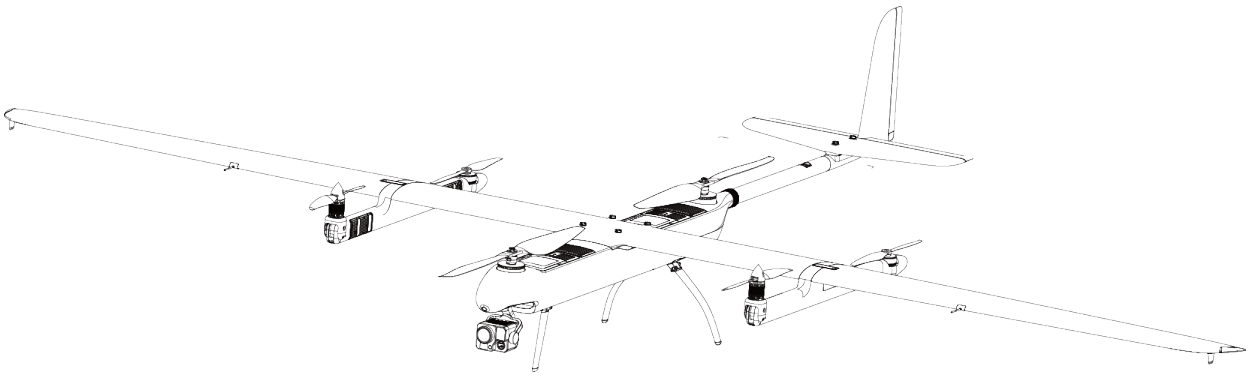
Dragonfish Series

Dragonfish-25
eVTOL Fixed-Wing Aircraft

Flight Manual

V1.1.1



AUTEL ROBOTICS

Copyright

Trademark Information

Reading Assistance

- This manual is an electronic PDF document that supports high-resolution printing.
- If you are using a PDF reader such as Adobe Reader or Microsoft Edge to read this manual, press Ctrl+F on Windows or Command+F on Mac to search for keywords.
- View the content structure in the table of contents and click on titles to navigate to the respective pages.

Update Log

Version	Date	Content Updated
V1.0.0	2025.05	First issue
V1.0.1	2025.09	Flight mission interface updated; delete DG-L20T.
V1.1.1	2025.12	Optimize the description and format.

Thank you for purchasing and using the Dragonfish-25 aircraft (hereinafter referred to as “aircraft”) from Autel Robotics. Relevant user documents for this product are provided in electronic form along with the product, and download links are provided in this manual. Before using this product, please carefully read the operation steps and precautions in this manual, so that you can quickly understand the characteristics and usage methods of this product, so as to ensure safe use of the product.

	• The final interpretation right of this document and all related documents of this product belongs to Autel Robotics. • This document is subject to update without notice.

Legend

The following symbols are used in this manual to draw the user's attention to important safety and operating information. Please be sure to follow the notes or requirements under each symbol, otherwise, it may affect the safety features of the product or cause personal injury.

Symbol	Definition
	Warning: Alerts to a potentially hazardous situation.
	Important: Reminds the user to pay attention to a point.
	Remarks: Supplementary information.
	Tips: Quick tips to get the best possible experience.

Read Before Your First Flight

To ensure safe use of the aircraft, Autel Robotics provides you with the following documents.

- Disclaimer and Safety Operation Guidelines
- Quick Start Guide
- Flight Manual
- Smart Battery Quick Start Guide
- Maintenance Manual

Getting Tutorial Videos and User Documents

You can scan the QR codes below or visit the following links to access tutorial videos and user documents or download relevant software for the aircraft:

To download the user manual, please visit:

https://manuals.autelrobotics.com/?dir=/eVTOL/Dragonfish-25/English/

Manual Guide

This manual contains the following chapters. You can refer to the corresponding chapters for the desired information.

Chapter	Chapter Overview
Product Overview	This chapter introduces the main functions of the aircraft.
Flight Safety	This chapter introduces the flight environment, wireless communication requirements, and important flight safety features of the aircraft.
Product Details	This chapter introduces details of the aircraft, gimbals, Autel smart antenna transmission and the ground control station (remote controller).
Flight Operations	This chapter introduces the whole flight operations, includes pre-flight operations, during-flight operations and post-flight operations.
Firmware Updates and Maintenance	This chapter introduces how to perform firmware updates and routine maintenance for the aircraft.
Appendix A	This chapter provides technical specifications for the aircraft and its accessories.

Disclaimer

To ensure the safe and successful operation of this product, please read and fully understand all user documents listed above and strictly follow the operating instructions and steps described in this manual. Store the aircraft and its accessories out of the reach of children and pets. If you do not abide by the Safety Operation Guidelines, Autel Robotics shall not be responsible for any product damage or personal and property loss during use, and shall not provide any warranty service. Never modify the product using any incompatible component or in any way that does not conform to the official instructions of Autel Robotics. Please make sure that the operations you perform do not endanger the personal or property safety of yourself or those around you. By starting to use this product, you agree that you have read and accepted all terms related to this product. You undertake to be responsible for your own actions and all consequences arising therefrom. You undertake to use this product only for legitimate purposes and agree to these terms and any relevant policies or guidelines that Autel Robotics may establish.

Important

- When unboxing the product for the first time, carefully check the aircraft and other accessories included in the packing box according to the “Packing List”.
- The content of this manual will be updated from time to time based on the function updates of the product.
- Please be aware that in the absence of flight logs from Autel Voyager App and the flight logs stored inside the aircraft, Autel Robotics may not be able to analyze the causes of product damage or accidents and provide after-sales service.

Warning

- Using the aircraft of Autel Robotics involves certain safety risks. Do not allow minors to operate the aircraft.

End Use Statement

This product may be subject to export control laws in China, the U.S, EU or other countries, which can only be authorized for civil (not military) use in sale, export or domestic transfer. Users need to confirm the product will not be used in the following situations, otherwise he or she will assume all losses caused by usage in such situations and legal responsibility on their own:

1. any military end use;
2. used for nuclear weapons, biological or chemical weapons or missiles that carry those weapons;
3. export or re-export or transfer it to any entity or person sanctioned by China, U.S, EU or any other government with jurisdiction;
4. export, re-export or transfer it to Cuba, Iran, North Korea, Syria, Crimea, Sevastopol and other areas under embargo;
5. any device or equipment that supports monitoring purpose.

Warranty Policy

Autel Robotics guarantees users who purchase products through its official authorized channels that:

Under normal use, the Autel Robotics products you purchase will be free from material and workmanship defects during the warranty period.

If you can provide a valid purchase receipt, the warranty period of this product is calculated from the midnight of the next day after you receive the product.

If you cannot provide a valid purchase receipt, the warranty start date will be postponed by 90 days from the date of manufacture indicated by the product's serial number or as defined by Autel Robotics.

Tips
• For the after-sales policy of the product, please visit: **https://www.autelrobotics.com/service/policy/.**

After-Sales Support

If you have any questions or concerns about our products, please contact Autel Robotics customer support:

Hotline: (844) MY AUTEL or (844) 692-88 35

Maintenance Service

If your equipment needs to be inspected or repaired, please contact Autel Robotics through the following methods:

Email after-sale@autelrobotics.com or support@autelrobotics.com.

Call Autel Robotics customer support at (844) MY AUTEL or (844) 692-88 35.

Contact dealers authorized by Autel Robotics.

Important
• All data stored on the product may be erased during the repair process. To avoid data loss, please back up important files in your aircraft or remote controller before the product is under warranty.

Company Information

Manufacturer: Autel Robotics Co., Ltd.

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

Official Website: https://www.autelrobotics.com

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Chapter 1 Product Overview

1.1 Introduction

- **Aircraft**

  The Dragonfish-25 aircraft (hereinafter referred to as the “aircraft”) is a vertical takeoff and landing fixed-wing aircraft with a total weight of 29 kg (excluding the gimbal camera), a maximum payload of 10 kg, and a full battery life of up to 240 minutes. The aircraft adopts a unique tilt-rotor design, combining the advantages of both multi-rotor and fixed-wing flight modes: it uses multi-rotor mode for vertical takeoff and landing, adapting to various terrain conditions; during level flight, it switches to fixed-wing mode, balancing flight speed and long endurance.

  The aircraft's body features a modular design, enabling rapid assembly in 5 minutes. The aircraft incorporates multiple redundancy designs for safety and reliability. It has built-in dual battery slots, high-performance dual-engine RTK, and conventional GNSS positioning modules to support high-precision navigation. It includes an ADS-B receiver that can detect the status of manned aircraft and provide alerts through Autel Voyager App, facilitating safe operations and collision avoidance. The aircraft supports various gimbals and supports quick assembly and quick disassembly.

  The aircraft has excellent environmental adaptability and can operate in temperatures ranging from -20°C to 50°C.

- **Remote Controller**

  The Dragonfish ground control station (hereinafter referred to as the “remote controller”) is designed to control the flight of the aircraft, has strong anti-interference capabilities. After matching and connecting to the aircraft and tracking antenna, the remote controller can achieve stable transmission of real-time videos from the gimbal camera to the display screen. The remote controller is equipped with multiple function buttons, enabling quick aircraft control and gimbal camera operation.

  The remote controller is equipped with a 9.7-inch touch screen, with 2048*1536 ultra-high-definition resolution. The highest brightness is up to 1000cd/m², with a built-in 128GB memory, and the battery life is up to 4.5 hours. It adopts a customized Android system that supports the installation of third-party apps and offers functions such as satellite-based positioning, network connection, and HDMI output.

- **Autel Smart Antenna Transmission System**

  Autel smart antenna transmission system (hereinafter referred to as “tracking antenna”) is designed for this aircraft, integrating omnidirectional antenna, directional antenna, base station main body, RTK antenna and other function modules. In long distance application scenarios, Autel smart antenna transmission system can improve the transmitting and receiving capability of radio signal and enhance anti-interference performance.

  Autel smart antenna transmission system adopts quick-assembly structural design and is portable and easy to use. It can be used with a tripod in a place for routine operation. It can also be placed on vehicle, boat and other mobile platform, offering farther, more flexible inspection and searching mission and thereby leveraging industrial application values of the aircraft.

The video transmission range reaches 45 km when the Autel smart antenna transmission system operates in collaboration with the remote controller and the aircraft.

Tips

- For details of the total weight and maximum takeoff weight, see "**A.1 Aircraft**".
- The flight duration of the aircraft is measured in a laboratory environment and is for reference only. The actual flight duration may vary depending on factors such as the environment and flight mode.
- The protection level of the aircraft is not permanent and may experience varying degrees of failure as components age and wear. Regular maintenance of the aircraft is required according to Autel Robotics' requirements.
- The actual battery life may vary in different scenarios.
- The factory default setting is for the aircraft, tracking antenna, and remote controller to be used in combination. If only the remote controller and the aircraft are used in combination, the transmission distance will be limited, with a 5.8G data transmission distance of only 1 km and an image transmission distance of 8-10 km.

Warning

- If multiple aircrafts are flying in an area at the same time, please keep an appropriate air distance to avoid any accidents.

1.2 Product Acceptance Checklist

After unboxing the product, please check whether the actual items match the items describedin the packing list and carefully inspect the appearance of the aircraft and all accessories. If any missing or damage is found, please contact Autel Robotics After-Sales Support or authorized dealers promptly.

For the detailed items of packing list, see ***Quick Start Guide***.

1.3 UAS Introduction

Before first flight, please perform a comprehensive inspection of the UAS to ensure that all components meet the following requirements. A complete UAS consists of three parts: the aircraft, the tracking antenna and the remote controller. The relevant requirements and explanations are as follows:

- **Aircraft Components and Payload**

Please be noted that a complete aircraft includes the fuselage, gimbal camera, propellers, and batteries. Any damage or missing of these components may result in a malfunction.

Table 1-1 Component List

Item	Product Info	Manufacturer	Note
Aircraft	Max. Dimension: 2735×4566×823.6 mm (excluding propeller) EAN: 6924991141389 UPC: 889520221382	Autel Robotics	Standard configuration
Smart Battery	/	Autel Robotics	Standard configuration
Fuselage propeller	36X11.5, 47.24 inches	Autel Robotics	Standard configuration
Rear propeller	18X7.2, 18 inches	Autel Robotics	Standard configuration
Tilting propeller	16x12, 16 inches	Autel Robotics	Standard configuration
Gimbal Camera	DG-T5 or DG-T5L	Autel Robotics	Included one of them

Tips

- All the above components have passed Autel Robotics safety and compatibility tests, users can purchase and use accordingly.
- In case of adding any payload before flight, please evaluate the check the mounting weight and position reasonably. More details, see "**2.5 Declaration of Maximum Take-off Mass**".

■ Remote Controller Components & the App

A complete remote controller includes the controller body (equipped with a functional touchscreen and buttons), sticks, and antennas. Any damage or missing of these components may result in a malfunction. Autel Voyager App, serving as the flight application software that controls the aircraft, should be maintained to ensure comprehensive control over the UAS.

Table 1-2 Remote Controller Components List

Item	Operating System	Manufacturer	Note
Dragonfish Ground Control Station	Android 7.0	Autel Robotics	Includes sticks and antennas.

Table 1-3 Firmware and Software Version Details

No.	Item	Release Version	Note
1.	Video Transmission	V1.0.1.89 or later	/
2.	MCU	V2.0.0.5 or later	/
3.	Remote Controller	V1.0.1.89 or later	Base on Android 7.0
4.	Voyager	V3.4.1.47 or later	Flight Control Software

Table 1-4 List of Pre-installed Apps on the Remote Controller

NO.	Pre-installed App	Note
1.	Calculator	System Software
2.	Calendar	System Software
3.	Clock	System Software
4.	Files	System Software
5.	Gallery	System Software
6.	Chrome	System Software
7.	Settings	System Software

NO.	Pre-installed App	Note
8.	Maxitools	System Software
9.	Google Pinyin Input	System Software
10.	Android Keyboard (AOSP)	System Software
11.	CX File Explorer	System Software

Tips

- The pre-installed Apps mentioned are the basic application for the remote controller. Users also have the option to install third-party software if desired.
- In practical use, **software versions are updated periodically**. The actual version shall be prevailed.

■ Autel Smart Antenna Transmission System

Please be noted that a complete Autel smart antenna transmission system includes the directional antenna main body, omnidirectional antenna, RTK antenna and tripod. Any damage or missing of these components may result in a malfunction.

Table 1-5 Base Station Component List

NO.	Item	Quantity	Note
1.	Directional antenna main body	1 pc	Included
2.	Omnidirectional antenna	1 pc	Included
3.	RTK antenna holder	2 pcs	Included
4.	Tripod	1 pc	Included
5.	RTK antenna	2 pcs	Included
6.	Battery	4 pcs	Included

NO.	Item	Quantity	Note
7.	Power adapter/cable	1 set	Included

Tips

- The remote controller, tracking antenna and the aircraft have all been upgraded to the latest versions before shipment.
- When there's any prompt for updates, please follow the instructions to update accordingly to address any issues and to enjoy the new features. Users also have the option to temporarily pause updates; however, this won't affect the existing functions.

■ **Ground Control Device**

Excepting being paired with tracking antenna and remote controller, the aircraft can be also used with base station so as to remotely control the communication of the aircraft.

Table 1-6 Aircraft Remote Controller Device Support List

Control device Information	Ground Control Station	Autel Smart Tracking Antenna	Base Station
Part number (EAN)	6924991123699	6924991124016	6924991127680
Part number (UPC)	889520203692	889520204019	889520207683
Manufacturer information	Autel Robotics	Autel Robotics	Autel Robotics
Controlling software	Autel Voyager App	Autel Voyager App	Autel Voyager App
Software version requirements	V3.4.1.26 or above	V3.4.1.26 or above	V3.4.1.26 or above
Aircraft firmware version	V12.03.41 or above	V12.03.41 or above	V12.03.41 or above
Additional information	Standard configuration	Standard configuration	Optional

Tips

- Please note that base station is not included in the aircraft kit. Users need to purchase it separately.
- When remotely controlling the aircraft flight through the above device, ensure that the control software version meets the above requirements.

1.4 Communication Frequency Introduction

The frequency bands of the aircraft comply with regulatory requirements worldwide. The relevant used frequency bands are listed in the table below.

Tips

- After the aircraft is paired with the remote controller, the frequency bands between them will be automatically controlled by Autel Voyager App based on the GNSS locating information received by the aircraft. This is to ensure compliance with local regulations regarding frequency bands.
- Before flight, please ensure that the aircraft receives a strong GNSS signal after powering on. This allows Autel Voyager App to receive the proper communication frequency band.
- When users adopt ATTI function and the aircraft cannot receive GNSS locating information , the wireless communication frequency band between the aircraft and ground control station (remote controller and tracking antenna) will default adopt 2.4G band and 5.8G band.

Table 1-7 Global Frequency Bands Used (Video Transmission)

Classification	Detailed frequency	Supported country and region
900M	902 - 928MHz	■ US (FCC) ■ Canada (ISED)
2.4G	2.400 – 2.476GHz	■ Chinese Mainland (SRRC)
2.4G	2.400 – 2.4835GHz	■ US (FCC) ■ Canada (ISED) ■ EU (CE) ■ Australia (RCM)

Classification	Detailed frequency	Supported country and region
5.2G	5.15 – 5.25GHz	■ US (FCC) ■ Australia (RCM)
5.8G	5.725 - 5.829GHz	■ Chinese Mainland (SRRC)
5.8G	5.725 - 5.850GHz	■ US (FCC) ■ Canada (ISED) ■ EU (CE) ■ Australia (RCM)

Table 1-8 Global Frequency Bands Used (Wi-Fi)

Classification	Supported Country and Region
5.8G (5725 – 5829MHz)	■ Chinese Mainland (SRRC)
5.8G (5725 – 5850MHz)	■ US (FCC) ■ Canada (ISED) ■ EU (CE) ■ Australia (RCM)

Remarks

- Some countries and regions have strict restrictions on the use of radio communication frequency bands. It is crucial to use them legally, and any modification of communication modules is strictly prohibited.
- If flying in any countries not listed in the above table, please consult the local communication management authorities to ensure that the aircraft communication frequency bands comply with local regulatory requirements.
- Please note that UAS will automatically match legal frequency bands according to GNSS positioning.

Chapter 2 Flight Safety

Read and understand the entire manual carefully to ensure the safe and correct use of the aircraft. Before takeoff, perform the following:

- Before engaging in actual outdoor flights, it is essential to undergo relevant basic flight training (such as watching instructional videos, receiving guidance from professionals, etc.) to familiarize oneself with the functions and characteristics of the aircraft and remote controller.
- Please familiarize yourself with all local laws and regulations concerning civilian unmanned aerial vehicles. Choose an appropriate flight environment, set a reasonable flight altitude, and conduct legal flights in accordance with relevant flight requirements and restrictions. Using the aircraft in unsuitable flight environments may pose legal risks.
- Be sure to read the “Disclaimer and Safety Operation Guidelines” to understand relevant safety precautions.

2.1 Legal Use Notice

Upon the initial unboxing, please adhere to the legal requirements of the country or region where you are currently located and complete the real-name registration of the aircraft.

2.1.1 Chinese Mainland

- According to the requirements of the Civil Aviation Administration of China's “***Management Regulations for the Real-Name Registration of Civil Unmanned Aerial Vehicles***,” owners of civilian drones must register their real names on the “Comprehensive Management Platform for Civil Unmanned Aerial Vehicles” (**https://uom.caac.gov.cn**) after purchase and affix the QR code registration mark on the aircraft. Failure to register with real names and affix the registration mark may result in penalties imposed by regulatory authorities.
- The operation of this product by individuals under the age of 18 is prohibited by Autel Robotics. The pilots are required to obtain an UAV operation license according to the requirements of the Civil Aviation Administration. Application website: **https://uom.caac.gov.cn**.
- It is recommended to read the “Interim Regulations on the Management of Unmanned Aerial Vehicle Flights” for more detailed regulatory requirements before conducting flights.

2.1.2 The U.S.

- Before using a drone, please complete the real-name registration on the FAA website (**https://faadronezone-access.faa.gov/#/**) (registrants must be 18 years old or above). Failure to do so may result in regulatory and criminal penalties.
- The Federal Aviation Administration (FAA) in the United States may impose civil fines of up to $27,500. Criminal penalties may include fines of up to $250,000 and/or a maximum of three years in prison.

2.1.3 Canada

- Drone pilots must be 14 or older and always carry a valid drone pilot certificate while operating their drone. A valid drone pilot certificate is a printed or electronic document issued by Transport Canada. No other form of certification will be accepted. For details about how to get a drone pilot certificate in Canada, refer to the following link:
- https://tc.canada.ca/en/aviation/drone-safety/drone-pilot-licensing/getting-drone-pilot-certificate
- Before flight, please register your drone through the following portal:
- https://tc.canada.ca/en/aviation/drone-safety/drone-management-portal
- You can only fly the aircraft in following operating environments:

  1. In controlled airspace. For details about the controlled airspace, please refer to relevant Canadian law:

  https://tc.canada.ca/en/aviation/drone-safety/learn-rules-you-fly-your-drone/choosing-right-drone

  2. Near people. For details about flying a drone near people, please refer to relevant law:

  https://tc.canada.ca/en/aviation/drone-safety/learn-rules-you-fly-your-drone/choosing-right-drone
- Violation of relevant laws and regulations may incur penalty of up to 3000 dollars (for person) or 15000 dollars (for company) or jail time.

⚠ Warning
• Please do not fly over people, which may cause physical damage to people around.

2.1.4 The EU

- Drone operators/owners must register with the National Aviation Authority (NAA) of the Member State where they reside. (**https://www.easa.europa.eu/en/domains/civil-drones/naa**).
- This product is not a toy and should not be used by children under the age of 18.

2.1.5 Other Countries and Regions

Before flying, please consult local legal professionals or aviation authorities to obtain information on laws, regulations, and policies regarding civilian unmanned aerial vehicles. Follow the relevant guidelines to undergo legal registration.

2.2 Flight Operation Regulations

Before flying, it is crucial to understand and adhere to the following flight operation regulations. Violating these regulations may lead to severe consequences or even legal consequences.

- Operating the aircraft while under the influence of alcohol, drugs, medication-induced impairment, dizziness, fatigue, nausea, or any other compromised physical or mental condition is strictly prohibited.
- Avoid flying near manned aircraft and ensure that the aircraft's flight does not impact larger manned aircraft on their flight paths. Remain vigilant, steer clear of other aircraft, and land immediately if necessary.
- Do not fly in areas prohibited by local regulations without obtaining authorized permits. Prohibited areas may include airports, borderlines, major cities and densely populated areas, large event venues, emergency situations (such as forest fires), and sensitive building facilities zones (such as nuclear power plants, power stations, hydroelectric plants, prisons, traffic arteries, government buildings, and military facilities).
- Prohibit the use of the aircraft at large event venues, including but not limited to sports stadiums and concerts.
- Avoid flying in airspace exceeding the regulated altitude.
- Do not use the aircraft to carry any illegal hazardous materials.
- Ensure a clear understanding of the type of flight activity (e.g., recreational, official, or business). Obtain permits from relevant authorities before flying. If necessary, consult with local legal professionals for detailed definitions and explanations of flight activity types.
- When using the aircraft for filming, respect the privacy of others. It is strictly forbidden to use this product for any unauthorized surveillance activities, including but not limited to monitoring of individuals, groups, events, performances, exhibitions, or buildings.
- Please note that recording or photographing others, groups, events, performances, exhibitions, etc., without legal authorization may violate copyright, privacy rights, or other legal rights of others. Therefore, it is essential to thoroughly understand and comply with local laws and regulations before use.
- Do not use the aircraft for any illegal or improper activities, including but not limited to espionage, military operations, illegal investigation work, infringement of others' privacy rights or property rights, etc.

2.3 Flight Environment Requirements

- Do not fly in severe weather conditions such as strong winds, snow, rain, heavy fog, dust storms, extreme cold, or extreme heat. The aircraft has a maximum wind resistance of 12 m/s in fixed wing mode, while 10 m/s in multi-rotor mode.
- Please use the aircraft within the temperature range of -20°C to +50°C and fly at an altitude below 5000m. When flying in a low temperature environment, ensure that the fuselage of the aircraft is free of snow and the blades are not frozen.
- Ensure the aircraft takes off from and lands on open, unobstructed, and flat ground. Keep a safe distance from crowds, surrounding buildings, trees, etc., and control the aircraft within visible range to ensure flight safety.
- Due to poor lighting conditions, GNSS signal loss, narrow spaces, etc., some functions of the aircraft may be restricted. Always be aware of the surrounding environment and maintain safe control of the aircraft.
- For night flights, turn on the navigation light for flight safety.

- Do not take off from or land in flammable and explosive environments.
- Do not take off from or land on sandy surfaces to prevent sand particles from affecting the motor service life.
- When using the aircraft in disaster-stricken areas after events such as fires, explosions, lightning, storms, tornadoes, heavy rain, floods, earthquakes, sandstorms, etc., pay special attention to the safety of takeoff and landing points and changes in the surrounding environment. Prioritize personal safety.
- Keep the aircraft away from steel structures, iron ore mines, etc., to avoid interfering with the compass of the aircraft.
- Unless equipped with Autel smart antenna transmission system and set "**Work Mode**" to "**Mobile**" in Autel Voyager App, do not take off and land aircraft on a moving platform, such as moving vehicles and ships.

2.4 Wireless Communication Requirements

- Stay away from areas with strong electromagnetic interference, such as radar stations, microwave stations, mobile communication base stations, drone interference devices, etc., and maintain a distance of at least 200m.
- Stay away from UAV jamming equipment at least 2000m. When unavoidable, the UAV jamming equipment and the aircraft cannot work at the same time.
- Exercise caution when flying near electromagnetic interference sources and continuously monitor and assess the stability of the remote controller's video transmission signal and image. Common sources of electromagnetic interference include, but are not limited to, high-voltage transmission lines, high-voltage substations, mobile communication base stations, and TV broadcast signal towers. If significant interference occurs in these places during flight operations, the aircraft may not be able to fly normally, so return and landing should be done promptly.
- Choose open and spacious areas or high grounds for flying. Tall mountains, rocks, urban structures, and forests may obstruct the GNSS signal and the aircraft's video transmission signal.
- It is recommended to turn off unnecessary Wi-Fi and Bluetooth devices in the vicinity to avoid interference with the remote controller signal.

2.5 Declaration of Maximum Take-off Mass

During flight operations, make sure that the actual take-off mass of the aircraft does not exceed the maximum take-off mass (MTOM) declared for the aircraft. Exceeding this limit can lead to safety accidents. For detailed data, see "**A.1 Aircraft**".

The actual take-off mass of the aircraft consists of the aircraft's mass and the mount mass.

Remarks
• The aircraft's mass comprises the mass of the fuselage, gimbal camera, propellers, and battery. The weight of gimbal camera may vary from different models. If you change the gimbal camera with a different model, reevaluate the actual takeoff

weight of the aircraft through weighing.

- Payloads include functional module mounts and material mounts, among others. When users add payloads to the aircraft, it is essential to reevaluate the actual takeoff weight of the aircraft through weighing.
- The payload weight should adhere to the following rule: Payload Maximum Weight ≤ Maximum Takeoff Weight - Aircraft Weight.

Tips

- Before adding any mount, make sure that the mounting center of gravity should be located on the axle wire of the aircraft as far as possible, and should not block the bottom sensor and exceed the height of the landing gear, and the central position after mounting trim is within a reasonable range (the center of gravity is 853-866 mm away from the aircraft's nose).

2.6 Aircraft Mode Switching

The aircraft undergoes two mode-switching processes throughout the entire "takeoff—level flight—landing" sequence:

1. Vertical takeoff using the multi-rotor mode switches to horizontal flight using the fixed-wing mode.
2. Horizontal flight using the fixed-wing mode switches to vertical descent using the multi-rotor mode.

Departure routes (during takeoff) and arrival routes (during return) are involved during these two mode-switching processes.

2.6.1 Departure Route Mode Switching

The segment from takeoff to before the transition to level flight.

When users create a mission in Autel Voyager App, the system automatically generates the departure route. Users have the option to adjust the departure route's takeoff mode-switching altitude (relative to the takeoff point), departure hover radius, departure hover point coordinates, and departure altitude.

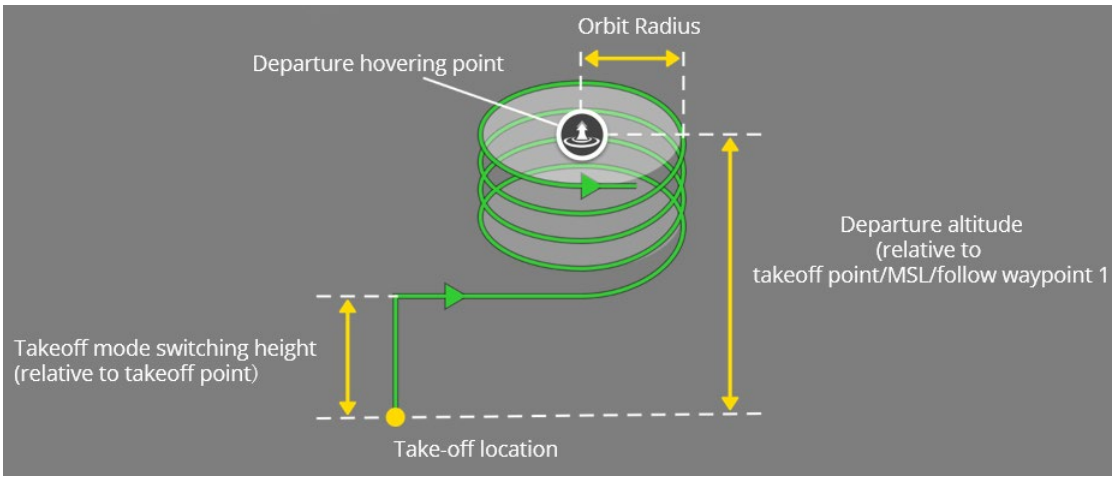


Figure 2-1 Departure Route

Table 2-1 Departure Route Attribute Settings

Departure Route Attribute	Altitude Type and Range		Meaning
Takeoff mode switching height (relative to takeoff point)	40 m to 500 m		The altitude at which the aircraft switches from multi-rotor mode to fixed-wing mode.
Departure hovering point coordinates	Follows latitude and longitude ranges		The central location of the hover during departure.
Departure altitude	Relative to takeoff point	40 m to 2000 m	The aircraft's departure altitude, as it leaves the departure route, is the height at which the aircraft, after switching to fixed-wing mode, will adjust to this altitude within the departure hover, departing the departure route to execute a normal mission.
	MSL (above sea level)	-410 m to 9000 m	
	Follow waypoint 1 (during waypoint missions)		
Departure orbit radius	200 m (minimum turning radius for the aircraft) to 2000 m		The radius of the hover circle centered around the departure hover

Departure Route Attribute	Altitude Type and Range	Meaning
		point in the departure route.

Tips

- The default minimum distance between the departure hovering point and the takeoff point is calculated as follows: "√3 times the minimum hover radius + 360 m". Users have the flexibility to drag the departure hover point icon "" on the map interface of Autel Voyager App to change its position. However, the distance between the departure hover point and the takeoff point cannot be less than the default distance. If a departure hover point is set to be closer than the default distance, the point will be automatically adjusted to a safe distance.

2.6.2 Arrival Route Mode Switching

After the completion of level flight, the aircraft transitions to the segment before landing.

When users create a mission in Autel Voyager App, the system automatically generates the arrival route. Users have the option to adjust the arrival route's landing mode-switching altitude (relative to the landing point), arrival hover radius, arrival hover point coordinates, and arrival altitude.

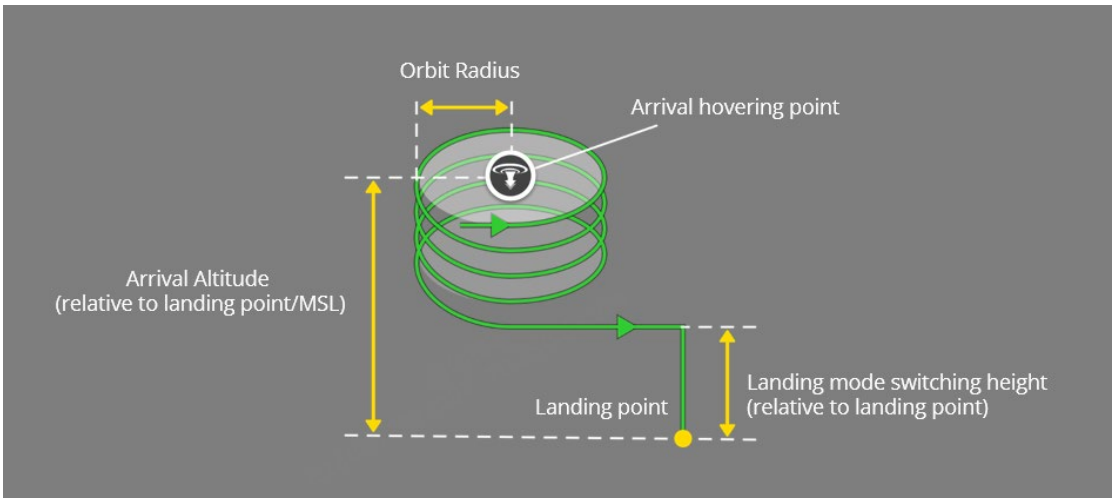


Figure 2-2 Arrival Route

Table 2-2 Arrival Route Attribute Settings

Arrival Route Attribute	Altitude Type and Range		Meaning
Landing point altitude	Relative to takeoff point	-6000 m to 6000 m	The altitude of the landing point (also known as the home point)
	MSL (Above sea level)	-410 m to 9000 m	
Landing mode switching height (relative to landing point)	40 m to 500 m		The altitude at which the aircraft switches from fixed-wing mode to multi-rotor mode during landing.
Arrival hovering point coordinates	Follows latitude and longitude ranges		The central location of the hover during arrival.
Arrival altitude	Relative to landing point	40 m to 2000 m	The minimum altitude at which the aircraft enters the arrival route; the aircraft will commence the arrival route at an altitude not lower than this specified value.
	Above sea level	-410 m to 9000 m	
Arrival orbit radius	200 m (minimum turning radius for the aircraft) to 2000 m		The radius of the hover circle centered around the arrival hover point in the arrival route.

Tips

- The default minimum distance between the arrival hovering point and the landing point is calculated as follows: "√3 times the minimum hover radius + 360 m". Users can drag the arrival hover point icon"" on the map interface of Autel Voyager App to change its position. However, the distance between the arrival hover point and the landing point cannot be less than the default distance. If an arrival hover point is set to be closer than the default distance, the point will be automatically adjusted to a safe distance.

In contrast to the departure route, the arrival route's arrival altitude is the minimum altitude at which the aircraft enters the arrival route. If the aircraft begins executing the

arrival route (e.g., completing a mission or returning in fixed-wing mode), the following strategy is implemented:

- If the current altitude of the aircraft is lower than the set arrival altitude, the aircraft needs to ascend to the arrival altitude before proceeding to the arrival hovering point.

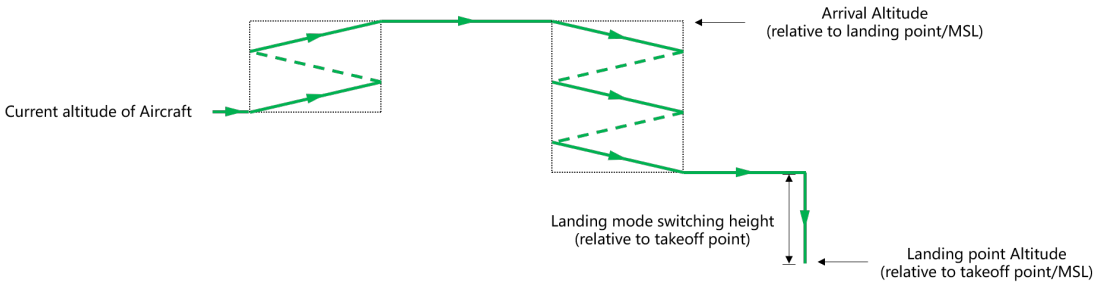


Figure 2-3 Ascending to Arrival Altitude Before Executing Arrival Route

- If the current altitude of the aircraft is greater than the set arrival altitude, the aircraft will directly proceed to the arrival hover point at its current altitude.

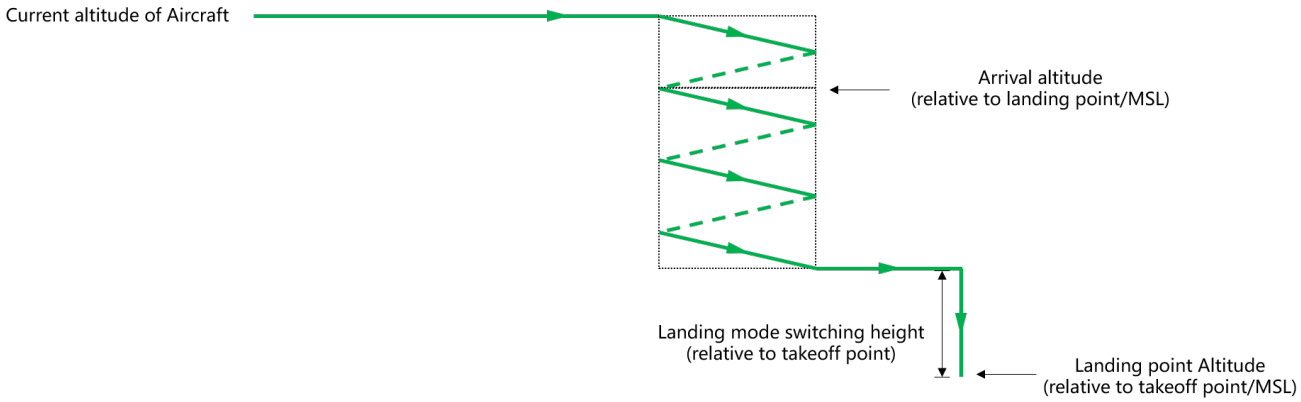


Figure 2-4 Normal Execution of Arrival Route

2.7 Flight Protection

2.7.1 Terrain Obstacle Avoidance

The aircraft achieves terrain avoidance functionality through terrain maps, preventing collisions with terrain obstacles such as mountains during flight. The implementation involves real-time monitoring of the aircraft's altitude and the terrain's elevation. Based on the user-defined safety height, the aircraft adjusts its altitude to avoid potential collisions.

Remarks
● During the execution of route missions (including waypoint missions and polygon missions) or temp mission, users have the option to selectively enable or disable

terrain avoidance functionality.

- When the aircraft is engaged in automatic return processes, emergency landing procedures, quick missions, dynamic track, or during mission transfer, terrain avoidance will be forcibly enabled.
- Terrain avoidance is not activated during manual flight or when failure protection is triggered (no GNSS signal). It is crucial to remain vigilant to changes in terrain during flight. For details about failure protection, see "2.7.4 **Failure Protection**".
- The terrain avoidance function relies on a pre-loaded terrain database within the aircraft. The accuracy of terrain avoidance is limited by the precision of the stored terrain data and may exhibit some latency. It may not respond to the latest changes in terrain or structures.

Tips

- The absolute altitude range for terrain obstacle avoidance is calculated as follows: Absolute Altitude Range = Terrain Elevation + Safety Height.
- To set the safety height, follow these steps in Autel Voyager App: "⚙"> "**safety**"> "**Safe altitude (m)**", follow the instructions on the interface.
- Users can also independently set the safety height for specific missions such as waypoint missions, polygon missions, temp mission, and quick missions during aircraft operation. For more details, see "**Chapter 4 Flight Operations**".

Users can inspect the terrain and altitude of the route by tapping on the elevation preview icon "⛰" in the top right corner of the corresponding mission interface when creating or executing waypoint missions or quick missions. They can also choose whether to enable terrain avoidance functionality during this process.

Important

- Upon selecting terrain avoidance, if there is a conflict between the current route and the terrain, the system will automatically adjust the altitude of the flight segment based on the terrain height and the set safety height. This adjustment will be displayed on the elevation preview.
- Please note that for waypoint missions, terrain avoidance is only effective during the segment from the end of the departure orbit to the beginning of the arrival orbit. It is not activated during the vertical takeoff to the end of the departure orbit or from the beginning of the arrival orbit to the vertical landing. Therefore, before initiating a waypoint mission, it is crucial to confirm the positions and altitudes of the takeoff point, landing point, as well as the arrival and departure orbit points, ensuring the safety of the airspace near these orbit points.

When terrain obstacle avoidance is enabled, if the aircraft's current flight altitude relative to the ground falls below the safety height, the aircraft will initiate a climb to avoid obstacles. The climb maneuver is subject to certain angle limitations, and climb avoidance can be categorized into the following 2 situations:

- If the distance between the aircraft and the obstacle is significant, and the altitude difference is small, the climb angle required is minimal, and the aircraft can perform a direct climb.

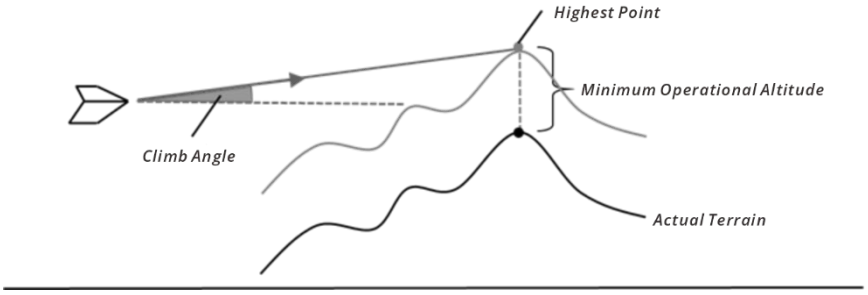


Figure 2-5 Climb Up to Avoid Obstacles

- If the distance between the aircraft and the obstacle is short, and there is a significant altitude difference, requiring a steep climb angle, the aircraft will utilize a spiraling maneuver to ascend to the obstacle avoidance height.

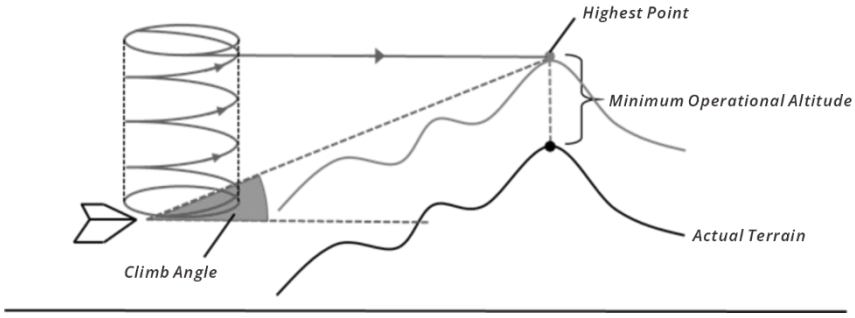


Figure 2-6 Circle Up to Avoid Obstacles

Remarks
• The aircraft's spiraling climb for obstacle avoidance has a circular path with its center located above the aircraft. The radius of this spiraling path is 200m.

After the aircraft has successfully avoided the collision threat, it will return to its original altitude and continue executing the initial mission.

⚠ Warning
• During the mode switching process before the aircraft enters the multi-rotor mode or fixed-wing mode, the terrain avoidance function will not be activated. When the user controls the aircraft to execute return, quick, or ad-hoc missions starting from

⚠ Warning

the multi-rotor mode, it is crucial to pay attention to the current flight altitude of the aircraft and ensure that the distance from the aircraft to the home point or the desired flight path satisfies the clearance requirements for the aircraft to switch to the fixed-wing mode.

- Regarding the return process, the terrain avoidance function is not active from the beginning of the arrival orbit to the vertical descent stage. Special attention is needed when setting up the arrival route.
- For the emergency landing process, if it is a temporary precision landing, the terrain avoidance function is not active from the beginning of the arrival orbit to the vertical descent stage. Extra caution is required when setting up the arrival route. The terrain avoidance function is also not available during an immediate emergency landing.
- If the aircraft returns to the route through waypoint adjustments, the safety height of the aircraft will be reset to the safety height of the returned route.

2.7.2 Landing Protection Function

When users manually operate the aircraft for landing to ensure a safe descent, the following procedures will be executed:

1. In manual flight mode (Mode M), control the aircraft's descent speed and altitude using the sticks. Automatic control of the sticks is engaged during the descent. When the aircraft's altitude is above 3 m above the ground, pulling the sticks down will result in a faster descent. When the aircraft is less than 3 m above the ground, the descent speed gradually decreases.
2. During the landing process, when the aircraft reaches an auxiliary descent height of 1 m above the ground, it will enter the automatic landing program and descend slowly.
3. During the automatic landing process, if you manipulate the sticks while in Mode M, the aircraft will assume that the user is taking control of the aircraft, and the automatic landing program will stop. At this point, the user can manually control the aircraft for landing.
4. If the aircraft's propellers are not locked after landing, you can only pull down the sticks and should avoid making lateral movements or other stick inputs to prevent the aircraft from tipping over.

Tips

- The setting of the sticks is dependent on the stick mode chosen by the user. For specific details, see “**4.4.1 Selecting Stick** ”.
- When the aircraft reaches directly above the landing point, you can release the stick to hover the aircraft in the air.

- If the aircraft's propellers are not locked after landing, you can enable the “Force Stop Power” function to turn off the aircraft's motors. To set this, navigate to Autel Voyager App's map interface or camera interface, and tap “⚙” > “**Safety**” > “**Emergency Stop Propellers**”.

Important

- Pay attention to the aircraft's flight speed when it reaches the airspace above the landing point to avoid collisions with buildings, trees, and other obstacles. During the landing process, be cautious to stay away from people, vehicles, and other moving objects to ensure flight safety.
- After the aircraft lands, if the ultrasonic sensor detects the ground, the aircraft will automatically lock the propellers. In areas like grass that may affect the performance of the ultrasonic sensor, the aircraft might not automatically lock the propellers. In such cases, you can choose to take off again, attempt another landing, or land the aircraft in another location with a flat surface. If it failed to lock propellers after several attempts, you can enable Emergency Stop Propellers function after the aircraft lands.

2.7.3 Rebuilding the C2 Link

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

- Within the first 15 seconds after the link is disconnected, the aircraft will automatically attempt to restore the C2 link. If the connection is restored within 15 seconds, the remote controller regains control of the aircraft.
- If the link is not restored within 15 seconds, the aircraft will automatically execute relevant flight actions according to set lost action and the current flight mode.
- During the execution of a lost action, the aircraft will continue its attempts to restore the C2 link with the ground control station.

Tips

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

2.7.4 Failure Protection

When there is no GNSS signal, the aircraft will enter the failure protection mechanism, The details are as follows:

1. If the aircraft is in the muti-rotor mode, and the altitude relative to takeoff point is less than 100m, the aircraft will hover for 10s, rotate its heading direction and land on the spot.
2. If the aircraft is not in the muti-rotor mode:
   - The altitude relative to takeoff point is more than 100 m, the aircraft will hover for 20s and descend to 100m, and it will slow down and hover within 20s and then rotate its heading direction and land on the spot.
   - If the altitude relative to takeoff point is less than 100m, the aircraft will slow down and hover within 20s, then rotate the heading direction and land on the spot.

If in the above process the GNSS signal of the aircraft is restored and become available, the above process will be terminated immediately and the aircraft will slow down, hover and switch to manual control mode.

2.7.5 Emergency Propeller Stop

The “Emergency Propeller Stop” function is used to forcefully shut down the power output of the aircraft motors, typically serving as a supplementary measure for emergency situations. Users can activate the “Emergency Propeller Stop” function in the following scenarios:

- Abnormal landing judgment function: When there is an issue with the ground sensors of the aircraft, it may fail to automatically stop the propellers' rotation after landing. In such a situation, the “Emergency Propeller Stop” function can be used to forcibly stop the propellers after the aircraft has completely landed.
- Loss of control of the aircraft: In the event of a complete loss of control during flight, posing a serious threat to ground personnel or property safety, the “Emergency Propeller Stop” function can be utilized to forcefully cut off the power output of the aircraft, minimizing potential harm caused by the loss of control.

Tips

- To set up the “Emergency Propeller Stop” function: In Autel Voyager App, navigate to the map interface or camera interface. Tap “⚙” > “**Safety**” > “**Emergency Stop Propellers**” option and toggle the switch to enable it. After confirming the secondary pop-up, the aircraft will immediately stop the rotation of all motors. For more details, see “**3.5.5 Aircraft Settings Interface**”.
- After using the Emergency Propeller Stop function, it is essential to first turn off the “**Emergency Stop Propellers**” switch and restart the aircraft to return it to normal operation.

⚠ Warning

- The “Emergency Propeller Stop” function is only intended for extremely rare emergency situations and risk avoidance. Once the emergency propeller stop operation is performed, the aircraft will be unable to restart the motors in the air, and improper handling may lead to a flying accident.
- In the event of an aircraft malfunction in the air, such as damaged propellers or abnormal motor power, if possible, users should attempt to control the stick to move the aircraft away from crowds or buildings. Lower the aircraft altitude and horizontal speed, then execute the emergency propeller stop function to minimize ground-related damage.
- After executing the emergency propeller stop in the air, it is crucial to contact Autel Robotics for a power inspection of the aircraft.

2.7.6 Mid-flight Sensing

Automatic Dependent Surveillance-Broadcast (ADS-B) is a manned aircraft monitoring technology that allows a manned aircraft to determine its position using satellite navigation systems and broadcast the information regularly, making the aircraft trackable. Other aircraft can receive the information to achieve attitude awareness and autonomous avoidance.

The aircraft is equipped with ADS-B receivers that can receive flight information broadcast by ADS-B transmitters that support the 1090ES and UAT standards within a range of 10 kilometers. By analyzing the received flight information, the position, altitude, course, and speed of the manned aircraft will be obtained, and the obtained information will be compared with the current position, altitude, course, and speed information of the aircraft. Autel Voyager App will provide real-time risk warnings, reminding users to plan flight paths rationally and pay attention to avoidance.

❗ Important

- Operation path: Tap “⚙” > “**Safety**” > “**Receive Remote Information**” on the map interface or camera interface of Autel Voyager Application and follow the on-screen instructions to perform relevant operations. For more information, see “**3.5.5 Aircraft Settings Interface**”.

2.8 Flight Restrictions

2.8.1 Geofencing System

To ensure the safe and legal operation of the aircraft, Autel robotics has developed a geofencing system. This system allows for relevant constraints and limitations on the

flight airspace of the aircraft during the flight. The geofencing system consists of two parts: Customized Electronic Fence and National No-Fly Zones.

- The Customized Electronic Fence enables users to add circular (or polygonal) no-fly zones or geofences. This ensures that the aircraft is restricted to the safe flight area planned by the electronic fence during the flight, providing users with customized flight safety assurance.
- The National No-Fly Zones ensure that the aircraft does not inadvertently enter flight-restricted areas specified by the laws and regulations of the country or region during the flight.

The geofencing system supports the unlocking of no-fly zones. If users need to carry out flight missions in restricted areas, the aircraft can have its flight restrictions lifted for the duration of the authorized unlock. The system does not guarantee full compliance with local legal requirements and regulations. Users are responsible for consulting and understanding local laws, regulations, and regulatory requirements before each flight to ensure their own flight safety.

⚠ Warning

- In the absence of GNSS signals, the electronic fence function of the aircraft will not function properly.
- The current electronic fence function does not support restricting the altitude of the aircraft. Before flying, users are advised to independently ensure that they are operating within the legally authorized safe flying altitude.

Tips

- Due to inherent delays in information retrieval, the no-fly zone information in the geofencing system may not necessarily align completely with the latest local laws and regulations. All information should be considered in accordance with local laws and regulations.
- For temporary airspace restrictions, users are strongly advised to synchronize the no-fly zone information when flying in the relevant areas.
- For information on the update mechanism of the electronic fence, see mechanism part of this section.

2.8.2 Restricted Zones

The geofencing system offers three different types of airspace restrictions: no-fly zones, customized geographical fences, and authorized zones. Autel Voyager App will provide different prompts based on the specific type of restriction in each area.

Restricted Zones

Table 2-3 Flight Restrictions of Restricted Zones

Restricted Zones	Flight Restriction Instructions
No-Fly Zones	Divided into national no-fly zones and custom no-fly zones. ● National no-fly zones: Built into the geofencing system at the factory, regularly updated. ● Custom no-fly zones: Added to the geofencing system by users themselves. Flight restrictions: If the aircraft is on the ground in the current area, it cannot take off; if the aircraft is in the air in the current area, it can only move outward at low speed until leaving the current area, and it cannot fly inward into the central area of that zone. If the aircraft is in the no-fly zone, the remote controller will prompt an alert “The aircraft is in the no-fly zone”.
Geofence	Added to the geofencing system by users themselves. Flight restriction: The aircraft can fly within any geofence area but cannot fly outside that range.
Authorized zone	After users apply for the lifting of the ban (obtaining an official airspace authorization document), the aircraft can legally operate within the restricted no-fly zone during the specified period of validity.

Remarks

- If an aircraft is simultaneously subject to restrictions from multiple electronic fences, the priority of different types of electronic fences is as follows: No-fly zones > Customized geographical fences, Customized geographical fences > Authorized zones, Authorized zones > No-fly zones. In other words, within a customized geographical fence, the priority of no-fly zones is higher than that of the customized geographical fence. The aircraft cannot enter the no-fly zones within the customized geographical fence. Authorized zones can be used to eliminate no-fly zone restrictions within their coverage, but customized geographical fences within the authorized zone still take effect. The aircraft cannot fly out of the customized geographical fences within the authorized zone.

Buffer Zones

When the aircraft is flying in the air, it possesses a certain initial velocity. To prevent the aircraft from entering restricted areas (before being authorized) and flying outside the

geofence area and the authorized zone, the geofencing system has set up a 350-meter buffer zones outside the edge of the restricted area and inside the edge of the geofence and the authorized zone.

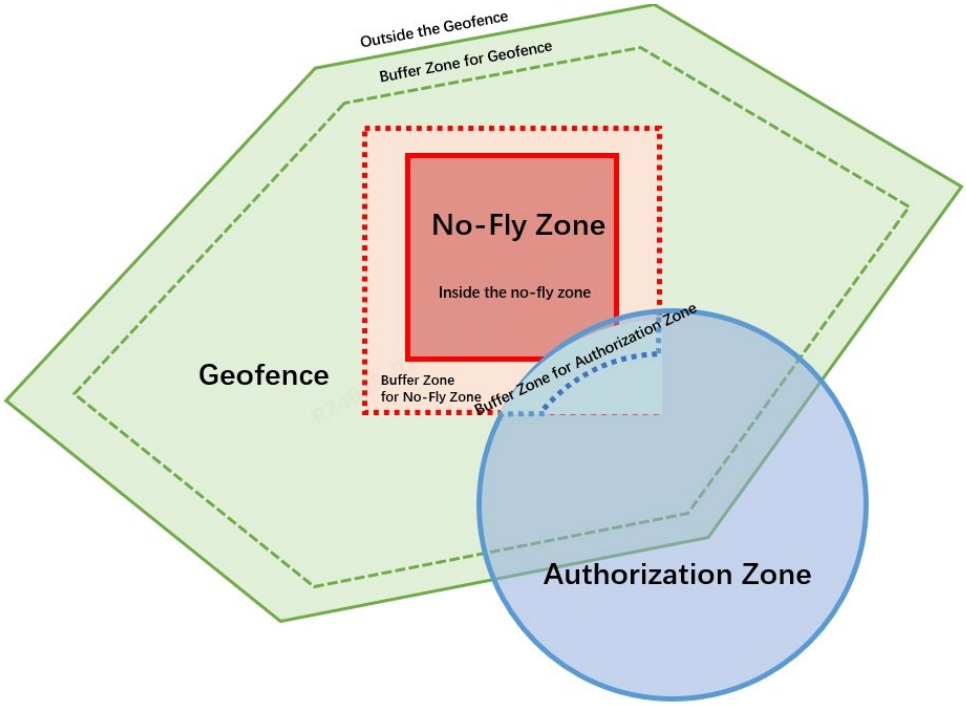


Figure 2-7 Buffer Zones

Table 2-4 Flight buffer Zone Description

Buffer Zone Type	Buffer Zone Description
Buffer Zone for No-Fly Zones	When an unauthorized aircraft approaches within a range of 350 meters near the edge of a no-fly zone, the remote controller will issue an alert “The aircraft is close to the no-fly zone”. When the distance is reduced to a range of 300 meters, the speed of the aircraft will be restricted. ● If the aircraft is on the ground, it will be prohibited from taking off. ● If the aircraft is in the air, it can only move slowly outward within the buffer zone of the no-fly zone until it exits the buffer zone. It cannot fly inward into the no-fly zone.
Buffer Zone for Geofences	When an aircraft approaches within a range of 350 meters near the edge of the geofence, the remote controller will issue an alert “The aircraft is close to the edge of the geo-fence”. When the distance is reduced to a range of 300 meters, the speed of the aircraft will be restricted. ● If the aircraft is on the ground, it will be prohibited from taking off. ● If the aircraft is in the air, it can only move slowly inward

Buffer Zone Type	Buffer Zone Description
	within the buffer zone of the geofence until it enters the geofence area. It cannot fly outward to leave the geofence.
Outside the Geofence*	When the aircraft is located outside the geofence, the remote controller will issue an alert “The aircraft is out of the geo-fence”. ● If the aircraft is on the ground, it will be prohibited from taking off. ● If the aircraft is in the air, there are no speed restrictions, and the aircraft can re-enter the geofence area.
Buffer Zone for Authorized Zones	The buffer zone of an authorized zone only exists in an authorized zone and a no-fly zone and their intersection areas nearby. When the aircraft approaches within a range of 350 meters near the edge of the authorized zone from the inside, the remote controller will issue an alert “The aircraft is close to the edge of the authorized zone”. When the distance is reduced to a range of 300 meters, t the speed of the aircraft will be restricted. ● If the aircraft is on the ground, it will be prohibited from taking off. ● If the aircraft is in the air, it can only move slowly inward within the buffer zone of the authorized zone until it enters the authorized zone. It cannot fly outward to leave the authorized zone.

Remarks

- When conducting flights within an authorized zone, the aircraft can operate normally if it is within the authorized airspace and during the authorized timeframe. However, once it exceeds the authorized airspace or timeframe, the aircraft will be subject to the airspace restrictions of the current area it is in.

⚠ Warning

- During flight, if the aircraft comes too close to an area restricted by the electronic fence, it may result in the aircraft switching to the multi-rotor mode. In this mode, the power consumption of the aircraft will increase, and please pay close attention to flight safety.
- When the aircraft is in manual flight mode, it will respond accordingly based on

the electronic fence restrictions in the airspace it traverses.

2.8.3 Altitude and Distance Limits

The altitude limit is the maximum flight altitude of the aircraft, while the distance limit is the maximum radius (distance from the take-off point) that the aircraft can fly.

Users can set altitude and distance limits in Autel Voyager App to ensure the safe flight of the aircraft.

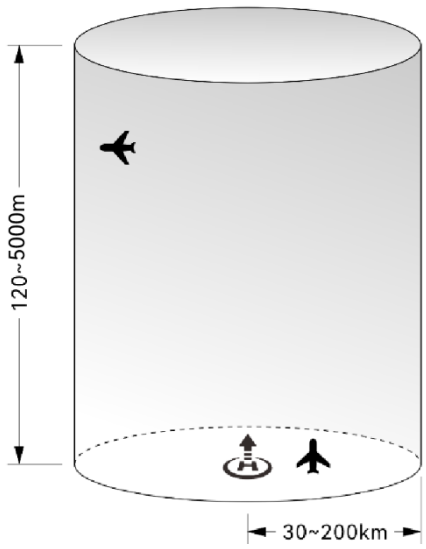


Figure 2-8 Diagram of Altitude and Distance Limits

Tips
● To set altitude and distance limits, follow these steps in Autel Voyager App's map interface or camera interface: Tap "⚙"> "**Safety**" > "**Maximum Distance (m)**" and "**Height Restriction (m)**." ● During actual flight, the set maximum altitude limit should not exceed the height restrictions imposed by local laws and regulations. For example, in mainland China, the European Union, the United States, and other countries and regions, the maximum flight altitude for aircraft is typically restricted to 120 meters or 400 feet. Flights exceeding this altitude require airspace authorization.

2.8.4 Unlocking National No-Fly Zones

Users can unlock a national no-fly zone by obtaining airspace authorization from authority. if users need to operate their aircraft within national no-fly zones, they must provide valid airspace authorization documents approved by the local aviation authority to Autel Robotics to request the lifting of the aircraft's restrictions. If the approval is

granted, the remote controller will update the aircraft based on its serial number to authorize it for operation within national no-fly zones.

The materials required for applying for the lifting of restrictions are as follows:

- Applicant's personal information and contact details.
- Approval document: Scanned or imaged valid approval document from the local authorities (e.g., local public security bureau, aviation management department, or any relevant organization/agency) regarding the flight application.
- Authorization area: A cylindrical region containing the following information:
  - Name of the authorization area.
  - Coordinates of the center point of the flight airspace plan (latitude and longitude with six decimal places).
  - Radius of the flight airspace plan (in meters with two decimal places).
  - Flight altitude (in meters with two decimal places).
- Authorization date: To be filled in by the user based on the valid approval document, ideally down to the day/hour/second.
- Aircraft S/N serial number: Multiple serial numbers can be applied for at once.

Remarks

- Unlock No-fly-zone Website: **www.autelrobotics.com/service/noflight/**.
- Before creating a flight mission, please adhere to local regulations concerning unmanned aircraft and obtain the necessary airspace authorization, if required.
- After submitting the lifting request, it will be reviewed within 24 hours, and the lifting will be completed within 48 hours. Please plan your flight schedule in advance accordingly.

2.9 Dual Control Function*

The aircraft supports a dual control function (only OTA version supports), meaning that in scenarios where the aircraft, the tracking antenna, and the remote controller are used in combination, one aircraft can simultaneously connect to two remote controllers (both connected to the tracking antenna). This allows simultaneous control by two remote controllers, with one primarily used for flying the aircraft and the other for controlling the camera or other payload operations. Utilizing the dual control function enhances the flexibility and versatility of the aircraft's operation. This function is commonly used in scenarios that require simultaneous flight operations and complex tasks, thereby improving efficiency and safety.

When using the dual control function, the two remote controllers are assigned different roles based on operational permissions, as outlined below:

- Pilot operator role: All operational permissions for the aircraft, including all flight controls and payload control permissions. Responsibilities may include managing the flight control of the aircraft, such as takeoff, cruising, landing, and other critical operations, or performing gimbal and camera operations.

- Observer role: Only perform gimbal or camera operations in certain scenarios (such as taking photos, recording videos, etc.) and view relevant information (such as assisting in map viewing) or perform partial configuration operations.

Remarks

- The operations performed on the remote controller in the observer role, such as controlling the aircraft gimbal and camera, will be synchronized to the remote controller in the pilot role. However, when switching between the map interface and the camera interface on the remote controller in the observer role, these operations will not be synchronized to the remote controller in the pilot role.

Permission Explanation of Observer Role Identity

Table 2-5 Explanation of Operational Permissions Allowed in the Observer Role Identity

No.	Scene
1.	Gimbal operation permissions in non-tracking mode (i.e., when the aircraft is not in dynamic track mode): includes pointing and centering, adjusting gimbal angle, and using gimbal lock.
2.	Camera operation permissions include zooming and focus adjustment, linked zoom, switching cameras and split screens, taking photos, recording videos, and adjusting camera settings.

Table 2-6 Explanation of Unauthorized Operations for Observer Role Identity

No.	Scene
1.	Unable to control the aircraft's flight through virtual or physical buttons or sticks.
2.	Unable to control the aircraft's flight through commands: this includes not allowing editing, uploading, or executing missions, not permitting editing and issuing quick missions, and not allowing control of the aircraft's return.
3.	Not allowed to edit, set, or upload electronic fences.
4.	Not allowed to turn on or off the RTK function.
5.	Not allowed to perform airspeed calibration operations.
6.	Not allowed to set the expected landing battery level for the aircraft.

No.	Scene
7.	Not allowed to operate the "**Aircraft Settings**"> "**Safet**y" section in Autel Voyager App.
8.	When the aircraft is in tracking mode, unable to operate the gimbal of the aircraft.

Remarks

- When an observer role attempts to perform unauthorized operations, Autel Voyager App will prompt "Insufficient permissions".
- The role identity on the remote controller can be determined through the status bar icon in Autel Voyager App. For more details, see "**3.5.2 Status** ".

Connection and Permission Explanation

In scenarios where the aircraft, the tracking antenna, and the remote controller are used in combination, the aircraft is connected to the ground control station via the video transmission link, and the remote controller is connected to the tracking antenna via the tracking antenna's Wi-Fi (or wired connection). The first remote controller connected to the tracking antenna will automatically obtain the pilot role identity, and subsequent remote controllers connected to the tracking antenna will automatically become observer role identity. The remote controller with the pilot role identity will automatically establish a 5.8 GHz frequency connection with the aircraft.

Tips

- The allocation of role identities is solely based on the order in which the remote controllers connect to the ground control station, regardless of the connection method.
- For frequency allocation and connection operations between the aircraft, ground control station, and remote controller, see "**4.2.4 Matching and Connection**".

When the remote controller with the pilot role identity disconnects from the tracking antenna (the 5.8 GHz link between the remote controller and the aircraft will also automatically disconnect), the operational permissions of the pilot role will automatically transfer to the remote controller with the original observer role identity. The role identity of the remote controller with the original observer role will change to the pilot role. At this point, Autel Voyager App will display a popup message saying "Previous pilot offline. You are now the pilot." and the remote controller will automatically establish a 5.8 GHz frequency connection with the aircraft.

Remarks

- If the connection between the remote controller with the pilot role and the tracking antenna is stable, there will be no permission transfer when the connection between the remote controller with the observer role and the tracking antenna is lost. Upon reconnection, the remote controller will still retain the observer role.
- If the 5.8 GHz link between the remote controller with the pilot role and the aircraft is disconnected while the connection with the tracking antenna is normal, the operational permissions for the aircraft will not transfer. The remote controller with the observer role will also not automatically establish a 5.8 GHz frequency connection with the aircraft.
- Please note that the current version does not support permission transfer when both remote controllers are connected to the tracking antenna.

2.10 Direct Remote Identification

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

The aircraft supports the DRI system.

Tips

- At present, in some countries and regions, it is mandatory to enable the remote identification function. When users are operating aircrafts in relevant airspace, please follow local laws and regulations.
- Operation path: On the map interface or camera interface of Autel voyager App, tap "⚙" > "**Safety**" > "**Broadcast Information**", and follow the on-screen instructions to perform relevant operations. For more information, see "**3.5.5 Aircraft Settings** ".

2.11 Aircraft Inspection Monitoring System

The aircraft is equipped with a one-key self-check function and a safety monitoring function, which, together with manual checks before and after flight, constituting a comprehensive inspection monitoring system to ensure flight safety. Users can monitor the aircraft status in real-time through Autel Voyager App. For details, see "**4.4.6 Real-Time Monitoring and One-Key Self-Check**".

2.12 Aircraft Calibration

Aircrafts undergo calibration processes before leaving the factory, and typically, calibration is not necessary. If you encounter any anomalies during the startup and usage of the device, please follow the calibration instructions provided by Autel Voyager App before proceeding with flight operations.

2.12.1 Compass Calibration

The aircraft compass is highly sensitive to strong magnetic field environments, which may result in deviations in magnetic heading. In severe cases, it could prevent the aircraft from taking off. If a compass malfunction prompt is displayed, please contact Autel robotics support or an authorized dealer for calibration.

Remarks

- Before leaving the factory, the compass of the aircraft has already been calibrated, and users can use it with confidence.
- Please note that the compass does not provide a user-initiated calibration method.

2.12.2 IMU Calibration

The IMU (Inertial Measurement Unit) module of the aircraft performs automatic calibration each time the aircraft is powered on, eliminating the need for manual user intervention.

Important

- If there is an abnormality in the IMU module after the power-on self-check, please contact Autel robotics support or an authorized dealer for assistance.

2.12.3 Airspeed Sensor Calibration

When Autel Voyager App displays an “Airspeed failure. Please calibrate the airspeed meter”. warning message, please follow the steps below to calibrate the airspeed meter.

1. After powering on the aircraft and remote controller, make sure they are successfully paired.
2. In Autel Voyager App, navigate to the map or camera interface, and **tap the “⚙> “Airspeed Meter.”**
3. Follow the on-screen instructions to install the airspeed tube protector. Tap the “**Start Calibration**” button.

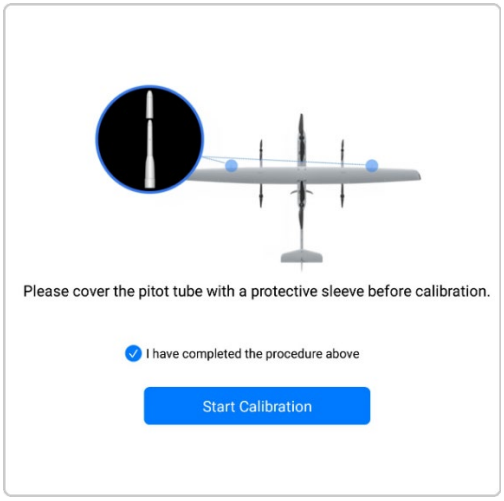


Figure 2-9 Start Calibration

Wait for the calibration to complete, and when the interface displays “Calibration Successful!”, the airspeed meter calibration is successful.

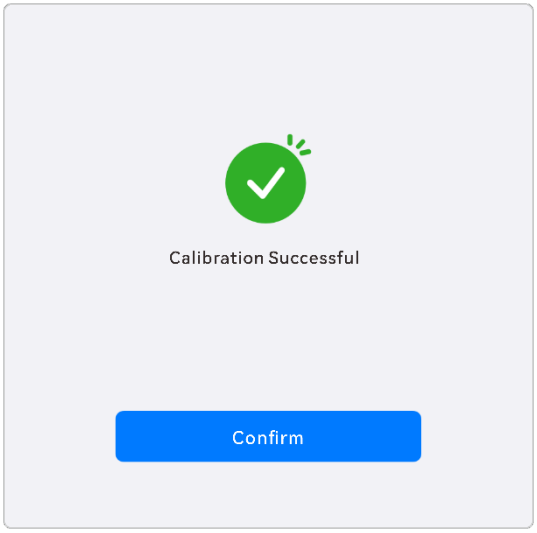


Figure 2-10 Confirm

⚠ Warning
● After successfully calibrating the airspeed meter, remove the protective sleeve of the pitot tube promptly. ● If the airspeed meter calibration fails multiple times, please stop flying and contact Autel Robotics Support team for assistance.

2.12.4 Gimbal Auto Calibration

The aircraft's gimbal performs a self-check each time the aircraft is powered on. If you notice any abnormal gimbal rotation during use, follow the steps below to perform an automatic calibration:

1. After powering on both the aircraft and the remote controller, ensure that they are paired.
2. Place the aircraft on a level surface and keep it still.
3. In Autel Voyager App, navigate to the map interface or camera interface and select "⚙"> "**Gimbal**" > "**Gimbal Calibration**" > "**Start**".
4. Tap the "**Confirm**" button on the calibration interface to initiate the calibration.

   Wait for the calibration progress bar to reach 100%,the gimbal auto calibration is complete.

Chapter 3 Product Details

3.1 Aircraft

3.1.1 Aircraft Components

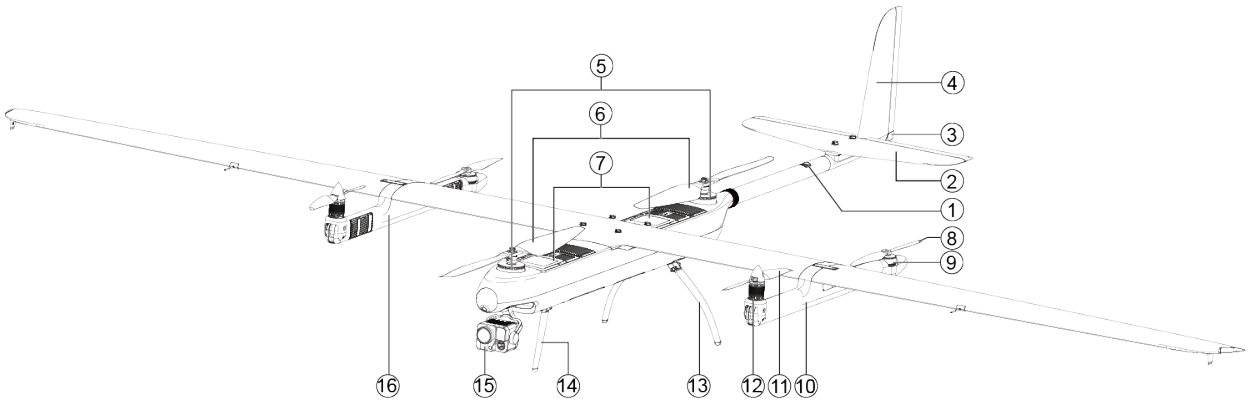


Figure 3-1 Aircraft Side Top View

Table 3-1 Description of the Side Top View of the Aircraft

No.	Name	Description
1.	Power button	After installing the smart battery, press and hold the power button for 3 seconds to turn on the aircraft.
2.	Horizontal tail	Used to control pitch angle and maintain longitudinal stability.
3.	Navigation light	When flying at night, the direction of the aircraft can be identified by the color of the navigation light.
4.	Vertical tail	Used to control course and maintain directional stability.
5.	Body motor	Power motors, used to drive the fuselage propeller to rotate.
6.	Fuselage propeller	During the vertical take-off and landing phase, it provides lift for the aircraft and stops rotating during the horizontal flight phase.
7.	Smart battery	The aircraft requires 2 batteries to provide the power

No.	Name	Description
		required for operation.
8.	Rear propeller on the nacelle	During the vertical take-off and landing phase, it provides lift for the aircraft and stops rotating during the horizontal flight phase.
9.	Rear motor on the nacelle	During the vertical take-off and landing phase, it provides lift for the aircraft; during the level flight phase, it provides thrust for the aircraft.
10.	Left nacelle	Used to accommodate part of power system, providing necessary thrust required for the aircraft.
11.	Tilting propeller	During the vertical take-off and landing phase, it rotates through its tilting mechanism to turn it upward, providing lift for the aircraft; during the level flight phase, it rotates through its tilting mechanism so that it faces the front of aircraft, providing thrust for the aircraft.
12.	Front motor on the nacelle	Power motor, used to drive the tilting propellers.
13.	Rear landing gear	Used to support the aircraft to avoid damage to the bottom of the fuselage.
14.	Front landing gear	Used to support the aircraft to avoid damage to the bottom of the fuselage.
15.	Gimbal camera	Integrate a variety of sensors for stable shooting or measurement while flying.
16.	Right nacelle	Used to accommodate part of power system, providing necessary thrust required for the aircraft.

Tips
● The frequency matching button is located inside debugging interface.

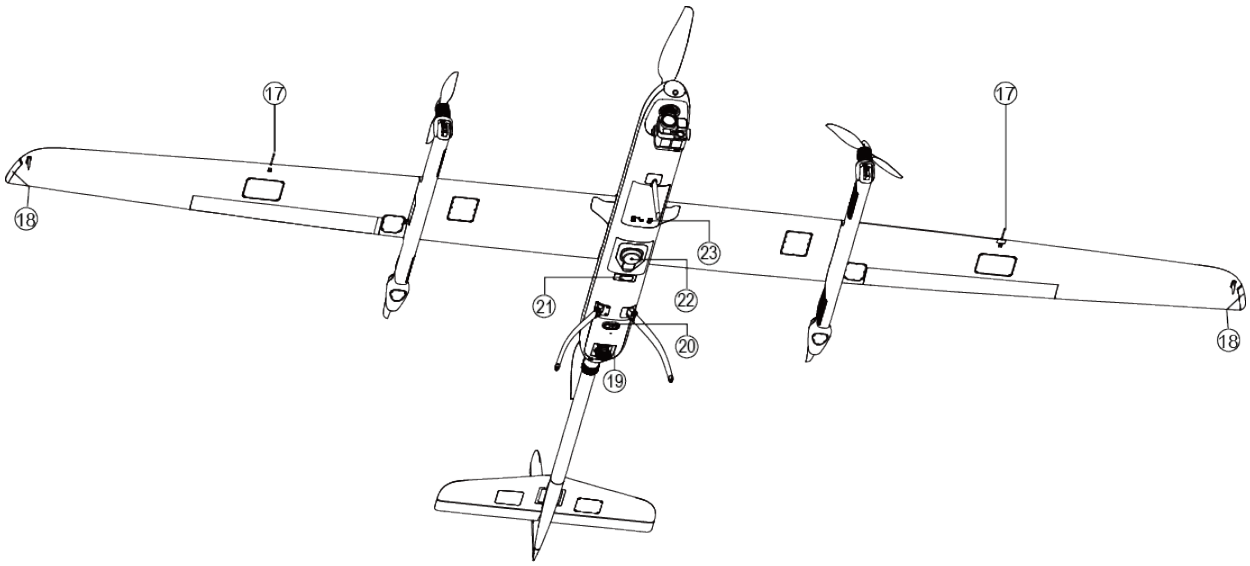


Figure 3-2 Aircraft Bottom View

Table 3-2 Description of the Side and Upward View of the Aircraft

No.	Name	Description
17.	Pitot tube	Used to measure the airspeed of the aircraft.
18.	Navigation light	When flying at night, the direction of the aircraft can be identified by the color of the navigation light.
19.	Debugging interface	Includes 2 USB ports and 1 match button. Among them, The USB ports are used for aircraft debugging and log acquisition; the match button is used for frequency matching between aircraft and tracking antenna and remote controller.
20.	Ultrasonic sensor	Used to detect the distance between the aircraft and the ground.
21.	Guidance pod (optional)	Downward-facing visual sensor, assists the aircraft in visual navigation and positioning.
22.	C-port interface of PSDK module	Used for power supply and communication for

No.	Name	Description
	(Optional)	external devices.
23.	P-port interface of PSDK module (Optional)	Used for power supply for external devices.

⚠ Warning

- Please do not disassemble the factory-installed parts by yourself (except for the parts expressly allowed in the description of this manual), otherwise the product will lose its warranty qualification.
- The gimbal camera interface area is equipped with a rubber protective cover to protect the microSD card slot and USB Type-C interface. Please make sure the rubber protective cover is tightly closed during flight.

3.1.2 Aircraft Navigation Lights

The aircraft navigation lights (left Navigation light, right Navigation light, rear Navigation light) are located on the wingtip on both sides of the fuselage and at the end of the tail of the tail wing. When flying at night, turning on the navigation light can indicate the aircraft's position and heading to avoid air traffic accidents. The aircraft's Navigation light can be turned on or off manually in Autel Voyager App.

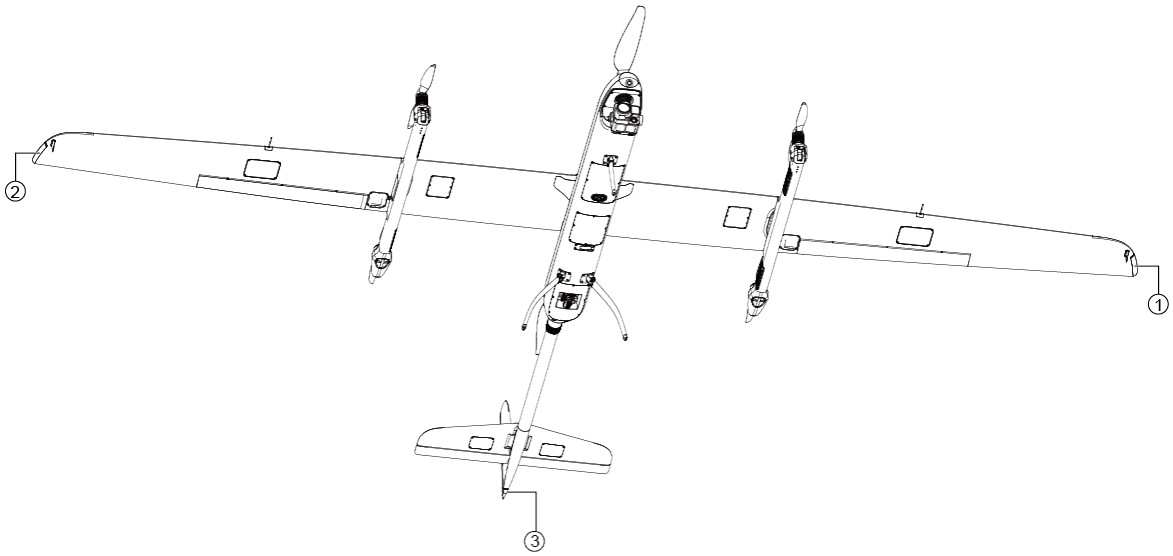


Figure 3-3 Aircraft Navigation Light

Table 3-3 Aircraft Navigation Light Description

No.	Name	Description
1.	Left navigation light	Located inside the rear end housing of the left wingtip, it supports dual-color display in green and red.
2.	Right navigation light	Located inside the rear end housing of the right wingtip, it supports dual-color display in green and white.
3.	Tail navigation light	Located inside the housing at the rear of the aircraft's tail boom, it supports dual-color display in green and white.

Table 3-4 **Navigation Light Status Description**

Flight Situation	Blinking Cycle
Auto flight mode	● Left navigation light: Green light on for 0.25 seconds/off for 0.1 seconds/red light on for 0.75 seconds/off for 0.1 seconds/red light on for 0.5 seconds/off for 0.1 seconds. ● Right navigation light: Green light on for 0.25 seconds/off for 0.95 seconds/green light on for 0.5 seconds/off for 0.1 seconds ● Tail navigation light: Green light on for 0.25 seconds/off for 0.1 seconds/white light on for 0.75 seconds/off for 0.1 seconds/white light on for 0.5 seconds/off for 0.1 seconds

Tips

- Navigation light setting path: Tap "⚙" > "**Navigation Light**" on the map interface or camera interface of Autel Voyager App, follow the interface guidance to perform relevant operations.
- The flight light setting is only valid for a single power-on operation. The flight lights will return to the default flashing state after the aircraft is restarted.

⚠ Warning
● Be sure to turn on the aircraft's navigation light when flying at night. Turning off the navigation light will violate local laws and regulations.

Remarks
● Please ensure that the navigation light settings comply with the relevant laws and regulations of the respective location.

3.1.3 Smart Battery

The aircraft comes standard with 2 smart batteries (hereafter referred to as battery) as the power battery. This battery is a rechargeable lithium-ion polymer (LiPo) battery and features high energy density and capacity. The battery can be charged with a standard battery charger.

Remarks
● The battery charger is included as part of the aircraft kit. Users do not need to purchase it separately.

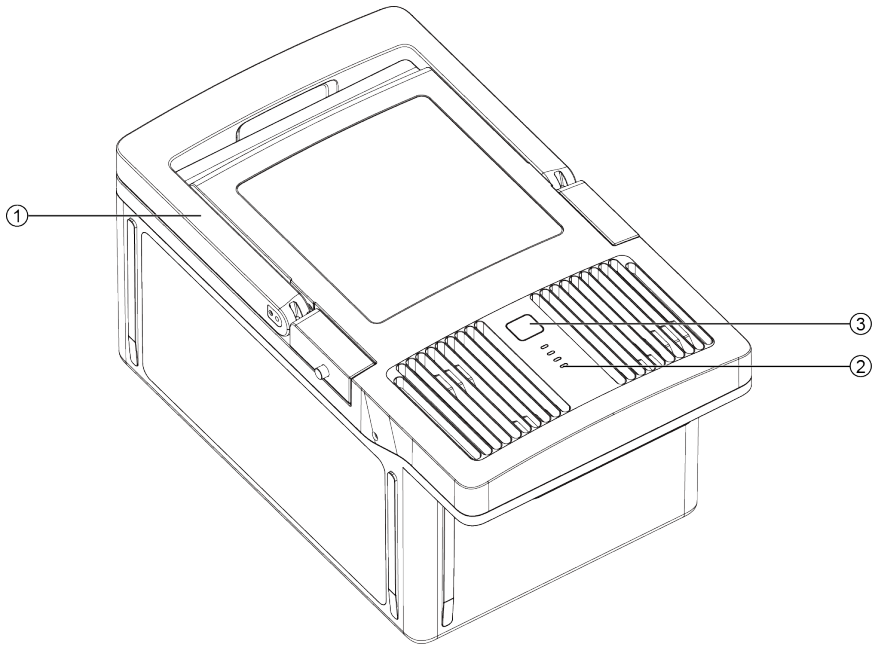


Figure 3-4 Battery Appearance

Table 3-5 Battery Appearance Details

No.	Name	Description
1.	Battery handle	To avoid the battery from falling and damaging, grasp the handle when transferring the battery.
2.	Battery level indicator	Used to display the current battery level of the battery in normal situations.
3.	Power level check button	When the battery is turned off, press this button for 1s to check current battery power range.

3.1.3.1 Checking the Battery Level

When the battery is turned off, press the power level check button for 1 second and then release it quickly to check the battery level.

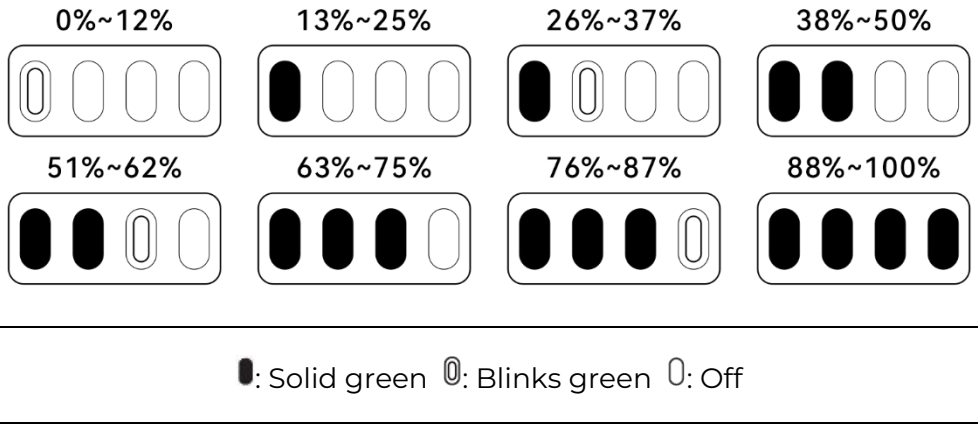


Figure 3-5 Battery Level Indicator Status (Non-Charging Status)

Tips

- After the aircraft is connected to the remote controller, you can check the current battery level of the aircraft in the top status bar or in the "**Aircraft Battery**" of Autel Voyager App.

3.1.3.2 Charging the Battery

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

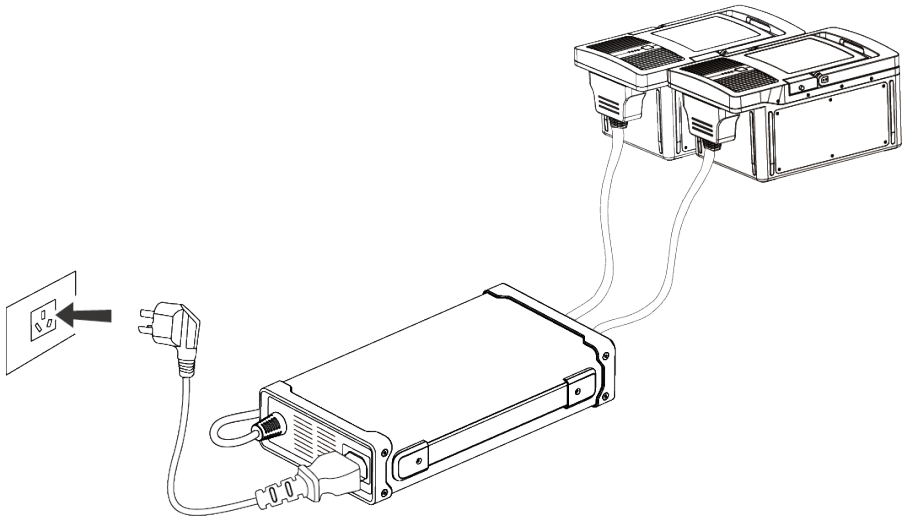
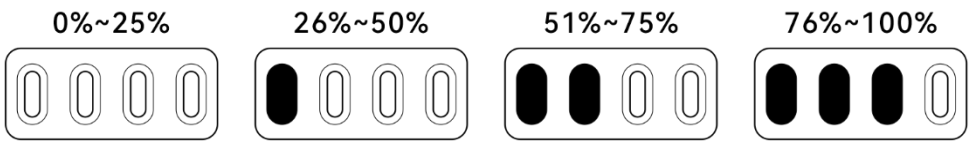


Figure 3-6 Use the Battery Charger to Charge the Battery



: Solid green : Blinks green

⚠ Warning

- Do not charge the battery that is smoking, bulging, leaking, or damaged.
- Do not use damaged charging devices to charge the battery.
- Modifying the official 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 battery away from flammable and explosive items during charging.
- After the battery is fully charged, disconnect the connection between the charger and the battery and power supply promptly.
- After flight, it is recommended to wait until the battery naturally cools down to an appropriate temperature before charging the battery. If the temperature of the battery is higher than 45°C (113°F), 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°C.

Remarks

- It is recommended to fully charge the battery of the aircraft before the aircraft takes off.
- It is recommended to mark and match the two batteries for simultaneous charging/discharging to get the best performance.
- Generally, it takes about 2 hours to fully charge a battery of the aircraft and about 3.5 hours to fully charge two batteries at the same time, but the charging time is related to the remaining battery level.

3.1.3.3 Indicator Warning Instruction

Table 3-6 Battery Indicator Warning Instructions

No.	Description	Illustration
1.	The charging temperature is too high/too low for charging.	
2.	The charging current is too high, which causes a short circuit.	
3.	A circuit overcurrent, a circuit overload, or a short circuit occurs during battery discharge.	

: Blinks green : Off

Tips

- During the take-off stage, if the battery temperature exceeds the usable range, Autel Voyager App will issue a “Front/Rear battery temperature is too high (or too low), please do not take off” warning and prevent take-off.

3.1.3.4 Battery Functions

The battery has the following functions:

- **Battery level display**

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

- **Communication**

During use, the aircraft acquires battery information through the communication interface of the battery, including voltage, capacity, current, battery level and temperature.

- **Self-discharge protection for storage**

If the battery is stored in high temperature environment or it is not used for 6 days at a high battery level, the self-discharge protection will be activated. The battery will automatically discharge to a safe level, this is a default setting, and the discharging process takes 2-3 days. The discharge threshold can be manually defined with Autel Voyager App.

Tips
• Although the battery has no indication in the self-discharge period, it is normal that the battery may be slightly hot.

- **Low battery protection**

In the case of low battery level, the battery will automatically enter sleep mode to avoid damage. Under this mode, there will be no reaction when pressing the power button. To wake up the battery, it must be connected with the charger.

- **Charging temperature protection**

To avoid further damage to the battery during continued charging, the battery will stop charging if its temperature exceeds normal charging range (5°C to 45°C).

- **Overcurrent protection**

Charging with a large current can severely damage the battery. The battery will stop charging if the charging current is too high.

- **Overcharge protection**

The battery will automatically stop charging after it is fully charged.

- **Balanced protection**

Each battery unit shall maintain voltage balance to avoid overcharge or overdischarge, so as to ensure the maximum performance of the battery.

- **Overdischarge protection**

The battery will automatically disconnect the power output function when it is not used and completes the self-discharge procedure. This function is disabled in flight.

- **Short-circuit protection**

The power supply will be disconnected if a short circuit is detected.

- **Power-down mode**

The battery will turn off if there is no operation within 5 minutes to reduce the battery consumption.

- **Low power consumption mode**

To save power, this mode will be activated when the battery is low and has not been charged for 1 day. After connecting the charger, the battery will resume normal functions.

- **Dust and water resistance**

After correctly installing the battery to the aircraft, the battery complies with IP43 protection level.

- **Self-heating**

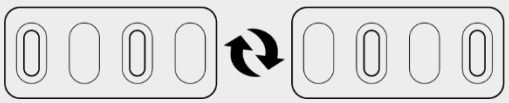
The battery has a self-heating function, which can increase the battery temperature in low-temperature environments, helping maintain good output performance.

- When the battery is installed in the aircraft and the battery power is turned on, if the battery temperature is lower than 25°C, the battery self-heating function will be activated to heat up to 27°C.
- If the battery is not installed in the aircraft, short press the power level check button for 1 second and then press and hold the power level check button for 3 seconds to activate the battery self-heating function to keep the battery temperature at 27°C for 10 minutes. At this point, if you want to exit the battery self-heating function, short press the power level check button for 1 second, and then press and hold the power level check button for 3 seconds.
- When the battery is connected to the battery charger and the battery power is turned on, if the battery temperature is lower than 5°C (41°F), the charger will supply power to the 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 battery is manually activated, the battery should have at least around 10% of remaining power for self-heating.

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

Table 3-7 Battery Level Indicator Status (Self-Heating and Heat Preservation)

No.	Description	Illustration
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 status.	

: Blinks green : Off

⚠ Warning

- To get the best performance of the battery, it is recommended to keep the battery temperature above 25℃ before flying.
- Using a battery in a low-temperature environment will reduce the battery life. You must ensure that the battery is fully charged before taking off and arrange the flight time reasonably.
- If the battery power is low, it is advised not to take off as the low power makes it difficult to activate the battery, compromising flight safety.
- During the flight, if Autel Voyager App prompts for intelligent low battery return, it is advisable to return immediately.
- In some low-temperature environments, even with the battery self-heating function turned on, the battery temperature may still not reach a usable temperature, so add the insulation measures during the heating process.
- In low-temperature conditions, the battery self-heating duration may be extended, it is suggested that the user provides battery insulation in advance to minimize self-heating time.

⚠ Warning

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

3.1.4 Flight Control System

The aircraft achieves stable and convenient flight control through the built-in intelligent flight control system. The system supports a number of advanced functions, including dynamic track, terrain obstacle avoidance, automatic return to home, loss of contact protection, etc.

Table 3-8 Flight Control System

Module	Description
IMU	Acceleration and angular velocity are measured using a three-axis gyroscope and three-axis accelerometer. When the aircraft is powered on, IMU calibration will be performed automatically.
Compass	Measures the geomagnetic field and provides heading reference for aircraft.

Module	Description
GNSS receiver	Receive global satellite navigation signals for determining longitude, latitude, and altitude.
Barometer	Measures atmospheric pressure and is used to determine the altitude of an aircraft.
Ultrasonic sensor	Measure the distance between the aircraft and the ground.

3.1.5 Flight Modes

Depending on the availability of GNSS signals and flight conditions, the aircraft can switch between 2 flight modes.

Table 3-9 Flight Mode

Flight Mode	Description
Auto flight mode	Switch the remote controller to A position. When the aircraft detects an appropriate GNSS signal, the aircraft will be able to fly fully autonomously without manual control. In automatic flight mode, the aircraft can achieve safe flight through terrain obstacle avoidance, and supports safety functions such as automatic return to home and loss of contact protection.
Manual flight mode	Switch the remote controller to M position, and the user can manually control the aircraft to fly through the remote controller. In this mode, the aircraft needs to be positioned through GNSS and supports safety functions such as automatic return to home and loss of contact protection.

⚠ Warning

- When there is no GNSS signal, the aircraft will enter the failure protection program. For details about failure protection, see "**2.7.4 Failure Protection**".
- If the user does not fully master the flight control of the aircraft, please do not fly in manual flight mode.
- In manual flight mode, the aircraft's terrain obstacle avoidance function cannot be turned on. Be sure to pay attention to the surrounding environment when flying.

Important
● When flying, please choose a flat, open, well-lit ground area as your take-off and home point.

3.1.6 Flight Speed

Under different flight stages, the aircraft has different flight performance:

Multi-rotor mode: used in the vertical take-off and landing phase of the aircraft. By rotating the servos of the nacelle , the aircraft switches to multi-rotor mode.

Fixed-wing mode: used during the level flight phase of the aircraft. After the aircraft takes off, the aircraft switches to fixed-wing mode by rotating the servos of the nacelle , turning off and locking fuselage motors.

Table 3-10 Maximum Flight Speed Range

Flight Phase	Description
Multi-rotor mode	Flight speed: 0 m/s~17 m/s, ascending: 5 m/s, descending: 4 m/s.
Fixed-wing mode	Flight speed: 17 m/s~35 m/s, ascending: 5 m/s, descending: 5 m/s.

⚠ Warning
● When flying manually in fixed-wing mode, be sure to pay attention to the surrounding environment and ensure that the flying airspace is open, unobstructed, and away from crowds, trees, and buildings.

3.1.7 Intelligent Flight Function

The aircraft can be used with Autel Voyager App to achieve related intelligent flight functions.

- **Dynamic track**

  Tap and drag to select the target on the camera interface of Autel Voyager App. After the gimbal locks the target, the aircraft can track the target point according to the set tracking method and tracking parameters.

- **Terrain obstacle avoidance**

  The aircraft achieves terrain avoidance functionality through terrain maps, preventing collisions with terrain obstacles such as mountains during flight. The implementation involves real-time monitoring of the aircraft's altitude and the

terrain's elevation. Based on the user-defined safety height, the aircraft adjusts its altitude to avoid potential collisions.

- **Automatic return**

When the GNSS signal is good, press and hold the Home button "  " on the remote controller for 3 seconds, you can manually activate the automatic return-to-home function. The aircraft will head towards the home point and return based on the current settings.

- **Loss of connection protection**

If the communication between the aircraft and the remote controller is interrupted, the loss protection will be activated. When the lost contact protection function is activated, if the GNSS signal is good, the aircraft will start the automatic return function. Once communications are restored, the user can still regain control of the aircraft.

- **Intelligent low-battery return**

When the GNSS signal is good, when the current battery power of the aircraft minus the set remaining power after landing is only enough for the aircraft to return to the home point, the aircraft will activate the automatic return function.

3.1.8 Video Transmission Function

The aircraft is equipped with Autel Robotics self-developed video transmission technology. When used in combination with the tracking antenna and remote controller, the video transmission distance can reach 45 kilometers. The relevant features are as follows:

- It supports adaptive frequency hopping transmission in multiple frequency bands, selects the optimal channel according to electromagnetic interference conditions, and has strong anti-interference capabilities.
- The real-time transmission quality reaches 1080p@30FPS, and it has a high transmission bit rate of 40Mbps and low-latency transmission characteristics.
- To ensure that end-to-end communication data cannot be intercepted, Data link uses AES-128 encryption and multimedia data storage uses AES-256 encryption.

Remarks

- The data of transmission bit rate comes from test data. The data may be different due to different test environments and conditions.
- The video transmission distance is for reference only. Please always pay attention to the quality of the video transmission signal during actual use. When the video transmission signal is poor, the flight radius should be shortened in time. See "**3.5.2 Status Bar**".
- Please note that when only using the remote controller in combination with the aircraft, the maximum video transmission distance is only 8-10 kilometers..

3.2 Gimbal Camera

The aircraft supports 2 types of Autel gimbal cameras, namely, DG-T5 and DG-T5L.

3.2.1 Gimbal Structure

The aircraft uses a three-axis stabilizing gimbal with a high-precision motor structure to ensure that the camera can capture stable images when the aircraft is in flight.

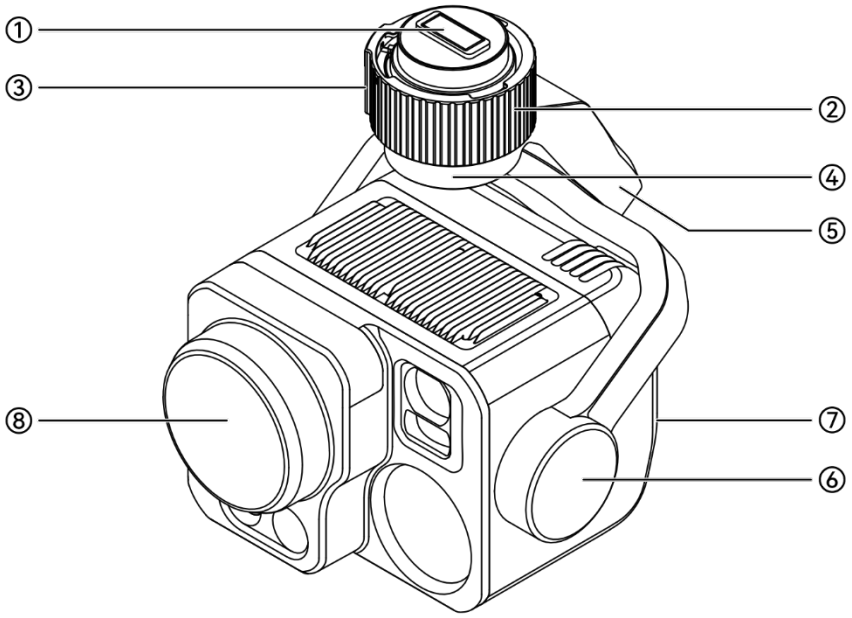


Figure 3-7 Gimbal Structure (DG-T5 as an Example)

Tips
● Please know that except for the difference in camera lens layout, the gimbal structures of the DG-T5 and DG-T5L are all the same or similar.

Table 3-11 Gimbal Structure Description

No.	Name	Description
1.	Gimbal interface	When installing a gimbal camera on an aircraft, you need to lock the connection between the gimbal camera and the aircraft through the gimbal interface.
2.	Pan/Tilt Lock Ring	● Install the gimbal camera: After the gimbal interface is docked in place, press the lock mark to rotate the gimbal locking ring to lock the gimbal camera on the fuselage. ● To disassemble the gimbal and camera: Press the

No.	Name	Description
		gimbal unlock button on the gimbal lock ring, and press the unlock mark to rotate the gimbal lock ring to remove the gimbal camera.
3.	Gimbal unlock button	After the gimbal camera is locked to the fuselage, you need to press the gimbal unlock button to rotate the gimbal locking ring.
4.	Yaw axis motor	Used to control the range of left or right rotation of the gimbal on its own axis.
5.	Roll axis motor	Used to control the range of the gimbal rolling left or right.
6.	Tilt axis motor	Used to control the range of the gimbal 's upward or downward rotation.
7.	Gimbal camera interface area	The surface is protected by a rubber protective cover and has a built-in USB Type-C interface and microSD card slot. The Type-C interface can be used for gimbal debugging and data transmission.
8.	Camera lens	Different models of gimbal cameras have different lens layouts. See "**3.2.2 Camera Layout**" for specific layout.

3.2.2 Camera Layout

Features of relevant adapted gimbal cameras are as follows:

- DG-T5: Equipped with a 4K 35x optical zoom lens, a 48-megapixel wide-angle lens, a 640×512 wide-angle infrared lens, a tele infrared lens, and a laser rangefinder.
- DG-T5L: Equipped with a 4K 35x optical zoom lens, a 48-megapixel wide-angle lens, a 640×512 infrared lens, a laser rangefinder and a laser fill light lens.

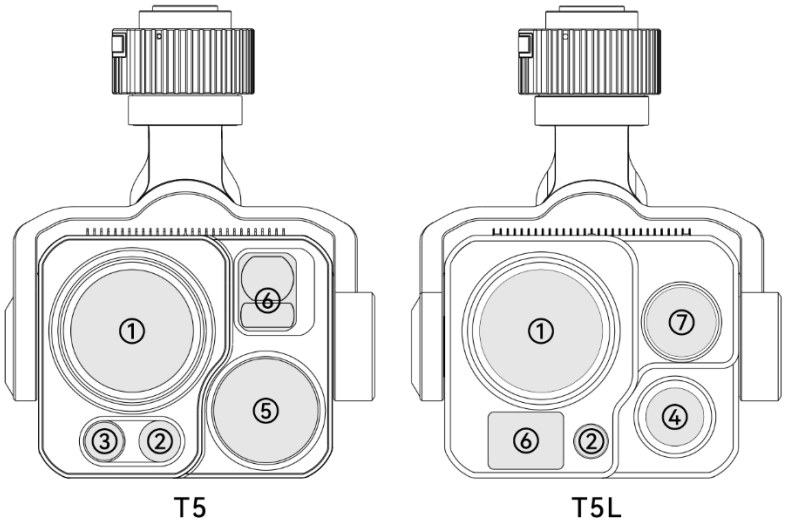


Figure 3-8 Gimbal Camera Adapted for Aircraft

Table 3-12 Instructions for Aircraft Gimbal Camera

No.	Name	Description
1.	Zoom lens	Used to take long shots, allowing clear shots of distant scenes. ● DG-T5 and DG-T5L: 1/1.8" CMOS, 8 million effective pixels, 35x continuous optical zoom, 16x digital zoom, 560x hybrid zoom.
2.	Wide-angle lens	Used to capture a larger field of view within a shorter shooting distance. DG-T5 and DG-T5L: 1/2” CMOS, 48 million effective pixels.
3.	13 mm Wide-angle infrared lens	Used for temperature measurement and night vision. It can monitor the temperature distribution of the measured target in real time, so as to determine the status of the target. DG-T5: 640×512 infrared resolution rate; temperature measurement range: -20℃ to 150℃ (high gain mode), 0 to 550℃ (low gain mode).
4.	25 mm Infrared lens	Used for temperature measurement and night vision. It can monitor the temperature distribution of the measured target in real time, so as to determine the status of the target. ● DG-T5L: 640×512 infrared resolution rate; temperature measurement range: -20℃ to 150℃ (high gain mode), 0 to 550℃ (low gain mode).

No.	Name	Description
5.	45 mm Tele infrared lens	Used for temperature measurement and night vision. It can monitor the temperature distribution of the measured target in real time, so as to determine the status of the target. DG-T5: 640×512 infrared resolution rate; temperature measurement range: -20℃ to 150℃ (high gain mode), 0 to 550℃ (low gain mode).
6.	Laser rangefinder	The distance is accurately determined by measuring the time it takes for the laser beam to travel back and forth to observe the target. DG-T5 and DG-T5L: Ranging range of 10-2000 meters.
7.	Laser fill light lens	In a low light environment, you can fill light to the environment by turning on the near-infrared light filler to improve the image quality of the visible light camera. This function is available for DG-T5L only.

⚠ Warning

- Never aim the infrared thermal imaging camera at strong energy sources, such as the sun, lava, laser beams, molten iron, etc., to avoid damaging the infrared detector.
- The temperature of the measured target should be less than 600°C. Observation exceeding this temperature will cause burns and damage to the infrared detector.

Tips

- The laser rangefinder is a Class 1 laser product and does not cause any harm to human eyes and skin. Please feel free to use it.

3.2.3 Installing and Uninstalling

The gimbal camera of the aircraft adopts a quick-detachable design, which allows users to quickly replace or assemble the gimbal camera.

Important

- Please follow the following operating guidelines to replace the gimbal camera, otherwise the gimbal interface may be damaged or have poor contact.
- Please use the gimbal camera model officially designated by Autel Robotics for replacement. Incompatible gimbal cameras can damage the aircraft.

Warning

- It is prohibited to install or remove the gimbal camera while the aircraft is powered on, and you must wait for 15 seconds after the aircraft's power is turned off before proceeding.

Install the Gimbal Camera

1. Make sure the aircraft is powered off, and remove the protective covers from the gimbal interface of the gimbal camera and the aircraft. Align the red dot on the gimbal lock ring with the red dot on the gimbal interface on the fuselage.
2. Hold the gimbal camera upward, align the gimbal interface and insert it into the gimbal interface of the fuselage, ensuring that the two are well connected.
3. Rotate the gimbal lock ring according to the locking direction of the gimbal interface on the fuselage until the red dot on the gimbal lock ring aligns with the lock mark on the gimbal interface of the fuselage. After the gimbal camera is locked, you will hear a click from the gimbal unlock button.

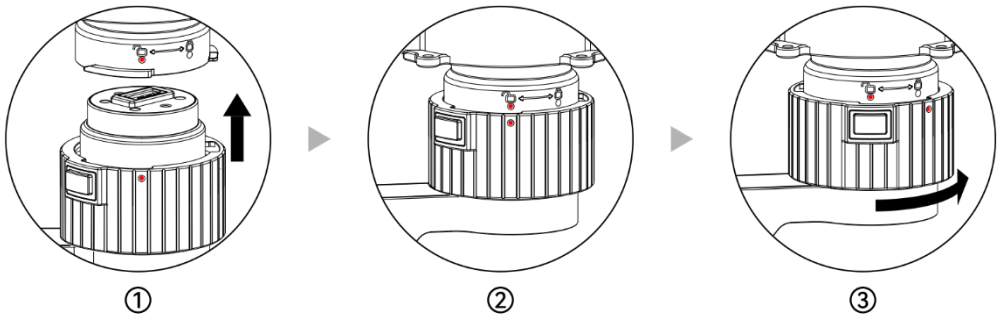


Figure 3-9 Install a Gimbal Camera on the Aircraft

Important

- After completing the installation of the gimbal camera according to the above steps, you can try to reversely rotate (do not press the gimbal unlock button) the gimbal locking ring. If the gimbal camera has been locked with the fuselage's gimbal

interface, the gimbal locking ring will not be able to be rotated.

- After installing the gimbal camera, please remove the gimbal camera lens protective cover in time.
- After installing the gimbal camera, please turn on the power of the aircraft and conduct self-test to ensure that the gimbal camera can work normally. During the self-test, the gimbal camera will automatically rotate for calibration. Please ensure that there are no objects near the gimbal camera that hinder its movement.

Uninstall the Gimbal Camera

1. Make sure the aircraft is powered off, hold the gimbal camera with one hand, and press the gimbal unlock button with the other hand.
2. Rotate the gimbal lock ring according to the unlocking direction of the gimbal interface on the fuselage until the red dot on the gimbal lock ring aligns with the unlock mark "" on the gimbal interface on the fuselage.
3. After being unlocked, the gimbal camera will automatically detach from the aircraft gimbal interface under the action of gravity.

⚠ Warning

- When removing the gimbal camera from the aircraft, be sure to support the gimbal camera to prevent damage to the gimbal camera from falling.

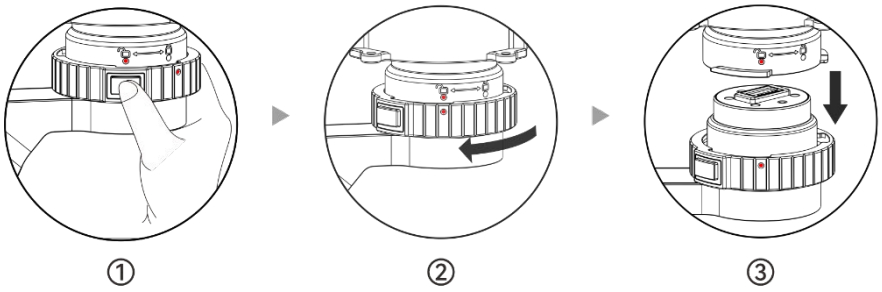


Figure 3-10 Uninstall the Gimbal Camera from the Aircraft

❗ Important

- After removing the gimbal camera, be sure to install the lens protective cover and gimbal interface protective cover (or aircraft gimbal interface protective cover) of the gimbal camera in time to avoid damage during transportation and storage.

3.2.4 Camera Operation

- **Control via remote controller function keys**

- Zoom toggle key: Controls the zoom factor of the selected camera. Push it up to expand the zoom factor; push it down to reduce the zoom factor.
- Photo/video button: Tap to take a photo; press and hold to start/end recording video.

Tip
● For the control operation of the remote controller, see "**3.4.1 Remote Controller Components**".

■ **Control By Autel Voyager App**

For the control and functions of the camera on Autel Voyager App, see "**3.5.4 Camera Interface**".

3.2.5 Mechanical Rotation Range

The mechanical rotation ranges of the gimbal 's pitch axis (Pitch), pan axis (Pan) and roll axis (Roll) are as follows:

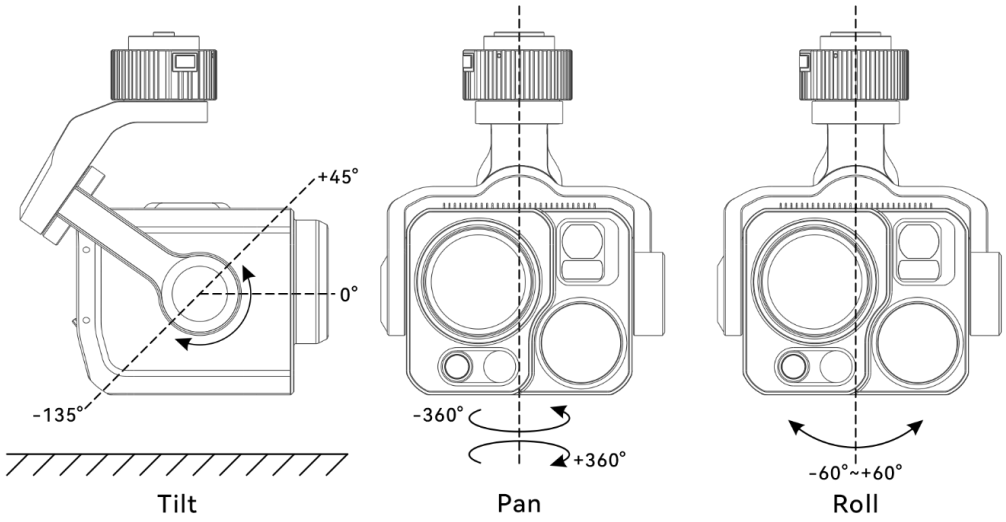


Figure 3-11 Description of the Mechanical Rotation Range of the Gimbal

Table 3-13 Description of the Mechanical Rotation Range of the Gimbal

Gimbal Model	Pitch Axis	Pan Axis	Roll Axis
DG-T5	-135°to 45°	-360°to 360°	-60°to 60°
DG-T5L	-135°to 45°	-360°to 360°	-60°to 60°

3.2.6 Controllable Movement Range

Gimbal Model	Pitch Axis	Pan Axis
DG-T5	-90° to 30°	-360° to 360° Support continuous rotation
DG-T5L	-90° to 30°	-360° to 360° Support continuous rotation

3.2.7 Other Functions

The DG-T5 and DG-T5L gimbals both support the de-fogging function. During flight shooting in foggy environments, moisture may accumulate on the surface of the gimbal camera lens, which can degrade the quality of captured images. This issue can be mitigated by enabling the de-fogging function in the "Camera Settings" of the Autel Voyager App.

Defog: When the de-fogging function is activated, the gimbal applies algorithm-based de-fogging processing. This enhances image clarity and transparency, while also boosting color vividness for sharper, more vibrant footage.

Camera defog: The DG-T5L gimbal is equipped with a dedicated Lens Defogging function. A built-in heating wire within the gimbal warms the camera lens to achieve physical defogging by evaporating moisture. Simultaneously, the captured images undergo real-time sharpening and enhanced color contrast processing, this further improves image transparency and eliminates issues such as blurriness or insufficient clarity.

⚠ Warning
After the heating defogging functionality is enabled, the surface temperature of the DG-T5 and DG-T5L gimbal cameras will warm up to around 60°C to 70 °C within 20s. During use, be sure to keep a distance from the gimbal camera to avoid burns.

3.2.8 Installing a microSD Memory Card

The gimbal camera has a microSD memory card installed by default before leaving the factory. If the user needs to replace the memory card with a larger capacity, perform the following procedure.

1. Remove the rubber protective cover from the gimbal camera interface area and pop out the installed microSD memory card (if any).
2. Insert the new microSD memory card into the card slot of the gimbal camera with the correct orientation, and secure the rubber protective cover.

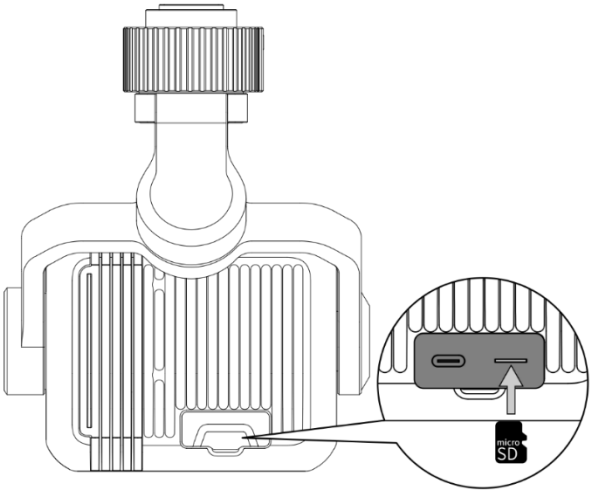


Figure 3-12 Install a microSD Memory Card on Gimbal Camera

Tips
● If you want to shoot high-definition videos, it is recommended to use a Class 10, UHS-3 or higher microSD memory card. ● DG-T5 and DG-T5L gimbal cameras support up to 256GB microSD memory card.

Warning
● To prevent data loss, please turn off the power of the aircraft before removing the microSD memory card. ● After installing the microSD memory card, please promptly cover the rubber protective cover of the gimbal camera interface area to avoid affecting the protective performance of the gimbal camera.

3.3 Tracking Antenna

The tracking antenna, with great environmental adaptability, can be used in -20 ℃ to 40 ℃.

3.3.1 Tracking Antenna Components

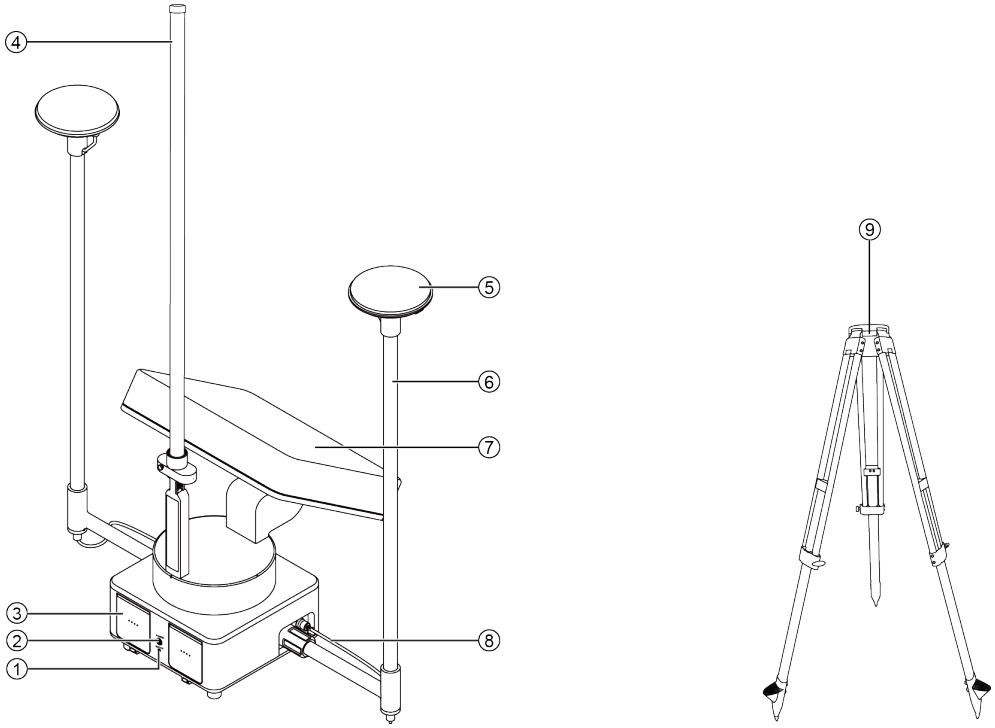


Figure 3-13 Main Appearance

No.	Part Name	Description
1.	Match button	Short press the button for 1 second to start tracking antenna frequency matching.
2.	Power button	When the tracking antenna is powered off, press the power button for 1 second to turn on the power of the tracking antenna. When the tracking antenna is powered on, press the power button for 1 second to turn off the power of the tracking antenna.
3.	Battery compartment cover	/
4.	Omnidirectional antenna	Used to transmit and receive 360° signals at short distance.
5.	RTK antenna	Used to receive high-precision GNSS signal.
6.	RTK antenna	The stand of the RTK antenna.

No.	Part Name	Description
	holder	
7.	Directional antenna	Used to transmit and receive signals in concentrated directions at long distance.
8.	Antenna feeder	Connects the RTK antenna to the main body of the tracking antenna.
9.	Tripod	Used to install the main body of the tracking antenna.

3.3.2 Turning Tracking Antenna On/Off

- When the antenna is off, press and hold the power button until it emits a “beep” sound, then the power indicator will be solid green, indicating it has been turned on;
- When it is on, press and hold the power button until it emits ‘beep” sound 10 times, and then the power indicator will be off, indicating it has been turned off.

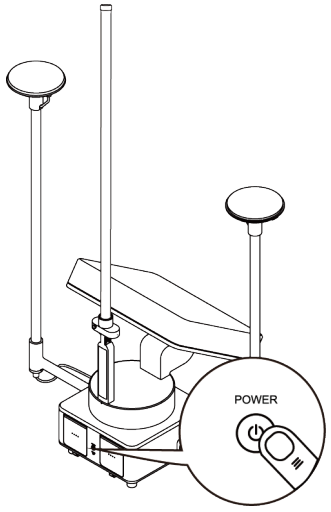


Figure 3-14 Turn on the tracking antenna

3.3.3 Checking Battery Level

When the battery is turned off, press the power level check button for 1 second and then release it quickly to check the battery level. After the battery is inserted into the battery compartment of the tracking antenna, you can check the battery level through the hole on the battery compartment cover.

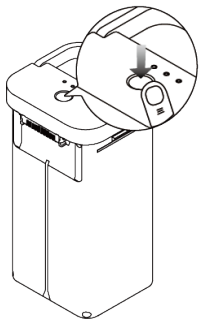


Figure 3-15 Checking battery level

Power Light Status	Remaining Battery Level
● ● ● ●	87.5% to 100%
● ● ● ◎	75% to 87.5%
● ● ● ○	62.5% to 75%
● ● ◎ ○	50% to 62.5%
● ● ○ ○	37.5% to 50%
● ◎ ○ ○	25% to 37.5%
● ○ ○ ○	12.5% to 25%
◎ ○ ○ ○	0% to 12.5%

●: Solid green ◎: Blinks green ○: Off

3.3.4 Battery Hot Replacement

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

3.3.5 Charging Tracking Antenna

Use the charger officially provided by Autel Robotics t**o charge the battery of the tr**acking antenna. Connect the triangle plug of the charger to AC power supply (100-240V).

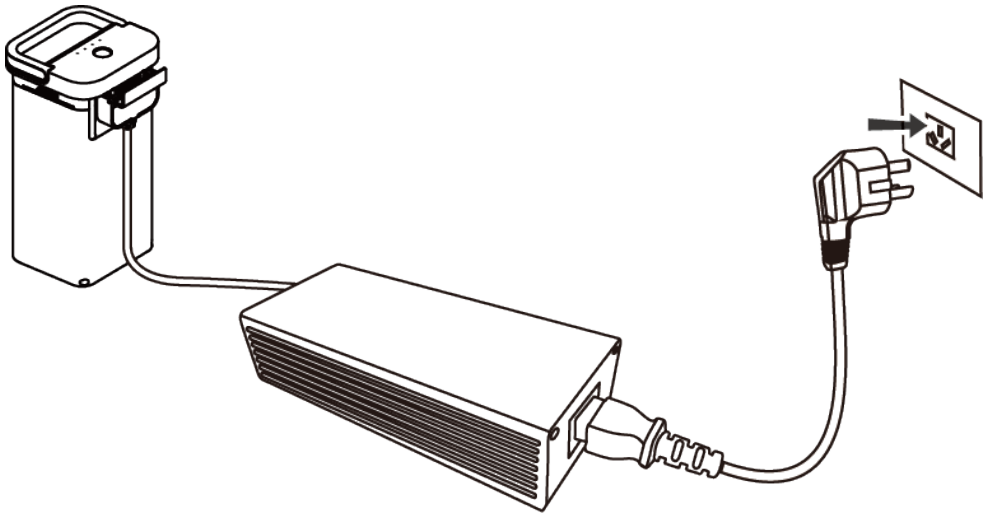


Figure 3-16 Charging Tracking Antenna

⚠ Warning
● Please use the charger officially provided by Autel Robotics to charge the battery of the tracking antenna. Using a third-party charger may damage the battery. ● After charging is completed, please disconnect the battery from the charging device in time.

Remarks
● Before taking off the aircraft, it is recommended to charge the battery to a fully charged state.

3.4 Remote Controller

The Ground Control Station (hereinafter referred to as the "remote controller") is installed with Autel Voyager App by default, allowing users to operate and set the aircraft, the gimbal camera and transmitting high-definition videos from the gimbal camera in real time.

When the remote controller is used combination with aircraft, its 5.8G data transmission distance is up to 1 km and the video transmission range is up to 8-10 km.

Remarks

- The maximum communication distance of the remote controller is measured under unblocked and interference-free conditions and is for references only.
- It supports adaptive frequency hopping transmission, selects the optimal channel according to the electromagnetic interference situation, and has strong anti-interference ability.
- The whole link data storage between the aircraft and the remote controller adopts the AES-128 encryption method to ensure end-to-end data communication security.

3.4.1 Remote Controller Components

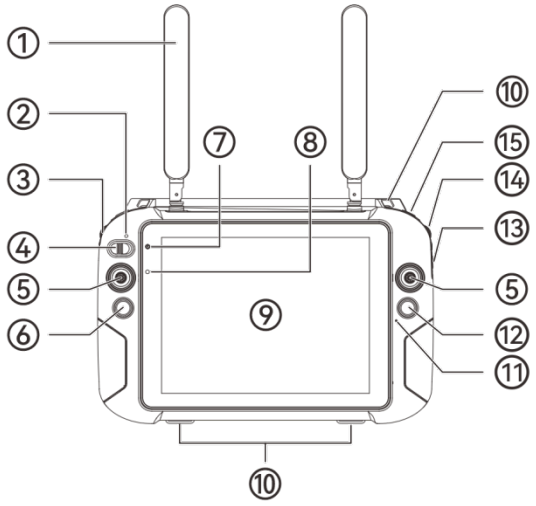


Figure 3-17 Remote Controller Front View

Table 3-14 Remote Controller Front View Details

No.	Name	Description
1.	Antenna	Transmits the control signals of the remote controller and receives the video transmission information of the aircraft.
2.	Mode switch indicator	If you switch to Auto mode, the green light is on, if you switch to Manual mode, the red light will on.
3.	Left dial wheel	The wheel for gimbal pitch: Turn the dial wheel to adjust the gimbal pitch.
4.	Mode switch key	A: Auto mode；M: Manual mode

No.	Name	Description
5.	Sticks	Controls the state of motion of the aircraft. The default stick mode is Mode 2. In this mode, you can use the left stick to control the ascent, descent, and heading of the aircraft; use the right stick to control the forward, backward, left, and right translational movement of the aircraft. You can set the stick mode in the Autel Voyager App.
6.	Return-to-home button	Press and hold the button for 3 seconds, and the aircraft will automatically begin the return-to-home process.
7.	Power status indicator	When the remote controller is being charged, it shows red, if fully charged, it shows green.
8.	Optical sensor	Detects ambient light and adjusts the screen brightness automatically.
9.	Display	Displays real-time video transmission views. Touch operation is supported.
10.	Hook	Used to connect and fix the remote controller lanyard.
11.	Audio input	Receives information from an external audio source near the remote controller.
12.	Shooting/video recording button	Press to take photos or start/stop recording.
13.	Zoom switch	Adjust the zoom factor of the camera. W: wide-angle；T: tele.
14.	Right dial wheel	Turn the dial wheel to adjust the gimbal pan angle.
15.	F1 key	Customizable button, available in future update.

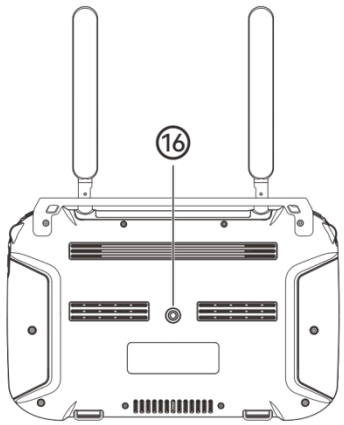


Figure 3-18 Remote Controller Rear View

Table 3-15 Remote Controller Rear View Details

No.	Name	Description
16.	Tripod Interface	Used for attaching tripods.

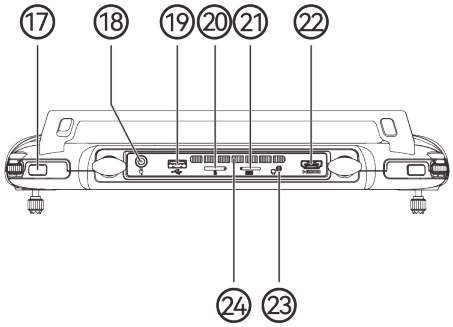


Figure 3-19 Remote Controller Top View

Table 3-16 Remote Controller Top View Details

No.	Name	Description
17.	Power button	Press to turn on/off the remote controller. When the remote controller is on, quickly press the power button to switch between Screen On and Screen Off.
18.	Charging interface	Used for remote controller charging.
19.	USB type-A	Connects to external USB device for data

No.	Name	Description
	interface	transmission.
20.	microSD card slot	Insert a microSD memory card to expand storage space for remote controller.
21.	Nano-SIM slot	Reserved for future use.
22.	HDMI interface	Outputs the live view of the remote controller to a supported display device.
23.	Headphone Jack	Compatible with 3.5mm headphones.
24.	Air inlet	Used for heat dissipation of the remote controller. Please pay attention to whether there are foreign objects blocking the air inlet when using it.

3.4.2 Turning the Remote Controller On/Off

- **Turning the remote controller on**

Press and hold the power button of the remote controller for 1 second until the remote controller emits a “beep” sound to turn it on.

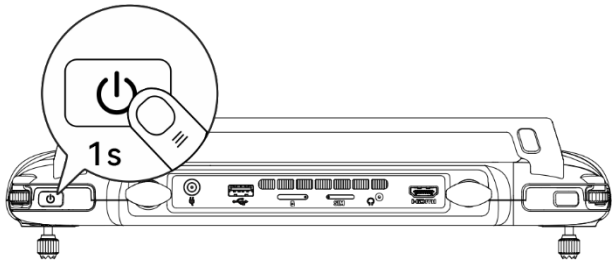


Figure 3-20 Turning the Remote Controller On

Tips
● When using a brand-new remote controller for the first time, please follow the on-screen instructions to complete the relevant setup.

- **Turning the remote controller off or restarting the remote controller**

When the remote controller is on, press and hold the power button of the remote controller until the “Off” or “Restart” icon appears at the top of the controller's screen.

Tapping the “Off” icon will turn off the remote controller. Tapping the “Restart” icon will restart the remote controller.

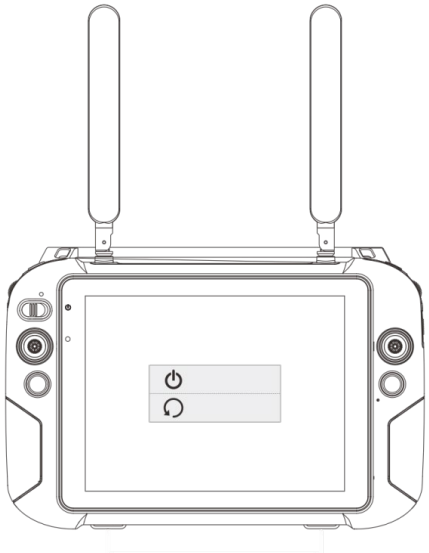


Figure 3-21 Turn the Remote Controller Off or Restart

Tips
● When the remote controller is on, you can press and hold the power button for 10 seconds to forcibly turn it off.

3.4.3 Flight Control Mode

By using the remote controller, users can control the aircraft in Auto mode or Manual mode. See “**3.1.5 Flight Modes**” for details.

- **Automatic Flight Control**

  Switch the mode switch button on the remote controller to the “A”. The mode switch indicator will turn green and the remote controller will not respond to stick commands. After planning the flight route in Autel Voyager App, execute takeoff, and the aircraft will automatically follow the planned path. During this process, user can control the gimbal camera by turning the dial wheels or using the zoom switch.

- **Manual Flight Control**

  Switch the mode switch button on the remote controller to the “M”. The mode switch indicator will turn red. In this mode, users can manually control the aircraft by using sticks during flight.

Warning
● If users are not fully skillful in controlling the aircraft, it is not suggested to use the manual mode.

- When users are controlling the aircraft with the remote controller, it is recommended to use the auto mode.

3.4.4 Checking the Battery Level of the Remote Controller

When the remote controller is on, you can check the current battery level of the remote controller in the following ways:

- Check it on the top status bar of Autel Voyager App.
- Check it by swiping down from the top of the remote controller's screen to access the Control Center to check the battery level.
- Go to the "**Aircraft Settings**" interface of the remote controller and check the current battery level of the remote controller.

3.4.5 Charging the Remote Controller

Connect the output end of the official charger to the interface of the remote controller and connect the plug of the charger to an AC power supply (100-240 V~ 50/60 Hz).

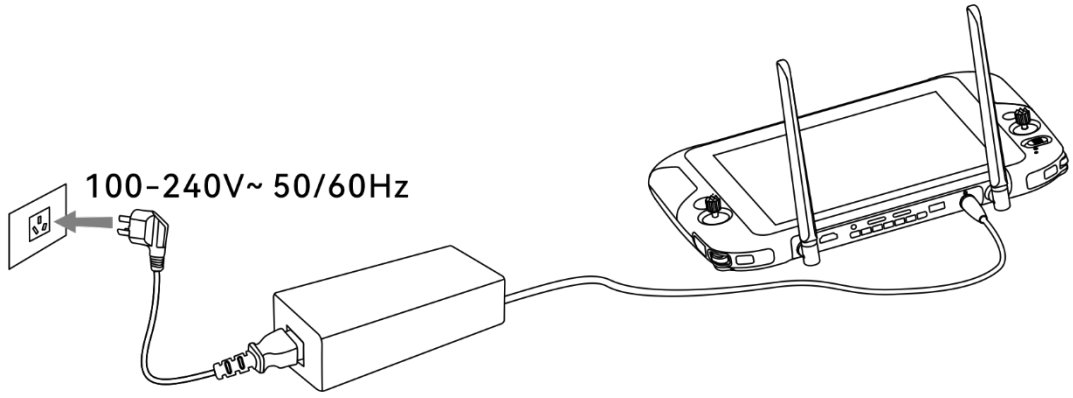


Figure 3-22 Use the Remote Controller Charger to Charge the Remote Controller

⚠ Warning

- Please use the official charger provided by Autel Robotics to charge the remote controller. Using third-party chargers may damage the battery of the remote controller.
- After charging is completed, please disconnect the remote controller from the charging device promptly.

Remarks

- It is recommended to fully charge the remote controller battery before the aircraft takes off.
- Generally, it takes about 120 minutes to fully charge the aircraft battery, but the charging time is related to the remaining battery level.

3.4.6 Adjusting the Antenna Position of the Remote Controller

During flight, please extend the antenna of the remote controller and adjust it to an appropriate position. The strength of the signal received by the antenna varies depending on its position.

When the angle between the antenna and the back of the remote controller is 180° or 270°, and the plane of the antenna faces the aircraft, the signal quality between the remote controller and the aircraft can reach its best state.

Important

- During flight, it is suggested to use the remote controller with tracking antenna to enhance the connection.
- When users operate the aircraft, make sure that the aircraft is in the place for the best communications.
- Do not use other communication devices of the same frequency band at the same time to prevent interference with the signals of the remote controller.
- During flight, if there is a poor video transmission signal between the aircraft and the remote controller, the Autel Voyager App will provide a prompt. Please adjust the antenna orientation according to the prompt to ensure that the aircraft is in the optimal data transmission range.

3.4.7 Calibrating the Remote Controller

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

1. Turn on the remote controller.
2. After entering map or camera interface in the Voyager application, tap "⚙" > "**Remote Controller**" > "**RC Calibration**". Follow the on-screen instructions to calibrate the remote controller.

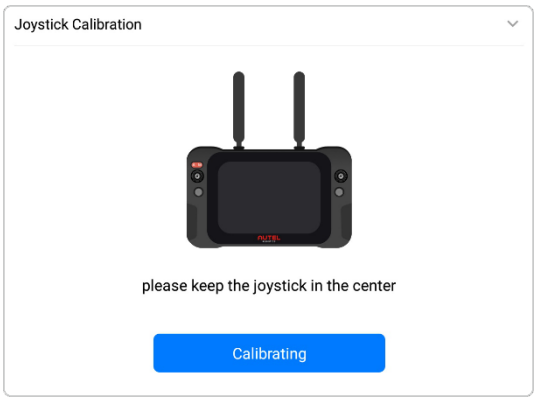


Figure 3-23 Joystick Calibration

3. According to the calibration guide interface 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 change from gray to dark blue, indicating that the orientation calibration was successful.

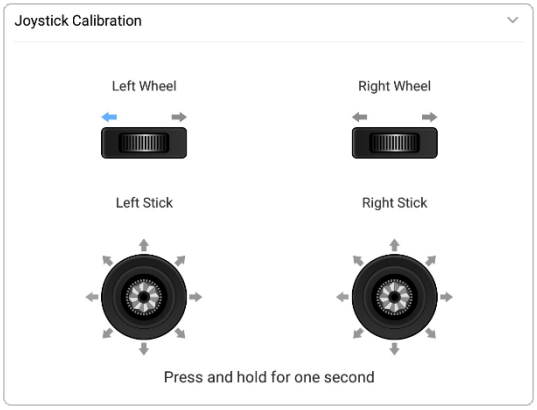


Figure 3-24 Calibrating

Remarks
• There is no order in which directions are calibrated, until all directions are calibrated.

3.4.8 HDMI Screen Output

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

3.5 Autel Voyager App

Autel Voyager App is an industrial flight software developed by Autel Robotics especially for the vertical take-off and fixed-wing aircrafts, and is installed on the remote controller. Autel Voyager App integrates multiple professional functions, supports a variety of mission modes such as waypoint missions, polygon missions, and quick missions. Users can achieve highly intelligent operations of the aircraft through various built-in intelligent flight functions, empowering industrial applications.

Remarks
● In practical use, due to application version update, some UI interfaces and functions may change. Please conduct operations according to the actual version.

3.5.1 Main Interface

Autel Voyager App consists of the following interface. Relevant interface main functions are as follows:

- Map interface: Users can create route missions on the map interface and save them to the mission library; users can also perform other flight missions.
- Camera interface: When performing a flight mission, it displays the real-time transmission image of the gimbal camera.

Tips
● When the aircraft is equipped with different gimbal camera, the lens displaced in camera interface will vary as well.

- “Aircraft Settings”: Provides access to software and hardware functionality settings related to flight safety.
- “New User Tutorials”: Provides access to teaching videos and user manuals for the aircraft, and supports downloading to local for management.
- “Flight Log”: Users can view the Flight Log of the aircraft (total flight mileage, total flight time, number of flights), and it supports downloading from the cloud to local for viewing.
- “Cloud Services”: Provides cloud service configurations that connect the remote controller to the Autel Integrated Command System.
- “Mission Library”: Users can view saved route missions and geofences and manage them.
- “Album”: Users can view all photos and videos taken by the gimbal camera.

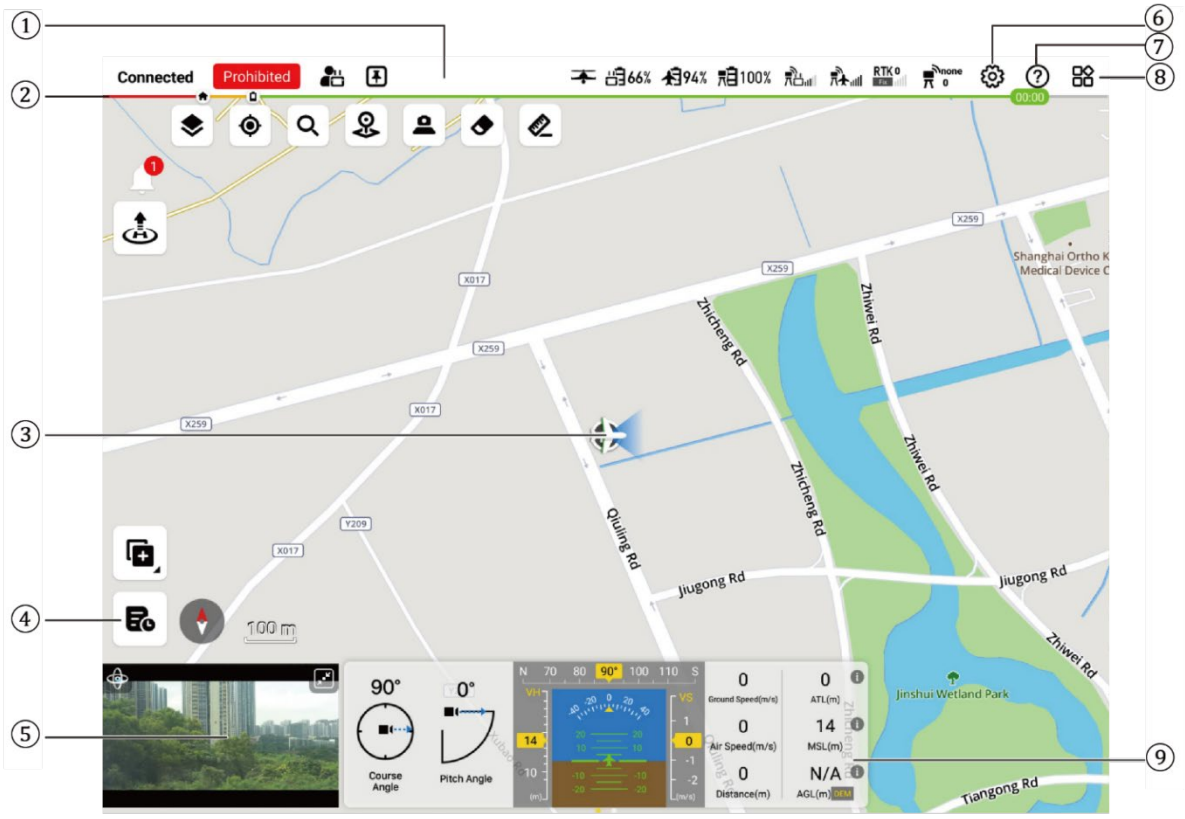


Figure 3-25 Interface Layout (Map Interface)

Figure 3-26 Interface Layout (Camera Interface)

Table 3-17 Interface layout description

No.	Layout/Icon	Description
1.	Status bar	Mainly displays UAS status information, including device status information of the aircraft, the tracking antenna, and the remote controller.
2.	Battery bar	Real-time display of the remaining battery level of the aircraft and the estimated remaining flight time.
3.	Map interface	Users can create waypoint missions and geofences on the map interface, and when performing missions, relevant information about the mission (route, track, mission execution status) will be dynamically displayed.
4.		Tap this icon to check saved route missions or geofences in "**Mission**" interface.
5.	Camera interface preview	Preview the live video transmission of the currently selected camera lens in a small window. Tap to enter the full-screen camera interface.
6.		Tap this icon to go to "**Aircraft Settings**" interface where you can set parameters in Autel Voyager App, aircraft, remote controller and base station.
7.		Tap this icon to go to "**Control Area Tips**" or "**Status Bar Tips**" interface.
8.		Tap this icon to go to "**New User Tutorials**", "**Flight Log**" or "**Cloud Service**" interface.
9.	Professional panel	Dynamically display the telemetry data of the aircraft, including the gimbal attitude, aircraft attitude, and flight data. Switch to the telemetry data panel by holding and sliding the professional panel to the left.
10.	Camera interface	Users can view the full-screen real-time video transmission of each lens of the gimbal camera on the camera interface and set the camera.
11.	Map interface preview	Preview the current aircraft's track information on the map in a small window. Tap to enter the full-screen map interface.

No.	Layout/Icon	Description
12.	Other lens previews	Preview the real-time video transmission of other lenses of the current gimbal camera in a small window. Tap to switch with the current full-screen lens image.
13.	Camera lens switch	Tap the corresponding lens icon to enter the full-screen video transmission screen of the corresponding lens of the gimbal camera.
14.	GNSS switch	Users may enable or disable GNSS as needed.
15.	VPS switch	Users may enable or disable VPS as needed.

3.5.2 Status Bar

The status bar is located at the top of the map interface and camera interface. It is mainly used to display UAS status information, including device status information of the aircraft, the tracking antenna, and the remote controller. At the same time, it provides users with access to the "**Aircraft Settings**" interface, "**New User Tutorial**" interface, "**Flight Log**" and "**Cloud Service**" interface.

Figure 3-27 Status Bar

Table 3-18 Status Bar Icon Description

No	Icon	Description
1.	Connected	Display the connection status between the remote controller and the aircraft, as well as the mission execution status.
2.	Prohibited	Display the current device status. If the device status is abnormal, a warning prompt will appear.
3.		When two remote controllers are connected to a tracking antenna at the same time, the current remote controller is the pilot role.
4.		When two remote controllers are connected to a tracking antenna at the same time, the current remote controller is the observer role.

No	Icon	Description
5.		The current tracking antenna's working mode is fixed mode.
6.		The no-fly zone is in lifted state.
7.		Fixed-wing mode, indicating that the aircraft is currently in a horizontal flight phase.
8.		Multi-rotor mode, indicating that the aircraft is currently in a vertical take-off and landing phase.
9.		The current battery level of the remote controller.
10.		The current battery level of the aircraft.
11.		The current battery level of the tracking antenna.
12.		The signal strength between the tracking antenna and the remote controller.
13.		The signal strength between the tracking antenna and the aircraft.
14.		The RTK signal strength and positioning accuracy level.
15.		GNSS signal strength.
16.		Tracking antenna signal strength.
17.		Obstacle avoidance function, turned on as green, and turned off as red.
18.		Tap this icon to enter the “**Aircraft Settings**” interface.
19.		Tap this icon to provide hints for related functions of the interface elements of the “**Control Area Tips**” and “**Status Bar Tips**”.

No	Icon	Description
20.		Tap this icon to enter the "**New User Tutorials**" interface, "**Flight Log**" or "**Cloud Service**" interface.

3.5.3 Map Interface

After tapping Autel Voyager App, you will enter the map interface by default.

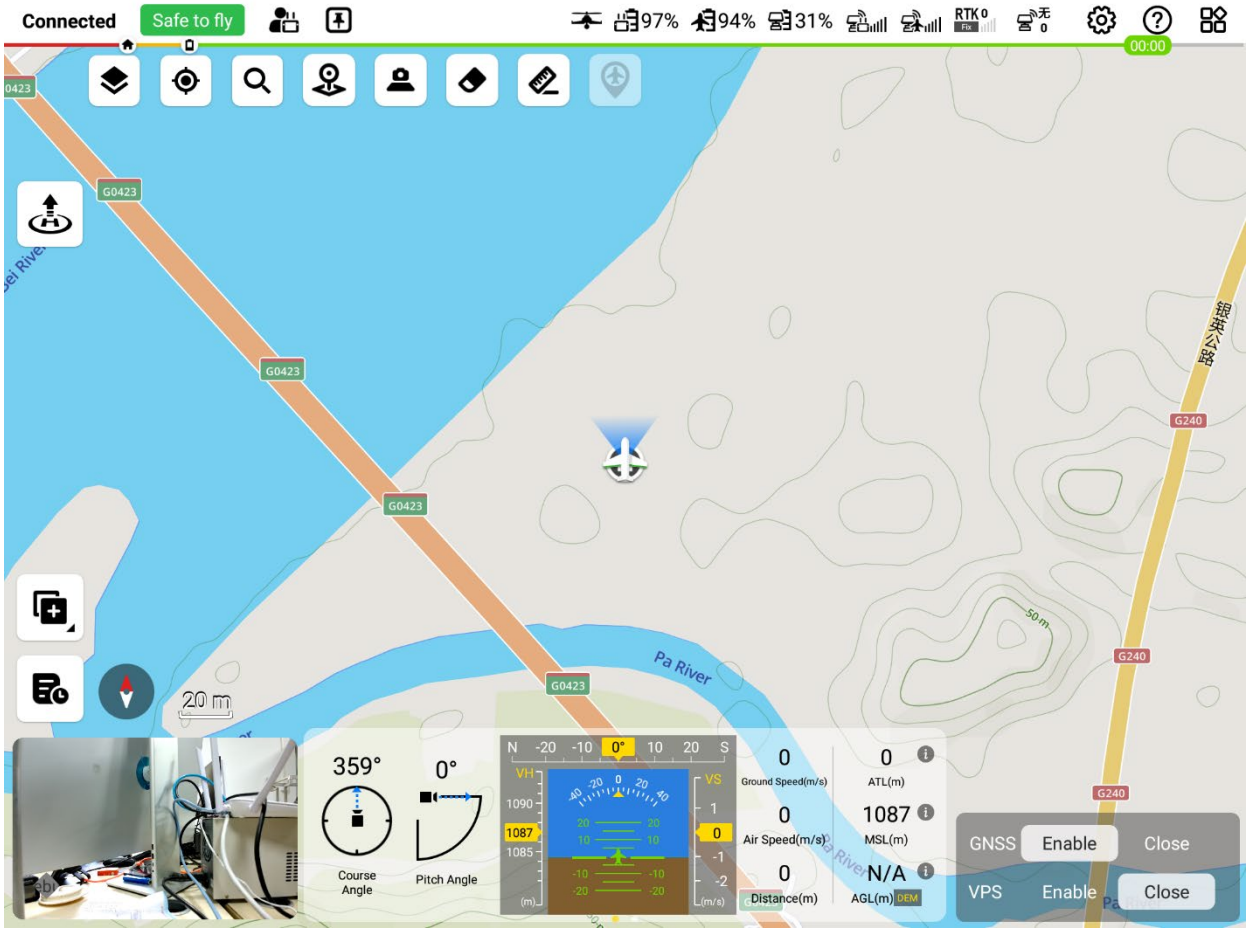


Figure 3-28 Map Interface

Table 3-19 Map Interface Icon Description

No.	Icon	Description
1.		Tap this icon to view the specific alarm content when an alarm icon appears.
2.		Tap this icon to select the map layer styles, and support managing marked points and downloading offline maps.

No.	Icon	Description
3.		Tap this icon to select quick location to "**RC Location**", "**Aircraft**", or "**Flight Route**".
4.		Tap this icon to search for an address or coordinates.
5.		Tap this icon to place marked points on the map.
6.		Tap this icon to project the gimbal image onto the map.
7.		Tap this icon to select clearing the overflew routes or projection.
8.		Tap this icon to measure the distance between two points on the map, supporting continuous marking for measurement.
9.		After editing and saving the route mission, tap this icon to perform a pre-flight check and then select to start the mission.
10.		Tap this icon to complete the pre-flight check and perform takeoff, and the aircraft will take off vertically and hover.
11.		During the mission: ● Tap this icon on the map interface to select auto landing or precise diversion. ● Tap this icon on the camera interface, and the aircraft will automatically descend and turn off the motor after landing.
12.		During the mission, tap this icon on the map interface, and the aircraft will vertically land from the current location.
13.		During the mission, tap this icon on the map interface and set a temporary alternate point on the map, and the aircraft will precisely land at the alternate point.
14.		During the mission, tap this icon, and the aircraft will automatically return.
15.		During the flight of the aircraft, tap this icon to exit the current mission and perform a quick mission.

No.	Icon	Description
16.		Before the aircraft takes off, tap this icon to select creating waypoint missions, polygon missions, and geofences. After the aircraft takes off, tap this icon to select creating temp missions.
17.		Tap this icon to create a waypoint mission.
18.		Tap this icon to create a polygon mission.
19.		Tap this icon to create a geofence.
20.		Tap this icon to create a figure-8 mission.
21.		Tap this icon to preview the route and terrain or set whether to enable the terrain obstacle avoidance function.
22.		Tap this icon to enter the “**Mission**” interface.
23.		Compass, red-end indicates the true north direction of the map.

3.5.4 Camera Interface

On the map interface, tap the camera interface preview window at the lower left corner to enter the camera interface.

3.5.4.1 Interface Icon Description

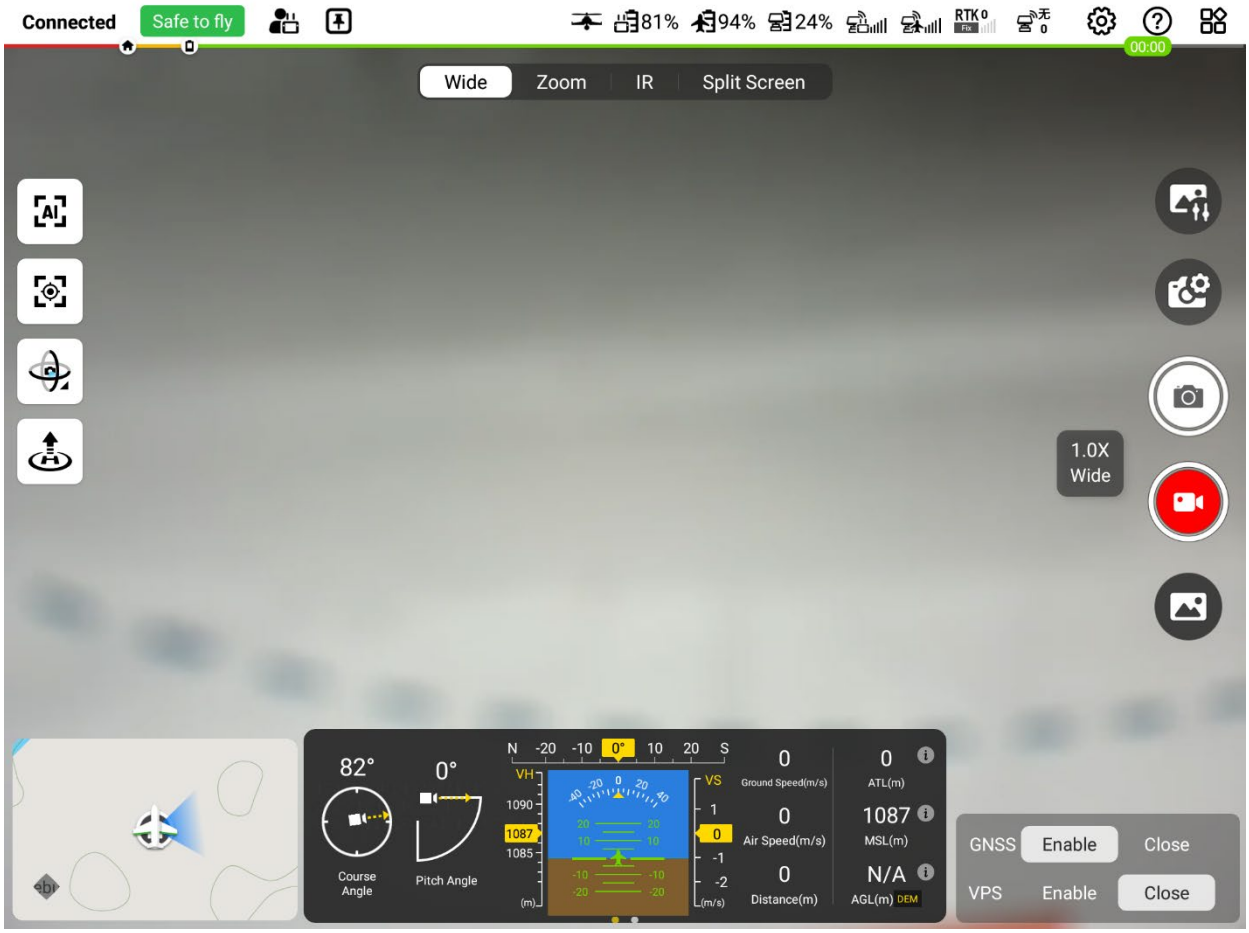


Figure 3-29 Camera Interface

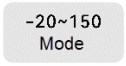
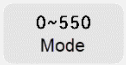
Tips

- When the aircraft is equipped with different gimbal cameras, the lens interface displayed on the camera interface will also be different.
- To switch to the corresponding camera lens full-screen, tap the lens icon on the top of the camera interface.

Table 3-20 Camera Interface Icon Description

No.	Icon	Description
1.		Tap this icon to enable gimbal lock. After locking the target point by tapping or tapping and dragging to select, the target point remains in the center of the video transmission screen.

No.	Icon	Description
2.		Tap this icon to automatically identify targets such as person, vehicle and other target in the camera interface.
3.		Tap this icon to realize quick return-to-center of the gimbal.
4.		Tap this icon to keep the gimbal tilt angle horizontal and the gimbal heading to follow the aircraft heading.
5.		Tap this icon, the gimbal's tilt angle will be 90° downward , and the gimbal's heading will follow the aircraft's heading.
6.		Tap this icon to keep the gimbal tilt angle in its current state and the gimbal heading to track the aircraft heading.
7.		Tap this icon to keep the gimbal tilt angle horizontal and the gimbal heading to the current state.
8.		Tap this icon to activate gimbal fill light. This function is available for the gimbal equipped with light filling function, such as DG-T5L.
9.		Tap this icon to enter the camera settings interface.
10.		Photo button. Tap this icon, the corresponding lens will take a photo.
11.		Recording button. Tap this icon, the corresponding lens will record, tap it again to stop recording.
12.		On the wide-angle camera interface, tap this icon to adjust the zoom of the camera.
13.		On the zoom camera interface, tap this icon to adjust the zoom magnification of the camera.
14.		On the infrared camera interface, tap this icon to adjust the zoom magnification of the camera.
15.		Tap this icon to enter the photo album to view the photos and videos you have taken.

No.	Icon	Description
16.		Tap this icon to achieve linked zooming of the zoom lens and infrared lens.
17.		On the infrared camera interface, tap this icon and then from the “color” pulldown list, drag up and down to select a color disk.
18.		High gain temperature measurement mode, temperature measurement range is -20℃-150℃. This mode has higher temperature measurement accuracy. On the Infrared camera interface, after temperature measurement function is enabled, tapping this icon switches to low gain temperature measurement mode.
19.		Low gain temperature measurement mode, temperature measurement range is 0℃-550℃. This mode has wider temperature measurement range. On the infrared camera interface, after temperature measurement function is enabled, tapping this icon switches to high gain temperature measurement mode.
20.		Tap this icon to perform Flat-Field Calibration. On the infrared camera interface, after temperature measurement function is enabled, you can tap this icon to perform calibration. After calibration, the thermal imaging picture quality will be optimized and temperature changes will be easier to observe.

3.5.4.2 Image Settings

On the camera interface, tap the “  ” icon to perform image parameter settings.

“Common Adjustment” Settings

Select “**Common**” to expand “**Common Adjustments**” interface, you can perform the following settings:

- Brightness: Adjusts the overall brightness of camera image.
- Night Mode: When enabled, wide-angle camera enters night shooting mode during recording videos. The image is still bright even through the shooting is in the low light environment.
- Defog: When enabled, this function will reduce haze, fog, and mist-induced blurriness in captured images through algorithmic post-processing, making the images clearer. Users can turn on/off the electronic defogging function as necessary.

- Camera Defog: When enabled, the gimbal will defog the camera lens through heating and display a defogging countdown. Users can turn the electronic defogging function on or off as needed.

Professional Image Settings

Select "**Professional**" to expand "**Pro Settings**" interface, you can perform the following settings:

- AF/MF (**Auto focus**/**Manual focus**): If the parameter is set to "MF", you can set focus manually.
- ISO: Supports manual adjustment. If the parameter is set to "**Auto**", the gimbal camera automatically adjusts parameters based on the environment.
- S (shutter speed): Supports manual adjustment. If the parameter is set to "**Auto**", the gimbal camera automatically adjusts parameters based on the environment.
- EV (exposure compensation): Supports manual adjustment.
- WB (**white balance**): Supports manual adjustment. If the parameter is set to "**Auto**", the gimbal camera automatically adjusts parameters based on the environment.

3.5.4.3 Camera Settings

On the camera interface, tap the "  " icon to perform camera parameter settings.

General Camera Settings

Select "**General Settings**" to expand "**General Camera Settings**" interface, you can perform the following settings:

- Shooting cameras: Select one or multiple options as necessary.
- Video encoding: H.264 and H.265 video encoding modes are available.
- Video format: MOV and MP4 video formats are available.
- Grid: The default is "None". You can select one or both options as necessary. Setting up a grid can help with composition when shooting.
- Center Point: Set the center point type on the camera interface.
- Subtitle: Set whether the video shows subtitles.
- Stamp: Select the options as necessary.
- Histogram: When "**Histogram**" is turned on, a floating "**Histogram**" window will be generated on the camera interface, which shows the distribution of the pixels in the image taken by the camera, so as to reflect the exposure of the image.
-

Tips
• If the histogram is turned on, a floating "**Histogram**" window will be generated in the remote controller screen. The user can drag the "**Histogram**" window to any area on the screen. Tap the "**Close**" button at the upper right corner of the window to turn

off the histogram function.

- **Tap to begin metering/focus:** After enabled, tap any point on the camera interface, and that point will automatically become the focus point.
- Storage location: Set the storage path of the media files generated by the gimbal camera. After setting, the captured image files will be stored in the corresponding location.
- Camera reset: When you reset the camera parameters, all settings of the gimbal camera will be cleared and restore to default state.
- Camera model: Check the camera model.

Wide-Angle Settings

Select "**Wide**" to expand "**Wide Camera Settings**" interface, you can set the image and video parameter information under the wide-angle lens.

Zoom Settings

Select "**Zoom**" to expand "**Zoom Camera Settings**" interface, you can set the image and video parameter information under the zoom lens.

Infrared Settings

Select "**IR**" to expand "**Infrared Settings**" interface, you can perform the following settings:

- Set the image and video parameter information under the infrared lens.
- Image Mode: "**Manual**" or "**Auto**" option is available.
- Image Enhancement: When enabled, you can set the enhancement effect.
- Temperature Measurement: When enabled, you can set Isotherm, emissivity and temperature alarm.
  - Isotherm: Select as necessary. When "Custom" is selected, you can set the low-temperature and high-temperature lines.
  - Emissivity (%): The setting range is 1% to 100%.
  - Temperature alarm: When enabled, you can set minimum and maximum temperature thresholds. The infrared camera interface will trigger alerts when observed temperatures exceed this defined range.

Tips

- When the temperature measurement function is enabled, the infrared camera interface will appear temperature measurement mode setting icon and FFC calibration icon.

⚠ Warning

- When shooting, do not point the infrared thermal imaging camera at strong energy sources, such as the sun, lava, laser beams, and molten iron, to avoid damaging the infrared detector.
- The measured target temperature should be within 600°C. Over-temperature observation will cause burns and damage to the infrared detector.

3.5.5 Aircraft Settings Interface

Tap "⚙" icon at the top of the map interface or camera interface in Autel Voyager App to access the "**Aircraft Settings**" interface for parameter settings for Autel Voyager App, as well as the aircraft, the remote controller, and the base station.

❗ Important

- If the remote controller belongs to the observer role, some settings will not have operating permissions. See "**2.9 Dual Control Function**" for details.

3.5.5.1 Setting Interface Overview

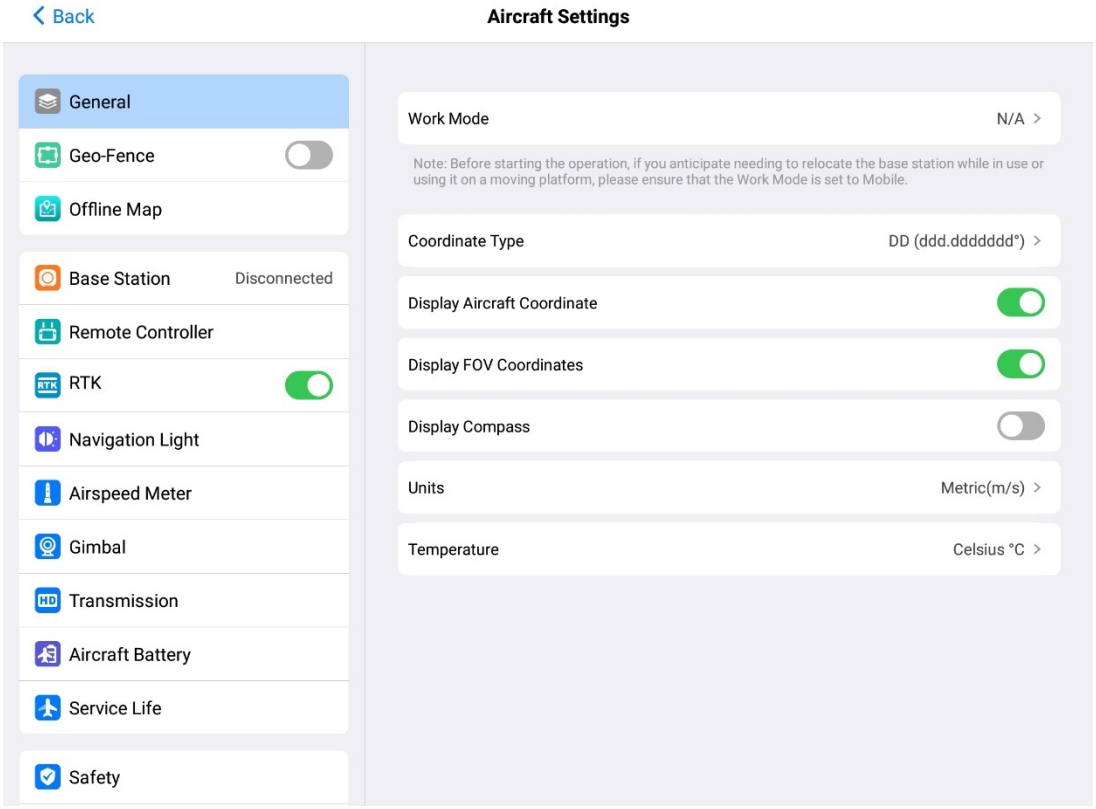


Figure 3-30 Aircraft Settings Interface 1

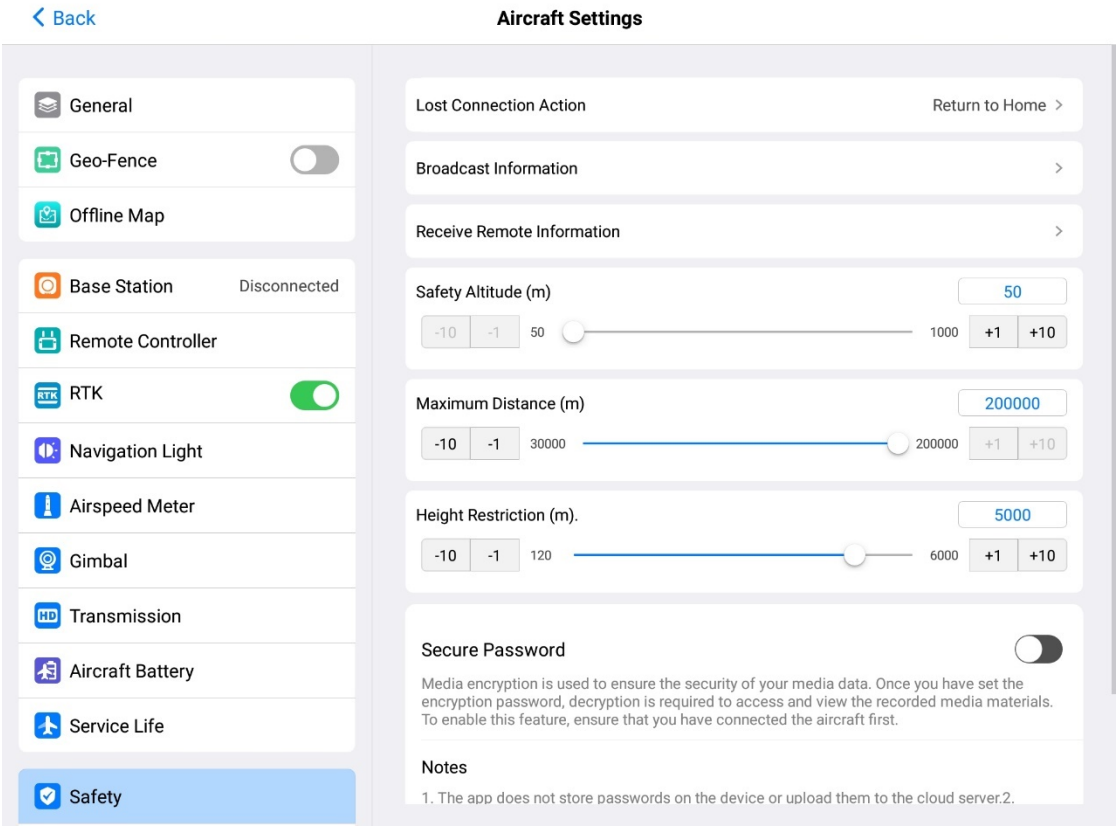


Figure 3-31 Aircraft Settings Interface 2

Table 3-21 Setting Items in Aircraft Interface

No.	Setting Entry	Setting Item
1.	General Settings	● Work Mode: Can be set to “**Fixed**” or “**Mobile**”. If you need to move the tracking antenna position and use it on a mobile platform, select “**Mobile**”. ● Coordinate Format: Select the coordinate type as necessary. ● Display Aircraft Coordinates: Set whether to display coordinate on the main interface. ● Display FOV Coordinates: Set whether to display FOV coordinate on the main interface. ● Wind Speed Display: Set whether to display wind speed on the main interface. ● Display Compass: When enabled, the compass will display on the camera interface. ● Units: Set units that appear in Autel Voyager App. ● Temperature: Can be set to “**Celsius** ℃ ” or “**Fahrenheit** ℉”.
2.	Geofence	You can enable or disable this function.
3.	Offline Map	Manage and download offline map.
4.	Base Station	Manage and connect base station Wi-Fi. After the initial connection, please change the base station password as prompted by the pop-up.
5.	Remote Controller	● RC Calibration: Calibrate sticks or dial wheels of the remote controller. ● Control Mode: Select **Mode 1**, **Mode 2**, or **Model 3**. ● Datalink frequency matching: Displayed when the base station is not connected to the aircraft.
6.	RTK	You can enable or disable RTK service.
7.	Navigation Light	Set the display mode of navigation lights. The setting is valid for a single startup. The navigation light is flashing when startup.
8.	Airspeed Meter	Perform airspeed meter calibration.
9.	Gimbal	● Gimbal Mode: "**Course following**" or "**Attitude lock**".

No.	Setting Entry	Setting Item
		● Gimbal EXP: Can be set from 1 to 100. ● Gimbal Adjustment: The fine tuning resolution is 0.1. ● Gimbal Calibration: Calibrate the three-axis movement of the gimbal.
10.	Video Transmission	● Image Transmission Mode: "**HD**" or "**Smooth**" can be set. ● Transmission Frequency Band: Set legal frequency band supported. ● Lock Frequency Band: When enabled, the current band remains unchanged after the aircraft restarts or relinks.
11.	Aircraft Battery	● Check the temperature, remaining power, number of discharges, serial number, and battery firmware version number of the front and rear batteries. ● Self Discharge Time: Set the battery self-discharge time to protect the battery. ● Return to Home (low battery): This function can be turned on or off. ● Intelligent Low Battery: The remaining power after landing can be set between 15% and 50%.
12.	Service Life	Check the number of times the wing has been used and the number of cycles on the front and rear batteries.
13.	Payload	Payload Control: When enabled, the payload interface will be displayed on the map or live view, allowing control. Display Payload info: When enabled, payload-reported information will be displayed on the map or live view during operation.
14.	Safety	● Signal Lost Action: "**Continue**" or "**Return to Home**" can be set. ● Broadcast Information: Send aircraft related information through Remote ID. ● Receive Remote Information: When it is turned on, corresponding risk prompts can be received within a set distance through the ADS-B receiver. ● Safety Altitude (m): Set the safety height value. ● Maximum Distance (m): Set the limit distance

No.	Setting Entry	Setting Item
		value. ● Height Restriction (m): Set the limit height value. ● Media Encryption: This function can only be turned on after a microSD card is inserted. ● Emergency Stop Propellers: When turned on, the aircraft motor will be powered off and shut down. ● Do not log aircraft data: This function is turned off by default, when enabled, it may lead to the inability to locate device faults or their causes, affecting detection and responsibility determination. ● Do not log remote controller data: This function is turned off by default. ● Do not log base station data: This function is turned off by default. ● Clear Device Logs: Select to clear all device logs.
15.	Aircraft Positioning	● Show GNSS Switch: When abled, main interface will display GNSS switch. ● Non-GNSS Flight Enabled: This function can be turned on or off. ● Non-GNSS RTL Heading(°): The escape direction Angle value can be set within the range of 0 to 360. ● Use visual capabilities to assist positioning and adjust flight attitude: When abled, main interface will display VPS switch.
16.	Laser Rangefinder	This function is applicable for the gimbal camera with a laser rangefinder.
17.	Projection Area	● Projection Area Display: This function can be turned on or off. ● Projection Center Coordinate Display: This function can be turned on or off.
18.	Live Stream	For live image transmission function.
19.	Software Update	● App Version: Displays Autel Voyager App version number and will give a prompt if there is an update. ● UAV Firmware: Displays the aircraft firmware version number and will give a prompt if there is an update. ● Base Station Wi-Fi: Displays the tracking antenna

No.	Setting Entry	Setting Item
		firmware version number, and will give a prompt if there is an update.
20.	Log Upload	After the remote controller is connected to the Internet, flight logs can be synchronized to the Autel cloud.
21.	About	● Total Flight Time: View total flight time. ● Check the App version number. ● Check the firmware version of each hardware of the aircraft system. ● Check the gimbal serial number, aircraft serial number, base station serial number and remote controller serial number.
22.	Compass	Used for compass calibration.

3.5.5.2 Compass Display

The aircraft supports displaying a compass on the camera interface to indicate the current orientation of the aircraft's gimbal camera. Users can turn on the "**Display Compass**" function in the "**Aircraft Settings**"> "**General Settings**" interface. After turning on the compass function, users can clearly distinguish the orientation of the gimbal camera and can adjust the gimbal camera heading according to the compass instructions.

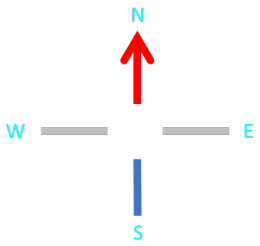


Figure 3-32 Compass Display

N/S/W/E marks on the compass represent the four directions of north/south/west/east respectively. These four marks will dynamically rotate based on the actual orientation of the gimbal camera to represent the current orientation.

Tips

- If the gimbal camera is facing north, the “N” will be directly above the remote controller, indicating that the aircraft is currently facing north.
- When gimbal camera changes its orientation during actual operation, the N/S/W/E mark on the compass will rotate in the opposite direction accordingly. For example, if the gimbal camera yaws 45° to the right, the “N” on the compass will also rotate 45° to the left.

3.5.5.3 Live Stream Function

The aircraft supports livestream function. After the remote controller connects the network which can visit upstreaming server, and the remote controller connects the aircraft normally, the image captured by the aircraft can be sent to the designated upstreaming address. The detailed procedures are as follows:

1. Select “**Aircraft Settings**” > “**Live Stream**”.

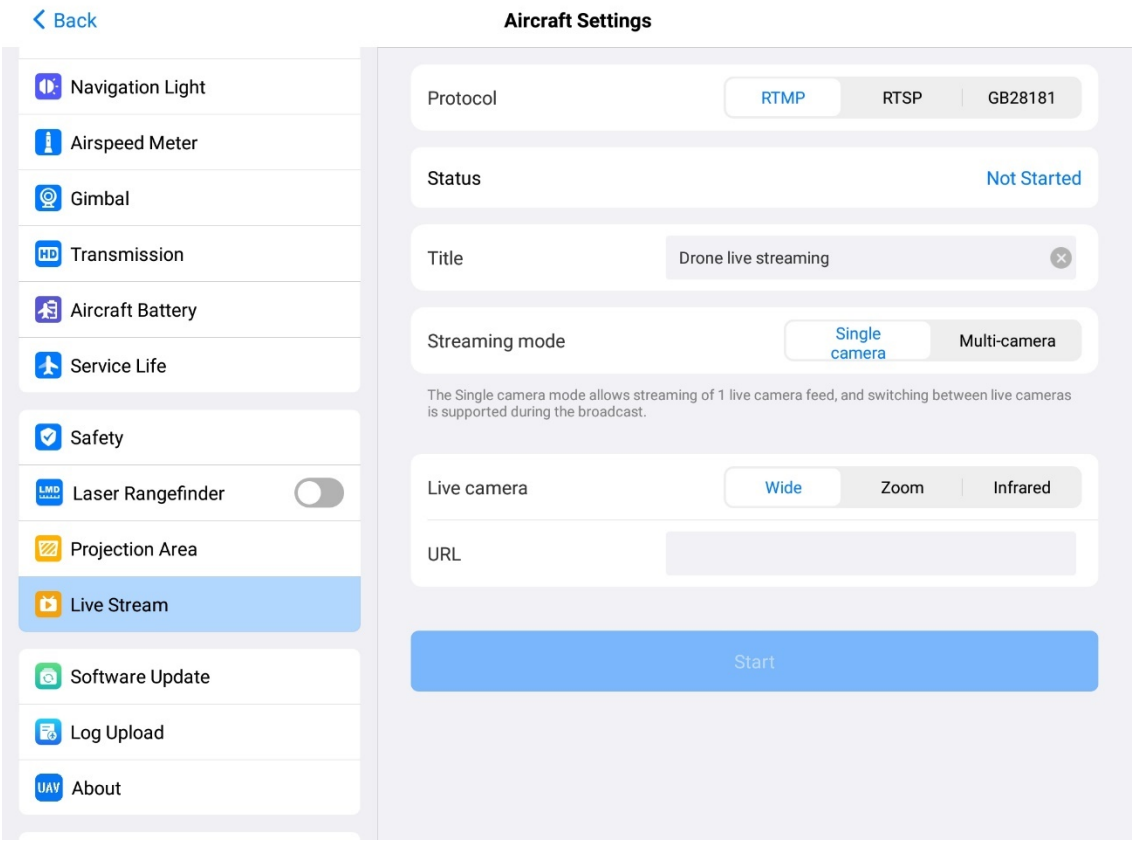


Figure 3-33 Enable Livestreaming

2. Set livestreaming information, such as inputting URL address.
3. Tap “**Start**” to start livestreaming.
4. If you need to stop livestreaming, tap this live streaming button on the right corner of the camera interface and tap “**End**” from the popup window.

3.5.5.4 Projection Area

Users can enable the projection area display function in the following ways:

- Turn on the "**Projection Area Display**" or "**Projection Center Coordinate Display**" function in the "**Aircraft Settings**" > "**Projection Area**" interface.
- Tap the "" icon to select the projection area display method and whether to enable "**Projection Center Coordinate Display**" function.
  - Stopped display: Turn off the projection area display.
  - Real-time display: Displays the real-time projection area of the gimbal camera when the aircraft is flying. When the aircraft position or gimbal camera status changes, the displayed projection area and projection center coordinates will also be updated in real time.
  - Incremental display: Displays the projection area swept by the gimbal camera within a period of "Incremental display time". An "Incremental display time" refers to the time from when the user turns on the "**Incremental**" to when the "**Incremental**" is turned off.

Remarks

- The projection area refers to the two-dimensional image area projected by the gimbal camera in three-dimensional space. When the camera captures a three-dimensional scene, it projects the points in the scene onto the imaging plane through light to form a two-dimensional image. The range of this two-dimensional image is the camera projection area.
- The shape and size of the projection area depends on the parameter settings of the gimbal camera, including focal length, angle of view, and size of the imaging plane. Different camera parameters will lead to different projection areas, thus affecting the viewing angle, perspective effect and depth of field of the final image.
- The projection center refers to the center point of the gimbal camera's projection area, which can also be understood as the viewpoint or optical center of the gimbal camera. During the projection process of the gimbal camera, the light starts from the projection center, is processed by the lens or optical system, and is finally projected onto the imaging plane to form an image.

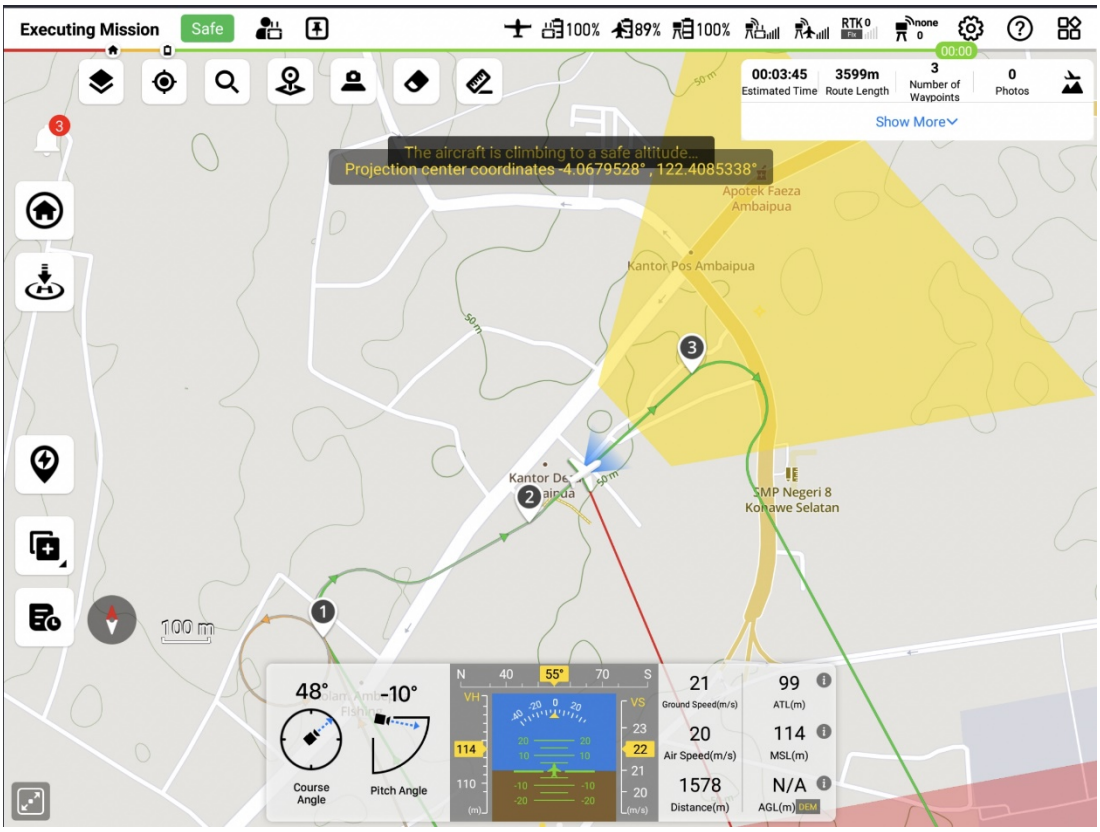


Figure 3-34 Projection Area Display Is On

Users can also clear the projected area on the map interface by the following ways:

- Turning off the projection area display function to clear the projection area.
- Tapping the "" > "**Clear Projection**" to clear all projection areas on the current interface. Note that this method does not turn off the projection area display function.

Important

- Projection area is displayed only when the gimbal tilt angle is from -90° to -3°. When the observation center is too far away from the aircraft, or the height is too tall, causing the gimbal tilt angle to be greater than -3°, the projection area will not be displayed.
- The above two projection area setting methods are related. Only "**Real-time**" display will activate the "**Projection Area Display**" function in the "**Aircraft Settings**". Neither "**Stopped**" nor "**Incremental**" display will activate the "**Projection Area Display**" function in the "**Aircraft Settings**".

3.5.6 Other Interfaces

On the status bar at the top of the camera interface or the map interface of Autel Voyager App, tap the "⊞" icon to access the "**New User Tutorials**" interface, "**Flight Log**" interface and "**Cloud Service**" interface.

3.5.6.1 New User Tutorials

The "**New User Tutorials**" interface provides instructional videos and manual downloads about aircraft functions. Users must watch the instructional video and read product instruction manual in detail before using the aircraft.

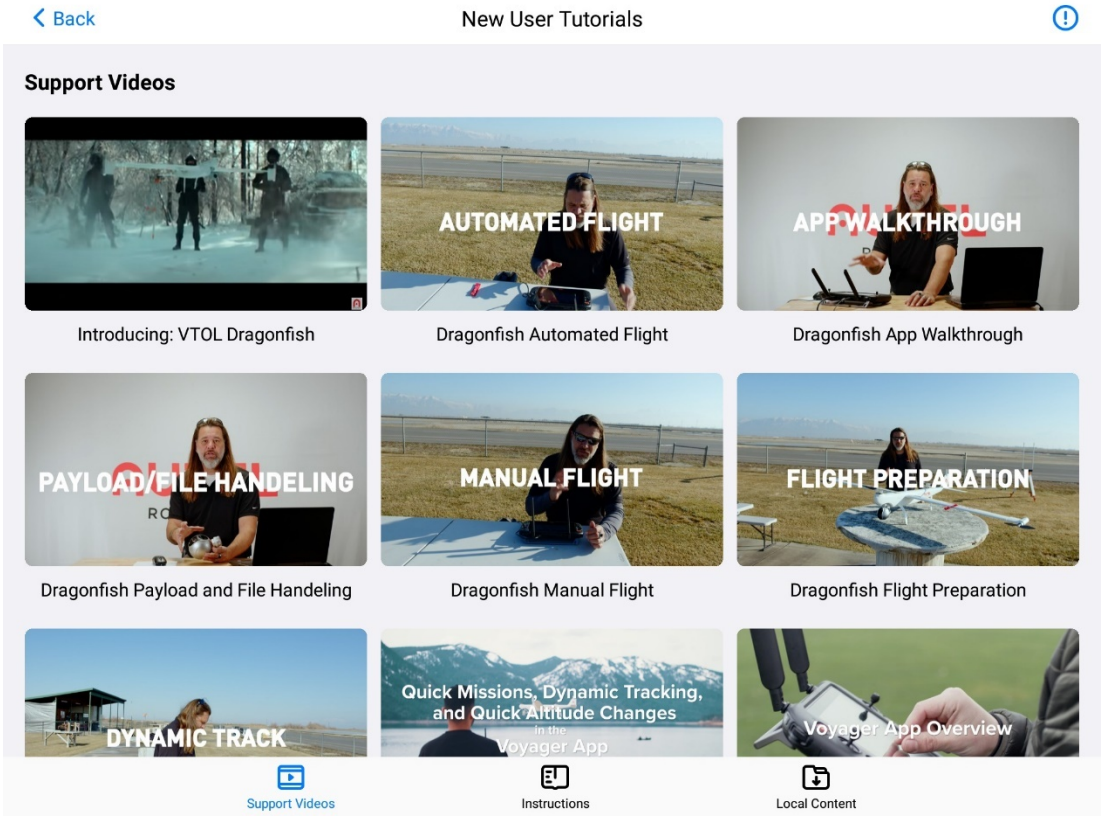


Figure 3-35 New User Tutorials

Tips
• Before accessing the "**New User Tutorials**", ensure that the remote controller can connect to the Internet normally.

3.5.6.2 Flight Logs

Autel Voyager App supports data recording of flight operations using the remote controller, and counts the total flight duration, total flight mileage and number of flights of all flight logs stored on the remote controller. It also supports playback of information

such as flight time, flight trajectory, aircraft attitude, and flight speed and flight altitude of each flight.

The remote controller supports uploading locally stored flight logs to Autel cloud or third-party platforms (currently supports uploading to Airddata and Dronelogbook) to achieve data synchronization. After logging into the Autel cloud account, flight logs uploaded to the Autel cloud can be downloaded and synchronized to other remote controllers. Users can also download the flight logs uploaded to the Autel cloud to the local computer for viewing.

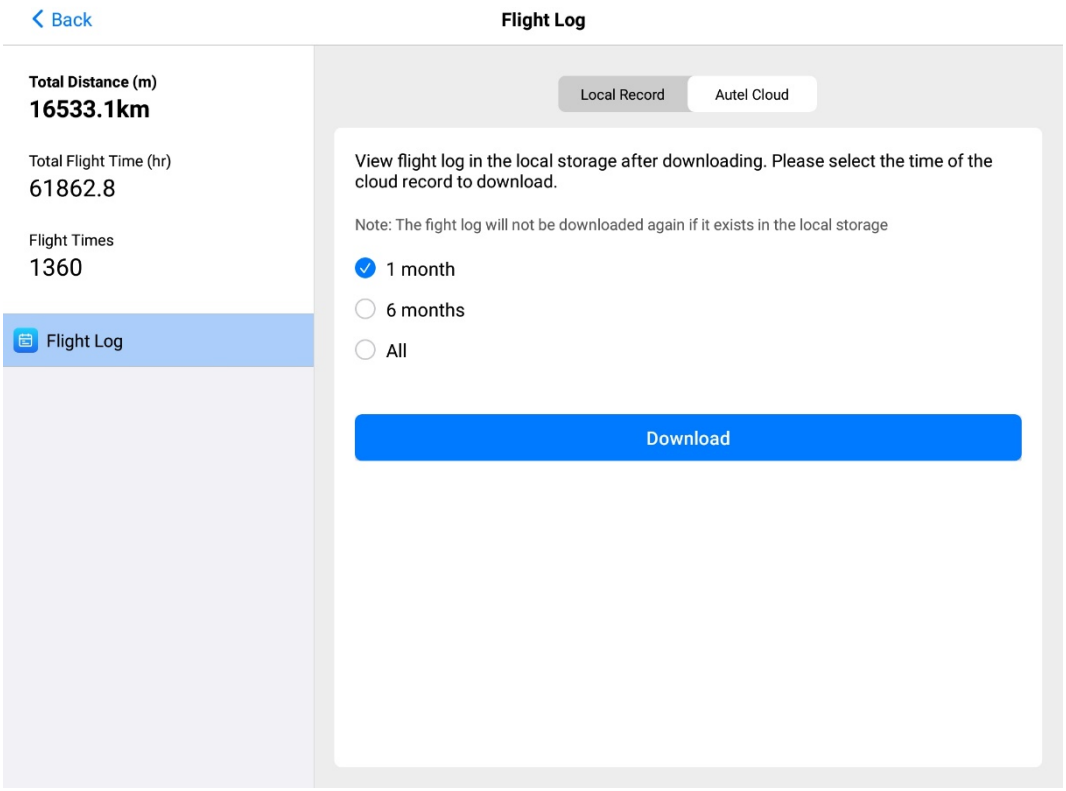


Figure 3-36 Flight Logs

Tips

- The flight record statistics function can only count the flight logs stored locally on the remote controller. Even if the user logs in to the Autel cloud, the data in the cloud cannot be directly counted. If there is cloud data that needs statistics, please download the cloud flight logs to the remote controller.
- If the flight logs are not uploaded to the Autel cloud and deleted directly from the remote controller, the flight logs will be permanently lost, so please operate with caution. For flight logs that have been uploaded to the cloud, when you delete them on the remote controller, only the local flight logs will be deleted, and the flight logs in the cloud will not be deleted.
- For data uploaded to the two platforms Airddata and Dronelogbook, currently only uploading flight logs to the corresponding platforms are supported, and downloading data back to the remote controller from these two platforms is not currently supported.

Tips

- After completing the flight, the remote controller will automatically generate a flight record. This recording function can be used without an Internet connection. However, if you need to synchronize the flight logs generated by the remote controller to the cloud or download the flight logs from the cloud to the local computer, the remote controller needs to be connected to the network.

3.5.6.3 Cloud Service

The remote controller supports cloud service connectivity. When integrated with the Autel Integrated Command System, it enables remote unified device monitoring, scheduling, and mission planning.

On the "**Cloud Service**" interface, users can log in to the Autel Integrated Command System by entering the relevant address.

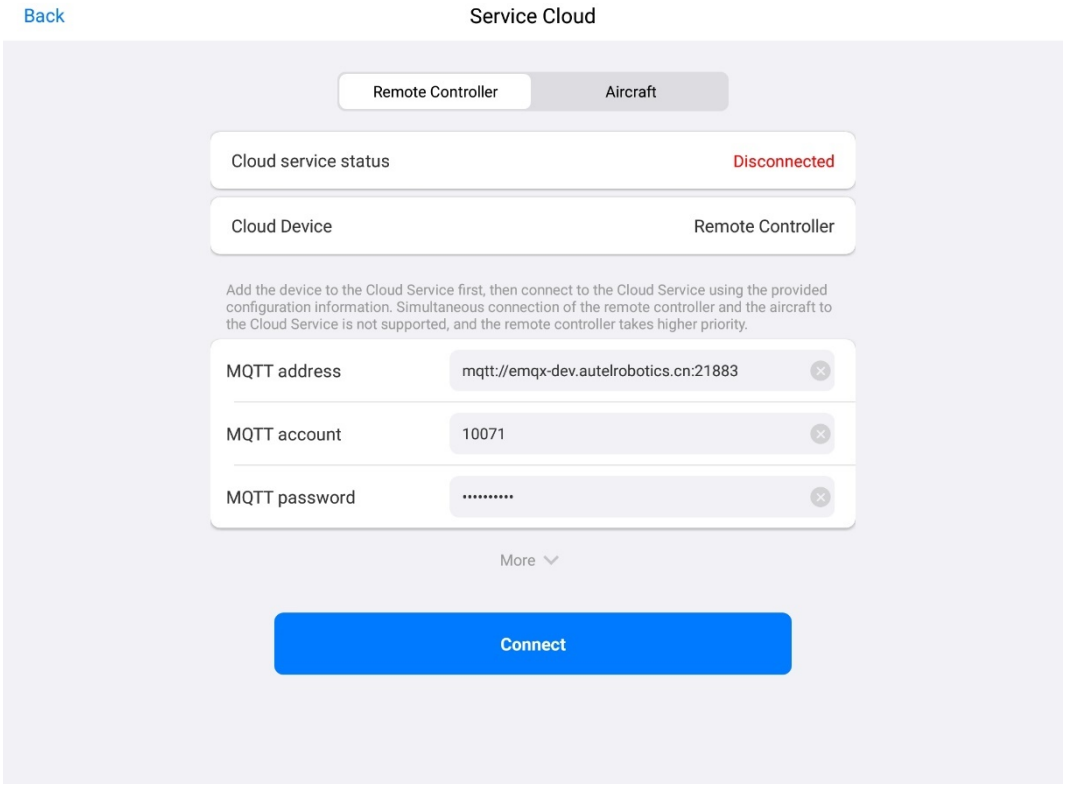


Figure 3-37 Service Cloud

3.5.6.4 Album

In the camera interface of Autel Voyager App, tap the "" icon to access the "**Aircraft Album**" interface. On the "**Aircraft Album**" interface, users can view, edit, or download images captured by the aircraft; on the "**Local Album**" interface, view the images or downloaded videos .

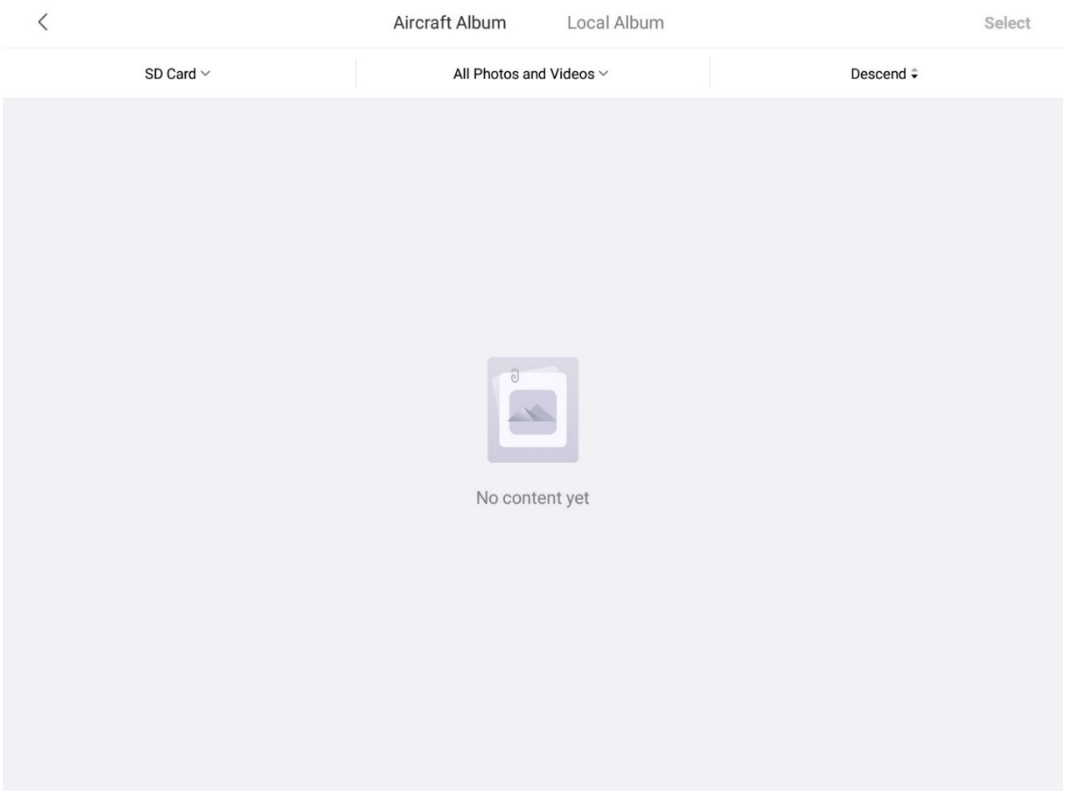


Figure 3-38 Album

3.5.6.5 Mission Library

In the map interface of Autel Voyager App, tap the “ ” icon to access the “**Mission**” interface. The “**Mission**” interface contains all saved waypoint missions, polygon missions and geofences. Users can search, filter and edit saved missions through the mission library, which supports import, export and delete operations.

Figure 3-39 Mission Library

Users can directly tap the mission card to enter the corresponding editing interface. The relevant operation instructions are as follows:

- If the aircraft is on the ground, tapping on the waypoint mission card will bring up the waypoint mission editing interface; if the aircraft has already taken off, tapping on the waypoint mission card will bring up the temporary waypoint mission editing interface, which does not include departure routes and arrival routes.
- If the aircraft is on the ground, tapping the polygon mission card will bring up the polygon mission editing interface; if the aircraft has taken off, tapping the polygon mission card will bring up the temporary polygon mission editing interface, which does not include departure routes and arrival routes.
- If the aircraft is on the ground, tapping the geo-fence card will directly enter the geo-fence editing interface; if the aircraft has already taken off, you will not be able to enter the geo-fence editing interface by tapping the geo-fence card, but the map interface will automatically locate the geo-fence location.

Tips

- Currently importing/exporting route files in kml format are supported.
- For a permanently effective geo-fence, "**Permanent**" will be displayed on the geo-fence card; for a time-limited geo-fence, "To be effective + start effective time" will be displayed when it is not in effect, and "Effective + effective end time" will be displayed when it is in effect. When it has expired, it will display "Expired + effective end time".

- The created temporary mission will also be in the mission library after being saved. However, since it does not contain departure route and arrival route information, if the temporary mission is called through the mission library on the ground, Autel Voyager App will, according to the current location of the aircraft, generate default departure and arrival routes. If you need to perform the mission, please pay attention to adjusting the attributes of the default generated departure route and arrival route.
- After the aircraft takes off, if the mission created on the ground is called through the mission library, the departure route and arrival route parts will be automatically removed, and the mission finish action of the temporary route will be added to the route by default. Therefore, when calling, please be sure to confirm the mission finish action of the generated temporary route.
- While the aircraft is flying, users will not be allowed to add, delete or edit geofences through the route library.

Chapter 4 Flight Operations

This chapter introduces the flight operation procedures and cautions, as well as manual check lists. To ensure flight safety, please go through this chapter.

4.1 Basic Flight Process

The following is the basic operation of aircraft flight:

1. See "**4.2 Pre-flight Operations**" or "**4.3 Pre-flight Inspection**" to complete the preparations before flight.
   - Place the aircraft in an open and flat area outdoors and make sure that there are no obstacles, buildings, trees, etc. around.
   - Press and hold the power button to turn on the power of the tracking antenna.
   - Press and hold the power button for 1s to turn on the power of the remote controller.
   - Press and hold the power button for 3s to turn on the power of the aircraft and wait for the aircraft to complete the self-checking.
   - Stand at least 10m away from the tail of the aircraft.
2. See "**4.5 Takeoff Methods**" to use the remote controller to start the aircraft and take off accordingly.
3. See "**4.4.1 Selecting Stick Mode**" to control the aircraft carefully.
4. See "**4.7 Landing**" to land the aircraft. When the aircraft has landed successfully, the motor will automatically lock the propeller.

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

Flight Strategy	Takeoff Denied
Abnormal Items	• IMU abnormal • Magnetometer abnormal • Airspeed meter abnormal • Barometer abnormal • Ultrasonic sensor abnormal • Servo abnormal • Elevator abnormal • Power motor failed • Battery level imbalance • Video transmission link not connected • Flight controller firmware version mismatch with aircraft model • Aircraft maintenance interval reached

Flight Strategy	Takeoff Denied
	● Weak RTK signal or GNSS signal ● Gimbal detection abnormal ● Initialization of the navigation attitude is incomplete ● RTK heading not locked ● Flight attitude detection abnormal

4.2 Pre-flight Operations

4.2.1 Assembling the Aircraft

During transportation, the aircraft needs to be disassembled into parts and placed in an industrial box. Before performing flight operations, each component must be assembled into a complete aircraft.

⚠ Warning

- Do not use incompatible parts or attempt to modify the aircraft in any way that does not comply with official instructions.
- Before each flight, be sure to check that each propeller is in good condition. If it is aged, damaged or deformed, please replace it before flying.
- Before each flight, be sure to check that each propeller is installed correctly and securely.
- Please use propellers provided by Autel Robotics. Propellers of different models cannot be mixed.
- Before replacing the propeller, make sure the aircraft is turned off.
- The edges of the propeller are sharp, so it is recommended to wear protective gloves when replacing the propeller.
- Do not get close to or touch the rotating propeller or motor to avoid injuries.
- Before conducting ground testing of the aircraft, make sure the propellers have been removed.

Remarks

- If the propellers are damaged, please stop flying and contact Autel Robotics to purchase new fuselage propellers. Users can replace them with the maintenance tools provided in the kit.
- Before installing the smart battery, ensure it is sufficiently charged. The power

Remarks
difference between two batteries must not exceed 12%.

1. Open the landing gear.
   Open the front and rear landing gears respectively.

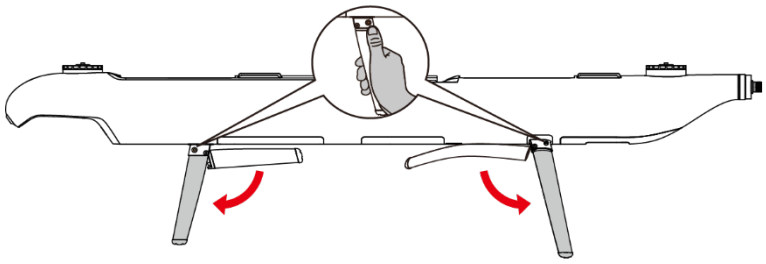


Figure 4-1 Open the landing gear

2. Assemble the tail wing.
   a. Tighten the aviation connector.
   b. Tighten the quick release knob.
   c. Align the horizontal tail with the mounting slot and then tighten the hand screws.

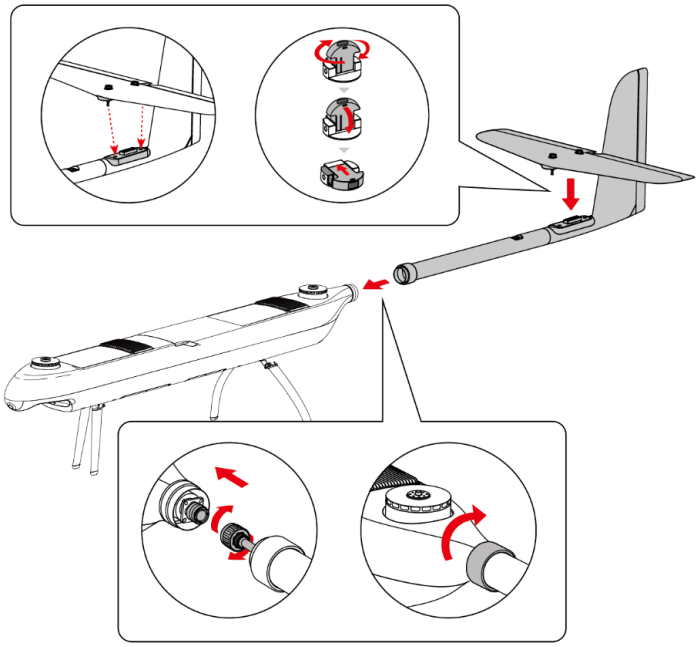


Figure 4-2 Assemble the tail wing

3. Assemble the central wing.

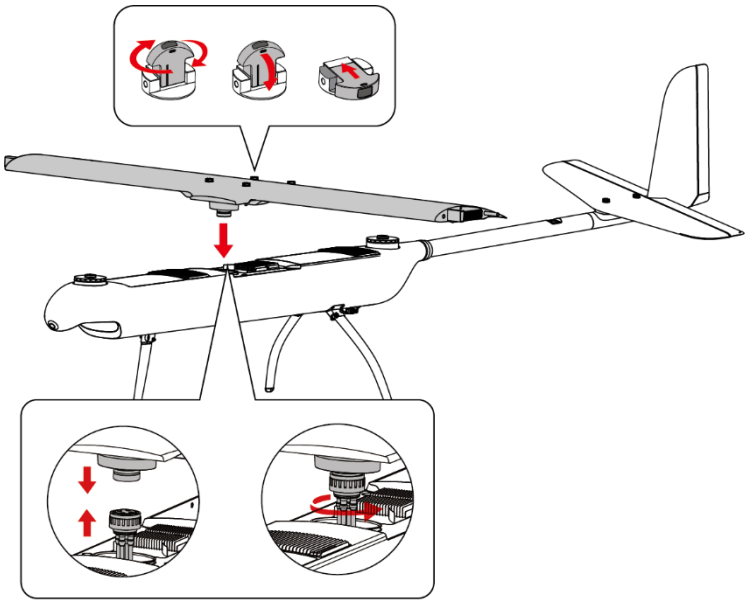


Figure 4-3 Assemble the central wing

4. Assemble the left nacelle and right nacelle.

   Align the nacelle sleeve with the extension section of the central wing on the side, push the nacelle in, and then tighten the hand screws on the nacelle.

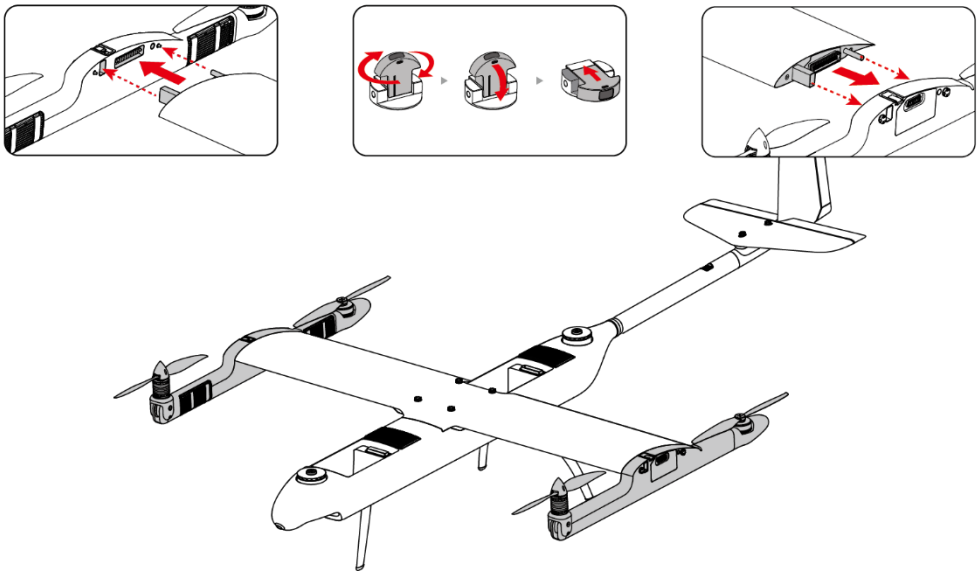


Figure 4-4 Assemble the left nacelle and right nacelle

5. Assemble the left wing and right wing.

   Insert the wings into the left and right motor arms respectively; fasten the wing locks to ensure that the two are firmly connected.

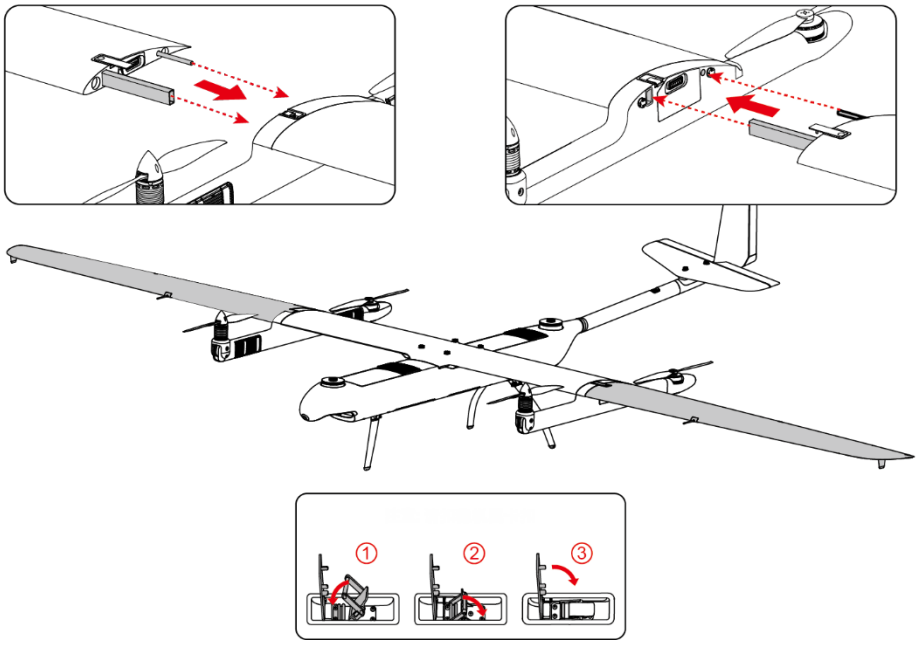


Figure 4-5 Assemble the left wing and right wing

6. Assemble the fuselage propeller. Please note the front and rear fuselage propellers are installed in opposite direction.
   - When installing the front propeller, rotate the fuselage motor counterclockwise until you hear a “click” sound; confirm that the fuselage motor cannot be rotated, press and hold the button with one hand while using your other hand to tighten the nut clockwise. Release the button after the nut is fully tightened.
   - When installing the rear propeller, rotate the fuselage motor clockwise until you hear a “click” sound; confirm that the fuselage motor cannot be rotated, press and hold the button with one hand while using your other hand to tighten the nut counterclockwise. Release the button after the nut is fully tightened.

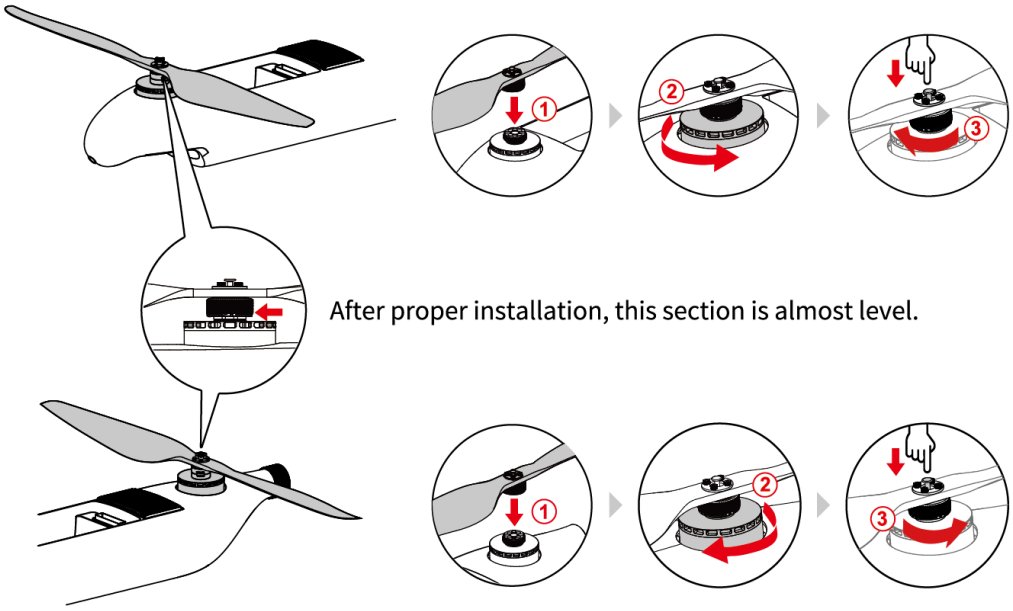


Figure 4-6 Assemble propeller

- When disassembling the front propeller, press and hold the button with one hand while using your other hand to rotate the nut counterclockwise, until the propeller can be lifted upwards.
- When disassembling the rear propeller, press and hold the button with one hand while using your other hand to rotate the nut clockwise, until the propeller can be lifted upwards.

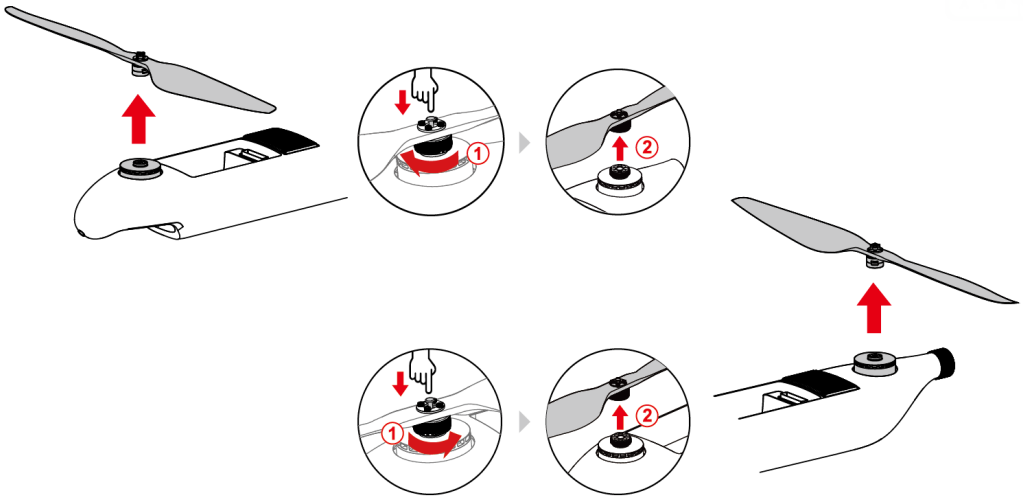


Figure 4-7 Disassemble propeller

7. Assemble the battery.

   When installing the battery into the aircraft, align the battery with the battery interface on the fuselage and push it down.

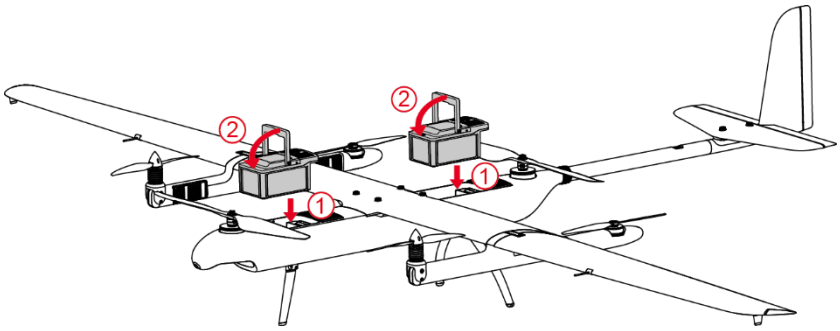


Figure 4-8 Assemble the battery

8. Assemble the gimbal camera.

   For details, see "**3.2.3 Installing and Uninstalling**".

⚠ Warning
● Before assembling the battery to the aircraft, make sure that there are no foreign objects in the aircraft's battery compartment and on the battery interface, avoid damaging the shell of the battery or leading to unsecure battery installation. ● If the battery is not installed properly, it may cause the battery to fall off during the flight, damage the aircraft, or even cause personal injury.

Remarks
● If the aircraft needs to be paired, the battery in the rear battery compartment can be installed after matching. ● Before installing the battery, ensure that the battery is fully charged and the power difference between the two batteries does not exceed 12%.

4.2.2 Turning the Aircraft On

After installing the battery to the aircraft, press and hold the power button of the aircraft for 3 seconds to turn on the aircraft.

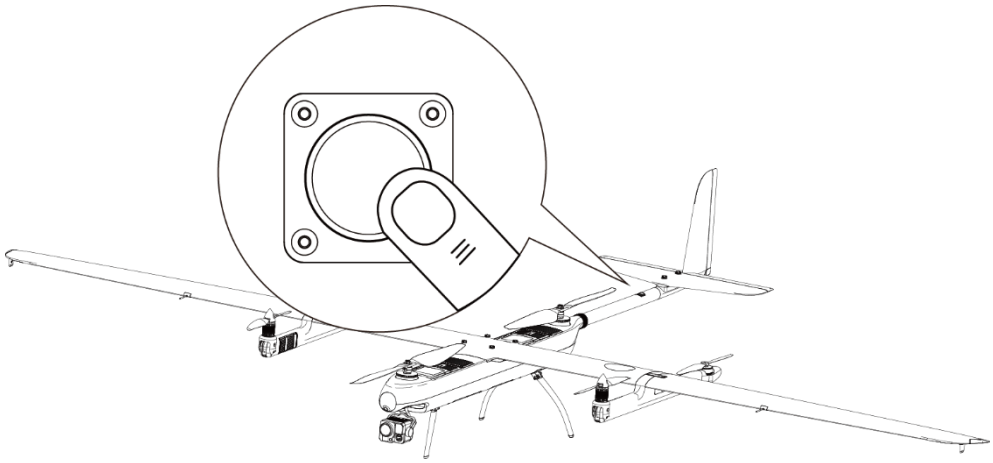


Figure 4-9 Turning the Aircraft On

Tips
● If any battery is removed while the aircraft is powered on, the aircraft will not be able to take off.

4.2.3 Assembling the Tracking Antenna

Before assembling the tracking antenna, please check whether the tracking antenna components are complete. For details about the component list, see "**1.3 UAS Introduction**".

For detailed assembly of the tracking antenna, see *Autel Smart Antenna Transmission User Manual*.

Important
● When assembling the tracking antenna, you should choose a solid and stable ground to place the tripod to prevent the tracking antenna from tipping due to geological instability during use, resulting in flight safety accidents.

Warning
● At the flight operation site, after the tracking antenna is assembled and the aircraft takes off, do not move the tracking antenna to avoid positioning deviation of the aircraft and triggering a flight accident.

4.2.4 Matching and Connection

Matching and connection refer to building up linkage communication relation among the aircraft, the tracking antenna and the ground control station (the remote controller). It has two connection methods:

- The combination of the aircraft, the tracking antenna and the remote controller;
- The combination of the aircraft and the remote controller.

Before shipment, the aircraft, the tracking antenna and the remote controller have been already matched in frequency and connected using the first method.

Combination of the Aircraft, the Tracking Antenna and the Remote Controller

The aircraft, the tracking antenna and the remote controller can be used only after matching and connection. The whole process includes the image transmission frequency matching between the tracking antenna and the aircraft, Wi-Fi connection between the remote controller and the tracking antenna, and 5.8G frequency matching between the aircraft and the remote controller. After the aircraft connects with the tracking antenna and the remote controller, the positioning accuracy and anti-magnetic interference capability of the aircraft will be enhanced, ensuring safe and reliable mission flights in environments with high voltage cables or around metallic buildings and thereby achieving more precise positioning flights.

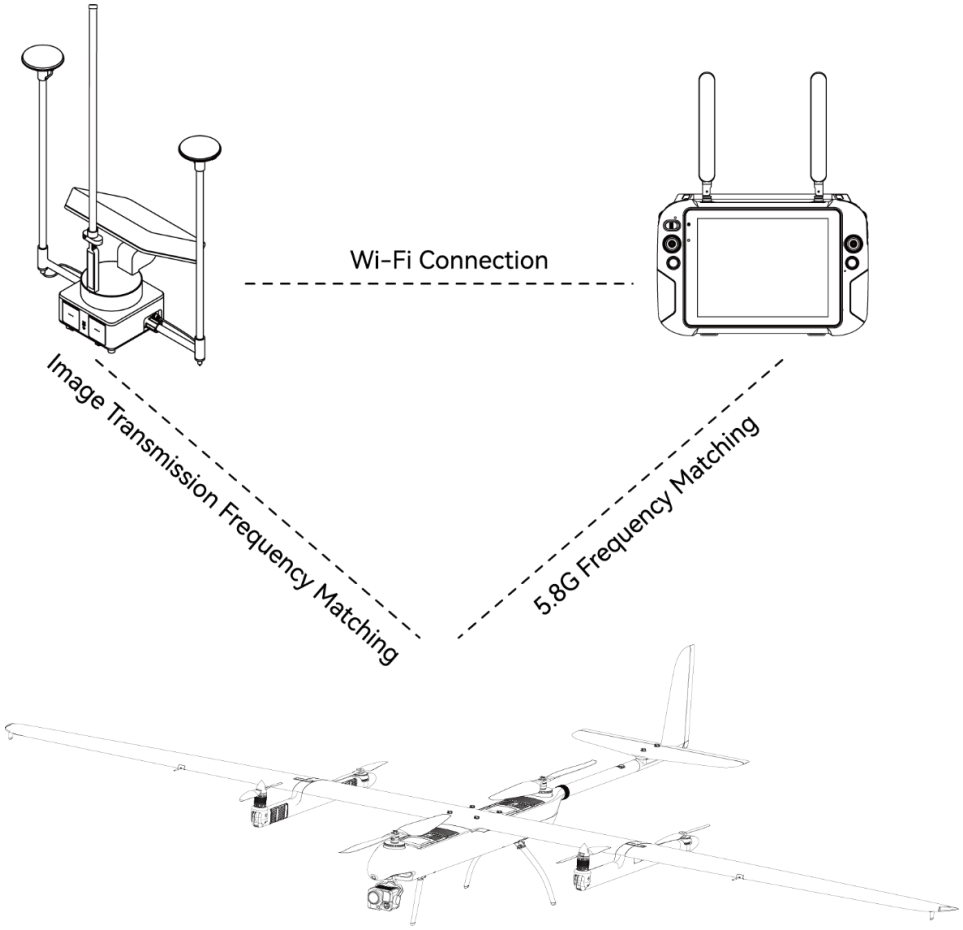


Figure 4-10 Matching and Connection

Matching between Tracking Antenna and the Aircraft

1. Turn on the power of the tracking antenna and the aircraft.
2. Press the tracking antenna match button until the match indicator light flashes quickly.
3. Open the cover of the debugging interface at the bottom of the aircraft, briefly press the match button for 1 second to put the aircraft into the matching state. During the matching process, the match indicator light will flash quickly.
4. After the matching is successful, the match indicator on the tracking antenna and the aircraft will change into the “Image transmission normal connection” match indicator status as described in the following table.

Table 4-1 Tracking Antenna Match Indicator Status Table

No.	Match indicator status	Status description
1.	Green light flashes on and off for 1.5 seconds/ 1.5 seconds	Image transmission not frequency linked
2.	Green light flashes on and off for 0.1 seconds/ 0.1 seconds	Video linking in progress
3.	Green light flashes on for 0.1 seconds/ and flashes off for 2.0 seconds	Image transmission normal connection
4.	Green light flashes on and off for 2.0 seconds/ and flashes off for 0.2 seconds	Upgrade download data
5.	Green light is always on	Firmware upgrade in progress

Remote Controller Connected to Tracking Antenna Wi-Fi

1. Turn on the power of the tracking antenna and the aircraft.
2. Run Autel Voyager App and tap “ ⚙”> “**Base Station**” on the map interface or camera interface of the Application.
3. Confirm that the tracking antenna, tap the tracking antenna name, enter the Wi - Fi password (default: 12345678).
4. After connected successfully, modify the password according to the screen instruction.

Tips

- If there are multiple tracking antennas at the same time, before the remote controller connects to the tracking antenna Wi-Fi, be sure to confirm the name of

the tracking antenna Wi-Fi to avoid flight risks caused by connection errors.

- When the tracking antenna works, two remote controllers can be connected to the tracking antenna Wi-Fi at the same time. One of them, as the control role, has all the operational rights of the aircraft; the other as an observation role, it can view the flight status of the aircraft and the picture transmission screen, and it can also control the gimbal camera, but it cannot control the flight of the aircraft. For details, see "**2.9 Dual Control Function**".

5.8G Frequency Matching between the Aircraft and Remote Controller

After the above process of frequency matching between the tracking antenna and the aircraft, and the remote controller connecting to the tracking antenna Wi-Fi, wait a few seconds. The system will automatically complete the 5.8G frequency matching process between the remote controller and the aircraft, without manual operation by the user.

⚠ Warning

- When performing the combination frequency matching or connection of the aircraft, the tracking antenna and the remote controller, keep the distance between the three within a small range (no more than 5 meters is recommended) to avoid the frequency matching or connection failure due to the distance.
- Avoid synchronizing or connecting with other aircraft, remote controllers and tracking antennas that are synchronizing or connecting at the same time, so as to avoid security risks caused by connection errors.

Remarks

- Please be aware that the frequency band used here "5.8G frequency matching between aircraft and remote controller" complies with Japanese radio frequency band requirements.
- In the scenario where the aircraft, the remote controller and the tracking antenna are used together, if the tracking antenna is disconnected, the user can only use the remote controller to control the aircraft for a short distance through the 5.8G link, in which case there is no picture signal or data signal transmission.

Combination between the Aircraft and the Remote Controller

When the tracking antenna is not in place, only after the remote controller and the aircraft are paired can users operate the aircraft using the remote controller for short distance manual flight and image transmission display.

1. Turn on the power of the remote controller and the aircraft.
2. In the camera interface or the map interface of Autel Voyager App, tap "⚙" > "**Remote Controller**" > "**Datalink frequency matching**" and follow the on-screen procedures.

3. Open the cover of the debugging interface at the bottom of the aircraft, briefly press the match button for 1 second, and the match indicator light will flash quickly.
4. Tap "**Start Connection**" button in the "**Datalink frequency matching**" popup window to start frequency matching.

   After the frequency matching is successful, the match indicator light will flash slowly.

Remarks

- The aircraft included in the aircraft kit is paired with the remote controller and the tracking antenna provided in the kit at the factory. No matching is required after the aircraft is powered on. Normally, after completing the aircraft activation process, you can directly use the remote controller to operate the aircraft.
- If the tracking antenna is not in place, or the remote controller become unpaired with the aircraft due to other reasons, please follow the above steps to pair the aircraft with the remote controller again.
- When the aircraft is matching with the remote controller, the aircraft can be available for both image transmission frequency matching and 5.8G frequency matching with the remote controller.

Warning

- When the remote controller and the aircraft are matching, keep the distance between the two within a small range (no more than 5 meters is recommended) to avoid the frequency matching or connection failure due to the distance.
- Avoid matching with other aircraft and remote controller that are matching or connected.
- Avoid matching with incompatible aircraft and remote controller to prevent safety issues.

4.2.5 Activating the Aircraft

It is necessary to activate the aircraft after unpacking it for the first time before starting flight operations. The aircraft has been linked to the ground control station (remote controller, tracking antenna) by default before leaving the factory. After turning on the aircraft, remote controller, and tracking antenna, an activation prompt will appear when entering Autel Voyager App. Please follow the prompts in Autel Voyager App to activate the aircraft.

Tips

- Before the aircraft is activated, users will be unable to control it. Autel Voyager App

will display a pop-up alert stating “Aircraft inactivated”.

Important

- Make sure the remote controller is connected to the Internet before activation, otherwise the activation will fail.
- If activation fails, please contact Autel Robotics User Support for resolution.
- For frequency binding operations between the aircraft, remote controller, and tracking antenna, see “**4.2.4 Matching and Connection**”.

4.2.6 Installing the Remote Controller Lanyard

Tips

- The remote controller lanyard is an optional accessory. You can choose whether to install it as required.
- The remote controller is suitable for operation on a desktop. When holding the remote controller for a long time during flight operations, we recommend that you install the remote controller lanyard to effectively reduce the pressure on your hands.

The installation procedure is as follows:

1. Clip the two metal clips on the lanyard's shorter straps to the two metal rings on the bottom side of the **remote** controller.
2. Clip the two metal clips on the lanyard's longer straps to the metal rings on both sides of the metal handle at the top of the **remote** controller.
3. Wear the lanyard around your neck, as shown in the figure below, and adjust it to a suitable length.

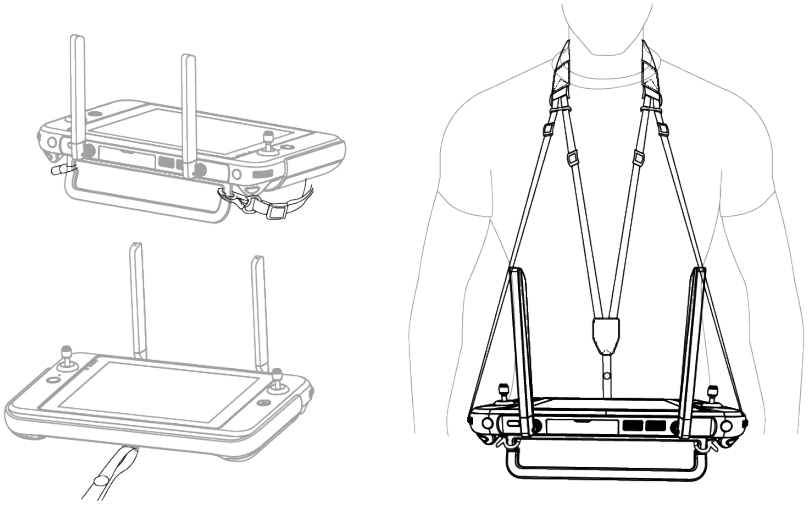


Figure 4-11 Install the Remote Controller Lanyard (As Required)

4.3 Pre-flight Inspection

Before the aircraft performs a flight mission, it is necessary to conduct a pre-flight inspection. Pre-flight inspections are divided into manual inspections and automatic inspections. After confirming that all conditions are normal, use "Aircraft Status Monitoring" in the application and the aircraft's "One-tap self-check" function to confirm the safety status of the aircraft before flight. Users can refer to "**5.4 Pre-flight Manual Checklist**" for pre-flight inspections.

4.3.1 Visual Inspection on the Entire Aircraft and Components

- **Appearance Clean Inspection**

Check that the surface of the fuselage and each installed component is clean without stains. For the cleaning procedure, see the maintenance manual. Although the appearance cleaning condition that is not extremely bad will not seriously affect flight safety, it may reduce product performance and user experience.

- **Appearance Paint Inspection**

Examine the paint condition of the fuselage and the surface of the installed components to ensure that there are no damages, obvious scratches, cracks, or peeling. Although non-extreme paint conditions will not seriously affect flight safety, they may reduce product performance and user experience.

- **Structure Status Inspection**

Check the structural condition of the fuselage and installed components to ensure that there are no cracks, deformations, or fractures, no delamination or de-bonding in the composite materials, and no damage such as indentations or grooves caused by foreign objects on the surface. Structural damage can seriously affect the flight safety of the aircraft, so if there is any structural damage found during the inspection that needs to be repaired, please repair by referring to the maintenance manual or contacting the after-sales engineer.

Before flight, the following parts/components should be checked for structural integrity:

1. Landing gear structure;

2. Fuselage structure, including the fuselage body and bottom mounting access covers;
3. Power system structure, including the front and rear fuselage propellers and left-and-right nacelle propellers;
4. Central wing structure, including the central wing body, hand screws on the central wing, wing-body connection carbon tubes;
5. Nacelle structure, including structure body, tilting mechanism and hand screws.
6. Outer wing structure, including outer wing body, aileron structure, connection carbon tubes and locking buckle.
7. Tail structure, including the tail body, vertical tail structure, and horizontal tail structure and tail-wing connection structure.

- **Installation Interface Inspection**

Check the condition of the interface surfaces to ensure they are clean with no dirt or damage. Dirty or damaged interfaces will seriously affect the flight safety of the aircraft. If any dirt or damage is found during the inspection, see the maintenance manual or contact the after-sales engineer for guidance on cleaning or repair.

Before flight, the following interfaces should be checked:

1. Aviation connector between the central wing and fuselage interface;
2. Aviation connector between the tail boom and fuselage interface;
3. The interface for connecting the horizontal tail and the tail boom.
4. The interface for connecting the central wing and nacelle.
5. The interface for connecting outer wings and nacelle.
6. Gimbal-to-bracket interface;
7. Battery-to-battery compartment interface.

4.3.2 Components Assembly Inspection

During operation, the various connecting components of the aircraft may experience assembly loosening due to vibration and alternating stresses. Additionally, after quickly assembling detachable components, an assembly status check is required. Improper connection or loose installation can seriously affect the flight safety of the aircraft, and it is necessary to refer to the maintenance manual or contact after-sales personnel for tightening or repair.

- **Tightening Inspection**

Check the following components for tight installation to ensure that the fasteners are in place without missing, the installation is tight without looseness, and the components are firmly connected:

1. Motor and propeller connection: Including the front and rear fuselage motors, propellers, tilting motors on the nacelle, tilting propellers, rear motors on the nacelle, and rear propellers on the nacelle.
2. Installation of the cover plates: Including the belly, horizontal tail, vertical tail, central wing and outer wings.
3. Pitot tube: Pitot tubes on the left and right wings.
4. Landing gear unfolded without shaking: After the front and rear landing gears are unfolded, the landing gear lock and pop out normally without loosening.

- **Quick-release Component Assembly Inspection**

Perform an assembly inspection on the installed quick-release components to ensure that their connection status is intact.

1. Connection between central wing and the fuselage: Tighten the hand screws, the central wing and the fuselage are connected tightly without obvious shaking.
2. Connection between tail wing and the fuselage: The quick-release knob is intact. Tighten the quick-release knob after the tail boom is inserted to the fuselage. Tail wings (including the tail boom, horizontal tail and vertical tail) have no obvious shaking after connection.
3. Connection between central wing and nacelle: Tighten the hand screws, the central wing and nacelle are connected tightly without no obvious gap and shaking.
4. Connection between outer wing and nacelle: the buckles on the out wing are intact, the fastening force is moderate, and there is no obvious gap and shaking after the outer wing and the nacelle are connected.

4.3.3 Actuator Inspection

Defects in an actuator, such as excessive clearance, loose connection, or stuck movement, can seriously affect the flight safety of the aircraft, and it needs to be repaired or replaced by referring to the maintenance manual or contacting the after-sales staff.

The inspection of the actuator mainly includes:

1. Tilting mechanism on the nacelle: Check whether the tilting mechanism is loose in static condition, and shake the tilting mechanism up and down to check the status of servos; After the power is turned on, gently tilt the tilting mechanism to confirm whether servos are normally powered on and check the virtual position of servos.
2. Aileron mechanism: Shake the rudder control surface of the left and right ailerons up and down in static condition to check the status of the servos; After the power is turned on, gently tilt the rudder control surface of the left and right ailerons to confirm whether servos are normally powered on and check the virtual position of servos.
3. Vertical tail mechanism: Shake the rudder control surface of vertical tail from side to side in static condition to check the status of the servos; After the power is turned on, gently tilt the rudder control surface of the vertical tail to confirm whether servos are normally powered on and check the virtual position of servos.
4. Horizontal tail mechanism: Shake the rudder control surface of horizontal tail from up and down in static condition to check the status of the servos; After the power is turned on, gently tilt the rudder control surface of the horizontal tail to confirm whether servos are normally powered on and check the virtual position of servos.
5. Motor: Rotate the fuselage motor, tilting motor on the front of the nacelle, and the motor on the rear of the nacelle to ensure that the motor is free of stalling and abnormal sound during rotation
6. Gimbal camera: After power-on, check whether the stability of the gimbal camera is normal and that the attitude change is consistent with the control command.

4.3.4 Communication Link Inspection

The combination of the communication links between the aircraft, the tracking antenna, and the remote controller is an important condition for ensuring fly safety. Before flight, it is necessary to confirm that the communication status between the three is normal to ensure that the aircraft can fly more safely and accurately.

4.3.5 Pre-flight Gimbal Check

A comprehensive inspection of the gimbal camera is required before flight to ensure that it can meet task requirements.

- **Visual Inspection**

Perform a visual inspection of the gimbal camera to confirm that there are not following defects:

1. Paint peeling or fading;
2. Dirty or foggy lens;
3. Structural defects, especially the gimbal connection mechanism;
4. Dirty connection interface.

- **Assembly Inspection**

Connect the gimbal camera to the gimbal bracket, and confirm that the gimbal dial has been rotated to the lock icon, and the left and right rotation joints are not loose (be careful not to press the unlock button).

- **Power-on Inspection**

Power on the aircraft, and the gimbal starts self-checking. Users need to pay attention to the gimbal self-checking process. If the self-checking fails, see "**5.3 Troubleshooting Guide**" or contact the after-sales service.

- **Adjustment and Fine-Tuning**

The gimbal of the aircraft performs a self-check every time the aircraft is turned on. If you find that the rotation angle of the gimbal is abnormal during use, see "**2.12.4 Gimbal Auto Calibration**".

4.4 Pre-flight Preparations

4.4.1 Selecting Stick Mode

Tips
Setting of stick mode: In Autel Voyager App tap " ⚙ "> "**Remote Controller**" > "**Control Mode**".

⚠ Warning

- Do not hand over the remote controller to persons who have not learned how to use the remote controller.
- If you are operating the aircraft for the first time, please keep the force gentle when moving the stick until you are familiar with the operation.
- The flight speed of the aircraft is proportional to the degree of the stick movement. When there are people or obstacles near the aircraft, please do not move the stick excessively.

When using the remote controller to operate the aircraft, you need to know the current stick mode of the remote controller and fly with caution.

Three stick modes are available, that is, Mode 1, Mode 2 (default), and Mode 3.

- **Mode 1**

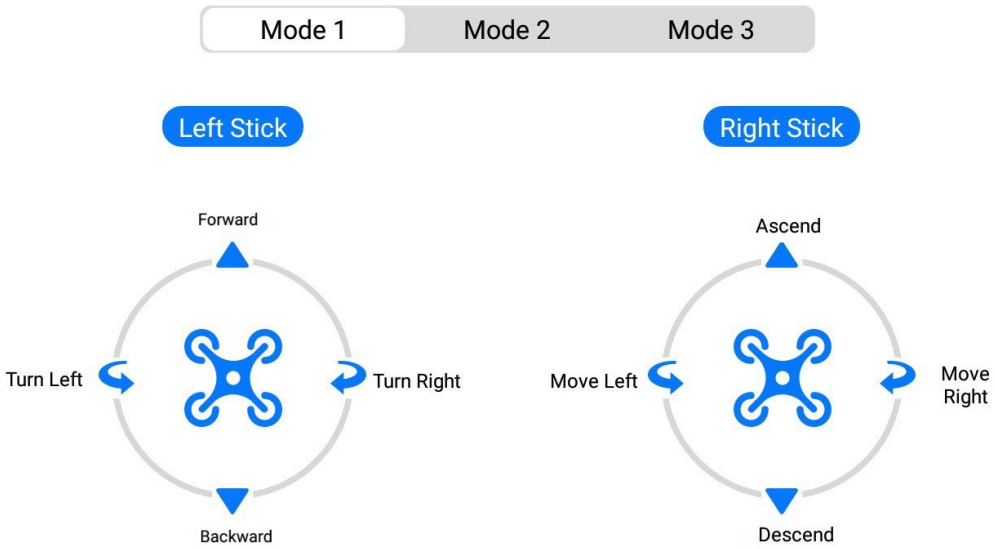


Figure 4-12 Mode 1

Table 4-2 Mode 1 Details

Stick	Move Up/Down	Move Left/Right
Left stick	Controls the forward and backward movement of the aircraft	Controls the heading of the aircraft
Right stick	Controls the ascent and descent of the aircraft	Controls the left or right movement of the aircraft

■ **Mode 2**

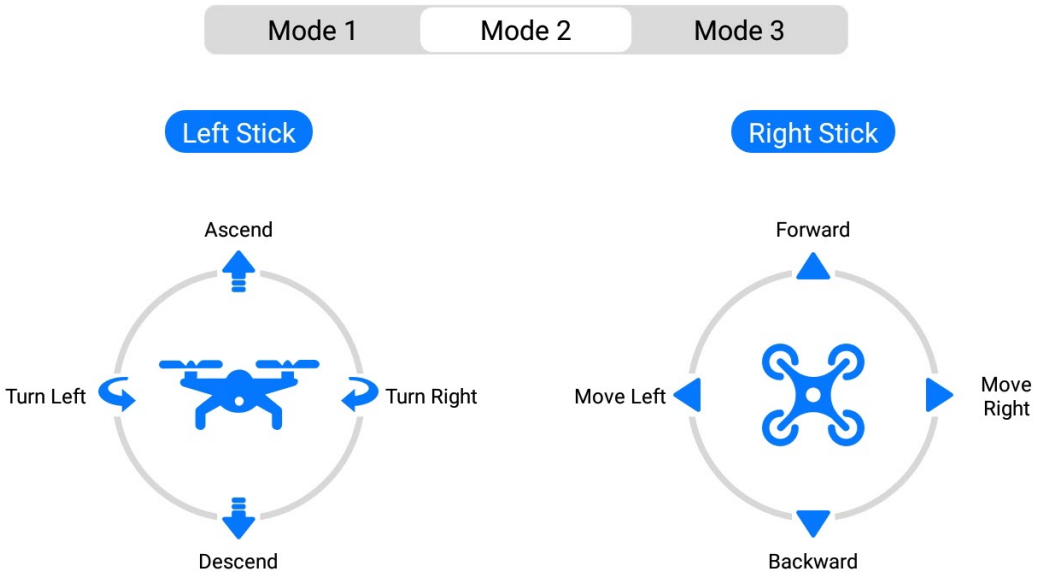


Figure 4-13 Mode 2

Table 4-3 Mode 2 Details

Stick	Move Up/Down	Move Left/Right
Left stick	Controls the ascent and descent of the aircraft	Controls the heading of the aircraft
Right stick	Controls the forward and backward movement of the aircraft	Controls the left or right movement of the aircraft

■ **Mode 3**

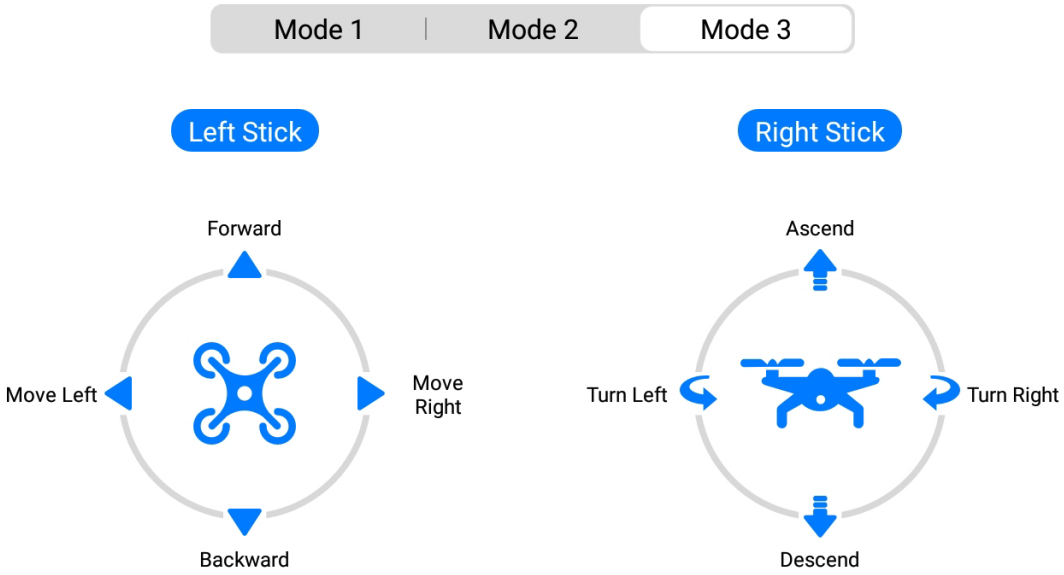


Figure 4-14 Mode 3

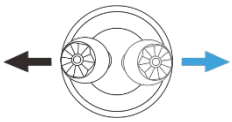
Table 4-4 Mode 3 Details

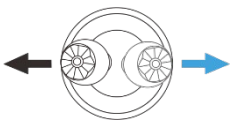
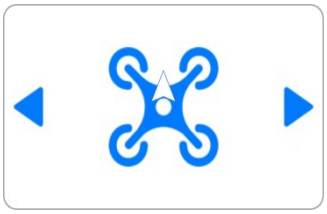
Stick	Move Up/Down	Move Left/Right
Left stick	Controls the forward and backward movement of the aircraft	Controls the left or right movement of the aircraft
Right stick	Controls the ascent and descent of the aircraft	Controls the heading of the aircraft

The default stick mode of the remote controller is “Mode 2”.

Table 4-5 Default Control Mode (Mode 2)

Mode 2	Aircraft Flight Status	Control Method
Left stick move up or down		

Mode 2	Aircraft Flight Status	Control Method
		1. The up-and-down direction of the left stick is the throttle stick, which is used to control the vertical lift of the aircraft. 2. When the aircraft is in muti-rotor mode or fixed-wing mode, push the throttle stick up, and the aircraft will rise vertically; pull the throttle stick down, and the aircraft will descend vertically. 3. When the stick returns to the center, the vertical speed of the aircraft is expected to be zero. 4. When the aircraft takes off, only by pushing the stick up to above the center, will the aircraft lift off the ground.
Left stick move left or right 		1. The left-and-right direction of the left stick is the yaw stick, which is used to control the heading of the aircraft. 2. When the aircraft is in muti-rotor mode or fixed-wing mode, push the yaw stick to the left, and the heading of the aircraft will change leftward; push the yaw stick to the right, and the heading of the aircraft will change rightward. 3. In fixed-wing mode, it is by mapping to the roll channel that using the yaw stick to change the aircraft heading is achieved. In other words, the aircraft changes its heading direction by rolling. 4. When the stick returns to the center, the rotational angular speed of the aircraft is expected to be zero. 5. The larger the degree of the stick movement, the greater the rotational angular speed of the aircraft.
Right stick move up or down		1. The up-and-down direction of the right stick is the pitch stick, which is

Mode 2	Aircraft Flight Status	Control Method
		used to control the flight of the aircraft in the forward and backward directions. 2. When the aircraft is in muti-rotor mode or fixed-wing mode, push the pitch stick up, and the aircraft will produce a forward speed and fly forward; pull the pitch stick down, and the aircraft will produce a backward speed, and fly backward. 3. When the stick returns to the center, the forward speed of the aircraft is expected to be zero. 4. The larger the degree of the stick movement, the faster the flight speed of the aircraft. 5. Please note that when the pitch stick is pushed to its fullest, the forward speed of the aircraft is expected to be the cruise speed; when the speed of the aircraft reaches the cruise speed, the aircraft will enter into fixed-wing mode for flight.
Right stick move left or right 		1. The left-and-right direction of the right stick is the roll stick, which is used to control the flight of the aircraft in the left and right directions. 2. When the aircraft is in muti-rotor mode or fixed-wing mode, push the roll stick to the left, and the aircraft will roll leftward; push the roll stick to the right, and the aircraft will roll rightward. 3. When the stick returns to the center, the side speed of the aircraft is expected to be zero. 4. The larger the degree of the stick movement, the faster the side speed of the aircraft.

Remarks

- When controlling the aircraft for landing, pull the throttle stick down to its lowest position. In this case, the aircraft will descend to an altitude of 1.2 meters above the ground, and then it will perform an assisted landing and automatically descend slowly.

4.4.2 Offline Map Download and Caching

The aircraft supports an offline map function, which allows users to assist in mission planning by pre-downloading map data without a network connection.

Before flying and after the remote controller is connected to the Internet, users can pre-download offline maps of different levels of detail in the desired area on the offline map download interface in the Autel Voyager's offline map download interface.

In the "**Aircraft Settings**" > "**Offline Map**" interface, users can view the downloaded offline map area, or tap to enter the offline map download interface to select the area you want to download.

Tips

- Users can obtain map data through map data software (such as "Shui Jing Zhu") and then access the remote controller through a USB flash drive to perform external import of offline maps.

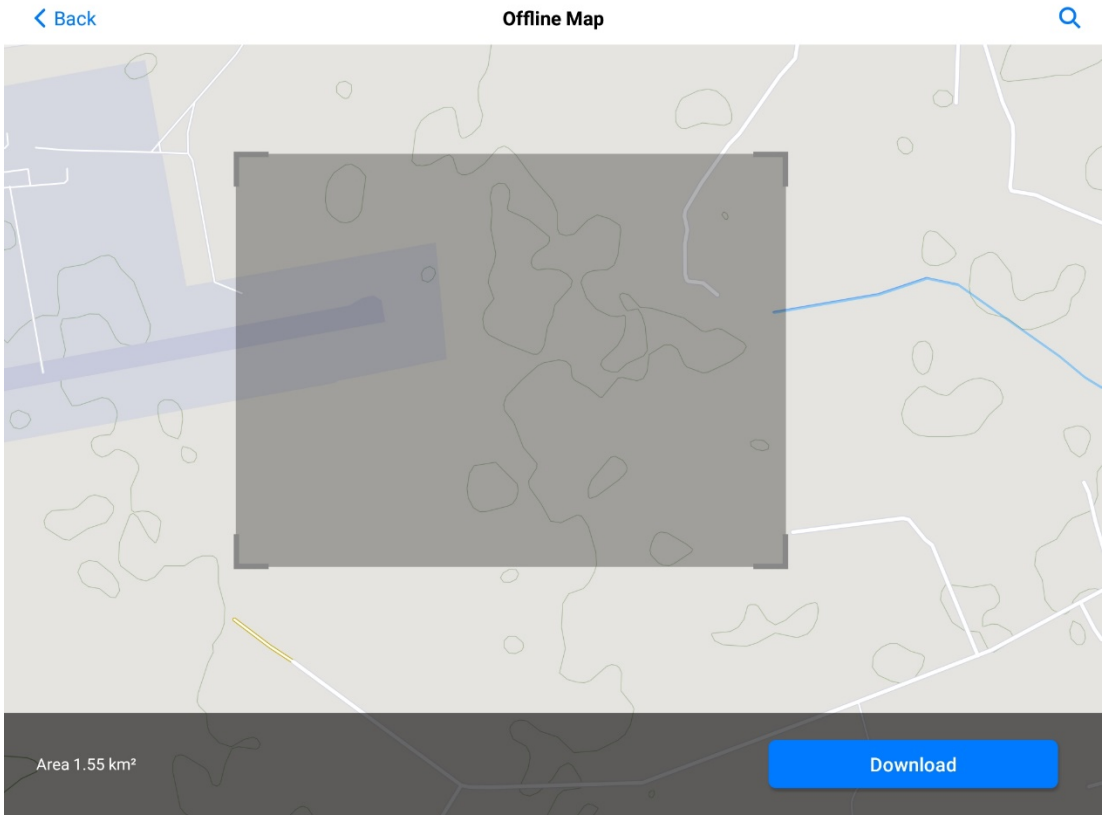


Figure 4-15 Offline Map Download Interface

- Users can drag the gray box on the interface or zoom the map to adjust the offline map area to be downloaded.
- You can view the size of the selected area in real time at the lower left corner of the interface.
- Tap the " 🔍 " icon at the upper right corner of the interface to directly search for keywords or latitude and longitude and jump to the corresponding area.
- After tapping the "**Download**" button at the lower right corner of the interface, you can download the offline map of the area covered by the gray box. Users can modify the offline map name and select the map level (up to 1-17 supported) and map layer type ("**Standard**" and "**Hybrid**") in the pop-up "**Map Layers**" window.
- After the download is completed, the interface will change to a preview interface of the downloaded offline map. The name of the area will be displayed at the top of the interface, and the level, size and download time of the currently downloaded offline map will be displayed at the bottom of the interface. If the downloaded offline map is incorrect, you can tap the " ••• " icon at the upper right corner of the interface to delete it.

The offline maps that have been downloaded will be displayed altogether in the "**Aircraft Settings**" > "**Offline Map**" interface, where users can view the name and size of those downloaded offline maps. You can also choose to delete a downloaded offline map. Tapping on an offline map will enter the preview interface of the offline map, making it easy to view the area covered by the offline map.

4.4.3 Creating a Geofence

The aircraft's flight control system is equipped with a geofencing system. Before each flight, it is important to ensure that the remote controller can connect to the internet to automatically update legally restricted no-fly zone information and synchronize it with the aircraft. During the flight, relevant flight space restrictions will be displayed synchronously on Autel Voyager App to ensure the safe and legal operation of the aircraft.

4.4.3.1 Creating a (Customized) Geofence

Users can create a (customized) geofence as necessary, including No-Fly Zones and Geofence to meet the special restrictions on the operational airspace. To do so, perform the following:

1. Log in Autel Voyager App.
2. Tap " " > " " icon on the map interface to enter the "**Edit Geofence**" interface.
   - No Fly Zone: An area planned by the user to restrict aircraft from flying into the area.
   - Geo-FenceGeofence: Users plan an area to restrict the aircraft from flying out of the area.

Users can place a rectangular or circular area by tapping anywhere on the map interface. After placing the area, if it is a circular area, you can adjust the area size by stretching the radius adjustment points; if it is a polygon area, you can tap the icon between the area edges to add vertices, or stretch vertices to adjust the area size. After adjustment, Autel Voyager App will generate a customized no-fly zone or customized geofence based on the area type and valid period set by the user.

Tips
• Select and drag an area on the map interface to quickly adjust its position on the map.

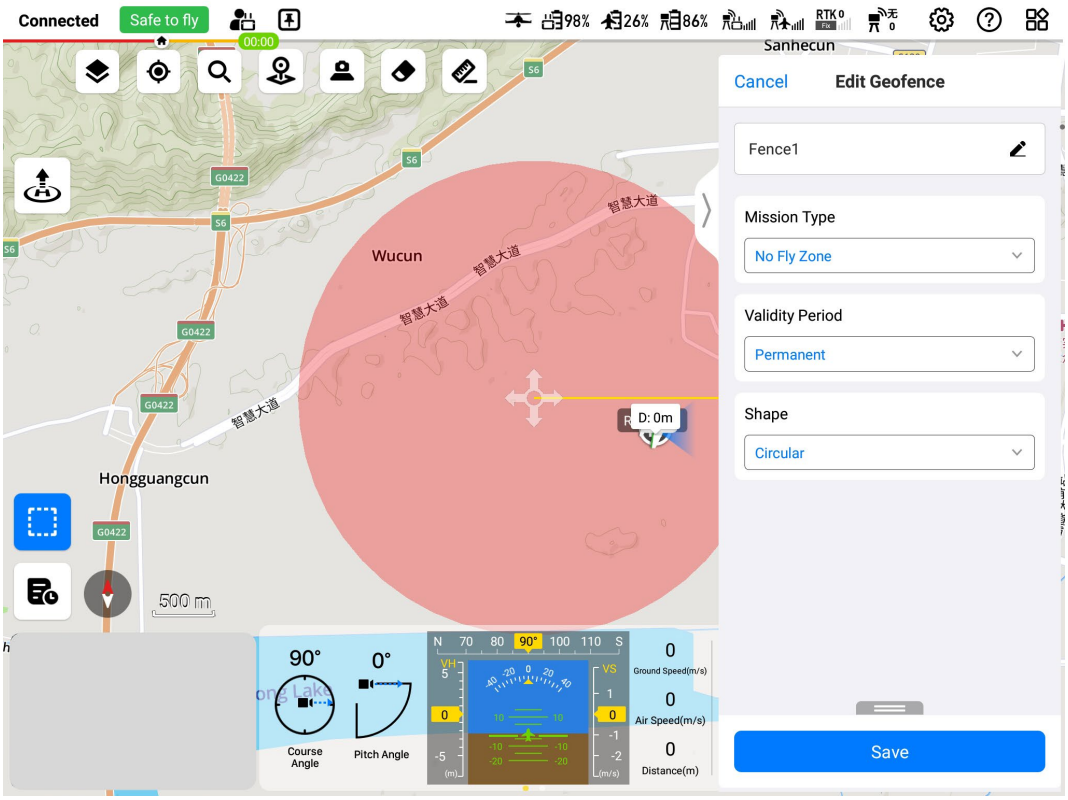


Figure 4-16 Create a (Customized) Geofence

4.4.3.2 Editing a (Customized) Geofence

On the "**Edit Geofence**" interface, you can perform the following operations:

- Misson Type: can be set to "**Geofence**" or "**No Fly Zone**".
- Validity period: can be set to "**Permanent**" or "**Temporary**".

  When selecting "**Temporary**", you need to set the start (date + time)/end (date + time), down to the minute.
- Shape: can be set to "**Circular**" and "**Polygonal**".
  - ➢ Circular: Place a circular area on the map interface, support adjusting the radius of the circular area, and displaying the radius simultaneously.
  - ➢ Polygon: Place a polygon area (rectangle by default) on the map interface. You can view the length of the connection between adjacent vertices and set the longitude and latitude coordinates of each vertex.

Tips

- On the map interface, no-fly zones are displayed in red and geofences are displayed in green.
- After the (customized) electronic fence is edited and saved, you can tap the " " icon on the map interface to enter the "**Mission**" for viewing and editing.

Remarks

- After the “**Aircraft Settings**” > “**Geofence**” option is enabled, the saved electronic fence will be displayed on the map. After turning off this function, the customized geo-fence set by the user will no longer be displayed on the map, and the customized geo-fence will not be enabled.
- Please note that the national no-fly zone is enabled by default and is not affected by the “**Geofence**” function switch.

4.4.3.3 Importing a Geofence

Users can also import a geofence into the remote controller.

The aircraft supports the geofence import function, in addition to the users can create their own geofence, allowing users to obtain the restricted flight zone data file of their country or region and upload it to the flight control system of the aircraft. When the aircraft approaches the relevant airspace during flight, it will execute corresponding status responses (including alerts, deceleration, etc.) to ensure flight safety.

Tips

- The import function supports importing json-type no-fly zone data files. Users can import no-fly zone data files published by the aviation management department.
- Operation method: Save the json file to the root directory of the remote controller, on the map interface of Autel Voyager, tap "  "> “**More**” > "**Import**" and select the json file.

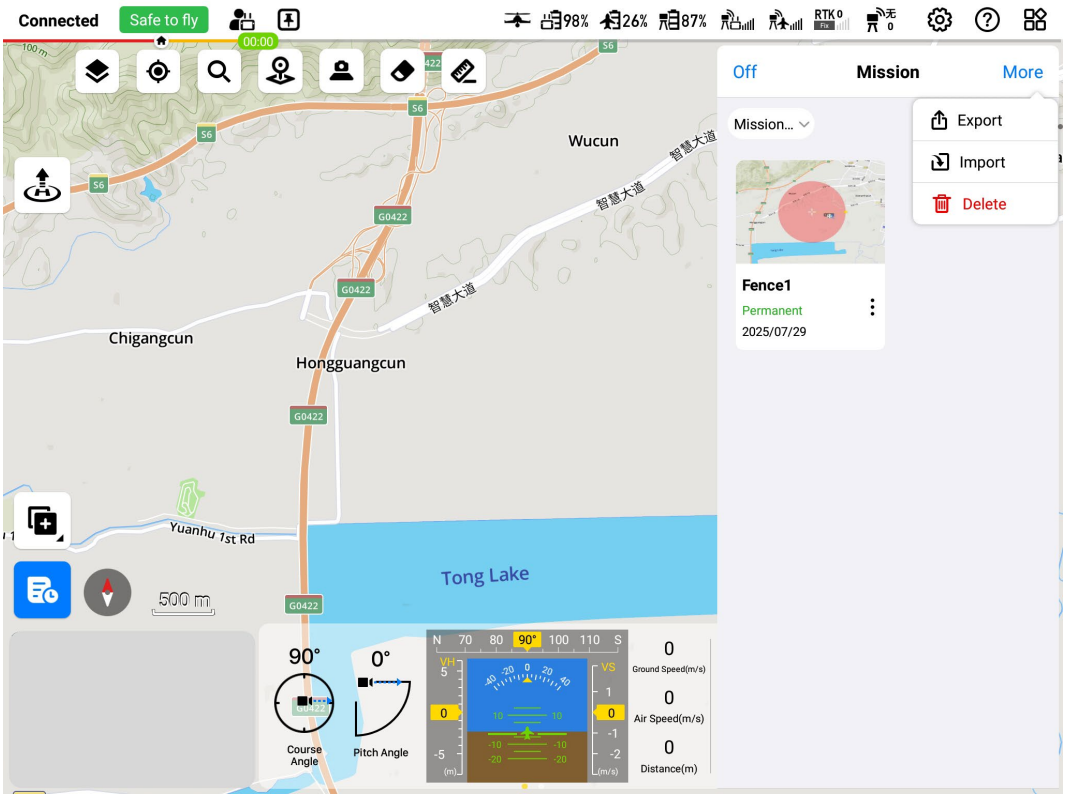


Figure 4-17 Import a Geofence

4.4.3.4 Electronic Fence Update Mechanism Description

After turning on or off the "**Geofence**" function switch, the remote controller will re-synchronize the geo-fence information with the aircraft. In order to ensure that the geo-fence information displayed on the remote controller is consistent with the geo-fence information stored in the aircraft, the remote controller will update the geo-fence information to the aircraft under the following circumstances:

- The remote controller is connected to the aircraft, the aircraft is on the ground, and the current latitude and longitude positioning information of the aircraft can be obtained.
- After the aircraft completes its flight mission and lands.
- The remote controller is connected to the aircraft, the aircraft is on the ground and turn on or off the "**Geofence**" function switch on the remote controller.
- The remote controller is connected to the aircraft, the aircraft is on the ground and save the "**Geofence**" content on the remote controller.

Tips

- When the remote controller updates the geo-fence information to the aircraft, a warning message "Flight data is being synchronized with aircraft and base station" will be displayed at the bottom of Autel Voyager App, and the aircraft is prohibited from taking off at this time.

Tips

- During flight, the remote controller will no longer update the electronic fence information to the aircraft. Therefore, during flight, users cannot update the customized geo-fence information that has been synchronized to the aircraft by turning on or off the "**Geofence**" function switch.
- During the flight, users cannot add, modify or delete (customized) electronic fence information.

4.4.3.5 Geofence Limitation Function

After a geofence is created, it will limit the following missions or functions:

- **Route Flight**

a. Route editing

During the process of route editing, the editing and saving of a route will not be limited by geofencing information.

b. Mission route take-off verification

Before a mission route is uploaded, the ground control station will verify the relation between the route and geofence. If there is a conflict (such as the route approaching a no-fly zone, the route being located within a no-fly zone, or the route being located outside a geofence), the aircraft will not be able to take off along that route.

c. During the route flight

After takeoff, the route that has passed the geofence verification on the RC will generally not trigger a geofence warning. However, in case of extraordinary circumstances where the aircraft severely deviates from the route and enters the restricted area of a geofence during flight, the aircraft will be restricted by the fence and may experience deceleration and hover.

- **Quick Mission**

After a quick mission on the remote controller is edited and tapped to execute, the remote controller will verify whether there is a conflict between the quick mission area and the existing geofences. If there is a conflict between the quick mission area and the existing geofences, the remote controller will prohibit the user from executing this quick mission. The remote controller only verifies the hovering area of the quick mission. If the aircraft is restricted by a geofence during its flight to the quick mission area, it may also result in deceleration and hover due to the fence restriction.

- **Dynamic Track**

- When the tracking mode is synchronous tracking, the aircraft will select a suitable synchronous tracking point outside the no-fly zone, within the geofence, or within the authorized area, and fly to this synchronous tracking point for synchronous tracking.
- If the aircraft is in multi-rotor mode and the tracking mode is simple tracking, circling tracking, or figure-8 circling tracking, the aircraft needs to accelerate from the multi-rotor mode to the fixed-wing mode first. During the acceleration

process, the aircraft will be restricted by the electronic fence, resulting in deceleration or Hover.

- If the aircraft is in fixed-wing mode and is performing simple tracking, circling tracking, or figure-8 circling tracking, the aircraft will automatically select a suitable hovering point outside the no-fly zone, within the geofence, or within the authorized area, allowing the aircraft to track the target electronically. When near the fence restricted area, it will not be restricted by the electronic fence and will slow down and hover (when the target point is within the no-fly zone or outside the geo-fence, the aircraft's tracking and hovering path will remain 300 m away from the outside of the no-fly zone boundary or 300 m inside the geofence boundary).

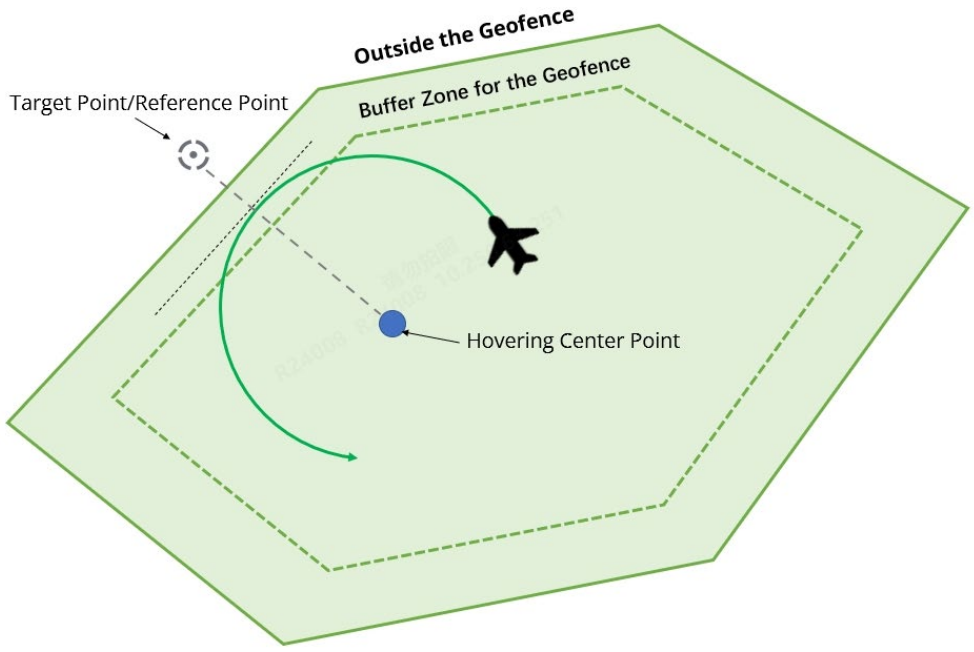


Figure 4-18 When the Target Point is Outside the Geofence

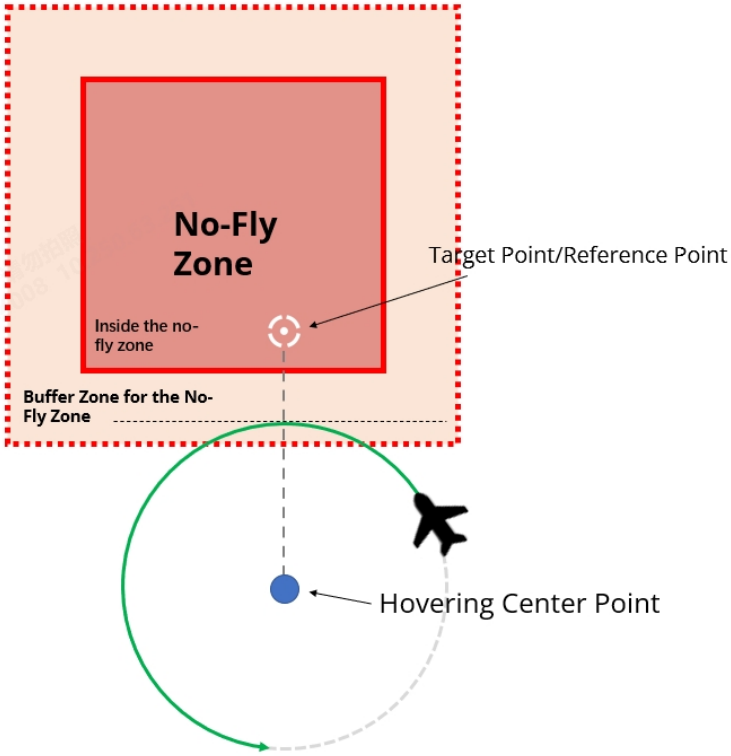


Figure 4-19 When the Target Point is Inside the No-Fly Zone

Tips
● For more information about dynamic track, see "**4.6.3 Dynamic Track**".

- **Return**

During the process of return, the aircraft will be limited by geofences. For details, see mechanism part of geofencing system.

- **Manual Flight**

During the process of manual flight, the aircraft will be limited by geofences based on the area that the aircraft is heading to. For details, see mechanism part of geofencing system.

4.4.4 Creating a Waypoint Mission

Waypoint Mission is a basic function of the aircraft. Users can add one or more waypoints on the map interface, and each two adjacent waypoints are connected to form a flight segment, and one or more flight segments constitute a route. When users are placing waypoints, Autel Voyager App will automatically generate departure hovering point, arrival hovering point, and home point (the takeoff position of the aircraft by default).

After the editing of the waypoint mission is completed, upload the waypoint route to the aircraft through the remote controller and the tracking antenna. The aircraft will traverse the waypoints in the order of the waypoints when performing the waypoint route,

perform the preset flight actions at the waypoints, and can cooperate with the mounted gimbal camera to implement tasks such as taking pictures and recording in flight.

The waypoint missions of the aircraft are divided into ordinary waypoint missions and observation area waypoint missions.

Remarks

- Observation area waypoint mission: That is, on the basis of the ordinary waypoint mission, a specified number of observation areas can be set, and the observation areas are associated with the flight path executed by the aircraft by covering or specifying the flight segment. When the aircraft flies through the effective range of the specified observation area on the route, the gimbal will always face the center position of the observation area until it flies away from the effective range of the observation area.

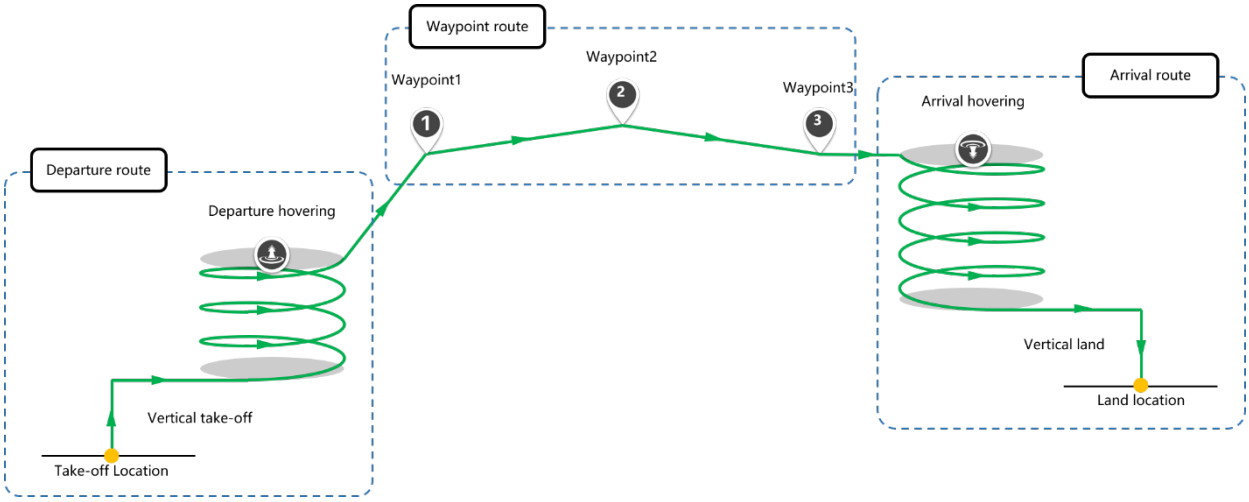


Figure 4-20 Waypoint Mission Route Procedures

Remarks

- Observation area waypoint mission: That is, on the basis of the ordinary waypoint mission, a specified number of observation areas can be set, and the observation areas are associated with the flight path executed by the aircraft by covering or specifying the flight segment. When the aircraft flies through the effective range of the specified observation area on the route, the gimbal will always face the center position of the observation area until it flies away from the effective range of the observation area.

4.4.4.1 Mission Interface Overview

Supplementary Instructions for Waypoint Altitude

The waypoint altitude of each waypoint is the altitude when the aircraft leaves this waypoint. If the aircraft is limited by the climbing rate and fails to reach the altitude set for this waypoint when it arrives at this waypoint, the aircraft will hover and climb to the set waypoint altitude, then leave this waypoint and fly to the next waypoint.

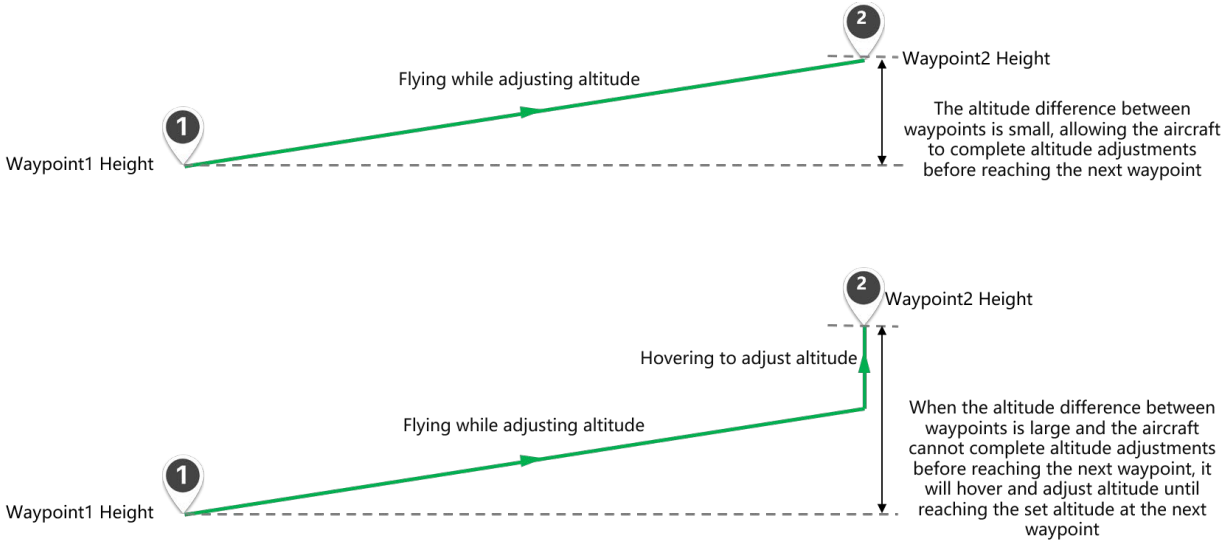


Figure 4-21 Waypoint Route Flight Altitude Transfer

Tips
• If the aircraft flies from the previous waypoint to a certain waypoint, it needs to adjust its altitude by hovering at the waypoint. The hovering radius is the turn radius set at the waypoint. • Number below each waypoint icon at the right side of the “Edit Mission” interface is the altitude of the corresponding point.

Supplementary Descriptions for Turn Mode

- Early Turn: Used when the aircraft does not need to strictly pass the coordinates of a certain waypoint, but only needs to plan a relatively smooth route. When “**Early Turn**” is set, the set waypoint position is used as an intermediate position to plan a smoother and shorter route. However, it should be noted that there are certain requirements for the distance between the waypoint and the previous and subsequent waypoints, as well as the connection angle between the waypoints. It is not always possible to plan an advance turning route without passing through the waypoints. When using it, please pay attention to the actual route planned on the remote controller and adjust it as needed.
- Fly-Through: Used when the aircraft needs to pass the coordinates of a certain waypoint before flying to the next waypoint.

- Timed Orbit/Orbit Laps: Used when the aircraft needs to hover at a certain waypoint to perform the corresponding task. The aircraft will complete the set hovering action at the waypoint according to the set hovering attributes (such as orbit parameters and turn radius). Then fly to the next waypoint. Timed Orbit/Orbit Laps is mostly used when the aircraft is required to stay at a specific location of a certain waypoint for a period of time for observation operations.

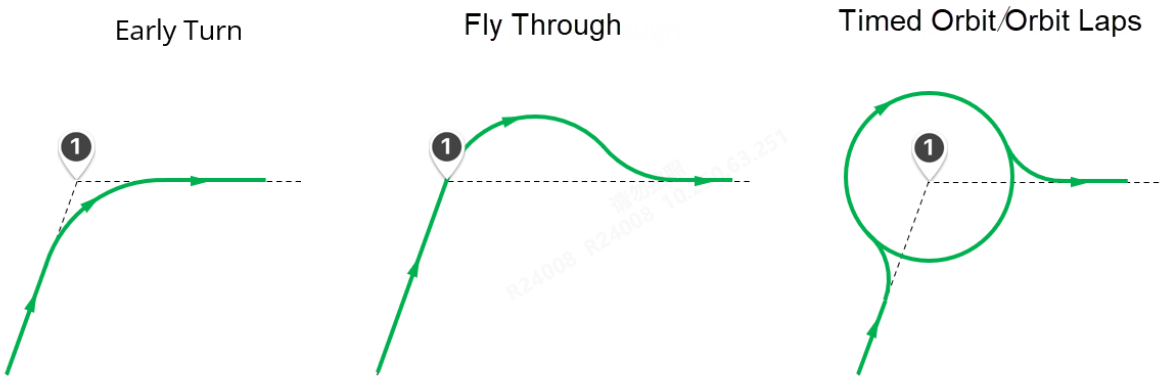


Figure 4-22 Turn Mode Description

Tips

- In the same waypoint mission, different turn modes can be set for different waypoints.
- Please know that for Timed Orbit/Orbit Laps, the set number of circles and circle time are the minimum number of circles and the shortest time spent on the circle. In actual flight, the aircraft needs to complete the altitude adjustment on the hovering circle first. It will not start counting the number of hovering circles until the altitude is adjusted to the height set by the waypoint and the aircraft reaches the exit point of the hovering circle. The timed circle will first convert the set circle time into the minimum number of circles set by the aircraft to reach the time and use this calculated number of circles as the judgment condition for the aircraft to leave the circle. Therefore, the actual flight time of the aircraft on the hovering circle will be different from the set hovering time.

Supplementary Descriptions for Flight Segments

Each waypoint has its own corresponding flight segment, where the starting position of the flight segment is the location where the aircraft completes the flight of the previous waypoint and adjusts the aircraft's course to the position facing the current waypoint. The end position of the flight segment is the location where the aircraft completes flying at the current waypoint and adjusts the aircraft's course to the next waypoint.

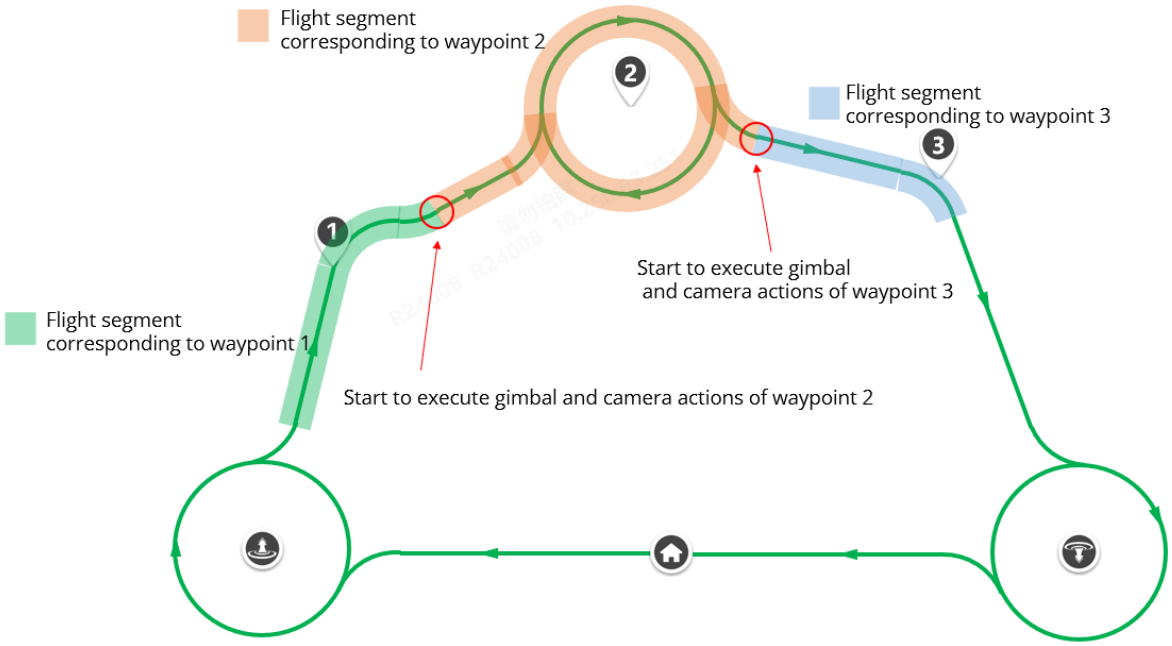


Figure 4-23 The Flight Segment Corresponding to the Waypoint

Supplementary Descriptions for Gimbal Movements

- Gimbal Pitch Angle: When the aircraft enters the segment corresponding to the waypoint, it will automatically adjust the gimbal pitch angle to the set angle value. It is defined that 0° means the gimbal is facing forward horizontally, and -90° means the gimbal is pointing vertically downward.
- Gimbal Relative Heading Angle: The offset angle of the gimbal's heading relative to the heading of the current segment when the aircraft enters the segment corresponding to the waypoint. The current route heading is the connection direction from the previous waypoint to the current waypoint. 0° to 180° corresponds to the right side of the route and heading, and 0° to -180° corresponds to the left side of the route and heading.

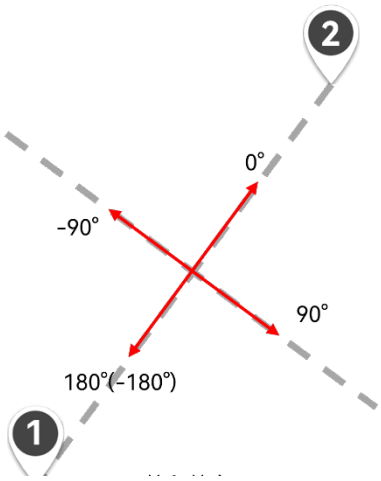


Figure 4-24 The Heading Corresponding to the Route Segment No. 2

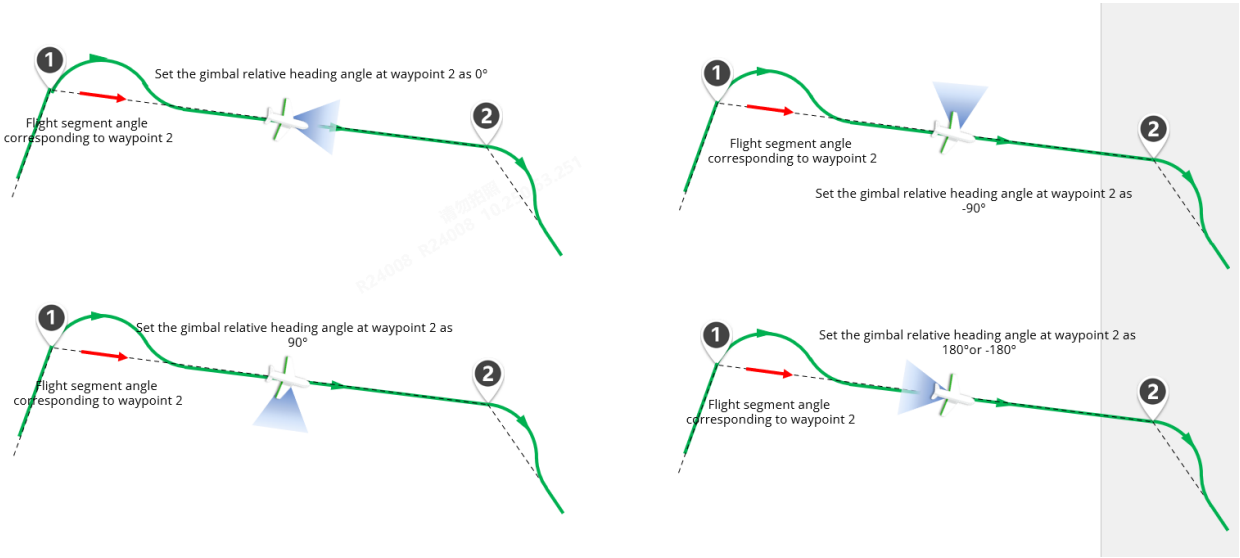


Figure 4-25 Description of Gimbal Relative Heading Angle

Remarks

- The gimbal action (gimbal pitch angle and gimbal relative heading angle) will only take effect once at the beginning of the flight segment corresponding to the waypoint. After entering the flight segment corresponding to the new waypoint, the aircraft will adjust the pitch angle and the relative heading angle of the gimbal once based on the gimbal action set for the new waypoint. During the flight segment, the user can manually control the angle of the gimbal.
- The camera action (payload action) will always be effective during the flight segment corresponding to the waypoint.
- Please note that in the waypoint mission, the gimbal and camera actions set at waypoint 1 will not take effect. The gimbal and camera actions will only take effect starting from waypoint 2.

4.4.4.2 Entering Edit Mission Interface

1. In Autel Voyager App, Tap the “”> “ ” icon on the left side of the map interface..
2. In the popup “**Key Parameter Settings**” window, confirm the key parameters of flight routes.

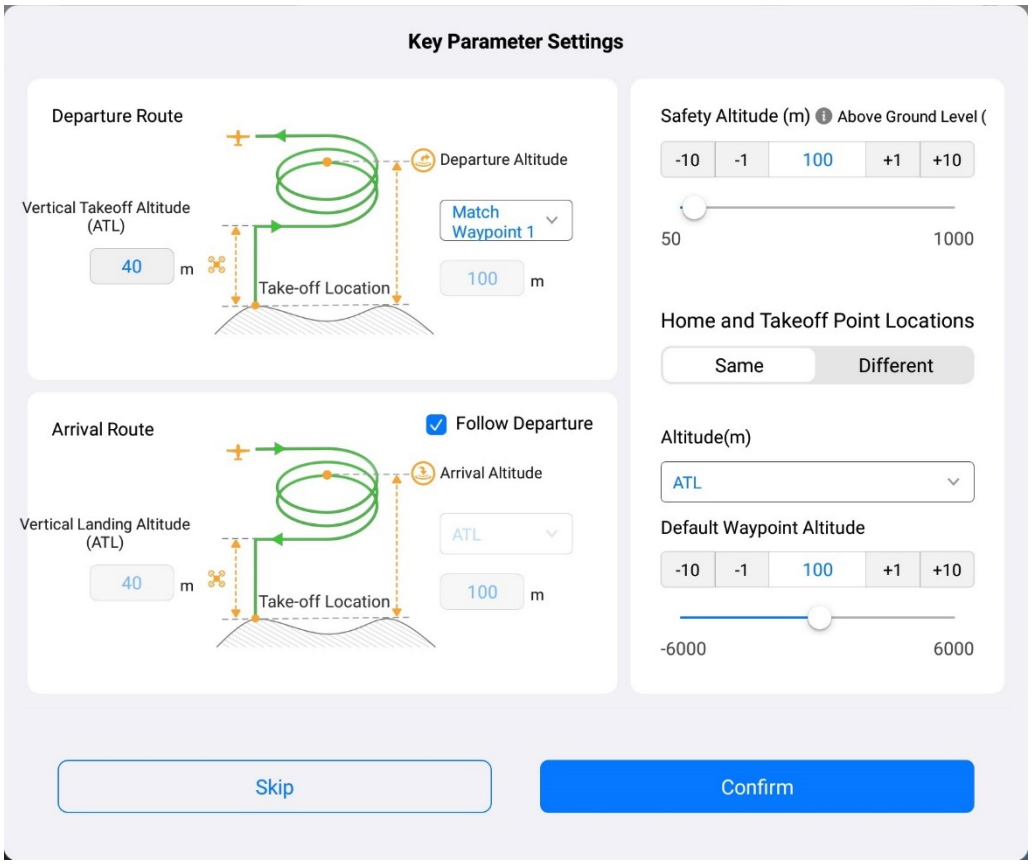


Figure 4-26 Key Parameter Settings

3. Click "**Conform**" to enter "**Edit Mission**" interface.
4. Click on the location on the map where you need to place the waypoint mission.

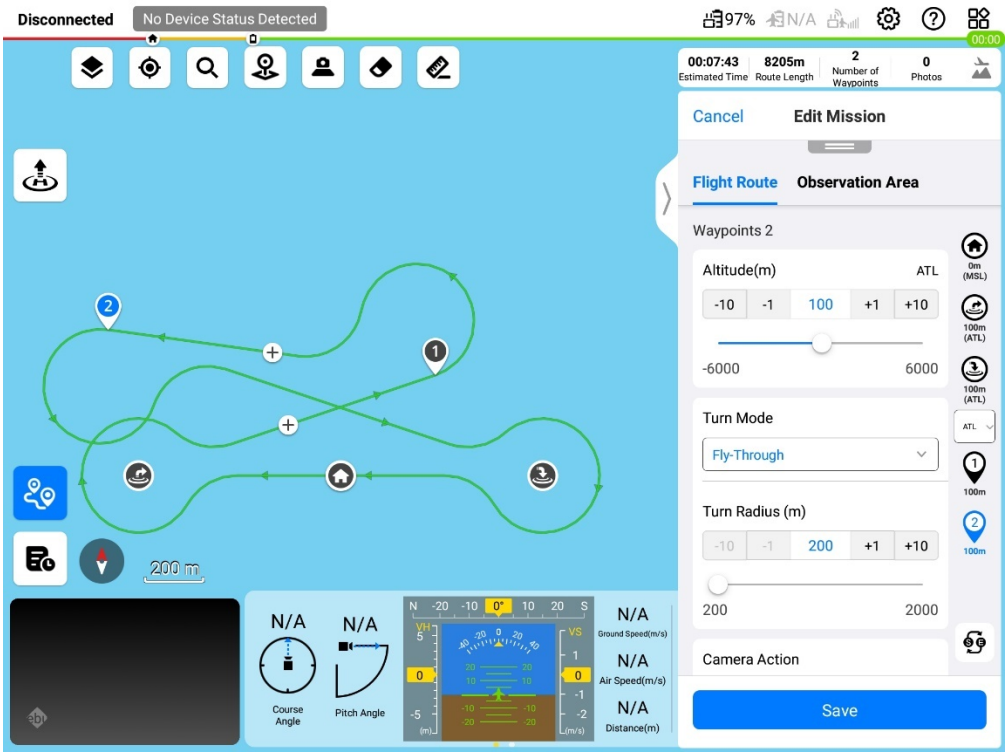


Figure 4-27 Create a Waypoint Mission

Table 4-6 Waypoint Mission Interface Icon Description

No.	Icon	Description
1.		Home point position of the aircraft.
2.		Departure hovering point position of the aircraft.
3.		Arrival hovering point position of the aircraft.
4.		Waypoint position (distinguished by numbers).
5.		Observation area (center point) position (distinguished by numbers).
6.		Tap this icon to reverse the order of waypoints on the route.

4.4.4.3 Adding Waypoints

When creating a waypoint mission, users can add waypoints by tapping anywhere on the map interface, or after adding the first waypoint.

- Tap the "⊕" icon between the flight segments to add waypoints.
- Select and drag each waypoint, home point, departure hovering point, or arrival hovering point on the map interface to quickly adjust their positions on the map.

4.4.4.4 Editing Waypoints

Important

- The setting of the landing point altitude will affect the landing speed control of the aircraft. When enabling the remote take-off and landing function, please fill it in according to the actual altitude.
- When setting the take-off point and home point, be sure to pay attention to the ground conditions and ensure that the home point is flat and not in a densely populated area.
- When placing departure and arrival hovering points, be sure to pay attention to the surrounding building distribution and airspace height. The terrain obstacle avoidance function does not take effect during the departure route and arrival route phases. Please set a reasonable height to ensure that there are no obstacle conflicts on the route.

Tips

- Users can tap the "ⓘ" icon after the departure route or the arrival route to learn about the relevant instructions of the departure hovering point and the arrival hovering point. See "**2.6 Aircraft Mode Switching**" for specific details.
- When placing departure and arrival hovering points on the map interface, please pay attention to the wind direction in takeoff and landing and be sure to choose the upwind direction to place the hovering points. When the aircraft takes off vertically from the take-off point to the take-off mode switching altitude and changes to a straight flight to the departure hovering circle, it needs to accelerate to a certain speed (airspeed) to switch from the multi-rotor mode to the fixed-wing mode. If there is a tailwind and the wind speed is high, the switching process requires a longer acceleration distance and time; when the aircraft flies out of the arrival hovering circle and flies straight over the landing point (landing mode switching height), it needs to decelerate to switch from fixed-wing mode to multi-rotor mode. If it is a tailwind state, insufficient resistance will make it difficult for the aircraft to decelerate. When the aircraft flies over the landing point, if the speed has not decelerated to zero, it may cause it to overshoot the landing point. The higher the wind speed, the farther it travels.

Edit a Waypoint

On the "**Edit Mission**" > "**Flight Route**" column, users can perform the following operations:

1. Tap the "" icon to edit the home point. The home point is the takeoff position of the aircraft by default.

   If you cancel the default setting, you can set the home point position yourself (used to realize the long-range takeoff and landing function). The settings include:

   - MSL (m): Select altitude value.
   - Waypoint Coordinates: Select a coordinate type and input the latitude and longitude coordinates of the home point.

2. Tap the "" icon to set the departure hovering point. Setting items include the following:

   - Departure Altitude (m): It can be set to "**Match Waypoint 1**", "**ATL**" or "**MSL**".
   - Vertical Takeoff Altitude (ALT) (m): The vertical altitude relative to the takeoff point. When reaching this height, the aircraft accelerates to fixed-wing flight mode.
   - Radius (m): Set the departure hovering radius value.
   - Departure Circling Point: Select a coordinate type and input the latitude and longitude coordinates of the departure hovering point by yourself.

3. Tap the "" icon to set the arrival hovering point. Setting items include the following:

   - Arrival Altitude (m): It can be set to "**ALT(LND)**" altitude or "**MSL**".
   - Vertical Landing Altitude (ALT[LND]) (m): The vertical altitude relative to the landing point. After arrival hovering, the aircraft adjusts to this height, and then accelerates to rotor-wing flight mode.
   - Radius (m): Set the arrival hovering point radius value.
   - Arrival Circling Point: Select a coordinate type and input the latitude and longitude coordinates of the arrival hovering point by yourself.

4. Set altitude reference to "ATL" or "MSL".

5. Tap the "" icon to set the designated waypoint and corresponding flight segment. Setting items include:

   - Altitude (m): Set to "**ATL**" or "**MSL**".
   - Turn Mode: Set the turn method of the aircraft at the waypoint.
     - Turn Radius (m): Set this when "**Early Turn**" or "**Fly-Through**" is selected. The turn radius is the radius corresponding to the arc of the aircraft when turning.
     - Orbit Parameters (s): Set this when "**Timed Orbit**" is selected. The orbit time can be set.
     - Orbit parameters (laps): Set this when "**Orbit Laps**" is selected. The number of orbit circles can be set.
   - Turn Radius (m): Set the turn radius of the aircraft at the waypoint. The turn radius value (at the waypoint) can be set.
   - Camera Action: Set the gimbal camera action corresponding to the waypoint, which can be set to "**No Action**", "**Timelapse**", "**Distance Lapse**", or **"Start Recording**".

- Interval (s): Set this when selecting "**Timelapse**". You can set the photo interval.
- Interval (m): Set this when "**Distance Lapse**" is selected. The photo interval can be set.

➢ Gimbal Action: Set gimbal action of flight segment corresponding to the waypoint. When "**Action**" is selected:

- Gimbal Pitch (°): Set the gimbal camera pitch angle for the route segment corresponding to the waypoint. The gimbal pitch angle value can be set.
- Gimbal Yaw (°): Set the offset angle of the gimbal relative to the waypoint corresponding to the course of the flight segment. The angle value of the relative heading can be set.

➢ Waypoint Coordinates: Select a coordinate type and input the longitude and latitude coordinates of the waypoint by yourself.

➢ Delete Waypoint: When the number of waypoints in the route exceeds 1, you can tap this button to delete the corresponding waypoint.

Batch Edit Waypoints

The remote controller supports batch editing of waypoints, which can improve the efficiency of waypoint adjustment when there are many waypoints in a waypoint mission.

1. After placing the waypoints, the user can tap the "**Edit Mission**" > "[redacted]" > "**Waypoint Batch Editor**".
2. Modify the attributes of the selected waypoints in batches.

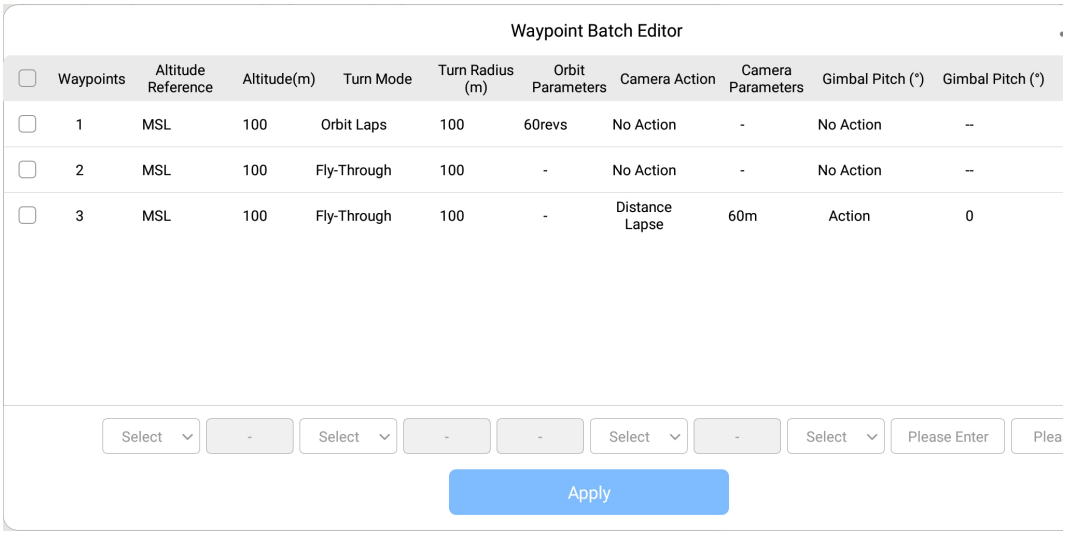


Figure 4-28 "Waypoint Batch Editor" Window

3. Click "**Apply**" to apply the modification.
4. Click "**Complete**" to exit the batch edition window.

4.4.4.5 Adding Observation Area

On the "**Edit Mission**" > "**Observation Area**" column, you can add a circular area observation area by tapping anywhere on the map interface.

Tips

- Select and drag the observation area on the map interface to quickly adjust its position on the map.
- After adding an observation area and associating it with the corresponding flight segment, you can execute the observation area waypoint mission.

4.4.4.6 Editing Observation Area

Tips

- You can choose whether to link the flight segment with the observation area. If the linked flight segment is not set, when the aircraft flies through the segment covered by the observation area, the aircraft gimbal will keep locked on the center point of the observation area; if the associated segment is set, when the aircraft flies through the associated segment, the aircraft gimbal will keep always locked on the center point of the observation area.
- If multiple observation areas are set up, each observation area can be associated with multiple flight segments, but one flight segment can only be associated with one observation area. If the associated flight segment settings are repeated, the subsequent observation area settings will overwrite the previous settings. When two or more circular observation areas overlap, the gimbal will face the observation area with the smallest number.
- The priority of the aircraft gimbal control in the observation area is higher than the gimbal action set by its waypoint. The gimbal will give priority to the gimbal instructions required in the observation area.
- Temporary observation missions and gimbal locking have a higher priority for aircraft gimbal control than the priority of the observation area set on the route. Therefore, when performing a temporary observation mission or gimbal lock, even if the aircraft enters the range of the route observation area, the gimbal will not face the center point of the route observation area.

On the "**Edit Mission"** > "**Observation Area**" column, the users can perform the following operations:

- POI Tracking: Input the serial numbers of two waypoints and tap the "Add" button. The flight segments between the two waypoints will be associated with the observation area.
- Elevation: Elevation correction is used to correct the altitude of the ground in the observation area to prevent the camera from being unable to align the target point due to errors in the pitch angle during gimbal observation caused by errors in the target height.
- Effective Radius (m): The effective radius of the observation area can be set.

- Waypoint Coordinates: Select a coordinate type and input the latitude and longitude coordinates of the center point of the observation area by yourself.
- Delete Observation Area: You can tap this button to delete the observation area.

4.4.4.7 Saving Mission

After the user completes editing the waypoint and observation area, please tap the "**Save**" button under the "**Edit Mission**" interface to check and save the waypoint mission. When saving, please check and modify the route according to the prompts on the "**Save Mission**" interface to ensure that the route settings are qualified and conflict-free.

After saving the waypoint mission, the relevant information of the waypoint mission (estimated time, route length, number of waypoints, and photos) will be displayed in a small window at the upper right corner of the map interface.

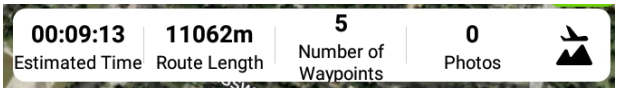


Figure 4-29 Waypoint Mission Information Window

On the map interface, you can perform the following operations:

- Tap the "⛰" icon in the small window at the upper right corner to display the current route and terrain preview. The user can choose whether to turn on the terrain obstacle avoidance (terrain following) function on this interface.

Figure 4-30 Route and Terrain Preview

- Tap the "Edit" icon in the small window at the upper right corner to re-edit the waypoint mission.
- After the aircraft performs pre-flight inspection, you can choose to tap the "" icon to take off and perform waypoint missions.

4.4.5 Creating a Polygon Mission

Users can place a polygon area (a rectangular area by default) on the map interface and perform operations such as dragging, adding vertices, and dragging vertices on the polygon area to adjust the location and size of the area; after adjustment, Autel Voyager App will automatically, based on the user-set side overlap rate and route angle, generate a continuous equally spaced route in the polygon area. When placing a polygon area, Autel Voyager App will automatically generate departure hovering points, arrival hovering points, and home point (the default one is the takeoff position of the aircraft).

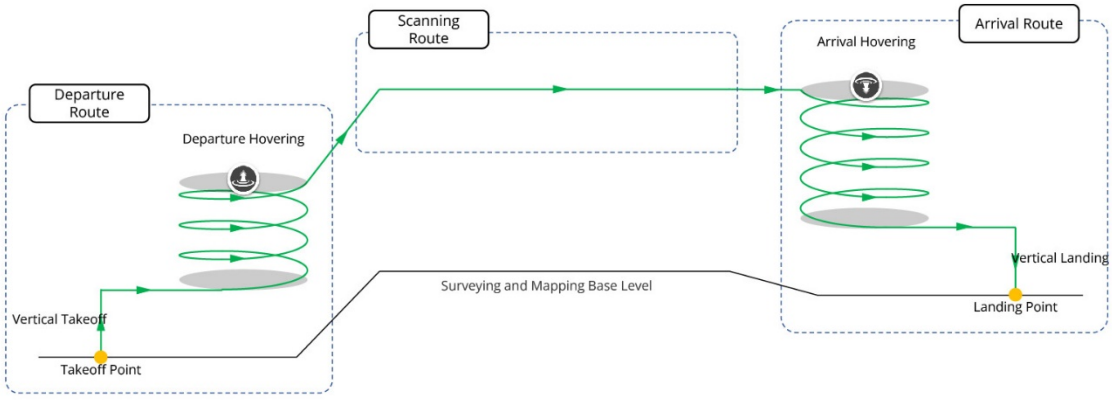


Figure 4-31 Polygon Mission Route Procedures

Tips

- Polygon missions are mostly used in mission scenarios such as surveying and modeling. Before performing this mission, please plan your own reasonable emergency support measures (such as planning reasonable airspace, safe flight time periods, obtaining official authorization, etc.) to avoid abnormal flight situations that may cause collateral damage to people or buildings on the ground.

4.4.5.1 Entering Polygon Mission Interface

1. On Autel Voyager App, tap the “ ”> “ ” icon on the left side of the map interface.
2. In the popup “**Key Parameter Settings**” window, confirm the key parameters of flight routes.

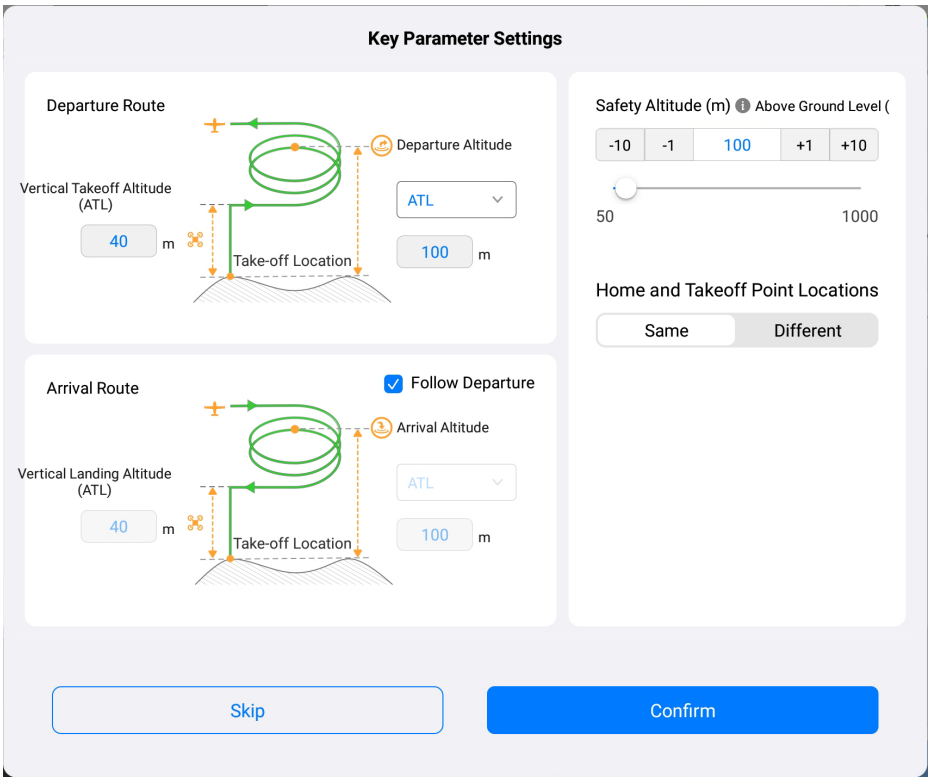


Figure 4-32 Key Parameter Settings

3. Click "**Conform**" to enter "**Edit Mission**" interface.
4. Click on the location on the map where you need to place the polygon mission.

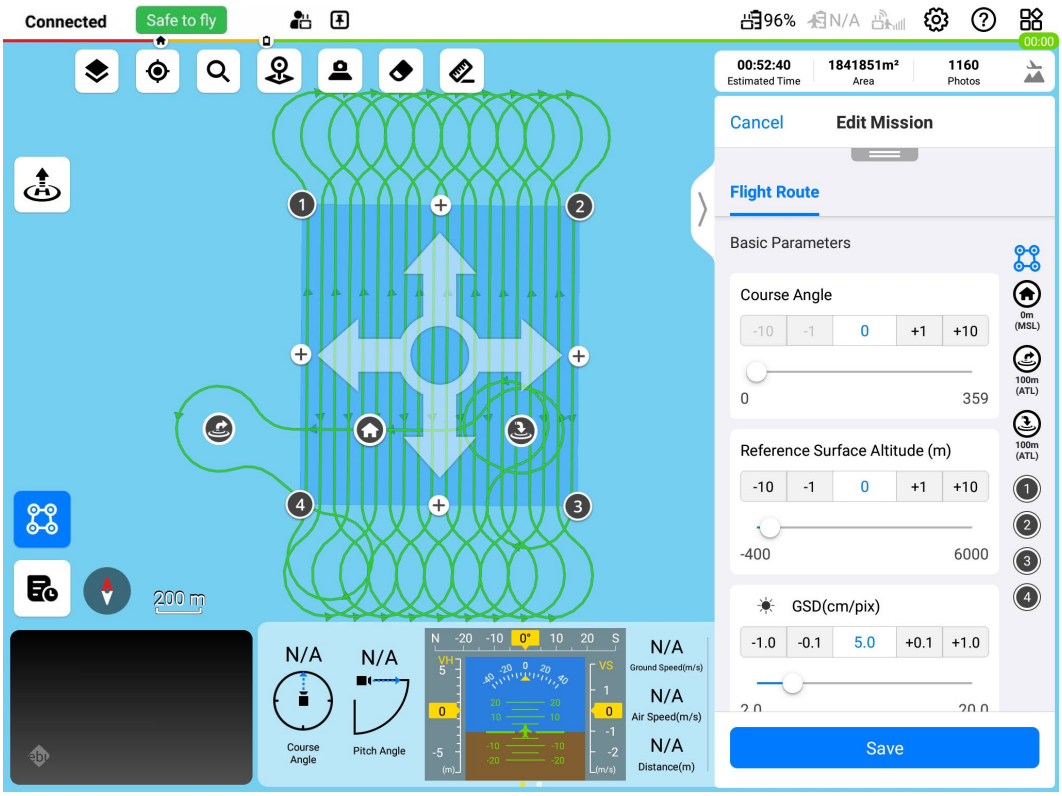


Figure 4-33 Create a Polygon Mission

Table 4-7 Polygon Mission Interface Icon Description

No.	Icon	Description
1.		Polygon mission route settings.
2.		The aircraft's home point position.
3.		The position of the aircraft's departure hovering point.
4.		The position of the aircraft's arrival hovering point.
5.		Polygon vertex positions (Identified by digits).

4.4.5.2 Adding Polygon Regions and Vertices

When creating a polygon mission, users can tap anywhere on the map interface to add a polygon area (the default one is a rectangular area). After placing the area:

- Tap the "⊕" icon between the area edges to add area vertices.

- Select and drag each vertex, home point, departure hovering point or arrival hovering point on the map interface to quickly adjust its position on the map.

4.4.5.3 Editing Polygon Region and Vertices

In the "**Edit Mission**" interface on the right side of the polygon mission interface, users can perform the following operations:

1. Tap icon to set the basic parameters of the polygon area. Setting items include:
   - Course Angle: The angle between the aircraft and true north (clockwise) when it starts executing the scanning route portion of the polygon mission.
   - Reference Surface Altitude (m): The reference surface altitude value can be set.
   - GSD (cm /pix): The ground resolution value can be set.
   - Relative Reference Surface Flight Altitude (m): The flight altitude value can be set.
   - Side Overlap (%): Refers to the image overlap rate between two adjacent photos taken when taking photos along two adjacent routes.
   - Front Overlap (%): Refers to the image overlap rate between two adjacent photos taken when taking photos along the heading.

Remarks

- GSD and Relative Reference Surface Flight Altitude are related to each other. Adjusting one will cause the other to change accordingly.

Tips

- Please pay attention to the terrain drop, fill in the "Reference Surface Altitude" according to the actual altitude of the surveying area, set the "Relative Reference Surface Flight Altitude" reasonably, and check whether the route elevation is safe before flying, otherwise there may be a risk of collision.
- When setting the side overlap ratio /front overlap ratio, you need to consider the operation accuracy requirements, and also take into account factors such as lighting conditions during surveying and mapping, survey area range, storage size, etc. While ensuring surveying and mapping accuracy and engineering margins, the number of photos taken can be reasonably reduced and work efficiency improved.
- When setting the front overlap ratio, you need to consider the shutter speed of the gimbal camera. The greater the front overlap ratio, the shorter the time interval between the two photos before and after, which may cause the gimbal camera to be too late to take photos. If this happens, it is recommended to adjust the "GSD/Relative Reference Surface Flight Altitude "or "Front Overlap Ratio" and other parameters.

2. Tap the "" icon to edit the home point. The home point is the takeoff position of the aircraft by default.

If you cancel the default setting, you can set the home point position yourself (used to realize the off-site takeoff and landing function). The settings include:

- MSL(m): Set the altitude of the home point according to the actual situation.
- Waypoint Coordinates: Select a coordinate type and input the latitude and longitude coordinates of the home point yourself.

3. Tap the "" icon to set the departure hovering point. Setting items include:
   - Departure Altitude (m): It can be set to **"ATL"** or "**MSL**".
   - Vertical Takeoff Altitude (ATL) (m): The vertical altitude relative to the takeoff point. When reaching this height, the aircraft accelerates to fixed-wing flight mode.
   - Radius (m): The departure hovering radius value.
   - Departure Circling Point: Select a coordinate type and input the latitude and longitude coordinates of the departure hovering point by yourself.
4. Tap the "" icon to set the arrival hovering point. Setting items include:
   - Arrival Altitude (m): It can be set to "**ALT(LND)**" or "**MSL**".
   - Vertical Landing Altitude (ALT[LND]) (m): The vertical altitude relative to the landing point. After arrival hovering, the aircraft adjusts to this height, and then accelerates to rotor-wing flight mode.
   - Radius: The arrival hovering point radius value.
   - Arrival Circling Point: Select a coordinate type and input the latitude and longitude coordinates of the arrival hovering point by yourself.
5. Tap the "" icon to set the specified vertex. Setting items include:

   Waypoint Coordinates: Input the latitude and longitude coordinates of the vertex by yourself.
6. After editing the polygon area, please tap the "**Save**" button under the "**Edit Mission**" interface to check and save the polygon mission conflict. When saving, please check and modify the route according to the prompts to ensure that the route settings are qualified and conflict-free.

4.4.5.4 Saving Mission

After saving the polygon mission, the relevant information of the polygon mission (estimated time, area, and photos) will be displayed in a small window in the upper right corner of the map interface.

Figure 4-34 Polygon mission information

On the map interface, you can perform the following operations:

- Tap the "" icon to display the current route and terrain preview. The user can choose whether to enable terrain obstacle avoidance on this interface.
- Tap the "Edit" icon to re-edit the polygon mission.
- Tap the "" icon, and after the aircraft performs pre-flight inspection, you can choose to take off and perform polygon missions.

Important

- Do not perform polygon missions near crowded areas, densely built areas, or sensitive locations unless you have special official authorization.
- When uploading and executing a polygon mission, if it conflicts with the set electronic fence, execution of the mission will be prohibited.

4.4.6 Real-Time Monitoring and One-Key Self-Check

The aircraft is equipped with a one-key self-check function and a safety monitoring function, which, together with manual checks before and after flight, constitute a comprehensive inspection monitoring system to ensure flight safety. Users can monitor the aircraft status in real-time through Autel Voyager App.

Safety Monitoring

The aircraft is equipped with various types and quantities of sensor devices, and advanced fault detection algorithms enable real-time monitoring of various states throughout the entire flight. Key information is collected and analyzed, identifying necessary faults promptly. Through measures such as warnings, isolation, handling, and recovery, flight safety is ensured. The real-time safety monitoring items during the entire flight cycle mainly include:

- Sensor information.
- Navigation status information such as attitude, speed, and position.
- Remote controller and telemetry link information.
- Battery level and battery safety status information.
- Actuator connection and communication information.
- Electronic fence information.
- Some important hardware connection states.
- Some important hardware health states.
- Overall maintenance status information.
- Instruction sending status information, etc.

One-Key Self-Check

The one-key self-check function is used for process testing of certain actuators before the aircraft takes off. During the self-check, the left and right tilt servos, as well as the tail servo, will actuate according to the predetermined program under the drive of the design command. The actuation results are recorded and evaluated in real-time. Before performing a one-key self-check, the following pre-checks must be completed:

- Check if the wing locks are securely fastened.
- Check if the tail (tail boom and horizontal tail) is securely connected to the fuselage.
- Verify if the fuselage propellers are installed correctly.
- Confirm if the battery is securely installed.

- Ensure that the airspeed tube protective cover has been removed.

Important

- During the execution of the one-key self-check, the tilt servos on the aircraft's nacelle will deflect. Please pay attention to the safety of personnel and equipment.

Tips

- The safety monitoring function is automatically enabled and remains active continuously after the aircraft is powered on. The one-key self-check function is used for ground checks before takeoff and troubleshooting checks in case of malfunctions.
- Key status and alarm information from safety checks will be displayed on the left side of the remote controller's status bar. During use, it is important to constantly monitor the equipment status. If the equipment status shows "Warning", "Device Abnormal", "Flight Prohibited" or similar alarms, promptly check the abnormal situation and take appropriate actions. For more details, see "**3.5.2 Status Bar**".
- The triggering mechanism for the one-key self-check function depends on the aircraft's takeoff method (manual takeoff, one-key takeoff, or mission takeoff). For details, see "**4.5 Takeoff Methods**".

4.5 Takeoff Methods

The aircraft provides different types of takeoff methods for users to choose accordingly, which includes manual takeoff, one-key takeoff and mission takeoff.

Important

- Before taking off, please do a pre-flight inspection to ensure that the aircraft is in a safe and flyable condition.
- When preparing to take off, please stand behind the aircraft and maintain a safe distance of at least 10m.
- Under certain abnormal circumstances, even if the aircraft passes the self-inspection, the motors may not be unlocked during takeoff. If you encounter an abnormal situation that cannot be unlocked, please troubleshoot according to the prompt information on the Application. If you still cannot solve the problem, please contact Autel Robotics or an authorized dealer.
- After the aircraft motor is unlocked, a status check will be performed while the motor is idling. If the motor status check fails, the aircraft will not be able to take off. In this case, the aircraft motors will automatically lock after a period of time. If you encounter this type of problem, please contact Autel Robotics or an authorized

dealer.

4.5.1 Manual Takeoff

Important

- Before manual take-off, please ensure you have chosen and set the stick modes of the remote controller properly and know the corresponding control method. For details, see "**4.4.1 Selecting Stick Mode**".
- The position of the throttle stick differs in different stick mode, see "**4.4.1 Selecting Stick Mode**" for details.

The procedure is as follows:

1. Power on the aircraft, the tracking antenna and the remote controller and complete matching and connection. For details about matching and connection, see "**4.2.4 Matching and Connection**".
2. Switch the mode switch key on the remote controller to "M" position, and then the indicator will turn red.

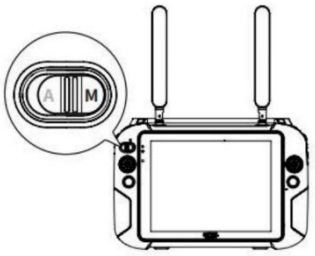


Figure 4-35 When the Mode Switch Key is Switched to "M" Position

3. Simultaneously move the left and right sticks inward or outward for 2s and finish the pre-check list as shown in the remote controller, then simultaneously move the left and right sticks inward or outward to start the aircraft motor.
4. Push the throttle stick up, and the aircraft will ascend vertically in multi-rotor mode.

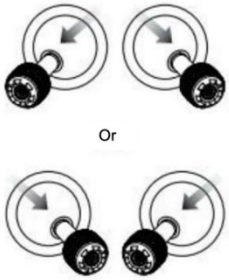


Figure 4-36 Start the Aircraft Motor

4.5.2 One-key Takeoff

The procedure is as follows:

1. Power on the aircraft, tracking antenna and remote controller and complete matching and connection.
2. Switch the mode switch key on the remote controller to “M” position, and then the indicator will turn red.

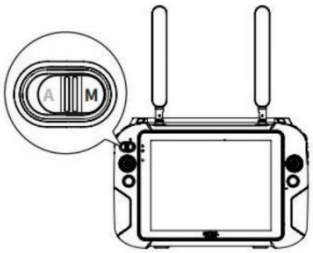


Figure 4-37 When the Mode Switch Key is Switched to “M” Position

3. Tap the “ ” icon in the upper left corner of the map interface of Autel Voyager App. After completing the check items in the pop-up pre-flight pre-check window, drag the “ ” icon to the right to take off. The aircraft will take off vertically in multi-rotor mode.

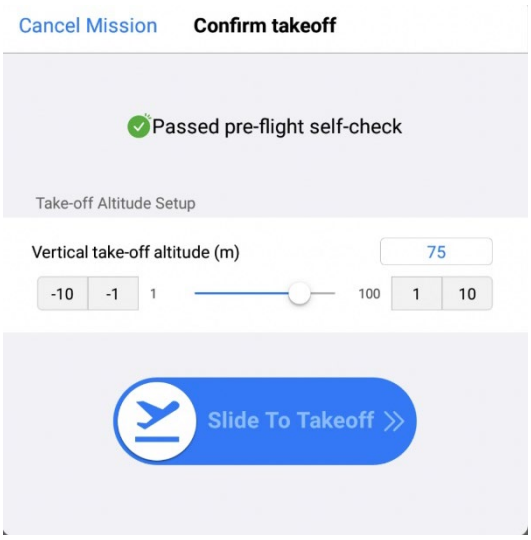


Figure 4-38 One-Key Takeoff Confirmation

Tips
• During the one-key takeoff process, the user can interrupt the one-key takeoff process by operating the remote controller stick at any time and manually take over the aircraft. • Please note that the aircraft will not be able to take off if it does not pass the pre-flight check.

4.5.3 Mission Takeoff

The procedure is as follows:

1. Ensure the mode switch key on the remote controller to is switched to “A” position.

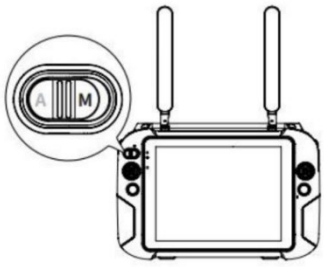


Figure 4-39 When the Mode Switch Key is Switched to “A” Position

2. After creating a route mission in Autel Voyager App, or tapping the mission library icon, load a route mission.
3. Tap “ ” to perform one-key self-check. After the self-check is completed
4. Slide the button to confirm takeoff. Then the aircraft will execute the corresponding mission automatically.

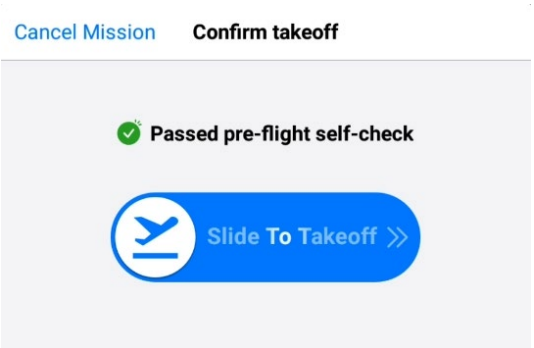


Figure 4-40 Confirm Takeoff (Mission Takeoff)

Tips
• For details about creating a route mission, see "**4.4.4 Creating a Waypoint Mission**" or "**4.4.5 Creating a Polygon Mission**".

4.6 During Flight Operations

4.6.1 Quick Mission

The quick mission function is used to plan a simple mission in a certain area through the remote controller during flight and then the aircraft immediately goes to the designated area to perform the mission.

When performing a quick mission, if the aircraft is not restricted by electronic fences, when the aircraft accelerates to fixed-wing mode, the expected diversion route will appear on the map, and the route will be displayed in orange.

Mission Execution Logics

Mission execution logics are as follows:

- If the aircraft is in multi-rotor mode, it will decelerate to near zero in speed, and then adjust the altitude while adjusting the heading to point to the fast mission center point. If the current height relative to the take-off point is lower than the mode switching height, it will rise to the mode switching height; if the current height relative to the take-off point is higher than the mode switching height, it will maintain that height. After the aircraft completes altitude and heading adjustments, the aircraft will accelerate and switch to fixed-wing mode. After entering the fixed-wing mode, if the quick mission flight altitude exceeds the current aircraft altitude, the aircraft will hover and climb to the nearest fast mission flight altitude, and then transfer to the quick mission hovering circle; if the quick mission flight altitude is lower than the current aircraft altitude, the aircraft will maintain the current altitude and fly toward the quick mission hovering circle. After reaching the quick mission hovering circle, according to the flight altitude and hovering radius set for the mission hovering circle, lower the altitude while hovering.

- If the aircraft is in fixed-wing mode, and if the quick mission flight altitude exceeds the current aircraft altitude, the aircraft will hover and climb to the nearest quick mission flight altitude, and then transfer to the quick mission hovering circle; if the quick mission flight altitude is lower than the current aircraft altitude, then the aircraft maintains its current altitude and flies toward the fast mission circle. After reaching the quick mission hovering circle, it will fly in a circle while lowering its altitude according to the flight altitude and circle radius set for the mission hovering circle.

Tips

- When the aircraft is conducting a quick mission, the terrain obstacle avoidance function is forcefully turned on.
- The quick mission only changes the aircraft route, and the gimbal will maintain the original mission status.

Create Flight Missions

The aircraft can create and switch to a quick mission when it is in manual flight, mission flight, quick mission, dynamic track, alternate landing or automatic return. The quick mission is an infinite loop of circular routes. After executing the quick mission, the user's manual intervention is required to exit the quick mission.

Users can perform quick missions in the following ways:

- Tap the "  " icon on the left side of the map interface, wait for the "**Edit Quick Mission**" interface to appear, and then tap an area of the map to set a quick mission point. Users can drag the quick mission point icon on the map, or accurately set the location of the quick mission point by entering coordinates on the "**Edit Quick Mission**" interface.
- Tap the "  " icon on the upper left corner of the map interface, place a marked point at a certain location on the map, and select the quick mission icon "  " in the marked point to edit the quick mission.

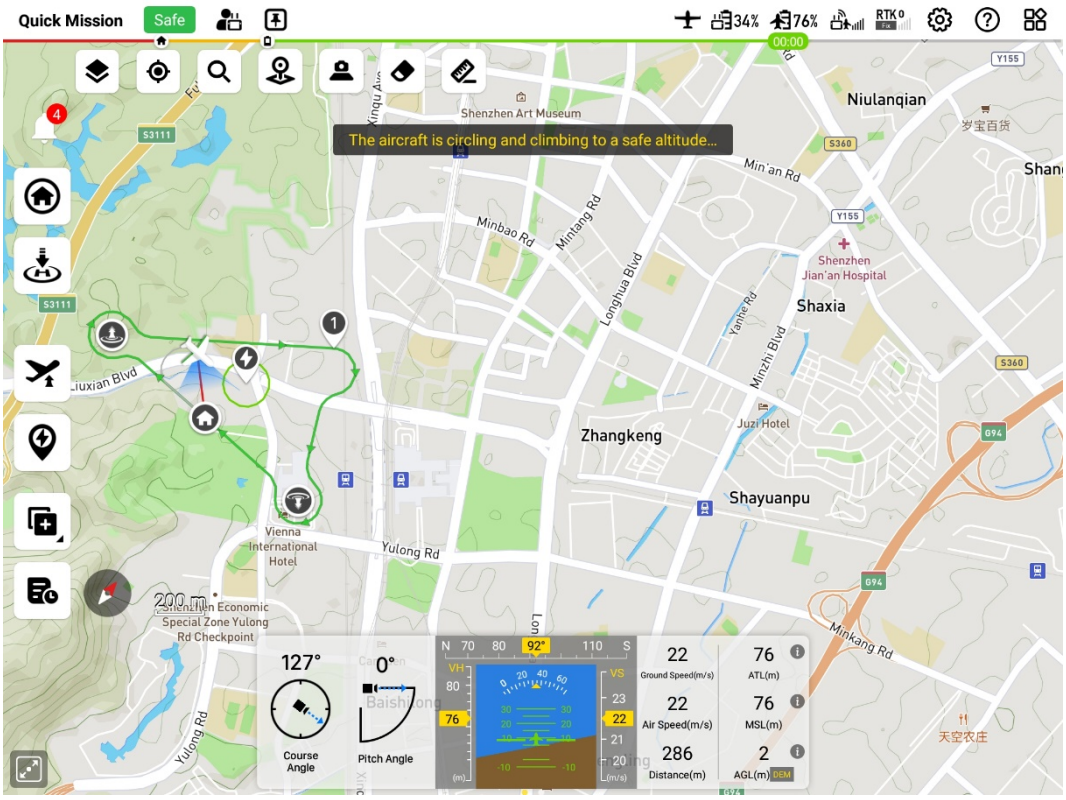


Figure 4-41 Quick Mission

After placing the quick mission point, the user can make the following settings for the quick mission on the "**Edit Quick Mission**" interface on the right side of the map interface:

- Safety Altitude (m): Set the safety height value. The safety altitude is related to the terrain obstacle avoidance function. For details, see **"2.7.1 Terrain Obstacle Avoidance** ".
- Altitude (m): Set to "ATL" or "MSL".
- Radius (m): Set the circle radius.
- Waypoint Coordinates: Input the longitude and latitude coordinates of the center point of the circular quick mission by yourself.

⚠ Warning

- After the user completes quick mission editing on the remote controller, when saving the quick mission, the remote controller will verify whether there is a conflict between the quick mission area and the existing electronic fence. If there is a conflict between the quick mission area and the existing electronic fence, the remote controller will pop up a prompt box to prohibit the user from performing this quick mission.
- The remote controller only checks the circle area for quick missions. If the aircraft is restricted by an electronic fence when flying to a quick mission area, it may be restricted by the electronic fence, causing the aircraft to slow down and hover.
- When making negative altitude adjustments, be sure to pay attention to the current flight altitude to ensure flight safety.

Tips

- When editing quick mission parameters, the default altitude is the aircraft's current flight altitude when editing the quick mission.
- After the quick mission is executed, the user can tap the one-key altitude change icon " " on the left side of the map interface to adjust the height. For details on the height adjustment related logic, see "**4.6.7 One-click to Change Attitude**".

4.6.2 Gimbal Operations

During flight, users can control the gimbal by setting gimbal mode or performing gimbal operations, so as to complete specified gimbal actions.

Gimbal Mode

Tap"⚙"> "**Gimbal**" > "**Gimbal Mode**" on the map interface or camera interface of Autel Voyager App, and set the gimbal mode.

- Attitude lock

  The roll direction of the gimbal is maintained at 0°. The user can specify the gimbal heading by operating the dial, centering the pointing point, and returning the gimbal heading to the middle. The gimbal heading remains at the fixed orientation specified by the user and does not deflect with the aircraft heading. The user can adjust the gimbal heading. The tilt angle of the platform enables observation, photography and video recording of the current heading.

- Course following

  The roll direction of the gimbal remains at 0°, and the gimbal 's heading deflects along with the aircraft's heading. The user can remotely control the gimbal's tilt angle.

Gimbal Operation

During flight operations, users can quickly control the gimbal through the dial wheels on the remote controller or control the gimbal through Autel Voyager App. Operating the gimbal will not affect the normal flight of the aircraft.

Tips

- The priority of gimbal operations from high to low is "Gimbal Lock" > "Observation Mission" > "Quick Return to Center" > "Point to Center" > "Dial Wheel Operation" > "Gimbal Mode".

The following operations are performed through the left and right dial wheels of the remote controller.

- Left dial wheel: Control the tilt angle of the gimbal. Turn it to the left and the gimbal will rotate downward; turn it to the right and the gimbal will rotate upward.
- Right dial wheel: Control the course angle of the gimbal. Push it to the left and the gimbal will rotate to the left; push it to the right and the gimbal will rotate to the right.

Remarks

- When the gimbal is locked or the aircraft is executing an observation mission, the dial wheels are not supported to operate the gimbal. If you need to operate the dial wheels, please confirm that the gimbal is in an unlocked state on the camera interface of Autel Voyager App and the aircraft is not executing an observation mission.
- The stroke of the dial wheel operation is directly related to the rotation speed of the gimbal. The greater the stroke, the greater the rotation speed of the gimbal.
- The gimbal rotation speed operated by the dial wheels is related to the zoom factor. The greater the zoom factor, the smaller the gimbal rotation speed caused by operating the dial wheels.

The following gimbal operations need to be performed in Autel Voyager App. For operations in Autel Voyager App, see "**3.5.4 Camera Interface** ".

Gimbal Lock

Lock the selected target point on the camera interface to keep the target point at the center of the image transmission interface.

1. Tap the gimbal lock icon "  " on the camera interface to enable gimbal lock.
2. Tap and drag to select the target point on the camera interface or tap the target point automatically recognized by vision, and the gimbal will lock the target point.
3. To achieve precise locking of the target, tap and drag to select or tap the target point multiple times.

Point to Center

Tap the target point on the camera interface to place the target point in the center of the interface to quickly observe the target point.

1. Open the camera interface, tap the target point, and the gimbal will display the target point in the center of the camera interface.
2. Point and center multiple times to achieve manual tracking and precise observation of the target point.

Tips

- After the pointing and centering operation is performed when the gimbal is in an unlocked state, the gimbal will maintain the current pitch angle and heading angle. If you need to maintain observation of the target point, you need to perform pointing

and centering operations multiple times.

- After the pointing and centering operation is performed in the gimbal locked state, the gimbal will keep pointing to the latitude and longitude of the target point. If you need to lock the moving target point, you need tap and drag to select the target and enter the gimbal locked state.
- When using a gimbal camera to point and center a target that is far away, the first estimated position of the target point may be inaccurate. You can improve the accuracy by pointing and centering multiple times.

■ Quick Return to Center

Quickly return the gimbal angle to the specified position.

1. Open the camera interface and make sure the gimbal is unlocked.
2. Tap the quick return to center icon "  " on the camera interface.
3. Select one of the following:
   - Pitch Level Return to Center: Means the gimbal tilt angle remains level and the gimbal heading follows the aircraft heading.
   - Level Return to Center Pitch Down: Means that the gimbal tilt angle is downward and the gimbal heading follows the aircraft heading.
   - Level Return to Center: Means that the gimbal tilt angle remains in its current state and the gimbal heading tracks the aircraft heading.
   - Pitch Return to Center: Means the gimbal tilt angle remains horizontal and the gimbal heading maintains the current state.

Remarks

- When the gimbal is locked or the aircraft is executing an observation mission, the quick return to center function is not supported. If you need to quickly return to center, please confirm that the gimbal is in an unlocked state on the camera interface of Autel Voyager App and the aircraft is not executing an observation mission.
- When the gimbal is in attitude lock mode, when you select one of the gimbal's "Pitch Level Return to Center", "Level Return to Center Pitch Down", or "Level Return to Center", the gimbal mode will automatically switch to "Heading Follow". The gimbal mode will not be changed when selecting "tilt the gimbal back to center".
- When the gimbal is in Course Following mode, the gimbal mode will not change after a quick return to center operation.

■ Observation Mission

Observation missions are divided into: Observation area waypoint mission and temporary observation mission.

- Observation area waypoint mission

  That is, on the basis of the ordinary waypoint mission, a specified number of observation areas can be set, and the observation areas are associated with the flight path executed by the aircraft by covering or specifying the flight segment. In an observation area waypoint mission, after associating the flight segment with observation area, when the aircraft is passing through the effective range of the designated observation area, the gimbal of the aircraft will always face the center of the observation area until it leaves the effective range of the observation area. For details, see "**4.4.4 Creating a Waypoint Mission**".

- Temporary observation mission

  The temporary observation mission function is used during flight. Users specify a certain point on the map as the center point of the temporary observation area. After that, the aircraft's gimbal will always lock the center position of the temporary observation area and observe the observation area. For details about temporary observation mission, see "**4.6.6 Temporary Observation Mission**".

4.6.3 Dynamic Track

Tips
● Dynamic track can be performed when the aircraft is in manual flight, mission flight, temp mission, quick mission, auto-return or diversion. ● During the execution of a certain tracking method, you can also switch to other tracking methods. ● When dynamic track is enabled, the terrain obstacle avoidance function will be forced to be turned on.

Important
● Before tracking is enabled, the gimbal must be in the gimbal locked state.

During the flight, the user can interrupt the current flight (or mission) and perform dynamic track of the specified target point.

Enable Dynamic Track

1. Tap the "  " icon on the camera interface to enable gimbal lock.
2. Tap and drag to select the target point on the camera interface.
3. Set the dynamic track method (tap the corresponding tracking method icon).
4. Tap the "  " icon to set tracking parameters.

Dynamic Track Icon Description

Table 4-8 Dynamic Track Icon Description

No.	Icon	Description
1.		After selecting the dynamic track method, tap this icon to set the relevant tracking parameters of the corresponding tracking method.
2.		Tap this icon to enable figure-8 tracking. The aircraft performs figure-8 tracking around a reference point at a specified distance and angle from the target point in a figure-8 hovering trajectory.
3.		Tap this icon to enable simple tracking (or surround tracking). The aircraft tracks around the target point with the hovering radius and orbiting direction set by the user.
4.		Tap this icon to enable circling tracking. The aircraft performs circle tracking around a reference point at a specified distance and angle from the target point with a hovering radius and orbiting direction set by the user.

Dynamic Track Application Scenario Description

- Figure-8 hovering tracking: It is used in scenarios where the user is observing a target point and expects the aircraft to perform figure-8 hovering tracking at a specified distance from the target point.
- Simple tracking: Applicable to scenes where the user turns on the gimbal lock, performs fixed-range surround tracking and omnidirectional shooting of the target point, and there are no obvious obstructions around the target point.
- Circling tracking: It is used when the user locks and observes a target point and expects the aircraft to circle and track at a specified distance and direction from the target point, so that the aircraft can better always lock and observe the target from a certain direction and avoid the target from being blocked from some certain angles.
- Synchronous tracking: It is used in scenarios where the user turns on the gimbal lock to observe from the relative distance and at the relative orientation of the target point for a long time, such as a scenario where the target point needs to be observed at a certain orientation of the target at a specified angle.
- Pointing flight: Applicable to scenarios where gimbal lock is turned on and temporary target points are observed.

Track Parameter Description

- Tracking Radius (m): Set the tracking radius value.
- Circling Direction: Set surround direction of the aircraft.

Auto: If set to “Auto”, the aircraft will automatically calculate the shortest flight tracking orbit direction based on the positional relationship between the current position and the target point. If the target point is on the left side of the aircraft's current route, the automatic orbit direction will be counterclockwise, otherwise it will be clockwise.

- Reference point setting: You can set the reference point distance and reference point angle (choose absolute angle or relative angle).
  - Distance (m): Set the reference point distance value.
  - Absolute angle (°): Set the absolute angle value of the reference point.
  - Relative angle (°): Set the relative angle value of the reference point.

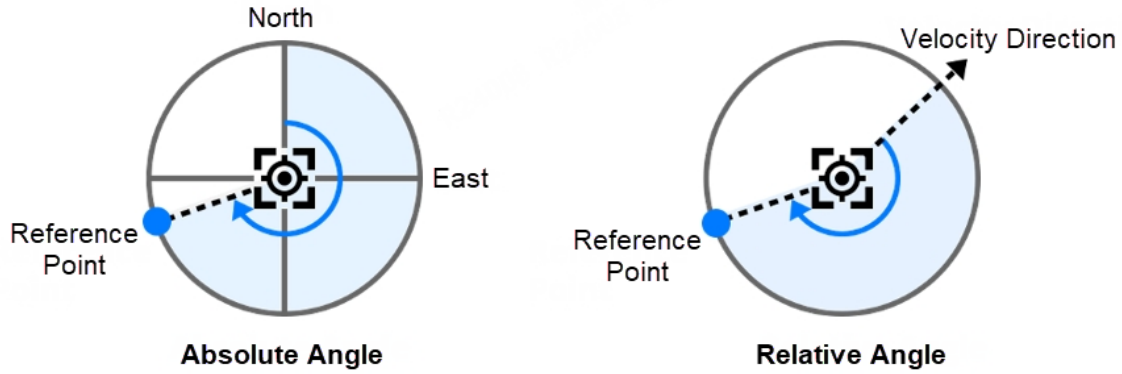


Figure 4-42 Absolute Angle and Relative Angle

Simple Tracking Settings

Tap the “ ” > “ ” icon to configure simple tracking settings:

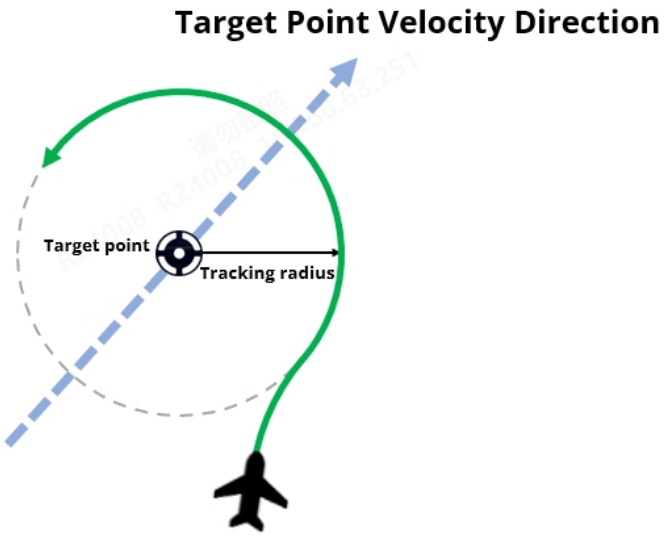


Figure 4-43 Simple Tracking

Circling Tracking Settings

Tap the " " > " " icon to configure circling tracking settings:

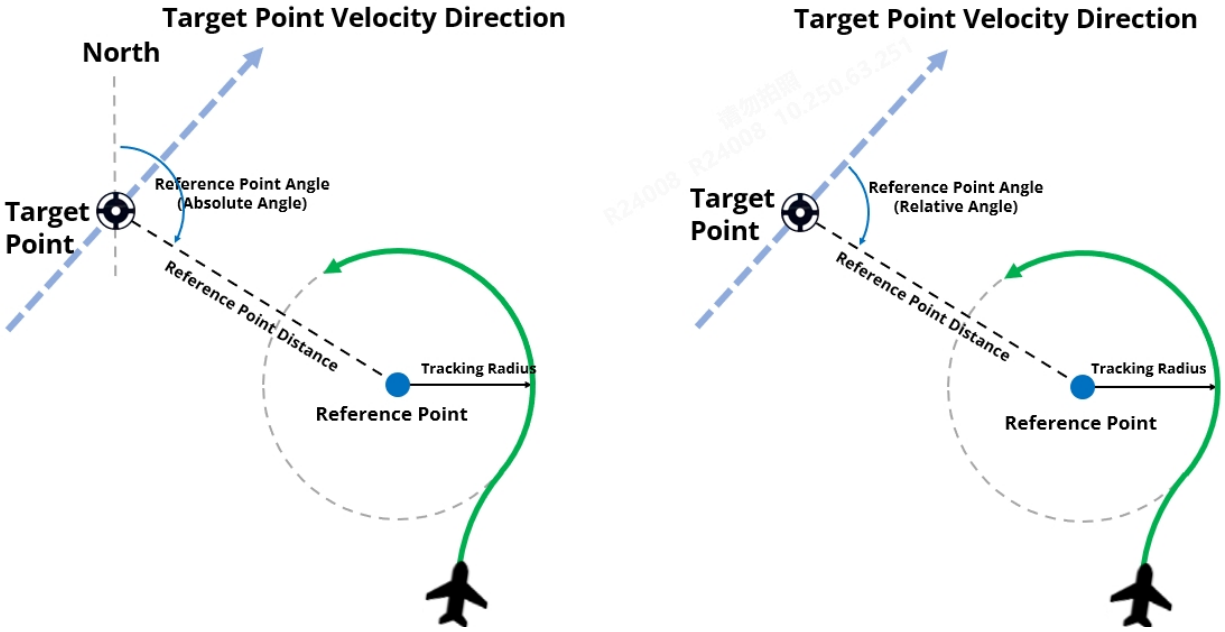


Figure 4-44 Circling Tracking

Remarks

- The absolute angle refers to the angle that takes the target point as the origin of the coordinates, the north as zero degrees, and rotates clockwise to the reference point.
- The relative angle refers to the angle of clockwise rotation to the reference point with the target point as the coordinate origin and the moving direction of the target point as zero degrees.
- It is not recommended that users use relative angles when tracking stationary objects. For an object that has been stationary, the direction of movement of the object at the last moment is difficult to determine, so the direction of the reference point cannot be directly and clearly determined.

Figure 8 Circling Tracking Settings

Tap the " " > " " icon to configure the figure-8 circling tracking settings:

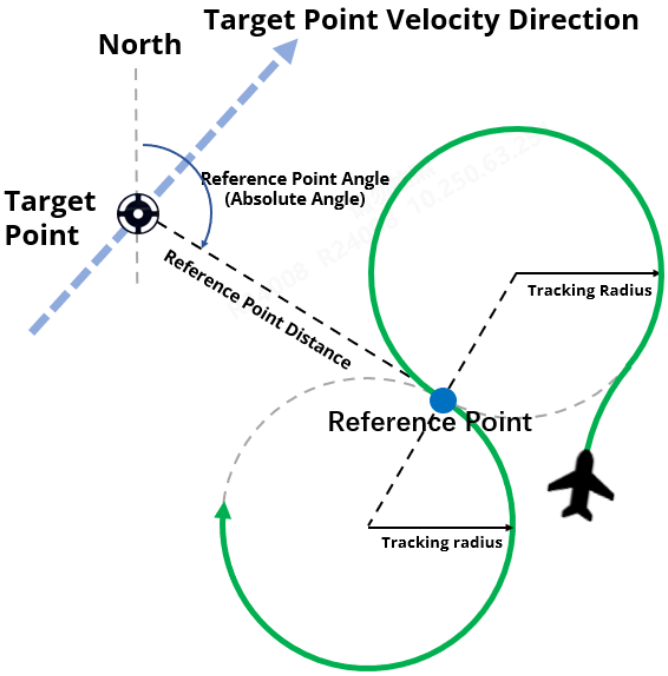


Figure 4-45 Figure-8 Circling Tracking

Synchronous Tracking Settings

Tap the " " > " " icon to configure synchronization tracking settings:

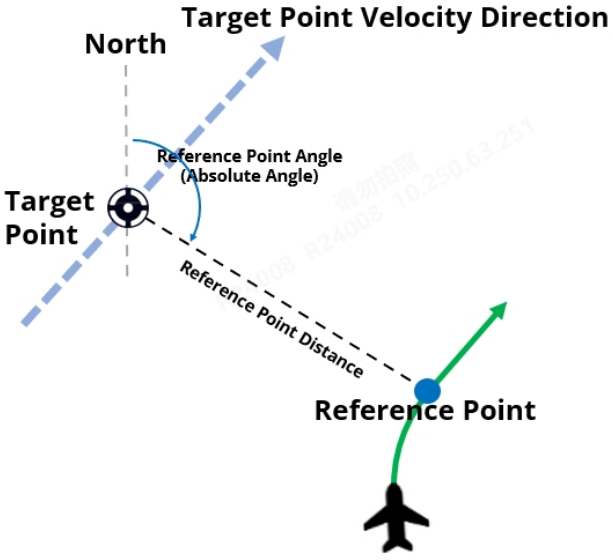


Figure 4-46 Synchronous Tracking

Enable Pointing Flight*

Pointing flight means that the aircraft quickly tracks the target point estimated in real time on the camera interface.

1. Tap the " " icon on the camera interface to enable gimbal lock.
2. Tap and drag to select the target point on the camera interface.

3. Set up dynamic track methods (tap any tracking method icon).
4. Tap any point on the camera interface to start pointing and flying.

Tips

- Pointing flight is often used in conjunction with simple tracking.
- Pointing flight is actually tracking a certain specified coordinate. It is not bound to the target object, but to the coordinates.
- High-precision pointing and flying of the same target coordinate can be achieved by tapping the same target coordinate multiple times.

Important

- The aircraft must be in tracking status to enable pointing flight.

4.6.4 Laser Position Record

When the aircraft is equipped with gimbal camera that has a laser rangefinder, the laser position record function can be realized. Through Laser position record, information such as distance, altitude, speed, longitude, and latitude of the target point can be obtained.

Laser position record process is as follows:

1. Turn on the "**Aircraft Settings**"> "**Laser Rangefinder**" in Autel Voyager App to enable this feature.
2. Tap the " " icon on the camera interface to enable gimbal lock.
3. Tap and drag to select, or tap or specify the target point to be measured on the camera interface. The camera interface will display the distance, altitude, speed, longitude and latitude of the target.
4. Tap the target point marking icon " " to mark the target point information.
5. Laser ranging can be performed on multiple targets in sequence. Multiple target point information will be recorded on the camera interface, and target point mark icons will be displayed on the map interface.

Important

- To use the laser position record function, you must first enable the laser ranging function on the "**Aircraft Settings**" interface. Otherwise, even if the gimbal is equipped with a laser rangefinder, laser position record still cannot be performed.
- Laser position record can only be performed when the gimbal is locked.
- As the laser rangefinder has a certain effective measurement range, please pay

attention to the performance of the hardware when using it.

- If no target point is selected, the camera interface will display the distance, altitude, speed, longitude and latitude of the center point of the screen.

4.6.5 Temporary Mission

The temporary mission function is used for users to perform new waypoint missions, polygon missions and figure-8 missions during flight. After starting the temporary mission, the system will automatically generate a transfer route from the current position to the temporary mission. The aircraft will fly to the temporary mission area and start flying from the first waypoint of the temporary mission to perform the mission.

Tips

- Compared with quick missions, temporary missions can adapt to more complex application scenarios, such as temporary area surveying and mapping operations, and temporary long-distance inspection operations.
- Through the temporary mission function, users do not need to recall the aircraft already flying in the air to land and re-plan the mission route on the ground when the operation mission is temporarily changed. Users only need to upload a new temporary mission in the air and the aircraft can immediately start execution. The new missions greatly shorten the redeployment time when missions change.

While the aircraft is flying, users can create temporary missions on the map interface in the following ways:

- Tap the "" icon > "" icon to enter the "Waypoint Mission" interface.
- Tap the "" icon > "" icon to enter the "Polygon Mission" interface.
- Tap the "" icon > "" icon to enter the "Figure-8 Mission" interface.

Remarks

- When the temporary mission is generated, it will only include the waypoint route part of the waypoint mission or the route scanning part of the polygon mission or the figure-8 route but will not include the departure route and the arrival route.
- Please note that for temporary waypoint missions, if there is only one waypoint, this waypoint will be set to the hovering type by default; if there are more than one waypoints, you can set the turning type of each waypoint (if you need to set "**Early Turn**" as the turn mode of the waypoint, the waypoint must be neither the first nor the last waypoint, otherwise the planned route will still be a go-through route. For results of route planning under different settings, see the route planning results on the remote controller).

Remarks

- For the operation of creating a temporary waypoint mission or a temporary polygon mission, see "**4.4.4 Creating a Waypoint Mission**" and "**4.4.5 Creating a Polygon Mission**".
- The created temporary mission route is displayed as a blue route on the remote controller.

Edit Figure-8 Mission

After choosing to create a figure-8 mission and placing the mission center point on the map, in the pop-up "**Edit Quick Mission**" interface on the map interface, you can edit the following parameters:

- Safety Altitude (m): Set the safety height value.
- Altitude (m): Can be set to "**ATL**" or "**MSL**".
- Radius (m): Set the circle radius value.
- Distance (m): In the figure-8 mission, the distance between the centers of two hovering circles can be set.
- Heading (°): In the figure-8 mission, the angle between the normal line connecting the centers of the two hovering circles and the north direction (clockwise).
- Waypoint Coordinates: Input the longitude and latitude coordinates of the figure-8 mission center point by yourself.

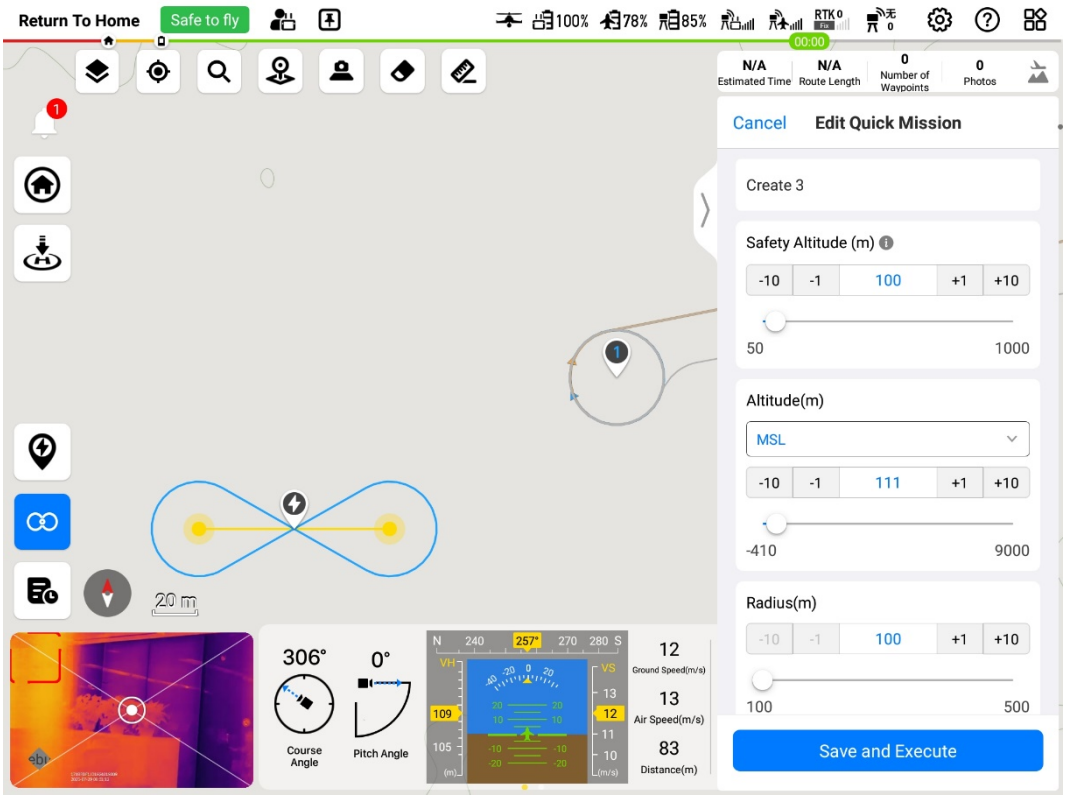


Figure 4-47 Edit Figure-8 Mission

Tips

- Users can drag the mission center point on the map interface to quickly adjust its location.
- After setting the figure-8 mission, the route information (estimated time, route length) displayed in the upper right corner of the map interface is N /A.
- When the figure-8 mission is enabled, users can turn on the terrain obstacle avoidance function.

Remarks

- When starting a temporary mission, if the aircraft is in multi-rotor mode, the aircraft will first accelerate forward to the fixed-wing mode at the current flight altitude. After the aircraft enters the fixed-wing mode, a transfer route will be generated based on the current position of the aircraft and the starting point of the temporary route, and the aircraft will fly to the starting point of the temporary mission according to the transfer route and perform the temporary mission. Since in multi-rotor mode, the aircraft will maintain its original altitude and accelerate forward to fixed-wing mode, special attention needs to be paid to the flight altitude of the aircraft when it is performing temporary missions, and whether there may be obstacles in front of the aircraft that may affect the aircraft's acceleration and switching to fixed-wing mode.
- If the aircraft is in fixed-wing mode, the aircraft will immediately generate a transfer route and fly to the starting point of the temporary mission according to the transfer route to perform the temporary mission.
- When executing a transfer route, the aircraft will not perform gimbal and camera movements at the target waypoint.

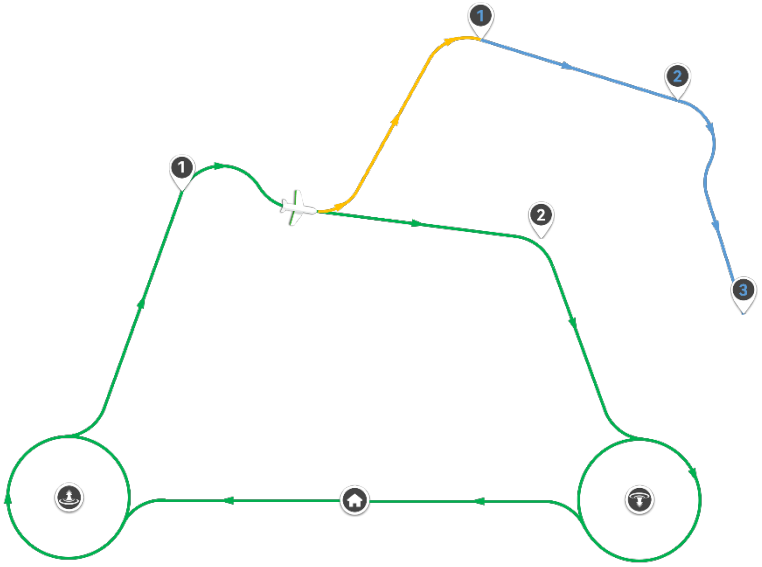


Figure 4-48 Perform Temporary Missions by Diverting Routes (Orange)

The terrain obstacle avoidance function will be enabled by default during the route transfer stage. The starting point altitude of the transfer route is the current flight altitude of the aircraft, and the end point altitude of the transfer route is the starting point altitude of the temporary mission route. The aircraft will fly to the temporary route at the attitude which is the higher one between the aircraft's current flight altitude when the transfer route is generated and the altitude of the starting point of the temporary mission route.

- If the current flight altitude of the aircraft is higher than the starting point of the temporary mission route as the transfer route is being generated, the aircraft will fly to the starting point of the temporary mission route at the current flight altitude and lower the altitude to the starting point altitude before starting to execute the temporary mission route.
- If the current flight altitude of the aircraft is lower than the starting altitude of the temporary mission route as the transfer route is being generated, the aircraft will first climb to the starting altitude of the temporary mission route and then fly to the temporary mission route to perform the mission.

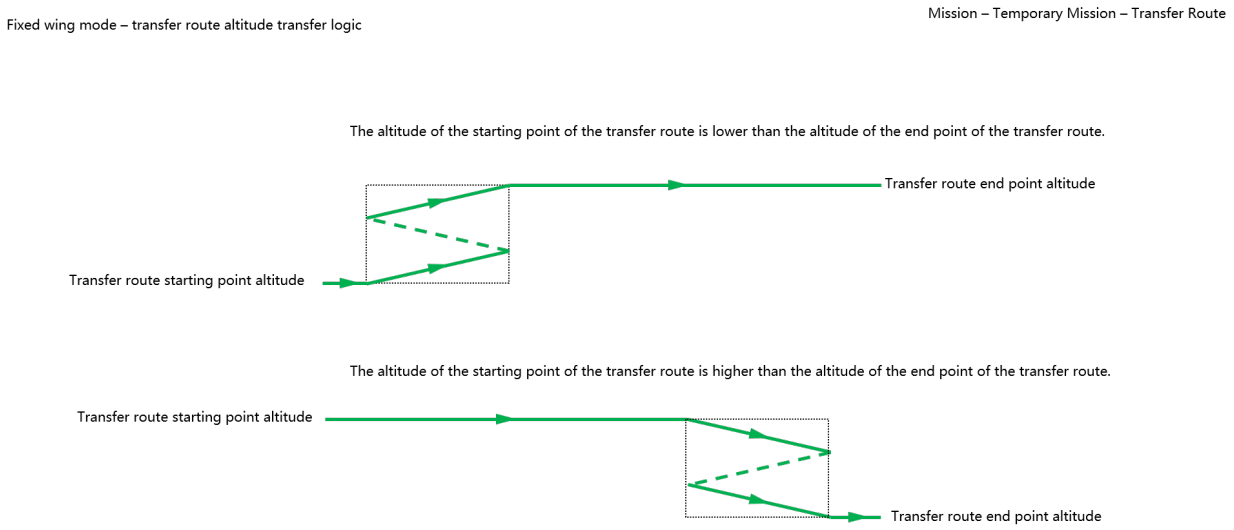


Figure 4-49 Transfer Route Altitude Adjustment

Important

- Only one temp mission can exist at the same time. If you re-create an upload temporary mission when there is already a temporary mission, the original temporary mission will be overwritten by the newly uploaded temporary mission.
- In temporary waypoint missions and temporary polygon missions, it is required to set the mission finish action of the aircraft. If the mission finish action is set to hovering, the aircraft must take over in time after completing the temporary mission. Even if the aircraft's mission finish action is set to hovering, after turning on the intelligent low battery return function, if the battery of the aircraft is too low, the aircraft will trigger an automatic return.
- After the user completes the temporary mission editing and saves the mission on the remote controller, when executing the temporary mission, the remote controller will verify whether there is a conflict between the temporary mission area and the existing electronic fence. If there is a conflict between the temporary mission area and the existing electronic fence, the remote controller will pop up a prompt box to prohibit the user from performing this temporary mission.
- Temporary missions support waypoint adjustment. For related function details, see "**4.6.8 Waypoint Adjusting**".
- Temp missions support the one-click altitude change function, and the flight height can be adjusted freely during the flight of the aircraft. Tap the " " icon to make increment or decrement adjustments based on the original set height value. For details, see "**4.6.7 One-click to Change Attitude**".
- The transfer route is not included in the verification range of the electronic fence. Therefore, during the flight of the transfer route, the aircraft may get too close to the area restricted by the electronic fence, causing the aircraft to switch to multi-rotor mode. Therefore, when performing missions, please be sure to pay attention to whether the generated transfer route conflicts with the existing electronic fence.

Temporary Mission Finish Action

For temporary waypoint missions and temporary polygon missions, since the temporary mission does not include the arrival route, the user needs to specify the mission finish action of the aircraft after the aircraft completes the temporary mission flight. The aircraft supports the following types of mission finish action settings:

- Return: If the finish action is set to "**Return to Home**", the aircraft will automatically trigger the return after completing the temporary mission route.
- Hovering: If the finish action is set to hovering, whether it is a temporary waypoint mission or a temporary polygon mission, the last point of the route will be modified to the hover. After the mission route is completed, the aircraft will continue to hover in the hovering circle at the end of the route, waiting for the user's next instruction.

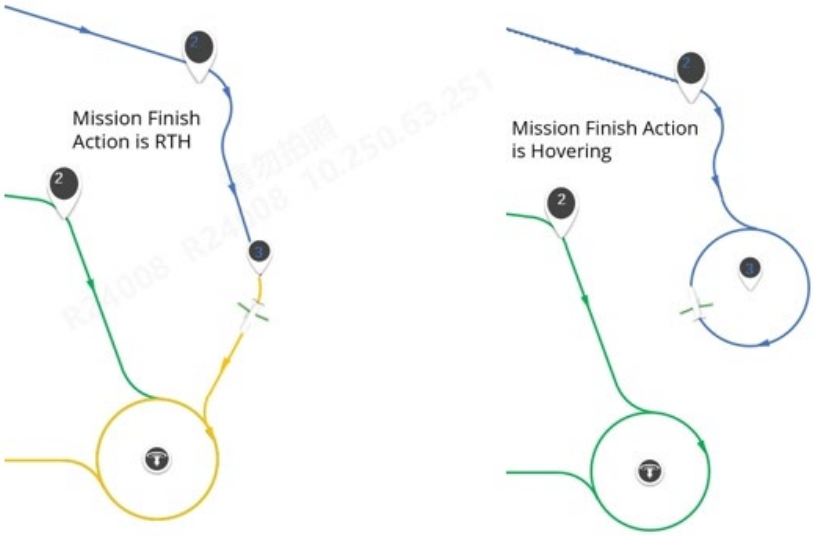


Figure 4-50 Temporary Waypoint Mission Finish Action

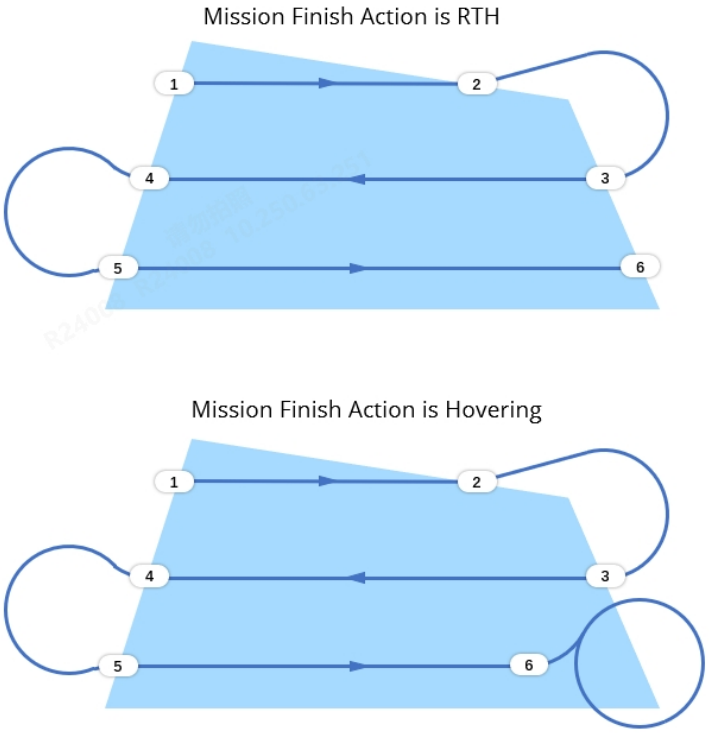


Figure 4-51 Temporary Polygon Mission Finish Action

Figure-8 mission is an infinite loop of ∞-shaped routes and does not support setting mission finish actions. After the aircraft executes the figure-8 mission, the user's manual intervention is required to exit the mission.

4.6.6 Temporary Observation Mission

The temporary observation mission function is used during flight. The user specifies a certain point on the map as the center point of the temporary observation area. After that, the aircraft's gimbal will always lock the center position of the temporary observation area and observe the observation area.

During the flight of the aircraft, the user can tap the "" icon at the upper left corner of the map interface, place a marked point at a certain location on the map, and then select the temporary observation area icon "" in the marked point to start the temporary observation mission.

Figure 4-52 Execute a Temporary Observation Mission

When the aircraft performs a temporary observation mission, the gimbal will lock the center point of the temporary observation area and conduct temporary observation of the relevant area. Users can remotely control the aircraft to take photos and videos. You can also tap the “Exit Mission” button below the center point of the temporary observation area. After the second confirmation, the aircraft will exit the temporary observation mission and the gimbal will be unlocked. The user can freely adjust the gimbal angle or perform other tracking or observation missions.

Tips

- When the aircraft performs temporary observation missions, the gimbal will not support dial wheel operation and quick return-to-center functions. If you want to perform other gimbal operations, please exit the temporary observation mission and unlock the gimbal.
- If the temporary observation mission and route observation area exist at the same time, the aircraft will give priority to the temporary observation mission. When the aircraft flies through the route observation area which covers or is associated with a flight segment, if a temporary observation mission is set, the aircraft gimbal will prioritize locking the center point of the temporary observation area, instead of focusing on the center point of the route observation area; similarly, if the aircraft flies through the route observation area when it is executing a temporary mission, it will continue to perform the temporary observation mission.
- During the execution of a temporary observation mission, if you need to display the

current observation range in real time, you can tap the projection icon " " at the upper left corner of the map interface , select "**Real-time Display**" and turn on "**Projection Center Coordinate Display**", or go to "**Aircraft Settings**">"**Projection Area**" to turn on "**Projection Area Display**" and "**Projection Center Coordinate Display**" functions to display the projection area and projection center coordinates in real time during the temporary observation mission. For relevant details, see "**3.5.5 Aircraft Settings Interface"**.

Remarks

The difference between the route observation area and the temporary observation mission is as follows:

- The shape of the route observation area is circular, and each observation area can be chosen whether to be associated with a flight segment. If there is no associated flight segment, when the aircraft flies through the observation area covering the segment, the gimbal will stay locked on the center point of the observation area; if the observation area is set to be associated with a certain segment, when the aircraft flies through the associated segment, the gimbal will keep always locked on the center point of the observation area. After leaving the scope of the observation area, the aircraft's gimbal will return to the angle set on the original route.
- The temporary observation mission has no coverage area and associated flight segments. The aircraft will lock the center point of the temporary observation area throughout the flight until it exits the temporary observation mission, and the aircraft gimbal returns to the angle set on the original route.

4.6.7 One-click to Change Attitude

The one-click to change attitude function can be used to quickly modify the set flight altitude during the execution of time-sensitive missions such as quick missions, temporary missions, and dynamic track.

During the execution of the above missions, the user can modify the flight altitude in the pop-up one-click altitude change window by tapping on the one-click height change icon " " that appears on the map interface on the remote controller.

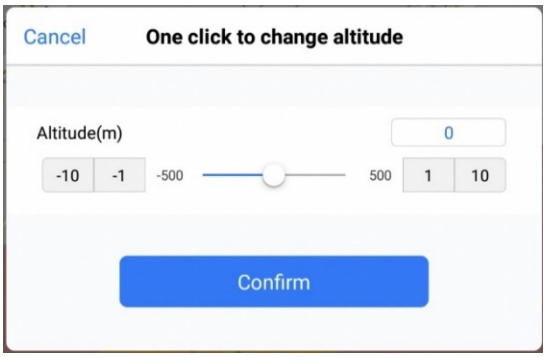


Figure 4-53 Change Altitude with One-Click

Tips

- The one-click altitude change function can perform incremental or decremental adjustments based on the original mission setting altitude value. A single operation allows the mission setting height to be adjusted upward or downward up to 500 meters.
- If the one-click altitude change operation is performed multiple times, the aircraft's mission setting altitude will be modified multiple times. Each one-click altitude change will be based on the previously modified flight altitude setting value.

As shown in the figure below, assuming that the original mission height is set to 100 meters, the first time the height is changed to +10 meters with one click, the second time the height is changed to +20 meters with one click, and the third time the height is changed to -40 meters with one click, then quickly the final set altitude of the mission became 90 meters.

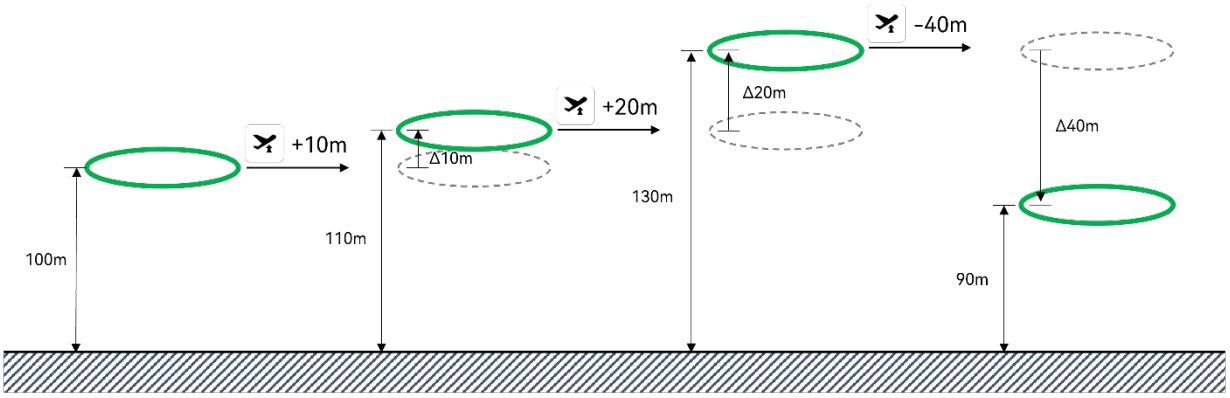


Figure 4-54 Change Altitude Logic Multiple Times with One Click

Important

- When users are executing the one-click altitude change function, special attention needs to be paid to the set altitude of the current mission of the aircraft, especially when changing height in the negative direction, so as to prevent the aircraft from flying too low after changing the height.
- The one-click altitude change function only takes effect for the currently executing mission. If the aircraft switches from the current mission to another mission, the height change that has been performed will be invalid. For example, the aircraft performs an altitude change operation while performing a temporary route mission and switches to other flight modes midway; or the aircraft switches to an automatic return home after the temporary route mission is completed. At this time, if the waypoint adjustment function is used again (see "**4.6.8 Waypoint Adjusting**") , it will return to the temporary route mission, and the set altitude of the temporary route mission will be restored to its original set altitude, not the set altitude after the last change.
- For quick missions and temp missions, if the aircraft is in multi-rotor mode or in an

intermediate state between multi-rotor mode and fixed-wing mode, the one-click altitude change function will not take effect immediately. The one-click altitude change function will not take effect until the aircraft enters fixed-wing mode.

- For temporary missions, the one-click altitude change function will modify the altitude of the entire route (i.e., the flight set altitude of each waypoint in the temporary waypoint route mission, or the flight set altitude of the scanned route part of the temporary polygon mission). Changing the altitude with one click may result in the aircraft's flight altitude not being adjusted when it reaches the waypoint. Therefore, additional altitude adjustment and hovering are required at the waypoint. For the specific location of the hovering circle, see "**4.4.4 Creating a Waypoint Mission**".
- For temporary missions, the one-click altitude change function will not change the route setting altitude in the "**Route Preview**" interface on the right. The original altitude of the temporary mission will always be displayed in the "**Route Preview**" interface.
- For quick missions, dynamic track, or temporary missions with terrain obstacle avoidance turned on, if the mission's flight altitude is set lower than the safe altitude plus terrain altitude, the aircraft's terrain obstacle avoidance function will still take effect, and the aircraft's actual flight altitude will not lower to the changed set height. If the aircraft fails to lower to the set altitude after performing a negative one-click altitude change, please check the current safe altitude of the aircraft and the current altitude of the aircraft flying above the ground, and do not change the altitude in negative directions multiple times before checking the safe altitude and the current altitude above the ground.

4.6.8 Waypoint Adjusting

During the flight of the aircraft, the user can flexibly adjust the waypoint currently being executed by the aircraft through the waypoint adjustment function, so that the aircraft can adjust to the selected target waypoint and continue to perform the mission. Its application scenarios are as follows:

- When the aircraft is performing a non-route mission (such as when performing a quick mission or a dynamic track mission), the waypoint adjustment function allows the aircraft to return to a specific waypoint of the route mission or temporary route mission to continue performing the mission.
- If the aircraft has completed a certain flight segment, but you want the aircraft to perform the flight mission of this segment again, you can use the waypoint adjustment function to return the aircraft to the starting waypoint of the segment and re-execute the flight mission of this segment.
- The aircraft is flying on a temporary mission and is expected to start a temporary mission from a certain waypoint; or the aircraft is flying on a temporary mission and is expected to return to a certain waypoint on the mission and continue performing the mission.

Tips

- The waypoint adjustment function is applicable to waypoint missions, polygon missions, temporary waypoint missions, temporary polygon missions and figure-8 missions.
- If the aircraft is in a fixed-wing state, the system will automatically generate a transfer route from the current position of the aircraft to the target waypoint. For altitude switching of the transfer route, see "**4.6.5 Temporary Mission**".

Users can trigger this function by tapping a waypoint in the route displayed on the map interface that supports waypoint adjustment. If the waypoint supports waypoint adjustment, after tapping it, the waypoint will be highlighted, and the "**Switch Waypoint**" icon will appear above it. After users tap the icon and confirm it twice, the aircraft will adjust to the waypoint and continue to perform the mission.

- For waypoint missions, it is supported to adjust the aircraft to a waypoint with a waypoint icon in the style of "".

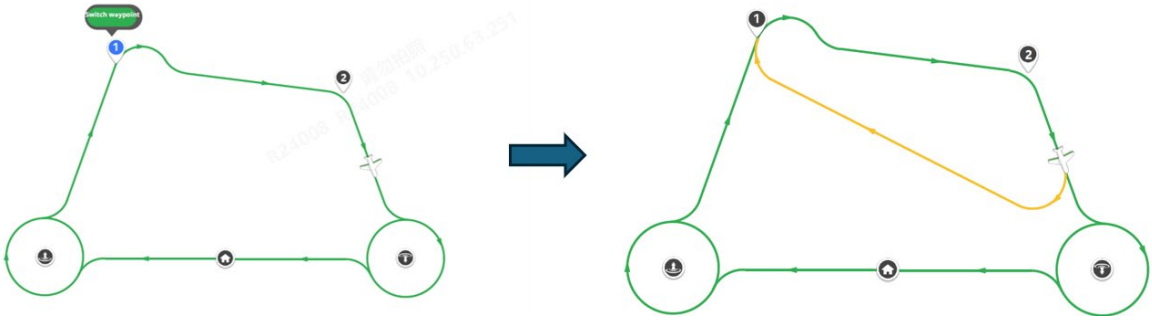


Figure 4-55 Waypoint Adjustment (Waypoint Mission) Instructions

- For polygon missions and figure-8 missions, it is supported to adjust the aircraft to a waypoint with a waypoint icon in the style of "1".

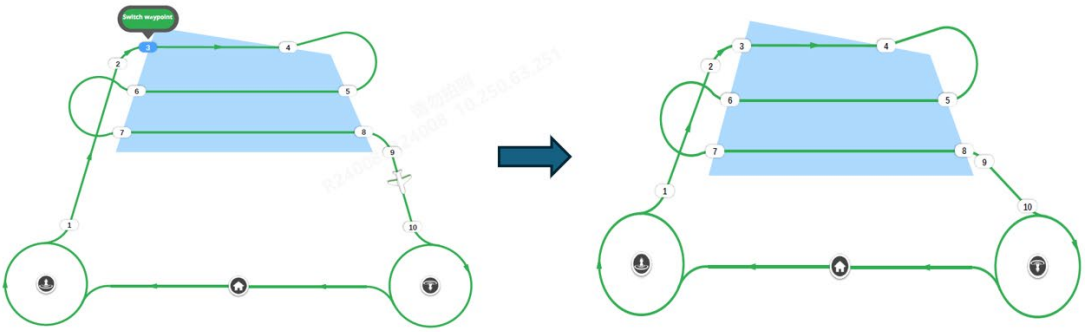


Figure 4-56 Waypoint Adjustment (Polygon Mission) Instructions

- If the aircraft has a temporary mission in the air, it can also be adjusted to any waypoint of the temporary mission. As shown in the figure below, a temporary waypoint mission is used as an example. During the flight of the mission route, the aircraft adjusts to a certain waypoint of the temporary mission through the waypoint adjustment function to perform the temporary mission.

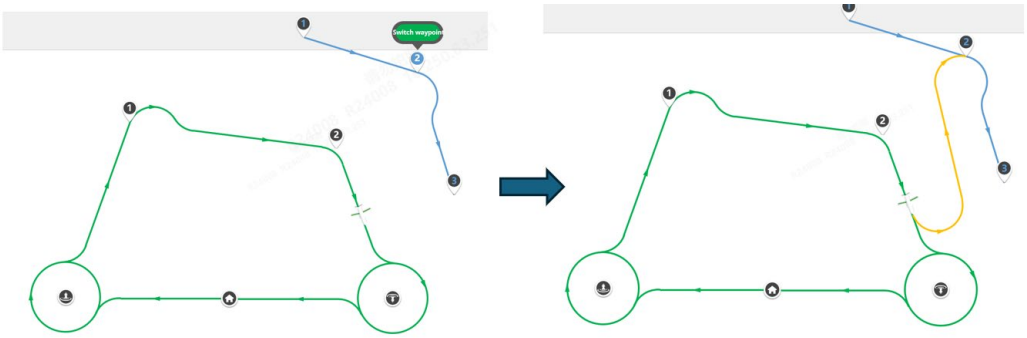


Figure 4-57 Waypoint Adjustment (Temporary Waypoint Mission) Instructions

⚠ Warning
• When performing the waypoint adjustment function, although the aircraft will automatically turn on the terrain obstacle avoidance function, if the aircraft has previously turned off the terrain obstacle avoidance and is flying in a ridge or valley area, you still need to pay special attention to the current flight of the aircraft when performing the waypoint adjustment. • The waypoint adjustment function is applicable to waypoint missions, polygon missions, temporary waypoint missions, and temporary polygon missions. • When executing waypoint adjusting, if the aircraft is in non-fixed-wing mode, the aircraft will accelerate at current height and switch to fixed-wing mode. Therefore, when executing temporary mission, users need to pay special attention to the current height of the aircraft. • The height of the ending point at the transfer route after waypoint adjusting is the original set height of the target waypoint. For instance, when one-click to change attitude function is used to adjust the height in a temporary mission, if at this moment, in waypoint adjusting with the waypoint of the temporary mission as the target point, the height of the target point is still the preset height of the temporary route, not the height after one-click to change attitude.

4.6.9 Marked Points

The marked point function allows users to record key information on map and camera interfaces, and is used to generate quick missions, precise diversions, temporary observation points, and reference points. Users can add marked points to the favorite list and can also modify the style and edit attributes of marked points. The generated marked points will be included in the marked point list. Autel Voyager App supports searching and batch processing of the generated marked points.

4.6.9.1 Creating a Marked Point

Users can tap the map interface of Autel Voyager App to pinpoint points or generate marked points on the map interface by marking the coordinates of the center of the aircraft's field of view, marking the coordinates of tracked objects, or searching for map coordinate information (marked points are divided into several types: PinPoint, Quick Mission, Search Location, Track Object, and Field of View Center). The specific methods are as follows:

- Create a marked point (pinpoint) on the map

  Tap the "" icon at the upper left corner of the map interface. Tap anywhere on the map to generate a marked point. The default icon is "" ("" style will appear around the selected marked point). After the marked point is generated, the operating circle of marked point will be expanded by default.

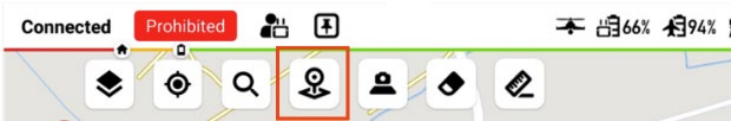


Figure 4-58 Tap the Marked Point Icon

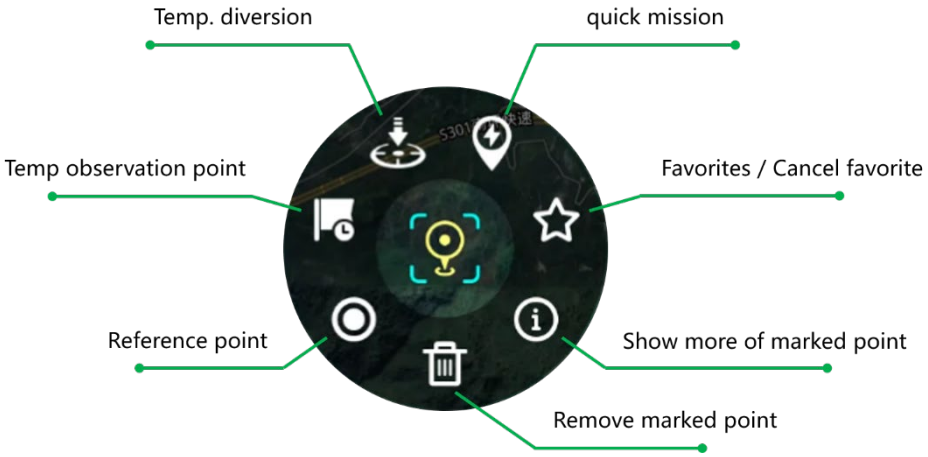


Figure 4-59 Marked Point Operation Circle

Tips

- Users can turn on the display of marked points on the layer by tapping the "" icon at the upper left corner of the map interface. After marked point display is turned off, the marked point still exists but will not be displayed on the map interface.
- Users can tap the "" > "**Marked Points List**" to get an overview of all marked point information (icon, name, creation time, generation time and favorite state) in the "**Marked Points**" interface that pops up on the map interface and can collect and remove marked points. After tapping a marked point in the list, the map screen will automatically locate the marked point.

- Mark the coordinates of a tracked object to generate a marked point (track object)

  When the aircraft is tracking an object and the aircraft's laser rangefinder works, users can mark the coordinates of the object point based on laser measuring distance information in video transmission interface. The target points marked in this way will also be transferred into marked points, which are displayed in the map. The icon of generated marked points is " " by default and the default name is "Track object#". Marked points generated in this way also record images taken at the moment when those points are marked.

- Mark the coordinates of the field of view center to generate a marked point (field of view center)

  After the FOV (Field of view center) coordinate display is enabled, users can mark points by using the FOV coordinate displayed. The icon of marked points generated in this way is " " by default and the default name is "FOV#". Marked points generated in this way also record images taken at the moment when those points are marked.

- Generate a marked point (quick mission) based on the quick mission coordinate

  After a quick mission is completed, a temporary marked point is generated automatically. The icon of the generated target point is " " by default. The default name is "Quick Mission Point#".

- Search a coordinate to generate a marked point (search location)

  Users can also search a location by coordinate in the map to generate a temporary marked point. The icon of the generated target point is " " by default. The default name is the location name if there is the corresponding name or the coordinate if not.

4.6.9.2 Using a Marked Point to Create a Mission

After a marked point is created, users can use the marked point to create a quick mission, a temporary precise diversion mission or temporary observation mission.

- Create a quick mission by using a marked point

  When the aircraft is flying in air, select the marked point and tap the quick mission icon on the marked point operating circle. Then enter the editing mode of a quick mission. The marked point will be the center of the quick mission. For details about quick mission, see "**4.6.1 Quick Mission**".

- Create a temporary precise diversion mission by using a marked point

  When the aircraft is flying in air, select the marked point and tap the temporary precise diversion mission icon " " on the marked point operating circle. Then enter the editing mode of a temporary precise diversion mission. The marked point will be the diversion point of the mission and a default arrival hovering point will be generated. When using a marked point to create a temporary precise diversion mission, please carefully edit and confirm the relevant settings of the precise diversion. For details about precise diversion mission, see "**4.7.4 Precise Diversion**".

- Create a temporary observation mission by using a marked point

  When the aircraft is flying in air, select the marked point and tap the temporary observation mission icon " " on the marked point operating circle, and then tap

"**Execute**" to create a temporary observation mission at the location of the marked point. For details about temporary observation mission, see **"4.6.6 Temporary Observation Mission**".

Important

- If the aircraft is not connected or has not taken off, some functions of the marked point, such as creating quick missions, creating precision diversion missions, creating temporary observation missions and converting to reference points, will be disabled.
- When generating precise diversion missions based on marked points, please note that the marked points are only used to generate the latitude and longitude information of the landing point. The altitude information of the landing point, including information about the landing arrival route, needs to be carefully adjusted and filled in according to the actual situation.

Remarks

- Users can collect the generated marked points. After collection, the marked points will be saved in the remote controller and will not be cleared due to shut down. A "⭐" icon will appear at the lower right corner of the collected marked points.
- Users can view the generated marked point details. After users select the marked point details card, the marked point details interface will expand on the right side of the map. Users can create quick missions, precise diversion, temporary observation points, and reference points based on the marked points on the interface. They can also edit the name, longitude and latitude, altitude, icon color, icon style, remarks and collection status of the marked point. When the altitude of the marked point is set to "Follow terrain", the altitude of the marked point will become the altitude of the marked point's longitude and latitude stored on the remote controller.
- While the aircraft is flying, the user can select a marked point and generate a reference point based on the location of the marked point.

4.7 Landing

The aircraft offers landing functions of manual landing, automatic return, auto landing and precise landing, ensuring safe landing of the aircraft.

4.7.1 Manual Landing

Manual landing refers to: in manual control mode, the user takes over and controls the aircraft to land safely by using the remote controller's sticks.

For safety reasons, it is recommended that users follow the following steps to land the aircraft manually:

1. Choose an open, flat, and well-lit area as the landing location for the aircraft;
2. Manually operate the sticks of the remote controller to control the aircraft to fly to the landing location. For details about the operation of the sticks, see "**4.4.1 Selecting Stick Mode**";
3. When the aircraft arrives above the landing location, check the flight speed on the parameter panel at the bottom of the map interface or camera interface to avoid collisions with buildings, trees, and other things;
4. When the aircraft arrives above the landing location, release the sticks to hover it above;
5. Manually operate the sticks to control the descending speed and height of the aircraft. During landing, the throttle will be automatically controlled. When the aircraft height is above 3m, the descending speed is fast, and it gradually slows down below 3m;
6. When the aircraft lands at the auxiliary take-off and landing height (1m), continuously pull the stick down for 1 second, and then the aircraft will enter the automatic landing program;
7. If users are using the sticks in manual mode during the automatic landing process, the aircraft will determine that the user has intervened in the operation, the automatic landing is stopped, and the user can manually control the landing.

Tips

- After the aircraft lands, if the ultrasonic sensor detects the ground, the propellers will automatically lock. If the aircraft lands in an area where the ultrasonic sensor's performance is affected, such as on grass, the propellers may not automatically lock. In this case, you can choose to takeoff again, retry landing, or land the aircraft in another location with a flat surface. If you have tried several times and still cannot stop the propellers automatically, you can use the emergency propellers stop function after confirming that the aircraft is on the ground. For details about the emergency rotor stop function, see "**2.7.5 Emergency Propeller Stop**".
- Other operations such as auto return and auto landing can be performed during manual landing.

Warning

- Pay attention to whether the aircraft will collide with surrounding buildings, trees, or personnel during landing. Keep away from personnel, vehicles, and other moving objects to avoid affecting the flight safety.
- If the propellers do not lock after the aircraft lands, pull down the throttle stick and do not perform lateral movements to prevent the aircraft from tipping over.

4.7.2 Auto Return

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

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

Remarks
● Home Point: Refers to the landing point used when the aircraft executes an automatic return. The system allows users to modify the location of the home point after the aircraft has taken off.

In the case of a good GNSS signal, the settings for the home point are as follows:

- In automatic flight mode, users can set the takeoff point as the home point or manually input the latitude and longitude coordinates for the home point. They can also directly drag the "" waypoint icon on the map in Autel Voyager App's mission editing interface to set the home point.
- In manual flight mode, the aircraft will automatically use the takeoff point as the home point. During the return, the center position of the arrival orbit's hovering point is located along the takeoff heading and at a distance of "√3 times the minimum hovering radius + 360 meters" from the takeoff point. The arrival orbit's hovering radius is the minimum turning radius of the aircraft. The arrival altitude (relative to the landing point) is set to 100 meters, and the landing mode switching altitude (relative to the landing point) is set to 100 meters.

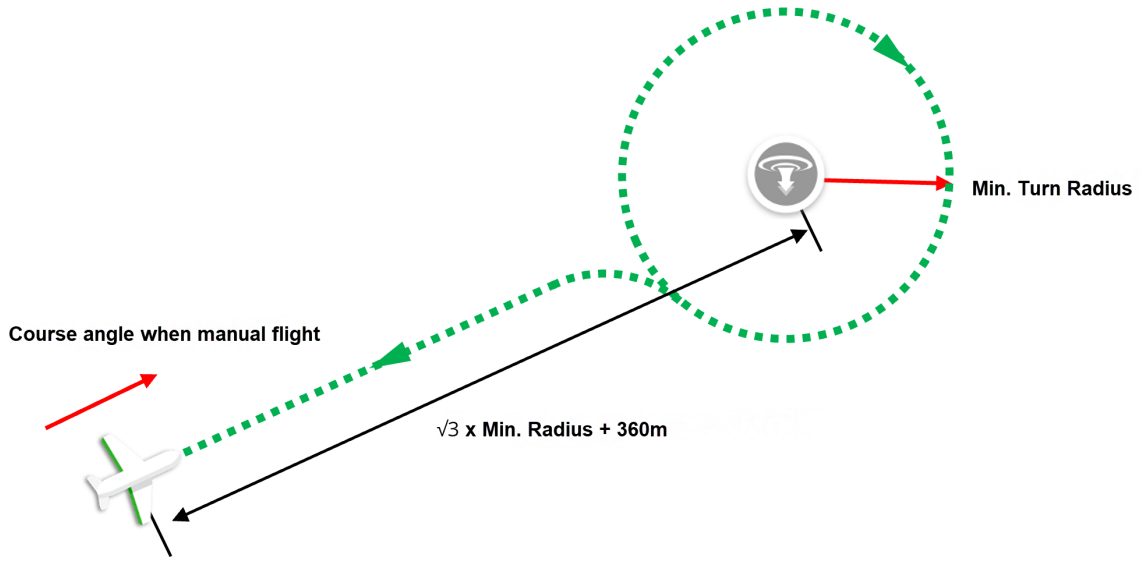


Figure 4-60 Position of Arrival Hovering Point in Return in Manual Flight

- After the aircraft takes off, users can tap "" icon on the map interface and select "**Edit RTH**" in the pop-up window to plan return route according to the new home point.

⚠ Warning

- If GNSS signal is poor, auto return will not be activated.
- During auto return, the aircraft will be affected by the electronic geo-fencing and may slow down or stop and hover as it is close to the edge of restricted zones or of geofence. If this kind of situation occurs, please take over the aircraft in time. For working mechanism of geofence, see "**4.4.3 Creating a Geofence**".
- Please choose open and even region with great light conditions as the landing point of the aircraft. If the landing point for auto return does not qualify for aircraft landing (such as uneven floor or being crowded), please manually control the aircraft in landing.

Tips

When the aircraft is in the process of automatic return, if it is necessary to interrupt the automatic return, you can perform the following operations:

- In automatic flight mode, you can exit automatic return by creating a new quick mission, tracking mission, temporary mission or by adjusting a waypoint.
- In manual mode, you can exit automatic return by manipulating the remote controller's sticks.

4.7.2.1 Manual Activation of Automatic Return

During the flight, users can manually activate the automatic return in any one of the following ways:

- Press and hold the return button on left side of the remote controller for 3 seconds to activate the automatic return.
- On Autel Voyager App's map interface, tap the "" icon on the left side, and then select the "Execute" option to activate the automatic return.
- On Autel Voyager App's map interface, tap the "" icon on the left side, then select the "**Edit Return Mission**" option. After completing the return mission editing, tap the "**Upload and Execute**" button to activate the automatic return.

Tips

- When execute auto return by modifying the home point through the "**Edit Return**

Mission", the edited arrival route will be displayed in red on the map interface. After users tap the "**Upload and Execute**" button on the right side of the edit bar and tap the confirm button in the prompt, the return mission will be executed immediately. If the user interrupts the return by manually taking over the aircraft or using other methods, and goes back to and carries on the route mission, the aircraft will automatically trigger the return mission based on the new home points and arrival route after completing the waypoint mission or scanning part of the route (polygon mission) in the air. It will not land based on the arrival route and home points in the ground-planned route mission.

- After modifying the return route, the home points will be saved. Even if you exit the return mode to perform other missions, the return will be triggered again based on the modified home points when activated.

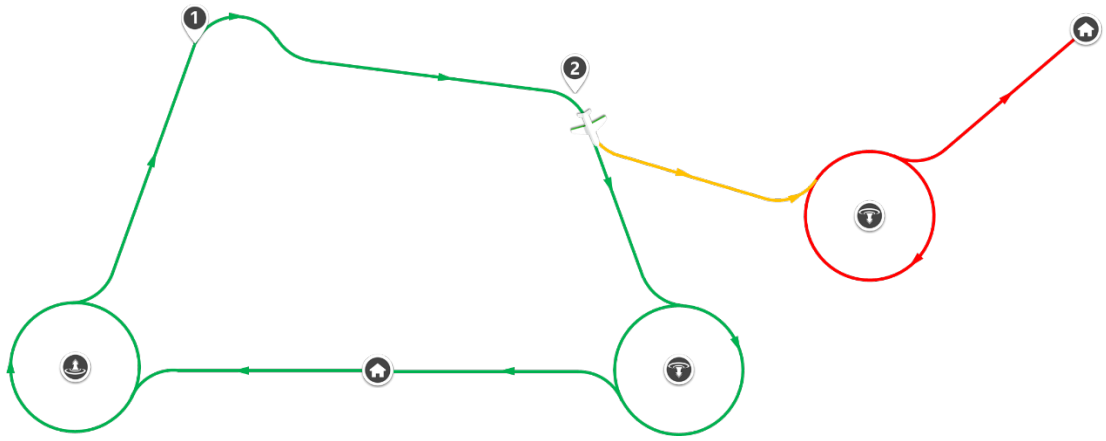


Figure 4-61 Modifying Aircraft Home Points and Executing a New Arrival Route After Takeoff

4.7.2.2 Low Battery Activation of Automatic Return

During flight, to prevent unnecessary risks due to insufficient battery power, the aircraft will intelligently assess whether the current battery level is sufficient based on its current position.

If the "Current Aircraft Battery Level - Expected Remaining Landing Battery Level" is only sufficient to complete the return journey, the aircraft will automatically trigger automatic return, and Autel Voyager App will display a pop-up alert, prompting the user to initiate low battery automatic return.

⚠ Warning

- When Autel Voyager App displays relevant warning prompts, it is essential to promptly follow the provided instructions.
- If the aircraft triggers low battery automatic return, it is advised not to cancel the automatic return process. Otherwise, the aircraft may not have sufficient power to return to the designated home point, potentially leading to flight accidents and

property damage.

- When the aircraft triggers low battery automatic return, switching to intelligent missions, including temporary missions, quick missions, and dynamic track, is permitted but there are chances that the low battery automatic return will be triggered again.

Tips

- The trigger condition for low battery automatic return is calculated as follows: Current Battery Level - Required Battery Level for Return = Expected Remaining Landing Battery Level.
- To enable the low battery automatic return feature, you need to manually activate it. Here's how to do it: In Autel Voyager App, go to the map interface or camera interface. Tap > "**Aircraft Battery**" > "**Return to Home (low battery)**".
- You can also set the expected remaining landing battery level, which is the amount of battery remaining after the aircraft completes its flight and lands. This can be set within the range of 15% to 50%, with the default preset at 25%. Here's how to do it: In Autel Voyager App, go to the map interface or camera interface. Tap > "**Aircraft Battery**" > "**Intelligent Low Battery**".

4.7.2.3 Behavior Activation of Automatic Return

The automatic return feature of the aircraft will be activated in the following scenarios:

- While the aircraft is in the process of a waypoint or polygon mission, if the user edits the return mission and chooses to upload and execute, the aircraft will activate automatic return to the new home point position after completing the waypoint mission or scanning part of the route (polygon mission).
- After the completion of a temporary mission, and if the finish action for the temporary mission is set to "**Return to Home**", the aircraft will activate automatic return.
- When the aircraft and the ground control station (Remote controller or tracking antenna) have been disconnected for over 15s, the aircraft will trigger auto return under any one of the following situations:
  - If the aircraft is conducting a waypoint mission, and "**Return to Home**" action is set as the response to a loss of connection,
  - If the aircraft is in quick mission, temporary mission, dynamic track or manual flight mode.

Tips

- In Autel Voyager App, the loss of connection action can be set to either "**Resume**

Mission" or "**Return to Home**". When set to "Resume Mission" or when the aircraft is in a standby state for landing, the disconnection between the remote controller and the aircraft will not trigger automatic return.

- To configure the loss of connection action, go to the map interface or camera interface in Autel Voyager App and follow this path: ⚙ > "**Safety**" > "**Lost Connection Action**".
- Within 15s of the aircraft losing connection with the remote controller, the aircraft will attempt to reconnect to the remote controller. If the reconnection is not successful, the lost connection action will be executed.
- During the automatic return process triggered by loss of connection, if the aircraft re-establishes a connection with the remote controller, the aircraft will continue with the auto-return.
- When the aircraft loses connection with the remote controller, and if the GNSS signal is not available, the aircraft will execute failure protection program for landing, instead of return actions. For details about failure protection, see "**2.7.4 Failure Protection**".

4.7.2.4 Auto-return Mechanism

- **Fixed-Wing Mode Return Logic**

1. After triggering automatic return, the aircraft will return to the arrival hovering point at the higher altitude between the current flight altitude and the arrival altitude. It will then descend and hover to the landing mode switching height (relative to the landing point), followed by exiting the arrival hovering circle to fly towards the landing point.
2. Brake trigger distance is calculated based on ground speed, and deceleration begins when the distance from the landing point reaches the braking distance.
3. Fly to the landing point directly in multi-rotor mode.
4. Enter the landing procedure.

Tips

- Landing point: The automatic return setting specifies the home point for the aircraft.

- **Multi-Rotor Mode Return Logic**

The multi-rotor mode return logic is associated with the return areas as follows:

- Return area 1 definition: Within a distance of 300m from the landing point and at an altitude lower than the sum of the landing mode switching height (relative to the landing point) and 50m.

- Return area 2 definition: Beyond a distance of 300m from the landing point or at an altitude higher than the sum of the landing mode switching height (relative to the landing point) and 50m.

Remarks

- The determination criteria for the return area are divided into two cases: manual flight mode and automatic flight mode. The difference lies in the landing mode switching height (relative to the landing point):
  1. In manual flight mode, the default landing mode switching height (relative to the landing point) is set to 100m.
  2. In automatic flight mode, the landing mode switching height (relative to the landing point) is configured based on the arrival route.

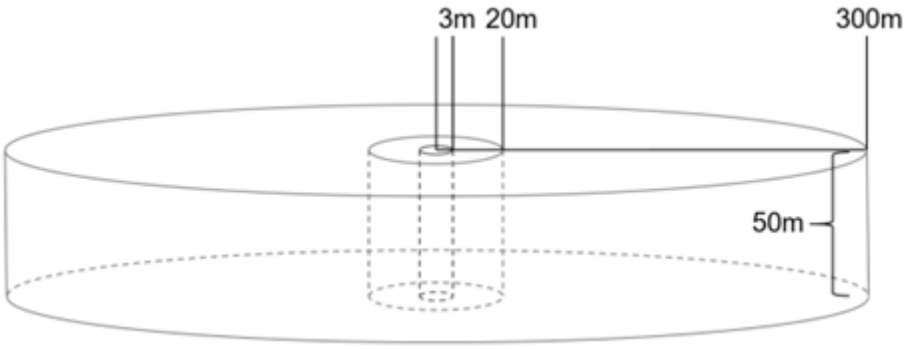


Figure 4-62 Return Area Diagram (Cylinder with the Lower Surface at the Switching Altitude)

1. When the aircraft is in return area 2, the following return logic is executed:
   - If the flight altitude is higher than the landing mode switching height (relative to the landing point), the aircraft first brakes, maintains the current altitude, turns toward the landing point, then accelerates, and switches to fixed-wing mode for the return.
   - If the flight altitude is lower than the landing mode switching height (relative to the landing point), the aircraft simultaneously climbs while turning the nose towards the landing point. Once it reaches the landing mode switching height (relative to the landing point), it accelerates and switches to fixed-wing mode for the return.
2. When the aircraft is in return area 1, within a range of 20m to 300m from the landing point, the following return logic is executed:
   - If the flight altitude is higher than the landing mode switching height (relative to the landing point), it maintains the current altitude while turning towards the landing point, then accelerates and switches to fixed-wing mode. The aircraft uses the landing point as a reference and flies directly toward it. When the distance from the landing point reaches the braking distance, it begins to decelerate.

- If the flight altitude is lower than the landing mode switching height (relative to the landing point), the aircraft simultaneously climbs while turning the nose towards the landing point. Once it reaches the landing mode switching height (relative to the landing point), it accelerates and switches to fixed-wing mode. The aircraft uses the landing point as a reference and flies directly toward it. When the distance from the landing point reaches the braking distance, it begins to decelerate.

3. When the aircraft is in return area 1, within a range of 3m to 20m from the landing point, the aircraft first turns its head towards the landing point and then returns in multi-rotor mode while maintaining the current altitude.
4. When the aircraft is in return area 1, within 3 meters from the landing point, it will directly enter the landing procedure.

Landing Logic

1. First, turn and adjust the heading angle to align with the target heading angle, where the target heading angle corresponds to the heading angle at takeoff.
2. During the landing process, when the ultrasonic sensor is active, the descent speed is determined by the measurement values of the ultrasonic sensor. The lower the relative height to the ground, the smaller the descent speed.
3. During the landing process, when the ultrasonic sensor is inactive, the descent speed is determined by the relative height to the landing point. The lower the relative height to the landing point, the smaller the descent speed.

Remarks

- Since the aircraft will automatically plan return route when auto-return is triggered, please pay attention to the timing of activating auto-return and the surrounding environment so as to prevent the aircraft from being too close to obstacles, having not enough time and space to ascend to safety height and affecting flight safety.
- When the aircraft is switching from multi-rotor mode to fixed-wing mode, it will maintain its current height.

4.7.2.5 Automatic Return Obstacle Avoidance

During the execution of the automatic return process, the aircraft will activate the terrain avoidance function. For more details, see "**2.7.1 Terrain Obstacle Avoidance"**.

4.7.3 Auto Landing

Auto landing function is used for quick landing during flight when the aircraft encounters an emergency.

During flight, users can tap the auto landing icon to perform landing operation on map interface or camera interface:

1. Tap "  " icon at the left side.
2. Tap "  " icon in the expansion bar.

The aircraft will automatically descend, hover and land before turning off motors.

Tips
• In the process of auto landing, users can interrupt auto landing function by using the sticks to control in manual control mode. • In the process of auto landing, users can perform manual landing or return-to-home triggered by the user. Auto RTH will not be triggered.

4.7.4 Precise Diversion

The precise diversion function is used during flight, when the aircraft encounters special circumstances such as low battery power and is unable to continue flying or needs to make an emergency landing, and the preset home point is too far or does not meet the conditions for landing. Users can reselect a suitable location for safe landing.

During the flight of the aircraft, the user can perform a precise diversion in the following ways:

- Tap the "  " icon on the left side of the map interface, then tap the "  " icon in the expanded item, wait for the "Edit Landing Mission" interface to appear on the interface, then tap a certain area of the map to set a temporary alternate point, and the remote controller will generate default arrival hovering point. Users can drag the icons of the arrival hovering point and landing point on the map, or accurately set the locations of the arrival hovering point and landing point by inputting coordinates on the "Edit Landing Mission" interface.
- Tap the "  " icon in the upper left corner of the map interface, place a marked point at a certain location on the map, and select the precise diversion icon "  " in the marked point to edit the landing mission.

Tips
• The precise diversion function can only take effect when the aircraft's GNSS signal is good. During landing, please always pay attention to the aircraft status and signal connection.

After placing the precise diversion point, the user can edit the following settings for the precise diversion mission on the "**Edit Landing Mission**" interface of the map interface:

1. Tap the "  " icon to edit the temporary diversion point (landing point).
   - ➢ Altitude (m): Select "ATL" or "MSL".
   - ➢ Coordinate: Input the latitude and longitude coordinates of the home point.
2. Tap the "  " icon to set the arrival hovering point. Setting items include:

- Vertical Landing Altitude (ALT[LND]) (m): The vertical altitude relative to the landing point. After arrival hovering, the aircraft adjusts to this height, and then accelerates to rotor-wing flight mode.
- Radius (m): Set the arrival hovering point radius value.
- Arrival Altitude (m): It can be set to “ALT(LND)” or “MSL”.
- Arrival Circling Point: Input the latitude and longitude coordinates of the arrival hovering point.

3. After drawing the diversion route on the map, tap the “**Execute**” button on the “**Edit Landing Mission**” interface, confirm the contents of the pop-up window and select Execute.

   The aircraft will follow the planned route (light green) to the designated landing point and prepare for landing accurately.

Tips

- The precise diversion route will not be stored and is only valid for a single precise diversion mission. If the aircraft exits the precision diversion function, it will need to re-edit the precise diversion route the next time it executes the precision diversion function.
- See “**2.6 Aircraft Mode Switching**” for the logic of the arrival route.
- During the process of precise diversion, users are allowed to create quick mission or temporary mission, or to use dynamic track or waypoint adjusting function so that the aircraft will exit from precise diversion, and switch to other flight modes.
- During the process of precise diversion, it is allowed to create, edit and execute new precise diversion and to use auto landing button to interrupt the precise diversion of the aircraft and switch to immediate landing.

Warning

- The precise diversion function is used in scenarios where users adopt rapid landing for emergency evacuation when encountering an emergency. When choosing a landing point, you should pay attention to the surrounding environment and try to choose a flat, open, obstacle-free ground. Avoid choosing densely populated, busy traffic or other dangerous areas as a landing point to avoid casualties or property losses.
- Users should set reasonable range for the remaining battery of the aircraft when using the precise diversion function, so that the landing point will not be so far that the aircraft will not have enough battery to arrive at landing point safely.
- During the precise diversion process, the user can interrupt the landing process by operating the sticks in manual flight mode.
- During the precise diversion process, the user can interrupt the landing process by triggering the automatic return-to-home, and the aircraft will instead fly to the home point for landing. The aircraft, when in backup landing, will enter the return mode

only because of manual triggering by users, instead of low battery level, damaged battery or aircraft lost.

4.8 Post-Flight Operations

4.8.1 Post-Flight Process

After each flight, it is recommended that user should take following operations:

1. After the aircraft ends its flight and lands, users must ensure that the aircraft propellers and motors are turned off and check whether the aircraft body and motors are hot, wait them to cool down before taking any other post-flight operations.
2. Inspect the appearance of the aircraft, check whether there is any damage on the aircraft, such as dent. If there is serious damage, please contact Autel Robotics.
3. Remove the batteries from the aircraft. For details about how to remove the battery, see "**4.2.1 Assembling the Aircraft**".
4. If you need to remove the gimbal camera after flight, see steps in "**3.2.3 Installing and Uninstalling**". After removing the gimbal camera, be sure to install the lens protective cover and gimbal interface protective cover of the gimbal camera or aircraft gimbal interface protective cover in time to avoid damage during transportation and storage.

Important

- The gimbal interface is a precision device. Please assemble or disassemble the gimbal according to relative operations; otherwise, poor contact between the aircraft and the gimbal may be caused.

5. If you need to transport the aircraft, dissemble the aircraft into components and put them in the case. For details about dissembling the aircraft, see "**4.2.1 Assembling the Aircraft**".

4.8.2 Post-Flight Check

After each flight mission, the aircraft must go through a post-flight inspection. The postflight manual inspection mainly includes visual inspection of the appearance of the aircraft and components, inspection of component assembly and actuating mechanism. According to whether need to be powered on while checking, it can be divided into "Power-on Inspection" and "Static Inspection". Users can conduct the postflight inspection by referring to "**5.5 Post-flight Manual Checklist**".

4.8.2.1 Power-On Inspection

- **Whole Aircraft Inspection**

a. Check that the appearance of the whole aircraft is clean without stains, the structure is intact without damage, and there is no abnormal deformation;

b. Check that the outer wings, tail wing (horizontal tail and vertical tail), and gimbal are installed normally without looseness, the connection gap does not expand, and the servo clearance does not expand after the wingtips and stabilizer are shaken slightly.

- **Battery Inspection**

a. Check that there are no abnormal error messages on the battery interface in Autel Voyager App. If there are error messages, see "**5.3 Troubleshooting Guide**" or contact the after-sales service for guidance and troubleshooting;

b. View the remaining battery power in Autel Voyager App and replace the battery as needed. For the steps to replace the battery, refer to the section on installing and replacing the battery in "**4.2.1 Assembling the Aircraft**"

4.8.2.2 Static Inspection

After powering off the aircraft, conduct a static inspection on the aircraft. If the flight mission is completed or the location is changed, refer to the "**Pre-Packing Inspection**" in this section to complete the relevant inspection; if the flight mission continues, refer to the "**Post-Flight Short Stop Inspection**" in this section to complete the relevant inspection.

Pre-Packing Inspection

- **Appearance Inspection**

a. Appearance cleaning inspection: Check that the surface of the aircraft body and each installed component is clean without stains;

b. Paint layer condition inspection: Check the paint layer condition of the aircraft body and each installed component to ensure that the paint layer is in good condition without damage, obvious scratches, cracks, peeling, etc.;

c. Structural condition inspection: Check the structural condition of the aircraft body and each installed component to confirm that there are no cracks, no deformation, no breaks, no delamination of composites, and no damage caused by foreign objects on the surface;

- **Assembly Inspection**

Before packing, it is necessary to conduct a fastening inspection of the components to confirm that the fasteners are in place without missing, installed firmly without looseness, and the components are firmly connected. For details, see "**4.3.2 Components Assembly Inspection**".

Post-Flight Short Stop Inspection

- **Appearance Inspection**

See "**4.3 Pre-flight** " for a general visual inspection of the aircraft body and each component.

- **Assembly Inspection**

Fasten the components for inspection to confirm that the fasteners are in place without missing, installed firmly without loose, and the components are firmly connected. Mainly include the following components:

1. Motor and propeller connection: including the front and rear fuselage motors, propellers, and left and right nacelle motors and propellers;
2. Landing gear is stable without shaking: including the front landing gear and rear landing gear.

For quick-release components, perform an assembly inspection to ensure that the connection is in good condition. For details, see **“4.3.2 Components Assembly Inspection**”.

- **Actuator Inspection**

Examine the actuating mechanism. For details, see “**4.3.3 Actuator Inspection**”.

4.8.3 Post-Flight Gimbal Check

After the aircraft lands, it is necessary to check the gimbal to determine if its condition meets the requirements for subsequent flights.

Short Stop Inspection

If the aircraft needs to continue to perform other flight missions, follow the steps below for a short stop inspection of the gimbal.

- **Appearance Inspection**

Examine the appearance of the gimbal camera to confirm that there are no following defects:

1. Surface structural damage, paint peeling or fading.
2. Dirty lens.

- **Assembly Inspection**

Confirm that the gimbal dial has been rotated to the lock icon, and the left and right turning joints are not loose (be careful not to press the unlock button).

Packing Inspection

If the flight mission is completed or the location is changed, follow the steps below to check the gimbal for packing.

- **Gimbal Disassembly**

Confirm that the gimbal disassembly process is smooth, and perform an appearance inspection on the removed gimbal:

1. The surface paint is in good condition and the lens is clean;
2. The structure is intact without damage, especially the gimbal connection mechanism.

- **Gimbal Storage**

Place the gimbal camera with the lens cap (if any) back in the industrial container.

Chapter 5 Upgrades, Maintenance and Checklists

In order to ensure the reliability and overall performance of the UAS and obtain the best operating experience, it is necessary to promptly upgrade the version of the aircraft and perform related maintenance regularly as required.

5.1 Equipments Upgrade

When the remote controller, tracking antenna and the aircraft are frequency-paired and the remote controller is connected to the internet, Autel Voyager App will automatically check for firmware updates.

1. Turn on the power of the remote controller, tracking antenna and aircraft, and ensure that the aircraft, the tracking antenna and the remote controller are connected and matching, that the power of the aircraft and the remote controller is greater than 30%, and that the network connection of the remote controller is normal, and the gimbal has a microSD card inserted.
2. Open Autel Voyager App. If there is a version update, you will be prompted in the application. Or tap "⚙" > "**Software Update**" on the home interface and follow the interface prompts to update manually.
3. After the upgrade is confirmed, the remote controller will automatically download and upgrade the relevant firmware and Autel Voyager App will also update simultaneously.
4. After the upgrade is completed, please restart all devices.

Remarks

- Updates of Autel Voyager App, aircraft firmware, base station firmware and remote controller firmware are available in "**Software Update**". When updated, it is necessary to follow the update sequence: aircraft firmware > base station firmware > remote control firmware.

Important

- Online upgrade requires ensuring that the remote controller can normally access the Internet.
- During the upgrade process, please do not turn off the aircraft or tracking antenna and keep them connected to the remote controller.
- The entire upgrade process is expected to last 15 minutes (depending on the network conditions to which the remote controller is connected).
- Do not push the stick before and after the upgrade and ensure that the aircraft

propellers remain stationary.

- When the aircraft firmware is being updated, the firmware of the battery and gimbal will also be upgraded to the latest firmware version.

5.2 Aircraft Maintenance

To ensure that the aircraft maintains optimal performance, all parts of the aircraft need to be maintained regularly. For details, see the Maintenance Manual. If you have any questions, please contact User Support of Autel Robotics.

Table 5-1 Aircraft maintenance instructions

Check Type	Maintenance Type	Maintenance Cycle	Replacement Material	Quantity
A -check	Check the whole machine	Every flight time of 200h or accumulated use of 1 month	/	/
	Clean the whole machine		/	/
B- check	Check the looseness of fasteners of the whole machine	Every flight time of 400h or accumulated use of 6 months	Front motor of the nacelle	2
	Clean the whole machine		/	/
	Replace front motor of the nacelle		/	/
C -check	Check the looseness of fasteners of the whole machine	Every flight time of 600h or accumulated use of 12 months	/	2
	Replace nacelle servos		/	/
D -check	Check the looseness of fasteners of the whole machine	Every flight time of 100h or accumulated use of 18 months	Rear motor of the nacelle	2
	Replace the body motor		Fuselage motor	2

Check Type	Maintenance Type	Maintenance Cycle	Replacement Material	Quantity
	Replace wing servos		Tail wing servos	3
			Outer wing servos	2

Tips

- After the aircraft reaches the maintenance period, users are required to contact Autel Robotics to provide maintenance services. If maintenance is not performed as required, the safety performance of the aircraft may be affected and flight safety accidents may occur.

Table 5-2 User-Replaceable Parts List

No.	Part	Quantity	Manufacturer Information
1.	Fuselage front motor propeller	1	Autel Robotics
	Fuselage rear motor propeller	1	
2.	Tilting propeller on the left nacelle	1	Autel Robotics
	Tilting propeller on the right nacelle	1	
	Rear propeller on the left nacelle	1	
	Rear propeller on the right nacelle	1	
3.	DG-T5 Gimbal Camera	1	Autel Robotics
4.	DG-T5L Gimbal Camera	1	Autel Robotics
5.	Smart battery	2	Autel Robotics

Tips

- Users can contact Autel Robotics to purchase the above parts and replace them according to this manual.
- If you need to replace parts that are not in the list, please contact Autel Robotics. Damage caused by unauthorized disassembly and assembly will not be covered by the warranty.
- See ***Maintenance Manual*** for the service life cycle of each component.

5.3 Troubleshooting Guide

Tips

- The following troubleshooting measures are limited to failure factors caused by use under normal limited conditions.
- For faults caused by abnormal use, please contact Autel Robotics directly for processing.

Faults	Troubleshooting
The remote controller cannot be turned on.	• Please check whether the battery power of the remote controller is sufficient. If the battery power is too low and the remote controller cannot be turned on, please fully charge it before turning it on. • Please confirm whether the ambient temperature is suitable. Low temperature will affect the battery output performance and may cause the remote controller to fail to turn on. • If the remote controller is accidentally shut down during the upgrade process, it may not be able to power on normally, please contact Autel Robotics. • If the remote controller has not been subject to external impact, liquid immersion or other destructive behavior, and does not meet the above conditions, it may be a hardware failure, please contact Autel Robotics.

Faults	Troubleshooting
The tracking antenna cannot be powered on.	● Please check whether the battery power of the tracking antenna is sufficient. If the battery power is too low and the tracking antenna cannot be started, please fully charge it and then power it on again. ● Please confirm whether the ambient temperature is suitable. Low temperature will affect the battery output performance and may cause the tracking antenna to fail to turn on. ● If the tracking antenna is accidentally shut down during the upgrade process, it may not be able to power on normally, please contact Autel Robotics. ● If the tracking antenna has not been subjected to external impact, liquid immersion or other destructive behavior, and does not meet the above conditions, it may be a hardware failure, please contact Autel Robotics.
The aircraft cannot be powered on.	● Please check whether the battery has sufficient power. If the power is too low, the aircraft will shut down and cannot be started. Please fully charge the battery before turning it on. ● If the battery has sufficient power, please check whether the battery is in good contact with the aircraft body. If there is dirt, rust, etc. at the battery interface, it will cause poor contact and needs to be processed before reinserting the battery to start the aircraft. ● Please check whether the metal contacts at the aircraft battery interface and battery interface are missing or damaged. If so, please contact Autel Robotics. ● Please confirm whether the ambient temperature is suitable. Low temperature will affect the battery output performance and may cause the aircraft to fail to boot. ● If the aircraft or battery is powered off abnormally during the firmware upgrade process, it may fail to boot. Please contact Autel Robotics. ● If the above conditions are not met and the aircraft can be turned on after replacing the new battery, then the battery hardware is faulty; if the aircraft still cannot be turned on, the

Faults	Troubleshooting
	aircraft hardware is faulty, please contact Autel Robotics.
The aircraft displays a fault during self-check after powering on.	Please follow the instructions of Autel Voyager App to handle it accordingly. If it is a hardware connection failure (assembly failure), the aircraft should be shut down before handling to avoid personal injury.
The aircraft does not respond to the remote controller during the matching process.	● Please make sure that the distance between the two is kept relatively close. ● Please make sure there are no metal objects, mobile devices, signal interfering devices or other remote controllers nearby.
After the aircraft completes self-check, the motor cannot start.	● Please confirm whether the remote controller and aircraft are paired. ● In manual flight mode, please check whether the remote controller stick function is normal and whether the remote controller is correctly calibrated. ● Please check whether the aircraft battery is completely installed and whether the battery power is sufficient. ● Please pay attention to relevant prompts on the interface of the remote controller and troubleshoot accordingly before trying to start the motor again. ● If the problem cannot be solved with measures above, please contact Autel Robotics.
After the aircraft motor is started, the aircraft cannot take off.	Please re-start the aircraft and try again, if it still cannot take off after trying many attempts, please contact Autel Robotics.
Aircraft flight time shortened.	● Low ambient temperature during flight, flying against the wind, airflow disturbance, and mounted flight will all reduce the normal flight endurance time to a certain extent. ● Please ensure that the number of cycles of the battery is within 200 times. The power of the battery will attenuate normally during its use cycle.

Faults	Troubleshooting
The video transmission received by the remote controller is unstable (such as stuck, lost or frequently disconnected).	● Please check whether the connection between the remote controller and the tracking antenna is stable and whether the antenna direction is adjusted to the appropriate direction. ● Please confirm that there are no strong magnetic fields or signal interference sources around the aircraft, the remote controller, and the tracking antenna. ● Please confirm that the distance between the aircraft, the remote controller, and the tracking antenna is within the effective communication range, and shorten the flight radius in time.
The video transmission screen is disconnected when the aircraft is flying outside the visual range.	Please activate the automatic return command to return the aircraft to the home point.
When it comes to aircraft obstacle avoidance, what should be noted?	● Terrain obstacle avoidance is not turned on when the aircraft is flying manually. When performing route missions, you can choose to turn on/off terrain obstacle avoidance. Terrain obstacle avoidance is only forcibly turned on during automatic return, precise diversion, quick mission, waypoint adjusting and tracking missions. ● Before flying, please set a reasonable safe altitude for the aircraft. ● When flying, please pay attention to your surroundings and the safety tips of Autel Voyager App.
The image is tilted when recording video in flight.	● Place the aircraft horizontally and keep it stationary, and calibrate the gimbal according to the “Gimbal Calibration” function in Autel Voyager App. ● If the problem persists, adjust the gimbal according to the guidelines in the “Adjust Gimbal” function.
The gimbal camera automatically turns off during flight recording	● Please check whether the microSD card memory is full. If it is full, please replace it with a new microSD card or transfer media files. ● Please check whether the gimbal camera is firmly connected to the aircraft. The gimbal

Faults	Troubleshooting
	camera may become loose due to flight vibrations, resulting in poor contact and failure to work properly.
The aircraft lens is dirty.	Please use a dry lens cleaning cloth to gently wipe the lens. It is recommended to use the lens cleaning cloth provided in the industrial box.
The aircraft, tracking antenna, and remote controller unexpectedly shut down during the upgrade process.	● Please restart the device. If it can boot normally, make sure the device has sufficient power before upgrading normally. ● If the device cannot be started, please contact Autel Robotics.
To restore the remote controller to factory settings.	Tap the “Tools” application on the home interface of the remote controller to restore factory settings. Please back up important data before operating.
Force restart after remote controller freezes.	● Press and hold the power button on the top of the remote controller for more than 10 seconds to force the remote controller to shut down. ● Restarting the remote controller during flight will trigger the aircraft to perform lost connection action.

5.4 Pre-flight Manual Checklist

The following checklist is required before every flight operation. Please confirm the relevant contents carefully.

Table 5-3 Pre-flight Manual Checklist Reference Sheet

<table>
<tr><td colspan="8">Pre-flight Checklist</td></tr>
<tr><td>Aircraft Model</td><td colspan="2"></td><td>Aircraft No.</td><td></td><td>Flight Date</td><td colspan="2"></td></tr>
<tr><td>Mission</td><td colspan="7"></td></tr>
<tr><td rowspan="4">Environmental condition records</td><td colspan="2">Temperature</td><td>Humidity</td><td>Altitude</td><td>Wind Speed</td><td>Wind Direction</td><td>Weather</td></tr>
<tr><td colspan="2"></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td colspan="3">Other environment descriptions</td><td colspan="4"></td></tr>
<tr><td colspan="3">Does the environment meet flight conditions?</td><td colspan="2">▫ Y ▫ N</td><td>Signature</td><td colspan="2"></td></tr>
<tr><td rowspan="2">Static inspection</td><td>No.</td><td colspan="2">Inspection Items and Standards</td><td>Checker</td><td colspan="2">Restricted Release</td><td>Test Result</td><td>Abnormal Results</td></tr>
<tr><td>1</td><td colspan="2">Landing gear inspection
● Component installation: Check that the landing gear is firmly</td><td></td><td colspan="2">The landing gear structure is damaged, loose or displaced; the folding part of the</td><td>▫ Y
▫ N</td><td></td></tr>
</table>

		after being deployed and without looseness or displacement. ● Structural status: Check that the structural status is normal and there is no damage such as deformation or breakage. ● Paint surface: Check that the surface is clean and free of stains, and that the paint layer is not peeling off.		landing gear cannot be reset.		
	2	Fuselage motor and propeller inspection ● Quick-release stucture: Check that quick-release structure of the fuselage propeller is installed in place and fastened without obviously shaking. ● Motor status: Check that the motor is in good condition, rotates smoothly, has no lag or abnormal noise. ● Propeller status: Check that the appearance of the propeller is intact, with no obvious structural damage such as deformation, breakage, fracture, delamination, etc., and the surface is clean and free of stains.		● The motor or propeller installation is not tight. ● The motor rotates abnormally. ● The propeller structure is severely damaged or installed in the wrong direction.	□ **Y** ▫ **N**	

		● Propeller steering: Check that the propeller is installed in the correct direction.				
	3	Inspection of the bottom of the fuselage ● Drain holes, and ultrasonic probe: Check that the surface of the ultrasonic probe is clean and free of stains, no foreign objects are clogging the slot, and that the heat dissipation holes are free of cracks and foreign matter clogging. ● Bottom protective cover: Check that the protective cover is in good condition and has no missing screws. The installation is tight. After installation, the protective cover is basically flush with the surrounding skin and the gaps are even.		● The ultrasonic probe surface is seriously stained; the slot is clogged by foreign object. ● The drain holes are seriously blocked. ● Protective cover is not installed tightly.	▫ **Y** ▫ **N**	
	4	Central wing and fuselage connection inspection ● Aviation connector: Check that the interface is clean, free of foreign matter and there is no damage to the appearance. ● Central wing and screws: Check that there is no		● The aviation connector interface is dirty. ● The wing body is wobbling. ● The screw structure is distorted.	▫ **Y** ▫ **N**	

		structural damage or deformation in appearance, and the installation is firm without displacement.				
	5	Tail wing and fuselage connection inspection ● Aviation connector: Check that the interface between the tail wing and the fuselage is clean and free of foreign matter, and the appearance is intact and undamaged. After the tail boom is inserted into the fuselage, and the connection gap does not exceed 1mm. ● Rudder control surface of the horizontal tail and vertical tail: Manually rotate the flat tail rudder control surface in minor angle, and the rotation is smooth without jamming or abnormal noise. ● Tail boom is properly and firmly connected to the fuselage.		● The aviation connector interface is dirty. ● The quick-release knob cannot be locked properly after the tail boom is connected. ● The rudder control surface is stuck or makes abnormal noise.	▫ **Y** ▫ **N**	
	6	Left and right nacelle inspection ● The motor on the nacelle: Check that the motor installation is firmly without		● The motor, and propellor installation are shaking. ● The structure of the propellor is severely	▫ **Y** ▫ **N**	

		jamming or abnormal noise. ● Propeller on the necella: Check that the propeller is firmly installed without a gap. The appearance of the propeller is not deformed, damaged, aged, softened, etc. ● Screw: Tighten with moderate force. There is no obvious shaking after the necella is connected.		damaged. ● The screw structure is distorted.		
	7	Left and right wing inspection ● Wing installation: Check that the wing is installed firmly, with no looseness or displacement along the span ● Locking latch: Check that the locking latch is intact. The tighten force is moderate. There is no obvious shaking after the outer wing is connected. ● Cover plate: Check that the cover plate is in place and installed firmly.		● Outer wing makes abnormal noise or is loose. ● Cover plate is missing or the its installation is loose.	▫ **Y** ▫ **N**	
	8	Pitot tube inspection ● Pilot tube: Check that the appearance is intact and there		● The pilot tube is clogged. ● The pilot sleeve was	▫ **Y** ▫ **N**	

		is no damage, the installation is secure, the air inlet is not blocked, and the pilot tube protective sleeve has been removed and put away before takeoff.		forgotten to be removed.		
	9	Battery check ● Appearance: Check that the battery surface is clean and free of damage and stains, and that the battery compartment and battery interface are clean and free of foreign matter. ● Installation status: Check that the battery is installed firmly and the battery handle is fully lowered.		● The battery compartment and battery interface are dirty. ● The battery handle cannot be lowered properly.	▫ **Y** ▫ **N**	
	10	Gimbal camera inspection ● Installation status: Check that the connection between the gimbal and the fuselage is stable, the gimbal is installed tightly and there is no empty position, and the protective cover is fastened normally after the Micro SD card is inserted. ● Appearance status: Check that the appearance is clean and free of stains, the structure is		The gimbal installation is unstable.	▫ **Y** ▫ **N**	

		intact and free of damage, and the camera lens is clear and free of dirt.				
	11	Whole machine surface inspection ● Inspection of the whole machine: Check that all components are installed and tightened, there is no abnormal sound when shaking gently, the surface of the whole machine is clean and free of stains, and the structure is not damaged.		There is shaking in the installation of components or abnormal noise for unknown reasons.	▫ **Y** ▫ **N**	
	12	Tracking antenna check ● Appearance status: Check that the appearance is clean, without stains or deformations, the heat dissipation vents are not blocked, the tripod structure is not damaged, and the installation is firm. ● Antenna feeder: Check that the structure is not damaged, the interface is clean and free of foreign matter, and the connection is stable.		● The antenna feeder is damaged. ● The cooling vents are clogged.	▫ **Y** ▫ **N**	

	13	Remote controller check ● Appearance status: Check that the surface is clean and free of foreign matter, the heat dissipation vents are not blocked, and the structure is intact without damage. ● Stick inspection: Check that the stick is in the neutral position, and that the stick, gears, and dials move smoothly without jamming.		● The stick, gear, and dial movements are stuck. ● The cooling vents are clogged.	▫ **Y** ▫ **N**	
Power-on inspection	**No.**	**Inspection items and standards**	**Checker**	**Restricted release**	**Test result**	**Abnormal results**
	1	Full machine status check ● Part gap: Check that there are no obvious gaps between outer wings and nacelles. ● Navigation light status: Check that the outer wing and tail navigation lights flash normally and synchronously. ● Propeller status: Check that the propeller rotation direction is correct and the rotation axis is vertical without deflection.		● There is a false position between outer wing and nacelle and the gap is too large. ● The propeller rotation direction is wrong or the rotation axis is deflected.	▫ **Y** ▫**N**	

	2	Battery check ● Battery capacity and cycle: Check that the battery capacity meets flight requirements and the number of cycles is relatively consistent.		● Cycle times is too large. ● The difference in battery power is no more than 12%.	□ **Y** □**N**	
	3	Gimbal camera ● Self-inspection and control: Confirm that the gimbal self-inspection is completed, the gimbal rotates normally, the camera screen is viewed normally in the Autel Voyager App, and the ground control station can control the camera normally.		The movements of the gimbal and camera are uncontrolled.	□ **Y** □ **N**	
	4	Remote controller system check ● Battery power and operation: Check that the battery power meets the flight mission requirements and the application can operate normally.		The battery is too low.	□ **Y** □ **N**	
	5	Tracking antenna system ● Power and signal: Check that the power of the tracking antenna meets the flight		● Signal strength is too low. ● The battery is too	□ **Y** □ **N**	

		mission requirements. The tracking antenna indicator light is normal(the match indicator light flashes green slowly, the Wi - Fi indicator light is steady green, and the RTK indicator light is steady green). ● Signal strength: Check Wi - Fi, RTK, image transmission status and signal strength in Autel Voyager App.		low.		
	6	Communication link system check ● Image transmission and 5.8G: Check the video transmission and 5.8G connection status in Autel Voyager App.		The link connection is lost.	□ **Y** □ **N**	
	7	Navigation system check ● Initialization process: Check that the navigation initialization is completed and RTK positioning calculation can be performed normally. ● Attitude change: Rotate the aircraft along the three axes and confirm that the attitude change is normal.		● An error occurred during the navigation initialization process. ● Attitude feedback error.	□ **Y** □ **N**	

	8	Whole machine system parameter inspection ● Version module: Obtain the version number of each module of the whole machine, confirm the match, and self-check without error message, the flight control system settings are normal.		● Version numbers don't match. ● The flight control information is set incorrectly.	□ **Y** □ **N**	
Inspector's signature						
Complete machine release instructions				**Signature**		

5.5 Post-flight Manual Checklist

The following checklist is required after every flight operation. Please confirm the relevant contents carefully.

Table 5-4 Post-flight Manual Checklist Reference Sheet

Post-flight Checklist

Aircraft Model			**Aircraft No.**		**Flight date**	
Mission					**Flight time**	
Abnormal record						
Power-on inspection	**No**	**Inspection items and standards**		**Test result**	**Checker**	**Abnormal results**
	1	Complete machine inspection: ● Surface structure: Check that the surface structure of the components is intact without damage and without abnormal deformation. ● Connection status: Check that the outer wing, nacelle, tail wing and the gimbal are installed normally without looseness, the connection gap does not expand, and the servo empty position does not expand.		□ Y □ N		
	2	Battery inspection: ● Abnormal information: Check that there is no abnormal error message on the Autel Voyager App > "**Aircraft Battery**" interface. ● Battery status: Check that the battery temperature is normal, check the remaining battery power, and charge as needed.		□ Y □ N		
	3	Gimbal camera inspection: ● Appearance structure: Check that the surface is clean without dirt and the structure is intact without damage. ● Overall status: Check that the gimbal camera does not have unexplained movement and abnormal noise, and Autel Voyager App can		□ Y □ N		

		normally control the gimbal camera without abnormal operation.			
Static check	**No**	**Inspection items and standards**	**Test result**	**Checker**	**Abnormal Results**
	1	Servo and control surface inspection: ● Outer wing servo: Manually rotate the rudder control surface of the outer wing, rotate smoothly without jamming, and there are no abnormal phenomena such as abnormal noise and stuck servos. ● Rudder control surface of the outer wing: Swing the rudder control surface of the horizontal tail up and down, swing the rudder control surface of the vertical tail left and right, smooth without jamming, and the servo has no abnormal noise.	□ Y □ N		
	2	Power system inspection: ● Appearance structure: Check the appearance of the fuselage, nacelle motor and propeller to confirm that there is no damage such as cracking, deformation, etc. ● Installation status: Check that the motor and propeller mounting screws are not missing, and the components are installed and tightened. ● Motor temperature: Check that the temperature of the fuselage and nacelle motor is normal.	□ Y □ N		
	3	Battery inspection: ● Installation status: Check that the battery	□ Y □ N		

		connection is stable without shaking, and the locking status of the side latches is normal. ● Appearance: Remove the battery and check that the appearance is clean without stains, the structure is intact without damage, and the battery handle can be normally lowered.			
	4	Pitot tube inspection Appearance: Check that the appearance is intact and there is no damage, the installation is secure, the air inlet is not blocked, and the pitot tube protective sleeve has been removed and put away before takeoff.	□ Y □ N		
Inspector's signature					
Note: If it is required to continue executing a flight mission, please check major components and system against “Pre-flight Preparation”.					

Appendix A Specification

A.1 Aircraft

Basic Parameter	
Weight	29.0 kg (including battery and propellers, excluding gimbal camera)
Max. Takeoff Weight	39.0 kg
Max. Extra Payload Weight	10 kg
Dimensions	3025.7 x 4566 x 823.6 mm (with propellers installed) 2735 x 4566 x 823.6 mm (without propellers installed)
Supported Gimbal Camera	DG-T5, DG-T5L
Gimbal Installation	Detachable (E-type)
Rotation Speed of Fuselage Propeller	500 to 3300 rpm
Rotation Speed of Tilting Propeller on the Nacelle	1500 to 10000 rpm
Rotation Speed of Rear Propeller on the Nacelle	700 to 9000 rpm
Max. Ascent Speed	Multi-rotor mode: 5 m/s Fixed-wing mode: 5 m/s
Max. Descent Speed (vertical)	Multi-rotor mode: 4 m/s Fixed-wing mode: 5 m/s
Flight Speed (ground velocity)	Multi-rotor mode: 0 to 17 m/s Fixed-wing mode: 17 to 35 m/s

Max. Horizontal Flight Speed (ground velocity)	35 m/s
Service Ceiling Above Sea Level	5000 m
Max. Flight Time*	240 min *Tested in near no wind environment and the data is for reference only.
Max. Wind Resistance	Multi-rotor mode : 10 m/s Fixed-wing mode : 15 m/s
Max. Bank Angle	Pitch: 20° Roll : 25°
Max. Angular Velocity	Pitch: 180°/s Yaw: 60°/s
Operating Temperature	-20°C ~ 50°C
Air Sensing	ADS-B receiver (support 1090ES)
GNSS	GPS+Galileo+BeiDou+GLONASS
Hovering Accuracy (P-mode with GPS)	Vertical: ±0.5 m (GNSS enabled) ±0.2 m (RTK FIX) Horizontal: ±1.5 m (GNSS enabled) ±0.2 m (RTK FIX)
RTK Positioning Accuracy	Multi-rotor, when RTK enabled: Horizontal: 1 cm+1 ppm Vertical: 1.5 cm + 1 ppm Fixed wing, when RTK enabled: Horizontal: 3 cm+1 ppm Vertical: 3 cm + 1 ppm

Video Transmission	
Operating Frequency	**900M**: 902 - 928MHz* **2.4G**: 2.400 – 2.476 GHz**, 2.400 – 2.4835 GHz*** **5.2G**: 5.15 – 5.25 GHz**** **5.8G**: 5.725 - 5.829 GHz**, 5.725 - 5.850 GHz*** *Only applies to FCC and ISED regions ** Only applies to SRRC region *** Only applies to FCC, ISED and CE regions **** Only applies to FCC region Note: Some frequencies are only available in some regions or in door. For details, see local laws and regulations.
Max. Signal Distance	Omnidirectional antenna (FCC): ≥30 km Directional antenna (FCC): ≥60 km *Combined use of aircraft, remote controller and tracking antenna under the condition of no interference and obstruction*
Equivalent Radiated Power (EIRP)	**900M**: ≤30 dBm（FCC/ISED） **2.4G**: ≤20 dBm（SRRC/CE/UKCA）; ≤30 dBm（FCC/ISED/RCM） **5.2G**: ≤30 dBm（FCC/RCM）; ≤23 dBm（CE/UKCA） **5.8G**: ≤30 dBm（FCC/ISED/SRRC）; ≤14dBm（CE/UKCA）

A.2 Gimbal Camera

A.2.1 DG-T5

Basic Specification	
Weight	993 g
Dimensions	144.7×133.3×168.4 mm
Protection Rate	IP55

	Note: It may lead to failure when it is aged worn due to prolonged use.
Operating Temperature	-20 to 50°C
Storage Temperature	-30 to 70°C
Storage Capacity	128GB microSD
Memory Card Type	Supported Class 10, UHS-3, or higher specification microSD memory cards, with a maximum capacity of up to 256GB.
Storage File System	exFAT/FAT32
Gimbal	
Mount Method	Detachable
Angular Vibration Range	<0.005°
Mechanical Range	Tilt: -135° to 45° Roll: -60° to 60° Pan: -360° to 360°, support continuous rotation
Controllable Range	Tilt: -90° to 30° Pan: -360° to 360°, support continuous rotation
Stable System	3-axis mechanical gimbal (Tilt, pan, roll)
Max Control Speed	Tilt: 100°/s; pan: 100°/s
Zoom Camera	
Sensor	1/1.8" CMOS, Effective pixels: 8 MP
Lens	DFOV: 66.7°-2.9° Focal length: 7.1-172 mm 35mm equivalent focus range: 34.7-838 mm Aperture: F1.6 (Wide) -F5.2(Tele)

	AF type: CDAF Manual focus distance: 20 m~∞
ISO Range	Manual: ISO100~ISO6400 Auto: ISO100~ISO6400
Shutter Speed	Photo: 0.5s to 1/8000s Video: 1/30s to 1/8000s
Zoom	35x optical zoom, 16x digital zoom, 560x hybrid zoom
Photo Size	3840×2160
Photo Format	JPG
Video Resolution	3840×2160@30fps
Video Format	MP4/MOV
Video Subtitle	Supported
Video Code	H.264/H.265
Wide-Angle Camera	
Sensor	1/2 " CMOS, Effective pixels: 48 MP
Lens	DFOV: 84° Focal length: 4.49 mm 35mm equivalent focus range: 24 mm Aperture: F2.8 AF type: PDAF+CDAF Manual focus distance: 0.5 m~∞
ISO Range	Manual: ISO100~ISO6400 Auto: ISO100~ISO6400
Shutter Speed	Photo: 0.5s to 1/8000s Video: 1/30s to 1/8000s

Zoom	1x to 16x digital zoom
Photo Size	4000×3000
Photo Format	JPG
Video Resolution	4000×3000@25fps
Video Format	MP4/MOV
Video Subtitle	Supported
Video Code	H.264/H.265
Wide-Angle Thermal Camera	
Sensor	Uncooled VOx Microbolometer
Lens	FOV: 42° Focal length: 13 mm Aperture: F1.2 Focus distance: 6 m~∞
Noise Equivalent Temperature Difference (NTED)	≤50mK@25°C， F#1.0
Pixel Pitch	12um
Wavelength Range	8-14um
Temperature Measurement Method	Central measurement, spot measurement, area measurement
Temperature Measurement Range	High gain mode: -20 to 150°C Low gain mode: 0 to 550°C
Temperature Measurement Accuracy	±3°C or ±3% of reading (whichever is greater, observe at a distance of 5 meters from the blackbody in a windless laboratory environment at 25°C) @Environmental temperature -20 to 60°C

Accurate Temperature Measurement Range	5m
Equivalent Digital Zoom	1x to 3.5x wide-angle thermal imagery digital zoom; support synchronized zoom
Temperature Alert	During area temperature measurement, it supports setting high and low temperature alarm thresholds, and reports regional temperature values along with coordinates of temperature anomalies.
Palette	White Hot/ Black Hot/ Iron Red / Rainbow/ Rainbow HC/ Lava/ aurora / Searing/ Gradation/ Heat Detection
Photo Size	640×512
Photo Format	JPG
Video Resolution	640×512@25fps
Video Format	MP4/MOV
Tele Infrared Thermal Camera	
Sensor	Uncooled VOx Microbolometer
Lens	FOV: 12.4° Focal length: 45 mm Aperture: F1.2 Focus distance: 35 m~∞
Noise Equivalent Temperature Difference	≤50mK@25℃，F#1.0
Pixel Pitch	12um
Wavelength Range	8-14um
Temperature Measurement Method	Central measurement, spot measurement, area measurement

Temperature Measurement Range	High gain mode: -20° to 150° Low gain mode: 0° to 550°
Temperature Measurement Accuracy	±3°C or ±3% of reading (whichever is greater, observe at a distance of 35 meters from the blackbody in a windless laboratory environment at 25°C) @Environmental temperature -20 to 60°C
Accurate Temperature Measurement Range	35m
Equivalent Digital Zoom	3.5x to 56x wide-angle thermal imagery digital zoom; support synchronized zoom
Temperature Alert	During area temperature measurement, it supports setting high and low temperature alarm thresholds, and reports regional temperature values along with coordinates of temperature anomalies.
Palette	White Hot/ Black Hot/ Iron Red / Rainbow/ Rainbow HC/ Lava/ aurora / Searing/ Gradation/ Heat Detection
Photo Size	640×512
Photo Format	JPG *With temperature information, parsed by professional tools.*
Video Resolution	640×512@25fps
Video Format	MP4/MOV
Laser Finder	
Wave Length	905 nm
Eye Safety Level	Class 1
Measuring Accuracy	< 400m: 1m; > 400m:D*×0.3% **D indicates the distance from the vertical reflector.*

Measuring Range	10 to 2000m
Service Life of Gimbal Vibration Damping Balls	After 200 flight hours, inspection of the vibration damping balls for wear or cracks is required.

A.2.2 DG-T5L

Basic Specification	
Weight	1016 g
Dimensions	144.7×133.3×168.4 mm
Protection Rate	IP55 *Note: It may lead to failure when it is aged worn due to prolonged use.*
Operating Temperature	-20 to 50°C
Storage Temperature	-30 to 70°C
Storage Capacity	128GB microSD
Memory Card Type	Support Class 10, UHS-3, or higher specification microSD memory cards, with a maximum capacity of up to 256GB.
Storage File System	exFAT/FAT32
Gimbal	
Mount Method	Detachable
Angular Vibration Range	<0.005°
Mechanical Range	Tilt: -135° to 45° Roll: -60° to 60° Pan: -360° to 360°, support continuous rotation

Controllable Range	Tilt: -90° to 0° Pan: -360° to 360°, support continuous rotation
Stable System	3-axis mechanical gimbal (Tilt, pan, roll)
Max Control Speed	Tilt: 100°/s; pan: 100°/s
Zoom Camera	
Sensor	1/1.8" CMOS, Effective pixels: 8MP
Lens	DFOV: 66.7°-2.9° Focal length: 7.1-172 mm 35mm equivalent focus range: 34.7-838 mm Aperture: F1.6 (Wide) -F5.2(Tele) AF type: CDAF Manual focus distance: 20 m~∞
ISO Range	Manual: ISO100~ISO6400 Auto: ISO100~ISO6400
Shutter Speed	Photo: 0.5s to 1/8000s Video: 1/30s to 1/8000s
Zoom	35x optical zoom, 16x digital zoom, 560x hybrid zoom
Photo Size	3840×2160
Photo Format	JPG
Video Resolution	3840×2160@30fps
Video Format	MP4/MOV
Video Subtitle	Supported
Video Code	H.264/H.265
Focal Length (Vehicle License Plate Recognition)	250m to 300m

Wide-Angle Camera	
Sensor	1/2 “ CMOS, Effective pixels: 48 MP
Lens	DFOV: 84° Focal length: 4.49 mm 35mm equivalent focus range: 24 mm Aperture: F2.8 AF type: PDAF+CDAF Manual focus distance: 0.5 m~∞
ISO Range	Manual: ISO100~ISO6400 Auto: ISO100~ISO6400
Shutter Speed	Photo: 0.5s to 1/8000s Video: 1/30s to 1/8000s
Zoom	1x to 16x digital zoom
Photo Size	4000×3000
Photo Format	JPG
Video Resolution	4000×3000@25fps
Video Format	MP4/MOV
Video Subtitle	Supported
Video Code	H.264/H.265
Thermal Camera	
Sensor	Uncooled VOx Microbolometer
Lens	FOV: 22° Focal length: 25 mm Aperture: F1.2 Focus distance: 13 m~∞

Noise Equivalent Temperature Difference (NTED)	≤50mK@25℃，F#1.0
Pixel Pitch	12um
Wavelength Range	8-14um
Temperature Measurement Method	Central measurement, spot measurement, area measurement
Temperature Measurement Range	High gain mode: -20 to 150°C Low gain mode: 0 to 550°C
Temperature Measurement Accuracy	±3°C or ±3% of reading (whichever is greater, observe at a distance of 10 meters from the blackbody in a windless laboratory environment at 25°C) @Environmental temperature -10 to 50°C
Accurate Temperature Measurement Range	10 m
Equivalent Digital Zoom	1x to 16x digital zoom; support synchronized zoom
Temperature Alert	During area temperature measurement, it supports setting high and low temperature alarm thresholds, and reports regional temperature values along with coordinates of temperature anomalies.
Palette	White Hot/Black Hot/Tint/ Iron Red/Hot Iron/Arctic/Medical/Lava/Rainbow 1/Rainbow 2
Photo Size	640×512
Photo Format	JPG *With temperature information, parsed by professional tools.*
Video Resolution	640×512@25hz
Video Format	MP4/MOV

Laser Finder	
Wave Length	850±10 nm
Eye Safety Level	Class 3B (FDA/IEC)
Measuring Accuracy	Near Angle 70°: Effective Distance ≥ 80m, Spot Diameter 112m Near Angle 70°: Effective Distance ≥ 80m, Spot Diameter 112m
Measuring Range	≥800 m
Service Life of Gimbal Vibration Damping Balls	After 200 flight hours, inspection of the vibration damping balls for wear or cracks is required.

A.3 Remote Controller

Remote Controller	
Material	PC+ABS
Size	319×233×74 mm (antennas folded, sticks and bracket included) 319×233×220 mm (antennas vertical to screen, sticks and bracket included) 319×398×74 mm (antennas unfolded, sticks and bracket included)
Weight	1972g
Operating Time	2.5 h (max. brightness) 4.5 h (50% brightness)
Operating Temperature	-20 to 40°C
Storage Temperature	15 to 25°C (in 1 year) 0 to 30°C (in 3 months) -20 to 45°C (in 1 month)

Protection Rate	IP43 *Note: It may lead to failure when it is aged worn due to prolonged use.*
System Peformance	
Operation System	Based on Android 7.0
Pre-install Flight Application	Autel Voyager
Application Installation	Support 3rd party application
Built-in Memory	128GB, support microSD memory cards
GNSS	Support GPS+Galileo+GLONASS
Interface Specificaiton	
Power Outlet	Charge: 19V⎓4.74A
HDMI	Support max. 1080P@60fps
USB-A	Power supply: 5V/0.5A Data transmission: USB2.0
Data Transmission	
Operation Frequency	5.729-5.771GHz *Note: Some regions have designated frequency ranges. For details, see the local laws and regulations.*
EIRP	≤30 dBm (FCC/ISED/SRRC/RCM) ; ≤14 dBm (CE/UKCA)
Max. Effective Signal Distance	2 km *Note: No interference, no obstruction*
Video Transmission	
Antenna	Dual antenna, 1T2R

Operating Frequency	**900M:** 902 – 928 MHz* **2.4G:** 2.400 – 2.476 GHz**, 2.400 – 2.4835 GHz** **5.2G:** 5.15 – 5.25 GHz*** **5.8G:** 5.725 - 5.829 GHz**, 5.725 - 5.850 GHz**** *Only applicable for FCC and ISED regions **Only applicable for SRRC region ***Only applicable for FCC and RCM regions ***Only applicable for FCC, ISED, CE and RCM regions *Note: Some frequencies are only available in some regions or in door. For details, see local laws and regulations.*
EIRP	**900M:** ≤30 dBm (FCC/ISED) **2.4G:** ≤20 dBm (CE/SRRC/UKCA)；≤30 dBm (FCC/ISED/RCM) **5.2G:** ≤30 dBm (FCC/RCM) **5.8G:** ≤30 dBm (SRRC/FCC/ISED/RCM); ≤14 dBm (CE/UKCA)
Max. Effective Signal Distance	FCC:10 km CE: 5 km SRRC: 5 km *Note: No interference, no obstruction*
Screen	
Type	TFT LCD
Size	9.7 inches
Max. Brightness	1000 nits Max
Resolution	2048×1536
Refresh Rate	60Hz
Touch	Supported
Battery	

Battery Type	Li-Po 3S
Rated Capacity	8200mAh
Battery Energy	93Wh
Nominal Voltage	DC 11.4V
Operating Time	Maximum brightness: 2.5 hours 50% brightness: 4.5 hours

A.4 Tracking Antenna

For the specification of the tracking antenna, see *Autel Smart Antenna Transmission User Manual*.

A.5 Smart Battery

For the specification of the battery, see *Battery Quick Start Guide*.

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