

# MATRICE 400

## Ship-based Takeoff/Landing

### 船上起降使用及注意事项

#### Before Takeoff

1. Download the official landing marker file.
2. Print the marker at the original size of 1.8 m × 1.8 m. Ensure the printed material does not have noticeable reflection under sunlight (e.g., carpet-like textiles, rubber, or non-polished resin materials), and the pattern can be fully recognized in the downward vision assist view of the aircraft.



Reflectivity requirements for reference (not mandatory):

- Check the reflectivity at a wavelength of 500 nm in the visible spectrum, with a threshold of black reflectivity <4% and white reflectivity >80%.
- Check the reflectivity at a wavelength of 450 nm in the visible spectrum, with a threshold of black reflectivity <0.75% and white reflectivity >65%.
- It is recommended to use carpet-like materials for convenient storage and movement. If stable deployment is required, stickers with the required reflectivity can be printed and placed in a fixed position. However, the reflectivity needs to be checked regularly to ensure it meets the requirements.


- 
3. Choose a flat, open area of at least 3 m × 3 m (such as a ship's deck) with a uniformly colored surface, preferably dark. Ensure that there are no obstacles within 20 m of vertical airspace above the area.
  4. Place the landing marker in the center of the area, ensuring the pattern is flat and not deformed, and clearly visible without obstructions in the aircraft's vision assist view.



- The wind will be strong during takeoff and landing, make sure the landing marker is secured and will not deform or move.
  - Replace the landing marker if the landing marker pattern is obviously distorted or the wear exceeds 30% of the area.
  - DO NOT attach any payload on the underside of the aircraft, as this may affect the landing detection function.
-


# Take Off

1. Tap **Settings** > **Flight Settings** > **Takeoff Settings** in the DJI Pilot 2, and then enable **Boat Launch Mode**. Ensure **Update Home Point Continuously** is enabled, and the home point will continuously update to the current location of the remote controller.
2.
  - a. **Auto Takeoff**: Set the auto takeoff altitude in the pop-up window, then slide the slider to start auto takeoff.
  - b. **Manul Takeoff**: Manually take off and quickly ascend the aircraft to an altitude of over 20 m, keeping it away from the ship and any obstacles.

- 
-  • It is recommended to use auto takeoff.
- During auto takeoff, ensure the ship maintains a constant straight-line course at a speed not exceeding 10 knots relative to the ground, with environmental wind speeds below 5 m/s and calm sea conditions.
  - It is recommended that the ship remain stationary or move at a speed of less than 1 m/s relative to the ground during manual takeoff. This can be confirmed by observing the speed display of an aircraft with a strong satellite signal placed on the ship.
  - After enabling Boat Launch mode, the downward obstacle sensing is automatically disabled. Carefully observe the takeoff environment to avoid collision caused by ship movement, waves, or wind.
- 


## Return to Home (RTH)

After completing the operation, press and hold the RTH button to initiate RTH. When the aircraft is within 50 m of the remote controller, cancel RTH manually. If the ship has stopped, wait for the aircraft to reach the home point, and it will automatically exit RTH and hover.

- 
-  • Ensure the positioning and video transmission are normal during RTH.
- Try to keep the ship stationary relative to the ground during RTH, otherwise it may lead to insufficient power for RTH.
- 

## Land

1. Enable the landing detection function in the DJI Pilot 2. Manually control the aircraft to fly directly above the landing marker, and then lower the altitude. Keep the landing marker in the center of the vision assist view.
2. When the aircraft successfully recognizes the landing marker, "C1 Auto Landing" will pop up on the screen, and a green frame will appear around the landing marker in the Vision Assist view. There will also be vibration and voice prompts. At this point, press the C1 button, and the aircraft will automatically land on the marker.

- 
-  • For safe landing, ensure the ship maintains a constant straight-line course at a speed not exceeding 10 knots relative to the ground, with environmental wind speeds below 5 m/s and calm sea conditions.
- Pressing the C2 button during auto landing will exit the auto landing mode.

- During auto landing, if the landing marker recognition fails, the aircraft will automatically ascend to the auto takeoff altitude or to more than 20 m above the takeoff point, accompanied by voice and pop-up alerts. If the landing marker is recognized again during ascent, the auto landing will resume.



- When the aircraft descends to within 0.5 m of the landing marker, the remote controller will vibrate to alert the user. At this time, pressing both the video recording button and the shutter button simultaneously will stop the motors mid-flight. Use this feature only in emergency situations.

## 起飞准备

1. 下载官方提供的降落标识文件。
2. 确保按照图案原大小 1.8 m×1.8 m 打印降落识别文件。确保打印的材质在阳光照射下无明显反光（例如地毯类的纺织品、橡胶、非抛光的树脂材质），并且图案在飞行器的下视辅助影像中能被完整分辨。



反射率要求参考（非强制）：

- 按可见光 500 nm 波段反射率做检查，阈值为黑色区域反射率 <4%，白色区域反射率 >80%。
- 按可见光 450 nm 波段反射率做检查，阈值为黑色区域反射率 <0.75%，白色区域反射率 >65%。
- 若需要方便收纳且可移动，可使用地毯相关材质。若需要稳定部署，可打印反射率符合要求的贴纸贴在固定位置，但需要定期检查反射率是否符合要求。

3. 选取至少为 3 m×3 m 大小的平整空地（如船只甲板），颜色均一，尽量为深色调，正上方 20 米空域无遮挡。
4. 在场地中央放置降落标识，确保图案平铺、无形变，且在飞行器下视辅助影像中清晰可见、无遮挡。



- 飞行器起降过程中风力较大，确保降落标识固定，不会变形或移动。
- 若降落标识图案存在明显变形或磨损面积超过 30%，务必更换降落标识。
- 飞行器机身腹部不可挂载任何负载，否则将影响识别降落功能。

## 起飞

1. 在 DJI Pilot 2 App 飞行界面中点击 **设置 > 飞行器设置 > 起降设置**，打开 **船上起降** 模式，并打开 **动态刷新返航点**，此时返航点将持续刷新为遥控器当前位置。
2. a. **自动起飞**：在弹窗中设置自动起飞的高度，设置完毕后滑动滑块使飞行器自动起飞。  
b. **手动起飞**：手动控制飞行器起飞，并迅速飞高至 20 米以上，远离船只和任何障碍物。

- 
- ⚠ • 建议优先使用自动起飞。
- 自动起飞时务必在保持船只相对地面速度不变、不超过 10 节且直线航行、环境风速小于 5 m/s、海面平静的情况下起飞。
  - 手动起飞时建议船只保持相对地面静止或速度小于 1 m/s，可通过观察放置在船上的搜寻良好的飞机的速度显示来确认。
  - 开启船上起降模式后，下视避障功能自动关闭。谨慎观察起飞环境，避免因船只移动、海浪和环境风等带来的碰撞风险。
- 

## 返航

作业完毕后，长按智能返航按键返航，当飞行器返航到遥控器附近 50 米时，取消返航。若船已停则可等待飞行器到达返航点上方后自动退出返航并悬停。

- 
- ⚠ • 返航时确保遥控器定位、图传连接正常。
- 返航过程中尽量保持船只相对地面不动，否则可能导致返航电量不足。
- 

## 降落

1. 在 DJI Pilot 2 App 中打开“识别降落”，手动控制飞行器前往降落标识正上方，然后降低高度。建议调整飞行器位置，保持降落标识在下视辅助影像画面中央。
2. 当飞行器成功识别降落标识时，屏幕上将弹出“C1 自动降落”，下视辅助影像画面中降落标识上显示绿框；同时会有震动和语音提示。此时点击 C1 按键，飞行器将进入自动降落模式，自动飞向降落标识。

- 
- ⚠ • 务必在保持船只相对地面速度不变、不超过 10 节且直线航行、环境风速小于 5 m/s、海面平静的情况下降落。
- 自动降落模式中按下 C2 按键将退出自动降落模式。
  - 自动降落过程中，若降落标识识别失败，飞行器将自动上升至设置的自动起飞高度或离起飞点高度 20 米以上，同时出现语音及弹窗提示。上升过程中若重新识别到降落标识将再次进入自动降落。
- 
- 💡 • 飞行器下降至离降落标识 0.5 米内时，遥控器会震动提示，此时支持同时按下录像按键和拍照按键紧急停桨。仅在紧急状况下使用此功能。
-