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 "6.5.1 Flight Control Parameter Setting" 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.

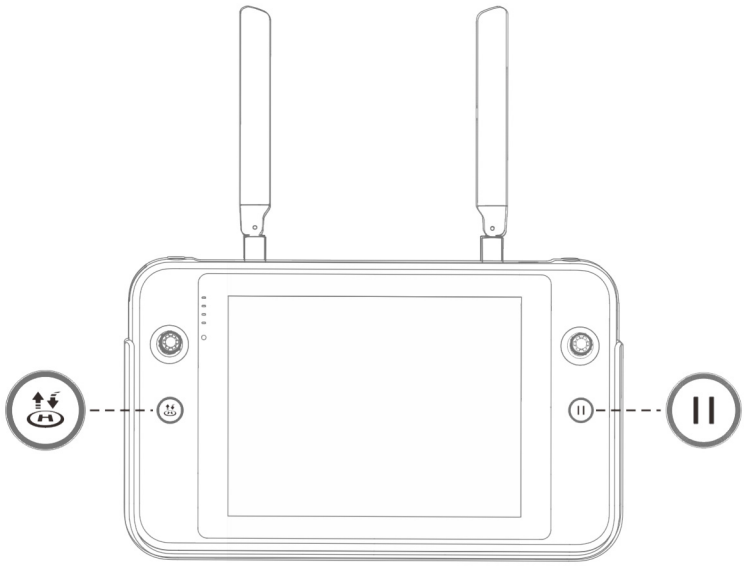


Fig 4-17 Take-off/Return-to-Home Button and Pause Button

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 Titan aircraft comes standard with two ABMC0 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 DF15_CHARGER.

Note

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

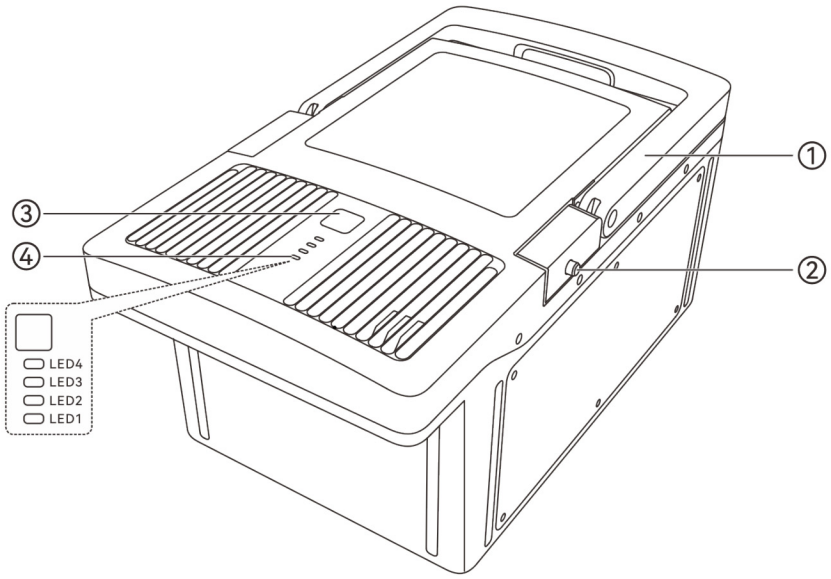


Fig 5-1 Battery Appearance

Table 5-1 Battery Appearance Details

No.	Name	Description
1	Battery Handle	After inserted the smart battery into the aircraft, as shown in the diagram, tighten the battery handle. The battery lock lever will secure the battery in the compartment.
2	Battery Lock Lever	When tightening the battery handle, the lock lever will lock the battery in the compartment. When lifting the battery handle, the lock lever will release the battery.
3	Power Button	When battery is powered off, short power the button for 1s to check the battery level.

4	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 In-place Detection

When the smart battery is been installed in place, the aircraft will detect and if the battery handle if not fastened, the aircraft motors can not be activated.

■ 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℃ (50℉) or higher than 45℃ (113℉) 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 interface facing battery compartment interface.
2. Slowly insert two smart batteries into the battery compartment one by one on the aircraft fuselage.
3. Fasten the battery handle to ensure it is tightly attached to the battery shell. At this time, the battery lock lever will extend to lock the battery in the battery compartment.

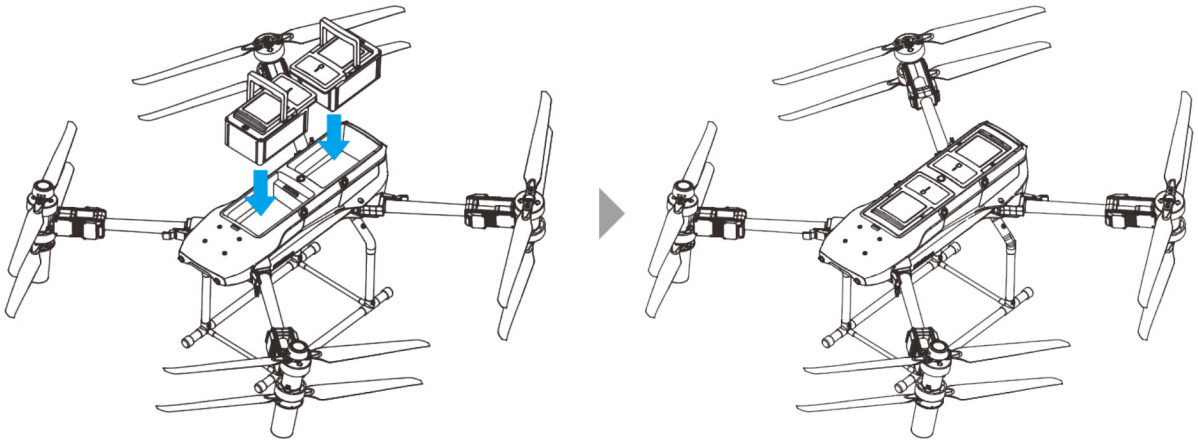


Fig 5-2 Install the Smart Battery

⚠ Warning
● When the battery handle if not fastened, the aircraft motors can not be activated.

- 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

Turn off the aircraft before removing the battery. Then conduct the opposite operation as described above.

■ 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. Hold the battery handle and take the battery out of the aircraft's battery compartment, then insert a fully charged battery and fasten the battery handle.
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.

⚠ Warning

- When hot swapping the battery, it is prohibited to operate the RC command stick to avoid any accidents or injury.

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.

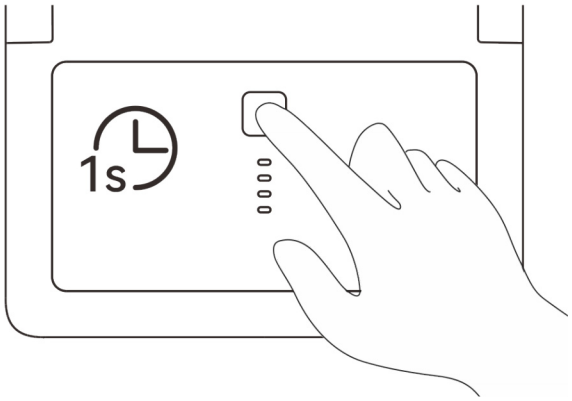
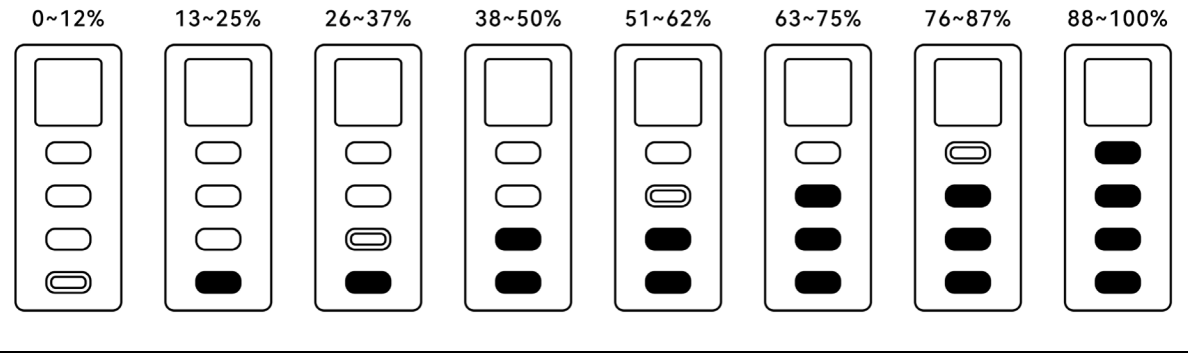


Fig 5-3 Checking Battery Level

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



: 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 “6.3 Status Notification Bar” and “6.5.5 Aircraft Battery” 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℃, 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℃ and 20℃ 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℃(50℉), the charger will supply power to the smart battery for self-heating. Once the battery temperature reaches 15℃, 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.

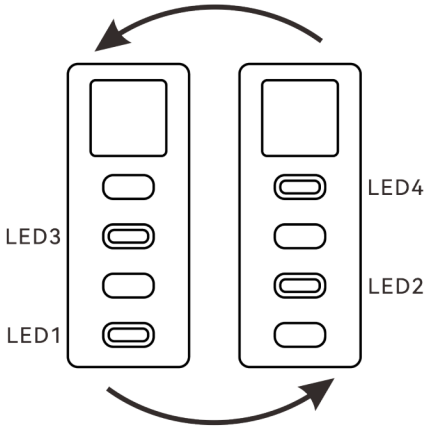


Fig 5-4 Self-heating State

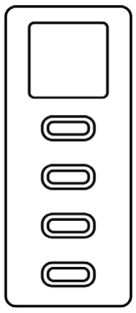


Fig 5-5 Heat Preservation State

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.
	⓪: Green light blinking ○: Off

⚠ Warning

- When the temperature of the smart battery is lower than -10℃ or higher than 75℃, 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℃, 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℃ to 35℃ 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 AC plug to the AC power supply (100-240 V~ 50/60 Hz).

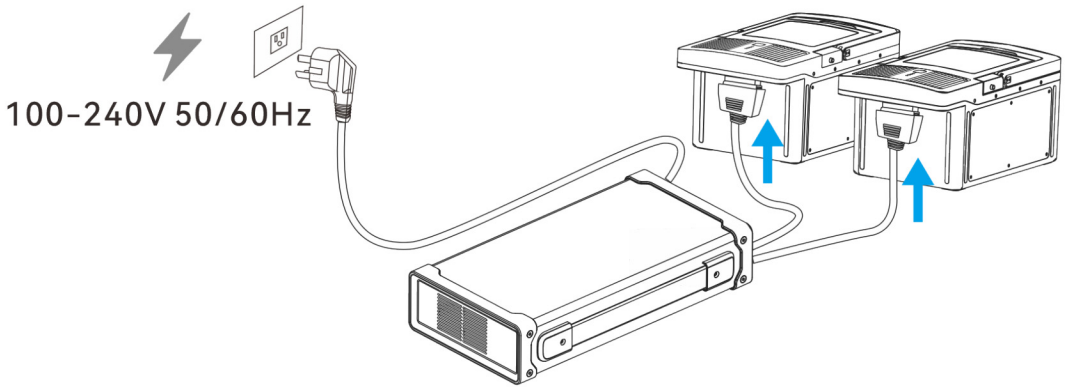
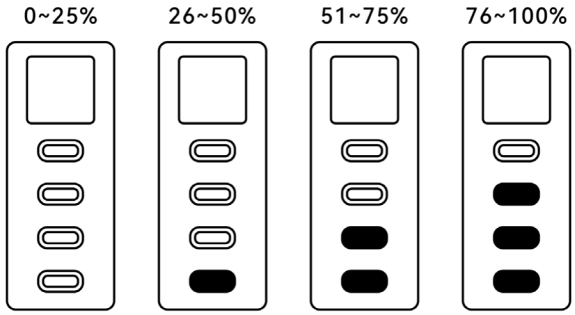


Fig 5-6 Use the Battery Charger to Charge the Smart Battery

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



: Green light is always on : Green light blinking

⚠ 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 200 minutes to fully charge two smart batteries 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℃ to 28℃, and the ambient humidity is 65%±20% RH.
The energy of the ABMC0 smart battery is 1090 Wh (capacity is 23000 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℃ (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.

Tip

- When the Autel Titan aircraft is flying without a gimbal camera, the camera function will not be displayed in the Autel Enterprise App, only the image transmission image of the forward visual camera will be displayed. If users want to take photos or record videos, please install the gimbal camera.
- The gimbal camera is not included in the standard package and users can purchase according to the needs. Any query, please contact Autel Robotics for details.
- The Autel Titan only supports DG-L35T gimbal camera for the moment. For detailed specification, see "3.7 Cameras*" in Chapter 3.

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.

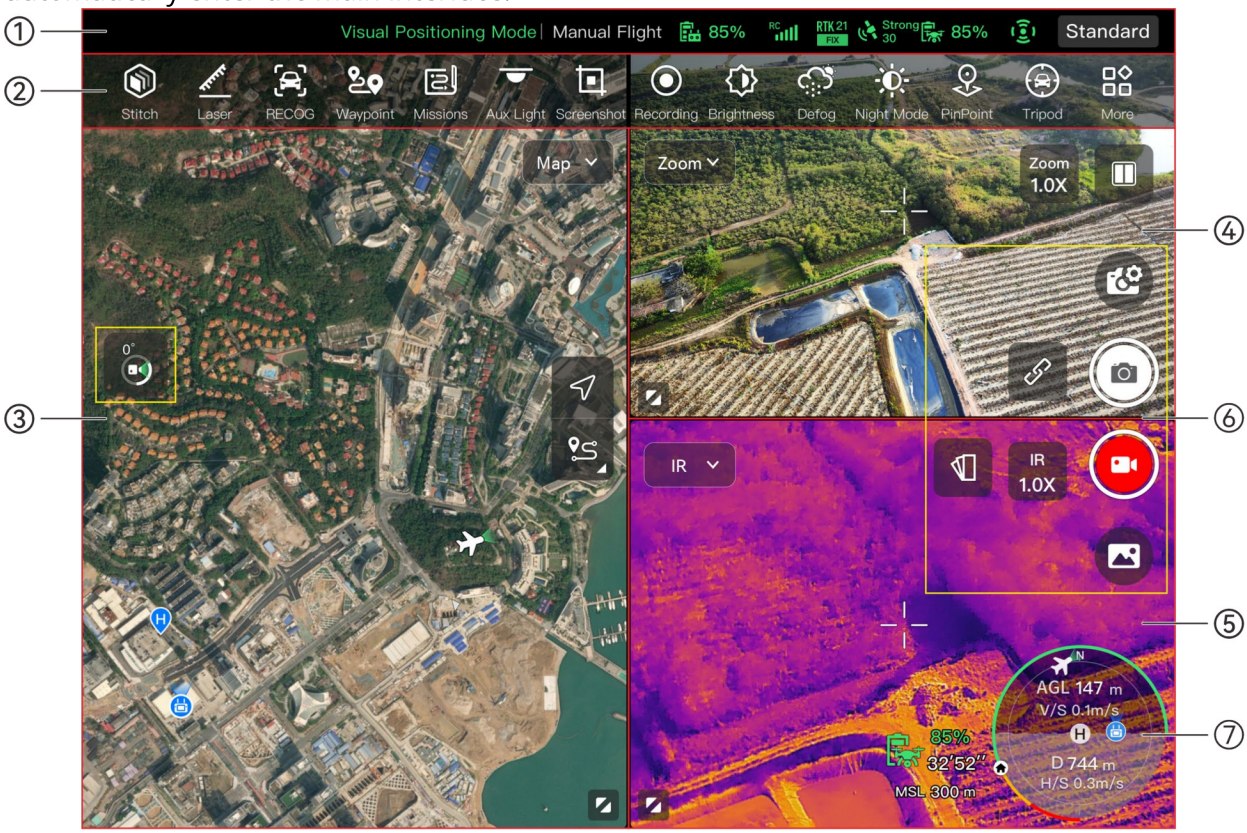


Fig 6-1 Main Interface of the Autel Enterprise App

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 status, 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.

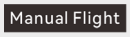
Tip

- 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 Status	Displays the current flight status. There are 3 modes: GNSS mode, visual positioning mode, and ATTI mode. For more information, see "3.8.1 Flight Status" 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	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.