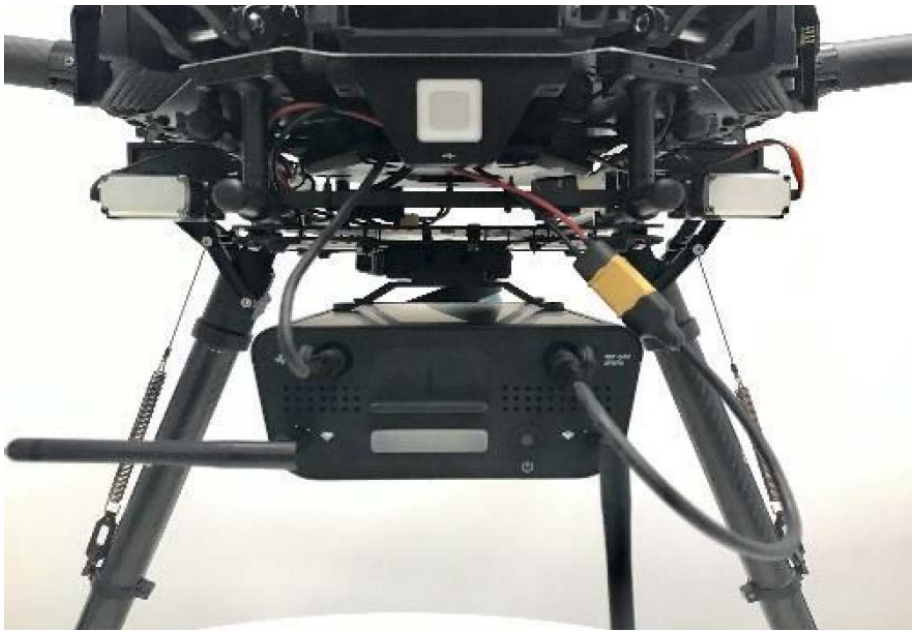

Figure 5 **Hovermap powered by DJI M600**

Figure 6 **Hovermap powered by external battery**

1.1.1 Horizontal payload mounting for Autonomous Waypoint mode operation

> **Note**
> Autonomous Waypoint mode is not compatible with vertical VF1 Hovermap payloads.

To provide the maximum amount of upward visibility for horizontal HF1 payloads during flight in Autonomous Waypoint mode, the payload must be located in the furthest forward position.

Please note the images below, in particular the forward-most mount located on the outside of the main rail mounts of the M600.

Figure 7 Autonomous Waypoint mode: Forward mounting close up

Figure 8 **HF1 Autonomous Waypoint mode: Forward mounting**

2. Compatible Aircraft and Firmware

Table 1 **Hovermap-supported drone firmware**

Drone	Approved firmware
DJI M210 v1	V01.02.0450 (2019-12-10)
DJI M210 RTK	V01.02.0450 (2019-12-10)
DJI M600	V01.00.01.67 (2019-02-26)
DJI M600 PRO	V01.00.01.67 (2019-02-26)
DJI M300	V01.00.02.11

2.1 DJI M600 activation

If you are using a new drone, it needs to be activated, configured, and prepared for standard operations, as DJI's instructions. We recommend that you thoroughly read DJI's user manual and ensure that you have a good working knowledge of local and federal regulations for safe operations in your region, regardless of whether you're using the drone with Hovermap.

Warning

- Drone settings may be reset after a DJI firmware update.
- Do not upgrade your drone beyond the Emesent-approved firmware.
- Recheck all settings after updating the firmware.
- You are responsible for safe operation and compliance with local regulations.

2.2 DJI SDK configuration

To enable communication between Hovermap and the drone through the DJI SDK, use the following settings in the DJI Assistant 2 program. Download the DJI Assistant 2 software from the DJI website and install it on your computer.

1. Read and familiarize yourself with the DJI's user manuals.
2. Connect the drone to your computer with the DJI-supplied USB cable.
3. Power on the drone and toggle the USB mode switch at the back of the DJI M600 to the left (laptop icon).
4. Launch DJI Assistant 2, then go to M600 to configure the settings.
5. Go to the **Firmware** tab and ensure that the drone has the latest Hovermap-supported firmware.
    a. If the drone's firmware version is *behind* the version supported by Emesent, log in with your DJI account and select the upgrade button.
    b. If the drone's firmware version is *ahead* of the version supported by Emesent, downgrade to the one supported by Emesent if possible, or contact Customer Success.

6. Ensure that your computer has internet access to enable a download of the supported firmware version.
7. Go to the **SDK** tab and configure the following settings:
    a. **Enable API Control:** Checked
    b. **Ground Station Status:** Checked
    c. **Enable SDK Failsafe Action:** Checked
    d. **Baud Rate:** 921600
    e. **Remote Controller Channel Data:** 50 Hz
    f. **SDK Failsafe Action:** Return Home
8. All other parameters are set by Hovermap at startup.
9. Close DJI Assistant 2, turn off the drone, and disconnect the USB cable.

2.3 DJI SDK activation

Register and activate the onboard SDK application as follows:

1. Connect Hovermap to the drone using the provided serial and power cables.
2. Power on the drone and Hovermap, then run the **DJI GO application** on a tablet. Ensure the tablet is connected to the internet.
3. Press the button on Hovermap and wait for it to start scanning (the status LED should be green and the LiDAR puck will start rotating).
4. DJI GO will prompt you to confirm that you authorize the Hovermap. Click **Accept**.
5. Press the button on Hovermap again and wait for it to stop.
6. Power down the drone and Hovermap.
7. Exit DJI GO.
8. Power on the drone and Hovermap again.
9. Run the DJI GO application on a tablet and ensure that the tablet is connected to the internet.
10. Once Hovermap is slowly flashing blue, press the power button. Wait for it to scanning to start with the status LEDs flashing green and the LiDAR puck rotating. This step is required to complete the activation process.
11. Press the power button on Hovermap again, then wait for it to stop scanning.
12. Power down the drone and Hovermap.

13. Exit DJI GO.

The drone and Hovermap are now ready to fly.

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