



DJI AUTONOMOUS MODE CHECKLIST

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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.



Warning

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.



Drone inspection and preflight	
Inspect the LiDAR sensor.	Clean and serviceable
Mount Hovermap to the drone and ensure that the LiDAR sensor can rotate freely.	Secured, clear
<p>Ensure the Hovermap is allowed sufficient time to acclimatize to the ambient temperature of the flight environment before take-off. (No visible Fogging on lens. DO NOT WIPE allow it to dry off naturally)</p> <p>Note: If the intended flight path is expected to encounter high humidity environments, non-alcohol based anti-fog spray may be used on directly on the LiDAR lens.</p>	Checked
<p>Connect the power cable, and serial cable.</p> <p>Note: Test the cable connection by gently tugging on the power and serial cables (single cable for Hovermap ST/ST-X) to ensure they are positively retained on the Hovermap. If the cables fail to keep connected during this test, it is recommended to get in touch with Emesent support.</p>	Connected
<p>For HVM100, ensure both Wi-Fi antennas are connected and positioned 90 degrees apart. It is recommended to orient one antenna vertically and the other horizontally for optimal results.</p> <p>Note: The Hovermap ST and ST-X have internal antennas.</p>	Offset
<p>If using the Samsung tablet, connect it to the controller using the supplied USB-A to USB-C cable.</p> <p>If using the DJI RC Plus controller, make sure that the correct version of Commander is installed</p>	<p>Connected</p> <p>Correct version Commmander installed on tablet or RC Plus controller</p>



<p>Conduct standard DJI preflight checks, as required by DJI including:</p> <ul style="list-style-type: none"> • Controller, tablet, and drone batteries are fully charged. • Propellers are undamaged and mounted correctly. • Airframe is airworthy no deformations or cracks. 	<p>Checked</p>
<p>Check that the take-off space is of adequate size and is clear of obstacles:</p> <ul style="list-style-type: none"> • M210: 2.2 m horizontal, 2 m vertical • M300: 3.0 m horizontal, 2 m vertical • M350: 3.0 m horizontal, 2 m vertical • M600: 3.6 m horizontal, 2 m vertical <div data-bbox="225 880 1061 1043" style="border: 1px solid #0070C0; padding: 10px; margin-top: 10px;"> <p> Note: These figures are the minimum. Pilot capabilities must be considered.</p> </div>	<p>Checked, clear</p>
<p>Position the drone so that it is level and facing away from the operator</p>	<p>In position</p>
<p>Power on and preflight</p>	
<p>Power on the controller and wait for the tablet to boot up.</p> <p>When prompted, double-tap the Commander icon on the tablet, or touch once and select only once (USB permissions).</p> <div data-bbox="225 1462 1061 1704" style="border: 1px solid #C00000; padding: 10px; margin-top: 10px;"> <p> Warning: If using the Samsung tablet, ensure that it is connected to the controller using the supplied USB-A to USB-C cable. This ensures that DJI flight data is shown in Emesent Commander.</p> </div>	<p>Display: On Controller: On Emesent Commander App: Opened</p>
<p>Power on the drone</p>	<p>Green battery lights</p>



<p>A drone compass and IMU calibration should be conducted at least once every three months.</p> <p>In addition, compass calibration can be done directly through Emesent Commander’s Mission Workflow. On the Connectivity page, you will see a notification if compass calibration is required.</p>	<p>Follow DJI procedure</p> <p>Follow the on-screen instructions on the Emesent Commander app</p>
<p>Turn on Hovermap by pressing the power button once on the back of the unit.</p> <p>While booting/initializing, the status LED will flash red, light blue, orange, and will then slowly pulse blue.</p> <div data-bbox="225 752 1062 1093" style="border: 1px solid #0070C0; padding: 10px; margin: 10px 0;"> <p>Note:</p> <ul style="list-style-type: none"> • Do not move Hovermap until the slow pulsing blue state is reached. • If the status LED is not blue after 60 seconds, cycle power to the Hovermap. </div>	<p>Flashing red, flashing light blue, flashing orange</p>
<p>When auto-initialization and checks are complete, a slow pulsing blue will indicate that the system is ready.</p>	<p>Slow pulsing blue</p>
<p>Launch the Emesent Commander application</p>	<p>App landing page</p>
<p>Connect Emesent Commander to the Hovermap’s Wi-Fi.</p> <p>Network name: hvm100_xxxx, ST_xxxx, ST_5xxx</p> <p>Password: hovermap</p>	<p>Connected</p>
<p>Select the Assisted or Autonomous Mission tile in Emesent Commander. Follow the Mission workflow to configure the system and set up your scan mission.</p>	




<p>In the Connectivity page, go to Collision avoidance (shield):</p> <ul style="list-style-type: none"> • Check the limits are appropriate and set a buffer if required. <div style="border: 1px solid #0070C0; padding: 10px; margin-top: 10px;"> <p>Note: Flying less than 50 cm from rotor-tip to wall may result in an aerodynamically-induced crash.</p> </div>	<p>Confirmed</p>
<p>Click Start Scan and keep the payload still for the first 10 seconds.</p>	<p>LiDAR spinning smoothly, slow pulsing green</p>
<p>Allow the system to perform its pre mission checks this may take up to 60 seconds or more. Once passed, the Continue button becomes available. Tap to move into the next screen where you will conduct your operation from.</p>	<p>Green tick and Pre-scan checks passed indicator</p>
<p>Take-off in Hovermap mode</p>	
<p>Set the controller to Hovermap mode if not already done.</p> <ul style="list-style-type: none"> • M210, M300: P-Mode • M350: N-mode • M600: F-Mode 	<p>Set</p>




<p>Check that the telemetry values at the bottom of the Emesent Commander app are close to zero. If not, <i>do not</i> start the motors. Restart the drone and Hovermap.</p>	<p>Checked and zero values noted</p>
<p>Start (armed) motors. <i>Do not take off.</i></p>	<p>Running smoothly</p>
<p>Hovermap and the drone are now ready for flight</p>	<p>Clear for take-off</p>



<p>Push up on throttle to desired take-off height. Clear the lower Shield limit. Alternatively, tap the Take Off button in Emesent Commander.</p>	<p>Smooth take-off, stable hover, Shield button on the top left shows Shield On</p>
<p>Shield will auto-enable. This can be confirmed by a Shield On button on the top left of screen. Descend toward the ground to test and confirm the that the Shield boundary is active. It should prevent the drone from landing.</p>	<p>Shield set, tested</p>
<p>Test all flight controls. First flight of the day you should check all controls are full free and correct. Do this by moving each control separately a small amount. Watch for the aircraft to respond appropriately to this control.</p>	<p>Full free and Correct</p>
<p>Begin scanning flight</p> <div data-bbox="225 1010 1059 1211" style="border: 1px solid #0070C0; padding: 10px; margin: 10px 0;"> <p> Note: Emesent Commander no longer requires the operator to set the navigation method. It will set the appropriate method for the given environment.</p> </div>	<p>Begin mission</p>
<p>Place waypoints</p>	
<p>Add waypoints via the Task Manager then send these tasks to Hovermap.</p>	<p>Tasks sent to Hovermap</p>
<p>With a waypoint set, click Send to start the autonomous mission.</p>	<p>Activate</p>
<p>Mission Status indicator in Emesent Commander changes from Running - Pilot Assist to Running</p>	<p>Mission Status indicator on the top right showing the system is running on Autonomous mode</p>
<p>During flight/scan</p>	




 **Warning:** Never stop the scan during flight. Maintain visual line of sight to the drone.

<p>Maintain visual line of sight to the drone at all times when operating in Pilot Assist.</p> <p>Always remain vigilant and ready to take over control of the drone by switching to DJI (M210: S or A, M600: P or A, M300/M350: A or T) in the following circumstances:</p> <ul style="list-style-type: none"> • Warning sound (other than Low Battery or Connection Lost) • If the drone exhibits unsafe behaviour (for example, drifting toward a wall) • If stable in flight, look to Emesent Commander to determine if an obstacle is within the Shield or if a Hovermap failsafe has been triggered. • If a smart failsafe is triggered during flight, assess the failsafe and allow it to complete the return to home or to return to a Rally Point. 	<p>Stay vigilant and ready to respond while flying</p>
<p>During the flight, monitor the drone battery level in the Hovermap App and on the drone status LED.</p>	<p>Monitor</p>
<p>Best results are achieved by closing the loop for each scan. Try to ensure loop closure as far as practicable.</p>	<p>Loop closed</p>
<p>At the completion of the flight, recover the drone to a safe landing position of the home position.</p> <p>Fly the robot to the landing position or auto return to home. Click the Return to Home icon. The drone may pause for a short period (approximately 10 seconds) before the return to home begins.</p>	<p>Piloting skill</p>
<p>Landing</p>	



<p>Tap the Land button then tap Confirm when prompted.</p> <div data-bbox="225 349 1061 555" style="border: 1px solid #0070C0; padding: 10px; margin: 10px 0;"> <p>Note: It is strongly recommended to use this method of landing as it also automatically disarms the drone once it has landed.</p> </div>	<p>Landing environment considered</p> <p>Status Bar shows Running - Landing</p>
<p>Landing can also be performed in Hovermap mode or DJI mode:</p> <p>Hovermap mode: Recommended in a GPS-denied environment. Disable the Shield and immediately throttle down (with no other stick input) to land the drone. Then, continue to hold the throttle down until the drone disarms.</p> <p>DJI mode: Switch to S or A (M210), P or A (M600), A or T (M300/350), land the drone, then hold the throttle (only) down until the motors are off.</p> <div data-bbox="225 969 1061 1176" style="border: 1px solid #0070C0; padding: 10px; margin: 10px 0;"> <p>Note: In a GPS denied environment all switch positions except Hovermap will result in DJI ATTI mode.</p> </div> <div data-bbox="225 1200 1061 1603" style="border: 1px solid #000; padding: 10px; margin: 10px 0; background-color: #f0f0f0;"> <p>Warning: The Hovermap does not support disarming the drone in this way. If absolutely necessary, landing the drone using the remote control should only be done by experienced pilots. It is important to remember that, with the drone still armed and Shield disabled, any stick inputs will be obeyed. Therefore, the only necessary action is to hold the throttle down until the drone disarms.</p> </div>	<p>Landing environment considered</p>
<p>Download the data</p>	
<p>When finished scanning or the motors are off, press Stop Scan in Emesent Commander to end the scan.</p>	



<p>After the LiDAR sensor has stopped rotating, insert a USB flash drive into Hovermap to download the scan data.</p> <p>The status LED will change to a wiping blue bar while the data is transferring to the flash drive.</p> <div style="border: 1px solid #0070C0; border-radius: 10px; padding: 10px; margin: 10px 0;"> <p> Note: All data captured since the last transfer will be copied to the USB flash drive.</p> </div>	<p>Wiping blue bar</p>
<p>When the transfer is complete, the status LED will switch back to a slow pulsing blue. Remove the USB flash drive.</p>	<p>Slow pulsing blue</p>
<p>Shutdown procedure</p>	
<p>To shut down Hovermap, turn off the drone or disconnect the Hovermap power cable once the status LED shows a slow pulsing blue.</p>	



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