(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.
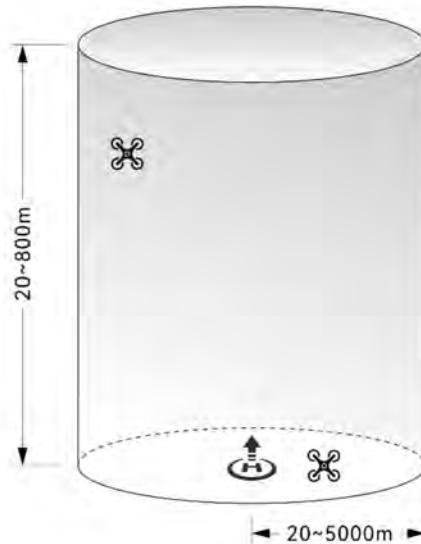
Fig 2-5   Diagram of altitude and distance limits

🔆 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.	

Hold the aircraft to keep it with the nose to the left and the side down.

4   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
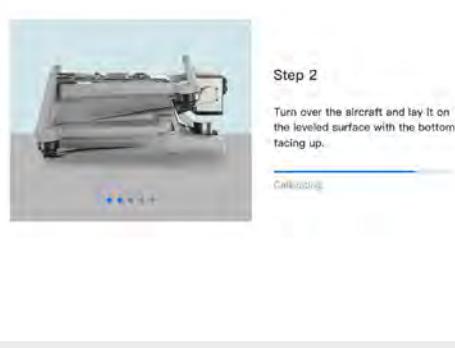
The IMU (Inertial Measurement Unit) of the aircraft has been calibrated at the factory, and no user calibration is required under normal conditions.

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.
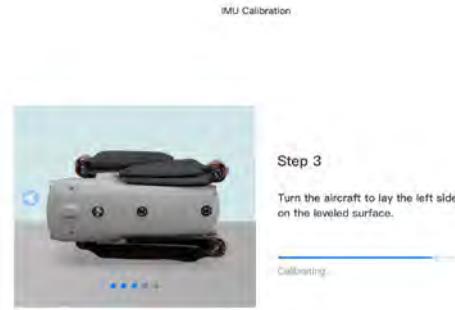
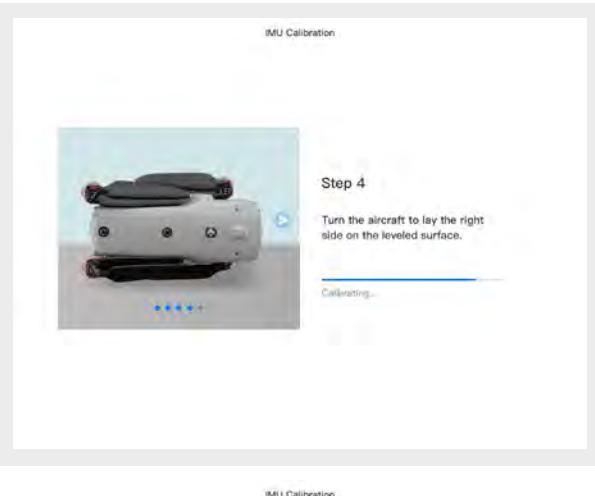| ⚠ Important |
| --- |
| ● Please place the aircraft according to the tips shown in the IMU calibration interface of the flight application, and keep the aircraft in a static state.
● Please place the aircraft on a flat ground, and do not move, shut down, or restart the aircraft during the calibration 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.	

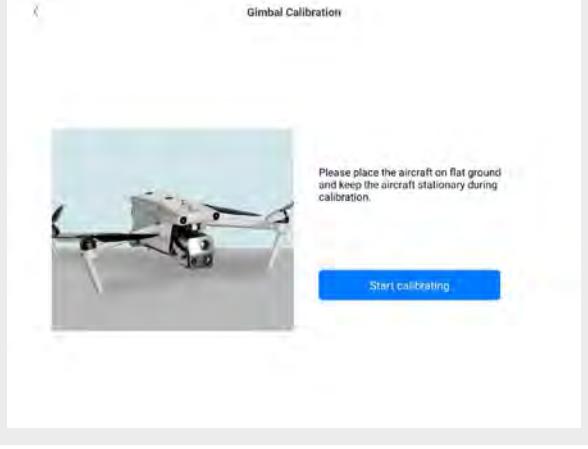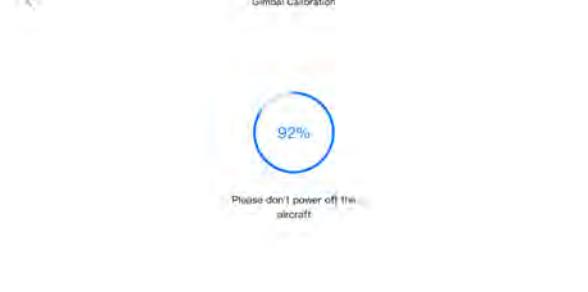|		
4	Put the left side of the aircraft flat on the ground until the interface prompts next step.	
5	Put the right side of the aircraft flat on the ground until the interface prompts next step.	
6	Fold the arms, turn the aircraft nose up, and lay it on the leveled surface until the interface prompts 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
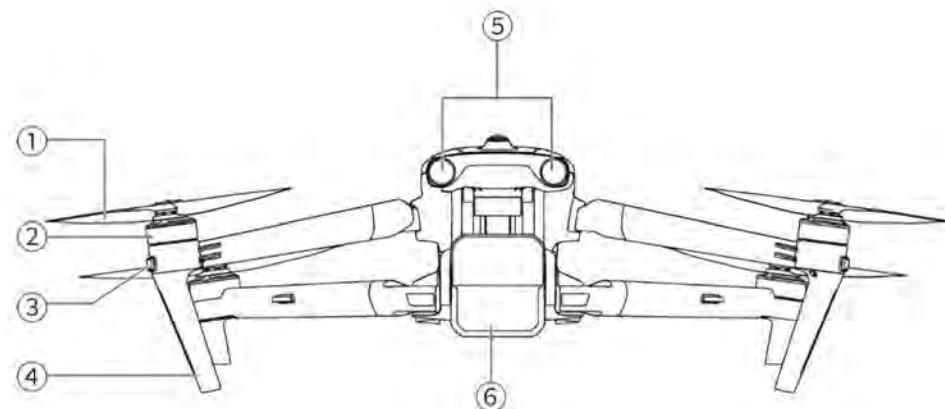
Fig 3-1   Aircraft Front View

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.
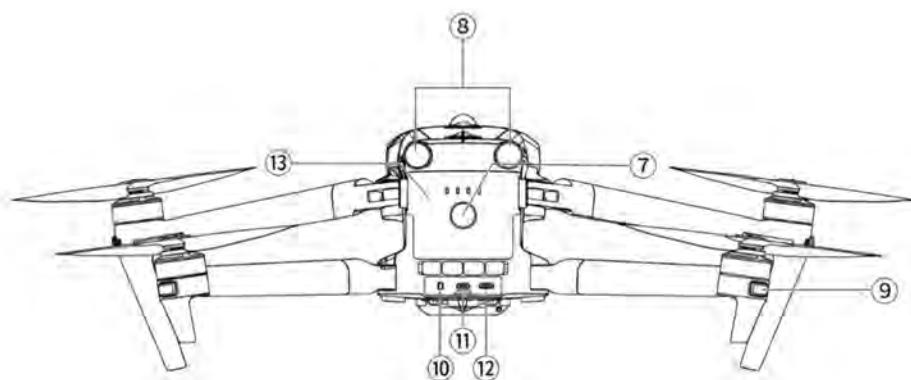
Fig 3-2   Aircraft Rear View

Table 3-2   Aircraft Rear View Details

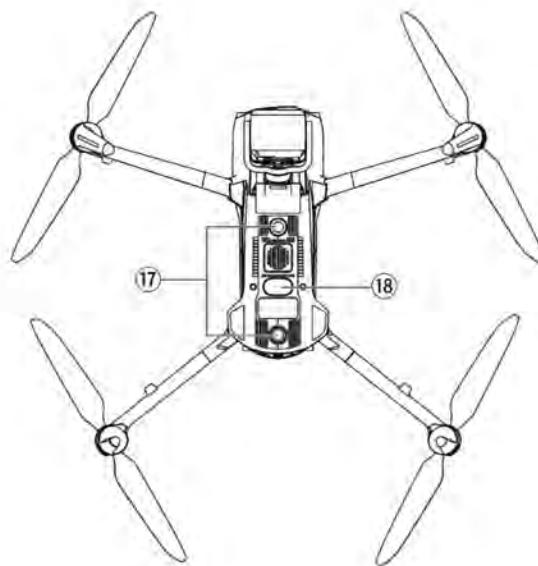| No.	Name	Description
7	Power Button	Press and hold the power button for 3 seconds to start the aircraft. After the aircraft is powered on, quickly press the power button twice to enter matching mode.
8	Rear Visual Obstacle Avoidance Lens Group	Used to sense the obstacles in the rear and avoid the aircraft 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.
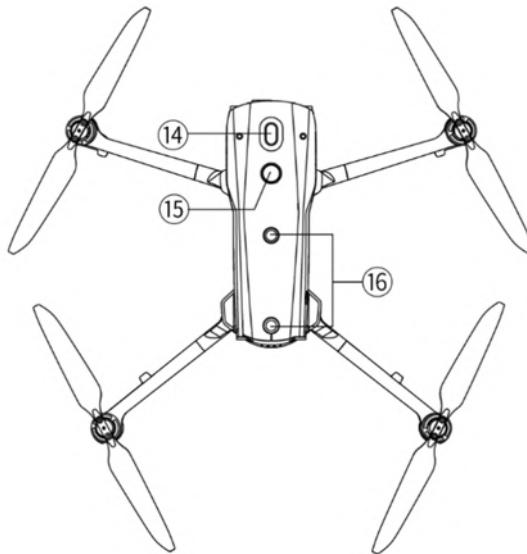
Fig 3-3   Aircraft Top-Down View

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.

3.3 Propeller

Propellers are consumable parts that require regular maintenance and replacement to ensure the safe flight of the aircraft. The aircraft uses a quick-release propeller design, making it easy for you to replace them.

⚠	● Keep body parts away from the rotating propellers to avoid injury.

3.3.1 Replacing Propellers

The propellers are installed in the aircraft by default at the factory, and users are not required to install them usually. If the propellers are damaged (e.g., broken or damaged blades), please replace them with new ones before flight.

> 💡 **Tip**
>
> ● Aircraft propellers are consumable parts. If needed, please purchase them from Autel Robotics.
> ● The propeller model is marked on the blade. You can check the model of a propeller at the edge of the blade near the propeller center shaft.
> ● Propellers cannot be installed on the wrong propeller mounts. Please carefully distinguish between propellers and mounts.
> ● Autel Robotics provides two spare propellers for each aircraft (with models 1158CW and 1158CCW respectively). Please refer to the "Packing List" and packaging for details.

> ❗ **Important**
>
> ● EVO Max series multi-rotor drone is currently compatible with two types of propellers: 1136 and 1158. 1136 propellers have been already out of service. Users (excluded EU users) who have bought this type of propellers can use 1158 propellers for replacement if they need to replace propellers.
> ● Compared with 1136 propellers, 1158 propellers have larger ratio of lift/gravity at high altitude and low voltage, and are much better in keeping flight silence, improving endurance time slightly. Please use accordingly.
> ● An aircraft must use propellers with same model. Do not use different types of propellers in one aircraft.
> ● After long use, the blades of propellers might deform, leading to tightness issue. In this case, please replace them in time.

■ Detaching the Propellers
1. Press and hold the smart battery power button for 3 seconds to power off the aircraft.

2. First hold the rotor of the motor on the arm below the propeller to prevent it from rotating, press down on the propeller center shaft firmly, and then turn it in the unlocking direction marked on the propeller center shaft to detach the propeller.

■ Installing the Propellers

When installing the propellers, strictly follow the following instructions:
1. Make sure that the aircraft is powered off before installing the propellers.
2. The aircraft needs to be installed with two models of propellers, that is, CW and CCW, with two of each model. The CCW propellers have a white circle mark at the center shaft, while the CW propellers do not have this mark at the center shaft.
3. There are two types of propeller mounts on the power motors of the aircraft. The mounts with a white circle mark at the center shaft are for CCW propellers, while the mounts without this mark are for CW propellers.
4. Place a propeller on the corresponding propeller mount. Make sure that the buckle at the center shaft of the propeller aligns with the slot on the mount. Hold the rotor of the motor below the propeller to prevent it from rotating, press down on the propeller center shaft firmly, and then turn it in the locking direction marked on the center shaft to secure the propeller in place.
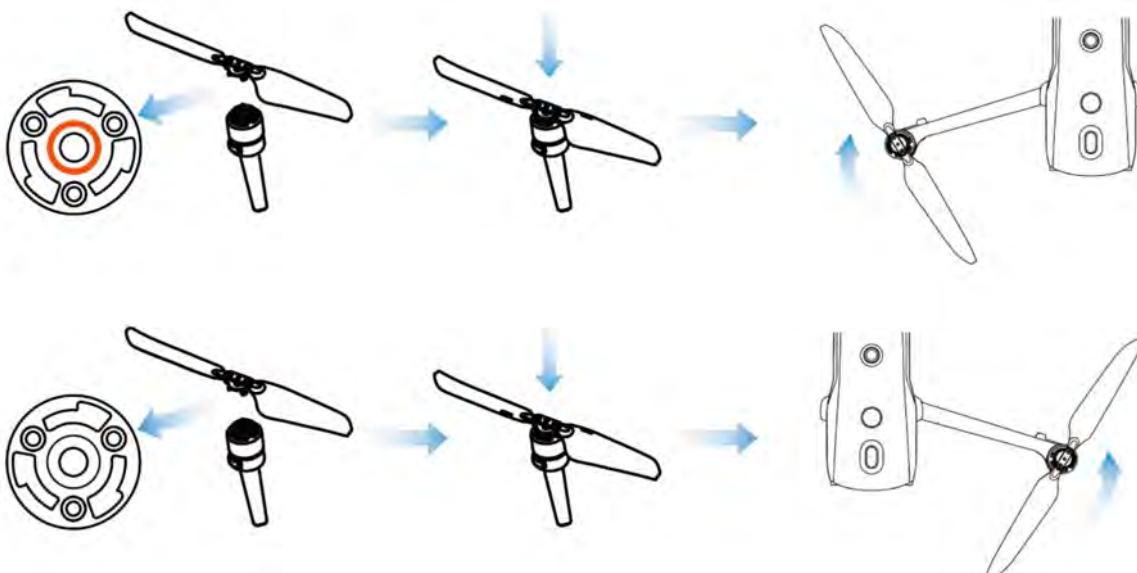

**Fig 3-5　Install the Propellers**

Table 3-5　Propeller Installation Details

Propeller Model	CCW (White circle on the center shaft)	CW (No white circle on the center shaft)
Installation Area	Mounts with a white circle mark	Mounts without white circle mark
Lock/Unlock	Lock orientation: Turn the propeller this way: ⟳ to tighten it into the mount. Unlock orientation: Turn the propeller this way: ⟲ to remove it from the mount.	

⚠️ **Warning**

- The propellers can rotate at a maximum speed of 8000 RPM (1136) or 7500 RPM (1158). Please operate with caution.
- Before each flight, make sure that all propellers are in good condition. If there are aged, damaged, or deformed propellers, please replace them before the flight.
- Before each flight, make sure that all propellers are mounted correctly and securely.
- Please use the propellers provided by Autel Robotics. Do not mix propellers of different models.
- Before replacing propellers, make sure that the aircraft is powered off.
- Propeller edges are sharp. When replacing propellers, it is recommended to wear protective gloves.
- Stay away from rotating propellers or motors to avoid injuries.
- Before testing the aircraft on the ground, make sure that the propellers are removed.

3.3.2 Storing Propellers

After using the aircraft, fold the arms as shown below and store the propellers in the rugged case.
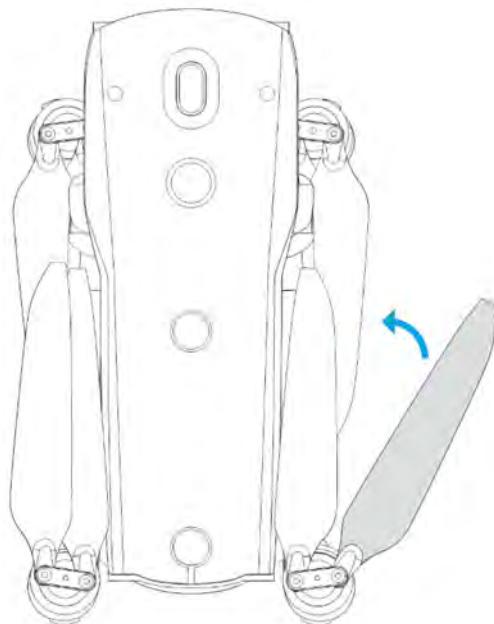
Fig 3-6   Store the Propellers

3.4 Arm Light

There is an LED indicator at the end of each arm of the aircraft. The front arm light is the heading light, and the rear arm light is the status light. After the aircraft takes off, the front arm lights will blink periodically, which can help you identify the direction of the aircraft nose; the rear arm lights will display the current flight status of the aircraft.

The front arm light is green when it lights up, and the rear arm light can display green, yellow, and red depending on the scene.
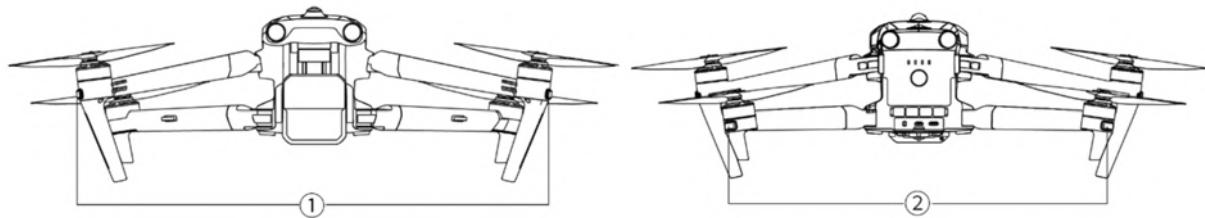
Fig 3-7   Arm Light

Table 3-6   Arm Light Status Details

Scence	①: Front Arm Light (Periodic state)	②: Rear Arm Light (Periodic state)
Remote Controller Not Connected to Aircraft	Green: 1s on/1s off	Yellow: 0.25s on/0.25s off
Start Compass Calibration	Green: 1s on/1s off	Yellow: 0.25s on/0.25s off
Current Step Calibration Successful	Green: 1s on/1s off	Green: 0.25s on/0.25s off
Compass Calibration Successful	Green: 1s on/1s off	Green: always on
Compass Calibration Failed	Green: 1s on/1s off	Red: always on
IMU Calibration	Green: always on	Red: 0.5s on/0.5s off
Low Battery Warning	Green: 1s on/1s off	Red: 0.5s on/1.5s off
Critical Low Battery Warning	Green: 1s on/1s off	Red: 0.25s on/0.25s off
IMU Abnormal	Green: 1s on/1s off	Red: always on
Illegal Battery	Green: 1s on/1s off	Red: 0.5s on/1.5s off
Magnetometer Abnormal	Green: 1s on/1s off	Red: 0.5s on/1.5s off → Yellow: 0.5s on/1.5s off
GNSS Mode	Green: 1s on/1s off	Green: 1s on → Red: 1s on* *When the front arm light turn off, the rear arm light turns red.*
Attitude Mode	Green: 1s on/1s off	Green: 1s on → Red: 1s on* *When the front arm light turn off, the rear arm light turns red.*
Take Off	Green: always on	Green: 0.5s on/1.5s off

Take off with Caution	Green: 1s on/1s off	Yellow: 0.25s on/0.25s off
Single Link	Green: 0.05s on/0.05s off	Green: 0.05s on/0.05s off
A-Mesh Link	Green: 0.05s on/0.05s off	Yellow: 0.05s on/0.05s off
Link Successful	Green: 0.05s on/0.05s off	Green: always on
Link Failed	Green: 0.05s on/0.05s off	Red: always on
Firmware Updating	Green: 0.1s on/0.1s off	Green: 0.1s on/0.1s off
Firmware Update Successful	Green: always on	Green: always on
Firmware Update Failed	Green: always on	Red: 0.5s on/0.5s off
Getting Logs	Green: always on	Green: 0.25s on/0.25s off→ Yellow: 0.25s on/0.25s off
Aircraft Search	Green: 1s on/1s off	Red: 0.5s on/1.5s off
Initializing Flight Mission	Green: always on	Red: 0.2s on → Yellow: 0.2s on → Green: 0.2s on → All: 0.4s off

3.5 Strobe

The aircraft is equipped with a strobe at the top of the fuselage to help identify the aircraft when flying at night. You can manually turn the strobe on or off in the flight application.

Fig 3-8   Strobe

Tip

● For how to turn the strobe on or off, see "6.4 Toolbar" and "6.5 "Settings" Interface" in

Chapter 6.

⚠ Warning

- Do not look directly at the strobe while they are on to avoid vision damage caused by strong light.

3.6 Auxiliary Bottom Light

The aircraft is equipped with auxiliary bottom lights (LED auxiliary lights) at the bottom of the fuselage. The lights are used to assist the downward visual obstacle avoidance lens group when the aircraft is landing in weak light environments, so as to ensure better visual positioning performance and enhance the landing safety of the aircraft. You can manually turn the bottom LED auxiliary lights on or off in the flight application.
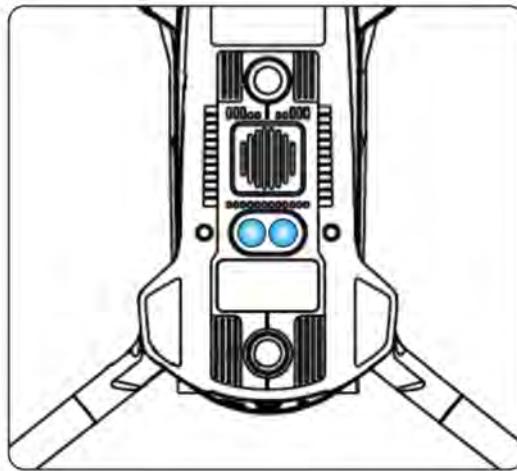
Fig 3-9   Auxiliary Light

💡 Tip

- For how to turn the auxiliary bottom lights on or off, see "6.4 Toolbar" and "6.5 "Settings" Interface" in Chapter 6.

⚠ Warning

- When the auxiliary bottom lights are set to auto mode, they will turn on automatically at an altitude of around 5 meters above the ground when the aircraft is landing and the ambient light is insufficient, and they will turn off automatically after successful landing.

3.7　Gimbal Camera

● The EVO Max 4T aircraft is equipped with the Fusion 4T Gimbal, which integrates a high-magnification zoom camera, allowing you to clearly shoot vehicles and boats up to 2 kilometers away.
● The EVO Max 4T XE aircraft is equipped with the Fusion 4T XE Gimbal, which integrates a high-magnification zoom camera, allowing you to clearly shoot vehicles and boats up to 2 kilometers away.
● The EVO Max 4N aircraft is equipped with the Fusion 4N Gimbal, which integrates a super-starlight night vision camera and has outstanding shooting performance under low-illuminance environments.
● Both gimbal cameras integrate a wide angle camera, a laser rangefinder, and an infrared thermal imaging camera and provide capabilities such as target thermal imaging, positioning, and ranging for flight operations, enhancing the flying experience in all-day operations.

3.7.1　Camera Structure

Fusion 4T　　　　Fusion 4N　　　　Fusion 4T XE
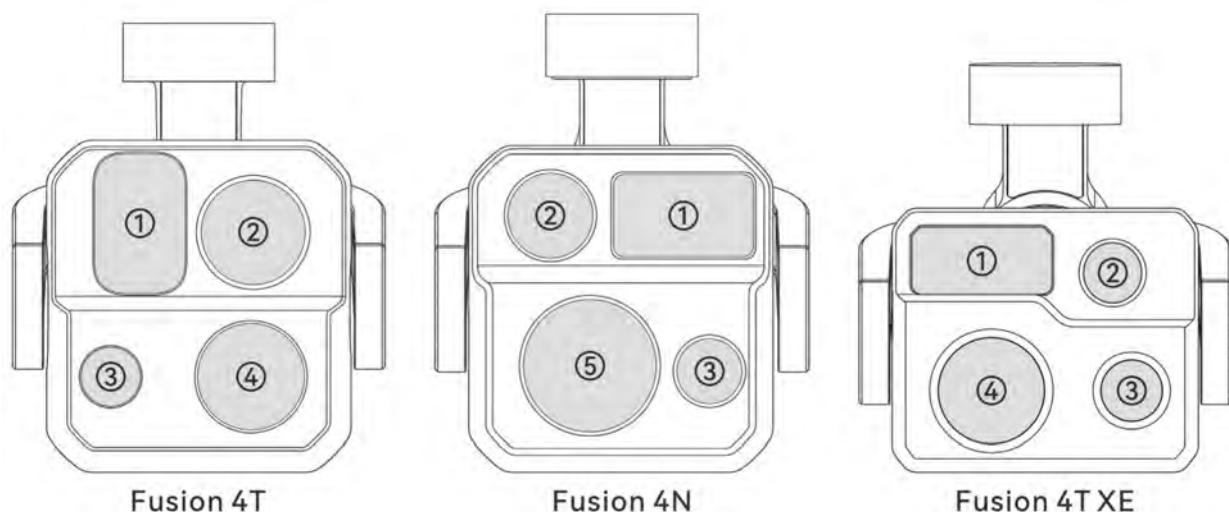
Fig 3-10　Aircraft Gimbal Camera Layout

Table 3-7　Aircraft Gimbal Camera Layout Details

No.	Name	Description
1	Laser Rangefinder	The laser ranger finder accurately determines the distance by measuring the time from the beginning of the laser emission to the time when the laser is reflected from the target. Measuring range: 5-1200 meters.
2	Infrared Thermal Imaging Camera	The infrared thermal imaging camera is used for radiometric measurement and night vision, which can monitor the temperature distribution of the measured target in real time, so as to judge the state of the target. Radiometric temperature range: -20°C ~ +150°C (high gain

mode) and 0°C ~ + 550°C (low gain mode).

3	Wide Angle Camera	The wide angle camera is used to capture images with a larger field of view within a shorter shooting distance. Fusion 4T Gimbal/Fusion 4N Gimbal: 1/1.28" CMOS, 50 million effective pixels, and 85° field of view. Fusion 4T XE Gimbal: 1/2" CMOS, 48 million effective pixels, and 83.4° field of view.
4	Zoom Camera	The zoom camera is used to shoot distant scenes, making the distant scenes clearer. 1/2" CMOS, 48 million effective pixels, 10x continuous optical zoom, 20x hybrid zoom and 160x digital zoom.
5	Night Vision Camera	The night vision camera is used for clear imaging in low-illuminance environments (such as nighttime). 0.0001 Lux ambient illumination recognition and 1920×1200 resolution.

> ⚠ **Warning**
>
> ● Do not point the infrared thermal imaging camera at intensive energy sources such as the sun, lava, laser beams, and molten iron, to avoid damage to the infrared detector.
> ● The temperature of the observation target should be less than 600 °C. Observing objects with temperatures above this limit may result in damage to the infrared detector.
> ● The laser rangefinder is a Class 3R laser product that emits laser radiation. Avoid direct exposure to the eyes when in use.

3.7.2 Camera Operations

■ Control Camera by RC Functional Buttons
● Right dial wheel: Used to adjust the zoom factor of the selected camera. Turn left to reduce the zoom factor, and turn right to increase the zoom factor.
● Video recording button: Press the button to start video recording and press again to end video recording.
● Shooting button: Press the button to take photos.

> 💡 **Tip**
>
> ● For the control operations of the remote controller, see "4.1.1 Remote Controller Components" in Chapter 4.

■ Control Camera in the Flight Application
For details about how to control the camera in the flight application, see "6.8 Camera Interfaces" in Chapter 6.

3.8 Aircraft Gimbal

The aircraft is equipped with a three-axis stabilized gimbal with a high-precision motor structure, which can ensure stable camera shooting when the aircraft is flying.
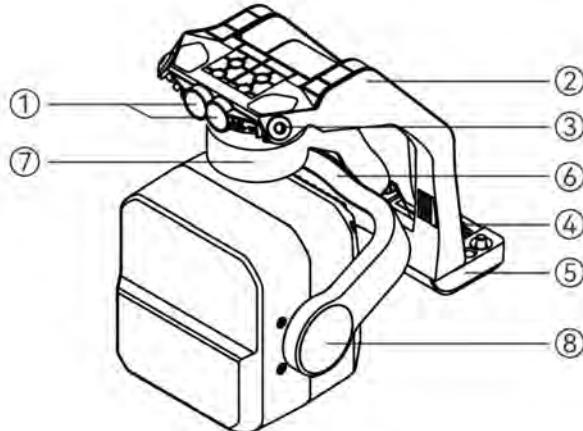
Fig 3-11   Gimbal Structure

💡 Tip
● Please be aware that, except for differences in lens layout, the structure of the Fusion 4T Gimbal, that of the Fusion 4T XE Gimbal and that of the Fusion 4N Gimbal are the same or similar.

Table 3-8   Gimbal Structure Details

No.	Name	Description
1	Cylindrical Holes	The two cylindrical holes at the front of the gimbal dampener mount are used to fix one side of the gimbal dampener mount to the two fixed pins in the aircraft nose gimbal compartment.
2	Dampener Mount	Used to support dampeners and gimbal cameras.
3	Dampener	Used to buffer the vibration of the gimbal.
4	Connector	The connector of the gimbal is connected to the connector slot at the bottom of the aircraft fuselage.
5	Connector Cover	The protective cover above the connector is used to fix the other side of the gimbal dampener mount to the bottom of the aircraft fuselage.
6	Roll Axis Motor	Used to control the moving range of the gimbal to roll left or right (mechanical range of Fusion 4T and Fusion 4T XE: -45° ~ +45°; mechanical range of Fusion 4N: -50° ~ +50°,).
7	Yaw Axis Motor	Used to control the moving range of the gimbal to rotate left or right with its own axis (mechanical range: -45° ~ +45°).

8	Pitch Axis Motor	Used to control the moving range of the gimbal to rotate up or down (mechanical range: -135° ~ +45°, controllable movement range: -90° ~ +30°).

3.8.1 Gimbal Mechanical Rotation Range

The mechanical rotation ranges of the pitch, yaw, and roll axes of the gimbal are shown below.

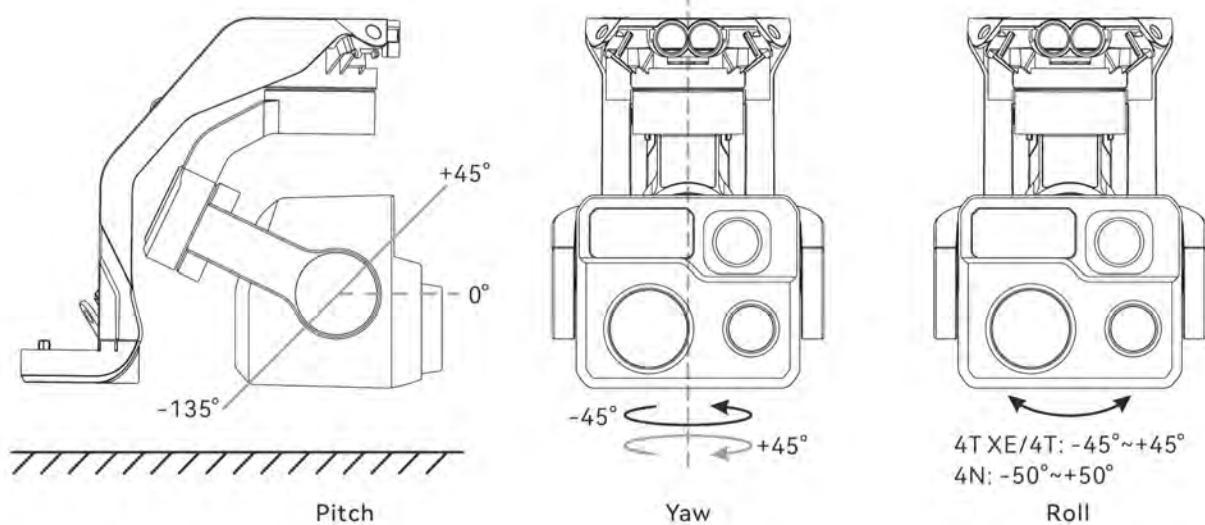**Fig 3-12   Mechanical Rotation Range of the Gimbal of the Aircraft**

📝 **Note**
● You can control the rotation range of the gimbal pitch, ranging from -90° to 30°. For more setting details, see "6.5 "Settings" Interface" in Chapter 6.

3.8.2 Gimbal Operations

■ Control Gimbal by RC Functional Buttons
● Left dial wheel: Used to adjust the gimbal pitch. Turn left to rotate the gimbal down, and turn right to rotate the gimbal up.
● Custom keys C1/C2: After setting the C1 or C2 key to "Gimbal Pitch Recenter/45°/Down", you can press the key to switch the gimbal angle.

💡 **Tip**
● For the control operations of the remote controller, see "4.1.1 Remote Controller Components" and "4.11.1 Custom Keys C1 and C2" in Chapter 4.

■ Control Gimbal in the Flight Application
For the gimbal control operations in the flight application, see "6.8.1 Camera Function Access" in Chapter 6.

⚠ **Warning**

- When the aircraft is not in use, especially when the aircraft is being transferred or stored, be sure to use the protective cover of the gimbal to fix the gimbal, so as to avoid damage to the gimbal camera due to accidental rotation or bumping.
- Please remove the protective cover of the gimbal before turning on the aircraft, otherwise, it may cause damage to the gimbal motor and related circuit.
- When turning on the power switch of the aircraft, the gimbal will automatically rotate to perform self-check and calibration, please make sure there is no object near the gimbal to hinder its movement.

3.8.3 Replacing the Gimbal

The aircraft adopts removable gimbal design, allowing users to easily replace the gimbal with one of different model to meet your flight needs in various scenarios.

🛈 **Important**

- Please follow the instructions below to replace the gimbal, as improper replacement may cause damage to the gimbal or poor contact with the gimbal interface.
- Do not replace the gimbal frequently. The gimbal connector is a precision element, and frequent plugging and unplugging may result in poor contact between the aircraft and the gimbal.
- Please use the gimbal model specified by Autel Robotics for replacement. Incompatible gimbals may cause damage to the aircraft.


⚠ **Warning**

- Do not attempt to remove or mount the gimbal when it is powered on. Wait for 15 seconds after powering off the aircraft (the internal capacitor is fully discharged) before removing or mounting the gimbal.
- When turning the aircraft upside down to remove or mount the gimbal, please protect the visual obstacle avoidance lens and strobe at the back of the aircraft fuselage to avoid scratches.
- If there is a function mount installed on the extension interface, please remove the mount before removing or installing the gimbal, so as to prevent the mount from being damaged.

■ **Removing the Gimbal**

1. Press and hold the power button of the smart battery for 3 seconds to turn it off and remove the smart battery.
2. Place the aircraft on a level surface with the bottom of the fuselage facing up.
3. Use a Phillips PH00 screwdriver to loosen the two anti-loosening screws securing the connector cover.
4. Slightly lift the connector cover and slide it back and up to take out the gimbal.

⚠ Warning
● When removing the gimbal, do not forcefully pull the gimbal out, as this may cause damage to the gimbal. You should hold the gimbal dampener mount to remove the gimbal.
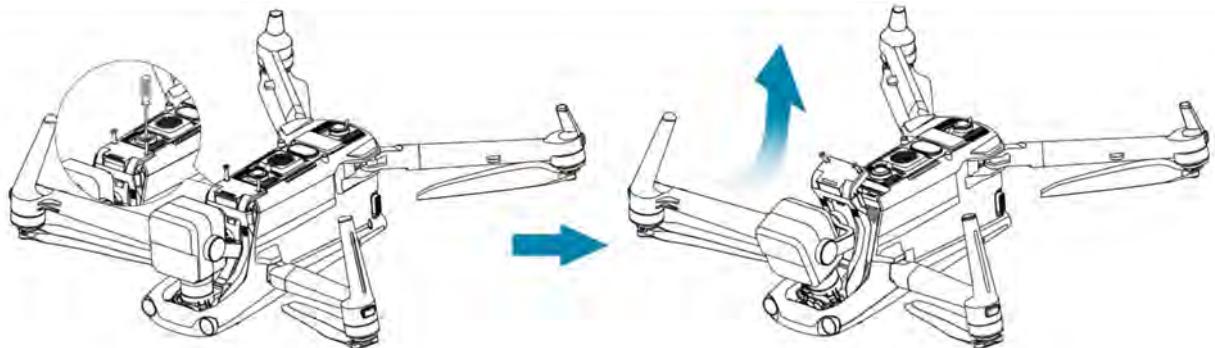
Fig 3-13   Removing the Gimbal

■ Mounting the Gimbal

1. Press and hold the smart battery power button for 3 seconds to turn the aircraft off and remove the smart battery.
2. After aligning the cylindrical hole on the front end of the gimbal dampener mount with the two fixed pins in the aircraft nose gimbal compartment, push and slide the gimbal forward until the connector cover is aligned with the connector slot in the aircraft.
3. Gently push down the connector cover to the bottom, so that the connector under the connector cover is inserted into the connector slot, and the connector cover needs to be flush with the bottom of the aircraft.
4. Use a Phillips PH00 screwdriver to partially tighten the two anti-loosening screws into the two fixing holes on the connector cover. After ensuring that the connector is perfectly aligned with the connector slot, fully tighten the two anti-loosening screws to secure the connector cover.
5. Press and hold the battery power button for 3 seconds to power on the aircraft. If the connector cable of the gimbal is connected correctly, the gimbal will automatically rotate the camera to perform a self-test.
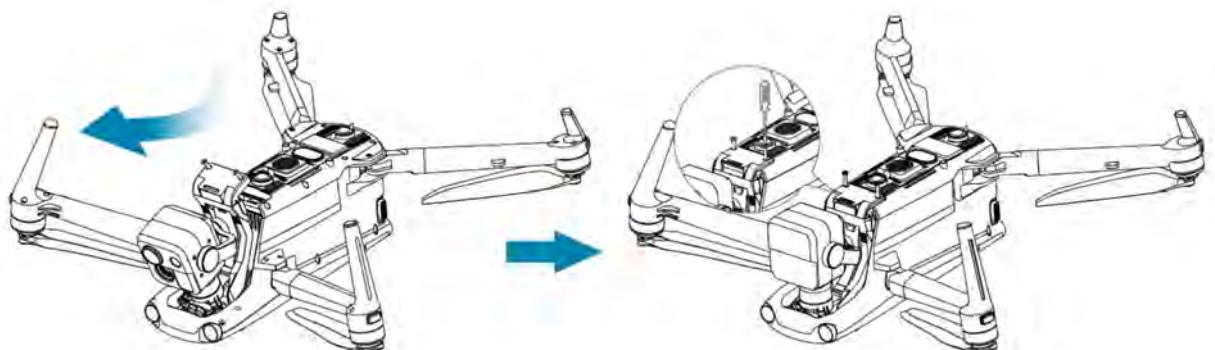
Fig 3-14   Mounting the Gimbal

ⓘ Important

● Please make sure that the connector cover of the gimbal camera is aligned with the connector slot at the bottom of the fuselage, otherwise, it will affect the connection between the gimbal and the aircraft.

⚠ Warning

● After mounting the gimbal to the aircraft, please make sure that all parts are fully fixed to avoid loss due to functional failures caused by loose assembly of the gimbal during flight.

3.9 Flight Control System

The aircraft achieves stable and convenient flight control through its built-in intelligent flight control system. The system supports a number of advanced functions, including auto-return, failsafe, and visual positioning system.

Table 3-9   Flight Control System

Module	Description
IMU	A three-axis gyroscope and a three-axis accelerometer measure acceleration and angular velocity.
Compass (Magnetometer)	Measures the geomagnetic field and provides reference information on the aircraft heading.
GNSS Receiver	Receives global satellite navigation signals to measure longitude, latitude, and altitude.
Barometer	Measures atmospheric pressure and is used to determine the altitude of the aircraft.
Visual Obstacle Avoidance Sensing System	Provides the aircraft with 720° obstacle avoidance sensing capability around the aircraft.
Millimeter Wave Radar	Provides the aircraft with all-day and all-weather obstacle avoidance sensing capability.

3.9.1 Flight Status

Depending on the availability of GNSS signals and flight conditions, the aircraft can automatically switch between the following three modes. Users can check the flight status of the aircraft in the status notification bar in the flight application. For details, please refer to "6.3 Status Notification Bar" in chapter 6.

Table 3-10   Flight Status

Mode	Description
GNSS Mode	When the aircraft detects a qualified GNSS signal, it will enter the GNSS mode automatically. In GNSS mode, if the obstacle avoidance system is turned on, the system will provide auxiliary information to more accurately locate and avoid obstacles, provide stable and smooth flight control, and support auto-return, failsafe, geo-fencing and other safety functions.
Visual Positioning Mode	When the aircraft is in the visual positioning mode, and the GNSS signal detected is not strong enough to activate GNSS mode, and it meets certain environmental and altitude requirements (The ambient light intensity is greater than 15Lux, the ground texture is clear, the diffuse reflectance is greater than 20%, and the UAV flight altitude is within the observation range of the visual obstacle avoidance perception system), the aircraft will automatically enter the visual positioning mode.
Attitude Mode	When there is no GNSS signal and the environment and altitude cannot meet the minimum requirements of the visual obstacle avoidance sensing system, that is, when there is no GNSS signal and visual positioning failure at the same time, the attitude mode will be activated. In this mode, the obstacle avoidance system is disabled, and the aircraft only controls the altitude through the barometer, and users are supposed to make their own decisions to ensure flight safety.

⚠ **Warning**

- If you have not fully mastered the flight control of the aircraft and the aircraft is in attitude mode, please do not take off rashly.
- If the aircraft is in visual positioning mode or attitude mode, the no-fly zone function of the geofencing system will be unavailable and please be cautious that do not enter restricted airspace.

3.9.2 Flight Modes

The aircraft has varying flight power output performance in different flight modes. You can set the flight mode of the aircraft in the flight application. For more information, see "6.3 Status Notification Bar" and "6.5 "Settings" Interface" in Chapter 6.

Table 3-11   Flight Modes

Flight Modes	Description
Slow	Forward, backward, left, and right: 3 m/s; Ascend: 3 m/s; Descend: 3 m/s.

Smooth	Forward, backward, left, and right: 10 m/s; Ascend: 5 m/s; Descend: 5 m/s.
Standard	Forward and backward: 15 m/s; Left and right: 10 m/s; Ascend: 6 m/s; Descend: 6 m/s.
Ludicrous	Forward: 23 m/s; Backward: 18 m/s; Left and right: 20 m/s; Ascend: 8 m/s; Descend: 6 m/s.

⚠ **Warning**

- If you have not fully mastered the flight control of the aircraft, it is not recommended for you to switch to Ludicrous mode.

- When flying close to the ground, it is recommended to switch to Slow mode for safety.
- When switching to Ludicrous mode, the obstacle avoidance function of the aircraft will become unavailable, and the aircraft will not automatically avoid surrounding obstacles during flight. Please always pay attention to the surrounding environment when using it, and manually control the aircraft to avoid obstacles.
- When switching to Ludicrous mode, its flight speed is greatly improved compared with Standard mode, so the safety distance in this mode will be correspondingly extended. Users should maintain the safety distance of at least 50 meters when operating the aircraft manually in this mode to ensure personal and flight safety.

3.9.3 Intelligent Flight Function

■ Accurate Landing
The accurate landing function uses the downward binocular visual obstacle avoidance lens group of the aircraft to record the information at its take-off point. When the aircraft is returning to the home point or landing, vision algorithms are used to calculate the distance between the aircraft and the take-off point in real time so as to make sure that the aircraft successfully lands at the take-off point.

■ Landing Protection
The landing protection function uses the downward visual obstacle avoidance lens group and downward millimeter-wave radar of the aircraft to create a depth map, then calculate the flatness and angle of the depth map to detect whether the surface is flat enough for a safe landing.

■ Intelligent Obstacle Avoidance
The intelligent obstacle avoidance function uses the combined observation results of the visual obstacle avoidance sensing system and the forward millimeter-wave radar sensing system of the aircraft to calculate the optimal flight path, achieving obstacle avoidance in multiple directions.

> **⚠ Important**
>
> - If there is no home point set, the aircraft will record the takeoff point as the default home point. When the home point is not refreshed in flight, the precise landing will initiate.
> - When the precise landing function is enabled, users should ensure the takeoff environment does not change.

3.9.4 Hot Swap Battery

The aircraft supports hot-swappable batteries, which allows you to replace smart batteries without powering off the aircraft, thus avoiding waiting for rebooting. When performing a hot swap, it is recommended to replace the battery within 8 seconds to ensure that the new battery can be properly activated when powering on the aircraft.

> **⚠ Important**
>
> - Before performing a hot swap, please enable the "Hot Swap Battery" function in the flight application. For more information, see "6.5 "Settings" Interface" in Chapter 6.
> - After you remove the battery during a hot swap, the aircraft will enter low power mode. In this mode, the aircraft is powered by its internal supercapacitor. Therefore, you should complete the battery replacement quickly.
> - The battery replacement time may vary under different temperatures. Please replace the battery within 8 seconds. If the replacement time exceeds 8 seconds, please reboot the aircraft. Hot swap operations in temperatures below -10°C may fail.

3.10 Installing the microSD Card

The aircraft comes with a 64 GB microSD card (pre-installed in the microSD card slot of the aircraft at the factory). If you want to replace it with a higher-capacity microSD card, please refer to the following operations.
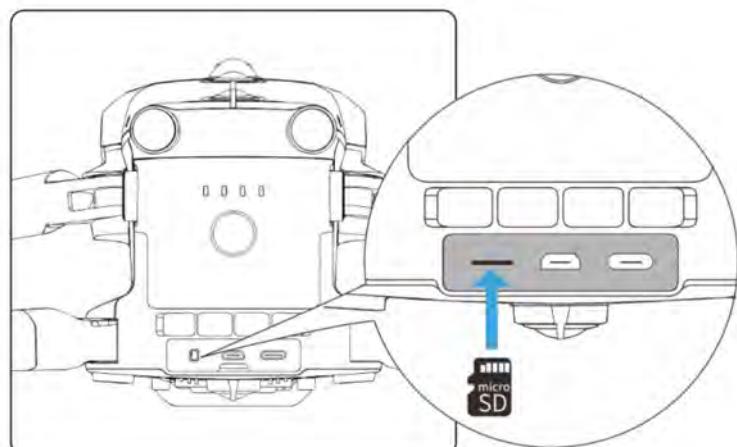

Fig 3-15   Installing the microSD Card