display the following warning prompts:
1. If the takeoff point is inaccurate: The flight application will display a warning "GNSS signal is weak. The landing point may deviate." with a corresponding verbal warning.
2. If GNSS signal is weak: The flight application will show a warning " GNSS signal is weak. Move the aircraft to an open area." with a corresponding verbal warning.
3. If GNSS is being spoofed: The flight application will display a warning "GNSS Spoofing" with a corresponding verbal warning.

2.6.4 Visual Obstacle Avoidance Function

The aircraft supports visual obstacle avoidance function. When there is sufficient light, the aircraft will detect obstacles within the flight range and brake or bypass within the set safety distance.

Note

- After the obstacle avoidance behavior is set, the obstacle avoidance function of the aircraft still may fail if there are obstacles that are too spare in the flight route, such as sparse fine wire meshes or small branches at the outer edges of trees. To ensure flight safety, please choose an open and spacious airspace for flight.
- Due to inertial, to ensure the aircraft brakes or bypasses within the set safety distance, the flight control system will limit the flight power performance of the aircraft and its attitude angle will be no more than 30° and its maximum flight speed will be less than 15 meter per second.

Warning

- The obstacle avoidance function of the aircraft cannot be enabled when Ludicrous mode is set for the aircraft.

2.6.5 Precautions for Using Obstacle Avoidance Systems

The measurement accuracy of the visual obstacle avoidance sensing system is easily affected by factors such as light intensity and object surface texture. Exercise caution when using the visual obstacle avoidance sensing system in the following scenarios:

- Flying over pure-colored surfaces (e.g., pure white, pure black, pure red, and pure green) and low-texture surfaces.
- Flying over surfaces with strong reflections.
- Flying over moving objects (e.g., crowds, swaying reeds, bushes, and grasses).
- Flying over water surfaces or transparent object surfaces.
- Flying in environments with rapid and intense changes in lighting or direct exposure to strong light sources.
- Flying over extremely dim (with light intensity of less than 15 lux) or extremely bright object surfaces.

- Flying over small obstacles (e.g., iron wires, electric wires, and tree branches).
- Lenses contamination (e.g., water droplets and fingerprints).
- Flying in low-visibility conditions (e.g., heavy fog, heavy snow, and sandstorm).
- Flying at an altitude below 2 meters with a very fast flight speed.

The millimeter-wave radar sensing system operates as an auxiliary enhancement system for visual obstacle avoidance and can work continuously throughout the day.

Note

- Please be noted that when flying in low-light conditions (such as at night), there is a strong possibility that the aircraft's visual obstacle avoidance sensing system may fail, leading to loss of visual obstacle avoidance function of the aircraft.
- If you need to fly in low-light conditions (such as at night), please confirm that the downward millimeter-wave radar of the aircraft is 60 GHz version. Additionally, please operate cautiously in nighttime flights, as in the nighttime obstacle avoidance is not 100% functional. It is recommended to fly in open areas.
- Please note that the aircraft does not support OA function in auto landing process. When you are setting home point, please make sure the home point and the airspace above are spacious with no obstacles; in some cases (such as critically low battery landing), when the aircraft is triggering auto landing, please take over the control of the aircraft in time to ensure the aircraft lands safely.

2.7 Auto-Return

The aircraft is equipped with an auto-return function. When the GNSS signal is good, once the auto-return condition is triggered, the aircraft automatically returns to the home point and lands to avoid possible accidents.

The aircraft provides three methods of activating the auto-return function: manual auto-return activation, low battery auto-return activation, and behavior-based auto-return activation.

Note

- Home point: the landing point of the aircraft during an auto-return flight. In the flight application, you can set the home point of the aircraft as "Aircraft" or "RC". For more information, see “6.5 “Settings” Interface” in Chapter 6.
- If no home point is set in the flight application, the take-off point is used as the home point.
- During an auto-return, the control function of the remote controller for the aircraft is disabled. In this case, users can quickly press the pause button "  " on the remote controller or press and hold it for 2 seconds to pause or exit the auto-return function, or pull the pitch stick down to exit the auto-return. After exiting the auto-return, the RC will regain control of the aircraft. For more information, see “4.11.2 Take-off/Return-to-Home Button and Pause Button” in Chapter 4.

⚠ Warning

- When the aircraft is in visual positioning mode or attitude mode, the auto-return function cannot be activated.
- If the obstacle avoidance behavior is set as “Turn off”, during an auto-return flight, the aircraft will not be able to automatically avoid obstacles.
- If the home point of an auto-return flight is not suitable for the aircraft to land (such as uneven grounds and crowds), please exit the auto-return function first, and then manually assume control to land the aircraft.

2.7.1 Manual Auto-Return Activation

During the flight, users can press and hold the return-to-home button “” on the remote controller for 2 seconds until the RC emits a “beep” to manually activate the auto-return function.

2.7.2 Low Battery Auto-Return Activation

During the flight, to prevent unnecessary risks caused by insufficient power of the smart battery, the aircraft will automatically check, based on the aircraft's current position, whether the current battery level is sufficient for returning to home point.
If the current battery level is only enough to complete the return journey, the flight application will prompt a warning “The remaining battery is only enough for Return to Home. The aircraft will Return to Home in 10s.” to prompt users to decide to execute low battery auto-return. If you choose to execute it or don't take any action within 10 seconds, the aircraft will initiate low battery auto-return after 10 seconds.
If you cancel the execution and continue flying with a low battery level, when the battery level decreases to critically low battery warning threshold, the aircraft will activate a critically low battery landing.

Tip

- Please note that besides the above intelligent low battery auto return, when the aircraft battery level decreases to the low battery warning threshold set in the flight application, the aircraft will also be triggered to return. The aircraft flight control system executes auto return no matter which one of those two scenarios occur.
- When critically low battery landing is triggered, in the process of landing, users can push and pull the remote controller sticks to adjust the landing location of the aircraft. After users stop using the sticks, the aircraft will continue to land.

⚠ Warning

- When the low battery auto-return is triggered in the aircraft, it is recommended that the auto-return process should not be canceled. Otherwise, the aircraft may be unable to

return to the home point due to insufficient power.
- It is recommended that the aircraft should not enter the critically low battery landing process. Once the critically low battery landing process is initiated, if the landing point does not meet safe landing standards, the aircraft may have no sufficient battery to land in safe place, which may lead to aircraft damage.
- When the flight application displays a warning alert, it should be processed according to the corresponding references immediately.

2.7.3 Behavior-Based Auto-Return Activation

During a flight mission, if "Finish Action" is set to "Auto RTH", the aircraft will activate auto-return after completing the mission; if "Signal Loss Action" is set to " Auto RTH ", when the flight application displays a warning saying “Aircraft disconnected.”, the aircraft will activate auto-return. For more information, see “6.9 Flight Missions” in Chapter 6.
During a manual flight, if "Signal Loss Action " is set to " Auto RTH ", when the flight application displays a warning saying “Aircraft disconnected.”, the aircraft will activate auto-return. For more information, see “6.5 “Settings” Interface” in Chapter 6.

Tip

- In the flight application, the signal lost action is set to “Return to Home” by default.
- During a flight mission, after the aircraft is disconnected from the remote controller, the aircraft will continue to fly in the original state. It will not perform the "Signal Loss Action" until the flight application displays a warning saying “Aircraft disconnected.”. During a manual flight, after the aircraft is disconnected from the remote controller, the aircraft will slow down and hover. It will not perform "Signal Loss Action" until the flight application displays a warning saying “Aircraft disconnected.”.
- During the lost action auto-return process, even if the aircraft resumes connection with the remote controller, the aircraft will continue to execute auto-return.

2.7.4 Auto-Return Mechanism

Table 2-1 Auto-Return Mechanism

Aircraft distance when the return mechanism is triggered	Return-to-Home Mechanism
Distance from the home point ≤ 10 meters	The aircraft returns to the home point at the current altitude.
10 meters＜Distance from the home point ≤ 25 meters	If the current flight altitude is lower than 20 meters, the aircraft ascends to the altitude of 20 meters and returns to the home point. If the current flight altitude is higher than 20 meters, the aircraft returns to the home point at the current

	altitude.
25 meters < Distance from the home point ≤ 50 meters	If the current flight altitude is lower than 30 meters, the aircraft ascends to the altitude of 30 meters and returns to the home point. If the current flight altitude is higher than 30 meters, the aircraft returns to the home point at the current altitude.
Distance from the home point > 50 meters	If the flight altitude is lower than the set RTH altitude, the aircraft ascends to the RTH altitude. If the flight altitude is higher than the set RTH altitude, the aircraft returns to the home point at the current altitude.

Note

- Aircraft distance refers to the horizontal distance from the current aircraft to the home point.

2.7.5 Auto-Return Obstacle Avoidance Process

When the obstacle avoidance system is enabled (the obstacle avoidance behavior is not set as “Turn off”) and the light/altitude conditions meet working requirement of the visual obstacle avoidance sensing system, the aircraft will achieve obstacle avoidance during the return process. The specific situation is as follows:

- During flight missions, the obstacle avoidance behavior is set as “Emergency stop” or "Bypass". In the case of a lost action auto-return, low battery auto-return, or auto-return after mission completion, when an obstacle is detected in front of the aircraft, the aircraft will automatically brake within the set safety distance and autonomously choose a random direction from the left, right, or upward directions to bypass the obstacle.

Important

- During the obstacle avoidance process, if the aircraft's ascent altitude reaches the maximum altitude limit and obstacle avoidance is not yet achieved, the aircraft will hover in place until a critically low battery landing is triggered. In this case, please manually take control of the aircraft in advance.

2.8 Landing Protection Function

When the landing protection function is enabled, the aircraft will assess whether the ground conditions are suitable for landing before landing. For more information, see “6.5 “Settings” Interface” in Chapter 6.

During the auto-return process, when the aircraft reaches above the home point and the landing protection function is enabled, the aircraft will execute the following strategies:

1. If the landing protection function detects that the ground is suitable for landing, the aircraft will land directly.
2. If the landing protection function detects that the ground is not suitable for landing (e.g., uneven ground or water below), the aircraft will keep hovering, send a prompt in the flight application, and wait for the user to take action. In this case, the aircraft will start descending only when a critically low battery landing is triggered, and the user cannot cancel this process.
3. If the landing protection function cannot detect ground conditions, the aircraft will descend to an altitude of 1.2 meter above the ground and enter the assisted landing process.

Note

- Assisted landing: During the landing process, when the aircraft reaches an altitude of 1.2 meters above the ground, it will automatically descend slowly and the user does not need to pull the throttle stick.
- Before the aircraft enters the assisted landing process, make sure that the landing point is suitable for the aircraft to land.

2.9 Rebuilding the C2 Link

To ensure the safety and controllability of flight behaviors, the aircraft will stay in reconnection status and constantly attempt to reestablish a connection with the ground control station (remote controller) after losing the C2 link. In practice, this process is divided into the following stages:

- When the aircraft is disconnected from the remote controller, if the connection can be restored within 10 seconds, the remote controller will automatically regain control of the aircraft.
- If the link is not restored within 10 seconds, the flight application will display a warning saying “Aircraft disconnected.”, and the aircraft will automatically execute relevant flight control actions according to the set lost action.
- During the execution of a lost action, the aircraft will continue its attempts to restore the C2 link. When the aircraft successfully restores the C2 link with the remote controller, the remote controller still cannot control the flight of the aircraft. To make the remote controller regain control of the aircraft, you must press and hold the pause button “⏸” on the remote controller for 2 seconds or pull the pitch stick to exit the lost action.

Tip

- During the flight, as long as the aircraft and the remote controller can communicate normally, the C2 link will remain active.
- If there are decoding errors that persist for a certain duration, leading to communication failure, the C2 link will be disconnected, and the aircraft will enter the reconnection status.
- The lost actions of the aircraft include RTH, hovering, and land.

- After the aircraft loses connection with C2 link, the flight application will display an alert “Aircraft disconnected.” with a corresponding verbal alert.

2.10 Flight Restrictions and Unlocking Restricted Zones

Important

- Before flying, always carefully plan out the airspace in which you intend to fly in accordance with local laws and regulations. Do not operate the aircraft in the restricted airspace without permission.

2.10.1 Geofencing System

Autel Robotics has developed a geofencing system for its aircrafts to ensure safe and legal flights. This system can provide real-time updates on airspace restriction information worldwide. In different restricted zones, the flight functions of the aircraft are subject to varying degrees of restrictions. The geofencing system also supports the function of unlocking restricted zones. If you need to perform a flight mission in a specific restricted zone, you can contact Autel Robotics to lift the aircraft within valid authorization period after obtaining legal authorization for unlocking the restricted zone.
The geofencing system does not completely align with local laws and regulations. Before each flight, you should consult and understand local laws, regulations, and regulatory requirements to ensure flight safety.
The flight control system of the aircraft is pre-configured with the geofencing system. Before each flight, make sure that the remote controller can connect to the Internet to automatically update airspace restriction information and synchronously upload it to the aircraft. During the flight, relevant airspace restriction information will be synchronously displayed in the flight application to ensure the safe and legal flight of the aircraft.

Tip

- Due to information lag, the airspace restriction information provided by the geofencing system may not always be completely consistent with the latest local laws and regulations. All information is subject to local laws and regulations.
- For temporary airspace restrictions, Autel Robotics can obtain the relevant regulatory announcements in a timely manner and synchronously upload the relevant airspace restriction information to the geofencing system. When you take flight actions in relevant zones, be sure to synchronize and update flight airspace restriction information.

Warning

- Please note that when GNSS signal is lost (the aircraft is in visual positioning mode or attitude mode), the geofencing system may not function, and relevant flight restriction

functions will not take effect normally.

2.10.2 Restricted Zones

The geofencing system divides airspace restrictions into four categories: no-fly zones, restricted altitude zones, warning zones, and unlocked zones. The flight application will provide different prompts based on the specific zone.

Table 2-2 Flight Restrictions of Restricted Zones

Restricted Zones	Flight Restriction Description
No-Fly Zones (appear in red on the map)	No-fly zones are divided into permanent no-fly zones and temporary no-fly zones. ● Permanent no-fly zones: The zones are pre-configured in the geofencing system at the factory and are regularly updated. ● Temporary no-fly zones: The zones are added by Autel Robotics in the geofencing system backend. Update method: After the remote controller is connected to the Internet, it will automatically retrieve update information related to no-fly zones and push it to the aircraft. Flight restrictions: Aircraft cannot take off or fly in no-fly zones. If you obtain authorization from relevant authorities to fly in a no-fly zone, contact Autel Robotics to request for unlocking the aircraft.
Restricted Altitude Zones (appear in grey on the map)	Autel Robotics only provides access to set altitude restrictions, allowing users to set the altitude limit accordingly. Update process: Users enable height restrictions and set the altitude limit within the flight application, based on the local legal regulations of the country and region. For detailed information, see "2.11 Altitude and Distance Limits" in Chapter 2 and "6.5 “Settings” Interface" in Chapter 6. Flight restrictions: When an aircraft is flying in a restricted altitude zone, the actual flight altitude of the aircraft will not exceed the set altitude limit.
Warning Zones (appear in yellow on the map)	Warning zones are pre-configured in the geofencing system at the factory and are regularly updated. Update method: After the remote controller is connected to the Internet, it will automatically retrieve update information related to warning zones and push it to the aircraft. Flight restrictions: In a warning zone, an aircraft can fly unrestrictedly (relevant flights must comply with local regulations).
Unlocked Zones	If you unlock a no-fly zone with a valid permit, you can legally

(appear in blue on the map) fly the aircraft within the validity period in the unlocked zone.

Tip

In the flight application, if you tap on a restricted zone on the map, the following geofencing information will be displayed for this zone:

- No-fly Zone: zone name, zone level (no-fly zone), region (prefecture-level city), and no-fly time (visible only for temporary no-fly zones).
- Restricted altitude zone: zone name, zone level (restricted altitude zone), altitude limit (AGL), and region (prefecture-level city).
- Warning zone: zone name, zone level (warning zone), altitude limit (AGL), and region (prefecture-level city).
- Unlocked zone: zone name, zone level (unlocked zone), altitude limit (AGL), region (prefecture-level city), and validity period.

Note

- Before any flight, users must fully understand the local regulations regarding altitude restrictions for unmanned aerial vehicles (UAVs) and set them in the flight application.
- It is important to note that it is not suggested to fly cross regions with different legal altitude restrictions. The altitude limit setting is only effective for the takeoff area, the limit may not comply with regulations in neighboring regions. Users should adjust the corresponding altitude limits when flying across different regions.

An aircraft in flight has a specific initial velocity. To prevent the aircraft from accidentally entering no-fly zones (before unlocking) and warning zones, a buffer zone with a horizontal distance of 200-meter and a vertical distance of 50-meter is set beyond the boundaries of these zones in the geofencing system.

Table 2-3 Buffer Zone Details

Buffer Zone Type	Buffer Zone Details
Buffer zones of no-fly zones	When an aircraft flies from the outside toward a no-fly zone: When the aircraft approaches the buffer zone boundary, the flight application will display a warning alert “The aircraft is close to the no-fly zone.” and the aircraft will automatically start to decelerate and eventually brake and hover within the buffer zone.
Buffer zones of warning zones	When an aircraft flies from the outside toward a warning zone: The aircraft can directly fly into the warning zone without limitation. When the aircraft approaches the warning zone boundary, the flight application will display a warning alert “The aircraft is close to the warning zone.” and after entering the warning zone, the App will display “Aircraft enters warning zone” to

remind users to be cautious.

Note

- When there is no GNSS signal, if an aircraft accidentally enters a no-fly zone while the aircraft is still locked from the zone, the aircraft will automatically land upon regaining the GNSS signal. During the landing process, the throttle stick will not work, but the user can control the horizontal movement of the aircraft.
- When an aircraft is hovering in the buffer zone of a no-fly zone, the user can control the aircraft to exit the buffer zone along the normal direction of the boundary.

For flights in an unlocked zone, if an aircraft is in the authorized airspace within validity period specified in the permit, the aircraft can fly normally in the zone. Once the aircraft flies beyond the authorized airspace or reaches the validity period, the aircraft will comply with the airspace restrictions of the current area.

2.10.3 UGZ Import

The aircraft supports for importing the UGZ (UAS Geographical Zones) file, users can get the no-fly zone data files of their own country or region, and upload the data to the aircraft's flight control system. When the aircraft approaches relevant airspace during flight, it will execute corresponding responses to ensure flight safety (including warnings and slowdown and other actions).

Tip

- The UGZ import supports JSON format. Users can import no-fly zone data files published by local aviation authorities.
- Operation path: Copy the JSON file into the root path of the remote controller. On the map interface of the flight application, tap "" > "Import Geo-fence" on the right side. Follow the on-screen instructions to complete the operations.

2.10.4 Unlocking No-Fly Zones

To apply for unlocking a specific airspace within a no-fly zone, prepare the following information in advance according to your flight plan:

- Identity and contact information of the applicant.
- Unlock permit: a scanned copy or image of the valid permit for the flight application issued by local authorities (local public security bureau, aviation management department, or any other relevant organization/agency).
- Unlocked zone: a cylindrical area. It includes the following information:
  1. Name of the unlocked zone.
  2. Coordinates of the center point of the flight airspace plane (latitude and longitude, with 6 decimal places).

3. Radius of the flight airspace plane (in meters, with 2 decimal places).
4. Flight altitude (in meters, with 2 decimal places).

- Unlock date: Enter the unlock date according to the valid permit. The date is recommended to be accurate to day/hour/second.
- Aircraft S/N (Serial number): Multiple serial numbers can be applied at once.
- Autel account of UAS operator: Multiple accounts can be applied at once.

Log in to the official website of Autel Robotics at www.autelrobotics.com/service/noflight/, enter the relevant information, and complete the waiver application.
After the unlocking application is approved, you will obtain an unlock permit. The permit contains the aircraft serial number, UAS operator account, and unlocked zone (including the validity period).

Tip

- After the waiver application is submitted, it will be approved within 24 hours, and unlocking will be completed within 48 hours. Please make a reasonable flight plan in advance.

2.11 Altitude and Distance Limits

The altitude limit is the maximum flight altitude of the aircraft, while the distance limit is the maximum radius (distance from the take-off point) that the aircraft can fly.
You can set altitude and distance limits in the flight application to ensure the safe flight of the aircraft. For more information, see "6.5 "Settings" Interface" in Chapter 6.

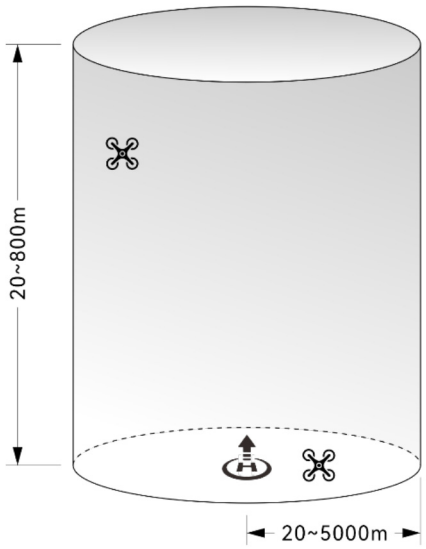


Fig 2-5 Diagram of altitude and distance limits

Tip

- In the flight application, the altitude limit should be set between 20 meters and 800 meters, and the distance limit should be set between 20 meters and 5000 meters. During actual flights, the maximum altitude limit should be set no greater than the

maximum altitude specified by local laws and regulations. For example, in Chinese mainland, and the European Union, the maximum flight altitude of civil aircraft is no more than 120 meters, and in US, it is no more than 400 feet.
- When setting the maximum altitude limit, consider whether the RTH altitude set is reasonable or not, which should not exceed the maximum altitude limit.
- The RTH altitude should be set higher than the altitude of the tallest obstacle in the flight area.

2.12 Aircraft Calibration

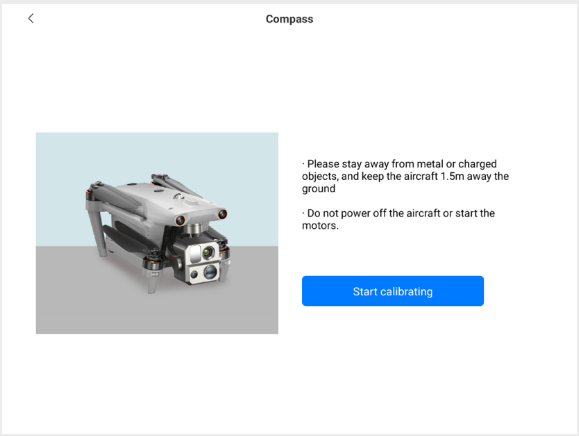
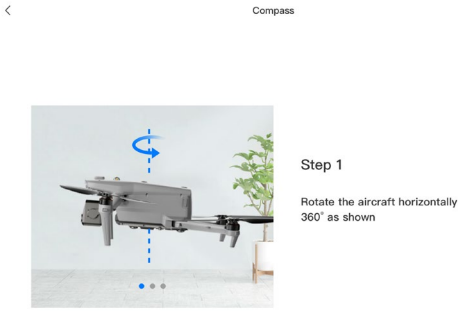
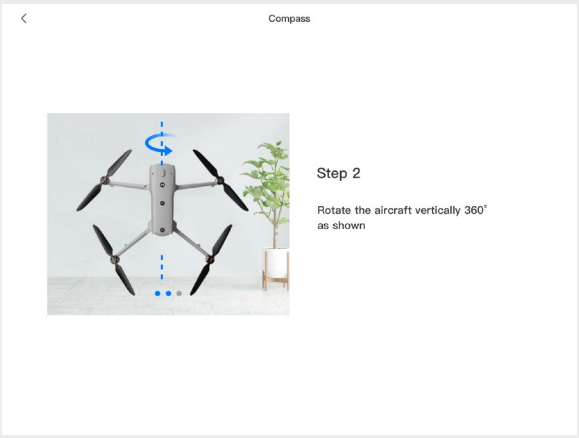
2.12.1 Compass Calibration

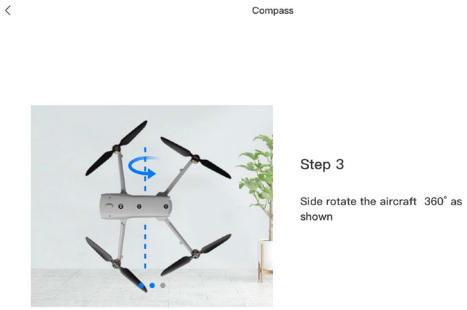
The compass (magnetometer) has been calibrated at the factory. In this case users do not have to calibrate it.
If the flight application displays a warning alert “Compass needs calibration, please calibrate before flight.”, please follow the steps below to calibrate it.

Important

- The compass is very easy to be affected by electromagnetic interference. Electromagnetic interference may lead to compass errors and degradation in flight quality.
- Please choose an open outdoor area for calibration.
- During calibration, please stay away from areas with a strong magnetic field or large metal objects, such as magnetic ore mines, parking lots, construction areas with underground reinforcing steel bars, underground areas, or locations near overhead power transmission lines.
- During calibration, do not carry ferromagnetic materials or metal objects on your person, such as mobile phones and watches.
- During the calibration process, please stay away from charged objects and ensure the aircraft fly 1.5 meters above the ground.
- During the calibration process, please do not turn off the power of the aircraft or start the motors.

Table 2-4 Compass Calibration

Step	Operation	Diagram
1	After turning on the aircraft and the remote controller, tap "⊞" > "⚙" > "◈" > "Compass Calibration" > "Start Calibration" in the main interface of the flight application. Follow the instructions on the interface for calibration.	
2	Hold the aircraft to keep it in a horizontal direction. Rotate the aircraft 360° horizontally until the interface prompts next step.	
3	Hold the aircraft to keep it in a vertical direction with the nose up. Rotate the aircraft 360° horizontally until the interface prompts next step.	



4 Hold the aircraft to keep it with the nose to the left and the side down. Rotate the aircraft 360° horizontally until the interface prompts successful calibration.

Tip

- Please perform the calibration steps according to the tips shown in the compass calibration interface of the flight application.
- If the calibration fails, the rear arm lights of the aircraft will turn solid red, and the above steps should be repeated at this time.
- If the compass still cannot work properly after the calibration, fly the aircraft to other places and calibrate the compass again.

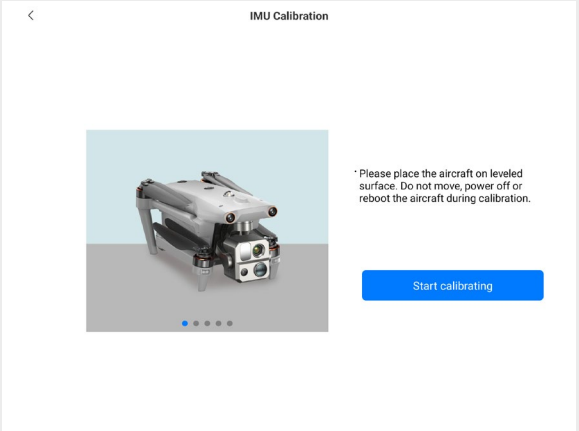
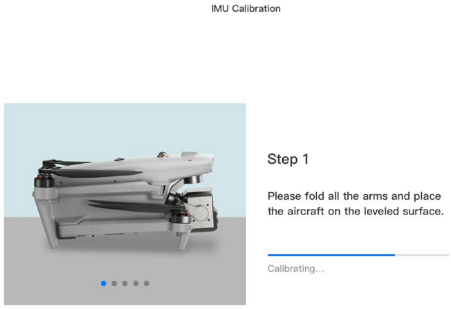
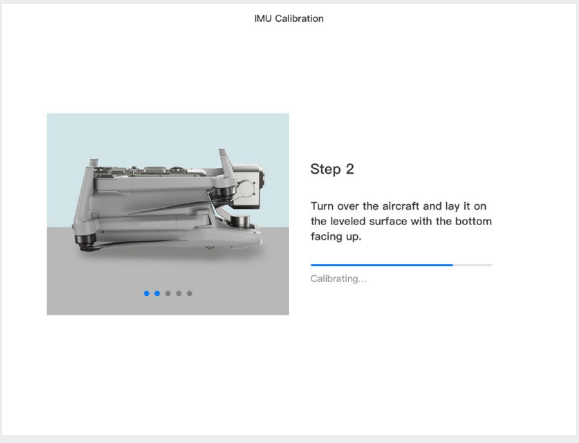
2.12.2 IMU Calibration

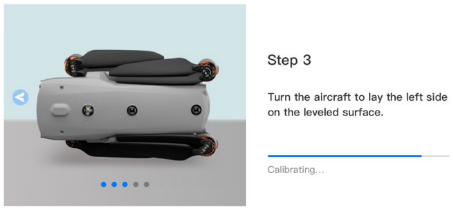
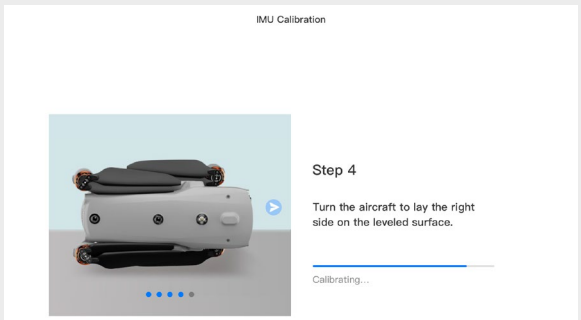
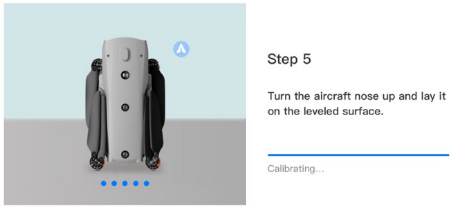
The IMU (Inertial Measurement Unit) of the aircraft has been calibrated at the factory, and no user calibration is required under normal conditions.
If the flight application displays warning alerts such as "Cannot take off due to IMU error. Calibrate IMU first." or "Please calibrate IMU", please follow the steps below to calibrate it.

Important

- Please place the aircraft according to the tips shown in the IMU calibration interface of the flight application, and keep the aircraft in a static state.
- Please place the aircraft on a flat ground, and do not move, shut down, or restart the aircraft during the calibration process.
- During IMU calibration, the gimbal will not work.

Table 2-5 IMU Calibration

Step	Operation	Diagram
1	After turning on the aircraft and the remote controller, tap "⊞" > "⚙" > "⊛" > "IMU Calibration" > "Start Calibration" in the main interface of the flight application. Follow the instructions on the interface for calibration.	
2	Fold up the arms and place the aircraft flat on the ground until the interface prompts next step.	
3	Turn the aircraft over 180° and lay the aircraft facing up until the interface prompts next step. Please pay attention to protecting the upward visual obstacle avoidance camera and strobe.	

4	Put the left side of the aircraft flat on the ground until the interface prompts next step.	
5	Put the right side of the aircraft flat on the ground until the interface prompts next step.	
6	Fold the arms, turn the aircraft nose up, and lay it on the leveled surface until the interface prompts calibration success. Be careful not to bump the rear camera lens.	

Tip

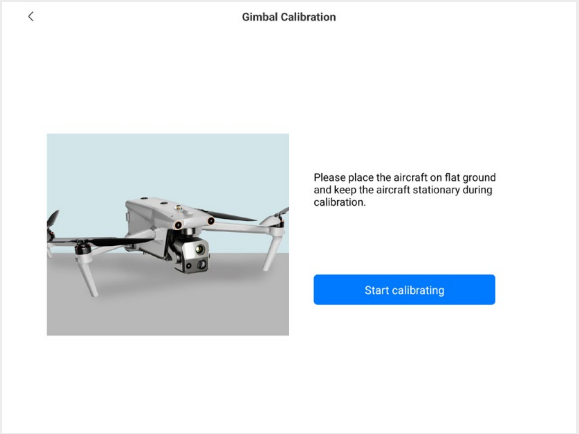
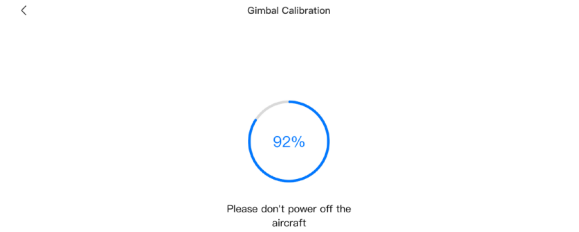
- Please perform the calibration steps according to the tips shown in the IMU calibration interface of the flight application.
- If the calibration fails, repeat the above steps.

2.12.3 Gimbal Calibration

The gimbal of the aircraft has been calibrated at the factory, and users do not have to do auto calibration on the gimbal usually.

If the flight application prompts an alert ”Please calibrate the gimbal motor”, please follow the steps below to calibrate it.

Table 2-6 Gimbal Calibration

Step	Operation	Diagram
1	Place the aircraft on a flat ground. After turning on the aircraft and the remote controller, keep the aircraft in a static state. In the main interface of the flight application, tap “” > “” > “” > “Gimbal Calibration” > “Start Calibration”.	
2	Wait for the calibration progress bar to reach 100%. When “Calibration Successful” is displayed on the screen, the gimbal is successfully calibrated.	

2.13 Emergency Stop Propellers During Flight

During flight, if the power motors of the aircraft experience power damage or failure (e.g., damaged or missing propellers and motor failure) that makes the aircraft out of control, users can enable the "Emergency Stop Propellers During Flight" function. At the same time, users need to manipulate the left and right sticks on the remote controller inward or outward to forcibly stop propeller rotation and allow the aircraft to descend freely for an emergency landing. This can reduce the potential damage to property and harm to ground personnel caused by aircraft malfunctions.

In the event of an aircraft malfunction, users should at first attempt to manipulate the sticks to move the aircraft away from crowds or buildings and lower the altitude and horizontal speed of the aircraft before enabling the emergency propeller stop function. For how to enable this function, see “6.5 “Settings” Interface” in Chapter 6.

Important

- If you stop the propellers when the aircraft has an initial velocity, the aircraft will fall along a parabolic trajectory. If the trajectory is unpredictable, do not stop the propellers.
- After completing an emergency landing, contact Autel Robotics promptly for a power system inspection and maintenance.

2.14 Remote Identification

The Remote Identification system allows for uploading the registration number (Remote ID) of a UAS operator to the system. During flight, it can actively broadcast some non-sensitive data to mobile devices within its broadcast range in real time via an open, documented transmission protocol. The non-sensitive data includes the registration number of the operator, the unique serial number and timestamp of the aircraft, the aircraft's geographical location, altitude above ground level or take-off point, route measured clockwise from true north, and ground speed of the unmanned aircraft, and the geographical location of the operator (if available, otherwise the geographical location of the take-off point). This system not only effectively controls potential risks to public safety posed by unmanned aircraft during flight but also provides effective information and data tools for unmanned aircraft flight regulation.
The aircraft supports the remote identification function and uses Wi-Fi (Wi-Fi Beacon, 802.11n) for broadcasting. Users can enter the corresponding Remote ID in the flight application.

Tip

- At present, in some countries and regions, it is mandatory to enable the remote identification function. When users are operating aircrafts in relevant airspace, please follow local laws and regulations.
- Operation Path (in places except Chinese Mainland): On the main interface of the flight application, tap "" > "" > "" > "Safety" > "Remote ID," and follow the on-screen instructions to perform relevant operations. For more information, see "6.5 "Settings" Interface" in Chapter 6.
- In Chinese Mainland, the aircrafts registered legally will enable Remote ID broadcast by default after completing power-on self-check.
- When the aircraft is in automatic check process after being turned on or in flight, if the remote identification function is detected as being abnormal, the flight application will prompt an alert "Remote ID anomaly, please comply with air traffic regulations during flight", the RC will emit sound alert at the same time.

2.15 Standard Flight Operation Process

2.15.1 Pre-Flight Checklist

Before each flight, please follow the steps below to perform a comprehensive pre-flight check to ensure flight safety:

- Make sure that the batteries of the aircraft and remote controller are fully charged, and the battery of the aircraft is installed in place, with the unlock button of the battery in a lock state.
- Make sure that the propellers of the aircraft are installed tightly without damage or deformation, the motor and propellers are clean and free of foreign objects, and the propellers and arms are fully extended.
- Make sure that the visual obstacle avoidance cameras of the aircraft, the lens of the gimbal, and the lens of the auxiliary light are free from foreign objects, dirt, or fingerprints, have their protective stickers removed, and are not blocked by loads or other accessories on the fuselage.
- Make sure that the protective cover of the gimbal has been removed and that the three-axis movement of the gimbal is in a normal state.
- Make sure that the microSD card is inserted into the aircraft, and that the rubber protective covers on the microSD card slot and PSDK interface are closed firmly. Otherwise, the protection performance of the aircraft will be affected.
- Make sure that the antenna of the remote control is unfolded.
- Place the aircraft in an open and flat area outdoors and make sure that there are no obstacles, buildings, trees, etc. around. You should stand at least 5 meters away from the tail of the aircraft when operating.
- Make sure that after the aircraft is powered on, the aircraft and the remote controller are connected, and the aircraft motors, gimbal, and camera are working normally.
- Make sure that the aircraft, the remote controller and the flight application have been upgraded to the latest version as prompted.
- Make sure that all warnings and errors displayed on the flight application are handled.
- Enter the flight application settings interface to set the flight control parameters, obstacle avoidance behavior, stick mode, and other related flight safety parameters, and be familiar with the flight operation, so as to ensure that the parameter settings meet your own needs and guarantee flight safety.
- If multiple aircraft are flying at the same time, please keep an appropriate air distance to avoid any accidents.

2.15.2 Basic Flight Process

The aircraft provides three stick modes: Mode 1, Mode 2, and Mode 3. Each mode controls the aircraft differently. The default mode is Mode 2. You can switch the mode in the flight application according to your control habit (For how to switch the mode, see “6.5 “Settings” Interface” in Chapter 6). The following is the basic operation of aircraft flight:

1. Please refer to "2.15.1 Pre-Flight Checklist" to complete the preparations before flight.
   - Place the aircraft in an open and flat area outdoors and make sure that there are no obstacles, buildings, trees, etc. around.
   - Press and hold the power button of the remote controller for 3 seconds to turn on the remote controller.
   - Press and hold the battery power button for 3 seconds to turn on the power of the aircraft, and wait for the image transmission screen to appear on the remote controller (indicating that the current status is normal).
   - Stand at least 5 meters away from the rear arms of the aircraft.
2. Please refer to "4.10.3 Starting/Stopping the Aircraft Motor" in Chapter 4 to use the remote controller to start the aircraft and take off.

3. Please refer to "4.10.1 Stick Modes" and "4.10.2 Setting Stick Mode" in Chapter 4 to control the aircraft carefully.
4. Please refer to "4.10.3 Starting/Stopping the Aircraft Motor" in Chapter 4 to land the aircraft, and then turn off the motors.

When the aircraft performs power-on self-test and any of the following situations occurs, the following strategies will be implemented to ensure flight safety.

Table 2-7 Power-on self-Test flight strategy

Flight strategy	Takeoff Denied	Takeoff Accepted
Abnormal Items	● IMU Abnormal ● Battery Verification Abnormal ● Aircraft ESC Abnormal ● RTK not Fixed in Mission Flight ● Internal Communication Abnormal ● Barometer Abnormal ● Remote Identification Abnormal(only in US)	● Compass Abnormal ● RTK not Fixed but not in Mission Flight ● Aircraft in attitude mode ● Remote Identification Abnormal (in countries or regions except US)

2.15.3 List of Safeguard

Before flight, please know the following safeguard information, which helps you handle abnormal situations in a correct and safe way.

Table 2-8 List of Safeguard

No.	Safety Function	Refer To
1	Auto-Return	2.7 Auto-Return
2	Emergency Propeller Stop During Flight	2.13 Emergency Propellers Stop During Flight

2.15.4 Post-flight inspection checklist

After each flight, please follow the steps below to perform a comprehensive post-flight check to ensure the safety of the UAS.

- After the flight, the drone should be landed on an open, flat, solid ground, and avoid landing on sand, wetlands, sloping ground or moving platforms.
- The landing point must be away from people or animal activity areas. When landing, you should maintain a horizontal distance of at least 5 meters from the landing point.
- After the drone lands, the drone motor should be turned off immediately before approaching the drone. Before performing a visual inspection, the drone power should be turned off.

- During the visual inspection, please check the visual obstacle avoidance cameras of the drone, the lens of the gimbal, and the lens of the auxiliary light to ensure that there are no foreign objects or dirt on the surface. If there is, please wipe it clean with a dry soft cloth.
- During the visual inspection, please check the appearance of the drone fuselage and the drone motor to ensure that the fuselage is not damaged, cracked, or loose, and the drone motor is not blocked. If there is, please stop using it and contact after-sales.
- Please check the propeller to ensure that there is no damage, looseness, deformation, etc. If there is, please replace it with a new propeller in time.
- Remove the smart battery from the drone and check whether the battery interface and appearance are abnormal. If the battery structure or interface is damaged, or there is bulging, leakage, etc., the battery should be stopped immediately and properly handled as required.
- After the above inspections are completed, install the gimbal protective cover for the drone, fold the drone arm as required, and store the drone and smart battery in the rugged case.
- Wipe the surface of the remote controller used clean, fold the antenna as required, and store the remote controller in the rugged case.

2.16 Warning Information Reference Table

During the entire flight phase, the abnormal status of the UAS will display on the left side of "6.3 Status Notification Bar" in the flight application. Users can query the following information reference table to understand the common status warning information prompts of the UAS.

Table 2-9 Warning Information Reference Table

No.	Warning level	Warning Message	Note
1	Medium-level	Mission has been aborted due to app operation.	
2	High-level	IMU is warming up. Take off later	
3	High-level	Cannot take off due to IMU error. Calibrate IMU first.	
4	Medium-level	Signal error.	
5	Medium-level	Remote ID is abnormal, please comply with air traffic control regulations to fly	In countries or regions except US
6	High-level	Remote ID is abnormal, takeoff is prohibited according to local regulations	Only in US
7	High-level	Remote ID is abnormal, returning.	Only in US, in flight
8	Medium-level	RTK is not ready, please take off later.	
9	Medium-level	Unstable RTK signal. Fly with caution.	
10	High-level	SD card read error. Replace it.	

11	High-level	SD card is full. Storage location will switch to internal storage	
12	High-level	Visual SLAM has been disabled. Fly with caution.	
13	Medium-level	Zoom camera error	
14	Medium-level	OA is abnormal and will be temporarily turned off. Please fly with caution.	
15	High-level	Some propellers are stopped. Land immediately.	
16	Medium-level	Currently in a no-fly zone, aircraft starts to descend, please be careful.	
17	High-level	Aircraft is in No-Fly Zone, cannot take off.	
18	High-level	Battery voltage difference too large, takeoff prohibited.	
19	High-level	Battery voltage error, please restart the aircraft.	
20	Medium-level	The flight speed is limited due to the low battery voltage.	
21	High-level	Battery voltage error. Land immediately.	
22	Medium-level	Battery powered-off, please long press the power button to power on!	
23	High-level	Battery over-discharged, please replace the battery.	
24	High-level	Battery data abnormal, takeoff prohibited.	
25	High-level	Battery not installed properly. Takeoff is forbidden.	
26	High-level	Battery temperature too low, flight speed limited.	
27	High-level	Battery temperature too low, please preheat before use.	
28	High-level	The battery temperature is too high. Wait until battery cools down.	
29	High-level	Battery temperature is too high. Return or land	

		immediately.	
30	High-level	Battery temperature too low, please reduce flight speed.	
31	High-level	Battery temperature too high, please reduce flight speed.	
32	High-level	Battery pressure difference too large, takeoff prohibited.	
33	High-level	Battery voltage difference is too large, please replace the battery.	
34	High-level	Battery voltage difference is too high. Return or land immediately.	
35	High-level	Battery error. Check or replace the battery.	
36	High-level	The motor temperature is too high. Please lower the flight speed.	
37	Medium-level	ESC Error	
38	Medium-level	Low battery, returning to home.	
39	Medium-level	Focus failed. Check the camera.	
40	Medium-level	The motors' power is too high, please check the payload.	
41	High-level	Flight control error. Land immediately	
42	High-level	Flight mission abnormality, please restart the aircraft.	When the aircraft is not taking off
43	Medium-level	Mission error. Fly with caution.	
44	Medium-level	Aircraft enters warning zone	
45	Medium-level	The aircraft battery level is too low to take off	
46	High-level	The aircraft is close to the no-fly zone.	
47	Medium-level	Aircraft enters critical warning zone	
48	High-level	Aircraft is tilted, please place it on a flat surface.	
49	High-level	Aircraft is not activated	
50	High-level	Aircraft is outside the flyable area, takeoff	

		prohibited.	
51	High-level	Aircraft is outside the flyable area, returning.	
52	High-level	Aircraft abnormal vibration, takeoff prohibited, please contact customer service.	
53	High-level	Aircraft abnormal vibration, please return or land as soon as possible, and contact customer service.	
54	High-level	The aircraft is close to the warning zone.	
55	High-level	Aircraft is disconnected from the remote controller	
56	Medium-level	GNSS Spoofing	
57	Medium-level	Aircraft attitude initializing...	
58	High-level	Aircraft attitude error. Land immediately	
59	High-level	The aircraft cannot fly steadily due to strong wind. Fly with caution.	
60	High-level	The payload exceeds the weight limit, please check the payload and try again.	
61	Medium-level	Wide camera error	
62	Medium-level	Failed to update firmware	
63	Medium-level	The mission has been completed.	
64	Medium-level	Clean the rear-view lens.	
65	High-level	Low ambient light, only radar obstacle avoidance is operational, please be cautious.	
66	High-level	Both side OA sensors are invalid in current low light environment. Fly with caution.	
67	Medium-level	Please check if the propellers are properly installed.	
68	High-level	Aircraft Impact detected	
69	Medium-level	Approaching Max. motor limit	
70	Medium-level	Approaching Min. motor limit	
71	Medium-level	Laser rangefinder error.	

72	High-level	Internal storage is full. Switching to SD card.	
73	High-level	Radar data error. Restart the aircraft.	
74	Medium-level	Radar overheated	
75	High-level	Radar is abnormal, please restart the aircraft	
76	High-level	Radar self-check failed, please restart the aircraft	
77	High-level	Front or rear OA sensor error.	
78	Medium-level	Clean the front-view lens.	
79	High-level	Please check the gimbal	
80	Medium-level	Please power on the aircraft or connect to a new aircraft	
81	Medium-level	Please confirm whether the propellers are well installed.	
82	High-level	Please calibrate IMU	
83	High-level	Please calibrate the gimbal motor	
84	High-level	Barometer error. Cannot take off	
85	Medium-level	Mission completed, returning to home.	
86	Medium-level	Clean the upper-view lens.	
87	High-level	Upward or downward OA sensor error.	
88	Medium-level	Visual Positioning disabled, please fly with caution.	
89	High-level	Non-GNSS environment. Turn off Novice Mode to take off.	
90	High-level	Invalid battery, takeoff prohibited.	
91	Medium-level	Clean the bottom-view lens.	
92	High-level	The RC battery temperature is too high. Wait until the battery cools down.	
93	High-level	Aircraft disconnected.	
94	Medium-level	Mission has been aborted due to remote control input.	

95	High-level	Abnormal right dial wheel. Release or calibrate it.	
96	High-level	Abnormal right stick. Release or calibrate it.	
97	Medium-level	Gimbal reached the mechanical limit. Check the gimbal or calibrate compass.	
98	High-level	Gimbal stuck error, please check	
99	High-level	Gimbal overheated, please check	
100	Medium-level	Gimbal failed	
101	Medium-level	Gimbal is not ready, please take off later.	
102	High-level	Gimbal and flight control communication disconnected	
103	High-level	Gimbal calibration failed, please check	
104	Medium-level	The visual sensors could be affected by rains and fogs, please disable OA and fly with caution.	
105	Medium-level	Heading to home point	
106	Medium-level	Calibrating compass	
107	High-level	Compass needs calibration, please calibrate before flight.	
108	High-level	Compass anomaly, takeoff prohibited, please contact after-sales for handling.	
109	Medium-level	Status error, RTH bypass is disabled.	
110	High-level	Abnormal left dial wheel. Release or calibrate it.	
111	High-level	Abnormal left stick. Release or calibrate it.	
112	High-level	Left and right OA and SLAM failed, please fly with caution.	

Chapter 3 Aircraft

3.1 Aircraft Activation

When unboxing the product for the first time, you need to activate the aircraft before using it. By default, the aircraft is pre-matched with the remote controller at the factory. After turning on the aircraft and the remote controller, you will see an activation prompt in the flight application. Please follow the steps in the flight application to activate the aircraft.

Important

- Make sure that the remote controller is connected to the Internet before starting the activation process. Otherwise, activation may fail.
- If activation fails, please contact Autel Robotics After-Sales Support for assistance.
- For how to match the aircraft with the remote controller in frequency, see "4.9 Frequency Matching Between the Aircraft and the Remote Controller" in Chapter 4.

3.2 Aircraft Components

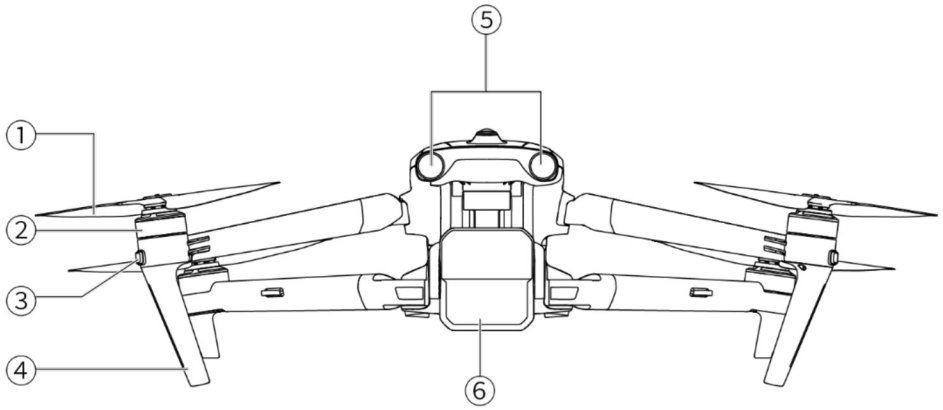


Fig 3-1 Aircraft Front View

Table 3-1 Aircraft Front View Details

No.	Name	Description
1	Propeller	Rotates in the air to generate thrust to propel the aircraft forward.
2	Motor	Used to drive the propeller to rotate.
3	Front Arm Light	Used to identify the nose direction of the aircraft.
4	Landing Gear	Used to support the aircraft to avoid damage to the bottom of

		the fuselage.
5	Forward Visual Obstacle Avoidance Sensing Lens Group	Used to sense the obstacles ahead and avoid the aircraft from colliding with them.
6	Gimbal Camera	Integrates multiple sensors for stable shooting or measurements during flight.

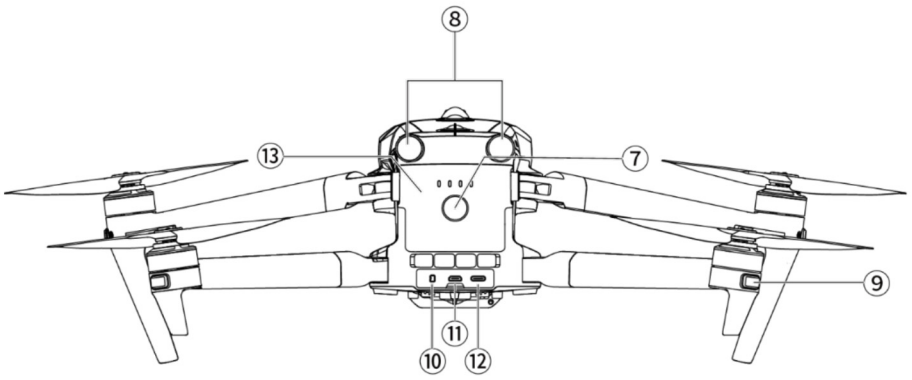


Fig 3-2 Aircraft Rear View

Table 3-2 Aircraft Rear View Details

No.	Name	Description
7	Power Button	Press and hold the power button for 3 seconds to start the aircraft. After the aircraft is powered on, quickly press the power button twice to enter matching mode.
8	Rear Visual Obstacle Avoidance Lens Group	Used to sense the obstacles in the rear and avoid the aircraft from colliding with them.
9	Rear Arm Light	Used to display the current flight status of the aircraft.
10	microSD Card Slot	For inserting a microSD card.
11	External SSD Interface	For connecting an external SSD.
12	USB-C Interface	Used to connect to a computer for firmware updates or debugging.
13	Smart Battery	Used to provide energy for aircraft operation.

⚠ Warning

- The USB-C interface of the aircraft cannot be used for charging. Do not connect the included remote controller charger. For how to charge the aircraft, see "5.3.5 Charging the Smart Battery" in Chapter 5.

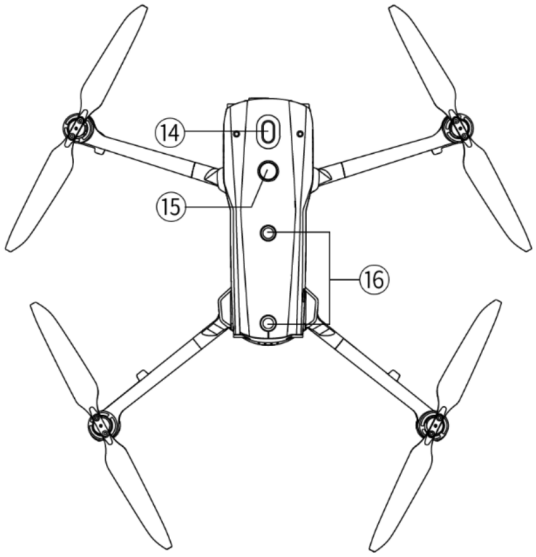


Fig 3-3 Aircraft Top-Down View

Table 3-3 Aircraft Top-Down View Details

No.	Name	Description
14	Mount Extension Interface	Additional mounts can be added to the aircraft fuselage through the extension interface, such as speaker, spotlight, and RTK module.
15	Strobe	Emits high-intensity strobe light to indicate the position of the aircraft at weak light conditions to avoid air traffic accidents.
16	Upward Visual Obstacle Avoidance Lens Group	Used to sense obstacles above, and to the left and right of the aircraft and avoid collisions.

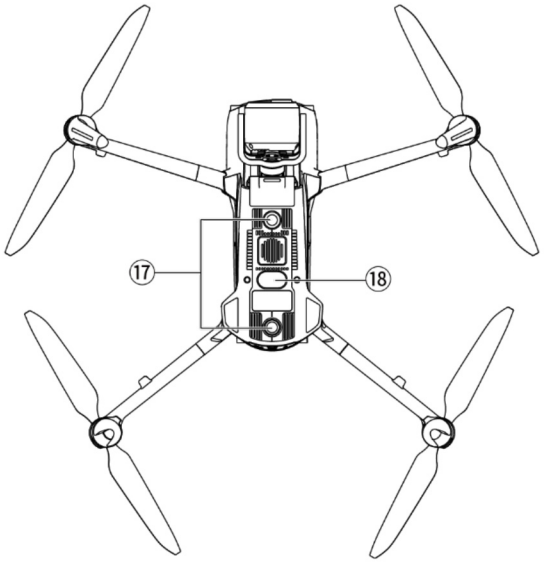


Fig 3-4 Aircraft Bottom-Up View

Table 3-4 Aircraft Bottom-Up View Details

No.	Name	Description
17	Downward Visual Obstacle Avoidance Lens Group	Used to sense obstacles below, and to the left and right of the aircraft and avoid collisions.
18	Auxiliary Light	An LED auxiliary light. In weak light conditions, it is used to enhance the ambient brightness of the landing area during the landing process, improve downward visual sensing performance, and ensure the safe landing of the aircraft.

⚠ Warning

- There is a rubber protective cover in the interface area on the rear side of the fuselage to protect the microSD card slot, external SSD interface, and USB-C interface. Please make sure that the protective cover is closed firmly during the flight.
- Do not disassemble the components that have been installed at the factory (except for the components explicitly permitted in the description in this manual), otherwise, the product warranty will be invalid.
- Please prevent the 4 millimeter-wave radars inside the fuselage from being blocked by foreign objects. The four millimeter-wave radars are located in the middle of the forward visual obstacle avoidance lens group, the rear visual obstacle avoidance lens group, the top shell of the fuselage, and near the fisheye lens at the bottom shell of the fuselage, respectively.