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 battery power button for 3 seconds to turn on the power of the aircraft, and wait for the rear arm light to turn green and blinks slowly (indicating that the current status is normal).
- Press and hold the power button of the remote controller for 3 seconds to turn on the remote controller.
- 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)

2.16 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

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

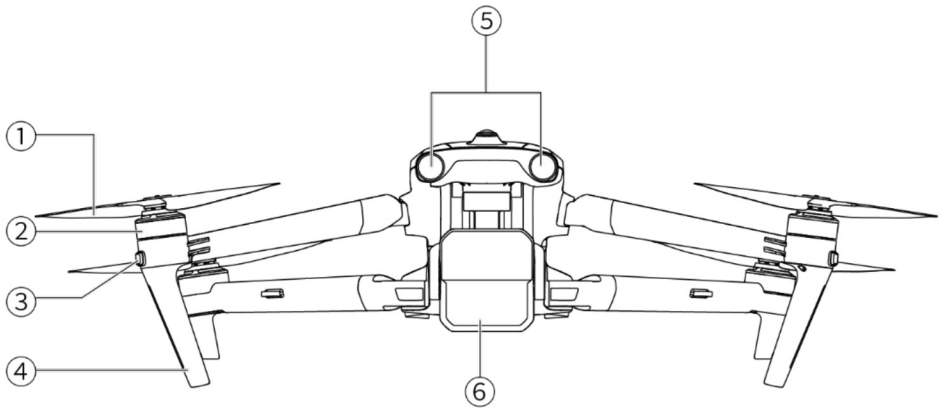

Fig 3-1 Aircraft Front View

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.

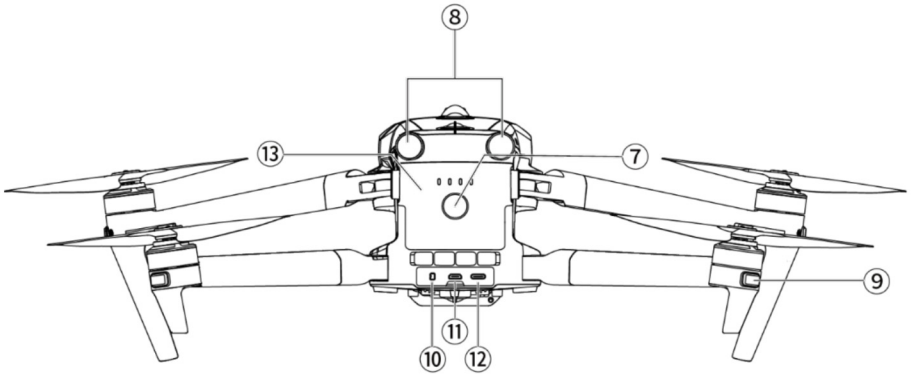

Fig 3-2 Aircraft Rear View

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.

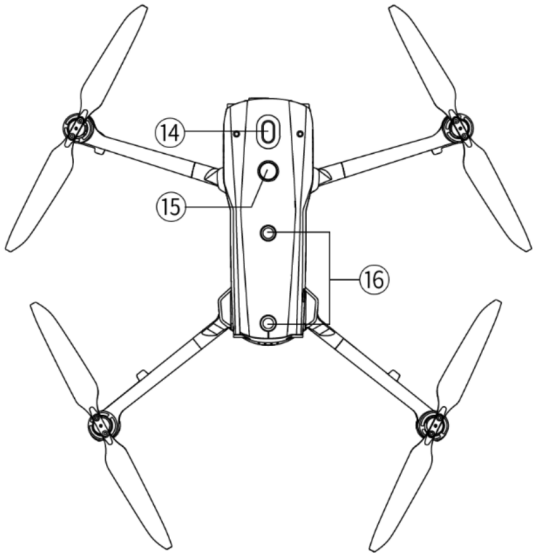

Fig 3-3 Aircraft Top-Down View

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.

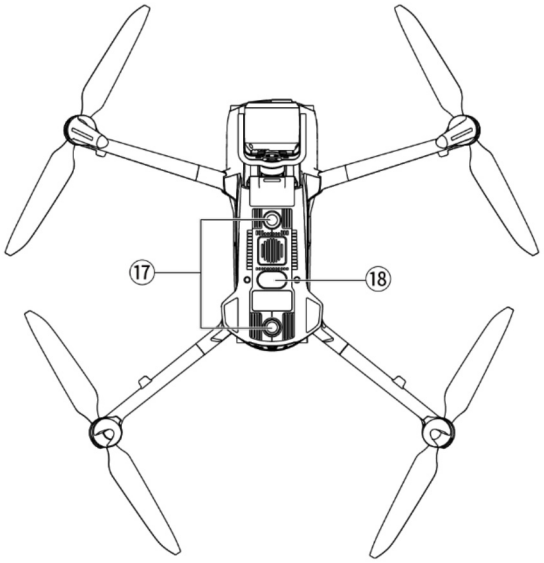

Fig 3-4 Aircraft Bottom-Up View

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 1136CW and 1136CCW or 1158CW and 1158CCW respectively). Please refer to the “Packing List” and packaging for details.

■ 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.

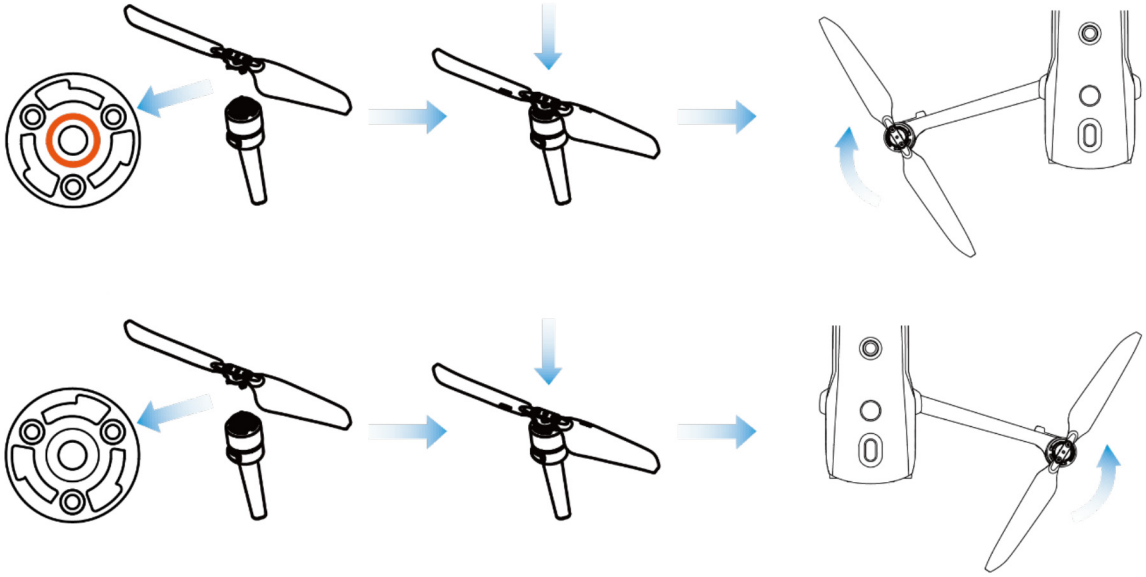

Fig 3-5 Install the Propellers

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. 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.

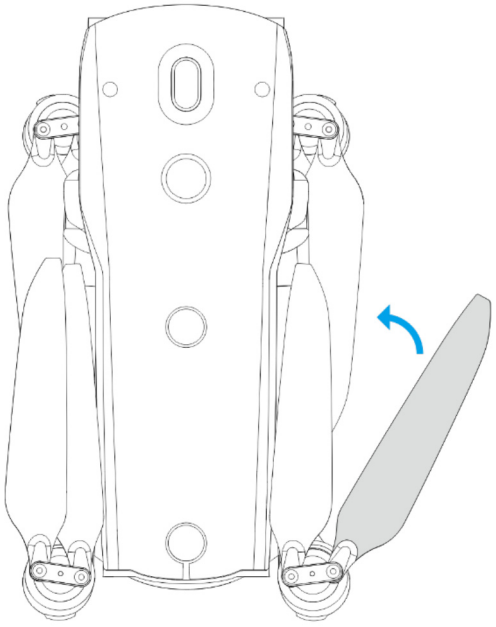

Fig 3-6 Store the Propellers

3.4 Arm Light

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

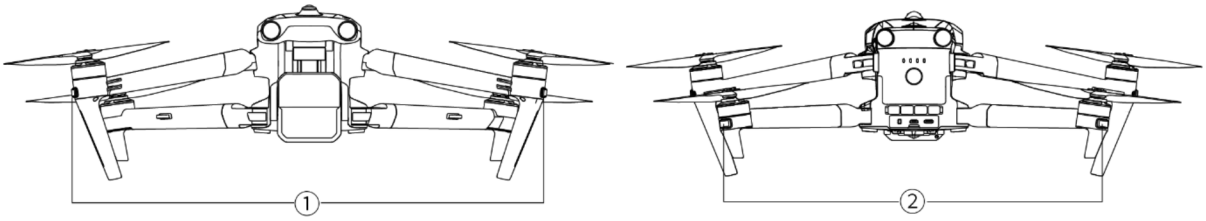

Fig 3-7 Arm Light

Table 3-6 Arm Light Details

Mode	Front Arm Light ①	Rear Arm Light ②
GNSS Mode Attitude Mode	During flight, the front arm lights will blink green slowly following a pattern of a period (1s on/1s off) to help identify the nose direction.	During flight, the rear arm lights will blink alternately in a cycle of a period (green light on for 1s /red light on for 1s) to help identify the tail direction.

Table 3-7 Rear Arm Light Status Details

Indicator Status (R: Red G: Green Y: Yellow)	Definition
Normal	
R– Ultra-fast Blinking /Fast Blinking →Y- Fast Blinking	System Self-Test
Compass/IMU Calibration	
Y– Slow Blinking	Start Calibration
G– Slow Blinking	Current Step Calibration Successful
G– Always On	Calibration Successful
R– Always On	Calibration Failed
Warning	
Y– Fast Blinking	Remote Controller Not Connected to Aircraft
R– Slow Blinking	Low Battery Warning/Illegal Battery
R– Fast Blinking	Critical Low Battery Warning
R– Always On	IMU Abnormal
RY-Alternate Slow Blinking	Magnetometer Abnormal/ Calibration Required

- Slow Blinking: blinks once every 2s (0.5s on/1.5s off).
- Fast Blinking: blinks twice per second.
- Ultra-fast blinking: blinks 5 times per second.

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.

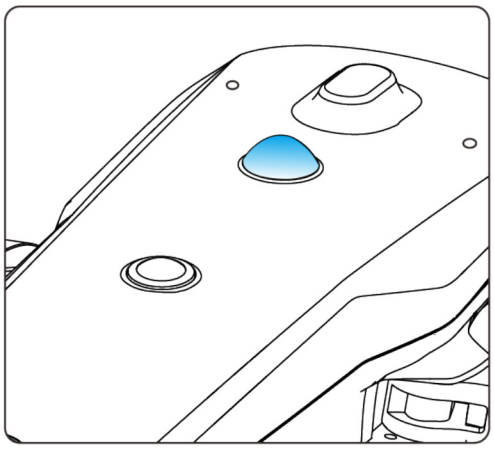

Fig 3-8 Strobe

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.

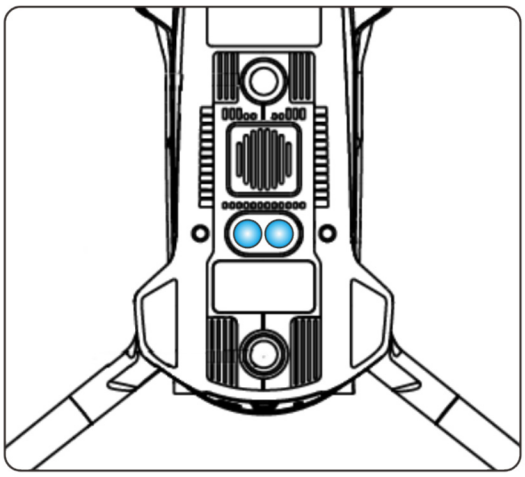

Fig 3-9 Auxiliary Light

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 3 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 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

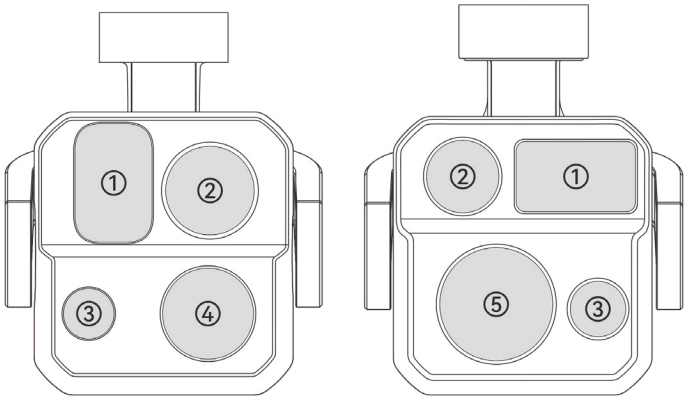

Fig 3-10 Aircraft Gimbal Camera Layout

Table 3-8 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. 1/1.28" CMOS, 50 million effective pixels, and 85° 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, and 160x hybrid 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.

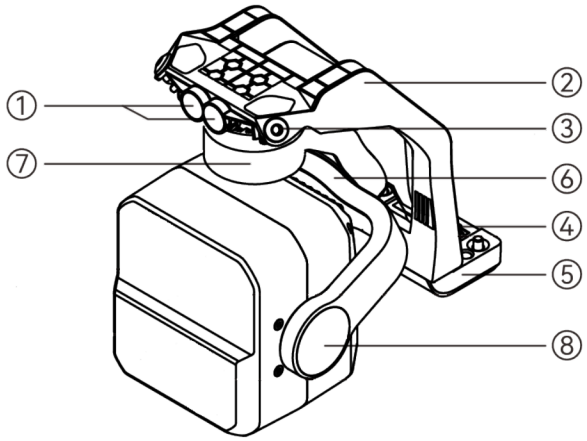

Fig 3-11 Gimbal Structure

Tip

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

Table 3-9 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: -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.

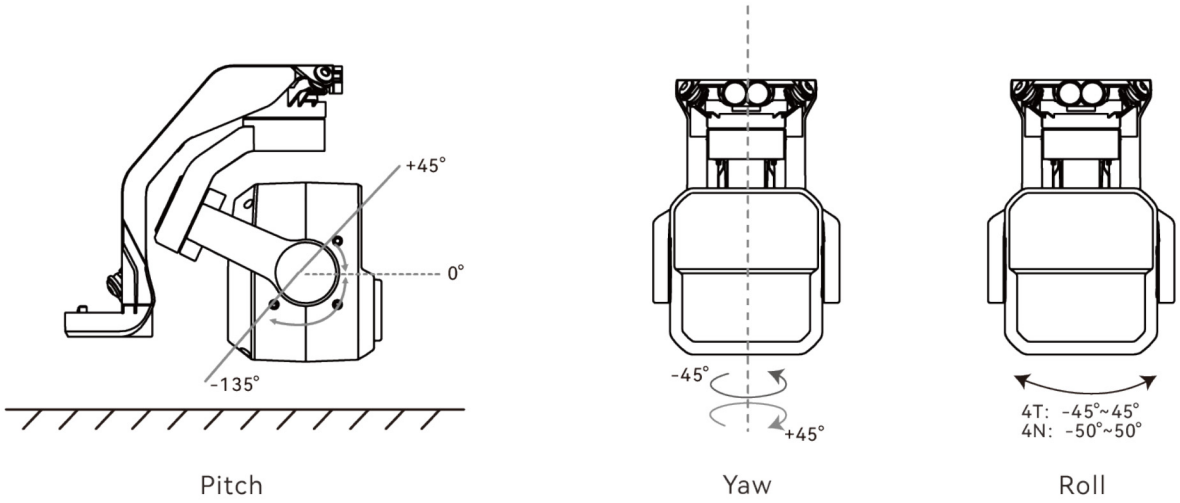

Fig 3-12 Mechanical Rotation Range of the Gimbal of the Aircraft

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 PH0 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.

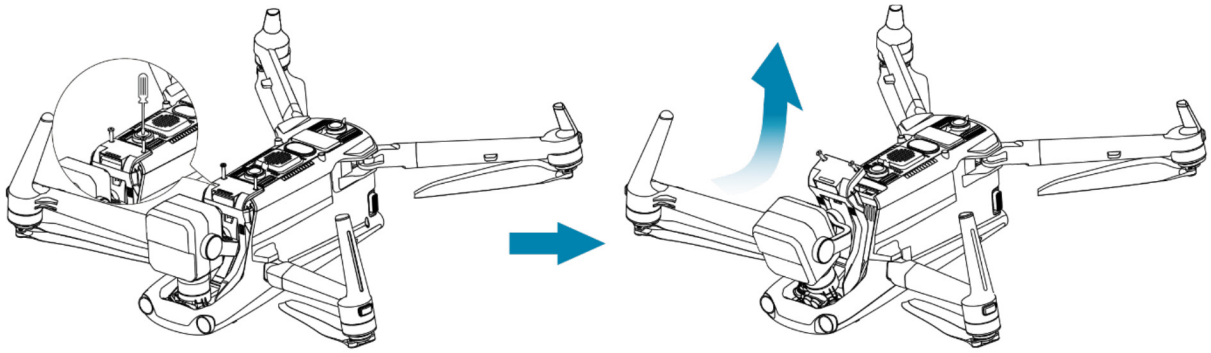

Fig 3-13 Removing the Gimbal

■ 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 PH0 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.

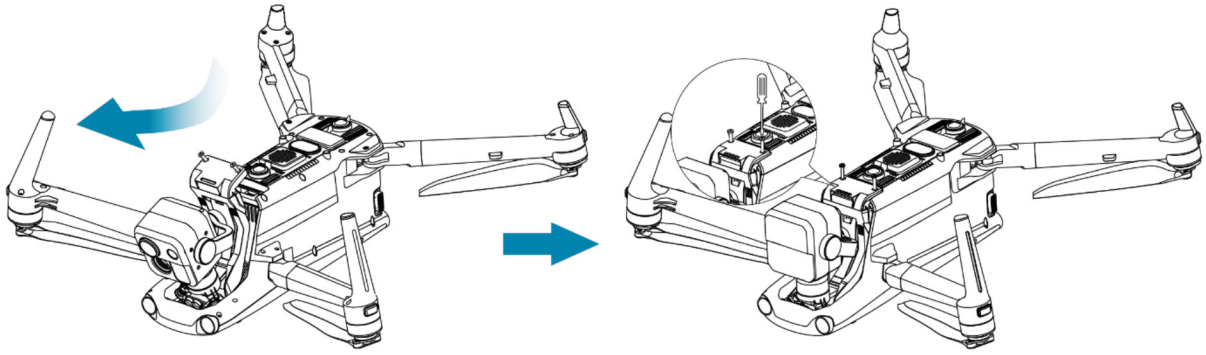

Fig 3-14 Mounting the Gimbal

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 3-10 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 3-11 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 3-12 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.

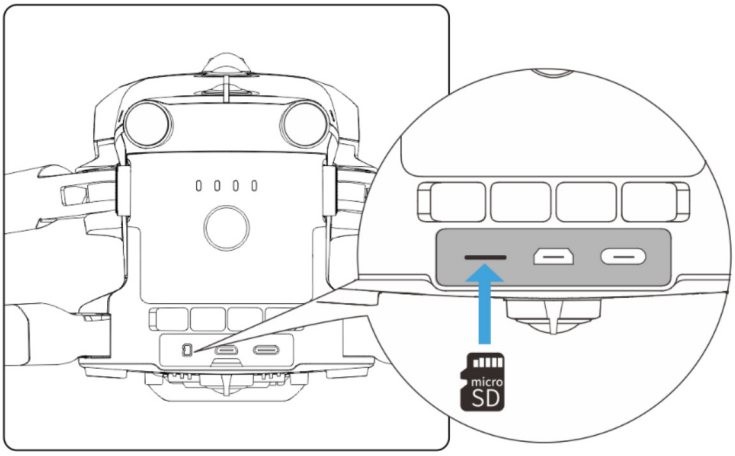

Fig 3-15 Installing the microSD Card

Tip

- The aircraft has built-in 128 GB storage space, with approximately 64 GB available due to storage of system firmware upgrade.
- It is recommended that you prioritize using an external microSD card for storing the image data collected during flight to avoid running out of internal storage space, which will affect the flight safety of the aircraft.
- If you plan to shoot high-definition videos, we recommend using a Class 10, UHS-3, or higher microSD card.

Warning

- To prevent data loss, please turn off the aircraft before removing the microSD card.
- After installing the microSD card, close the rubber protective cover over the interface area promptly to avoid affecting the protective performance of the product.

3.11 Connecting to PC/MAC

To transfer photos and videos to a PC, MAC, or other devices, please use a data cable to connect to the device through the USB-C interface of the aircraft.

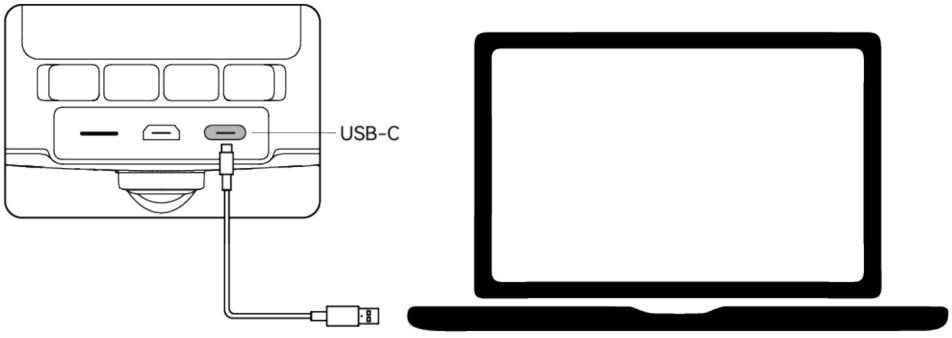

Fig 3-16 Connect to PC/MAC via Aircraft USB-C interface

3.12 Extension Interface

The aircraft has a PSDK extension interface at its top, which uses the USB-C interface standard. The interface allows for additional functional mounts such as the RTK module and speaker and spotlight system.

Important

- Mounts for the aircraft are sold separately. If you need a mount, contact Autel Robotics or third parties that have passed safety and compatibility certification test.
- Do not plug a device that uses other USB-C interface standards into the PSDK extension interface, as it may damage the aircraft.
- Before flight, make sure that the mount is securely connected to the aircraft and the fixing screws on both sides are tightened.
- Pay attention to the battery level of the aircraft during flight. Functional mount consumes the battery power of the aircraft, which will reduce the flight time of the aircraft.
- After removing a mount from the aircraft, be sure to close the rubber protective cover over the interface area. Otherwise, the protective performance of the aircraft will be affected.

Table 3-13 Compatible Mount List

Mount Information	XRT-2301H RTK Module	DU4 Speaker and Spotlight System
Part Number (EAN)	6924991127222	6924991124795
Part Number (UPC)	889520207225	889520204798
Manufacturer	Autel Robotics	JZ Technology
Maximum Mount Dimension	73×49×46 mm	145×117×83 mm
Maximum Mount Weight	28 g	200 g
Functional Compatibility Requirements	Aircraft firmware version: V1.5.0.75 Remote controller version: V1.4.0.55 Flight application version: V1.2.18	Aircraft firmware version: V1.8.2.21 Remote controller version: V1.8.2.21 Flight application version: V2.1.105

Tip

- Before using the above mount in the aircraft, make sure that the aircraft, the remote controller, and the flight application meet the functional compatibility requirements. If you use versions below those specified in the above requirements, the related functions cannot be enabled.