

4.11 Remote Controller Keys

4.11.1 Custom Keys C1 and C2

You can customize the functions of the C1 and C2 custom keys according to your preferences. For detailed setting instructions, see in Chapter 6.

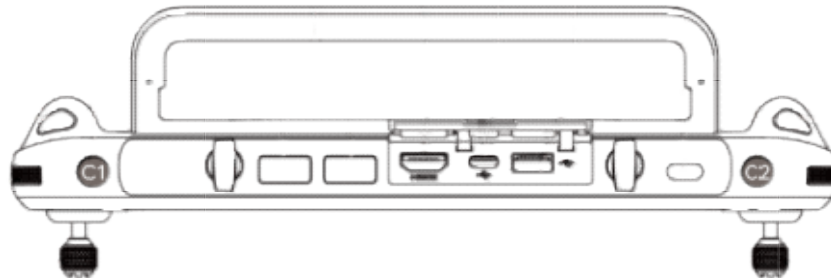


Fig 4-16 Custom Keys C1 and C2

Table 4-16 C1 and C2 Customizable Settings

No.	Function	Description
1	Visual Obstacle Avoidance On/Off	Press to trigger: turn on/off the visual sensing system. When this function is enabled, the aircraft will automatically hover when it detects obstacles in the field of view.
2	Gimbal Pitch Recenter/45°/Down	Press to trigger: switch the gimbal angle. ➤ Gimbal Pitch Recenter: The heading angle of the gimbal returns from the current position to be consistent with the heading of the aircraft nose, and the gimbal pitch angle returns to a 0° direction from the current angle; ➤ Gimbal Pitch 45°: The heading angle of the gimbal returns from the current position to be consistent with the heading of the aircraft nose, and the gimbal pitch angle returns to a 45° direction from the current angle; ➤ Gimbal Pitch Down: The heading angle of the gimbal returns from the current position to be consistent with the heading of the aircraft nose, and the gimbal pitch angle rotates to a 90° direction from the current angle.
3	Map/Image Transmission	Press to trigger: switch the map/image transmission view.
4	Speed Mode	Press to trigger: switch the flight mode of the aircraft. For more information, see “ 3.8.2 Flight Modes ” in Chapter 3.

Warning

- When the speed mode of the aircraft is switched to “Ludicrous”, the visual obstacle avoidance system will be turned off.

4.11.2 Take-off/Return-to-Home Button and Pause Button

Warning

- The auto-return function will only be enabled when the GNSS signal is good.
- If the obstacle avoidance system is disabled during a return flight, the aircraft will not be able to automatically avoid obstacles.
- Before using the auto-return function, you need to set the home point in advance in the Autel Enterprise App. For more information, see in Chapter 6. If the home point is not set, the aircraft will take the take-off point as the home point by default.

To manually activate the auto-return function, press and hold the take-off/return-to-home button "" on the remote controller for 2 seconds until the remote controller emits a "beep" sound. Upon receiving the command, the aircraft will automatically return and land at the preset home point. When the aircraft is in the auto-return state, the remote controller will be disabled. You can short press the pause button "" until the remote controller emits a "beep" sound to pause the auto-return, or long press the pause button "" for 2 seconds until the remote controller emits a "beep" sound to exit the auto-return. After pausing or exiting the auto-return, you can reactivate the remote controller for controlling the aircraft.

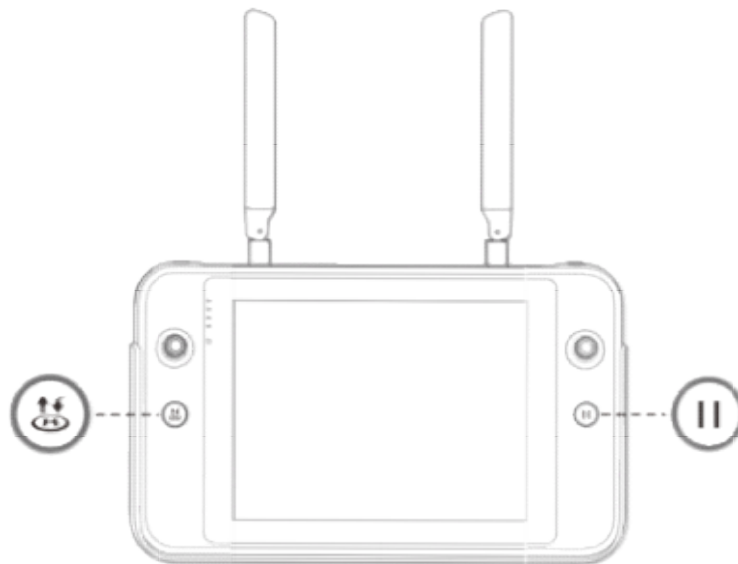


Fig 4-17 Take-off/Return-to-Home Button and Pause Button

Tip

- When the aircraft pauses an auto-return, it will hover in place. To resume the auto-return, press the pause button "" again until the remote controller emits a "beep" sound.

Warning

- If the auto-return home point is not suitable for the aircraft to land (such as uneven ground and crowds), please exit the auto-return before the aircraft reaches the home point, and then manually resume control to land.

4.12 Turning On/Off the Remote Controller Prompt Sound

In some scenarios, the remote controller will send a prompt sound, such as the screen lock sound and power-on sound.

 **Tip**

- You can access the system settings app from the main interface of the remote controller, and then drag the volume slider in "Sound" to adjust the media volume and notification volume separately.

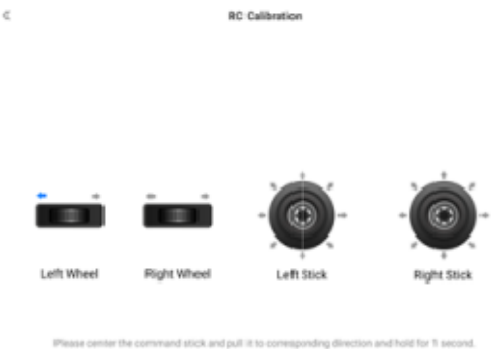
4.13 Calibrating the Remote Controller

If the remote controller is abnormal, it is recommended to calibrate it, as shown below.

Table 4-17 Calibrating the Remote Controller

Step	Operation	Diagram
1	Turn on the remote controller. After entering the main interface of the Autel Enterprise App, click "⚙️" in the upper-right corner, click "⚙️", select "⚙️", and then click "RC Calibration". Follow the on-screen instructions to calibrate the remote controller.	

- 2
- Calibration of the dials and command sticks: According to the calibration guide page of the remote controller, move the left and right dial wheels and the left and right sticks according to the directions shown in the figure and hold for 1 second. At this time, a beep will be heard, and the calibration direction icon will be changed from gray to dark blue, indicating that the orientation calibration was successful. There is no order in which directions are calibrated, until all directions are calibrated, the remote controller calibration is done.



4.14 HDMI Screen Output

The remote controller is equipped with an HDMI interface. The interface allows you to output the real-time screen of the remote controller to supported digital devices such as display screens.

Chapter 5 Smart Battery

5.1 Battery Introduction

The Autel Alpha aircraft comes standard with two MDH_10000_23700 smart batteries (hereafter referred to as smart battery) as the power battery. This battery is a rechargeable lithium-ion polymer (LiPo) battery and features high energy density and capacity. The smart battery can be charged with a DF-CHARGER.

 **Note**

- The battery charger is included as part of the aircraft kit. You do not need to purchase it separately.

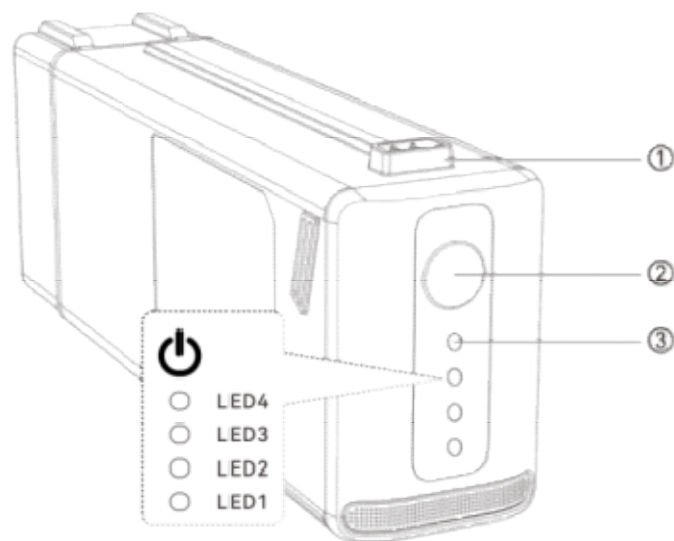


Fig 5-1 Battery Appearance

Table 5-1 Battery Appearance Details

No.	Name	Description
1	Battery Limiting Block	When installing the smart battery into the aircraft, ensure that this side is facing up, insert the battery into the battery compartment until the battery limiting block is locked by the battery unlock lever.
2	Power Button	When battery is powered off, short power the button for 1s to check the battery level.
3	Battery Level Indicator	Used to display the current battery level of the smart battery in normal situations.

5.2 Smart Battery Functions

The smart battery has the following functions:

■ **Battery Level Display**

The smart battery has a built-in battery level indicator, which shows the current battery level of the smart battery.

■ **Self-heating**

This function allows the smart battery to operate normally even in low-temperature environments, ensuring flight safety. For more information, see “5.3.3 Smart Battery Self-heating” in this chapter.

■ **Communication**

The aircraft can obtain real-time battery information, such as voltage, current, battery level, and battery temperature, through the communication interface on the smart battery.

■ **Power Saving Mode**

The smart battery will automatically shut down after 5 seconds of inactivity to reduce power consumption.

■ **Dust and Water Resistance**

When correctly installed in the aircraft, the battery has an IP43 protection rating.

■ **Ultra-low Power Mode**

When the smart battery is idle for 24 hours and the battery level is less than 8%, the battery BMS will enter the ultra-low power mode to reduce self-consumption. When entering ultra-low power mode, it needs to be activated by a charger before it can continue to use normally.

■ **Self-discharge Protection**

If the smart battery is stored in a high-temperature environment or not used for 6 days with a high battery level, the self-discharge protection will be activated. The smart battery will automatically discharge to a battery level of about 60% (by default) and the discharge process takes 2-3 days.



Tip

- Although the battery has no indication of a self-discharge cycle, you may notice that the battery is slightly warm, which is normal.

■ **Sleep Mode Protection**

If the smart battery has a low battery level, it will automatically enter sleep mode to prevent over-discharge. In this mode, the smart battery does not respond when the power button is pressed. To wake up the battery, you can connect it to a battery charger.

■ **Charge Temperature Protection**

The smart battery will stop charging when its temperature is lower than 10°C (50°F) or higher than 45°C (113°F) during charging, as charging the battery under such temperatures will damage the battery.

■ **Overcurrent Protection**

The smart battery will stop charging when the charging current is too high, as charging the battery with a high current can severely damage the battery.

■ **Overcharge Protection**

Charging will stop automatically when the smart battery is fully charged, as overcharging can severely damage the battery.

■ **Balance Protection**

The voltage of each battery cell in the smart battery is automatically kept balanced to protect the battery and maximize the performance of the battery.

■ **Short Circuit Protection**

Once a short circuit is detected, the power supply of the smart battery will be cut off to protect the battery.

■ Hot Swapping Batteries

The smart battery supports hot-swappable function. When the aircraft lands and battery replacement is needed, you can replace one fully charged battery without turning off the aircraft power, wait for 5 seconds, and then replace the other battery.

■ Over-Discharge Protection

When the smart battery is installed on the aircraft and is powered on but not in use, if the battery level becomes too low, the battery will automatically disconnect power output. This feature is disabled during flight.

Warning

- Before using the smart battery, please carefully read and strictly follow the requirements in this Manual, "Battery Safety Operation Guidelines", and "Disclaimer", and those on the battery's surface sticker. The user shall undertake all consequences if he/she fails to follow the usage requirements.

5.3 Smart Battery Usage

- Please use a smart battery within the appropriate temperature range (refer to the operating temperature of the aircraft). Using it in too high or low temperatures will affect the battery's safety and lifespan and may cause spontaneous battery combustion or permanent damage to the battery.
- To ensure flight safety, the aircraft is not allowed to take off when only one single battery is installed. When the two smart batteries' power difference is greater than 12%, the Autel Enterprise App will issue a warning and restrict the aircraft from taking off.
- Do not use the aircraft in a strong electrostatic (such as thunderstorms) or electromagnetic environment. Otherwise, some functions of the smart battery may fail (e.g., abnormal battery output and power failure), resulting in serious aircraft malfunctions.
- Do not use a smart battery that has ever been dropped from the aircraft or subjected to external impacts.
- Do not use a water-soaked smart battery or immerse a smart battery in water or other liquids. Water contact inside the battery may cause corrosion, resulting in spontaneous battery combustion and even an explosion.
- Do not use a smart battery that emits smoke, is bulged, leaks liquids, or has a damaged appearance.
- The liquid inside the smart battery is corrosive. If it leaks, please keep away from it. If it accidentally contacts your skin or eyes, rinse immediately with clean water for at least 15 minutes and seek medical attention.
- Do not disassemble, puncture, strike, crush, or burn a smart battery in any way. Otherwise, it may lead to battery combustion or even explosion.
- Do not short-circuit the positive and negative terminals of a smart battery.
- If the battery connector of a smart battery is dirty, use a dry cloth to clean it. Otherwise, it may cause poor contact, leading to energy loss or charging failure.
- Before replacing the smart battery of the aircraft, make sure that the battery connector, battery compartment interface, battery surface, and battery compartment surface are dry and free of water, and then insert the battery into the aircraft.

5.3.1 Installing/Removing the Smart Battery

■ Install the Smart Battery

1. Turn off the smart battery before installing the battery. Make sure the batteries are oriented correctly with the battery limit block facing the top of the aircraft.
2. Slowly insert two smart batteries into the battery compartment one by one on the aircraft fuselage. If installed properly, the battery unlock lever will lock onto the battery limit block.



Fig 5-2 Install the Smart Battery

Warning

- If the smart battery is not installed properly, it may cause the battery to fall off during the flight, damage the aircraft, or even cause personal injury.

■ Remove the Smart Battery

1. Turn off the smart battery before removing the battery.
2. Move the battery unlock levers on the left and right sides of the aircraft's battery compartments outward until they cannot be rotated. Then, pull out the smart batteries from the left and right battery compartments as shown in the figure.

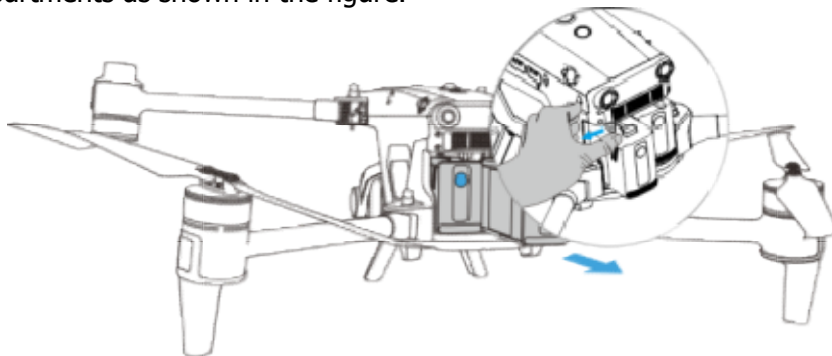


Fig 5-3 Remove the Smart Battery

Important

- When the battery unlock levers cannot be rotated, please do not press them hard to avoid any possible damage to the internal structure of the aircraft.

■ Battery Hot Swap

1. When the aircraft is powered on and the motors are not activated, you can perform a hot swap of the batteries.
2. Move the battery unlock lever on either side of the aircraft's battery compartment, take out the smart battery, and then insert a fully charged battery.

3. After waiting for 5 seconds (when the battery indicator lights up), repeat the above steps to replace the smart battery on the other side.

5.3.2 Checking Battery Level

When the smart battery is off, short press the battery power button for 1 second to check the current battery level through the battery level indicator status.



Fig 5-4 Checking Battery Level

Table 5-2 Battery Level Indicator Status (While Not Charging)

0~12%	13~25%	26~37%	38~50%	51~62%	63~75%	76~87%	88~100%
●: Green light is always on ◐: Green light blinking ○: Off							

Tip

- After the aircraft is connected to the remote controller, you can check the current smart battery level of the aircraft in the top status notification bar or on the "Battery Information" page of the Autel Enterprise App. For more information, see in Chapter 6.

5.3.3 Smart Battery Self-heating

The smart battery has a self-heating function, which can increase the battery temperature in low-temperature environments, helping maintain good output performance.

- When the smart battery is installed in the aircraft and the battery power is turned on, if the battery temperature is lower than 15°C, the battery self-heating function will be activated. After the aircraft takes off, the battery self-heating function will be automatically turned off.
- If the smart battery is not installed in the aircraft, short press the power button for 1 second and then long press the power button for 2 seconds to activate the battery self-heating function to keep the battery temperature between 15°C and 20°C for 10 minutes. At this point, if you want to exit the battery self-heating function, short press the power button for 1 second, and then long press the power button for 2 seconds.
- When the smart battery is connected to the battery charger and the battery power is turned on, if the battery temperature is lower than 10°C(50°F), the charger will supply power to the smart battery for self-heating. Once the battery temperature reaches 15°C, the self-heating function will be turned off.

 **Important**

- When the self-heating function of the smart battery is manually activated, the battery should have at least around 10% of remaining power for self-heating.

When the smart battery is in the states of self-heating and heat preservation, the statuses of the battery level indicators are shown in the following table.

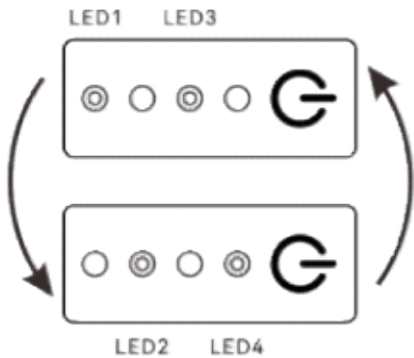


Fig 5-5 Self-heating State



Fig 5-6 Heat Preservation State

Table 5-3 Battery Level Indicator Status

No.	Description
1	LED1, LED3 and LED2, LED4 blink alternately in groups, indicating that it is heating.
2	The 4 LEDs blink at the same time, indicating that it has entered the heat preservation state.

: Green light blinking : Off

Warning

- When the temperature of the smart battery is lower than -10°C or higher than 75°C , the aircraft will not be allowed to take off. It is recommended to wait until the self-heating is over or the battery naturally cools down to an appropriate temperature before operating.
- When the temperature of the smart battery is lower than 10°C , the internal resistance of the battery will increase and the voltage will drop suddenly due to the low temperature, which will reduce the usable capacity of the battery and reduce the operating time of the aircraft. In low-temperature environments, make sure that the battery is fully charged before taking off.
- If the battery level of the smart battery is lower than 50%, it is not recommended to take off. When the battery level is low, it is difficult to activate the battery, which will reduce flight safety.
- During the flight, when the Autel Enterprise App prompts a low battery alarm, it is recommended to immediately return to the home point or land.
- In some low-temperature environments, even if the self-heating function is activated, the battery temperature may still not reach the usable temperature. In such cases, please add insulation measures during the heating process.
- In order to get the best performance from the smart battery, it is recommended to keep the battery temperature between 15°C to 35°C before flying.
- In a low-temperature environment, the self-heating time of the battery may be longer. It is recommended that you keep the battery warm in advance to shorten the self-heating time.

5.3.4 Charging the Smart Battery

Connect the charging interface of the official battery charger to the notch of the metal electrode of the smart battery, and connect the plug to the AC power supply (100-240 V~ 50/60 Hz).

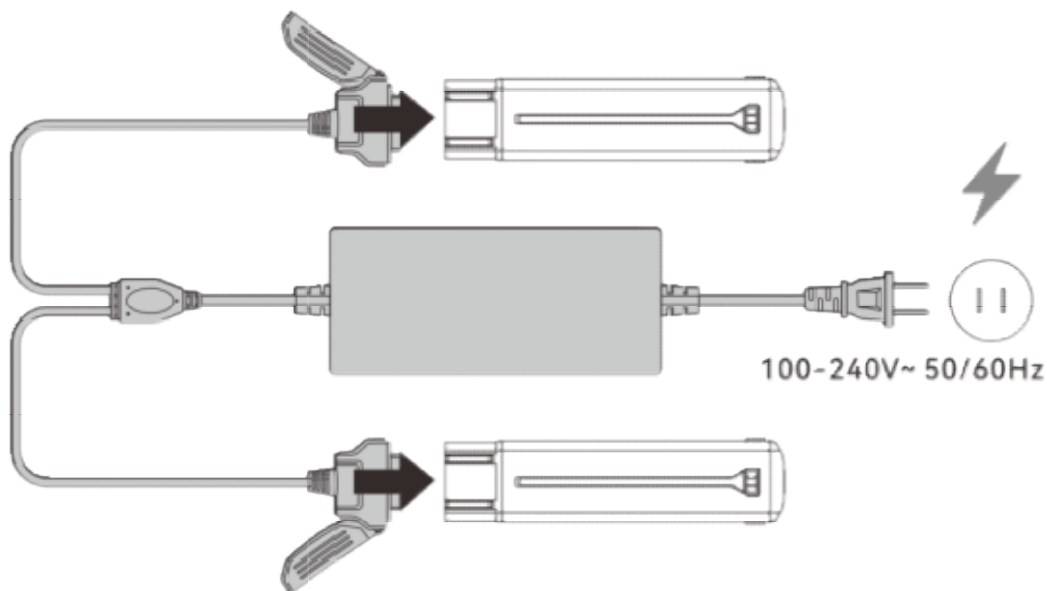
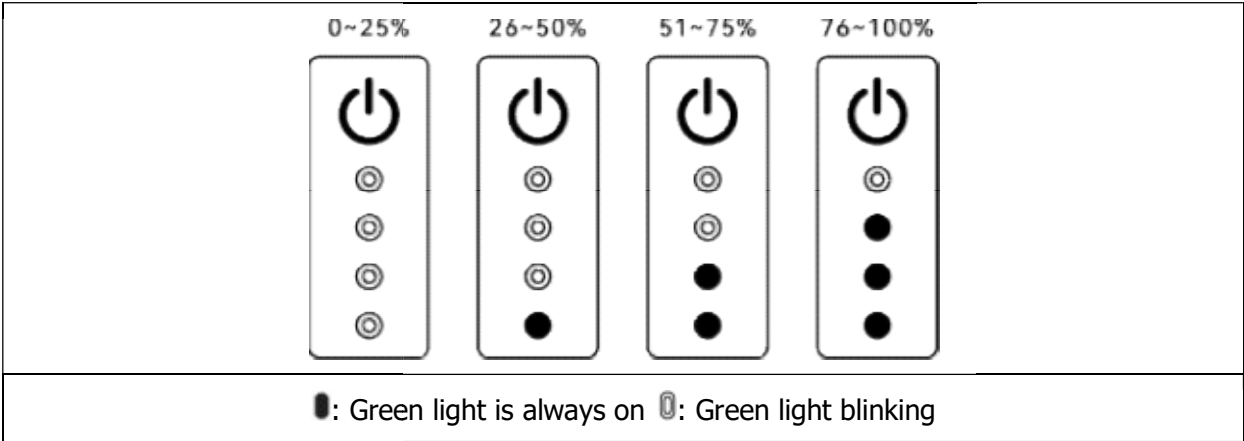


Fig 5-7 Use the Battery Charger to Charge the Smart Battery

Table 5-4 Battery Level Indicator Status (While Charging)



 Warning

- Do not charge a battery that emits smoke, is bulged, leaks liquids, or has a damaged appearance.
- Do not use damaged charging devices to charge the smart battery.
- Modifying the official smart battery or charging device provided by Autel Robotics is prohibited.
- Only use the battery and charging device provided by Autel Robotics. Autel Robotics is not responsible for any consequences, such as battery accidents and flight failure, caused by the use of third-party batteries or charging devices.
- Keep the smart battery away from flammable and explosive items during charging.
- After the smart battery is fully charged, disconnect the connection between the charger and the smart battery and power supply promptly.
- After flight, it is recommended to wait until the smart battery naturally cools down to an appropriate temperature before charging the battery. If the temperature of the smart battery is higher than 45℃, when the battery is connected to the charging device, the battery temperature protection function will be activated, and the battery cannot be charged until its temperature drops below 40℃.

 Note

- It is recommended to fully charge the smart battery of the aircraft before the aircraft takes off.
- Generally, it takes about 90 minutes to fully charge the smart battery of the aircraft, but the charging time is related to the remaining battery level.

Table 5-5 Other Battery Indicator Warning Instructions

LED1	LED2	LED3	LED4	Warning Description
				The temperature is too high for charging.
				The charging current is too high, which causes a short circuit.
				A circuit overcurrent, a circuit overload, or a short circuit occurs during battery discharge.

: Indicator light blinking : Off

5.4 Storing and Transporting the Smart Battery

When storing the smart battery, keep the battery away from water or heat sources and store it in a dry, well-ventilated environment at room temperature.

Ideal storage conditions: The battery level is at around 60%, the ambient temperature is between 22°C to 28°C, and the ambient humidity is 65%±20% RH.

The energy of the MDH_10000_23700 smart battery is 237 Wh (capacity is 10000 mAh). Please refer to local lithium battery transportation policies for battery shipping or carrying.



Tip

- Please be noted that according to airline requirements, lithium batteries over 160Wh cannot be carried on board.



Warning

- Before storing or transporting the smart battery, please turn off the battery.
- Store the smart battery out of the reach of children and pets.
- Store the smart battery away from direct sunlight, water, or reactive chemicals.
- Do not expose the smart battery to open flame, explosives, or other hazards.
- Do not store the smart battery in extreme temperatures. Otherwise, the lifespan of the battery may be shortened and the battery may even become damaged or ineffective. If the battery is not used for more than 1 day, it should be stored below 30°C (at room temperature).
- Do not place the smart battery in a microwave or pressure cooker.
- Do not place the smart battery directly on conductive surfaces (such as metal shells or panels).
- Do not place heavy objects on the smart battery. When subject to an external force, the battery may be damaged or even catch fire or explode.
- Do not store or transport the smart battery with sharp objects, watches, metal necklaces, earrings, or other metal items.
- Do not transport batteries that have a damaged appearance or a battery level of more than 30%.
- If the smart battery is left idle for a long time, please charge it every three months to avoid a shortened battery lifespan resulting from long-term low battery levels.

5.5 Maintaining and Handling the Smart Battery

5.5.1 Maintaining the Smart Battery

In order to maintain the activity of the smart battery of the aircraft, it is recommended to perform battery maintenance if any of the following conditions are met:

- It is recommended to perform battery maintenance for the smart battery every 50 times of battery cycle.
- The idle time of the smart battery reaches 3 months.
- Occasionally, there are situations that affect the lifespan of the smart battery. In this case, you can try maintenance and repair.
- The Autel Enterprise App reminds you when the smart battery needs maintenance.

The following battery maintenance check items are available for the smart battery:

1. Perform a standard charge and discharge operation on the smart battery.
2. Insert the smart battery into the aircraft and turn on the power. Check the battery information through the Autel Enterprise App, whether the voltage difference between the battery cells is less than 0.1 V, and whether the battery firmware is up to date.
3. Check whether the smart battery is bulged, leaked, or damaged.
4. Check the battery connector for dirt, damage, or rust.

5.5.2 Standard Charging and Discharging Process

Use the maintenance charging mode of the original charger, and proceed as follows:

1. Use the battery charger included in the standard aircraft kit to charge the smart battery to 100% and let the battery sit for 1 hour.
2. Insert the smart battery into the aircraft to fly, control the aircraft to land when the remaining battery level is less than 20%, and then take out the battery.
3. Let the smart battery sit for 8 hours.
4. After the above operations are completed, a standard battery charging and discharging operation is completed.

5.5.3 Smart Battery Replacement Standards

- There are obvious bulges, leakage, and damage on the smart battery surface.
- Damage to or irreparable rust on the metal contacts at the power supply interface of the smart battery.
- After the number of cycles of the smart battery reaches 200, it is recommended to replace the battery with a new one.
- After 2 consecutive standard charge and discharge operations, if the abnormal battery still cannot be repaired, it is recommended to replace it with a new one.

5.5.4 Recycling the Smart Battery

- If the smart battery is discarded due to damage, leakage, or other issues that compromise the integrity of the battery shell, it is recommended to completely immerse the battery in an insulated bucket filled with 5% salt water for more than 48 hours until the battery is completely discharged.
- If the smart battery is normally retired, confirm that it is completely discharged, and then properly recycle it according to local lithium battery waste disposal policies to avoid environmental pollution.

Important

- When the smart battery catches fire, please use solid fire extinguishers such as sand or dry powder extinguishers.

Chapter 6 Autel Enterprise App

6.1 Software Introduction

The Autel Enterprise App is a flight control software developed by Autel Robotics for enterprise applications. The software integrates a variety of professional functions to quickly get started and improve efficiency; through a variety of built-in intelligent flight functions, it can realize highly intelligent aircraft operations and empower industry applications. Cooperating with the Autel Enterprise App, the aircraft can be widely used in public safety, inspection, and other industries. Also, it supports multiple mission modes such as waypoint missions, rectangular missions, and polygonal missions.

 **Note**

- More mission modes will be available after subsequent app and firmware updates, and some UI interfaces may differ due to version updates.

6.2 Main Interface

After pairing the remote controller with the aircraft, open the Autel Enterprise App, and you will automatically enter the main interface.

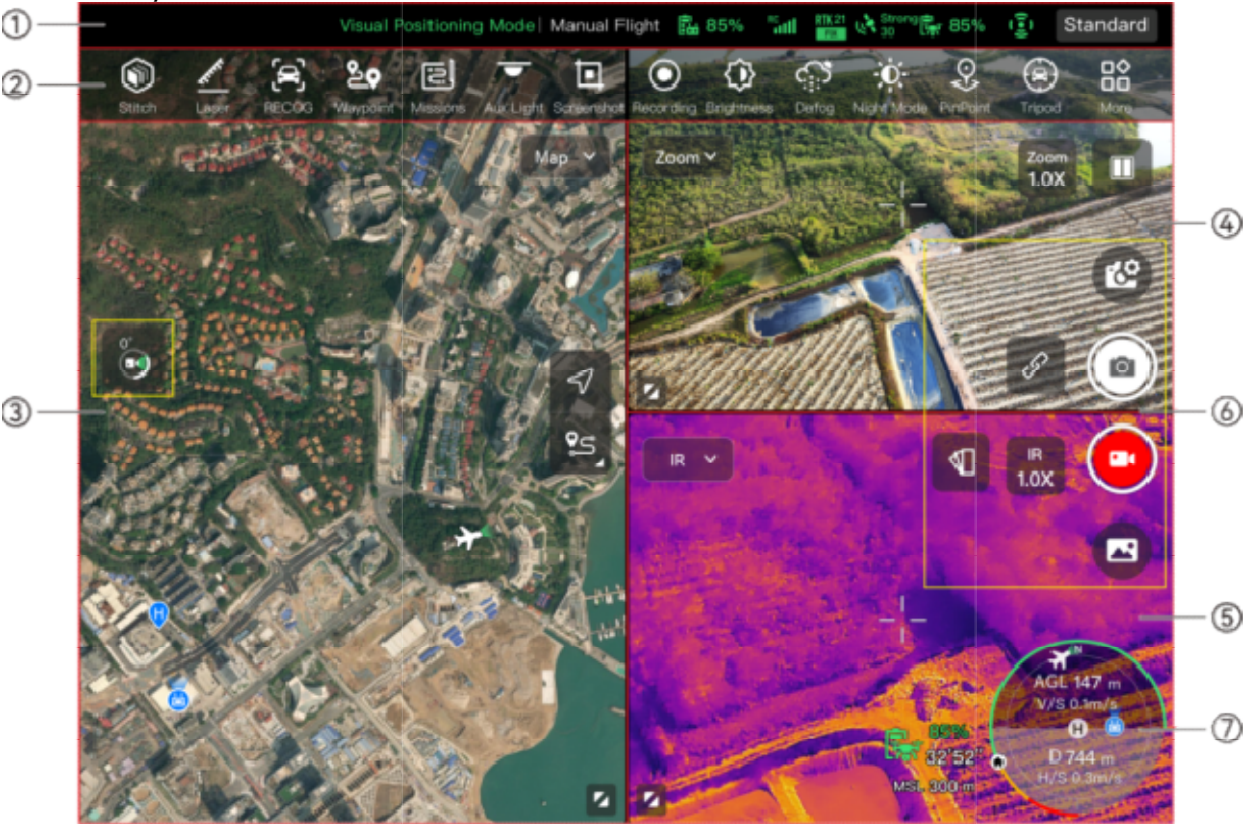


Fig 6-1 Main Interface of the Autel Enterprise App

Table 6-1 Details of the Main Interface of the Autel Enterprise App

No.	name	Description
1	Status Notification Bar	Displays the flight mode, warning information, flight mode, battery level of the remote controller and aircraft, remote controller signal, operating status of the obstacle avoidance system, and other information.
2	Shortcut Toolbar	Offers quick access to certain frequently used functions.
3	"Map" Preview Interface	Offers access to a full-screen map interface. You can freely scroll on the interface to view the map.
4	"Zoom" Preview Interface	Provides access to the full-screen interface of the zoom camera.
5	"Infrared" Preview Interface	Offers access to the full-screen interface of the thermal camera.
6	Camera Function Area	Offers access to the functions related to camera control, settings viewing, and gimbal camera switching.
7	Attitude Ball	Displays real-time flight-related data of the aircraft to assist in flight.

 Tip

- The Autel Enterprise App can automatically identify the gimbal camera model mounted on the aircraft and adjust the display content of the main interface accordingly. When an aircraft with a different gimbal camera model is connected to the remote controller, the display content on the main interface of the Autel Enterprise App may vary.

Table 6-2 Multi-Screen Switching Operations on the Main Interface

No.	Icon	Meaning	Description
1		Dual-Screen Mode	Click this icon to enter the dual-screen mode. The left and right sides of the remote controller screen can display any two of the four preview interfaces, which are "Map", "Wide" "Zoom", and "Infrared".
2		Three-Screen Mode	Click this icon to enter the three-screen mode. The Autel Enterprise App defaults to the three-screen mode. The left side of the remote controller screen displays the "Map" preview interface, the upper-right side displays the "Zoom" preview interface, and the lower-right side displays the "Infrared" preview interface.
3		Maximize Window	Click this icon to adjust a preview interface to the corresponding full-screen interface.

 Tip

- In any camera interface or camera preview interface, you can swipe up anywhere to hide all function icons and swipe down to restore the display of function icons.

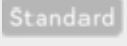
6.3 Status Notification Bar



Fig 6-2 Status Notification Bar of the Autel Enterprise App

Table 6-3 Details of the Status Notification Bar of the Autel Enterprise App

No.	Icon	Meaning	Description
1		Status and Fault Warning	Displays the current warning information of the aircraft: ➤ Gray indicates that the remote controller is not connected to the aircraft. ➤ Orange indicates a medium-level warning. In this case, the aircraft will not be prohibited from taking off but should pay attention to flight safety. ➤ Red indicates a high-level warning. In this case, the aircraft will be prohibited from taking off and can take off only after you solve the fault.
2		Flight Mode	Displays the current flight mode. There are 3 modes: GNSS mode, visual positioning mode, and ATTI mode. For more information, see "3.8.1 Flight Mode" in Chapter 3.
3		Mission Status	Displays the current mission type and mission status of the aircraft.
4		No SD Card	Indicates that there is no microSD card installed in the gimbal currently.
5		Remote Controller Battery	Displays the current battery level of the remote controller.
6		Remote Controller Signal Status	1. Displays the current communication signal status between the remote controller and the aircraft. 2. Click this icon to display the specific signal status: - When the signal is 3-5 grids, the remote controller signal is displayed as strong. - When the signal is 1-2 grids, the remote controller signal is displayed as weak. 3. When the remote controller is not connected to the aircraft, the remote controller signal is displayed in gray color.
7		RTK Signal Status	1. Displays the current RTK signal strength and positioning accuracy level.

8		GNSS Signal Status	1. Displays the current GNSS positioning signal status of the aircraft. 2. Click this icon to display the specific signal status and satellite connection status. 3. If the aircraft receives no GNSS signal, the GNSS signal is displayed in gray color.
9		Aircraft Battery	1. Displays the current battery information of the aircraft. 2. Click this icon to display the battery level, voltage, and temperature of the aircraft battery.
10		Obstacle Avoidance System	Displays the current activation status of the aircraft obstacle avoidance system. ➤ Green indicates that the obstacle avoidance system is activated. ➤ Red indicates that the obstacle avoidance system is deactivated.
11		Speed Mode Display	Displays the current speed mode of the aircraft. Four modes are available, that is, Slow mode, Smooth mode, Standard mode, and Ludicrous mode. For more information about the speed modes, see "3.8.2 Flight Modes" in Chapter 3.

6.4 Shortcut Toolbar

The shortcut toolbar is displayed at the bottom of the system status notification bar of the Autel Enterprise App, which allows you to quickly activate certain functions.

In the shortcut toolbar, you can long press and drag the function icons to customize the sorting. At the same time, you can also click on the "☰" icon to enter "Shortcuts" and then click on the "✎" icon on the right side of "Shortcuts" to add a function icon into or delete a function icon from the shortcut toolbar.

Tip

- You can add a maximum of 14 function icons to the shortcut toolbar.

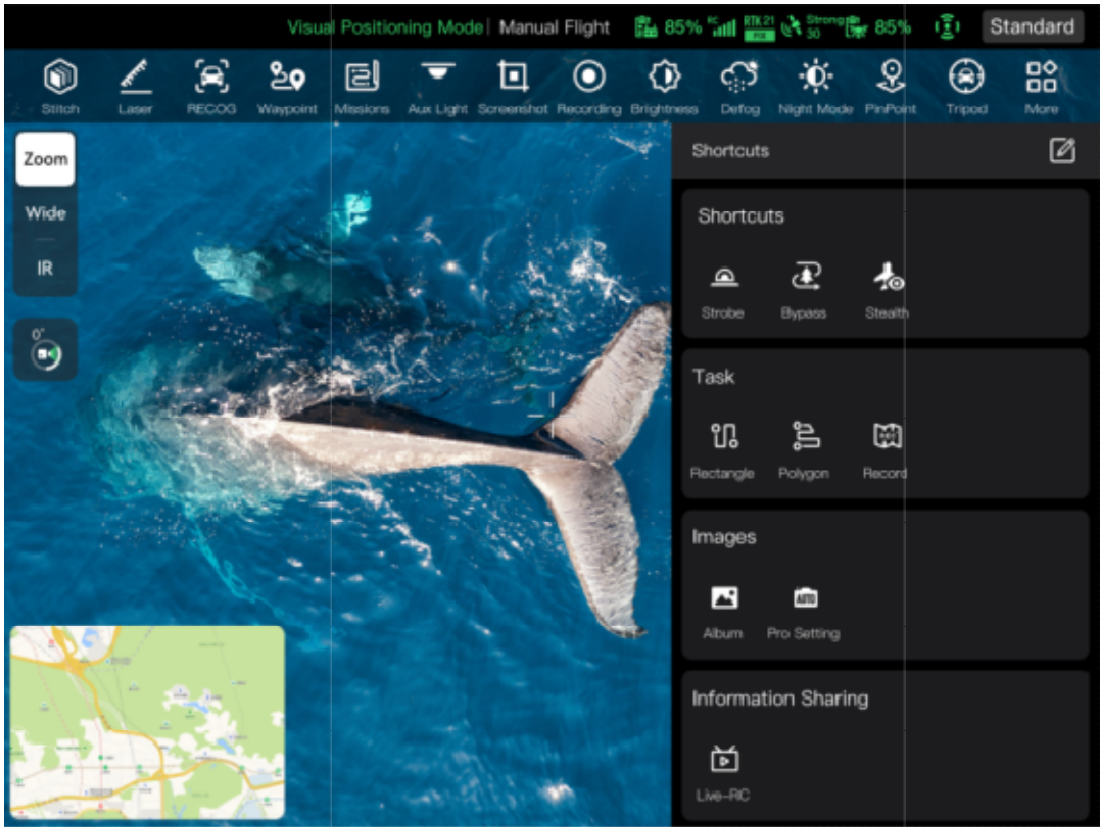


Fig 6-3 Shortcut Toolbar

Table 6-4 Shortcut Toolbar Details

No.	Icon	Name	Description
1		Stitch	Click this icon to configure the remote controller to connect to a server with 2D and 3D mapping software installed, which allows for fast mapping.
2		Laser	Click this icon to automatically measure the distance from the target point at the center of the lens to the aircraft, as well as the target point's altitude and coordinates (longitude and latitude).
3		RECOG	Click this icon to intelligently identify the target object type.
4		Waypoint	Click this icon to enter the "Waypoint" mission editing interface.
5		Missions	Click this icon to enter the "Missions" interface, where you can query, edit, favorite, and delete previously saved historical flight missions.
6		Aux Light	Click this icon to turn on the bottom LED auxiliary light, which can assist in landing and enhance the aircraft's visual sensing capabilities in weak-light environments.

7		Screenshot	Click this icon to capture the current screen in a screenshot.
8		Recording	Click this icon to start recording the current screen.
9		Brightness	Click this icon to move the slider left and right to adjust the brightness of the camera.
10		Defog	Click this icon to make the shooting or recording scene more transparent and enhance color contrast, which is used to eliminate the "fogging phenomenon" in the picture or the lack of picture clarity caused by smog.
11		Night Mode	Click this icon to enter night shooting mode. Even when shooting in a low-light environment, the picture will remain clear.
12		PinPoint	Click this icon to display information such as the latitude, longitude, and altitude of the target point selected on the image transmission interface.
13		Tripod	Click this icon, and the aircraft will automatically lock onto the selected target.
14		More	Click this icon to enter the "Shortcuts", where you can view all shortcut function icons.
15		Edit Shortcuts	Click this icon to add function icons from "Shortcuts" to the "Shortcut Toolbar" or move the function icons in the "Shortcut Toolbar" to "Shortcuts".
16		Strobe	Click this icon to turn on the strobe on the top of the aircraft fuselage.
17		Bypass	Click this icon to quickly set the OA mode of the aircraft to "Bypass".
18		Stealth	Click this icon, and the aircraft will turn off the arm lights, strobes, and auxiliary bottom lights.
19		Rectangle	Click this icon to enter the "Rectangle" mission editing interface.
20		Polygon	Click this icon to enter the "Polygon" mission editing interface.
21		Record	Click this icon to record real-time attitude, motion, and other parameters of the aircraft and gimbal camera during a flight mission, which allows for repeating the operation process for the next mission.

22		Album	Click this icon to view materials from the aircraft's album and the local album and download or delete them.
23		Professional Imagery	Click this icon to make professional settings for the gimbal camera parameters.
24		Live-RC	Click this icon to set live streaming of real-time aerial videos from the aircraft. Two streaming methods, that is, RTMP and GB28181, are supported.
25		Support	Click this icon to enter the "Personal Center" interface.
26		Settings	Click this icon to enter the "Settings" interface.
27		Flight Log	Click this icon to view the flight logs of the aircraft or synchronize them to a third-party platform. To use this function, you need to log in to your Autel account.
28		Encrypt	Click this icon to set a security password for encrypting captured media materials.
29		Log	Click this icon to query the flight logs of the aircraft. To use this function, you need to log in to your Autel account.

6.5 "Settings" Interface

On the main interface of the Autel Enterprise App, click the "☰" icon on the right side of the shortcut toolbar, and then click the "⚙️" icon to enter the "Settings" interface.

In the "Settings" interface, you can set parameters such as flight control, obstacle avoidance, remote controller, image transmission, battery, and gimbal.

6.5.1 Flight Control Parameter Setting

In the sidebar of the "Settings" interface, click the "✈️" icon to enter the "Flight Control Parameter Setting" interface, where you can set the relevant flight control parameters for the aircraft, as shown below.

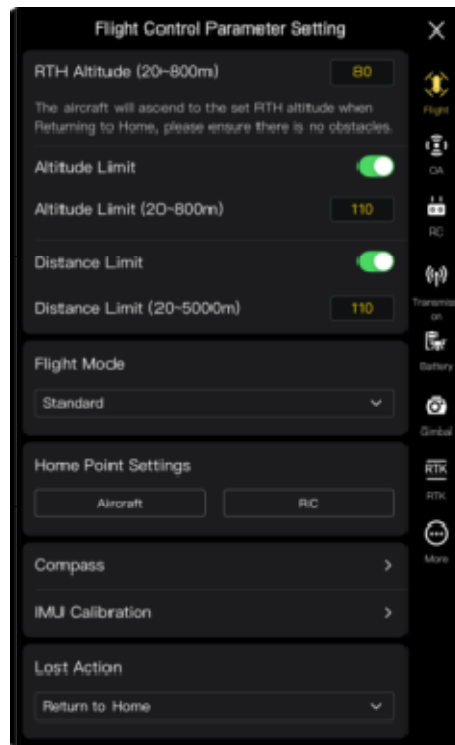


Fig 6-4 "Flight Control Parameter Setting" interface

■ Set RTH Altitude

Click the "RTH Altitude" edit box and enter the value. When executing an auto-return, the aircraft will rise to the RTH altitude before starting the return process.

Warning

- Although the Autel Enterprise App allows you to set a flight altitude within the range of 20-800 meters, this does not mean that the set altitude complies with local laws and regulations.
- The RTH altitude should be set higher than the altitude of obstacles within the flight operation area.
- The RTH altitude setting should comply with local (within the flight operation area) laws and regulations.
- For information about adjusting the RTH altitude of the aircraft, see "0
- [Auto-return Mechanism](#)" in Chapter 2.

■ Turn On/Off Altitude Limit

Click the button on the right side of "Altitude Limit" to turn on or off the altitude limit function.

- If this function is turned on, enter the altitude limit value in the edit box of "Altitude Limit (20-800m)" that pops up below, and the aircraft can rise up to the maximum altitude specified.
- If this function is turned off, the aircraft can keep ascending according to your operation until the battery is exhausted.

Tip

- The altitude limit should not be set lower than the RTH altitude value.
- The altitude limit setting should comply with local (within the flight operation area) laws and regulations. Flying the aircraft in an unsuitable flight altitude may have legal risks. Please comply with the flight safety requirements of relevant areas during flight operations.

■ Turn On/Off Distance Limit

Click the button on the right side of "Distance Limit" to turn on or off the distance limit function.

- If this function is turned on, enter the distance limit value in the edit box of "Distance Limit (20-5000m)" that pops up below, and the aircraft will fly within a circle with the take-off point as the center and the distance limit value as the radius.
- If this function is turned off, the aircraft can keep moving according to your operation until the battery is exhausted.

Tip

- Appropriate altitude limit and distance limit settings can improve flight safety.

■ Set Flight Mode

Click the "Flight Mode" drop-down list, and then select the appropriate mode from Slow, Smooth, Standard, and Ludicrous, that is, set the default speed mode every time you open the Autel Enterprise App. For the meaning of each mode, see "[3.8.2 Flight Modes](#)" in Chapter 3.

■ Set Home Point

Click "Aircraft" or "RC" to set the home point.

- If "Aircraft" is selected, the home point is the position where the aircraft took off this time.
- If "RC" is selected, the home point is the current position of the remote controller.

Note

- If the home point is not set, the aircraft will record the take-off point as the default home point.

■ Calibrate Compass/ IMU

Perform the calibration operation as instructed in the Autel Enterprise App. For more information, see "[2.11 Aircraft Calibration](#)" in Chapter 2.

■ Set Lost Action

Click the drop-down list of "Lost Action" to set the aircraft actions when disconnected.

Lost action refers to the action that the aircraft will perform when the aircraft is disconnected from the remote controller during flight. By default, the lost action is set to "Return to Home".

- If "Return to Home" is selected, when the aircraft disconnects, the aircraft will automatically return to the home point.
- If "Hovering" is selected, when the aircraft disconnects, the aircraft will hover at the current position.
- If "Land" is selected, when the aircraft disconnects, the aircraft will land at the current position.

Tip

- When the aircraft is disconnected from the remote controller, the aircraft will decelerate. If the connection is not restored after 4 seconds, the aircraft will execute the "Lost Action".
- When the aircraft initiates a return to home due to a disconnection, even if the aircraft re-connects to the remote controller, it will continue the return process. In this case, you can short press the "Pause" button on the remote controller to pause the return process or long press the "Pause" button for 2 seconds to exit the return process to regain control of the aircraft.

6.5.2 OA Settings

In the sidebar of the "Settings" interface, click the "📶" icon to enter the "OA Settings" interface, where you can set the OA system, brake distance, warning distance, radar display, obstacle detection notification sound, landing protection, and OA mode of the aircraft, as shown below.

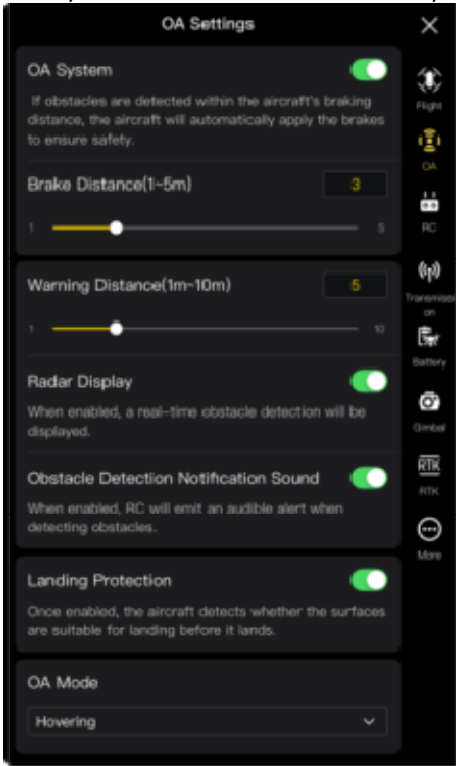


Fig 6-5 "OA Settings" Interface

■ **Turn On/Off OA System**

Click the button to the right of "OA system" to turn on/off the OA system function.

- If this function is turned on, you can set the brake distance. Enter a value in the edit box to the right of "Brake Distance (1-5m)" that pops up below, or adjust the value by moving the slider below left and right. When the aircraft detects an obstacle, it will stop at the brake distance as set.
- If this function is turned off, when the aircraft detects an obstacle, it will not stop.

 Warning

- To ensure flight safety, it is recommended to always turn the OA system on.
- When the flight mode of the aircraft is set to "Ludicrous", the OA system function is unavailable.

■ **Set Warning Distance**

Enter a value in the edit box to the right of "Warning Distance (1m-10m)", or adjust the value by moving the slider below left and right. If the aircraft detects an obstacle, it will send a warning at the warning distance as set.

■ **Turn On/Off Radar Display**

Click the button to the right of "Radar Display" to turn on or off the radar display function.

- If this function is turned on, when the aircraft detects an obstacle, it will provide risk warnings on the camera interface based on the set brake/warning distance.
- If this function is turned off, when the aircraft detects an obstacle, it will not provide risk warnings on the camera interface.

■ **Turn On/Off Obstacle Detection Notification Sound**

Click the button to the right of "Obstacle Detection Notification Sound" to turn on or off the obstacle detection notification sound function.

- If this function is turned on, when the aircraft detects an obstacle, it will emit an audible alert.

■ Turn On/Off Landing Protection

Click the button to the right of "Landing Protection" to turn on or off the landing protection function.

- If this function is turned on, the aircraft will detect whether the ground surfaces are suitable for landing before it lands.

Tip

- After the landing protection function is turned on, if the aircraft detects that the ground surface is not suitable for landing, it will keep hovering over the landing point. In this case, you need to use the command sticks to manually control the aircraft to land at an appropriate location.

■ OA Mode

Select the desired OA mode from the drop-down list of "OA Mode".

After the OA mode is set, the aircraft will perform the corresponding action when detecting obstacles. The default OA mode is "Hovering".

- If "Hovering" is selected, when the aircraft detects an obstacle during flight, it will hover at the current position.
- If "Bypass" is selected, when the aircraft detects an obstacle during flight, it will select an optimal path to bypass the obstacle.

Note

- In the current version, when the OA mode is set to "Bypass", the aircraft will ascend to an altitude that allows it to bypass obstacles. In future versions, the aircraft will have the capability to prioritize bypassing obstacles from the left or right side of the obstacles.

6.5.3 RC Settings

In the sidebar of the "Settings" interface, click the " " icon to enter the "RC Settings" interface, where you can set the stick mode, RC custom buttons, and EXP, and calibrate the remote controller, as shown below.

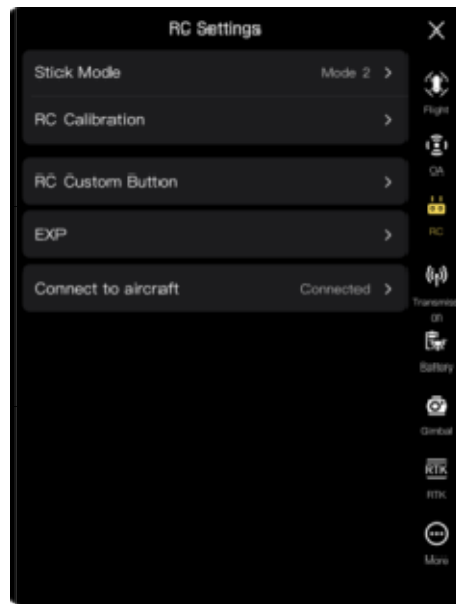


Fig 6-6 "RC Settings" Interface

■ Set Stick Mode

Click "Stick Mode" and select one of the three stick modes, that is, Mode 1, Mode 2, and Mode 3, according to your preferences. For the differences between the three stick modes, see ["4.10.1 Stick Modes"](#) in Chapter 4. The default stick mode is Mode 2.

■ Calibrate the Remote Controller

Perform the calibration operation as instructed in the Autel Enterprise App. For more information, see ["0](#)

[Calibrating the Remote Controller"](#) in Chapter 4.

■ Set RC Custom Button C1/C2

Click "RC Custom Button", and then click the drop-down list of C1 or C2, and select the customized function according to your needs. For more information, see ["4.11.1 Custom Keys C1 and C2"](#) in Chapter 4.

■ Set EXP

After clicking "EXP", drag the coordinate system curves of "Ascend", "Turn Right", and "Forward/Move Right" according to your needs, or input coefficients (in the range of 0.2-0.7) in each edit box.

The X-axis is the physical output of the command stick, and the Y-axis is the logical output of the command stick. That is, the X-axis represents the movement generated by the current command stick move, and the Y-axis represents the actual response strength of the current aircraft.

When the coefficient is 0.2, the slope of the curve increases gradually, which is convenient for fine-tuning; when the coefficient is 0.7, the slope of the curve gradually decreases, and the aircraft responds strongly when the command stick is slightly moved. Click "Reset EXP Parameters" to reset the EXP parameters.

■ Connect to Aircraft

- **Connect to aircraft:** If the remote controller is currently not connected to the aircraft, click "Connect to aircraft", and then double-click the power button of the aircraft according to the pop-up notification to complete the frequency pairing between the remote controller and the aircraft. For more information, see ["4.9 Frequency Pairing With the Remote Controller"](#) in Chapter 4.
- **Cancel:** If the remote controller is currently connected to the aircraft, click "Connect to aircraft", and then click "Cancel" in the pop-up window to disconnect the remote controller from the aircraft.

6.5.4 Image Transmission Settings

In the sidebar of the "Settings" interface, click the "📡" icon to enter the "Image Transmission Settings" interface, where you can set the image transmission mode, transmission frequency band, and split screen effect, as shown below.

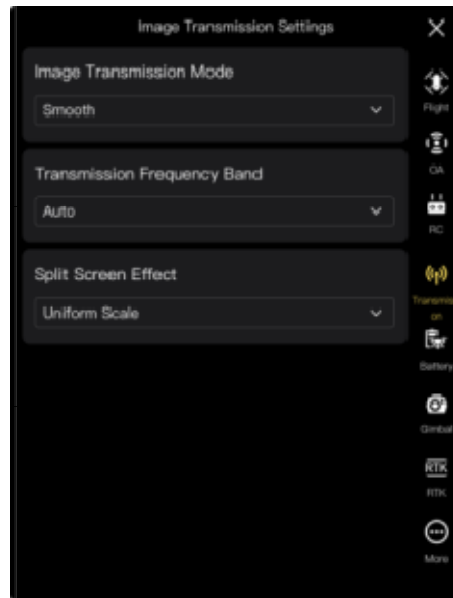


Fig 6-7 "Image Transmission Settings" Interface

■ Set Image Transmission Mode

Click the drop-down list of "Image Transmission Mode" and select "Smooth" or "HD" according to your needs. Once selected, the remote controller will receive and display the image transmission screen at the selected resolution.



Tip

- "Smooth" means 720P and "HD" means 1080P.

■ Set Transmission Frequency Band

Click the drop-down list of "Transmission Frequency Band" and select a transmission frequency band according to your needs.

- Auto: The optimal transmission frequency band is automatically selected for image transmission between the aircraft and the remote controller.
- 2.4G: The 2.4 GHz frequency band is used for image transmission between the aircraft and the remote controller.
- 5.8G: The 5.8 GHz frequency band is used for image transmission between the aircraft and the remote controller.

■ Set Split Screen Effect

Click the drop-down list of "Split Screen Effect", and select "Uniform Scale" or "Fit the Screen" according to your needs.

- Uniform Scale: In dual-screen mode, the image transmission screen is proportionally reduced.
- Fit the screen: In dual-screen mode, the image transmission screen is stretched to cover the screen.

Tip

- The split screen effect settings are only effective when the remote controller is in dual-screen mode.

6.5.5 Aircraft Battery

In the sidebar of the "Settings" interface, click the  icon to enter the "Battery Information" interface, where you can view the basic information of the current aircraft battery (that is, smart battery), set the battery warning threshold, and enable the hot swap battery function, as shown below.



Fig 6-8 "Battery Information" Interface

■ View Basic Information of the Smart Battery

Here, you can view the real-time status of the battery and the estimated flight time of the aircraft with the current battery level. Please refer to the parameters in the following table to view the basic information of the battery, so as to deal with it in time when the battery condition is not good.

Table 6-5 Power Parameter Details

Parameter	Description
Battery Level	If the battery level is higher than or equal to the critically low battery warning threshold and lower than or equal to the low battery warning threshold. In this case, there will be an orange warning. If the battery level is lower than or equal to the critically low battery warning threshold, there will be a red warning.
Temperature	The temperature range is -10°C-75°C. $6^{\circ}\text{C} \leq \text{battery temperature} \leq 74^{\circ}\text{C}$, the temperature is normal. $-10^{\circ}\text{C} \leq \text{battery temperature} \leq 5^{\circ}\text{C}$, the temperature is low, and there will be an orange warning. If the battery temperature is lower than or equal to -10°C, the temperature is too low and there will be a red warning.

If the battery temperature is $\geq 75^{\circ}\text{C}$, the temperature is high and there will be a red warning.

If the battery temperature is $\geq 95^{\circ}\text{C}$, the temperature is too high and there will be a red warning.

Voltage	Normal voltage range: 18.5-26.7V. When it exceeds the normal range, there will be a red warning.
Discharge Times	The normal range of the number of discharges is 0-200 times. When it exceeds the normal range, there will be a red warning.

■ Set Battery Warning Threshold

Move the slider left or right to set warning thresholds for low battery and critically low battery.

- Critically Low Battery Warning: Red status. The adjustable range is from 8% to 25%.
- Low Battery Warning: Orange status. The adjustable range is from 15% to 50%. The low battery warning threshold should be at least 5% higher than the critically low battery warning threshold.

6.5.6 Gimbal Settings

In the sidebar of the "Settings" interface, click the "📷" icon to enter the "Gimbal Settings" interface, where you can set the gimbal pitch sensitivity and extended pitch angle, or calibrate and adjust the gimbal, as shown below.

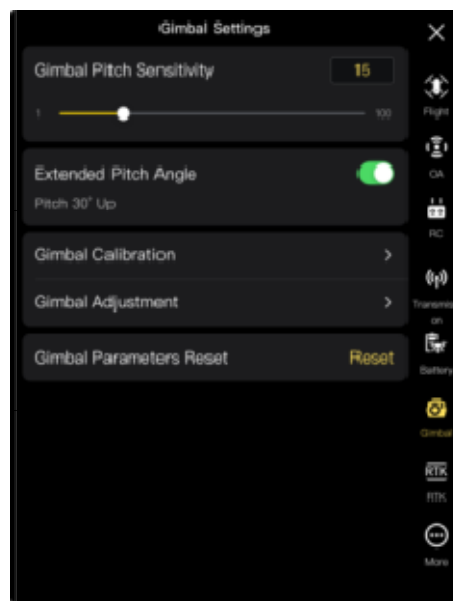


Fig 6-9 "Gimbal Settings" Interface

■ Set Gimbal Pitch Sensitivity

Enter a value in the edit box to the right of "Gimbal Pitch Sensitivity", or move the slider left or right to adjust the value, so as to set the number of degrees the gimbal rotates on the pitch axis per second (unit: $^{\circ}/\text{second}$).

■ Turn On/Off Extended Pitch Angle

Click the button to the right of "Extended Pitch Angle" to turn on the upward gimbal rotation function.

- If this function is turned on, the gimbal can rotate up to 30 degrees above the level baseline.
- If this function is turned off, the gimbal can only maintain a level or downward rotation and cannot rotate upwards to switch to a pitch view.

■ Gimbal Calibration

When there is an abnormality in the gimbal, click "Gimbal Calibration", and then click the "Start calibration" button, and the gimbal will automatically start calibrating. For more information, see ["0](#)

**Tip**

- If the calibration fails, the rear arm light of the aircraft will turn red and is always on, and the above steps should be repeated at this time.

Gimbal Calibration" in Chapter 2.

■ Gimbal Adjustment

When the position of the gimbal tilts, click "Gimbal Adjustment" and click the buttons under the functions of "Roll", "Yaw", and "Pitch" to adjust the gimbal, so that the horizontal and vertical axes on the screen remain aligned to the reference objects on the three-screen image transmission screen.

■ Gimbal Parameters Reset

Click the "Gimbal Parameters Reset" button, and then click the "Confirm" button to reset the gimbal parameters.

6.5.7 RTK Settings

On the "Settings" page, click the "RTK" icon in the sidebar to access the "RTK Settings". Users can enable the RTK positioning function, check the RTK connection status, and configure the reception mode for RTK signals.

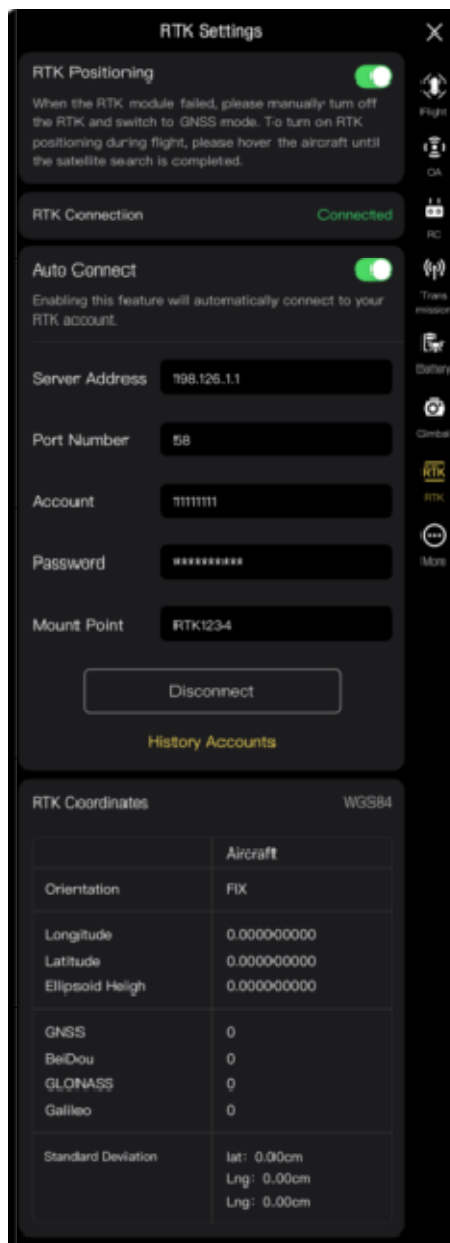


Fig 6-10 RTK Settings

■ Enable/Disable RTK Positioning

To enable or disable RTK positioning, click the button on the right side of "RTK Positioning".

Warning

- In case of RTK module issues, please manually disable RTK positioning and switch back to GNSS mode.
- When activating RTK positioning during flight, please hover the aircraft and wait for satellite searching.

■ Check RTK Connection

To check the RTK network status, enable RTK positioning, enter the RTK account, and click "Log In Account" to establish the RTK network connection.

- If the connection is successful, it will display "Connection Successful."

- If there is an issue, it will display "Connection Failed" along with a reason for the failure.

■ RTK Receive Signal Setting

For setting the RTK signal reception, enter the network RTK server address, port number, account, and mount point in the RTK service configuration section.

- Click "Log In Account" to log in to the network RTK service. If there's an issue with the configuration, will provide relevant prompts.
- Click "Historical Accounts" to view previously configured RTK accounts. The aircraft supports saving multiple network RTK accounts.
- Click the button on the right side of "Auto Connect" to enable or disable automatic login RTK

■ Check RTK Coordinates

To view the RTK coordinate system, after establishing the RTK network connection, check the coordinate system type, RTK orientation mode, latitude, longitude, altitude, satellite quantity, and standard deviation.

6.5.8 More

In the sidebar of the "Settings" interface, click the "More" icon to enter the "More" interface, where you can configure unit settings, light settings, safety, target recognition settings, and the language settings of the Autel Enterprise App for the aircraft and manually check for updates to the App or firmware.

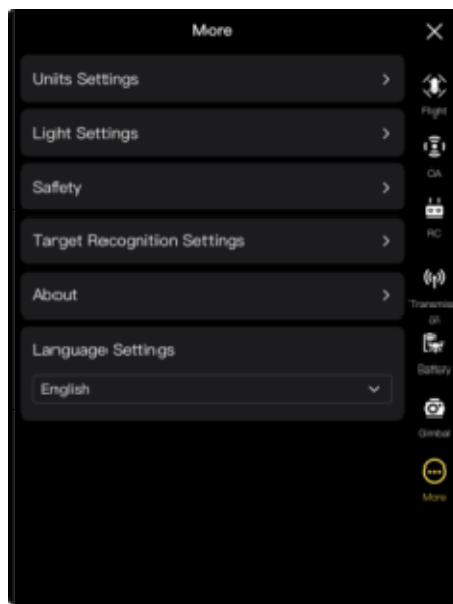


Fig 6-11 "More" interface

■ Unit Settings

Click "Units Settings", and then set "Speed/Distance Units", "Area Units", "Temperature Units", and "Coordinate Format" according to your needs. After the setting, the Autel Enterprise App will display relevant parameters in the specified units.

■ Light Settings

Click "Light Settings", and then set "Stealth", "Strobe", and "Aux Light" according to your needs.

● Turn On/Off Stealth Mode

Click the button to the right of "Stealth" to turn on or off stealth mode.

- If stealth mode is turned on, the arm lights, strobe, and auxiliary bottom light will be turned off by default.
- If stealth mode is turned off, you can configure the strobe and auxiliary bottom light.

 Warning

- Turning off the arm lights and strobe may violate local laws and regulations. Only turn on stealth mode when necessary.

- Turn On/Off Strobe

Click the button to the right of "Strobe" to turn on or off the strobe on the top of the fuselage.

 Warning

- When flying at night, please turn on the strobe to ensure flight safety.
- Do not look directly at the strobe while they are on to avoid vision damage caused by strong light.

- Set Aux Light

Click the drop-down list of "Aux Light" and then select "Auto", "On", or "Off" according to your needs.

- If "Auto" is selected, the auxiliary bottom light is automatically turned on or off according to ambient brightness.
- If "On" is selected, the auxiliary bottom light is always on by default.
- If "Off" is selected, the auxiliary bottom light is off by default.

 Tip

- The auxiliary bottom light is mainly used to enhance the ambient brightness of the landing point during the landing of the aircraft, improve the sensing performance of the downward visual sensing system, and ensure landing safety.

■ Turn On/Off Visual Positioning

Click "Safety", and then click the button to the right of "Visual Positioning" to turn on or off the visual positioning function.

- If the visual positioning function is turned on, the aircraft will hover in a place with a poor GNSS signal.

 Tip

- Turning on visual positioning is a must to enter visual positioning mode. For more information, see "[3.8.1 Flight Mode](#)" in Chapter 3.

■ Turn On/Off GNSS

Click "Safety", and then click the button to the right of "GNSS" to turn on or off the GNSS positioning function.

- If "Auto" is selected, the aircraft will automatically select the best GNSS positioning signal.
- If "Beidou" is selected, the aircraft will only receive GNSS positioning signals from the BeiDou Navigation Satellite System.

 Warning

- For non-specialized operations, it is recommended to always turn on GNSS positioning. GNSS positioning can enhance the flight safety of the aircraft.
- When GNSS positioning is turned on and the aircraft are flying in an environment with good

lighting and rich texture, the aircraft will enter the visual positioning mode.

- When GNSS positioning is turned off and the aircraft are flying in an environment with poor lighting or insufficient texture, the aircraft will enter the ATTI mode. In this mode, the aircraft has high safety risks and is prone to flight accidents.
- If you choose to turn off the GNSS positioning function and this leads to flight accidents or aircraft damage, Autel Robotics will not provide warranty services. Instead, you should be responsible for any related accidents on your own.
- The "Beidou" navigation mode is a specific function for China. In other regions, "Auto" is selected by default to automatically select the GNSS positioning signal. After switching the navigation mode, you must restart the aircraft for the changes to take effect.
- After the GNSS positioning function is turned off, the aircraft cannot turn on the auto-return function.

■ Turn On/Off Submit Flight Data to CAAC

Click "Safety", and then click the button to the right of "Submit Flight Data to CAAC" to turn on or off the function of submitting flight data to CAAC.

! Important

- It is recommended to turn on the function of submitting flight data to CAAC. According to Chinese laws and regulations, flight data must be submitted in real time to the official system of the Civil Aviation Administration of China (CAAC) via the internet.
- When the network is poor, the relevant flight data will be cached on your local device, and the Autel Enterprise App will not store or forward the data to other services.

■ Enter Registration No.

Click "Safety" and then click "Registration No." to enter the real-name registration number of the aircraft.

! Important

- According to Chinese laws and regulations, real-name registration is required for aircraft. For more information, see "[2.1 Legal Use Notice](#)" in Chapter 2.

■ Remote ID

Click "Safety" and then click "Remote ID". After entering the Remote ID, you can broadcast relevant information about the aircraft for identification by nearby devices.

! Important

- According to local laws and regulations, perform real-name registration for aircraft. For more information, see "[2.1 Legal Use Notice](#)" in Chapter 2.

■ Emergency Stop Propellers During Flight

Click "Safety" and then click the drop-down list of "Emergency Stop Propellers During Flight" to make relevant settings according to your needs.

- If "Off" is selected, the "Emergency Stop Propellers During Flight" function will be disabled.
- If "On" is selected, you can stop the propellers of the aircraft from spinning at any time during flight by simultaneously pushing the two command sticks inward or outward.

- If "Only in case of failure" is selected, you can stop the propellers of the aircraft from spinning by simultaneously pushing the two command sticks inward or outward only in the case of aircraft malfunctions.

! Important

- Please use the "Emergency Stop Propellers During Flight" function with caution. Once the propellers stop, the aircraft will fall freely without control.
- This function is only used to reduce additional harm or damage caused by aircraft malfunctions. Please stay away from crowds or buildings when using this function.
- After the "Emergency Stop Propellers During Flight" function is enabled, please stop using the aircraft and contact Autel Robotics to inspect the power system of the aircraft.

■ View Version Information

Click "About", and you can view the firmware version and the serial number of the aircraft, remote controller, gimbal, and battery, as well as the version of the Autel Enterprise App, and check for versions and perform updates for the App and firmware.

■ Language Settings

Click the drop-down list of "Language Settings" and choose one from Simplified Chinese, English, Traditional Chinese, Japanese, and Spanish. After you confirm the selection, the Autel Enterprise App will automatically restart and display in the chosen language.

6.6 Attitude Ball

The attitude ball is mainly used to dynamically display the relative positions of the aircraft, remote controller, and home point, and display the relevant attitude, flight speed, battery level, operating time, and other flight safety data of the aircraft. Any changes in the aircraft's status will be reflected in the attitude ball.

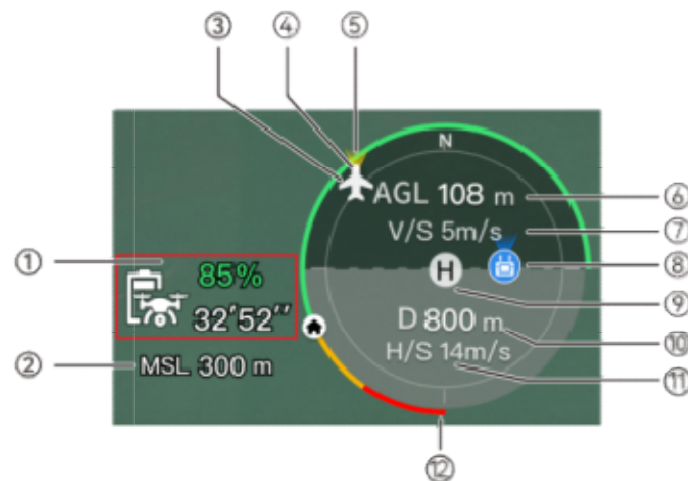


Fig 6-12 Attitude Ball

Table 6-6 Attitude Ball Details

No.	Description	Description
1	Estimated Remaining Flight Time of the Aircraft	Displays the current remaining battery level and estimated remaining flight time of the aircraft.

2	MSL Altitude	Refers to the current altitude of the aircraft relative to the mean sea level (MSL).
3	Aircraft Position	Displays the current position of the aircraft, which can help you observe the approximate position between the aircraft and the remote controller.
4	Aircraft Heading	Displays the current nose orientation of the aircraft. If the aircraft is no longer visible in the line of sight, the aircraft can be controlled to return to the home point based on the position and heading of the aircraft.
5	Gimbal Direction	Displays the current gimbal orientation of the aircraft.
6	Vertical Altitude	Refers to the current vertical altitude of the aircraft relative to the take-off point.
7	Vertical Speed	Refers to the current vertical flight speed of the aircraft.
8	Remote Controller Location	Displays the current position of the remote controller, which can help you observe the approximate position between the aircraft and the remote controller.
9	Home Point	Refers to the set home point of the aircraft.
10	Horizontal Distance	Refers to the current horizontal distance from the aircraft to the take-off point.
11	Horizontal Speed	Refers to the current horizontal flight speed of the aircraft.
12	Aircraft Battery	Displays the real-time remaining battery level of the aircraft in the dynamic circular battery bar.

6.7 "Map" Interface

On the main interface of the Autel Enterprise App, click the " " icon in the corner of the "Map" preview interface, or click the "Map" mini window in the lower-left corner after entering the "Zoom Camera" interface, "Thermal Camera" interface, or "Wide Angle Camera" interface, to enter the "Map" full-screen interface.



Fig 6-13 "Map" Interface

Table 6-7 Interface Button Details

No.	Icon	Name	Description
1		Search Map	When the remote controller is connected to the Internet, click this icon and enter the desired location name in the "Search Map" edit box. Based on the selected location, the map interface will switch to display the map of the corresponding location.
2		Map Type	Click this icon to adjust the map display style to a standard map or a hybrid map and set "Display/Clear Flight Path". ➤ Standard: 2D map. ➤ Hybrid: 2D map and satellite map combined.
3		Orientation Lock	This icon indicates that the display direction of the map is locked. When the remote controller is rotated, the display direction of the map will not change accordingly. Click this icon to unlock the display direction of the map of the current remote controller.
4		Orientation Unlock	This icon indicates that the display direction of the map is unlocked. When the remote controller is rotated, the display direction of the map will change accordingly. Click this icon to lock the display direction of the map of the

current remote controller.

5		Overview	Click this icon to simultaneously locate the positions of the remote controller, the home point, and the aircraft on the map.
6		Remote Controller Location	Click this icon to locate the position of the remote controller on the map.
7		Home Point Location	Click this icon to locate the position of the home point on the map.
8		Aircraft Position	Click this icon to locate the position of the aircraft on the map.
9		Re-center	If the map is moved from the current positioning point to another location, this icon will appear on the right side of the screen. Click this icon, and the map will quickly return to the current positioning point.
10		Aircraft Search	When the aircraft is lost, you can click this icon to query the location information of the lost aircraft.

6.8 Camera Interfaces

6.8.1 Camera Function Area

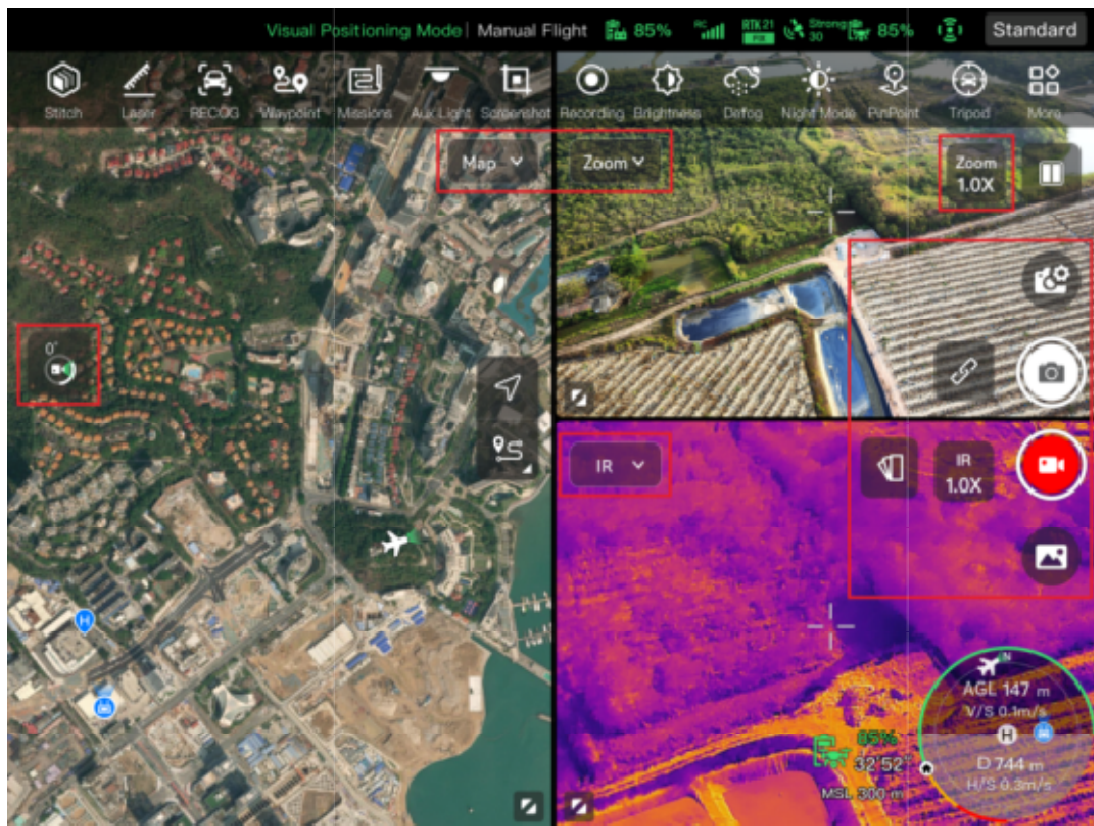


Fig 6-14 Camera Function Area

Table 6-8 Camera Menu Details

No.	Icon	Meaning	Description
1	Zoom	Switch to Zoom Camera	On any camera interface, click this icon to enter the zoom camera interface.
2	IR	Switch to Thermal Camera	On any camera interface, click this icon to enter the thermal camera interface.
3	Wide	Switch to Wide Angle Camera	On any camera interface, click this icon to enter the wide angle camera interface.
4		Camera Settings	Click this icon to view and set parameters related to the gimbal camera.
5		Photo	Click this icon to take a photo.
6		Video	Click this icon to start recording.

7		Album	Click this icon to view materials from the aircraft's album and the local album and download or delete them.
8		Zoom Camera Zoom	On the "Zoom Camera" interface, click this dynamic icon to adjust the zoom factor of the zoom camera.
9		Thermal Camera Zoom	On the "Thermal Camera" interface, click this dynamic icon to adjust the zoom factor of the infrared thermal imaging camera.
10		Wide Angle Camera Zoom	On the "Wide Angle Camera" interface, click this dynamic icon to adjust the zoom factor of the wide angle camera.
11		Linked Zoom	Click this icon to adjust the zoom factor of zoom and thermal camera simultaneously, resulting in the synchronous enlargement or reduction of camera images. The zoom camera will be adjusted to 1.8x automatically, the thermal camera will be adjusted to 1.2x.
12		Gimbal 0°	Click this icon, and the gimbal returns to the horizontal centering state.
13		Gimbal 45°	Click this icon, and the gimbal rotates obliquely downward, forming an angle of 45° with the horizontal direction.
14		Gimbal 90°	Click this icon, and the gimbal rotates directly downward, forming an angle of 90° with the horizontal direction.

On any camera interface, click the "" icon to enter the "Camera Settings" interface. On the "Camera Settings" interface, you can perform the following operations:

■ View Photo Properties

On the "Camera Settings" interface, click the "" icon to view the size and format of (zoom/wide angle) photos.

■ Set Video Properties

On the "Camera Settings" interface, click the "" icon to view the resolution, frame rate, and format of (zoom/wide angle) videos and set video encoding.

➤ Video encoding options are H.264 and H.265. The default option is H.264.

■ Set Infrared Shooting

On the "Camera Settings" interface, click the "IR" icon to view the size and format of infrared photos or videos and set the image mode and radiometric measurement function.

● Set Image Mode

Two image modes are available, that is, "Manual" and "Auto".

➤ If the "Manual" mode is set, you can adjust the "Contrast" and "Brightness" by entering a value or clicking the numbers on the left and right sides.

● Turn On/Off Radiometric Measurement

Click the button to the right of "Radiometric Measurement" to turn on or off the radiometric measurement function.

- If this function is turned on, you can set the image enhancement, isotherm, emissivity, and temperature alarm.
- If this function is turned off, both "Radiometric Measurement Mode" and "FFC " cannot be set.

1. Turn On/Off Image Enhancement

Click the button to the right of "Image Enhancement" to turn on or off the image enhancement function.

- If this function is turned on, you can enter a value in the edit box below or drag the slider left or right to set the image enhancement value. The larger the value, the clearer the image details.

2. Set Isotherm

Four isotherm statuses are available, that is, "Off", "Human", "Fire", and "Custom".

- If "Custom" is selected, you can set the minimum and maximum temperature of the radiometric measurement range.

3. Set Emissivity

Enter a value in the edit box to the right of "Emissivity" or drag the slider below left or right to adjust the emissivity value.

4. Turn On/Off Temperature Alarm

Click the button to the right of "Temperature Alarm" to turn on or off the temperature alarm function.

- You can set the minimum and maximum temperature for temperature alarms.

■ Advanced Settings

On the "Camera Settings" interface, click the "⚙" icon to perform advanced settings for the camera:

- Select Camera

Click "Select Camera" to select the lens used for shooting from the list of lenses of the gimbal camera. You can select one or more lenses.

- After a shooting lens is selected, when you click the "📷" or "📹" icon, the selected lens will simultaneously take photos or record videos. For unselected lenses, the shooting function will be unavailable.

- Set Grid

Three grid styles are available, which can assist with picture composition during shooting. You can select one or more grid styles.

- When multiple grid styles are selected, the grid styles will be superimposed and displayed on all camera interfaces.

- Set Defog

Defogging can make the shooting or recording scene more transparent and enhance color contrast and is used to eliminate the "fogging phenomenon" in the picture or the lack of picture clarity caused by smog.

- Three defog intensities are available, that is, "Weak", "Medium", and "Strong". The stronger the defog intensity, the darker the image.

- Turn On/Off Stamps/Subtitles

Click the button to the right of "Stamps/Subtitles" to turn on or off the stamps/subtitles function.

- If this function is turned on, you can set the time stamp, latitude & longitude and altitude, and aircraft SN functions. Once this function is enabled, the shot images will include the set stamp.

- Turn On/Off Arm Lights (When Shooting)

Click the button to the right of "Turn off arm lights when shooting" to turn on or off this function.

- If this function is turned on, the arm lights will be turned off when shooting.
- If this function is turned off, the arm lights will be turned on when shooting.

- Turn On/Off Pre-recording

Click the button to the right of "Pre-recording" to turn on or off this function.

- If this function is turned on, the aircraft will start recording 15 seconds in advance (click the "📹" icon).

Tip

- The pre-recording function can prevent missing important shots when the aircraft is flying rapidly.

- Turn On/Off Histogram

Click the button to the right of "Histogram" to turn on or off the histogram function. The histogram can display the distribution of pixels in the images captured by the camera, thereby reflecting the exposure of the images.

- If the histogram function is turned on, a floating "Histogram" window will be generated on the screen of the remote controller, and you can drag the "Histogram" window to any area on the screen. Click the "Close" button in the upper-right corner of the window to turn off the histogram function.

- Set Storage Location

You can choose "SD Card" or "Internal Storage" as the storage location. Also, you can view the storage status of "SD Card" and "Internal Storage" and click "Format" on the right side to format the corresponding storage location.

- Reset Camera Parameters

Click the "Reset" button to the right of "Camera Reset" to restore the camera parameters to default settings.

- View Camera Model

You view the gimbal camera model.

6.8.2 "Zoom Camera" Interface

On the main interface of the Autel Enterprise App, click the "🔍" icon in the corner of the "Wide Camera" preview interface, or click the "Zoom" icon after entering the "Thermal Camera" interface or "Wide Angle Camera" interface, to enter the "Zoom Camera" full-screen interface.

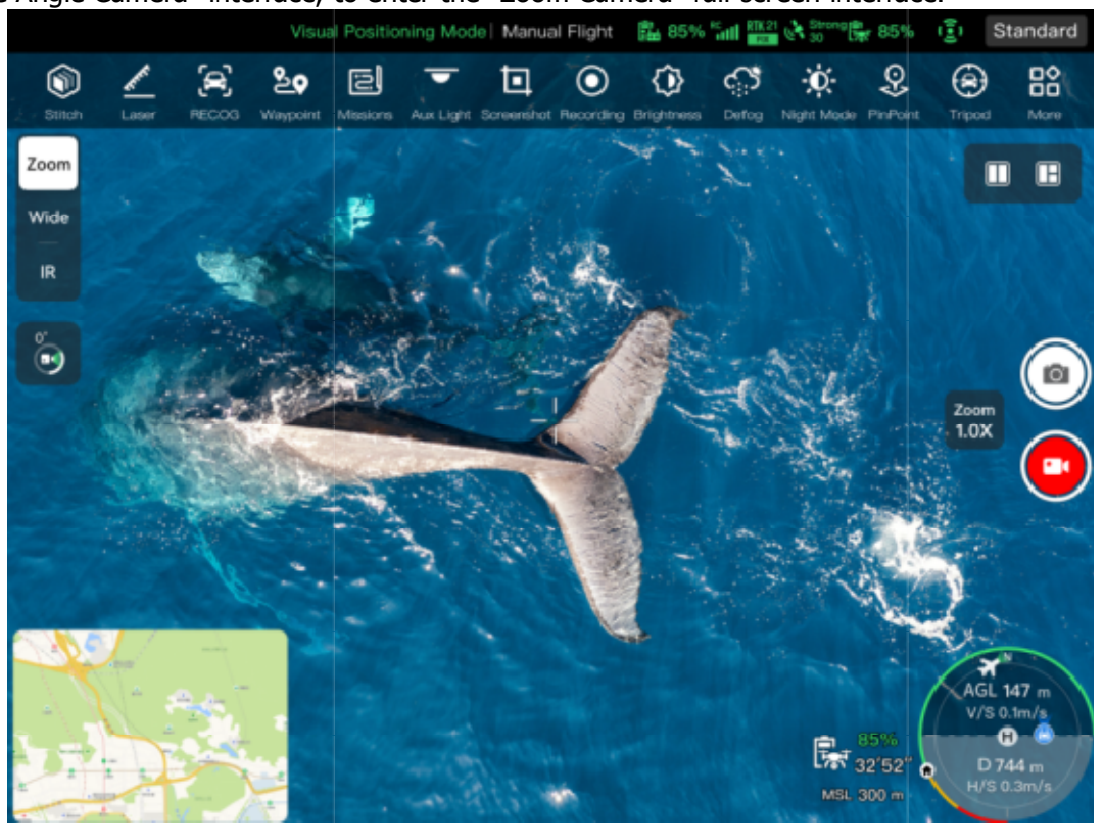


Fig 6-15 “Zoom Camera” Interface

■ Adjust the Zoom Factor

When shooting, click the "🔍" dynamic icon, and the zoom factor setting window will pop up. A maximum of 560x hybrid zoom is supported. You can drag up and down or click the number on the left to set the zoom factor according to your needs to zoom in and out on the shooting picture, so as to flexibly shoot objects at different distances.

■ Camera Settings

Click the "⚙️" icon to enter the "Camera Settings" interface and perform relevant settings. For more information, see 6.8.1 in this chapter.

6.8.3 “Thermal Camera” Interface

On the main interface of the Autel Enterprise App, click the "🔥" icon in the corner of the "Thermal Camera" preview interface, or click the "🔥" icon after entering the "Zoom Camera" interface or "Wide Camera" interface, to enter the "Thermal Camera" full-screen interface.

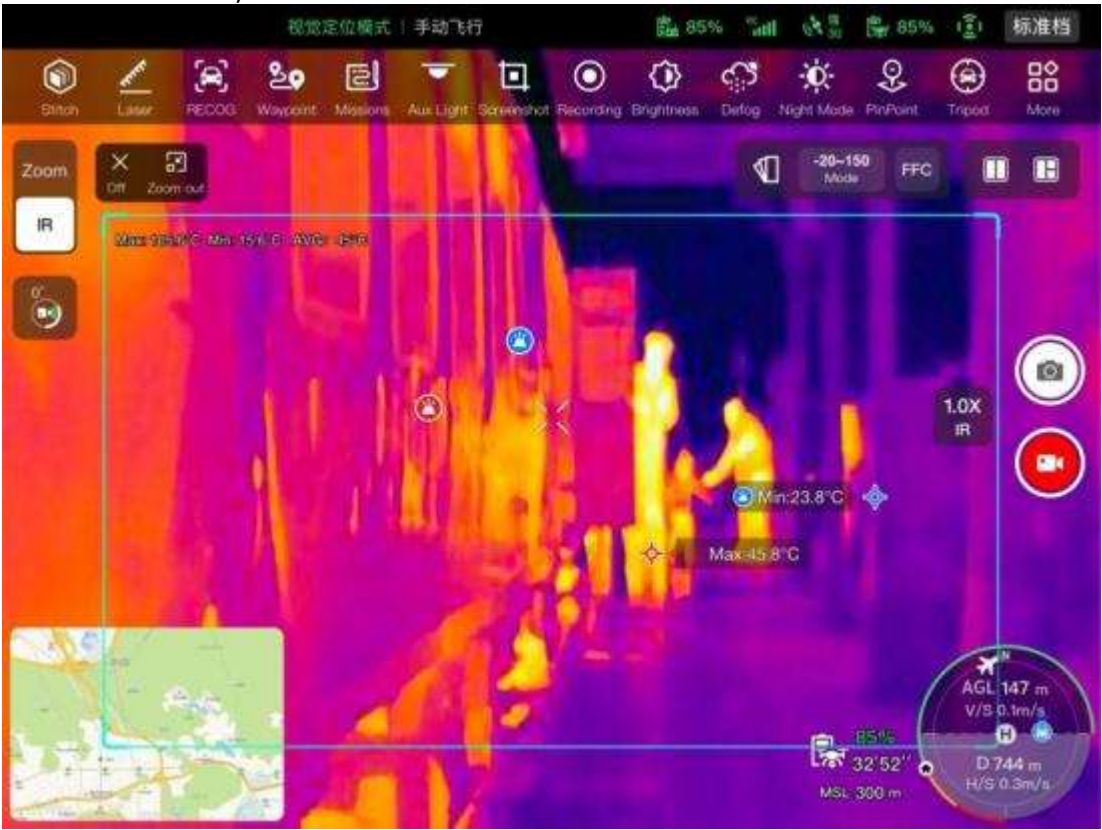


Fig 6-16 “Thermal Camera” Interface

Table 6-9 “Thermal Camera” Interface Details

No.	Icon	Meaning	Description
1		Thermal Color	Click this icon, and the drop-down list of “Thermal Color” pops up. You can scroll up and down in the list to select a color palette.
2		Radiometric Measurement Mode	High gain mode (-20℃ to 150℃), which enables more accurate radiometric measurement.

3		Radiometric Measurement Mode	Low gain mode (0°C to 550°C), which has a larger radiometric measurement range.
4		FFC Calibration	Flat-Field Calibration. After calibration, the image quality of thermal imaging will be optimized, and temperature changes will be easier to observe.

Warning

- While shooting, do not aim the infrared thermal imaging camera at strong energy sources such as the sun, lava, laser beams, and molten metal, to avoid damaging the infrared detector.
- The temperature of the measured target should be within 600°C. Over-temperature measurements can cause burns and damage to the infrared detector.

■ Set Thermal Color

After clicking the "" icon, you can scroll up and down in the pop-up drop-down list to select a color palette.

- After selection, the images from the thermal camera will be displayed in the color style of the selected color palette.

■ Set Infrared Shooting

Click the "" icon to enter the "Camera Settings" interface and perform relevant settings. For more information, see in this chapter.

■ Set Radiometric Measurement Mode

Click the "" icon or the "" icon to switch between radiometric measurement modes.

- High gain mode (-20°C to 150°C): This mode has higher radiometric measurement accuracy but a smaller radiometric measurement range compared with the low gain mode.
- Low gain mode (0°C to 550°C): This mode has a larger radiometric measurement range but lower radiometric measurement accuracy compared with the high gain mode.

■ FFC Calibration

Click the "" icon to enable the FFC calibration function.

Note

- The radiometric measurement mode and FFC calibration functions can be used only after the infrared radiometric measurement function is enabled in the camera settings.

■ Adjust the Infrared Zoom Factor

While shooting, click the "" dynamic icon, and the infrared zoom factor setting window will pop up. You can drag up or down to zoom in or out on the picture captured by the thermal camera, so as to flexibly shoot objects at different distances.

Tip

- The thermal camera of DG-L35T Gimbal support up to 16x digital zoom.

6.8.4 "Wide Angle Camera" Interface

On the main interface of the Autel Enterprise App, click the "Wide Angle Camera" icon in the corner of the "Wide Angle Camera" preview interface, or click the "Wide Angle Camera" icon after entering the "Zoom Camera" interface or "Thermal Camera" interface, to enter the "Wide Angle Camera" full-screen interface.

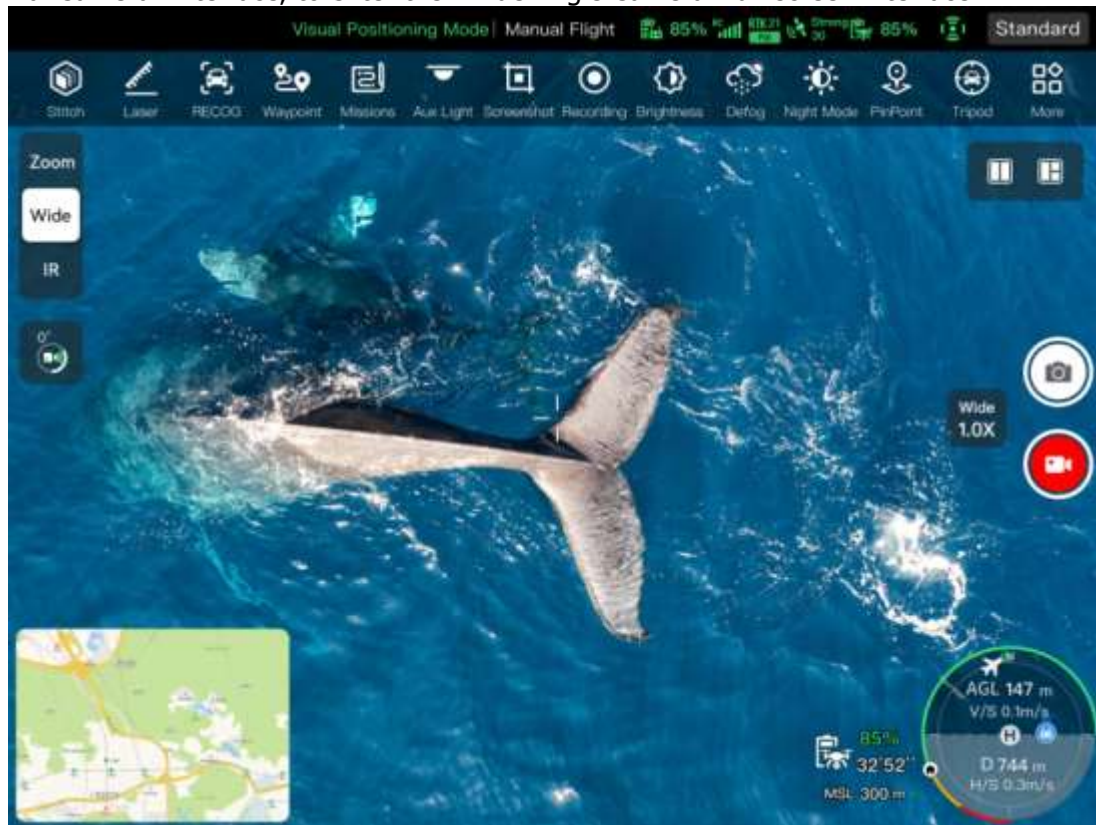


Fig 6-17 "Wide Angle Camera" Interface

■ Adjust the Wide Angle Zoom Factor

While shooting, click the "1.0X" dynamic icon, and the wide angle zoom factor setting window will pop up. A maximum of 16x digital zoom is supported. You can drag up or down to zoom in or out on the picture captured by the wide angle camera, so as to flexibly shoot objects at different distances.

■ Camera Settings

Click the "Camera Settings" icon to enter the "Camera Settings" interface and perform relevant settings. For more information, see in this chapter.

6.9 Flight Missions

Flight missions are divided into waypoint missions, rectangle missions, and polygon missions in terms of type. You can click the corresponding icon in the shortcut toolbar or toolbox to enter the relevant mission editing interfaces.

! Important

If any of the following conditions are detected, the flight mission will end automatically, and the aircraft will perform other operations according to the following conditions:

- Low battery power: A notification will pop up on the Autel Enterprise App to inform you that the

aircraft will return to the home point automatically.

- Critically low battery power: The aircraft will end its mission and automatically land at its current position.
- During a flight mission, if the remote controller is powered off, the aircraft will execute the lost action that you set.

Tip

- When the aircraft is in visual positioning mode, it cannot execute waypoint missions, rectangle missions, or polygon missions.

6.9.1 Waypoint

In the shortcut toolbar (or Shortcuts), click the "📍" icon to enter the "Waypoint" mission interface. You can add multiple waypoints on the map. Every two neighboring waypoints connect to form a flight segment and one or more flight segments form a route. By setting the flight altitude, flight speed, camera action, and waypoint actions of each waypoint for each route and each waypoint, the aircraft will automatically fly according to the route and perform corresponding actions at each waypoint.

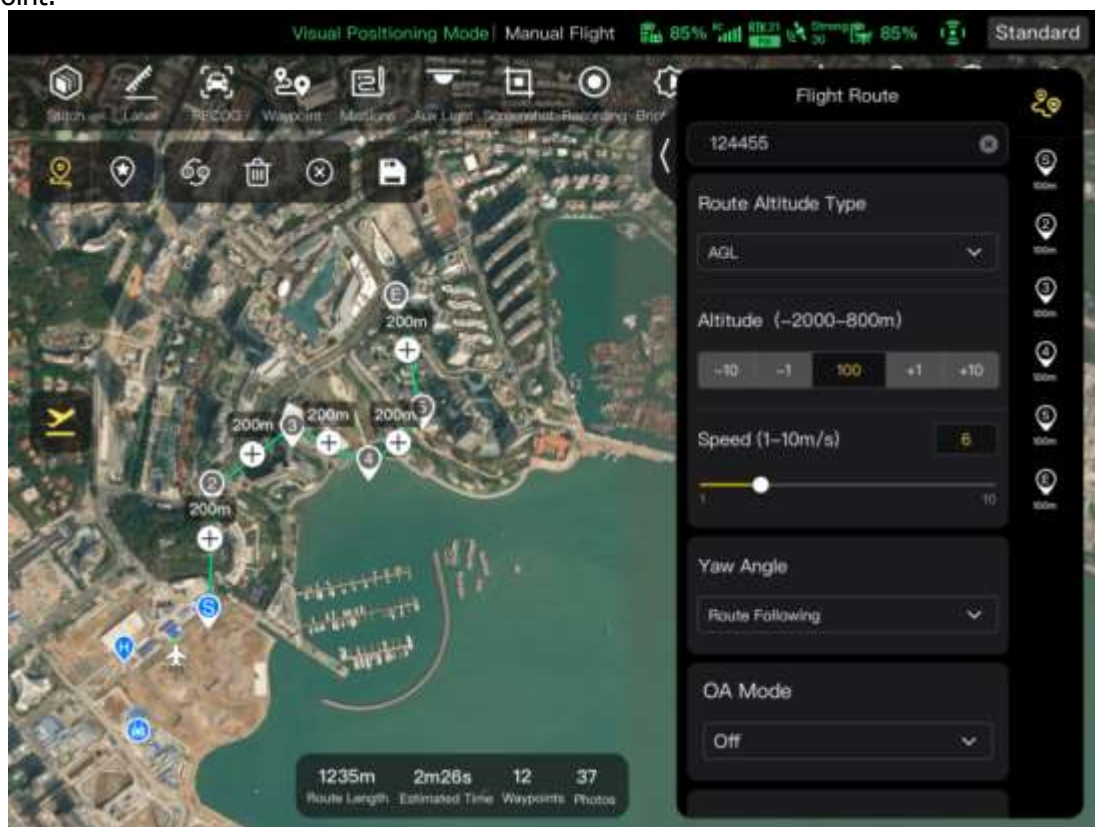


Fig 6-18 Waypoint

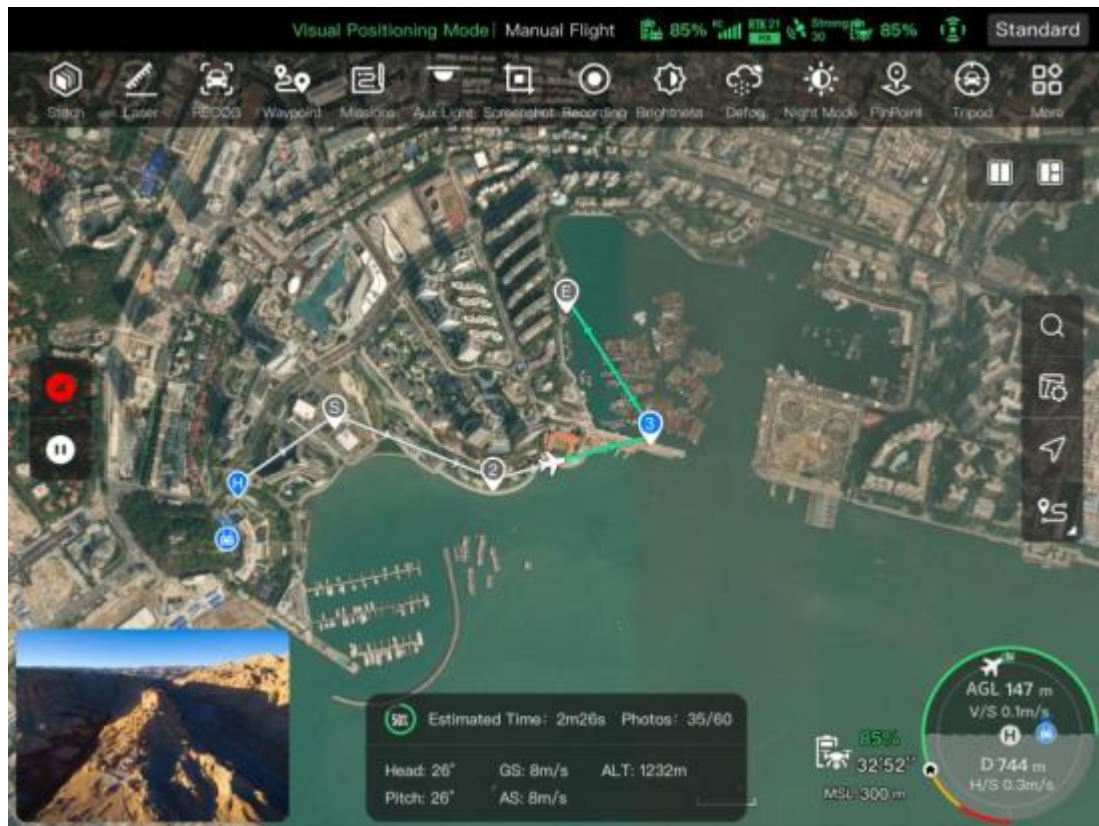


Fig 6-19 Waypoint Mission in Progress

Table 6-10 "Waypoint Mission" Terms and Details

Term	Definition
Relative Height	Refers to the vertical height of the aircraft relative to the take-off point.
Altitude	Refers to the vertical height of the aircraft relative to sea level.
Yaw Angle	It is used to set the position where the nose of the aircraft is facing. The default is to follow the route. When the point of interest has been added, it is often set in conjunction with the point of interest, that is, the yaw angle of the aircraft is set to turn to the point of interest.
Gimbal pitch	The observable range of the gimbal camera, that is, the angle from the top to the bottom ($0^{\circ} \sim 90^{\circ}$).
Finish Action	Refers to the actions that the aircraft will perform after finishing the waypoint mission.
Lost Action	Refers to the actions that the aircraft will perform when disconnected from the remote controller for more than 4 seconds during flight.
Segment Action	Refers to the actions performed by the camera, the gimbal, and the aircraft during the flight segment formed between the current waypoint and the next waypoint.
Waypoint Action	Refers to the actions performed by the camera, gimbal, and aircraft at a specific waypoint.

Table 6-11 "Waypoint Mission" Icons and Details

No.	Icon	Meaning	Description
1		Waypoint Settings	Click this icon to add a waypoint on the map as needed. Every two neighboring waypoints connect to form a flight segment and one or more flight segments form a route.
2		POI Settings	Click this icon to add a point of interest on the map as needed.
3		Heading Switch	Click this icon, and the starting point and ending point of the whole route will change direction.
4		Delete	When the aircraft is in waypoint setting status, clicking this icon once will delete the latest waypoint but cannot delete points of interest. When the aircraft is in POI setting status, clicking this icon once will delete the latest point of interest but cannot delete waypoints.
5		Clear	Click this icon and then click the "Confirm" button to clear all waypoints and POIs.
6		Save Route	Click this icon, and the currently edited waypoint mission will be saved to "Mission".
7		Edit Route	Click this icon to edit the saved route missions.
8		Execute Mission	Click this button, and the aircraft will enter the "Pre-flight Check" interface. After the check is completed, the aircraft will take off to perform the waypoint mission.
9		Pause Mission	When executing a waypoint mission, click this icon, and the aircraft will pause the waypoint mission and hover at the current position.
10		Exit Mission	Click this icon, and the aircraft will abort the current waypoint mission and automatically return.

■ Add Waypoints

On the waypoint mission interface, click the "📍" icon, find the starting point for the mission on the map and click it to create the first waypoint, and then repeat the previous operation to create multiple waypoints as required.

When adding waypoints, the waypoint mission settings interface will pop up on the right side of the waypoint mission interface.



Tip

- A route must include at least two waypoints: a starting point (📍) and an ending point (📍).
- To set a waypoint position more precisely, you can enter the waypoint coordinates under "Waypoint Coordinates" on the waypoint settings interface.

Click the "📍" icon in the upper-right corner of the waypoint settings interface to enter the route settings interface.

Click the waypoint icon on the right side of the waypoint settings interface to enter the corresponding waypoint settings interface.

■ Set Route Name and Route Altitude Type

On the route settings interface:

- Click the "Route Name" edit box and enter the name as required to set the name of a route.
- Click the drop-down list of "Route Altitude Type" and select "AGL" or "MSL" to set the altitude type of the entire route.

■ Set Flight Altitude

In the "Flight Altitude" edit box on the route settings interface, directly enter the flight altitude value or click the shortcut buttons on the left and right sides to adjust the integer value. This way, you set the flight altitude of the entire route.

On the waypoint settings interface, the flight altitude is set to "Align Route" by default. After deselecting "Align Route", in the "Flight Altitude" edit box, directly enter the flight altitude value or click the shortcut buttons on the left and right sides to adjust the value. This way, you set the flight altitude of the aircraft at the current waypoint.

Tip

- The maximum value for the flight altitude setting will be dynamically adjusted according to the altitude limit set in the "Flight Control Parameter Setting".

■ Set Flight Speed

In the "Flight Speed" edit box on the route settings interface, directly enter the flight speed value or move the slider below left or right to adjust the value. This way, you set the flight speed of the entire route.

On the waypoint settings interface, the flight speed is set to "Align Route" by default. After deselecting "Align Route", in the "Flight Speed" edit box, directly enter the flight speed value or move the slider below left or right to adjust the value. This way, you set the flight speed of the aircraft at the current waypoint.

Tip

- The flight speed setting ranges from 1 to 10 m/s.

Note

- After take-off, the aircraft will gradually adjust its "flight altitude" and "flight speed" to the set values while flying to this waypoint.

■ Set Yaw Angle

On the route settings interface, click the drop-down list of "Yaw Angle" to set the yaw angle of the aircraft in the entire route to "Route Following", "Manual", or "Custom".

On the waypoint settings interface, the yaw angle of the aircraft is set to "Align Route" by default. After deselecting "Align Route", click the drop-down list of "Yaw Angle" to set the yaw angle of the

aircraft at the current waypoint to "Route Following", "Manual", "Custom", or "Turn to Point of Interest" (the waypoint should be associated with the point of interest).

- Route Following: If it is set to "Route Following", the nose of the aircraft will follow the direction of the waypoint change, that is, turn from the current waypoint to the next waypoint according to the set route.
- Manual: If it is set to "Manual", you need to use the remote controller to control the nose direction of the aircraft during the flight.
- Custom: If it is set to "Custom", the "Yaw Angle (0°-360°)" setting item will be displayed. You can directly enter the value or click the shortcut buttons on the left and right sides to adjust the value. After setting, the aircraft nose will be adjusted according to the set value.
- Turn to Point of Interest: If it is set to "Turn to Point of Interest", the nose of the aircraft will always face the set POI during the flight segment where the yaw angle of the aircraft is set to "Turn to Point of Interest" when the waypoint mission is executed.

■ Set Obstacle Avoidance Mode

On the route settings interface, the obstacle avoidance mode can be set to "Bypass" or "Off".

- If "Bypass" is selected, the aircraft will automatically bypass obstacles.

Warning

- If the obstacle avoidance mode is turned off, the obstacle avoidance system of the aircraft will not be enabled. In this case, please try to choose an open area to control the aircraft.

■ Set Camera Action

On the route settings interface, click the drop-down list of "Camera Action" to set the camera action of the entire route to "Start Recording", "Stop Recording", "Shoot", "Stop Shooting", "Timelapse", "Distance Lapse", and "No Action".

On the waypoint settings interface, the segment action is set to "Align Route" by default. After deselecting "Align Route", click the drop-down list of "Camera Action" to set the camera action of the current flight segment to "Start Recording", "Stop Recording", "Shoot", "Stop Shooting", "Timelapse", "Distance Lapse", and "No Action".

- When it is set to "Timelapse", the "Photo Interval" will be displayed. At this time, you can move the slider left or right to adjust the value.
- When it is set to "Distance Lapse", the "Photo Distance" will be displayed. At this time, you can move the slider left or right to adjust the value.

■ Set Gimbal Pitch Angle

On the route settings interface, enter the value in the edit box to the right of "Gimbal Pitch Angle (0°-90°)", or move the slider below left or right to adjust the gimbal pitch angle of the entire route.

On the waypoint settings interface, the gimbal pitch angle (segment action) is set to "Align Route" by default. After deselecting "Align Route", enter the value in the edit box to the right of "Gimbal Pitch Angle (0°-90°)", or move the slider below left or right to adjust the gimbal pitch angle of the current segment.

■ Add a Waypoint Action

On the waypoint settings interface, click the "Add Action +" button under "Waypoint Action" to set the camera action, gimbal pitch angle, and yaw angle for the current waypoint. You can add a maximum of 10 waypoint actions for one waypoint.

■ Set Finish Action

On the route settings interface, click the drop-down list of "Finish Action" to set the flight action of the aircraft after completing the waypoint mission.

- If "Auto RTH" is selected, the aircraft will automatically return to the starting point after completing the mission.
- If "Hovering" is selected, the aircraft will hover at the end point after completing the mission.

■ Set Signal Loss Action

On the route settings interface, click the drop-down list of "Signal Loss Action" to set the flight action of the aircraft after losing connection with the remote controller for 4 seconds.

- If "Mission Continue" is selected, the aircraft will continue to execute the mission and perform the "Finish Action" after completing the mission.
- If "Auto RTH" is selected, the aircraft will automatically return to the starting point.

■ Set Waypoint Coordinates

After adding a waypoint, you can automatically obtain the longitude and latitude parameters of the waypoint. You can also manually enter and modify the longitude and latitude of the waypoint.

- Under "Waypoint Coordinates" on the waypoint settings interface, the waypoint coordinates can be set in two formats: DD (Decimal Degrees) and DMS (Degrees Minutes Seconds). Click the "Longitude" and "Latitude" edit boxes below and enter the longitude and latitude of the waypoint to complete the modification of the waypoint coordinates.
- When using the DD (Decimal Degrees) format, you can use the arrow keys located on the right side of the editing field to make fine adjustments to the longitude and latitude.

Table 6-12 Fine Adjustment of Latitude and Longitude

Parameter Type	Click Up Arrow	Click Down Arrow	Click Left Arrow	Click Right Arrow
Longitude	/	/	-0.000005	+0.000005
Latitude	+0.000005	-0.000005	/	/

■ Add Point of Interest

On the waypoint mission interface, click the "📍" icon, find the specific location on the map where the POI needs to be set and click it to create the first POI, and then repeat the previous operation to create multiple POIs as required.

When adding POIs, the POI setting interface will pop up on the right side of the waypoint mission interface.

■ Set POI Altitude

On the POI settings interface, you can set the POI altitude. POI altitude refers to the altitude of the point of interest relative to the take-off point. In the "Altitude (0-800m)" edit box, directly enter the altitude value of the point of interest or click the shortcut buttons on the left and right sides to adjust the value to set the POI altitude.

❗ Important

- When the point of interest is higher than the waypoint, the gimbal camera cannot look at the point of interest above.

■ Set Associated Waypoints

On the POI settings interface, click the waypoints to be associated under "Link Waypoint(s)" to associate the current point of interest with the selected waypoints. To associate all waypoints, check the "Select All" box on the right side.

After a waypoint is associated with a point of interest, the yaw angle of the aircraft at the waypoint will not be set to "Align Route" by default. If the "Yaw Angle" of the aircraft at the waypoint is set to "Turn to Point of Interest", the nose of the aircraft will always face the associated point of interest during the flight segment from this waypoint to the next waypoint when the waypoint mission is executed.

■ Start Pre-flight Check

After the completion of all settings for a route, relevant flight mission data will be synchronously displayed at the bottom center of the waypoint mission interface, including the route length, estimated time, waypoints, and photos to be taken. Click the “✈” icon on the left side to enter the "Pre-flight Check" interface.

■ Upload a Route and Start a Mission

After completing the pre-flight check, press the "Slide to takeoff" icon at the bottom of the "Pre-flight Check" interface, and the aircraft will automatically take off to execute the mission. The estimated completion time, current photo count, current altitude, current wind speed, and other basic information will be synchronously displayed at the bottom center of the waypoint mission interface. The lower-left small screen displays the current view observed by the gimbal camera. Click to enlarge it to full screen for viewing.

When the aircraft completes the waypoint mission, the relevant flight mission data of this route will be displayed at the bottom center of the map, including the route length, estimated time, waypoint, the number of photos taken, and the number of flights.

6.9.2 Rectangle Mission

In the shortcut toolbar (or Shortcuts), click the “” icon to enter the "Rectangle" mission interface. You can add a rectangular area on the map and perform operations such as dragging, scaling, and rotating to adjust the position and size of the area. After adjustments, the Autel Enterprise App will automatically generate a continuous series of equidistant flight routes within the rectangular area based on the side overlap and course angle settings. The aircraft will then automatically fly to execute the shooting mission according to these flight routes and relevant settings.

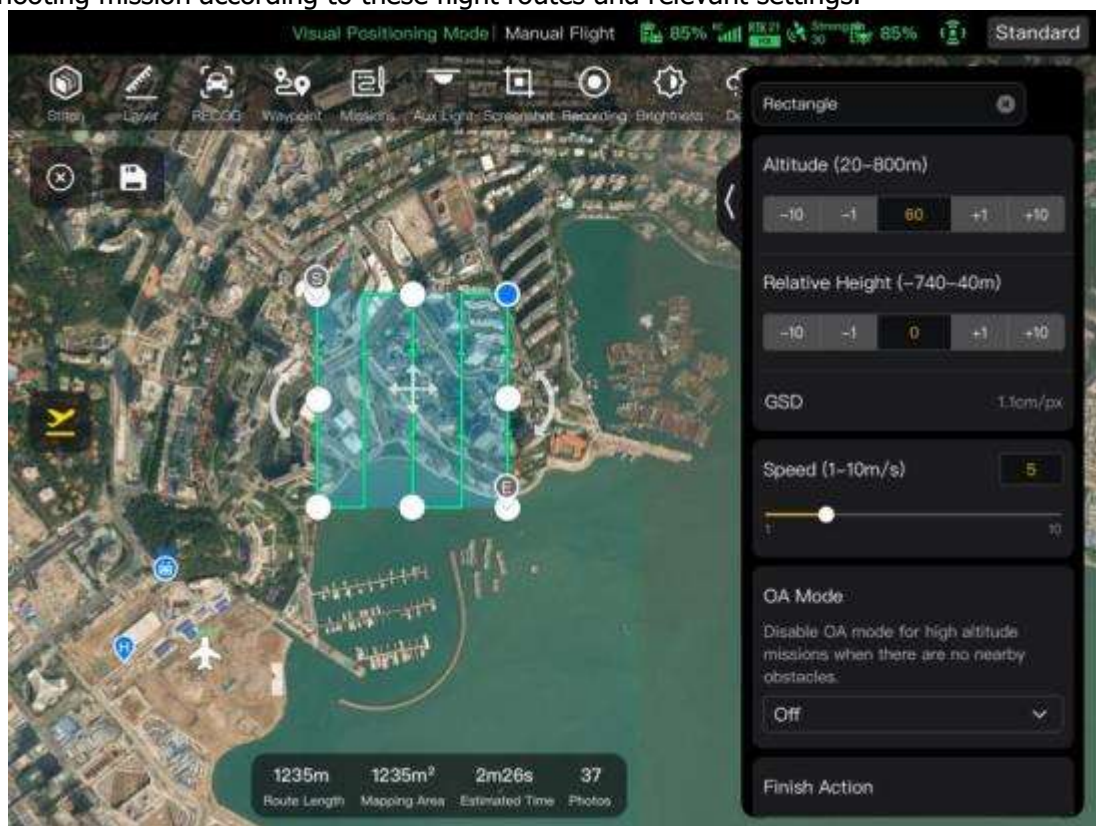


Fig 6-20 Rectangle Mission

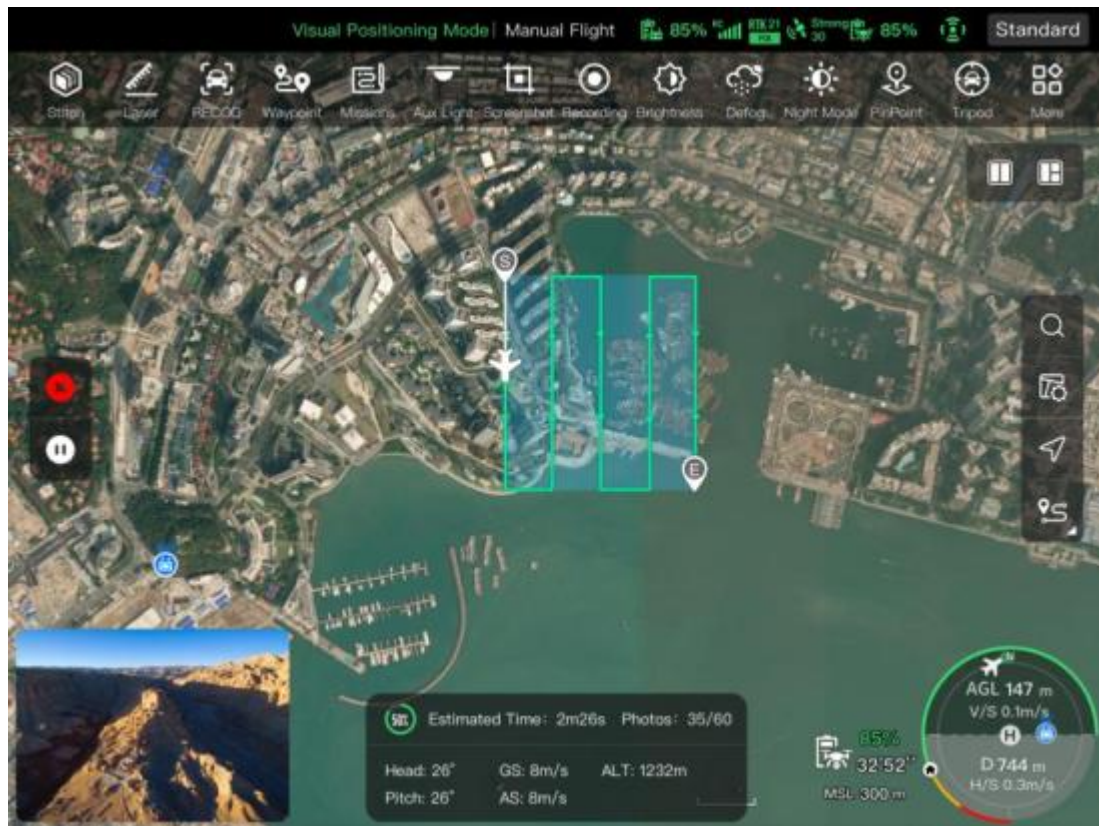


Fig 6-21 Rectangle Mission in Progress

Table 6-13 "Rectangle Mission" Terms and Details

Term	Definition
Relative Height	Refers to the vertical altitude of the work surface of the shot object relative to the take-off point of the aircraft.
GSD	Ground Sampling Distance.
Finish Action	Refers to the action that the aircraft will perform after completing a rectangle mission.
Lost Action	Refers to the actions that the aircraft will perform when disconnected from the remote controller for more than 4 seconds during flight.
Front Overlap	Refers to the image overlap rate between two consecutive photos taken when capturing images along the flight heading.
Side Overlap	Refers to the image overlap rate between two consecutive photos taken when capturing images along two adjacent flight routes.
Main Course Angle	Refers to the course angle between the main route and the latitude line (horizontal line) when the flight routes are automatically generated.
Gimbal pitch	The observable range of the gimbal camera, that is, the angle from the top to the bottom ($-30^{\circ} \sim 90^{\circ}$).
Coordinated Turns	When enabled, the aircraft will switch from one main route to an adjacent main route along the optimal arc-shaped path.

Table 6-14 "Rectangle Mission" Icons and Details

No.	Icon	Meaning	Description
1		Clear	Click this button, and then click the "Confirm" button in the pop-up window to reset the rectangle mission.
2		Save Route	Click this icon, and the currently edited rectangle mission will be saved to "Mission".
3		Edit Route	Click this icon to edit the saved rectangle mission.
4		Execute Mission	Click this button, and the aircraft will enter the "Pre-flight Check" interface. After the check is completed, the aircraft will take off to perform the rectangle mission.
5		Pause Mission	When executing a rectangle mission, click this icon, and the aircraft will pause the rectangle mission and hover at the current position.
6		Exit Mission	Click this icon, and the aircraft will abort the current rectangle mission and automatically return.

■ Add a Rectangular Area

On the map of the rectangle mission interface, find the center point of the mission to be executed and click it to automatically generate a rectangular area. You can adjust the area of the rectangle by dragging the eight white points at the edges of the rectangle. You can drag the "cross arrow" in the center of the rectangle to move the rectangle or drag the "curved arrow" on both sides of the rectangle to rotate the rectangle around the center point.

When adding a rectangular area, the rectangle mission settings interface will pop up on the right side of the rectangle mission interface.

Tip

- A rectangular area includes two waypoints, that is, the starting point () and the end point ()

■ Set Mission Name

On the rectangle mission settings interface:

- Click the "Mission Name" edit box and enter the name as required to set the name of a rectangle mission.

■ Set Flight Altitude and Relative Height

In the "Flight Altitude (20-800m)" edit box on the rectangle mission settings interface, directly enter the flight altitude value or click the shortcut buttons on the left and right sides to adjust the value. This way, you set the flight altitude of the rectangle mission.

The setting range of "Relative Height" will automatically be dynamically adjusted according to the flight altitude setting. In the edit box, directly enter the mission altitude value or click the shortcut buttons on the left and right sides to adjust the value. This way, you set the relative altitude of the rectangle mission.

 Tip

- The maximum value for the flight altitude setting will be dynamically adjusted according to the altitude limit set in the "Flight Control Parameter Setting".
- GSD varies with different flight altitude values.

■ Set Flight Speed

In the "Flight Speed" edit box on the rectangle mission settings interface, directly enter the flight speed value or move the slider below left or right to adjust the value. This way, you set the flight speed of the rectangle mission.

 Tip

- The flight speed setting ranges from 1 to 10 m/s.

■ Set Obstacle Avoidance Mode

On the rectangle mission settings interface, the obstacle avoidance mode can be set to "Bypass" or "Off".

- If "Bypass" is selected, the aircraft will automatically bypass obstacles.

 Warning

- If the obstacle avoidance mode is turned off, the obstacle avoidance system of the aircraft will not be enabled. In this case, please try to choose an open area to control the aircraft.

 Tip

- When flying at a high altitude, if there are no obstacles, it is recommended to disable the obstacle avoidance mode.

■ Set Finish Action

On the rectangle mission settings interface, click the drop-down list of "Finish Action" to set the flight action of the aircraft after completing the rectangle mission.

- If "Auto RTH" is selected, the aircraft will automatically return to the starting point after completing the mission.
- If "Hovering" is selected, the aircraft will hover at the end point after completing the mission.

■ Set Signal Loss Action

On the rectangle mission settings interface, click the drop-down list of "Signal Loss Action" to set the flight action of the aircraft after losing connection with the remote controller for 4 seconds.

- If "Mission Continue" is selected, the aircraft will continue to execute the mission and perform the "Finish Action" after completing the mission.
- If "Auto RTH" is selected, the aircraft will automatically return to the starting point.

■ Advanced Settings

On the rectangle mission settings interface, click "Advanced Settings" to enter the advanced settings interface and set the front overlap, side overlap, main course angle, and gimbal pitch angle for the rectangle mission.

- **Set Front Overlap**

In the "Front Overlap(%)" edit box on the advanced settings interface, directly enter the value or move the slider below left or right to adjust the value to set the front overlap of the rectangle mission.

- **Set Side Overlap**

In the "Side Overlap(%)" edit box on the advanced settings interface, directly enter the value or move the slider below left or right to adjust the value to set the side overlap of the rectangle mission.

 Tip

- The setting range of the front overlap and side overlap is 10%-90%, and the default value is 70%.

- **Set Main Course Angle**

On the advanced settings interface, you can set the main course angle (0-359°) in two ways: "Custom" or "Auto".

- If "Custom" is selected, you can directly enter the value or click the shortcut digital buttons on the left and right sides to adjust the angle between the main route of the rectangle mission and the latitude line.

- **Set Gimbal Pitch Angle**

On the advanced settings interface, enter the value in the edit box to the right of "Gimbal Pitch Angle (-30°-90°)", or move the slider below left or right to adjust the gimbal pitch angle of the entire route.

■ **Turn On/Off Elevation Optimization**

- If this function is turned on, the aircraft will create a route along the center point of the rectangle for re-shooting after completing the shooting of the main route. This helps optimize the overall shooting accuracy of the mission.

■ **Turn On/Off Double Grid**

- If this function is turned on, the aircraft will change its heading by 90° and shoot the rectangle mission area again after completing the shooting of the main route. The two routes have a 90° overlap.

■ **Turn On/Off Route Extension**

Due to the limited gimbal pitch angle and flight altitude, some areas on the outer edges of the rectangle mission area might not be captured by the camera. In such cases, you need to turn on route extension to extend the rectangle mission area so as to ensure complete coverage of the target area.

■ **Turn On/Off Coordinated Turns**

After this function is turned on, the aircraft will follow the optimal arc-shaped path for turns when switching from one main route to an adjacent one.

 Tip

- When the obstacle avoidance mode is set to "Bypass", the coordinated turns function does not take effect.

■ **Start Pre-flight Check**

After the completion of all settings for a rectangle mission, relevant flight mission data will be synchronously displayed at the bottom center of the rectangle mission interface, including the route length, mapping area, estimated time, and photos to be taken. Click the " " icon on the left side to enter the "Pre-flight Check" interface.

■ **Upload a Route and Start a Mission**

After completing the pre-flight check, press the "Slide to takeoff" icon at the bottom of the "Pre-flight Check" interface, and the aircraft will automatically take off to execute the mission. The estimated completion time, current photo count, current altitude, current wind speed, and other basic information will be synchronously displayed at the bottom center of the rectangle mission interface.

The lower-left small screen displays the current view observed by the gimbal camera. Click to enlarge it to full screen for viewing.

■ Complete Route Missions

When the aircraft completes the rectangle mission, the relevant flight mission data of this route will be displayed at the bottom center of the map, including the route length, mapping area, estimated time, the number of photos taken, and the number of flights.

6.9.3 Polygon

In the shortcut toolbar (or Shortcuts), click the "📐" icon to enter the "Polygon" mission interface. You can add a square area on the map and perform operations such as dragging, adding side boundaries, and dragging corner points to adjust the position and size of the area. After adjustments, the Autel Enterprise App will automatically generate a continuous series of equidistant flight routes within the polygonal area based on the side overlap and course angle settings. The aircraft will then automatically fly to execute the shooting mission according to these flight routes and relevant settings.

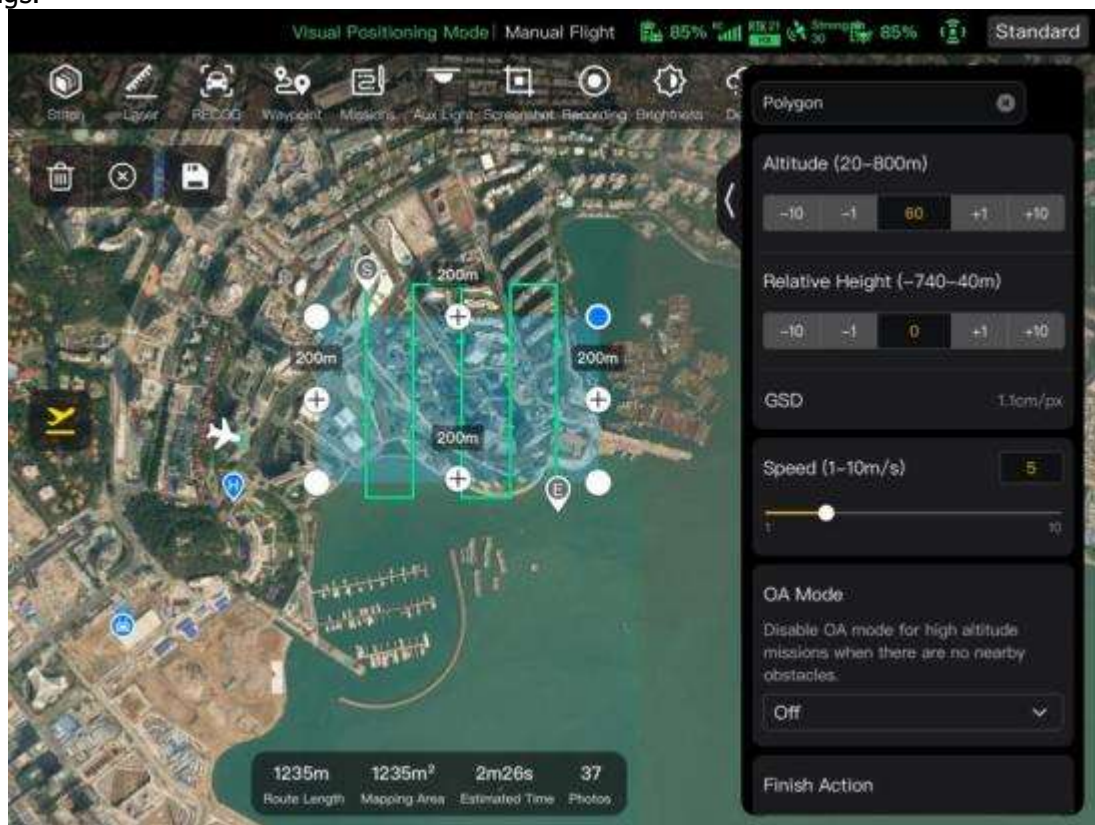


Fig 6-22 Polygon

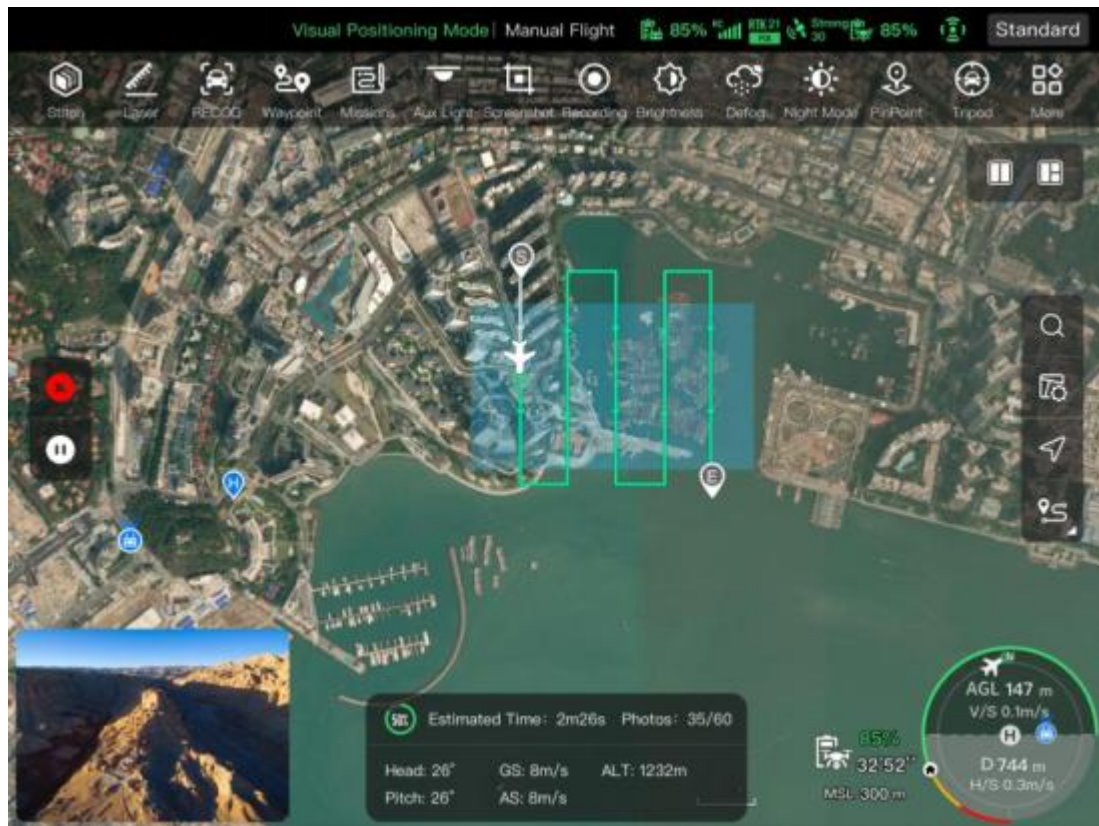


Fig 6-23 Polygon Mission in Progress

Table 6-15 "Polygon Mission" Terms and Details

Term	Definition
Relative Height	Refers to the vertical altitude of the work surface of the shot object relative to the take-off point of the aircraft.
GSD	Ground Sampling Distance.
Finish Action	Refers to the action that the aircraft will perform after completing a polygon mission.
Lost Action	Refers to the actions that the aircraft will perform when disconnected from the remote controller for more than 4 seconds during flight.
Front Overlap	Refers to the image overlap rate between two consecutive photos taken when capturing images along the flight heading.
Side Overlap	Refers to the image overlap rate between two consecutive photos taken when capturing images along two adjacent flight routes.
Main Course Angle	Refers to the course angle between the main route and the latitude line (horizontal line) when the flight routes are automatically generated.
Gimbal pitch	The observable range of the gimbal camera, that is, the angle from the top to the bottom ($-30^{\circ} \sim 90^{\circ}$).
Coordinated Turns	When enabled, the aircraft will switch from one main route to an adjacent main route along the optimal arc-shaped path.

Table 6-16 "Polygon Mission" Icons and Details

No.	Icon	Meaning	Description
1		Clear	Click this button, and then click the "Confirm" button in the pop-up window to reset the polygon mission.
2		Save Route	Click this icon, and the currently edited polygon mission will be saved to "Mission".
3		Edit Route	Click this icon to edit the saved polygon mission.
4		Execute Mission	Click this button, and the aircraft will enter the "Pre-flight Check" interface. After the check is completed, the aircraft will take off to perform the polygon mission.
5		Pause Mission	When executing a polygon mission, click this icon, and the aircraft will pause the polygon mission and hover at the current position.
6		Exit Mission	Click this icon, and the aircraft will abort the current polygon mission and automatically return.

■ Add a Polygonal Area

On the map of the polygon mission interface, find the center point of the mission to be executed and click it to automatically generate a square area. You can click the "+" icon between two white points to add side lines for the area. You can drag the white points to adjust the positions of the corner points of the polygon, which allows you to modify the area of the polygon. You can also drag the "cross arrow" in the center of the polygonal area to move the polygon.

When adding a polygonal area, the polygon mission settings interface will pop up on the right side of the polygon mission interface.

Tip

- A polygonal area includes two waypoints, that is, the starting point (📍) and the end point (📍).
- For the settings of other operations for a polygon mission, see in this chapter.

6.9.4 Pre-flight Check

Before the aircraft starts to execute a mission, a pre-flight check is required. On the "Pre-flight Check" interface, you can preview the current status (such as battery level, battery temperature, and SD card memory) and route data of the aircraft and perform some settings such as flight parameters and obstacle avoidance settings.

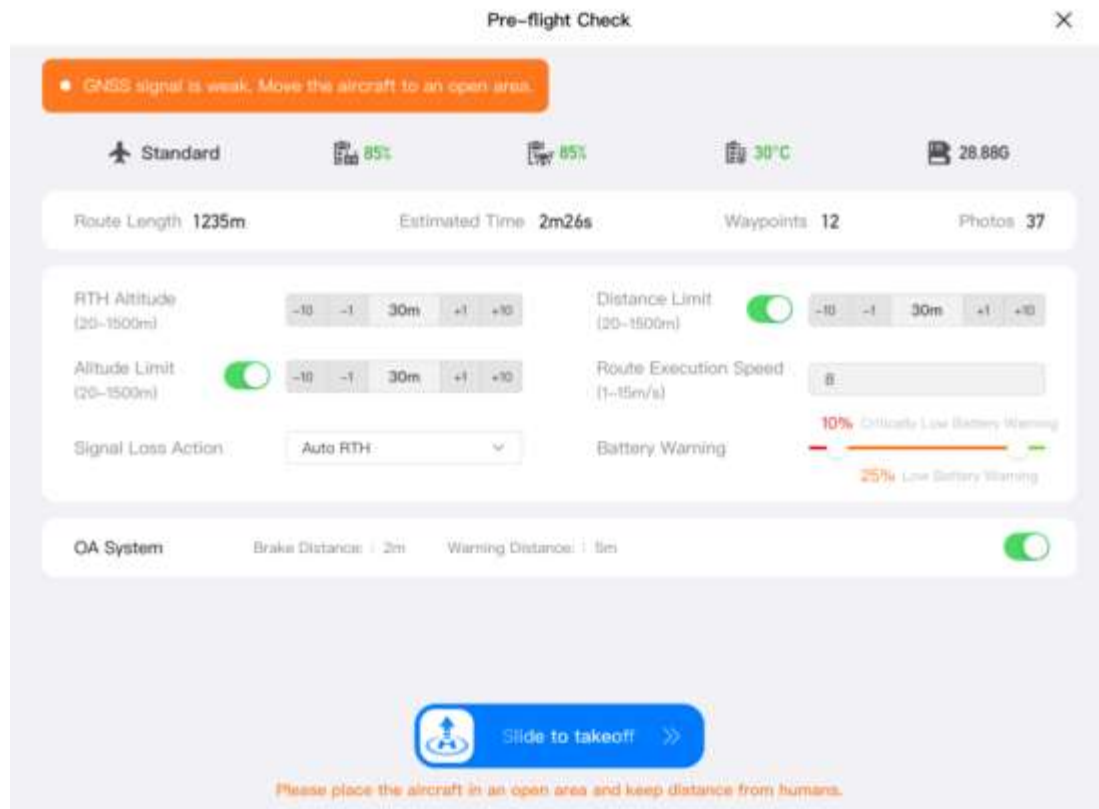


Fig 6-24 Pre-flight Check for a Flight Mission

1. On the ongoing flight mission interface, click the "✈" icon on the left, and the "Pre-flight Check" interface will pop up. Please make sure that there is no fault or abnormal alarm, otherwise, you need to follow the tips to solve it.
2. Confirm aircraft status and route preview data.
3. According to different types of flight missions, set the corresponding flight parameters. If not set, the "RTH Altitude", "Distance Limit", "Altitude Limit", "Home Point Settings", and "Remote Controller" settings are based on general settings.
4. Select to enable or disable obstacle avoidance.
5. After completing the above operations, press the "Slide to takeoff" icon at the bottom of the interface.

6.9.5 Resume Mission

When an abnormal situation such as an abnormal exit occurs during a flight mission, click the "📄" icon to enter the "Mission" interface. This will trigger the "Resume Mission" function, and a prompt window will pop up.

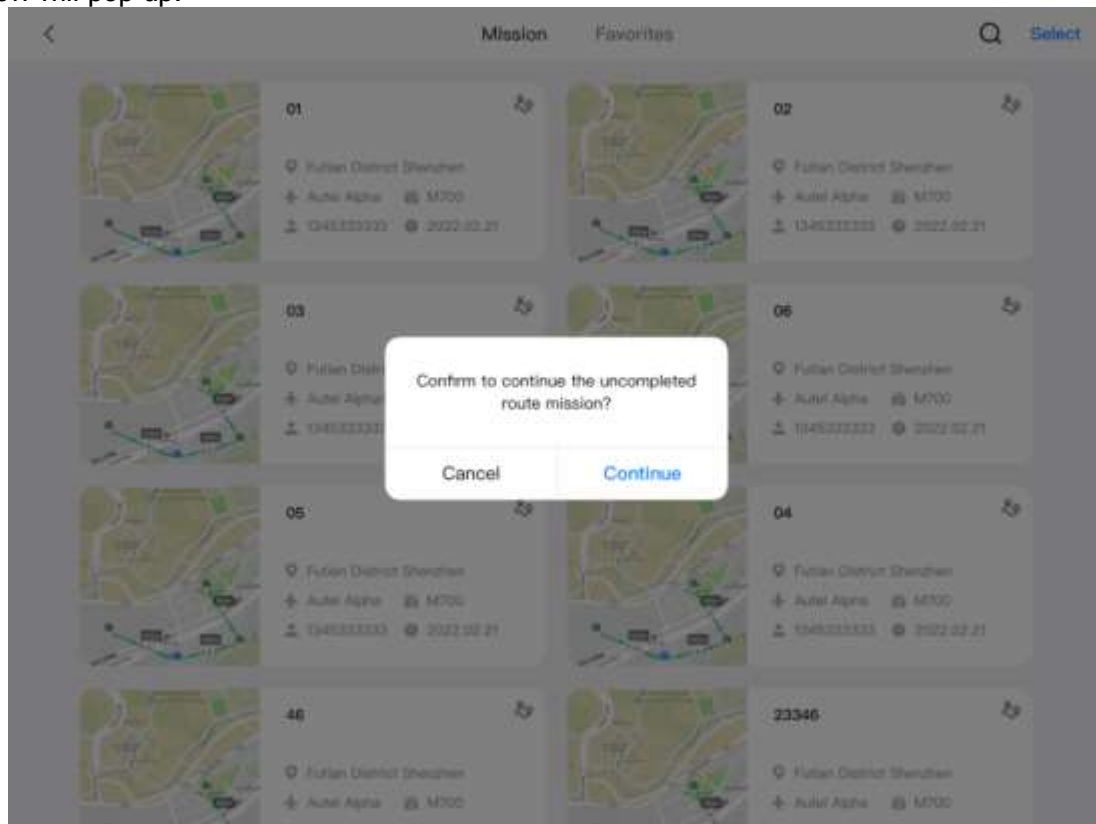


Fig 6-25 Resume Mission

■ Resume Mission Options

- Click the "Continue" button. The position where the aircraft stopped will be displayed, and the aircraft will fly to this position to continue the last mission.
- Click the "Cancel" button. After closing the pop-up window, the mission will no longer be executed from the last point.

6.9.6 Mission and Favorites

On the "Mission/Favorites" interface, you can query, edit, favorite, and delete previously saved flight missions.

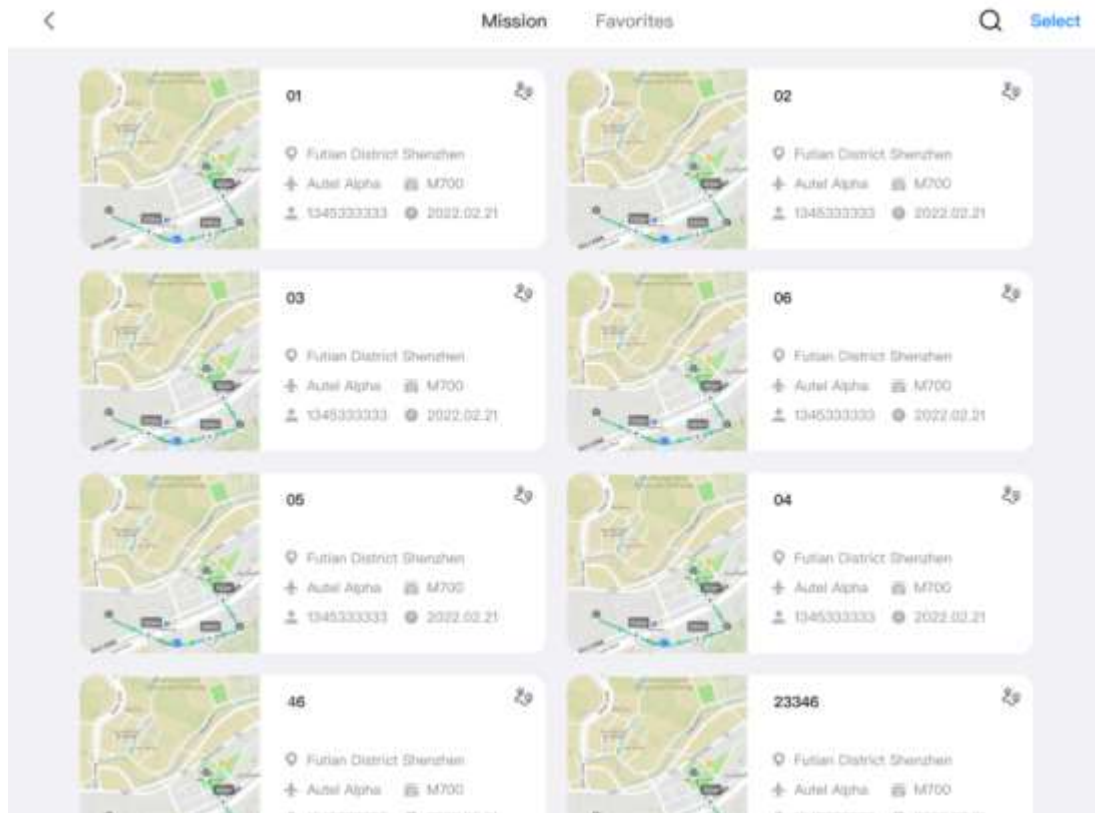


Fig 6-26 Mission/Favorites Interface

■ Query

Click the "Q" icon in the upper-right corner of the "Mission" interface and enter the desired content to quickly locate the corresponding historical flight mission.

■ Edit

Click a historical flight mission on the "Mission" interface to enter the waypoint mission editing interface. Click the "Pencil" icon to edit the flight mission.

■ Favorite

Click the "Select" button in the upper-right corner of the "Mission" interface, then single-select, multi-select, or select all the missions to be favorited, and then click the "Star" icon to complete the favoriting action. Favorited missions will be displayed on the "Favorites" interface for easy access.

■ Delete

Click the "Select" button in the upper-right corner of the "Mission" interface, then single-select, multi-select, or select all the missions to be deleted, and then click the "Trash" icon. After a dialog box pops up, click the "Confirm" button. This way, the selected flight missions are deleted.

6.9.7 Personal Center

Click the "User" icon (in the shortcut toolbar or Shortcuts) to enter the "Personal Center" interface. When using the product for the first time, you need to register and log in to the Autel Enterprise App.

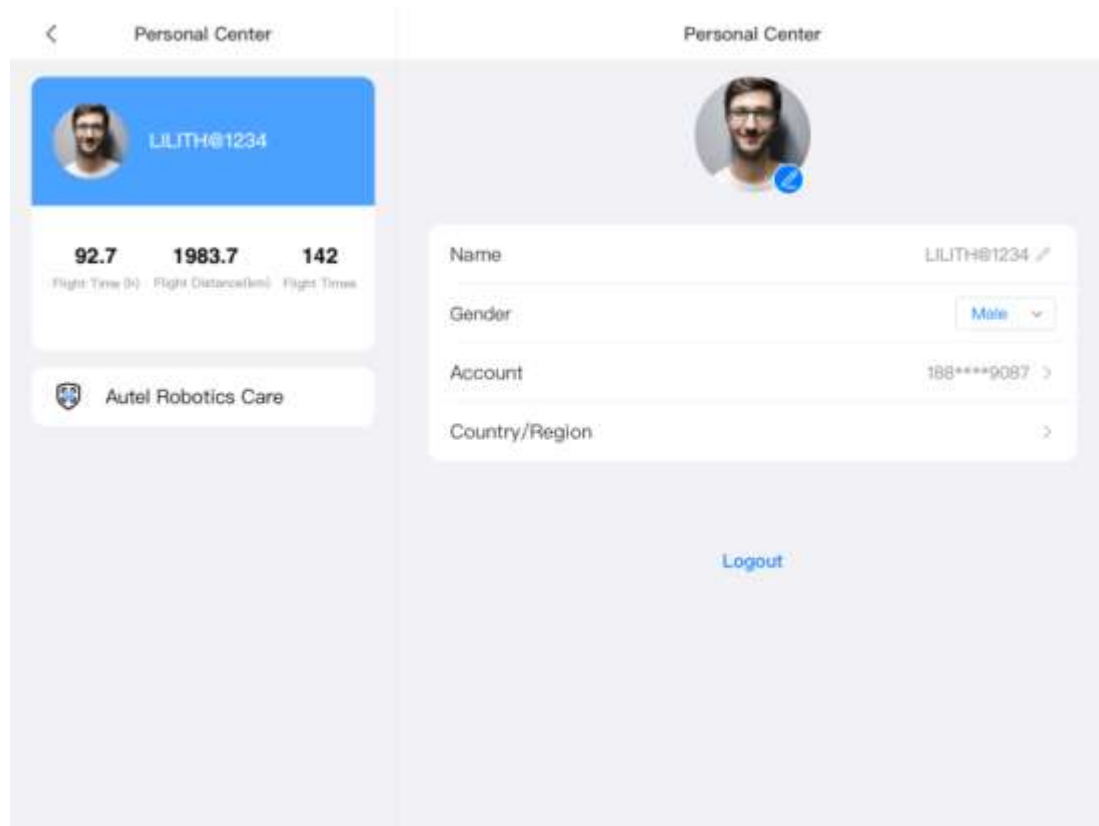


Fig 6-27 "Personal Center" Interface

On the "Personal Center" interface, you can perform the following operations:

■ Query Flight Data

On the "Personal Center" interface, you can query the flight time, flight distance, and the number of flights.

■ Purchase "Autel Robotics Care"

On the "Personal Center" interface, you can purchase the "Autel Robotics Care" value-added service for your aircraft (within 48 hours of activation).

Tip

- If you do not register and log in to the Autel Enterprise App, you cannot use cloud-related functions.
- You have the right to use a registered account, but the account ownership belongs to Autel Robotics. Please read the "User Agreement" carefully when registering.

Chapter 7 Firmware Updates and Maintenance

In order to ensure the reliability and overall performance of the aircraft and relevant parts, as well as to obtain the best flight experience, the aircraft, remote controller, and parts need to be updated to the latest firmware version.

Use the Autel Enterprise App to perform firmware updates for the aircraft, remote controller, smart battery, and other parts.

Important

- Online updates require that the remote controller can access the internet.

7.1 Aircraft and Remote Controller Firmware Updates

1. Power on the remote controller and aircraft. Make sure that the aircraft and remote controller are already paired, both have a battery level of more than 25%, and the network connection of the remote controller is normal.
2. Open the Autel Enterprise App. If there is a version update available, you will receive a pop-up notification on the main interface of the App or you can manually select the update in the settings of the App.
3. Click "Update All", and the Autel Enterprise App will automatically download and update the firmware for the remote controller and aircraft.
4. After the update is complete, follow the pop-up instructions to restart the remote controller and aircraft.

Important

- During the update process, do not power off the aircraft and keep it connected to the remote controller.
- The update process is expected to take about 15 minutes (depending on the network that the remote controller is connected to).
- Do not move the command sticks before and after the update to ensure that the propellers remain stationary.
- Make sure that the aircraft and remote controller have sufficient storage space for the firmware update packages.
- During the update process, the firmware of the smart battery MDH_10000_23700 will also be updated to the latest version.

7.2 Aircraft Parts Maintenance

To ensure the optimal performance of the aircraft, regular maintenance is required for the aircraft parts. For more information, see "Maintenance Manual". If you have any questions, please contact Autel Robotics After-Sales Support.

Table 7-1 Aircraft Wearable Parts List

No.	Part	Quantity	Note
-----	------	----------	------

1	Propeller CW	2	
2	Propeller CCW	2	
3	Powered Motor	4	Replacement only during deep maintenance (every 900 service hours/every 3 years).
4	Rubber Protective Cover P-Port	2	
5	Rubber Protective Cover C-Port	1	
6	Rubber Protective Cover O-Port	1	
7	Rubber Protective Cover DEBUG	1	
8	Rubber Protective Cover TF	1	
9	(Bottom Port) Rubber Protective Cover	2	
10	Air Inlet Dust Filter	1	
11	Air Outlet Dust Filter	1	
12	Remote Controller Sticks	2	

Table 7-2 User-replaceable Parts List

No.	Part	Quantity	Part Number	Manufacturer
1	Propeller CW	2	EAN: 6924991122296 UPC: 889520202299	Autel Robotics
2	Propeller CCW	2		
3	Gimbal	1	EAN: 6924991126195 UPC: 889520206198	Autel Robotics
4	Smart Battery	1	EAN: 6924991126201 UPC: 889520206204	Autel Robotics

** Tip**

- You can independently contact Autel Robotics to purchase the aforementioned parts and follow the operation instructions for replacement.
- If the part that you want to replace is not listed in the above lists, please contact Autel Robotics. Failures caused by unauthorized disassembly and reassembly will not be covered by the warranty.

- For the service life of each part, see "Maintenance Manual".

7.3 Troubleshooting Guide

Tip

- The following troubleshooting measures are only limited to failures resulting from normal usage.
- For failures resulting from abnormal usage, please contact Autel Robotics for handling.

1. The remote controller cannot power on:
 - Check whether the remote controller has sufficient power. If the battery level is too low, it may result in a power-on failure after shutdown. In this case, fully charge the remote controller and then power it on.
 - Check whether the ambient temperature is suitable, as low temperatures can affect battery output performance, resulting in a power-on failure.
 - If the remote controller was accidentally powered off during an update, it may not power on normally. In this case, contact Autel Robotics.
 - If the remote controller has not been subjected to external impacts, liquid submersion, or other destructive behaviors and does not have any conditions mentioned above, it may have a hardware failure. In such cases, contact Autel Robotics.
2. The aircraft cannot power on:
 - Check whether the smart battery has sufficient power. If the battery level is too low, it may result in a power-on failure after shutdown. In this case, fully charge the smart battery and then power the aircraft on.
 - If the smart battery has sufficient power, check whether the battery makes proper contact with the aircraft's fuselage. Dirt or rust at the battery connector can lead to poor contact and must be cleaned before being re-inserted into the battery for power-on.
 - Check whether there are any missing or damaged metal contacts at the aircraft battery connector and the smart battery connector. If yes, please contact Autel Robotics.
 - Check whether the ambient temperature is suitable, as low temperatures can affect battery output performance, resulting in a power-on failure.
 - If the aircraft or the smart battery is unexpectedly powered off during a firmware update, it may result in a power-on failure. In this case, contact Autel Robotics.
 - When none of the above conditions apply, if the aircraft can power on after the smart battery is replaced, it may be a hardware failure of the smart battery; if the aircraft still cannot power on after the smart battery is replaced, it may be a hardware failure of the aircraft itself. In this case, contact Autel Robotics.
3. The aircraft reports a fault during startup self-check:
 - Check the gimbal camera. If the gimbal camera has no response, power off the aircraft, reassemble the gimbal camera, and then perform a startup self-check again.
 - If the gimbal camera successfully passes the self-check, but the aircraft still reports a fault, it may be a hardware failure of the aircraft. In this case, contact Autel Robotics.
4. There is no response from the remote controller when pairing it with the aircraft:
 - Confirm that the distance between the aircraft and the remote controller is within 50 centimeters.
 - Check whether there is a metal object, mobile device, signal interference device, or another remote controller nearby.
5. After the aircraft powers on, the motors do not start:

- Check whether the remote controller is paired with the aircraft.
 - Please confirm whether the arms are fully unfolded. The motors will not be powered if the arms are not fully unfolded.
 - Check whether the command sticks of the remote controller are functioning correctly and whether the remote controller has been correctly calibrated.
 - Check whether the aircraft's battery has sufficient power.
 - Check whether the aircraft's compass has been correctly calibrated.
 - If none of the above conditions apply, it may be a hardware failure of the aircraft itself. In this case, contact Autel Robotics.
6. After the motors start, the aircraft does not take off:
- Check whether the aircraft is in a No-Fly Zone.
 - Check whether the aircraft is placed on a flat surface.
 - Check whether there are obstacles near the aircraft and whether the obstacle avoidance system of the aircraft is enabled.
 - Please confirm that all smart batteries are installed, and the battery level difference between the two batteries is less than 12%.
7. The aircraft has shortened flight time:
- During flight, factors such as low ambient temperatures, flying against the wind, air turbulence, and carrying a mount all may lead to a shortened operating time of the aircraft.
 - Make sure that the smart battery has fewer than 200 cycles. During the normal use of the smart battery, the battery capacity naturally decreases over time.
8. The remote controller has unstable image transmission (e.g., image lag, image loss, or frequent disconnection):
- Check whether the remote controller's antennas are securely connected and whether they are adjusted to an appropriate direction.
 - Check whether there is any strong magnetic field or signal interference source near the aircraft and remote controller.
 - Confirm that the distance between the aircraft and the remote controller falls within the effective communication range and promptly reduce the flight radius if needed.
9. The gimbal camera automatically turns off during recording:
- Do not immediately remove the microSD card from the gimbal. Instead, restart the camera and wait for the video file to be stored as much as possible.
 - Check whether the memory of the microSD card is full; if it is, replace it with a new microSD card or transfer the media files.
 - Check whether the gimbal camera is securely connected to the aircraft. If the gimbal camera is not securely locked during installation, it may become loose due to flight vibrations, leading to poor contact and thus malfunctions.
10. When the aircraft is flying beyond the visual line of sight, image transmission fails:
- Enable auto-return to let the aircraft return to the home point.
11. What precautions should I follow when using the omnidirectional visual sensing system?
- Before flying, make sure that the visual sensing camera lens is clean and not blocked ("Omnidirectional" means that the system can sense objects in six directions, including front, rear, left, right, up, and down).
 - When flying, pay attention to the surrounding environment and safety prompt messages of the Autel Enterprise App.
 - Obstacles can be detected by checking the texture of their surfaces. The detection function cannot work properly for objects with no texture, repeated texture, a surface of pure color,

moving objects, or tiny objects. It also cannot work properly in a strong light or weak light environment.

12. The accurate landing/landing protection function cannot work properly:

- The accurate landing function can be implemented by the visual sensing lens on the rear of the aircraft. The camera detects the ground texture when the aircraft takes off or lands.
- However, if the ground does not have any texture or the visual sensing lens on the rear of the aircraft is damaged, this function cannot work properly.

13. The omnidirectional visual sensing system cannot work properly:

- Restart the aircraft and check whether the system can work properly this time.
- Check whether the ambient light illuminance is suitable for the operation of the visual sensing system.

14. When recording video during flight, the image tilts:

- Place the aircraft horizontally and keep it stationary. Use the "Gimbal Calibration" function in the Autel Enterprise App to calibrate the gimbal.
- If the problem persists, adjust the gimbal according to the instructions described in the "Gimbal Adjustment" section.

15. The camera lens of the aircraft is dirty:

- Gently wipe the lens with a lens cleaning cloth. It is recommended to use the lens cleaning cloth provided in the rugged case.

16. The aircraft or remote controller experiences unexpected shutdown during firmware updates:

- Restart the device. If it can power on normally, make sure that the device is sufficiently charged before proceeding with the update.
- If the device cannot power on, contact Autel Robotics.

17. Restore the factory setting of the remote controller:

- Click the "Maxitools" app on the main interface of the remote controller to perform a factory reset. Please back up important data before performing this operation.

18. Forcefully restart the remote controller after lag:

- Press and hold the power button on the top of the remote controller for more than 4 seconds to forcefully power off the remote controller.
- Restarting the remote controller during flight will trigger the lost action of the aircraft.

Appendix A Product Specifications

A.1 Aircraft

Aircraft	
Autel Alpha Weight	6250 g (Smart battery, Gimbal, and propellers included)
Autel Alpha Maximum Take-Off Mass (MTOM)	8100 g
Fuselage Dimensions	1206×982×272 mm (unfolded, incl. propellers) 780×568×272 mm (unfolded, excl. propellers) 454×266×255 mm (folded, excl. propellers)
Diagonal Wheelbase	Diagonal: 813 mm
Propeller Dimension	19inches
Propeller weight	55 g
Maximum Propeller Rotational Speed	6000 RPM
Maximum Ascent Speed	Slow: 3 m/s Smooth: 5 m/s Standard: 6 m/s Ludicrous: 15 m/s
Maximum Descent Speed	Slow: 3 m/s Smooth: 5 m/s Standard: 6 m/s Ludicrous: 10m/s
Maximum Horizontal Flight Speed (Windless Near Sea Level)	Slow: 3 m/s Smooth: 10 m/s Standard: 15 m/s (forward & backward), 10 m/s (sideways) Ludicrous: 23 m/s (forward), 18 m/s (backward), 20 m/s (sideways)
Max Service Ceiling Above Sea Level	4500 meters
Maximum Flight Altitude	800 meters (Altitude limit in the App)
Maximum Flight Time (Windless)	40 minutes
Maximum Range	25 km
Maximum Hovering Time	38 minutes

(Windless)	
Maximum Wind Resistance (Take-off and Landing)	12 m/s
Maximum Tilt Angle	Slow: 10° Smooth: 30° Standard: 30° Ludicrous: 36°
Maximum Angular Velocity	Pitch axis: 300°/s Heading axis: 120°/s
Operating Temperature	-20℃ to 50℃
Hot-swappable Batteries	Supported
IP Rating	IP55
Strobe	Integrated
Mid-flight Sensing	ADS-B receiver. UAT and 1090ES are supported.
GNSS	GPS+Galileo+BeiDou+GLONASS
Hovering Accuracy	Vertically ±0.1 m (when visual positioning works normally) ±0.3 m (when GNSS works normally) Horizontally ±0.15 m (when visual positioning works normally) ±0.3 m (when GNSS works normally)

Image Transmission

Operating Frequency	902 -928MHz*/5.15 - 5.25GHz* 5.17-5.25GHz** 2.400 – 2.4835GHz/5.725 - 5.850GHz * Only applicable to FCC regions. ** Only applicable to CE, UKCA regions.
Maximum Transmission Distance (Without Interference and Blocking)	FCC: 20km CE: 8km
Effective Isotropic Radiated Power (EIRP)	902 - 928MHz: <28dBm (FCC) 2.400 - 2.4835GHz: <29dBm (FCC/IC) ; <20dBm (CE/SRRC) 5.150 - 5.250GHz: < 18dBm (FCC) 5.170 - 5.250GHz: < 21dBm (CE)

	5.725 - 5.850GHz: <29dBm (FCC/IC/SRRC) ; <14dBm (CE)
Visual Sensing System	
Sensing Range	Forward: 0.2 - 31 m Backward: 0.2 - 26 m Sidewards: 0.5 - 45 m Upward: 0.2 - 45 m Downward: 0.2 - 45 m
FOV	Forward & Backward: 90°(H), 90°(V) Sidewards: 90°(H), 90°(V) Upward: 90°(H), 90°(V) Downward: 90°(H), 90°(V)
Operating Environment	Forward, backward, sideways, and upward: The surface has rich textures, under a sufficient lighting environment (>15 lux, normal indoor fluorescent lighting environment). Downwards: The surface is a diffuse material with a reflectivity >20% (walls, trees, humans, etc.), under a sufficient lighting environment (>15 lux, normal indoor fluorescent lighting environment).
Millimeter-wave Radar Sensing System	
Operating Frequency	60 - 64 GHz(FCC)/24.0 - 24.25 GHz(IC)
Effective Isotropic Radiated Power (EIRP)	60 - 64GHz: <20dBm(CE/FCC), <13dBm (MIC) 24.0 - 24.25GHz: <20dBm(IC/KC)
Sensing Range	60 - 64 GHz radar: Upward: 0.3 - 20 m Downward: 0.15 - 80 m Forward & Backward: 0.3 - 50 m Sidewards: 0.3 - 50 m 24 - 24.25GHz radar: Downward: 0.8 - 20 m
FOV	Horizontal (6dB): $\pm 45^\circ/\pm 22^\circ$ (60 GHz/24 GHz) Vertical (6dB): $\pm 35^\circ/\pm 20^\circ$ (60 GHz/24 GHz)
Operating Environment	60 GHz millimeter-wave radar sensing system: Supports all-weather obstacle avoidance for glass, water, wires, buildings, and trees in 6 directions. Its obstacle avoidance distance varies with the obstacle's ability to reflect electromagnetic waves

	and its surface size. 24 GHz millimeter-wave radar sensing system: Supports downward sensing, and its sensing range varies by the ground material. For example, the sensing range of cement ground is 20 meters, and the sensing range of grass with a thickness of more than 3 cm is less than 10 meters.
Aircraft Version Limitations*	To comply with (national) regional regulations, certain aircraft versions use a 24 GHz millimeter-wave radar in the downward direction and use 60 GHz radars in the forward, backward, left, right, and upward directions. In the 24 GHz aircraft version, the 60GHz radars in the forward, backward, leftward, rightward, and upward directions are disabled in the flight software at the factory, and only the 24GHz radar in the downward direction is enabled to assist in landing. The 24 GHz aircraft version only supports visual obstacle avoidance under good lighting conditions and does not support millimeter-wave radar obstacle avoidance at night.

Radar and Visual Sensing Systems	
Sensing Range	Forward & Backward: 0.3 - 50 m Sideways: 0.5 - 26 m Upward: 0.2 - 26 m Downward: 0.15 - 80 m (60GHz radar)
FOV	Forward & Backward: 90°(H), 90°(V) Sideways: 90°(H), 90°(V) Upward: 90°(H), 90°(V) Downward: 90°(H), 90°(V)
Operating Environment	Forward, backward, upward, and downward: Supports all-weather obstacle avoidance for various conditions, including water, forests, buildings and high voltage lines. At least one of the two conditions should be met: sufficient lighting or the obstacle has a strong reflection ability to electromagnetic waves. Sideways: The surface has rich textures, under a sufficient lighting environment (>15 lux, normal indoor fluorescent lighting environment).

A.2 Gimbal Camera

Technical Specifications	
Gimbal Model	DG-L35T
Dimension	144.7×133.3×158.4 mm
Weight	910g

IP Rating	IP55
Installation	Detachable (E-shape design)
Operating Temperature	-20°C to +50°C
Storage Temperature	-30°C to +70°C
Compatible Model	Autel Alpha, Autel Titan
Data Storage	Support microSD
Max. Expandable Memory	256GB
Recommended Memory Card List	UHS-I Speed Class U3 or V30, minimum write speed 30MB/s
Gimbal	
Mechanical Range	Pitch: -135° to 45° Roll: -60° to 60° Yaw: -90° to 90°
Controllable Range	Pitch: -90° to 30°
Stable system	3-axis mechanical gimbal (pitch, yaw, roll)
Max Control Speed (pitch)	100°/s
Angular Vibration Range	<0.005°
Wi-Fi	
Wi-Fi Protocol	802.11a/b/g/n/ac/ax, Support 2 x 2 MIMO Wi-Fi
Wi-Fi Operating Frequency	2.400 - 2.4835 GHz; 5.150 - 5.250GHz (CE/FCC)*; 5.725 - 5.850 GHz * Only applicable to CE, FCC regions.
Wi-Fi Transmitter Power (EIRP)	2.400 - 2.4835 GHz FCC: < 30dBm; CE/SRRC: < 20dBm 5.150 - 5.250GHz FCC/CE: <19dBm 5.725 - 5.850 GHz FCC/SRRC: < 19dBm; CE: < 14dBm
Zoom Camera	
Image Sensor	1/1.8" CMOS. Effective pixels: 8M
Lens	Focal length: 7.1 - 171.95 mm±5% 35 mm equivalent focal length: 34.7 - 838 mm Aperture: f/1.61(Wide)- f/5.19(Tele)±5%

	Focusing distance: 10 m ~ ∞
ISO Range	Normal mode ISO100 - ISO25600 Super Night ISO100 - ISO240000
Shutter Speed	Photo: 0.5s ~ 1/8000s Video: 1/30s ~ 1/8000s
Digital Zoom	1.4 - 35x continuous optical zoom, 35-560x hybrid zoom
Max Photo Resolution	3840×2160
Photo Format	JPG
Photo Taking Mode	Auto
Video Resolution	3840×2160 30P
Video Format	MP4
Max Bit Rate	30Mbps
Supported File Systems	exFAT/Fat32

Wide Angle Camera

Image Sensor	1/2" CMOS. Effective pixels: 48M
Lens	Focal length: 4.49 mm Equivalent focal length: 24 mm Aperture: f/2.8
ISO Range	Auto: ISO100 - ISO3200
Shutter Speed	Photo: 0.5s ~ 1/8000s Video: 1/30s ~ 1/8000s
Photo Size	4000×3000, 8000×6000
Photo Format	JPG
Photo Taking Mode	Auto
Video Resolution	4000×3000 25P
Video Format	MP4
Max Bit Rate	30Mbps
Supported File Systems	exFAT/Fat32

Infrared Thermal Imaging Camera 1

Image Sensor	Uncooled VOx Microbolometer
Lens	FOV: 42° Focal length: 13 mm Aperture: f/1.2 Focusing distance: 6 m ~ ∞
Sensitivity	≤50mK@f/1.0, 25°C
Pixel Pitch	12um
Wavelength	8 - 14um
Radiometric Measurement Method	Center measurement/Pot measurement/Rectangular measurement
Radiometric Temperature Range	-20°C to 150°C (high gain mode); 0 to 550°C (low gain mode)
Radiometric Measurement Accuracy	±3°C or reading ±3% (using the larger value) @ ambient temperature ranges from -20°C to 60°C
Accurate Temperature Measurement Distance	1 - 25 m
Digital Zoom	1-3.5x wide angledigital zoom
Temperature Alert	High and low temperature alarm thresholds, Reporting coordinates and temperature values
Palette	White Hot/Black Hot/Searing/ Rainbow/Grey/Ironbow/Cold and Hot
Photo Size	640×512
Photo Format	JPG (the images contain temperature information and are parsed by dedicated SDK and PC tools)
Photo Taking Mode	Auto
Video Resolution	640×512@25FPS
Video Format	MP4
Infrared Thermal Imaging Camera 2	
Image Sensor	Uncooled VOx Microbolometer
Lens	FOV: 12.3° Focal length: 45 mm Aperture: f/1.2 Focusing distance: 35 m ~ ∞
Sensitivity	≤50mK@f/1.0, 25°C
Pixel Pitch	12um

Wavelength	8 - 14um
Radiometric Measurement Method	Center measurement/Pot measurement/Rectangular measurement
Radiometric Temperature Range	-20℃ to 150℃ (high gain mode); 0 to 550℃ (low gain mode)
Radiometric Measurement Accuracy	±3℃ or reading ±3% (using the larger value) @ ambient temperature ranges from -20℃ to 60℃
Accurate Temperature Measurement Distance	4 ~ 50 m
Digital Zoom	1-3.5x wide angle digital zoom 3.5x tele optical zoom 3.5-56x tele digital zoom
Temperature Alert	High and low temperature alarm thresholds, Reporting coordinates and temperature values
Palette	White Hot/Black Hot/Searing/ Rainbow/Grey/Ironbow/Cold and Hot
Photo Size	640×512
Photo Format	JPG (the images contain temperature information and are parsed by dedicated SDK and PC tools)
Photo Taking Mode	Auto
Video Resolution	640×512@25FPS
Video Format	MP4
Laser Rangefinder	
Wavelength	905 nm
Measurement Accuracy	<400m: +1m, >400m: D×0.3% where D is the distance to a vertical reflecting plane
Measuring Range	10 - 2000 m

A.3 Remote Controller

Autel Smart Controller V3	
Material	PC+ABS
Dimensions	269×189×66 mm (antennas folded) 269×302×87 mm (antennas unfolded)

Weight	1194 g (protective case excluded) 1365 g (protective case included)
Operating Temperature	-20°C to 40°C
Storage Temperature	+15°C ~ +25°C (within a year) 0°C ~ +30°C (within three months) -20°C ~ +45°C (within a month)
Protection Rating	IP43
Internal Storage	128GB
microSD Extension	Not supported
Operating System	Based on Android 11
Application Installation	Supports the installation of third-party Android apps
Video Performance	4K@24FPS H.264/H.265 video smooth play
HDMI	Outputs up to 1080P@60FPS video
USB Type-C	Charging: supports PD/QC fast charging, up to 65W Data: USB3.1 Gen2
USB Type-A	Charging: 5V/2A Data: USB2.0
GNSS	GPS+Galileo+BeiDou+GLONASS
Wi-Fi Protocol	802.11a/b/g/n/ac Supports 2×2 MIMO Wi-Fi
Wi-Fi Operating Frequency	2.400 - 2.4835 GHz 5.725 - 5.850 GHz
Wi-Fi Effective Isotropic Radiated Power (EIRP)	2.400 - 2.4835 GHz: ≤24dBm (FCC); ≤20dBm (CE/SRRC) 5.725 - 5.850 GHz: ≤22dBm (FCC/SRRC); ≤14dBm (CE)
Bluetooth	Bluetooth 5.0
Bluetooth Operating Frequency	2.400 - 2.4835 GHz
Bluetooth Effective Isotropic Radiated Power (EIRP)	≤11dBm
Image Transmission	
Antenna	Dual antennas, 1T2R, detachable design
Operating Frequency	902 - 928 MHz* * Only applicable to FCC regions.

	2.400 - 2.4835 GHz 5.725 - 5.850 GHz
Effective Isotropic Radiated Power (EIRP)	902 - 928 MHz: ≤28dBm(FCC) 2.400 - 2.4835 GHz: ≤28dBm (FCC); ≤20dBm (CE/SRRC) 5.725 - 5.850 GHz: ≤28dBm (SRRC/FCC); ≤14dBm (CE)
Maximum Transmission Distance (Without Interference and Blocking)	FCC: 15 km CE/SRRC: 8 km
Display	
Type	TFT LCD
Dimensions	7.9 inches
Maximum Brightness	2000 nits
Resolution	2048×1536
Refresh Rate	60Hz
Touch Control	Supports 10-point touch
Battery	
Battery Type	Li-Po 3S
Rated Capacity	5800 mAh
Voltage	11.55V
Battery Energy	67 Wh
Charging Time	About 120 minutes
Battery Endurance	2.5 hours (Max brightness) 4.0 hours (50% brightness)
Battery Replacement	Not supported

A.4 Smart Battery

Smart Battery MDH_10000_23700	
Battery Dimension	200×76.8×50 mm
Operating Temperature	-20℃ to 50℃

Battery Type	LiPo 6S
Rated Capacity	10000mAh
Battery Energy	237Wh
Voltage	23.7V
Charging Voltage Limit	26.7V
Rated Charging Power	180W
Maximum Charging Power	260W
Weight	988 g
Battery Charge Temperature	+10°C ~ +45°C* (When the battery temperature is below 10°C, the battery stops charging and activates self-heating. When the battery temperature is above +45°C, the battery stops charging.)
Battery Storage	
Ideal Storage Temperature	+22°C ~ +28°C
Storage Temperature & Humidity	-10°C ~ +30°C, 65±20%RH
Battery Charger DF-CHARGER	
Power Input	100-240V~ 50/60Hz, 4.0A
Output Port 1/2	26.4V=7.0A
Total Power Output	184.8W Max

Appendix B Declaration of Conformity

Declaration of Conformity

Product: Autel Alpha

Model Number: MDH

Manufacturer's Name: *Autel Robotics Co., Ltd.*

Manufacturer's Address: *601,701,801,901, Block B1, Nanshan iPark, No. 1001 Xueyuan Avenue, Nanshan District, Shenzhen, Guangdong, 518055, China*

We, *Autel Robotics Co., Ltd.*, declare under our sole responsibility that the above referenced product is in conformity with the applicable requirements of the following directives:

RED Directive: 2014/53/EU

RoHS Recast Directive: 2011/65/EU

Conformity with these directives has been assessed for this product by demonstrating compliance to the following harmonized standards and/or regulations:

Safety	EN IEC 62368-1:2020+A11:2020
EMC	ETSI EN 301 489-1 V2.2.3 (2019-11) ETSI EN 301 489-3 V2.3.2 (2023-01) ETSI EN 301 489-17 V3.2.4 (2020-09) ETSI EN 301 489-19 V2.2.1 (2022-09) EN 55032:2015+A11:2020+A1:2020 EN 55035:2017+A11:2020 EN IEC 61000-3-2:2019+A1:2021 EN 61000-3-3:2013+A1:2019+A2:2021
Radio	ETSI EN 300 328 V2.2.2 (2019-07) ETSI EN 301 893 V2.1.1 (2017-05) ETSI EN 300 440 V2.2.1 (2018-07) ETSI EN 303 413 V1.2.1 (2021-04) ETSI EN 303 213-5-1 V1.1.1 (2020-03) ETSI EN 305 550-1 V1.2.1 (2014-10) ETSI EN 305 550-2 V1.2.1 (2014-10)
Health	EN IEC 62311:2020 EN 50665:2017
RoHS	2011/65/EU

The notified body, Bay Area Compliance Labs Corp, notified body number: 1313, RED Directive 2014/53/EU.

Signed for and on behalf of: *Autel Robotics Co., Ltd.*

Place: Shenzhen, China

Date: 2023-11-29

Name: Cheng Zhuanpeng

Position: Legal Representative

Signature: *Cheng Zhuanpeng*

Appendix I

Product Name	Product Mix. Description	Model	Description
Autel Alpha	Autel Alpha	MDH	Quad copter equipped with a L35T Gimbal
Battery	Lithium Ion Polymer Rechargeable Battery	MDH_10000_237 00	Drone Battery
Remote Controller	Autel Smart Controller V3	EF9-3	Drone Remote Controller
Adapter	AC/DC ADAPTER	DF-CHARGER	Drone Adapter
Software version	V9.5.5	N.A	Drone software version



FCC Caution:

Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

IMPORTANT NOTE:

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator& your body.

ISED Warning

This device complies with Innovation, Science, and Economic Development Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions:

- (1) this device may not cause interference, and
- (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d' Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :

- (1) l'appareil ne doit pas produire de brouillage, et
- (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

The device is compliance with RF exposure guidelines, users can obtain Canadian information on RF exposure and compliance. The minimum distance from body to use the device is 20cm.

Le présent appareil est conforme Après examen de ce matériel aux conformité ou aux limites d'intensité

de champ RF, les utilisateurs peuvent sur l'exposition aux radiofréquences et la conformité and compliance

d'acquérir les informations correspondantes. La distance minimale du corps à utiliser le dispositif est de 20cm.