SIYI

SIYI UniGCS Software
（Android version）
User Manual

SIYI Technology (Shenzhen) Co., Ltd.

SIYI.biz/en

Thank you for choosing a product from SIYI Technology.

The UniGCS is designed and manufactured for professional applications. Operators are expected to possess fundamental technical skills. Please handle this product with care.

SIYI Technology shall not be held liable for any economic loss or personal injury resulting from improper or unsafe operation of this product.

Minors must be supervised and guided by a qualified professional when using this product.

SIYI products are intended for commercial use only and must not be used for military purposes.

Unauthorized disassembly or modification is strictly prohibited without prior consent from SIYI Technology.

This manual addresses most common usage questions. For additional assistance, please visit the official SIYI Technology website at www.siyi.biz, call our support hotline at 400-838-2918, or email our engineering support team at support@siyi.biz for product inquiries or technical support.

SIYI

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User Manual Update Log

Version	Date	Updates
1.0	2025.04	Original version

1 Product Overview

Functions：

The UniGCS App provides functionalities including flight control, aircraft configuration, UAV data monitoring, mission planning, camera operation, video transmission, and remote controller settings.

Applications：

Flight control and operation

Mission planning and execution

Data exchange and processing

System monitoring and maintenance

Supported UAV Types：

Multirotor UAVs

Fixed-wing UAVs

VTOL Fixed-wing UAVs

Ground vehicles

Watercraft

1.1Product Description

Purpose of the Software：

Flight control and mission execution

Data visualization and decision support

Core Features：

Flight control

Mission management and payload control

Data exchange and processing

System maintenance and diagnostics

Supported Platform：

Android

1.2User Guide Structure

Introduction

This user manual provides detailed instructions and descriptions of each functional module of the software.

Intended Audience

The UniGCS system is designed for professional use. Operators are expected to possess basic technical skills and should exercise caution during operation.

SIYI Technology shall not be held responsible for any economic loss or

personal injury resulting from improper or unsafe use of this product.

Minors must be supervised and guided by a qualified professional when using this product.

SIYI products are intended solely for commercial use and must not be used for military purposes.

Unauthorized disassembly or modification of the product is strictly prohibited without prior written permission from SIYI Technology.

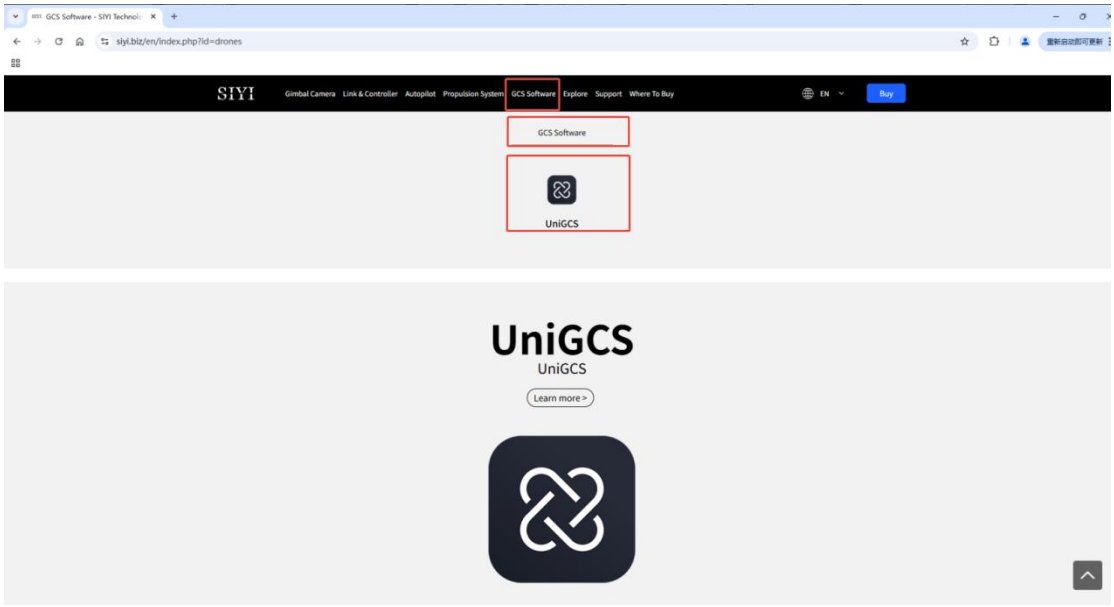
2 Installation and Configuration

2.1System Requirements

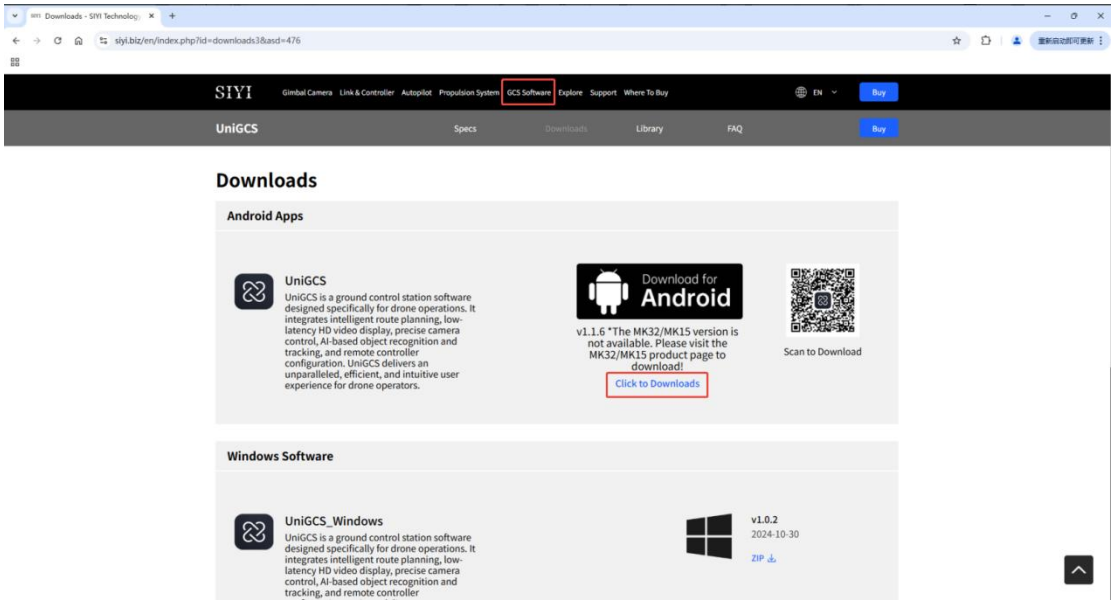
Minimum system configuration: Android 7.0, 2 GB RAM, 16 GB storage.

2.2Installation Steps

1. Log in to the official SIYI website and select the ground control software.



2. Select UniGCS and click Download to obtain the Android version.

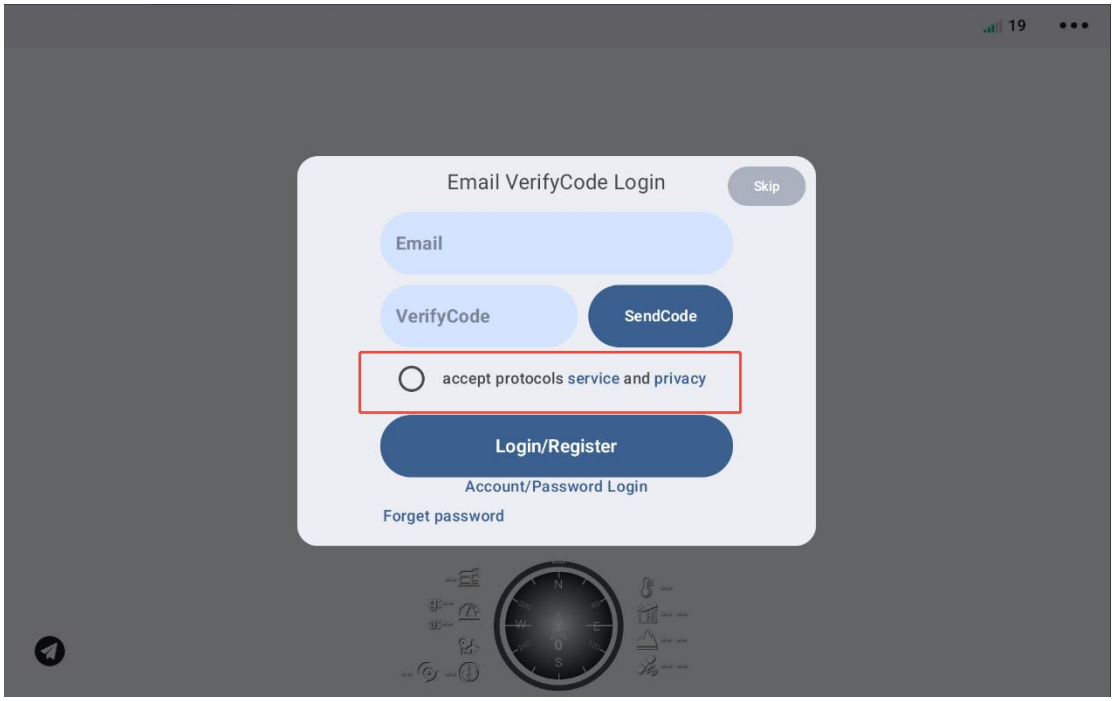


2.3Initial Configuration

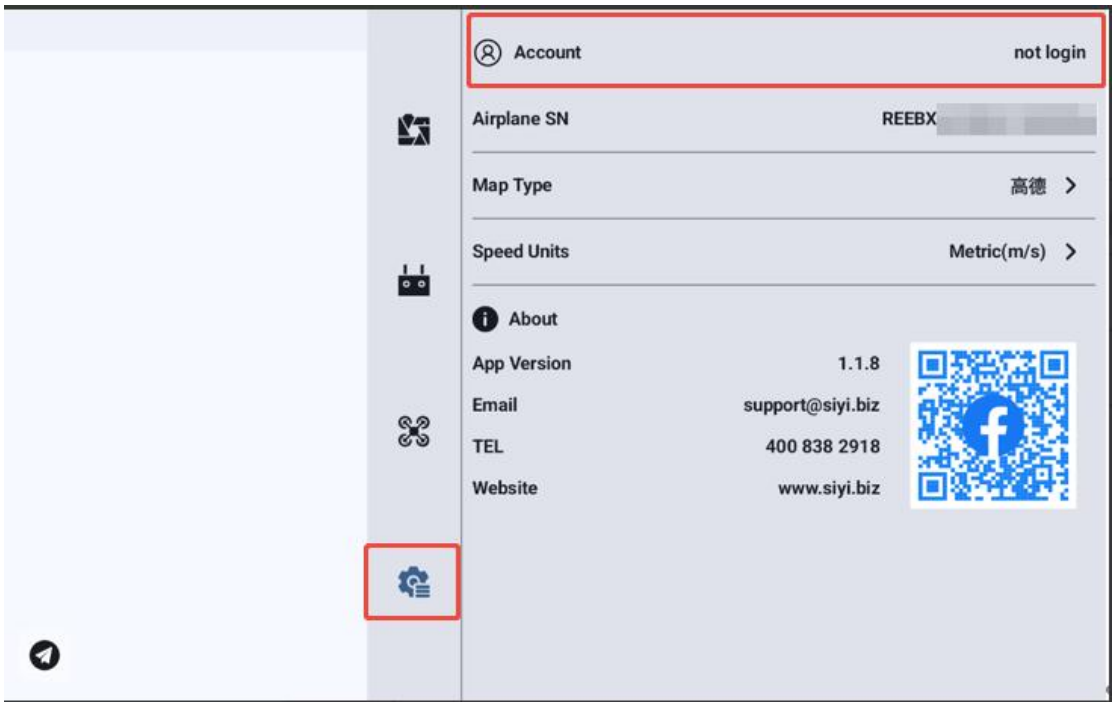
When launching the software for the first time, a login window will appear. You can log in using your account and password, mobile number, or email address.

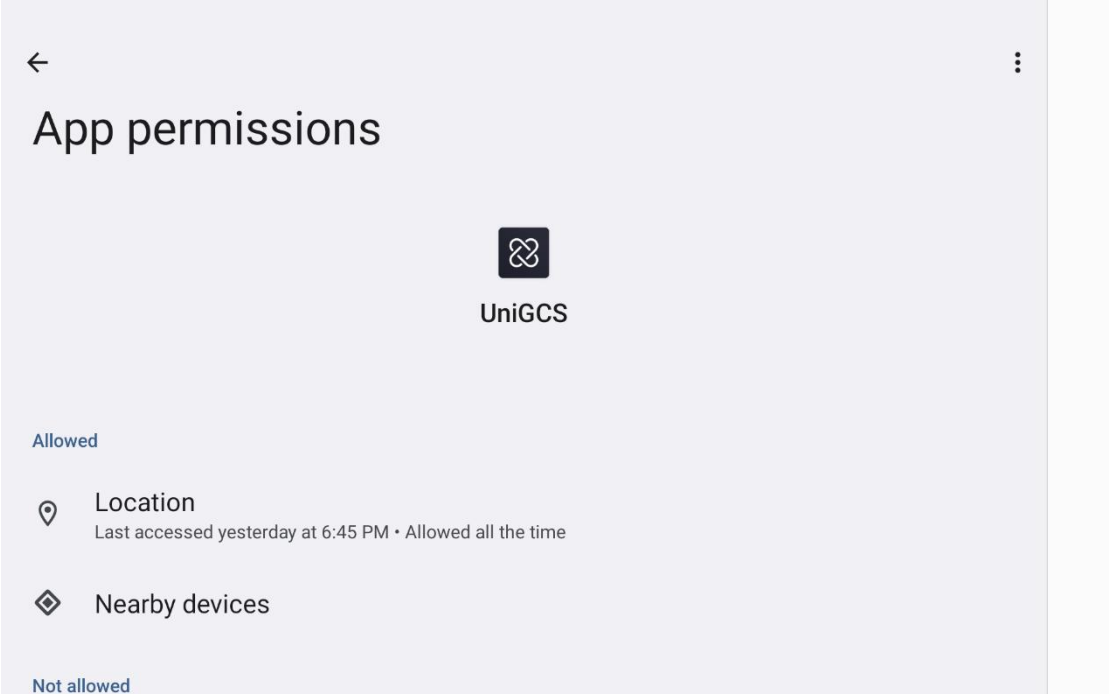
If the mobile number or email address has not been registered, the system will redirect you to the registration page.

During login, please make sure to check the box for “I have read and agree to the Terms of Service and Privacy Policy.”



After a successful login, you can view your account information in System Settings.

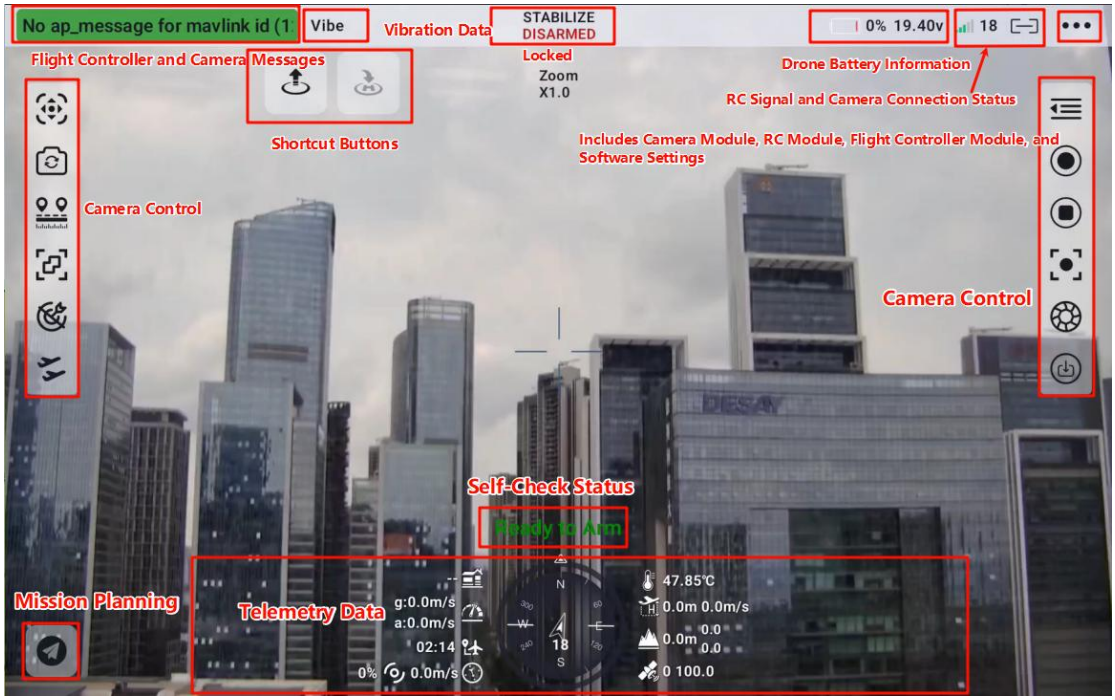




To ensure proper operation of the software, please enable all required permissions when prompted.

3 Quick Start

3.1Main Interface Overview



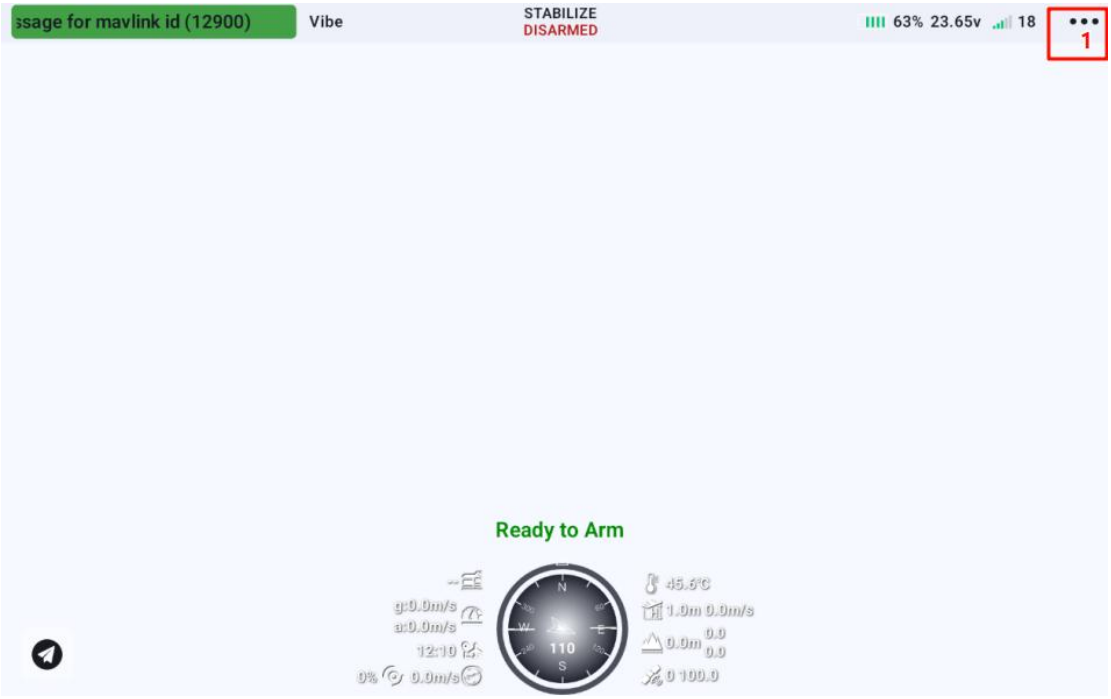
3.1.1 Flight Information

3.2 Quick Start Example

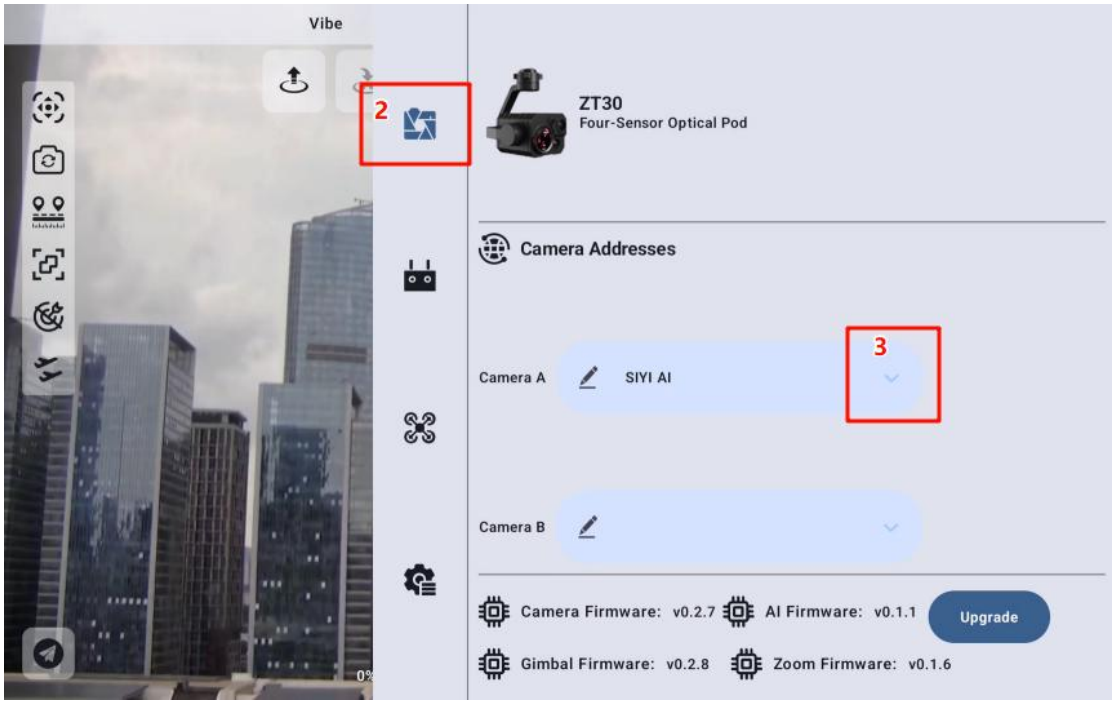
The following is an example of camera output, drone connection, and quick takeoff.

3.2.1 Camera Output

Step 1: Tap the three dots in the top-right corner.



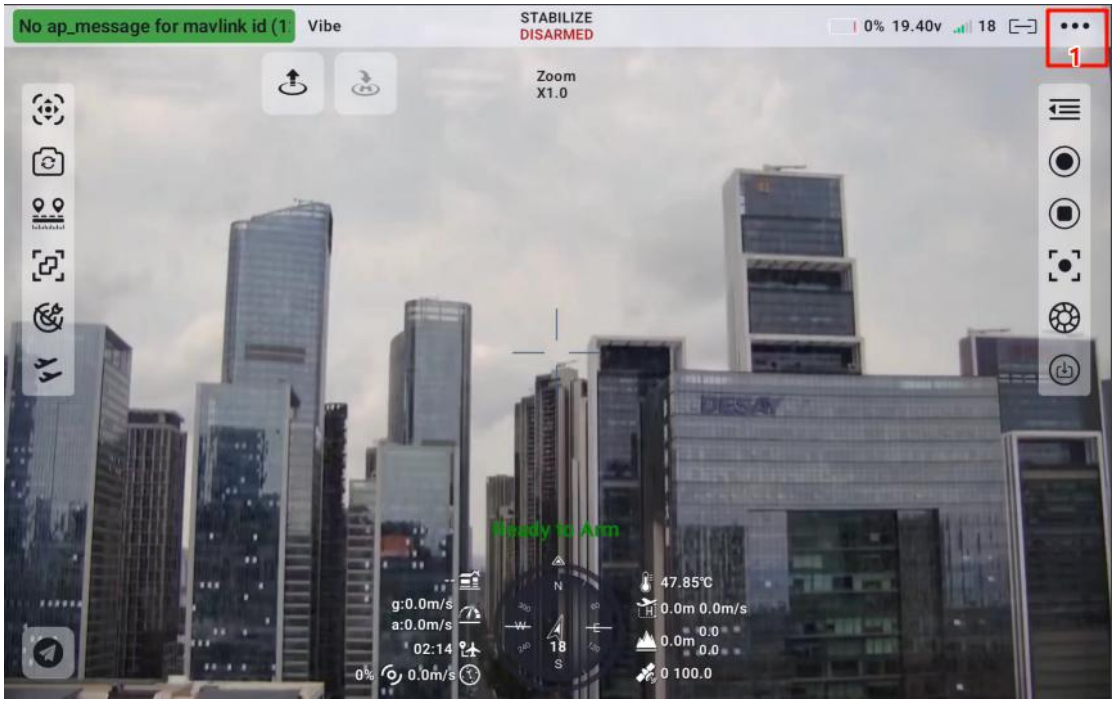
Step 2: Select the Camera Module.



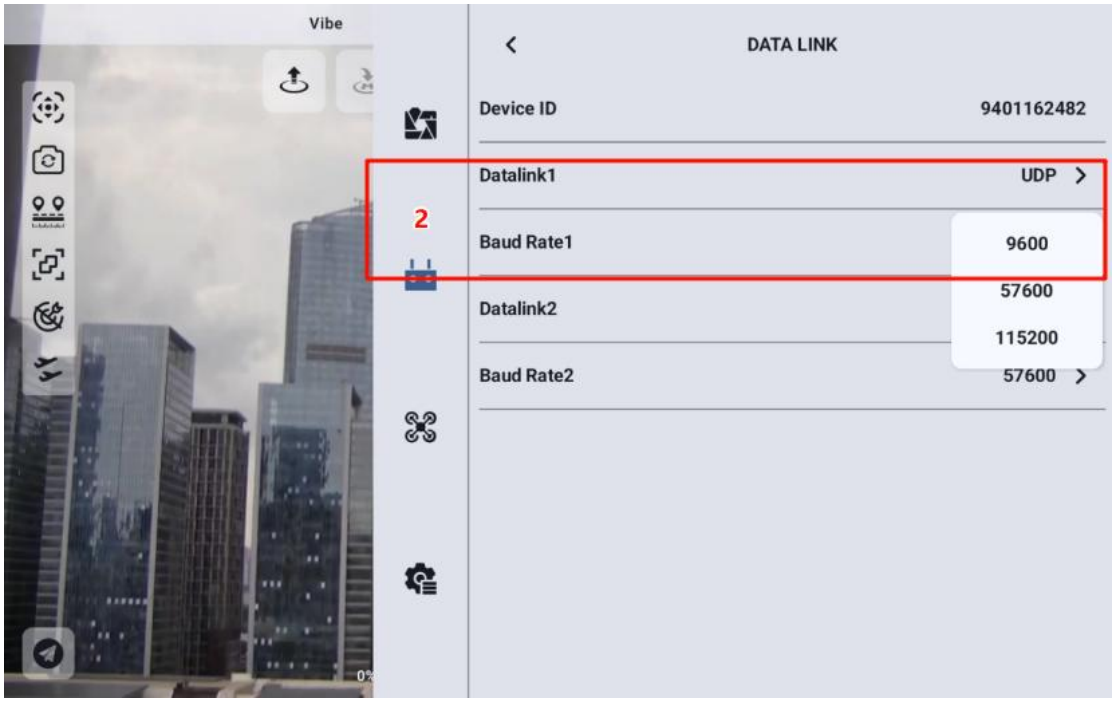
Step 3: Tap the downward triangle in the camera address bar and select the correct camera address. Alternatively, tap the pencil icon to manually enter the camera address as prompted.

3.2.2 Data Link Connection

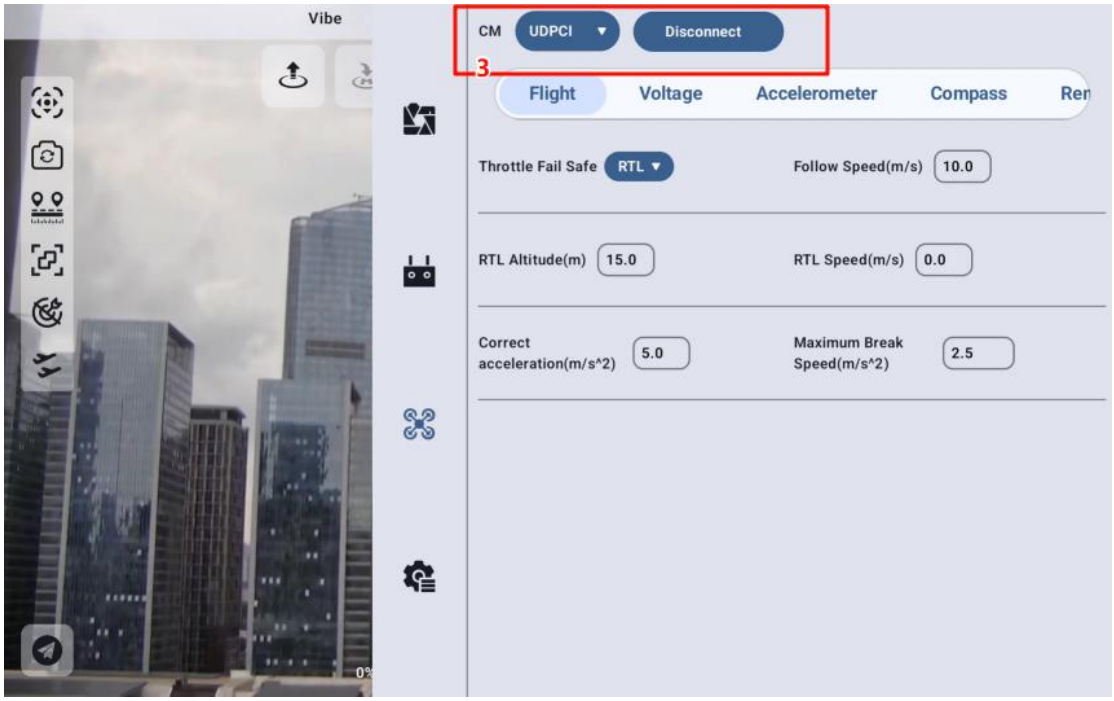
Step 1: Tap the three dots in the top-right corner.



Step 2: Set Data Link 1 to UDP, and set the baud rate to 57600 (ensure it matches the baud rate set in the flight controller, default is 57600).

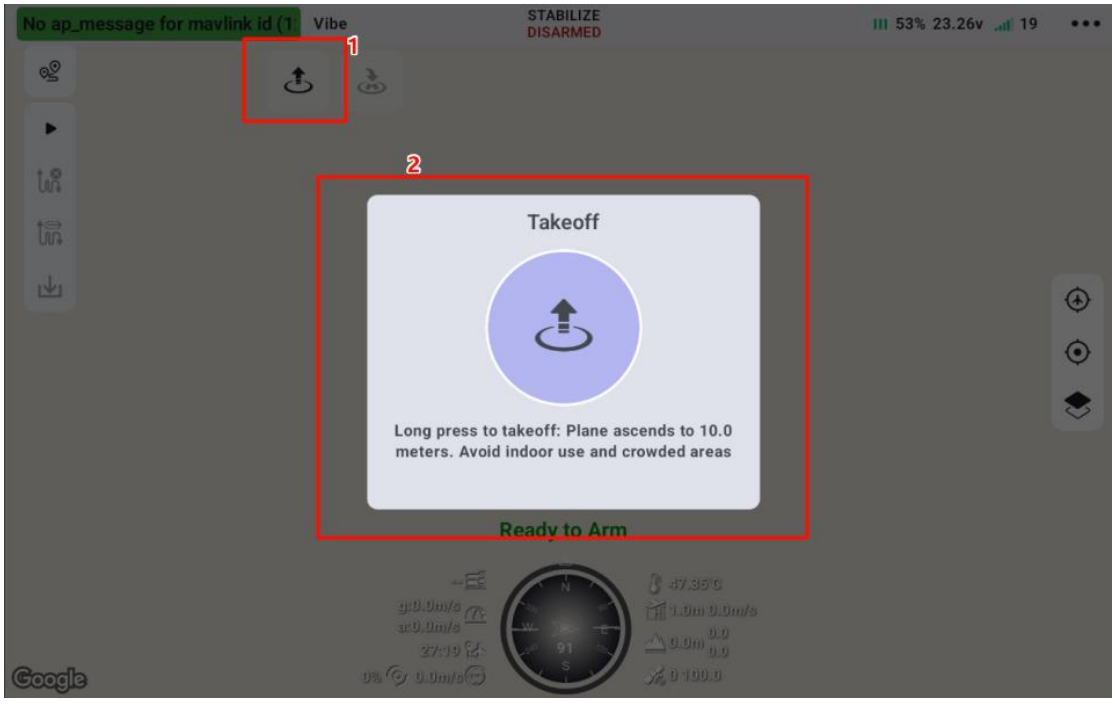


Step 3: Set the connection type to UDPCL, then click Connect. Enter the address as prompted and click Confirm to establish the connection.

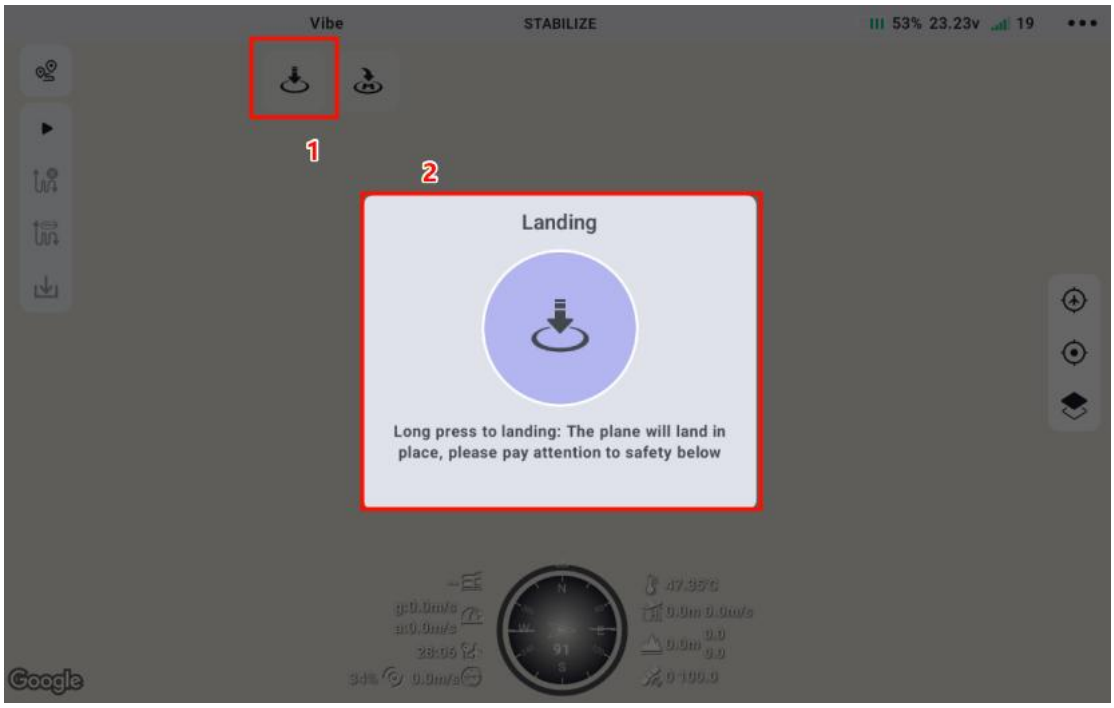


3.2.3 Shortcut Buttons

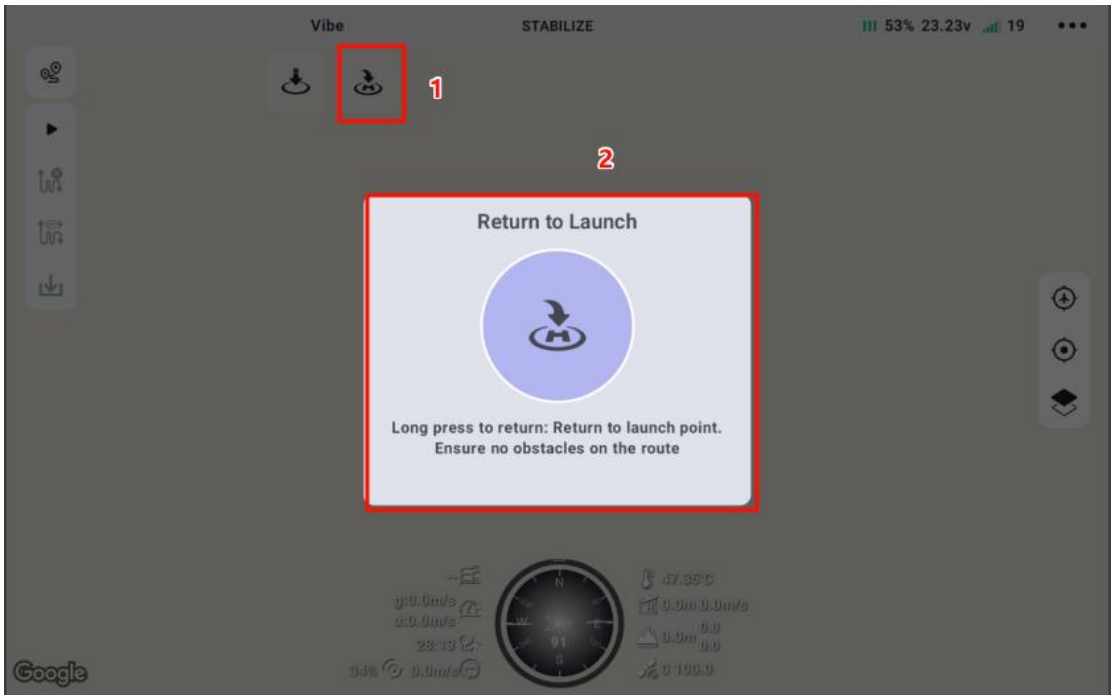
One-Touch Takeoff: Tap the one-touch takeoff button, then press and hold the button as prompted. The drone will climb to 10 meters and hover in place.



One-Touch Landing: Tap the one-touch landing button, and the drone will land at its current position.



One-Touch Return: Tap the one-touch return button, and the drone will climb to the return altitude and fly back to the takeoff point.



4 Core Function Instructions

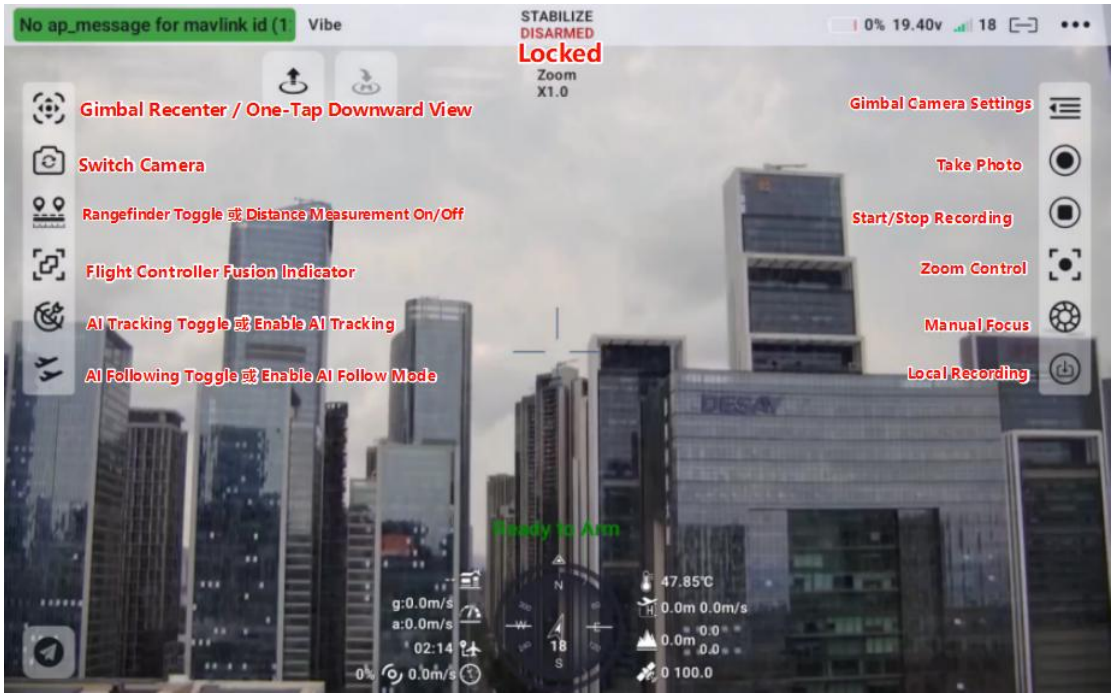
The core functions include: Camera Module, Remote Control Module, Flight Control Module, and Flight Route Module.

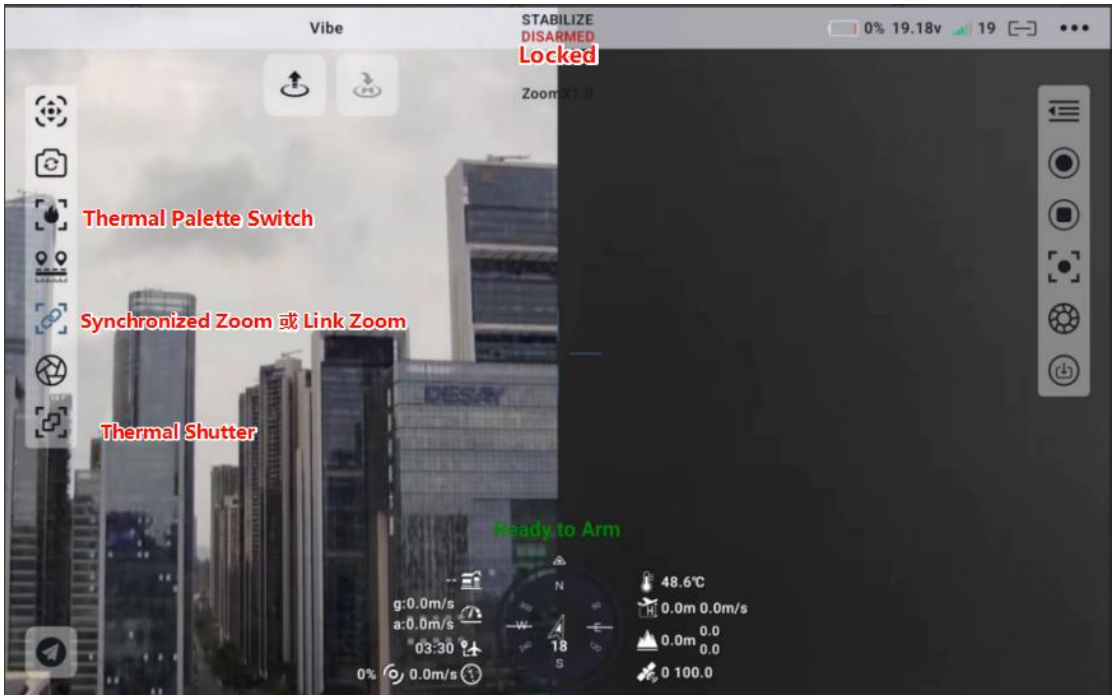
4.1Camera Module

Mainly includes camera stream address selection, camera version information, and various control buttons.

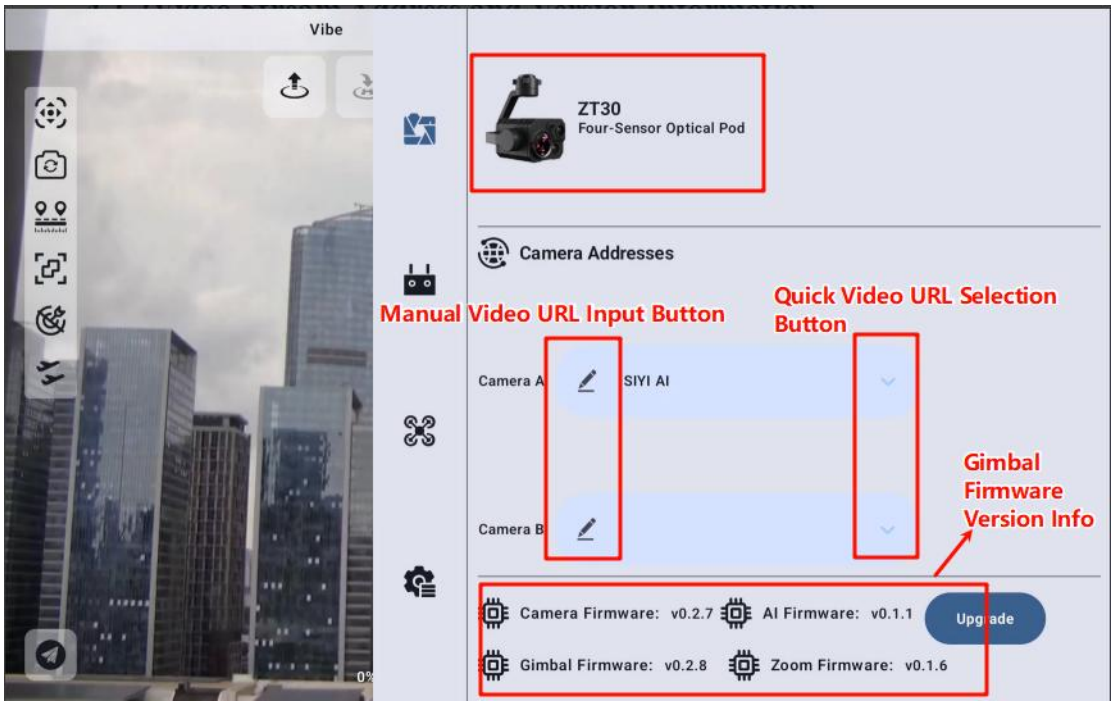
4.1.1Camera Main Menu

Preview of the functions of each button in the Camera Main Menu.





4.1.2Video Stream Address and Version Information



Main Stream / Sub Stream: Set the camera source and parameters for the main and sub streams respectively.

Address Settings: Configure the SIYI series cameras, main or sub stream,

select the default camera address or manually input the RTSP address, disable image display, etc.

Note: When manually entering the address, ensure that punctuation marks are in English mode.

Version Information:

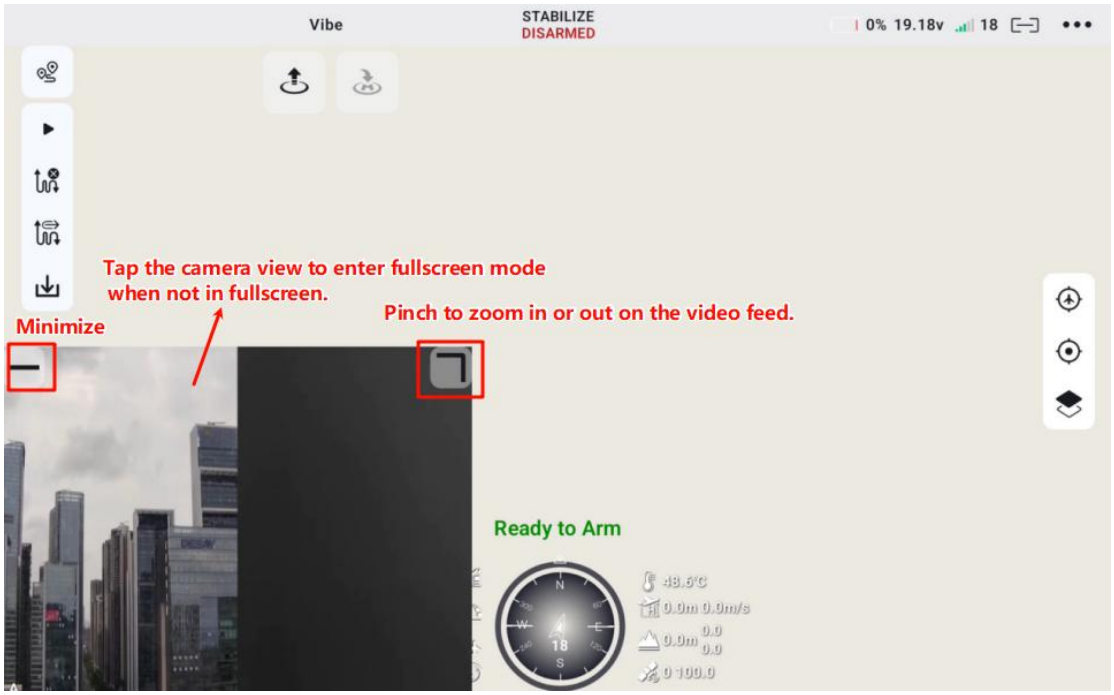
Camera Firmware Version: Displays the current camera firmware version.

Gimbal Firmware Version: Displays the current gimbal firmware version.

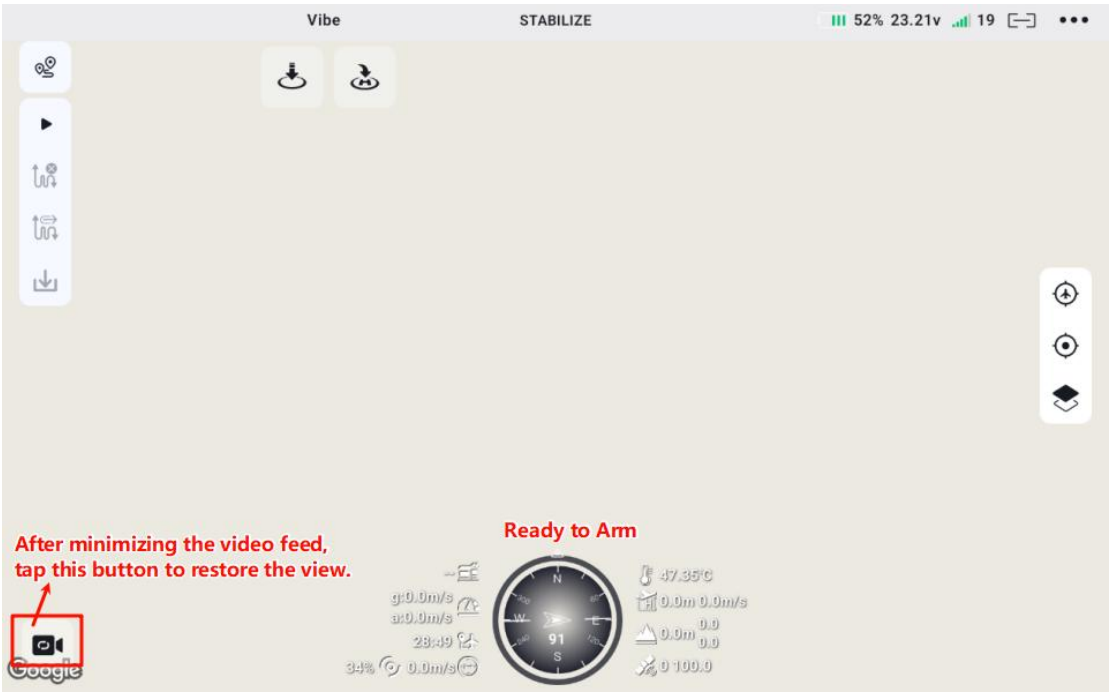
Zoom Firmware Version: Displays the current zoom firmware version (only supported for optical zoom cameras).

4.1.3 Camera Display Operations

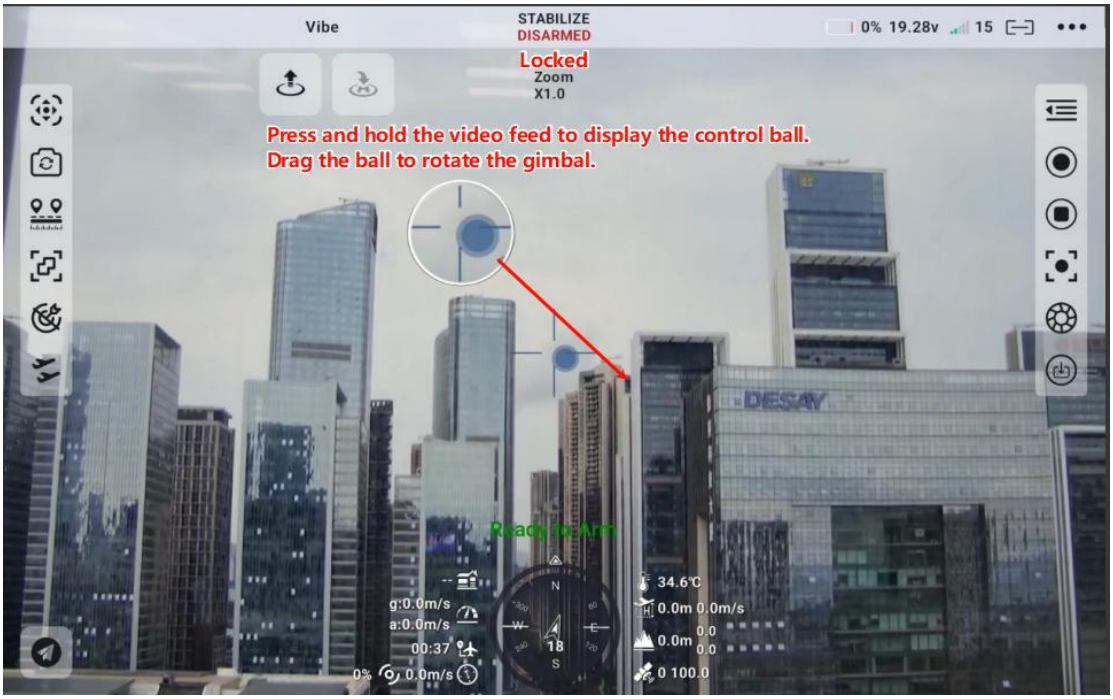
When the camera display is not in full screen, click the minimize button to hide the display. You can also drag the arrow at the top of the display to zoom in or out. Single-click the small window display to expand it to full screen.



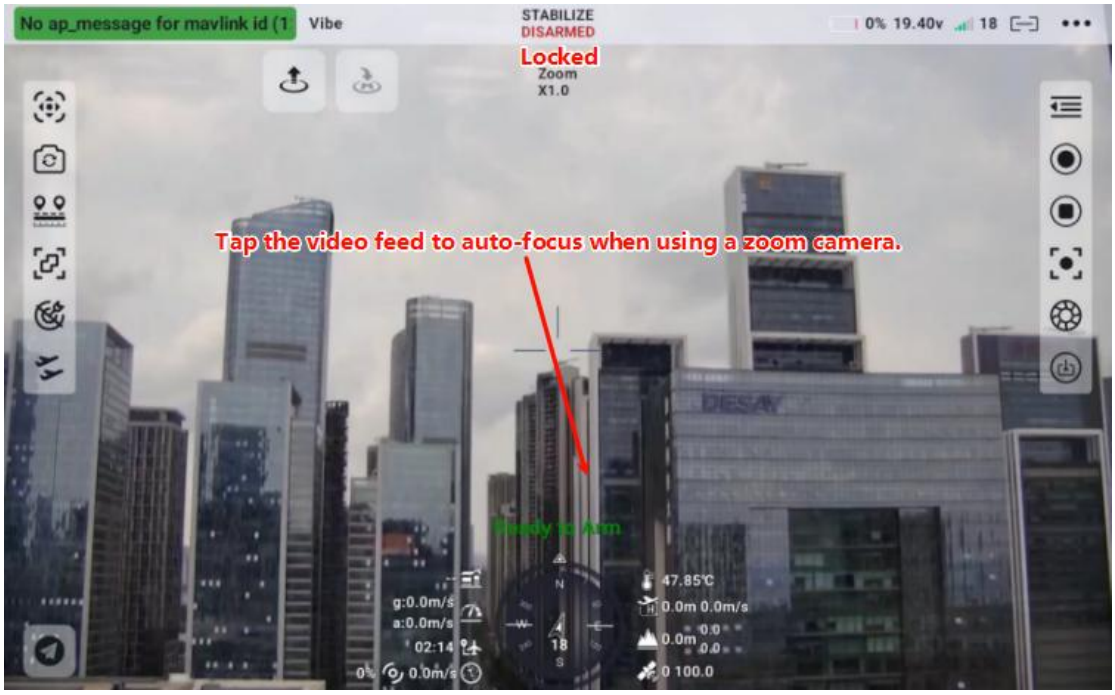
After minimizing the display, click the camera button to bring the display back up.



Long press anywhere on the screen, and when a small ball appears at the pressed location, drag the ball to rotate the camera.



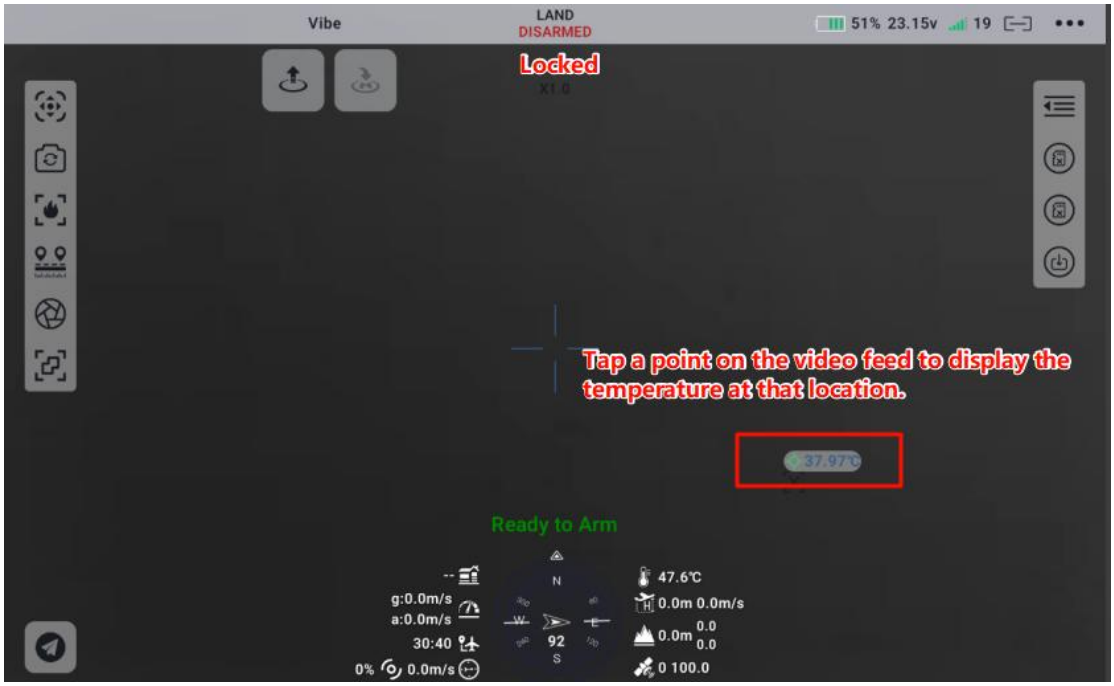
When the display shows a zoom camera, single-click anywhere on the screen to auto-focus on that location.



4.1.4 Thermal Imaging Temperature Measurement

4.1.4.1Spot Temperature Measurement:

Measure the temperature of a single point within the display. Simply click on a point in the display to show the current temperature information for that point.

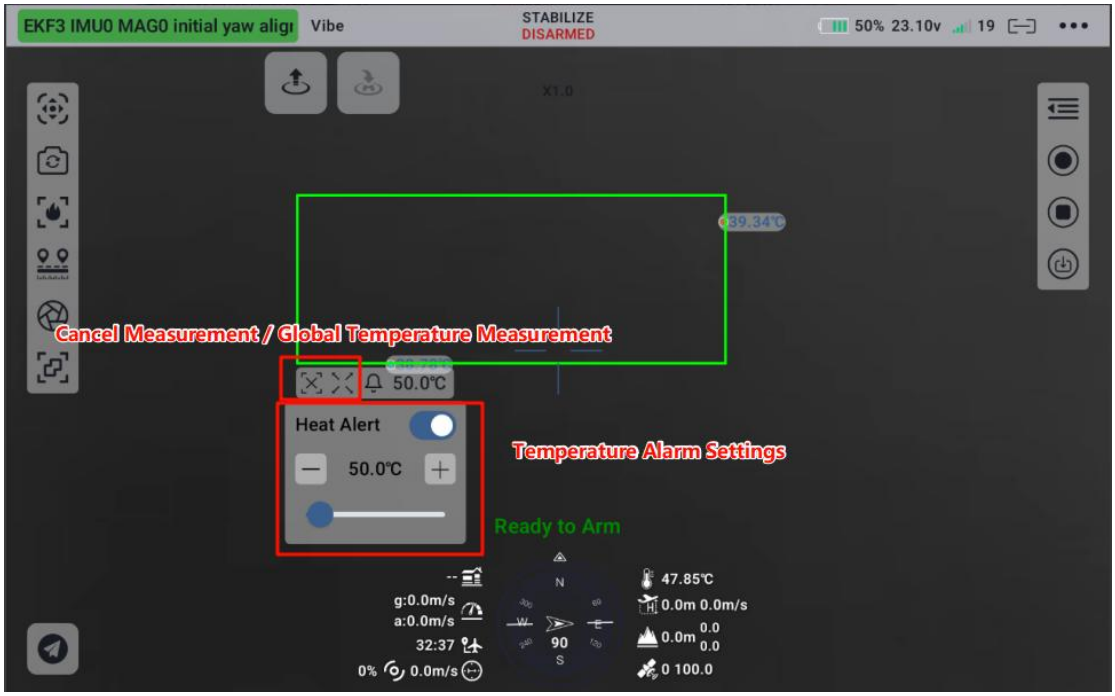


4.1.4.2 Area Temperature Measurement:

Measure the temperature of a specific area within the display. Press and drag to select an area on the screen, and the maximum and minimum temperatures within the selected range will be displayed. It also supports spot temperature measurement by single-clicking. Click the "Cancel Measurement" button to disable the temperature measurement function.

4.1.4.3 Over-Temperature Alarm

By clicking on the alarm temperature, you can set the over-temperature alarm threshold. Use the plus and minus buttons or drag the slider to adjust the alarm threshold. An alarm will be triggered when the temperature within the selected area reaches the set threshold.



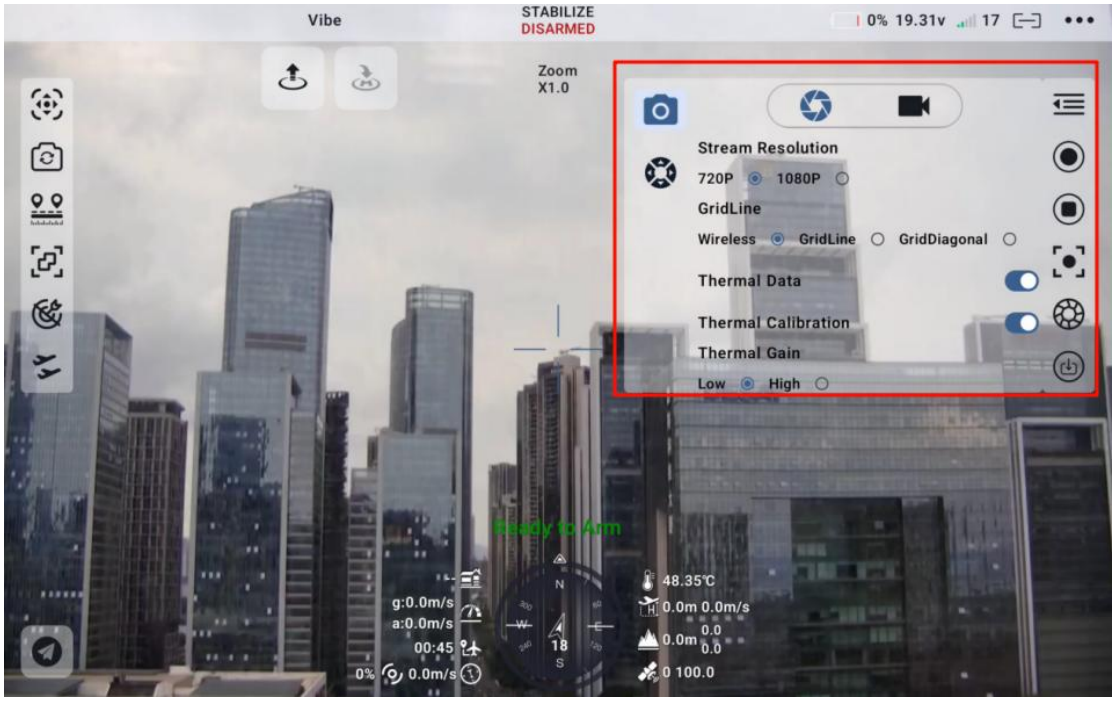
4.1.4.4Global Temperature Measurement:

By clicking the Global Temperature Measurement button below the area temperature measurement box, you can measure the temperature across the entire display. The maximum and minimum temperatures within the selected range will be displayed. It supports setting over-temperature alarms and also allows spot temperature measurement by single-clicking. Click the "Cancel Measurement" button to disable the temperature

measurement function.

4.1.5 Gimbal Camera Settings

Set the relevant parameters for the gimbal and camera.



4.1.5.1 Stream Resolution:

Determine whether to switch the current video stream resolution based on the source. Supports HD (720p) and Ultra-HD (1080p) stream resolutions.

Auto Record on Startup: Enable/disable automatic video recording to the TF card upon startup.

4.1.5.2 Grid Lines:

Overlay grid lines and diagonals on the camera screen for compositional assistance.

4.1.5.3 Thermal Imaging Raw Data:

Some thermal imaging cameras support saving photos and outputting raw data (i.e., a complete 640x512 resolution temperature frame).

- Imaging Only: Only outputs thermal imaging video stream.
- With Raw Data: Saving a photo will also save the thermal imaging raw data.

4.1.5.4 Thermal Imaging Environmental Correction:

- The thermal imaging camera's temperature measurement results are influenced by factors such as surrounding reflective temperatures, atmospheric temperature, target temperature, target emissivity, atmospheric transmittance, and target distance. To obtain accurate temperature measurements, environmental variable calibration is required for the thermal imaging camera.

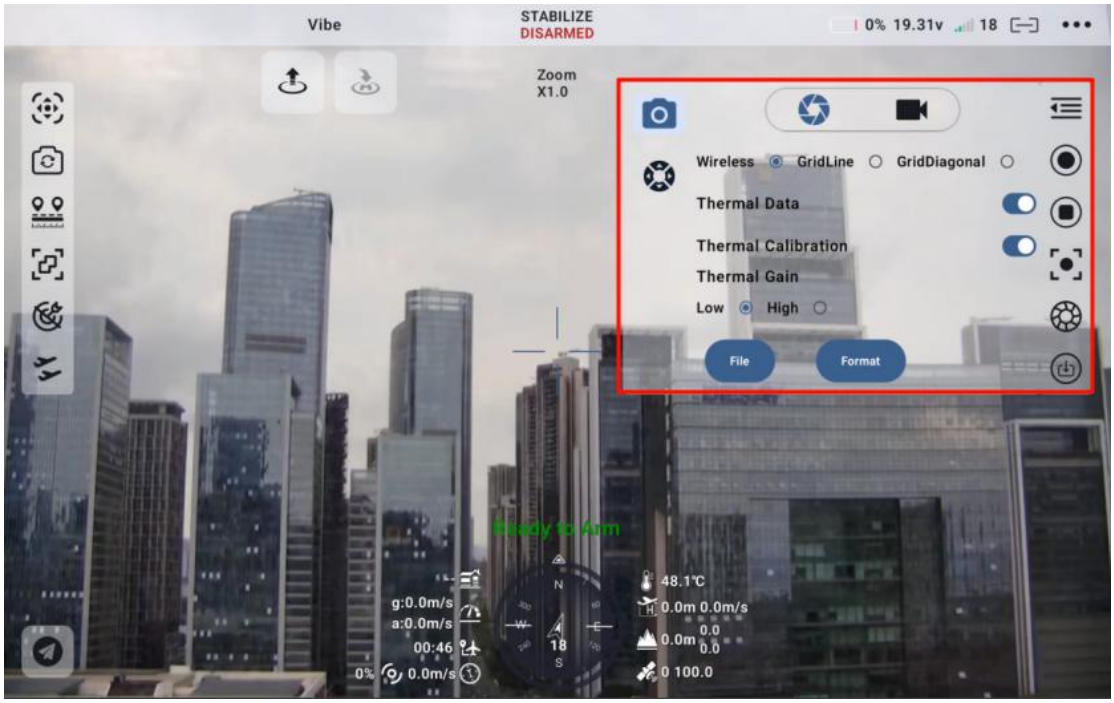
4.1.5.5 Thermal Imaging Gain:

The thermal imaging camera supports switching between high gain and low gain to meet different temperature measurement range requirements.

- High Gain Measurement Range: -20 ~ +150°C (±2°C)
- Low Gain Measurement Range: 0 ~ +550°C (±5°C)

4.1.5.6 File Management:

Preview photos and videos stored on the TF card, and format the TF card.



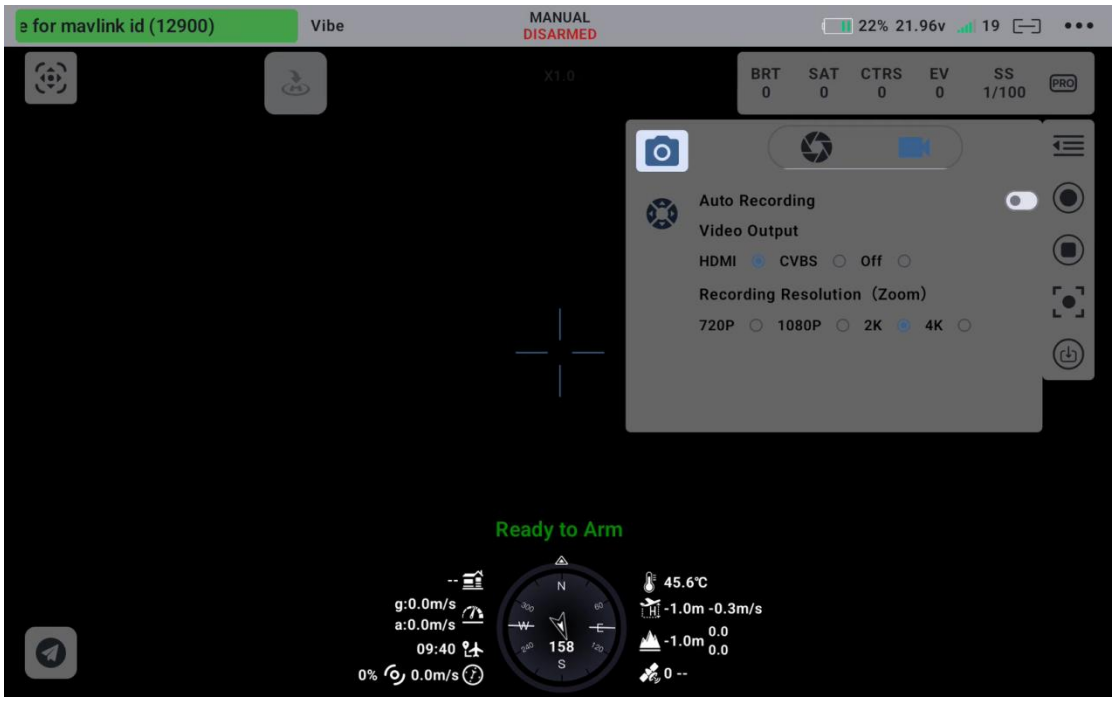
4.1.5.7 Video Recording Resolution:

Switch the camera's recording resolution based on the current video source. Supports HD (720p), Ultra-HD (1080p), 2K, and 4K resolutions.

4.1.5.8 Video Output Interface

Switch the video output interface of the camera.

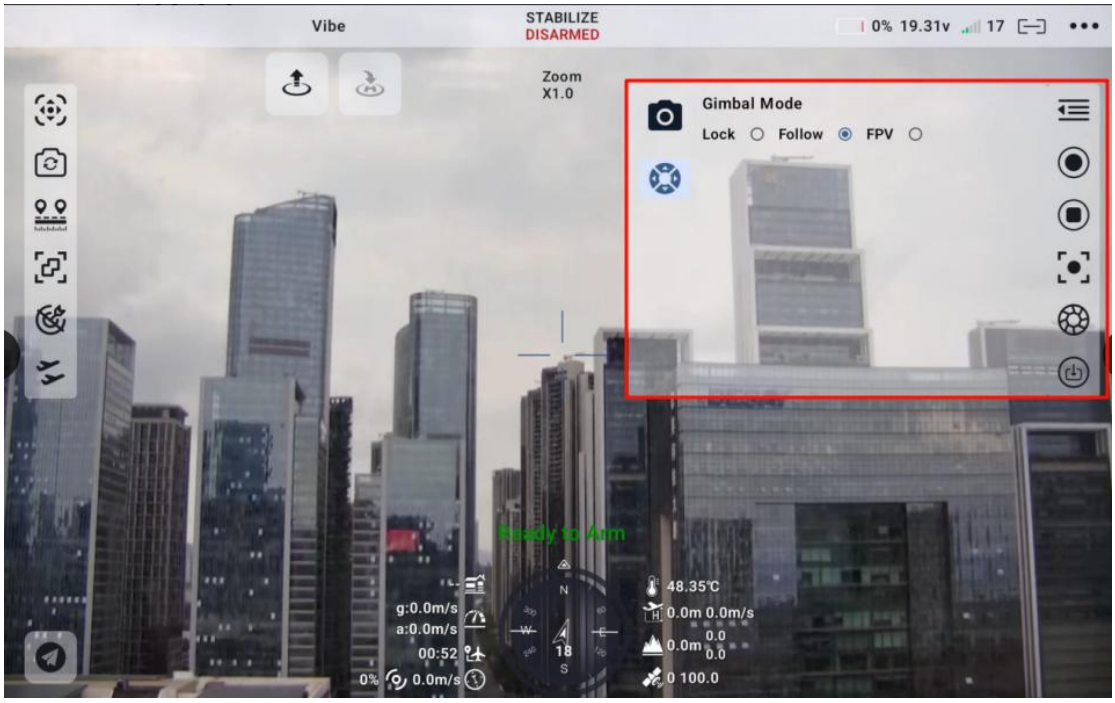
- HDMI: Output video via the Micro-HDMI interface on the gimbal camera (only supported by ZT6, ZR30, A8 mini).
- CVBS: Output video via the CVBS pin on the gimbal camera’s network port as an analog signal (only supported by ZT6, A8 mini).
- Off: Only output video via the gimbal camera's network port.

- 

4.1.5.9 Gimbal Work Modes:

Switch between different gimbal work modes:

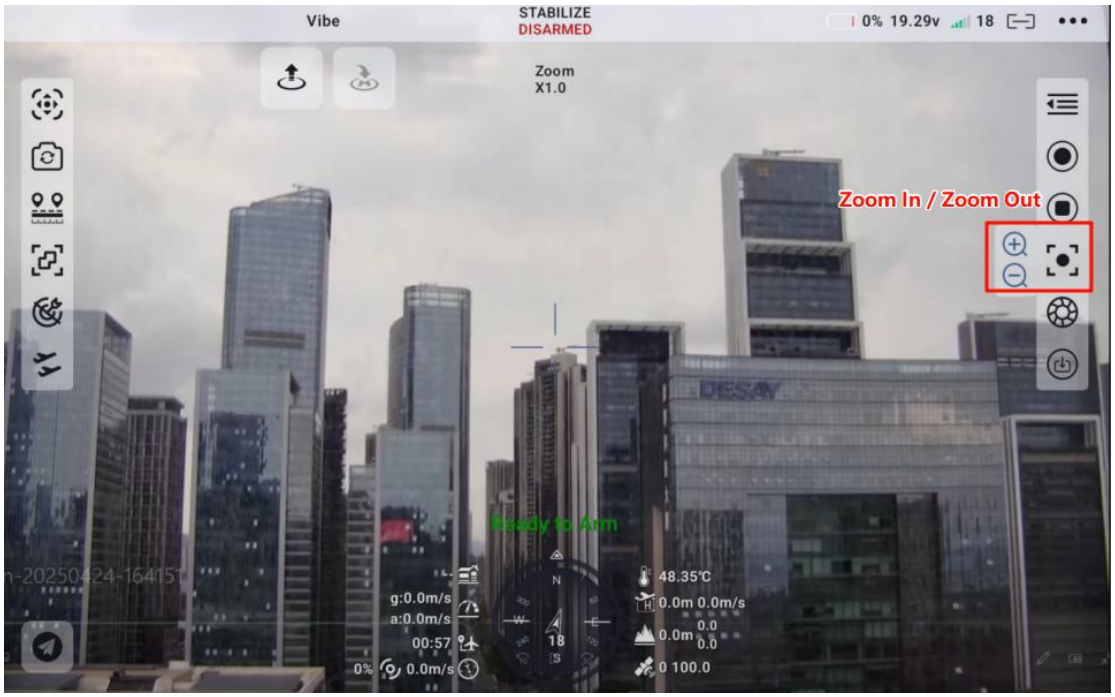
- Lock Mode: The gimbal does not follow the drone's movement in the horizontal direction. It remains locked in place as the drone rotates.
- Follow Mode: The gimbal automatically follows the drone's horizontal rotation, keeping the camera aligned with the flight direction.
- FPV Mode: The gimbal follows the drone's roll direction, providing a first-person view with enhanced stabilization for a smooth flying experience.
- AI Tracking Mode: When the gimbal camera is connected to the AI tracking module and the feature is activated, the system will operate exclusively in AI tracking mode.

- 

4.1.6 Camera Control

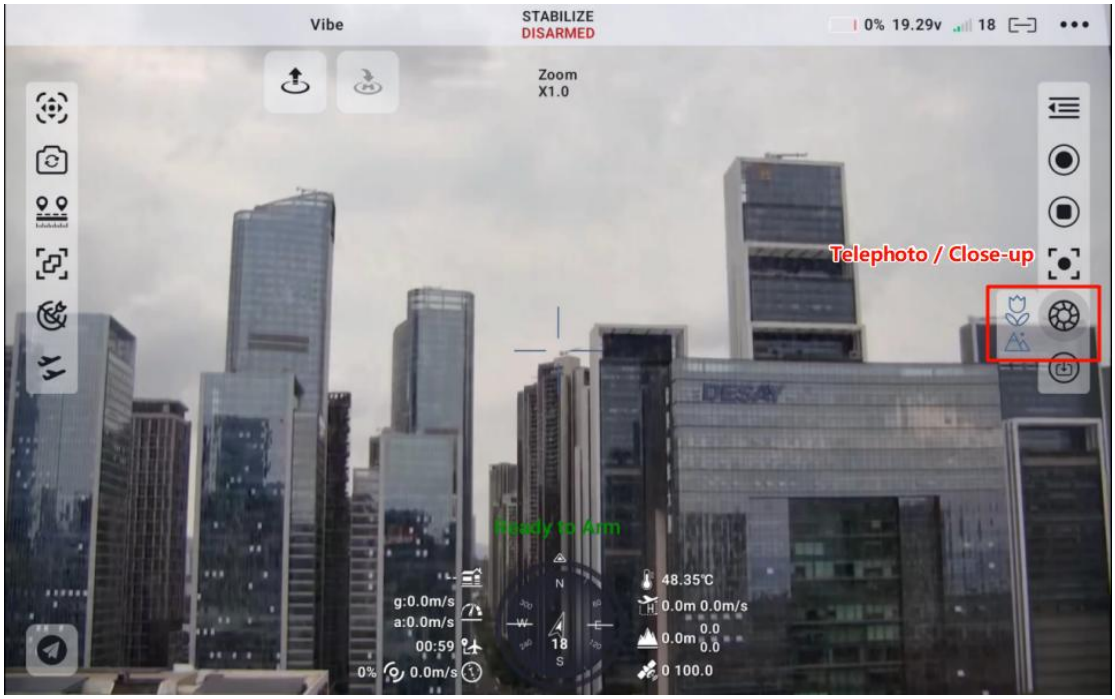
4.1.6.1 Camera Zoom:

Control the zoom camera to zoom in and out. A single click corresponds to a one-time operation, while a long press corresponds to a continuous operation.



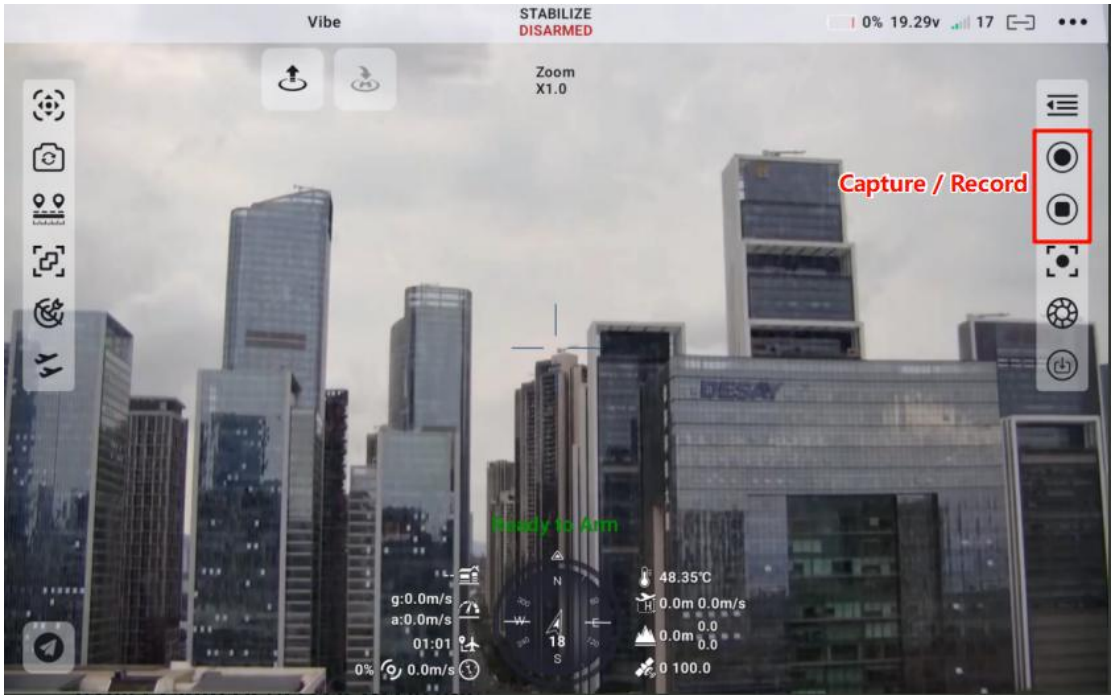
4.1.6.2 Manual Focus

Manually adjust the focus of the camera. A single click corresponds to a one-time operation, while a long press corresponds to a continuous operation.



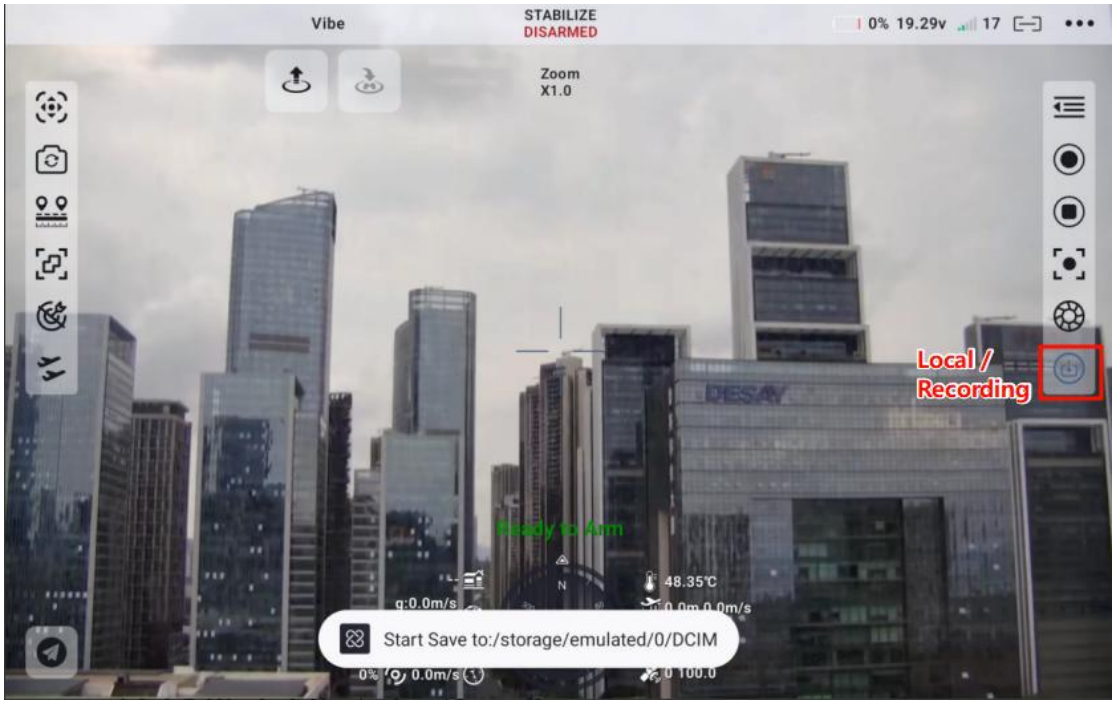
4.1.6.3 Photo and Video Recording

Control the camera to take photos and start or stop video recording. A single click on the photo button captures a photo, and a success message will appear on the screen. When the video button is square, click it to start recording, and the button will turn into a red circle. At this point, the recording time and resolution will appear in the top title bar. Clicking the button again will stop the recording, and the recording time and resolution will disappear from the title bar.



4.1.6.4 Camera Screen Recording

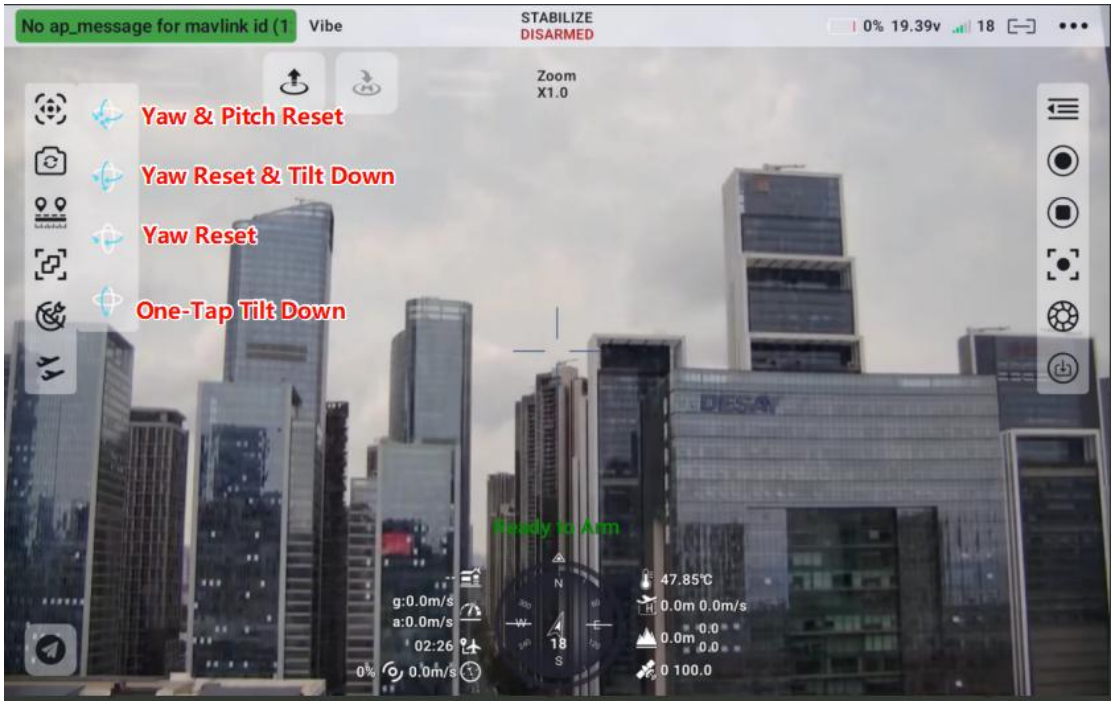
Record the camera screen on the remote controller and save it locally. Click the local recording button, which will highlight to indicate that recording has started, and a reminder will appear to confirm the save location. Clicking the button again will stop the recording.



4.1.6.5 Gimbal Centering / Lens Down

Center the gimbal's single-axis and multi-axis, and perform one-touch lens down when the gimbal is mounted upright.

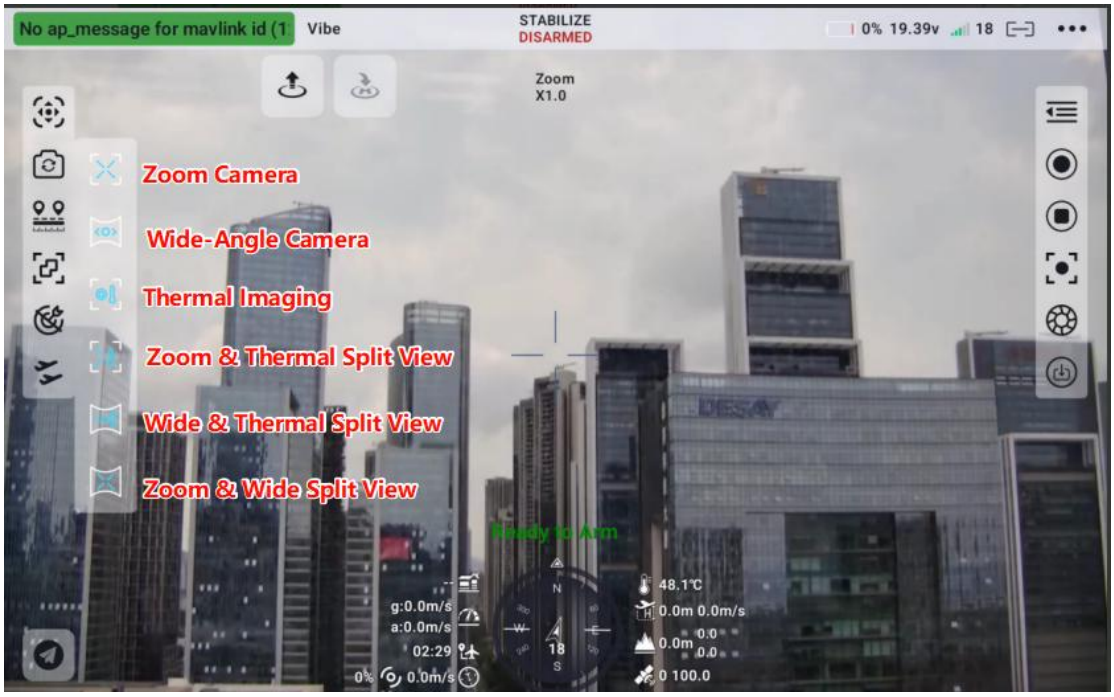
- Clicking the yaw and pitch centering button will automatically center the yaw and pitch axes.
- Clicking the yaw centering and one-touch lens down button will automatically center the yaw axis and tilt the pitch axis down.
- Clicking the yaw centering button will automatically center the yaw axis.
- Clicking the one-touch lens down button will automatically center the pitch axis.



4.1.6.6 Lens Switching

Taking the ZT30 as an example, the ZT30 supports zoom, wide-angle, thermal infrared, zoom wide-angle dual-display, zoom thermal imaging dual-display, and wide-angle thermal imaging dual-display. Other cameras will vary based on actual conditions.

- Clicking the zoom button will switch the display to the zoom lens view.
- Clicking the wide-angle button will switch the display to the wide-angle lens view.
- Clicking the thermal imaging button will switch the display to the thermal imaging lens view.
- Clicking the zoom thermal imaging dual-display button will switch the display to show both zoom and thermal imaging lenses.
- Clicking the wide-angle thermal imaging dual-display button will switch the display to show both wide-angle and thermal imaging lenses.
- Clicking the zoom wide-angle dual-display button will switch the display to show both zoom and wide-angle lenses.



4.1.6.7 Thermal Imaging Pseudocolor:

Switching between different thermal imaging colors to meet the needs of various scenarios.

1. White Hot

- **Characteristics:** High-temperature areas appear white, low-temperature areas appear black, with a grayscale transition in between.
- **Application Scenarios:**
    - **General Inspection:** Default mode, suitable for most industrial inspection scenarios (such as temperature detection of electrical equipment and mechanical components).
    - **Security Surveillance:** Nighttime personnel or animal

detection, with strong human eye adaptability, making it ideal for long-term observation.

    - **Building Thermal Bridge Detection:** Quickly identifies insulation defects or heat leakage spots through high contrast.

- **Advantage:** High contrast, visually intuitive, and not prone to fatigue.

2. Golden

- **Features:** Primarily golden tones, with high-temperature areas in bright gold and low-temperature areas in deep brown.
- **Application Scenarios:**
    - **Low-light Environment Observation:** Such as nighttime military or law enforcement operations, offering better concealment than rainbow colors and reducing visual stimulation.
    - **Industrial Equipment Monitoring:** Temperature analysis of metal surfaces, with a soft color tone that is suitable for extended use.
- **Advantages:** Soft tones that reduce visual fatigue and meet concealment needs.

3. Iron/Red Hot

- **Features:** Deep blue (low temperature) → red → white (high

temperature), with strong contrast.

- **Application Scenarios:**
  - **High-temperature Industrial Inspection:** Metallurgy, welding, boilers, etc., highlighting high-temperature danger zones.
  - **Electrical Equipment Hotspot Detection:** Temperature anomaly detection in areas such as transformers and cable joints.
- **Advantages:** High-temperature areas are prominent, making it suitable for quickly locating thermal faults.

4. Low Light/Night Vision

- **Features:** Primarily green tones, similar to night vision displays, with low temperatures in dark green and high temperatures in bright green/yellow.
- **Application Scenarios:**
  - **Nighttime Military/Security:** Compatible with night vision equipment, reducing glare interference.
  - **Wildlife Observation:** Minimizes disturbance to animals in low-light environments.
  - **Industrial Low-Light Inspection:** Such as monitoring equipment in mines or factories at night.
- **Advantages:** Adapts to dark environments and protects human eye

dark vision.

5. Arctic

- **Features:** Cool tones (deep blue → cyan → white), highlighting low-temperature areas.
- **Application Scenarios:**
  - **Refrigeration System Inspection:** Locating low-temperature leak points in air conditioning pipelines and cold chain logistics.
  - **Polar Scientific Research:** Analyzing temperature distribution of ice layers or snow in low-temperature environments.
- **Advantages:** Optimizes visualization of low-temperature ranges, enhancing the recognition of low-temperature details.

6. Red Hot

- **Features:** Predominantly red tones, with high temperatures displayed in bright red/white and low temperatures in dark red/black.
- **Application Scenarios:**
  - **Firefighting and Rescue:** Monitoring temperature distribution in fire scenes, quickly locating the core of the flames.
  - **Industrial High-Temperature Processing:** Monitoring

processes such as furnaces or glass manufacturing.

- **Advantages:** High-temperature targets are highly visible, making it suitable for quick responses in hazardous environments.

7. Medical

- **Features:** High-contrast rainbow color palette, optimized for human body temperature range (30°C–42°C).
- **Application Scenarios:**
  - Body temperature screening: Rapid identification of individuals with fever.
  - Medical diagnostics: Detection of inflamed areas and analysis of blood circulation.
- **Advantages:** Fine-tuned display for human body temperature, enhancing sensitivity to subtle temperature differences.

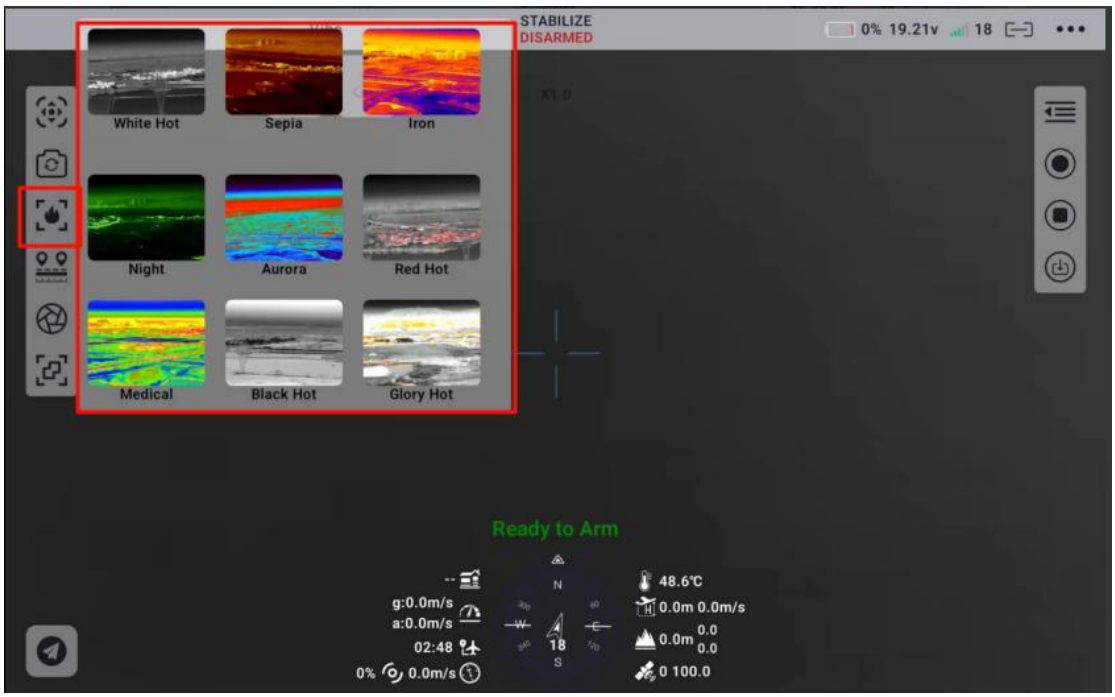
8. Black Hot

- **Features:** High-contrast rainbow colors, optimized for the human body temperature range (30°C–42°C).
- **Application Scenarios:**
  - **Temperature Screening:** Rapid identification of feverish patients.
  - **Medical Diagnosis:** Detection of inflammation areas and blood circulation analysis.
- **Advantages:** Refined display of body temperature, enhancing

sensitivity to small temperature differences.

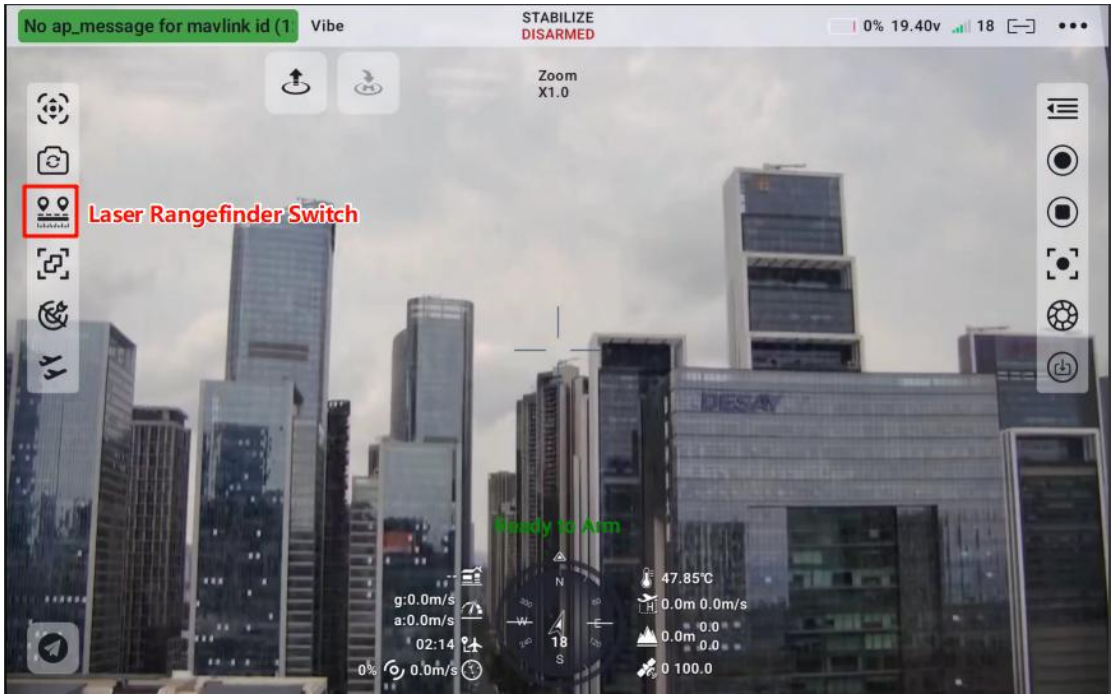
9. Gold/Red Fusion

- **Features:** A blend of gold and red, with high-temperature areas in golden red and low-temperature areas in deep blue.
- **Application Scenarios:**
    - **High-temperature Industrial Inspection:** Such as steelmaking and glass manufacturing, offering both high contrast and aesthetic appeal.
    - **Scientific Experiments:** Visualization of high-temperature chemical reactions or material phase transitions.
- **Advantages:** Dynamic color transitions enhance the ability to analyze complex scenarios.



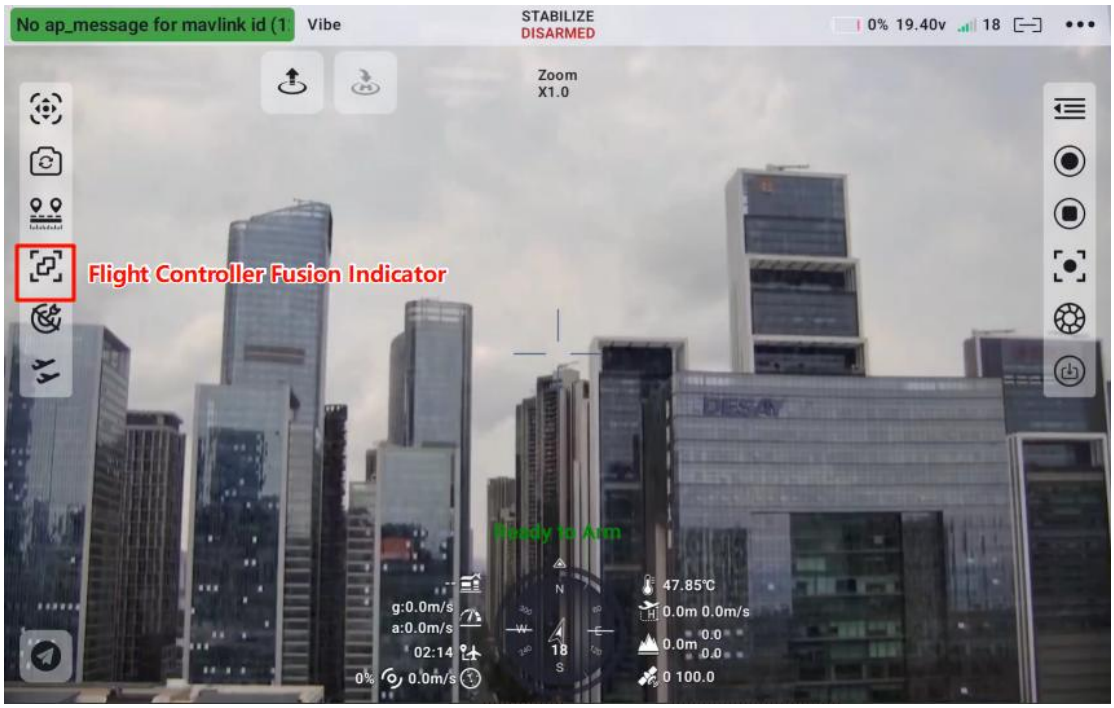
4.1.6.8 Range Finder Switch:

Turn the laser rangefinding function on or off by clicking the range finder switch. When activated, the button changes color. Point the lens center at the desired measurement location, and the distance from the lens to the target will be displayed on the screen. Click the color-changing button again to turn off the rangefinding function.

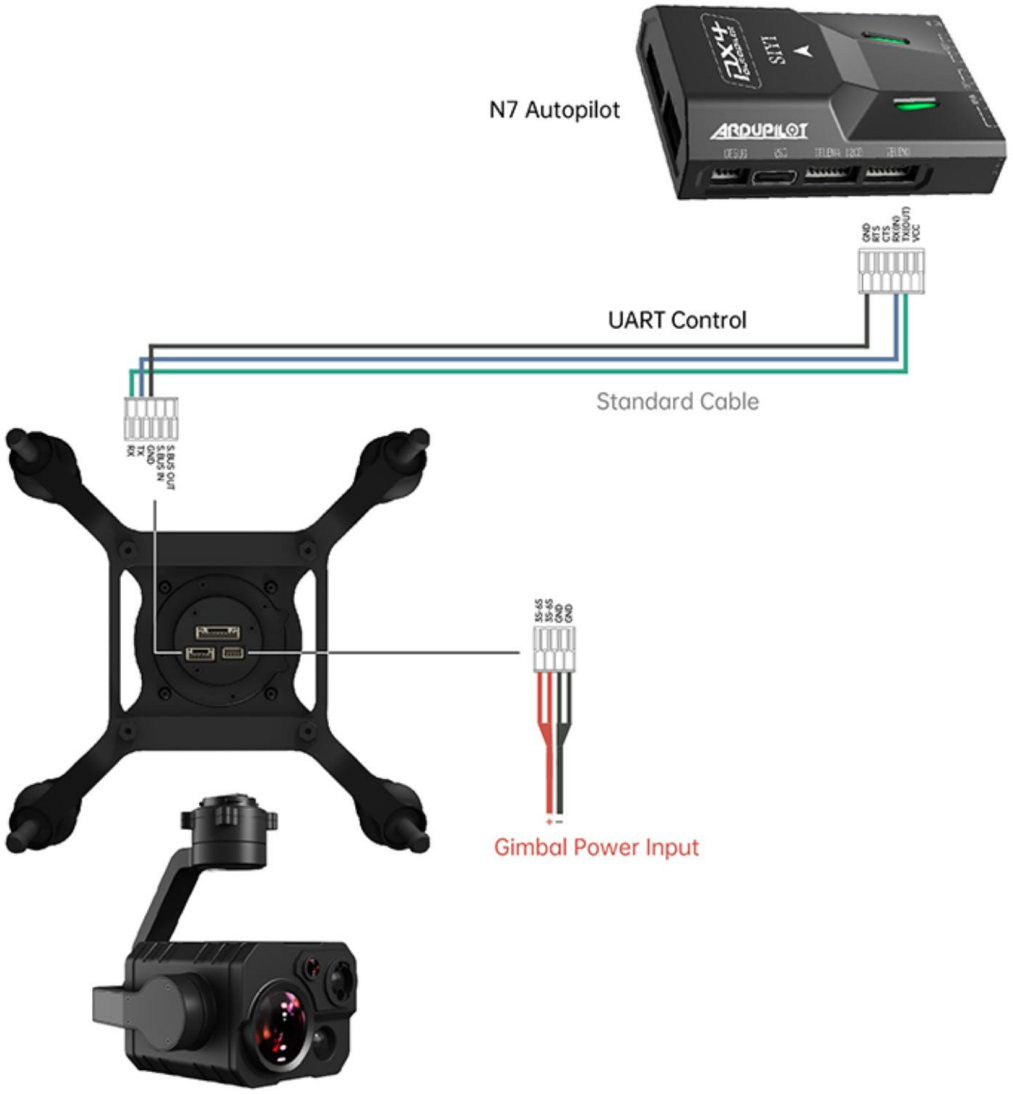


4.1.6.9 Flight Control Fusion Indicator:

This indicator appears when the gimbal is fused with the flight control system. The integration of flight control attitude data enhances the gimbal's performance during the aircraft's high-maneuverability flight states.



Through the UART serial port, the SIYI gimbal camera (electro-optical pod) can be controlled by the ArduPilot driver and fused with the flight control attitude data. The SIYI gimbal camera (electro-optical pod) UART serial port can be directly connected to the ArduPilot flight control serial port for communication with the flight control system, allowing the ArduPilot commands to control the gimbal's attitude and camera functions.



Preparation Work

Before use, it is necessary to prepare the following tools, firmware, and software:

- ArduPilot flight controller (firmware version 4.4.4 or above)
- SIYI optical pod (gimbal camera)

Note: The above products can be purchased from SIYI Technology and its authorized distributors.

- SIYI gimbal to PX4 / ArduPilot flight controller UART connection cable

Note: The above tools are included as standard accessories with the product packaging.

- UniGCS Android or UniGCS PC

Usage Steps:

1. Power up both the SIYI gimbal and ArduPilot flight controller separately.
2. Connect the gimbal serial port to the ArduPilot flight controller serial port to establish communication between the devices.
3. Run the ground station software and set the following parameters:

   Gimbal Camera Control

   Taking the use of the TELEM 2 interface and Camera 1 control with the flight controller as an example:

- Set SERIAL2_PROTOCOL to 8 ("SToRM32 Gimbal Serial")
- Set SERIAL2_BAUD to 115 (115200 baud rate)
- Set MNT1_TYPE to 8 ("SIYI") and reboot the flight controller
- Set MNT1_PITCH_MIN to -90

- Set MNT1_PITCH_MAX to 25
- Set MNT1_YAW_MIN to -160
- Set MNT1_YAW_MAX to 160
- Set MNT1_RC_RATE to 90 (deg/s) to control the gimbal speed when using the remote control
- Set CAM1_TYPE to 4 ("Mount / SIYI") to enable camera control
- Set RC6_OPTION to 213 ("Mount Pitch") to control the gimbal pitch via channel 6
- Set RC7_OPTION to 214 ("Mount Yaw") to control the gimbal yaw via channel 7
- Set RC8_OPTION to 163 ("Mount Lock") to switch between "Lock" and "Follow" modes via channel 8

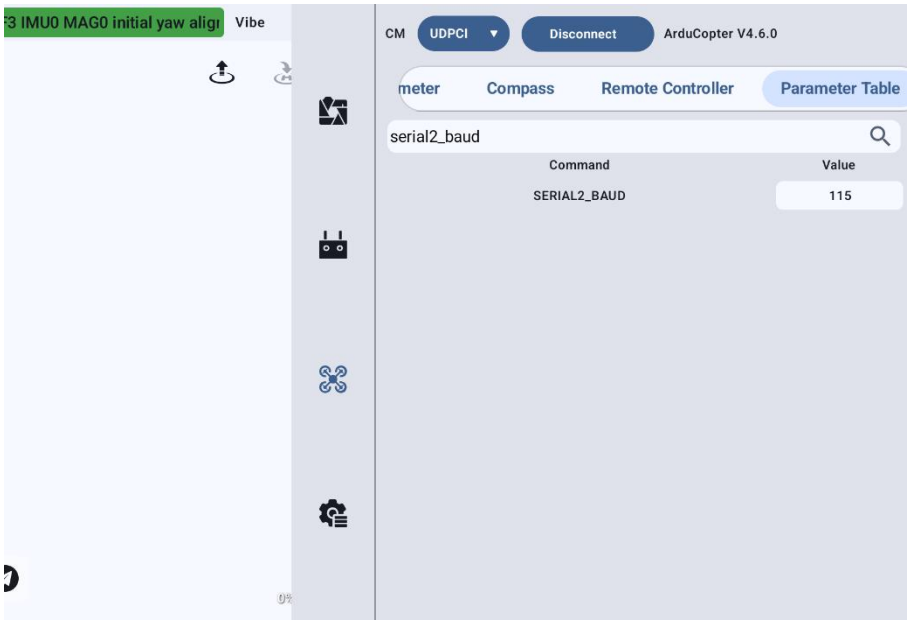
The following auxiliary functions are also available:

- Set RC9_OPTION to 166 ("Camera Record Video") to start or stop video recording
- Set RC9_OPTION to 167 ("Camera Zoom") to control zoom
- Set RC9_OPTION to 168 ("Camera Manual Focus") to manually focus
- Set RC9_OPTION to 169 ("Camera Auto Focus") to automatically focus

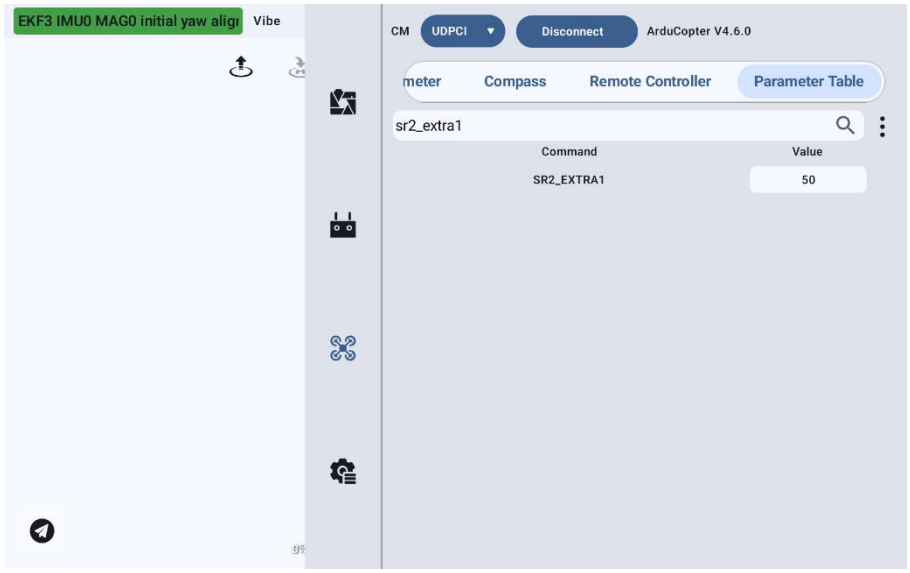
Fusion with Flight Controller Attitude Data

Using the TELEM 2 interface of the flight controller as an example:

- Set SERIAL2_BAUD to 115 (i.e., 115200 baud rate)



- Set SR2_EXTRA1 to 50 (the rate at which the flight controller sends attitude data via MAVLink)



After completing the settings, write the parameters and reboot the flight controller for the changes to take effect.

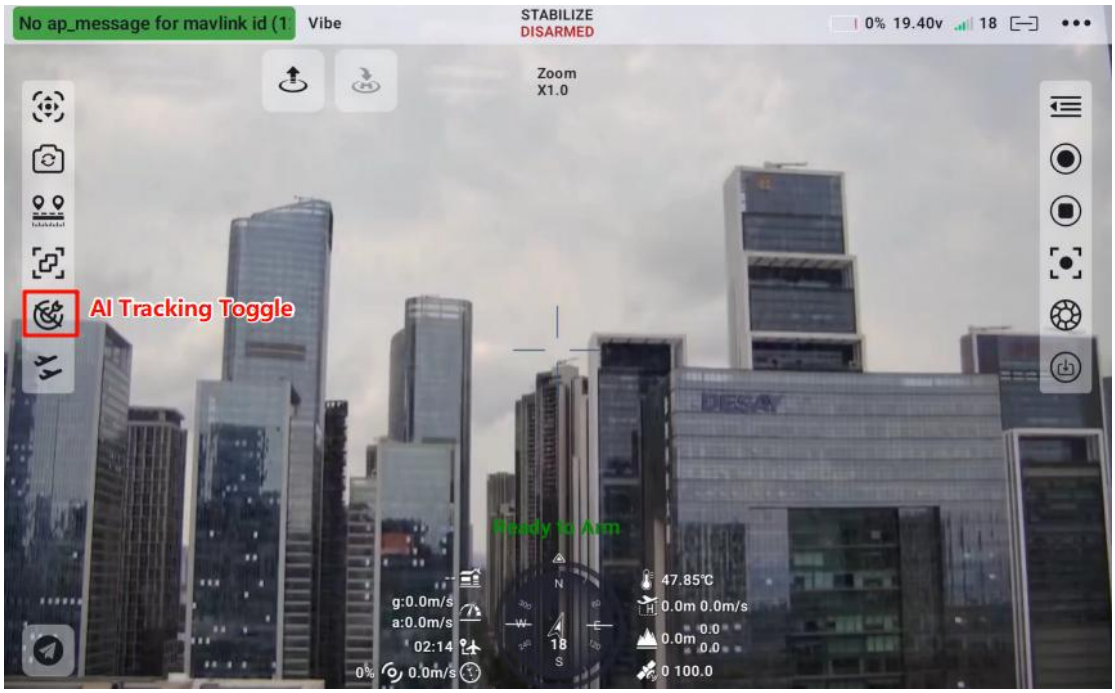
Note:

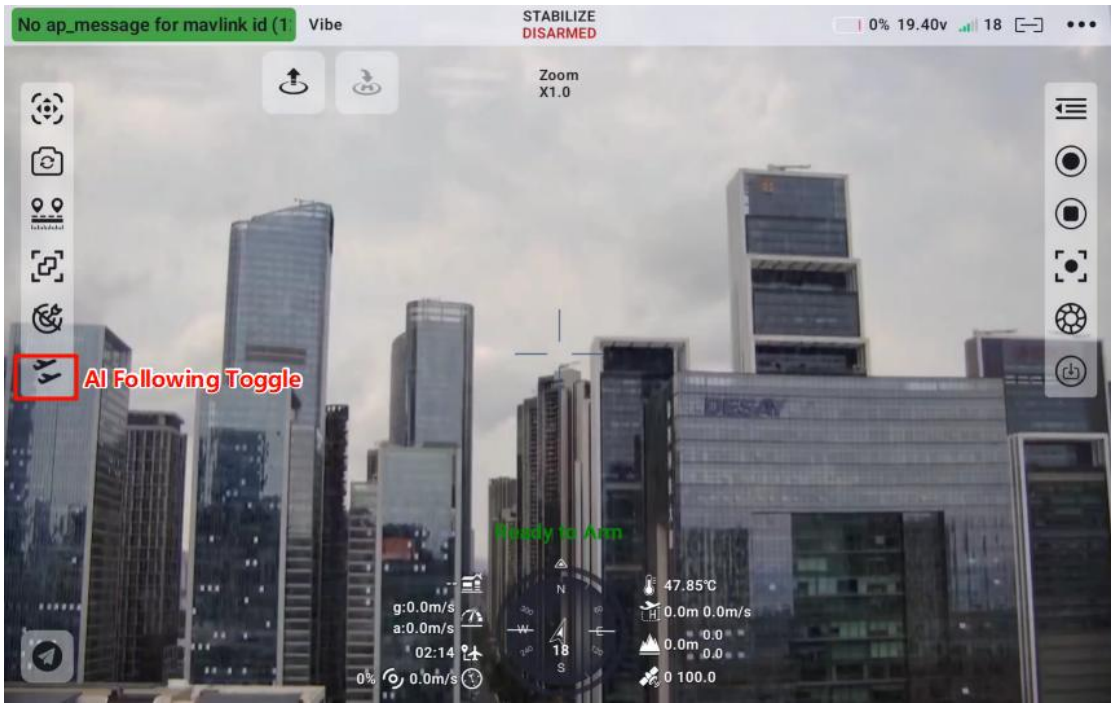
Fusing flight controller attitude data can enhance gimbal performance during aggressive or high-dynamic maneuvers.

4.1.6.10 AI Tracking:

The SIYI gimbal camera (optical pod) connects to the SIYI link via the SIYI AI tracking module to enable AI recognition, tracking, and follow-me functions.

Clicking the button will activate the feature with a highlighted prompt; clicking it again will disable the function.





The SIYI optical pod (gimbal camera) can be connected to the airborne unit via the SIYI AI tracking module. When the airborne unit is in communication with the ground station, this application enables AI recognition, tracking, and follow-me functionality.

Before use, it is necessary to prepare the following tools, firmware, and software:

- SIYI link product (for use with SIYI gimbal cameras, the UniRC7 series, MK32 standard kit, HM30, or MK15 industrial standard kit are recommended)
- SIYI optical pod (gimbal camera)
- Flight controller
- SIYI AI tracking module

Note:

The above products can be purchased from SIYI Technology and its authorized distributors.

- SIYI AI tracking module to SIYI link Ethernet communication cable
- SIYI AI tracking module to SIYI gimbal Ethernet communication cable
- SIYI gimbal to PX4 / ArduPilot flight controller UART connection cable

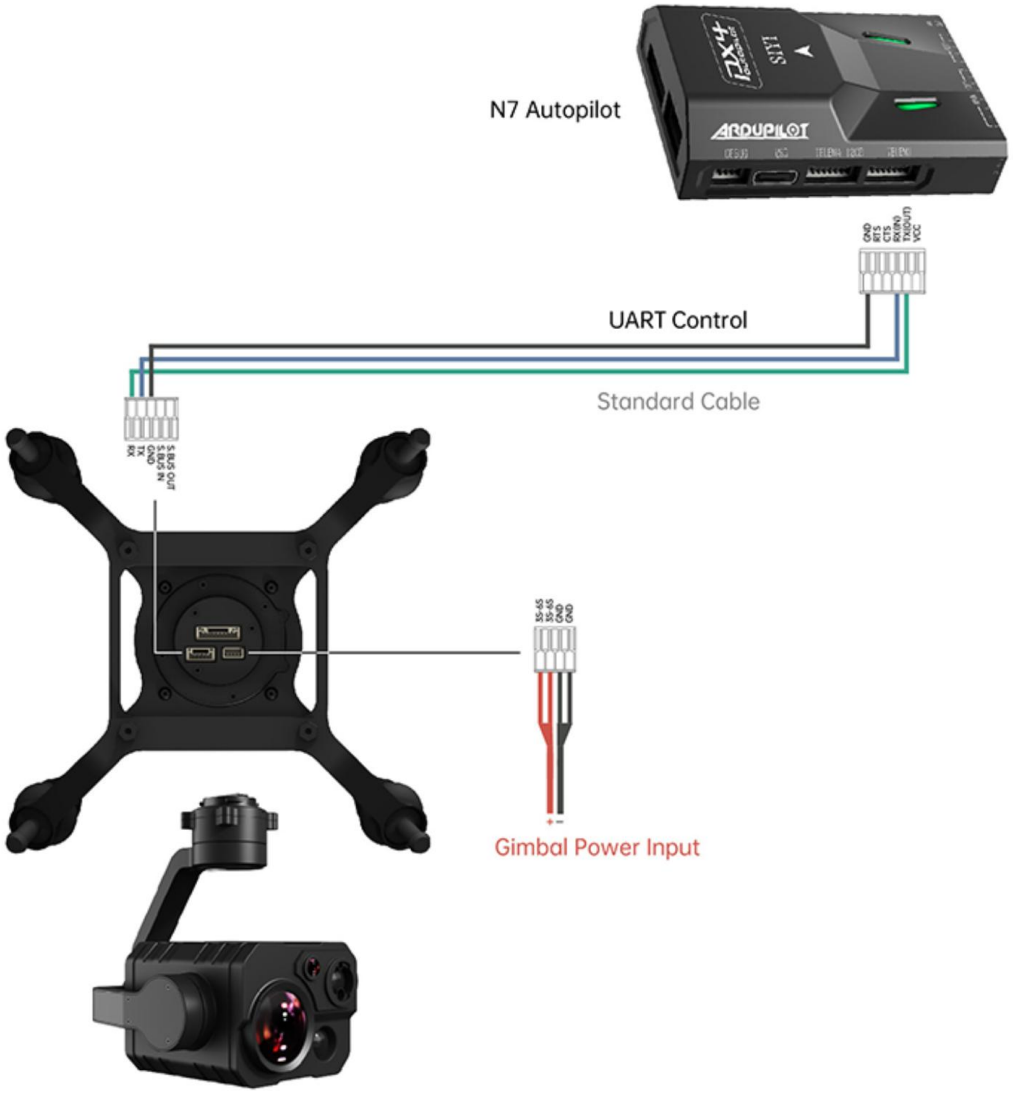
Note:

The above tools are included as standard accessories with the product shipment.

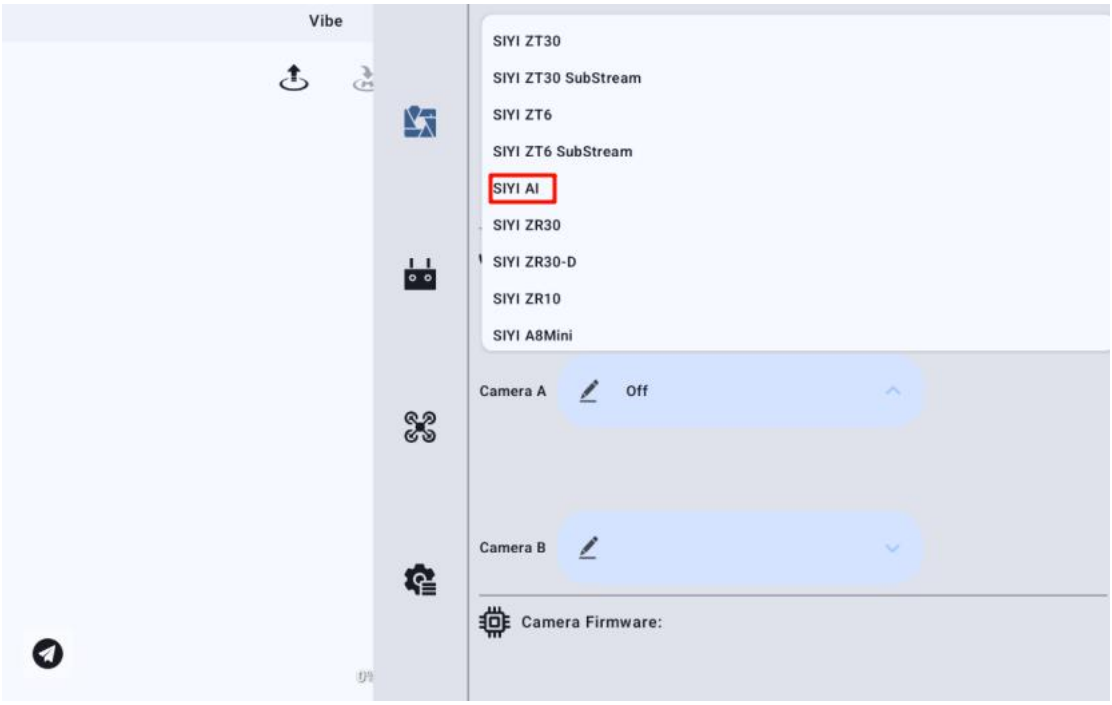
Setup Steps

1. Ensure that the gimbal camera firmware has been upgraded to a version that supports the SIYI AI tracking module's follow-me functionality.
2. Ensure that this application has been upgraded to a version that supports the SIYI AI tracking module's follow-me functionality.
3. Refer to the diagram below to connect the SIYI AI tracking module to the SIYI gimbal camera (optical pod) and the SIYI link.

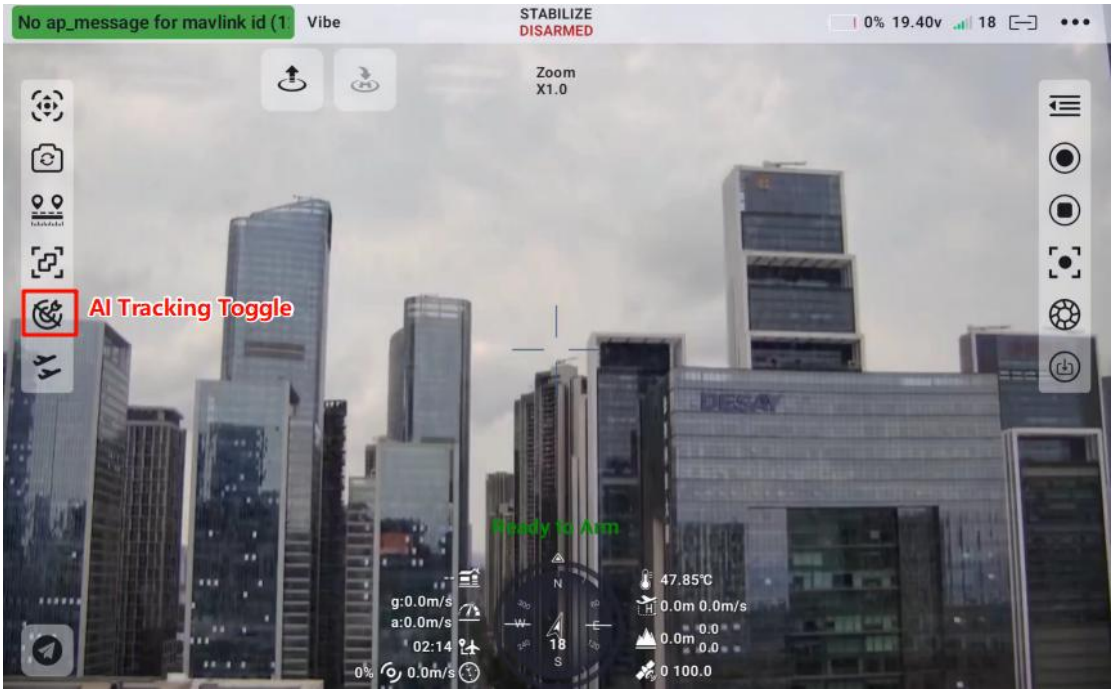
4. Refer to the diagram below to connect the SIYI gimbal camera (optical pod) to the flight controller and fuse flight controller attitude data.



5. Run the application, go to "Address Settings," and select "SIYI AI."

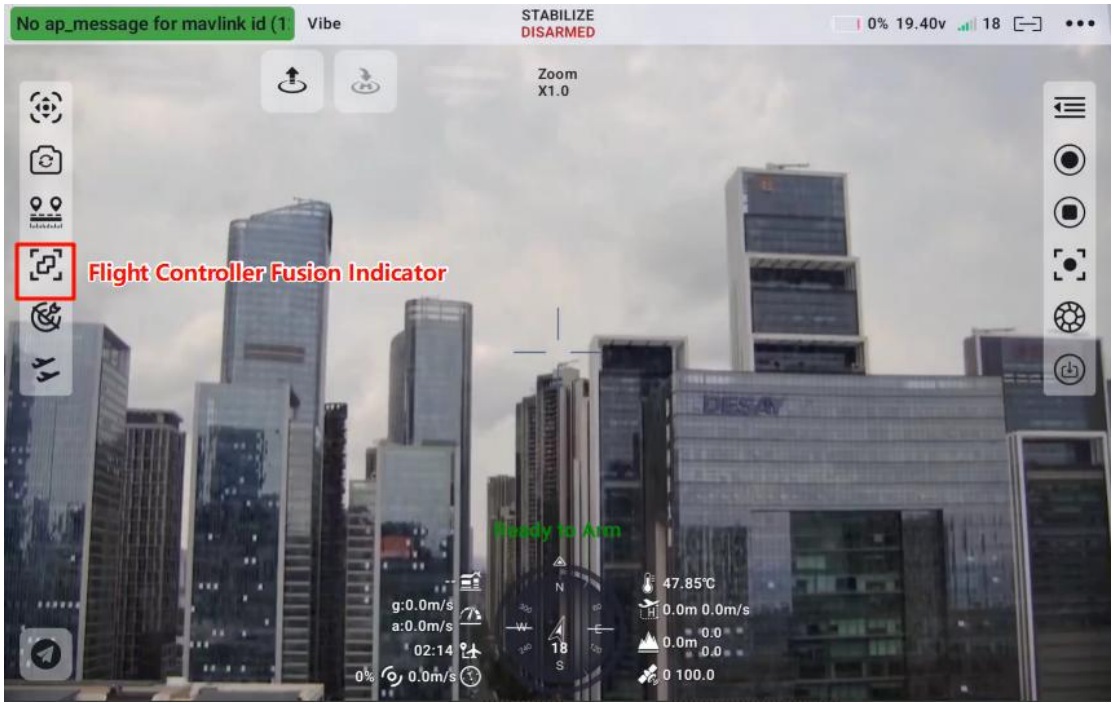


6. Return to the main screen and click the AI tracking recognition button to activate the feature.

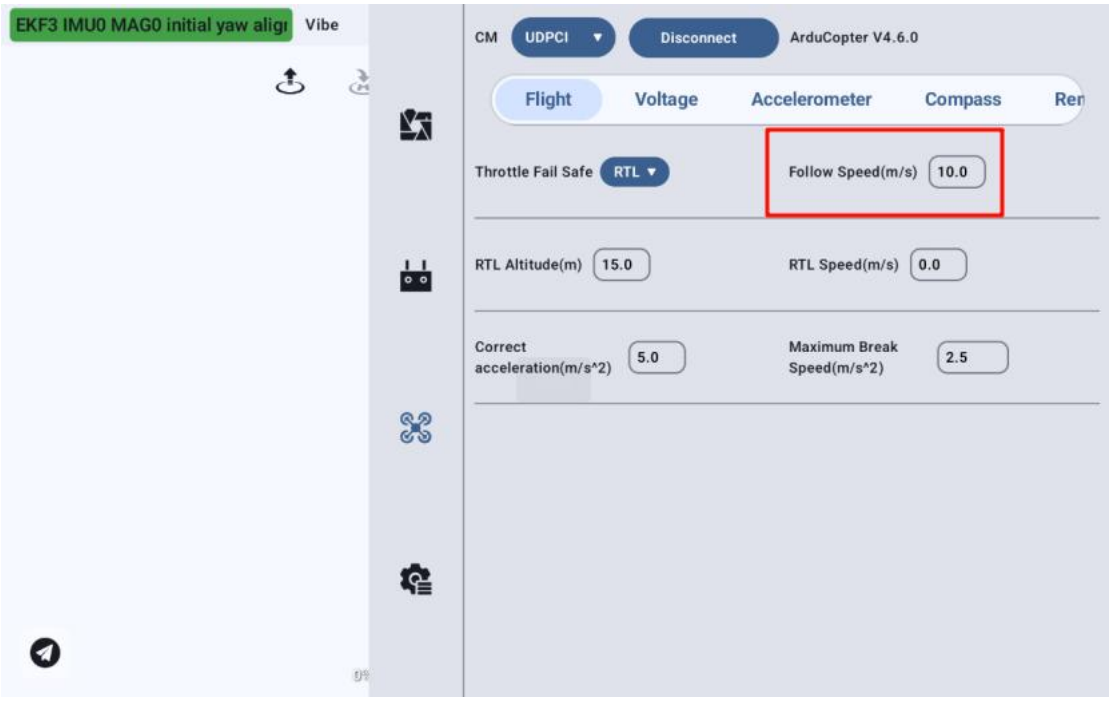


7. Check if the flight controller fusion indicator appears (indicating that

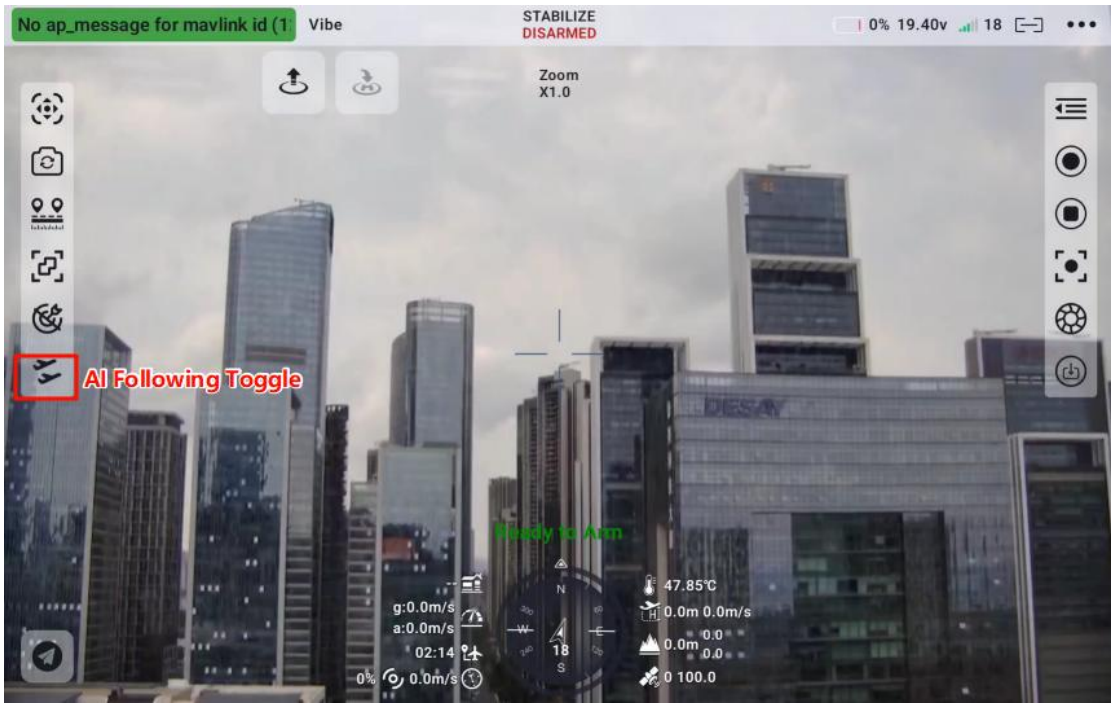
the flight controller attitude data fusion is functioning properly).



8. Switch the flight controller mode to "Guided Mode" and set the follow-me speed.



9. Click the AI tracking/follow-me function button again to disable the corresponding feature.



Danger

For flight safety, it is recommended to use the AI follow-me function in conjunction with the obstacle avoidance function.

When the AI follow-me function is activated, the operator will not be able to manually control the flight, and the ground station will be unable to control the aircraft using Guided Mode. Switching the flight controller flight mode will restore manual control.

When the AI follow-me function is activated, ensure that the flight path is clear of obstacles and the visibility is unobstructed. Always pay attention to flight safety. If an obstacle is encountered, immediately take manual control of the flight and re-plan the flight path.

If the tracking target is lost, the aircraft will hover.

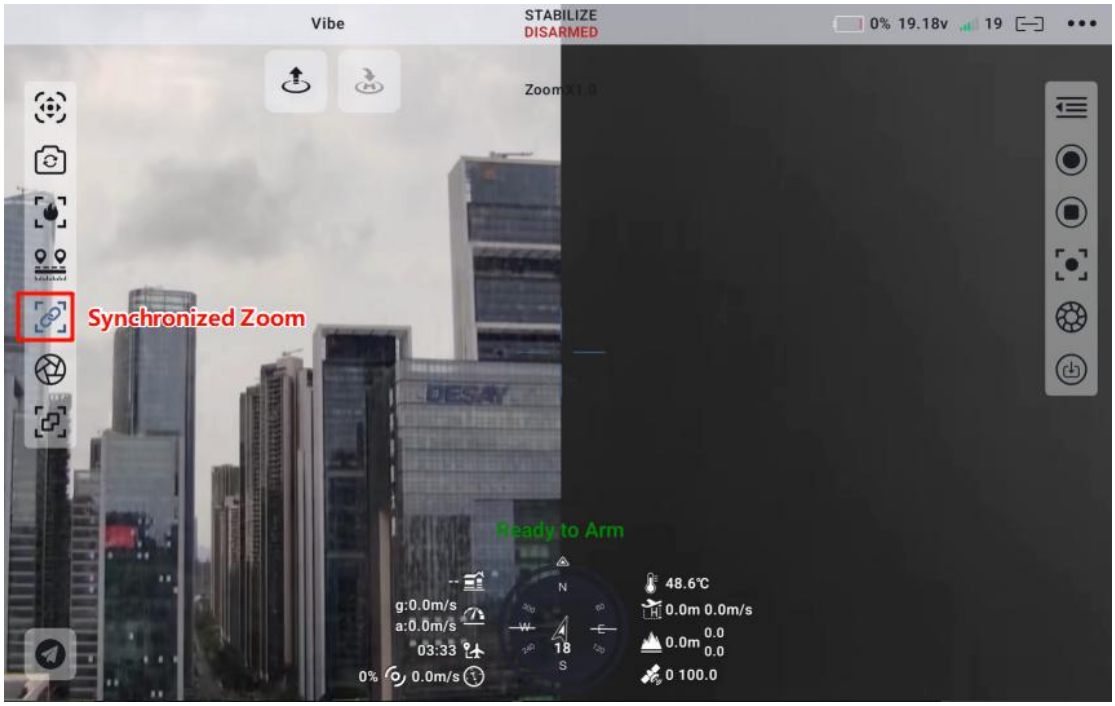
Note

When the SIYI AI tracking module is used with a multi-sensor pod, the main video stream of the pod must be set to "Zoom Camera" in this application.

If the tracked object is higher than the multirotor UAV in the horizontal plane, the follow-me function will not be effective. The best performance of the follow-me function occurs when the tracked object and the multirotor UAV are on the same horizontal plane.

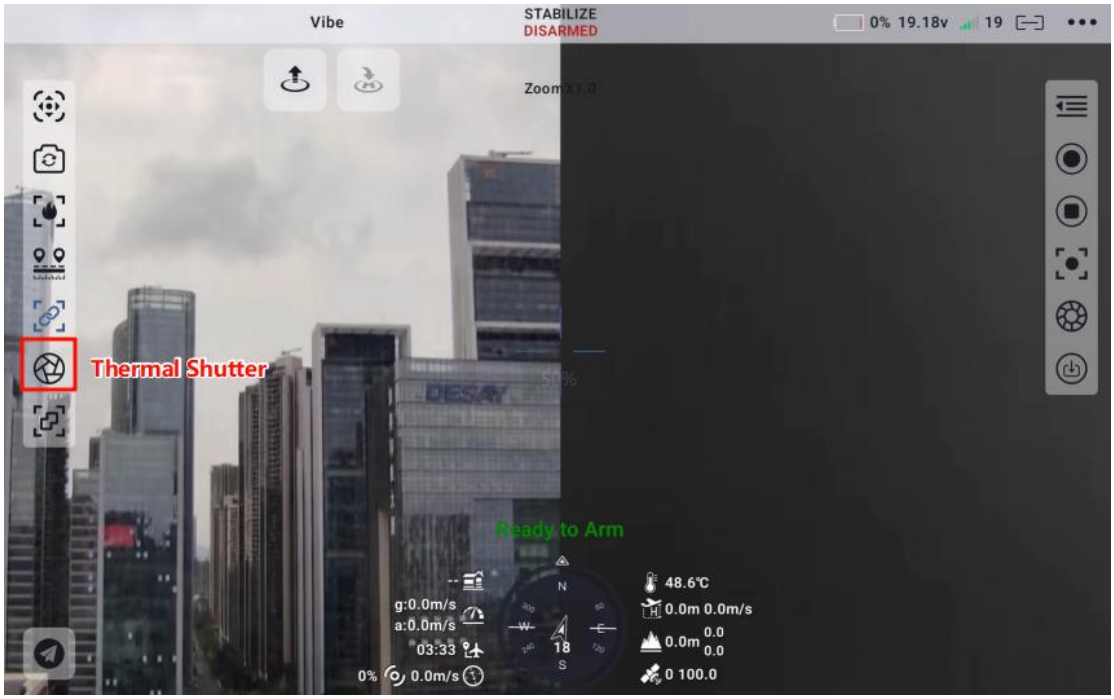
4.1.6.11 Linked Zoom

Taking the ZT30 as an example, when the ZT30 switches the lens to display a dual-image view of zoom and thermal imaging, the linked zoom function can be activated. Click the button to enable this feature, and the button will highlight. The zoom function can be controlled through the zoom button to scale the thermal imaging view. Click the button again to disable the feature.



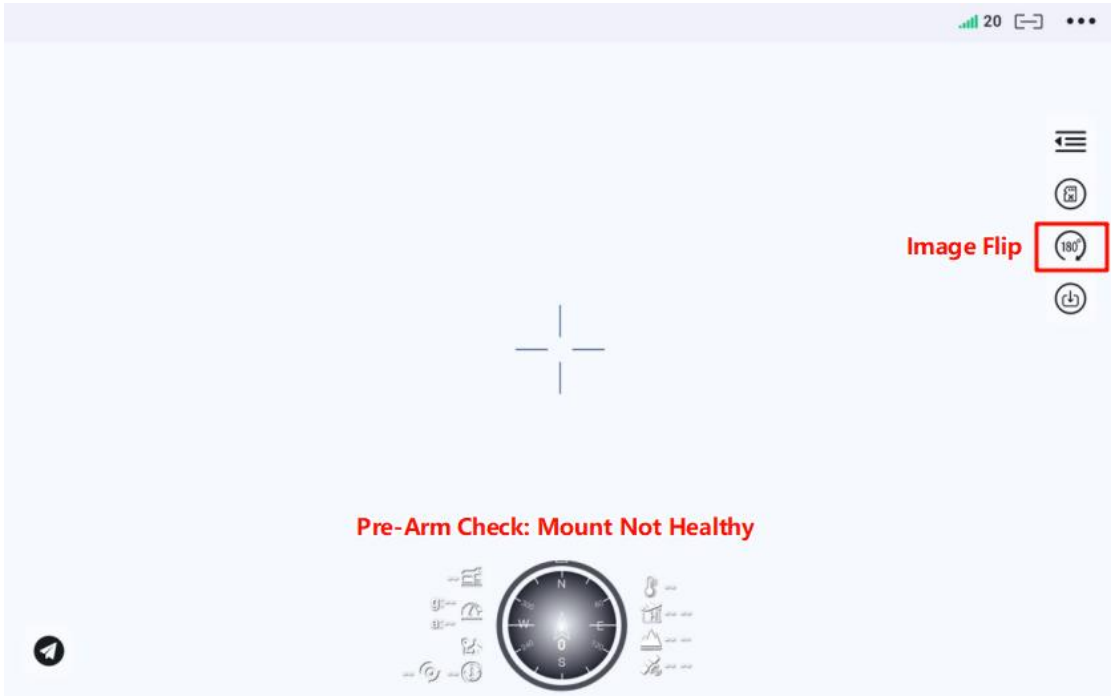
4.1.6.12 Thermal Imaging Shutter

This function is mainly used for calibration and maintaining temperature measurement accuracy. Each click triggers the thermal imaging shutter once.



4.1.6.13 Image Flip

When using the A2mini and R1M cameras, the image can be rotated 180° horizontally. An icon will appear on the right side to indicate this feature.

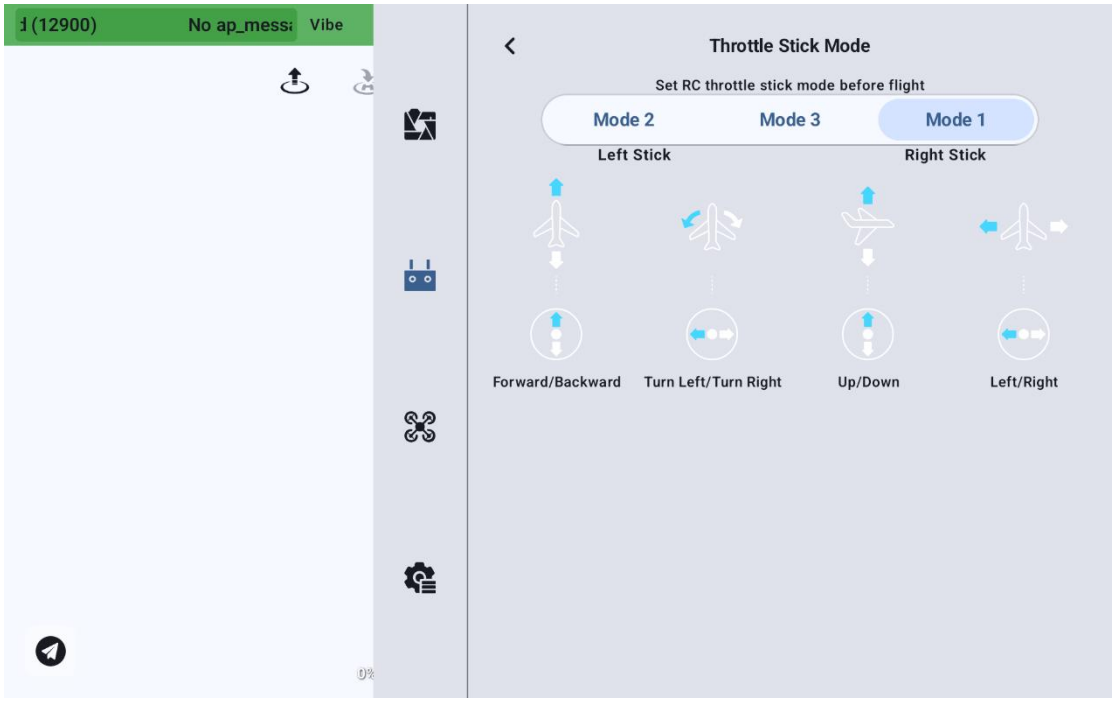


4.2 Remote Controller Module

Compatible with the SIYI series remote controllers, this module allows users to configure various controller functions.

4.2.1 Stick Mode

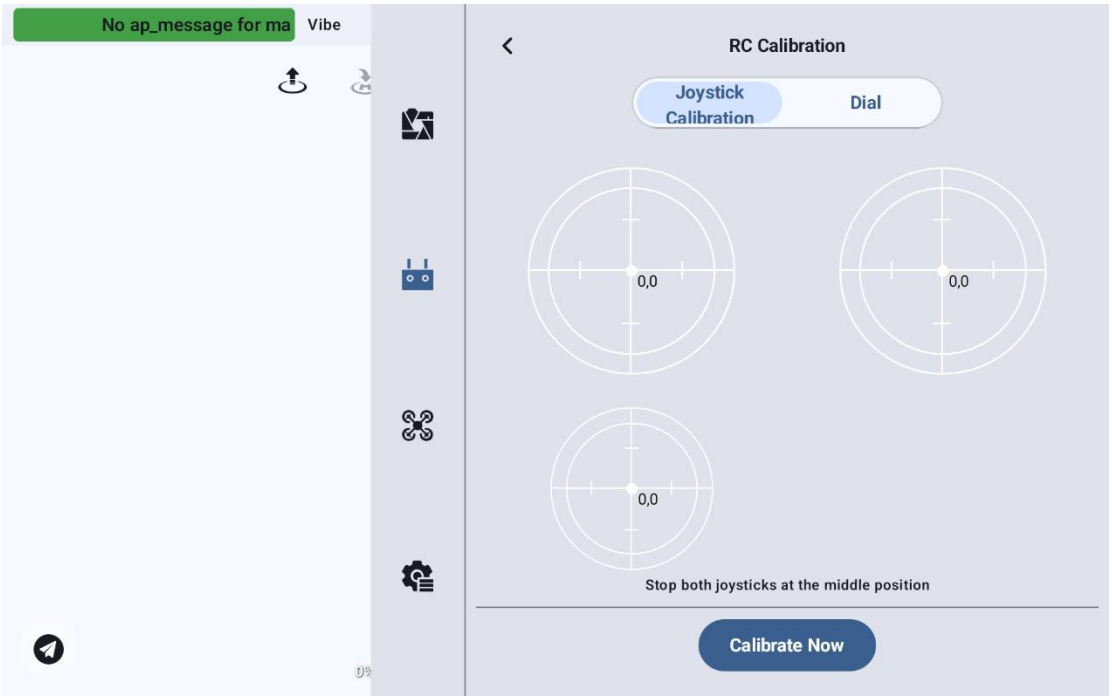
SIYI remote controllers support switching between Mode 1 (Japanese layout), Mode 2 (American layout), and Mode 3 (Chinese layout) via the UniGCS software. Users can easily change the stick mode by selecting the desired option with a single click.



4.2.2 Remote Controller Calibration

The calibration function allows users to calibrate the joystick and dial on the handheld ground station, ensuring accurate neutral positions and maximum range limits.

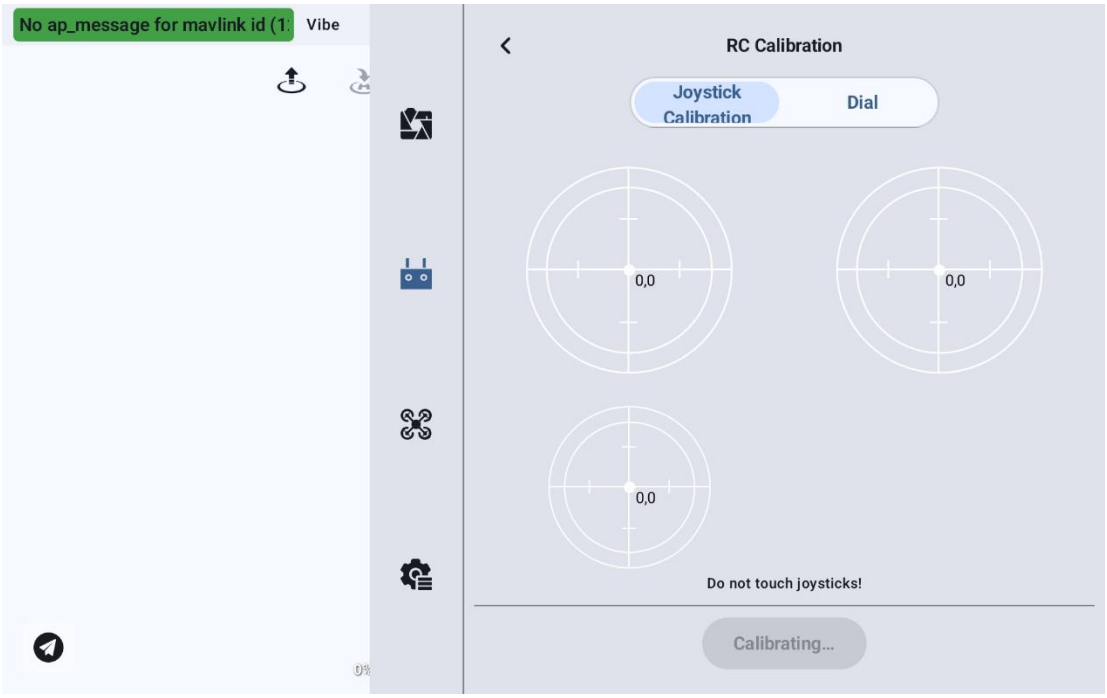
Regular calibration helps maintain the precision of channel output for optimal control performance.



4.2.2.1 Joystick Calibration Procedure

1.Before starting calibration, ensure that both joysticks on the handheld ground station are in their natural resting position, with no external force causing displacement.

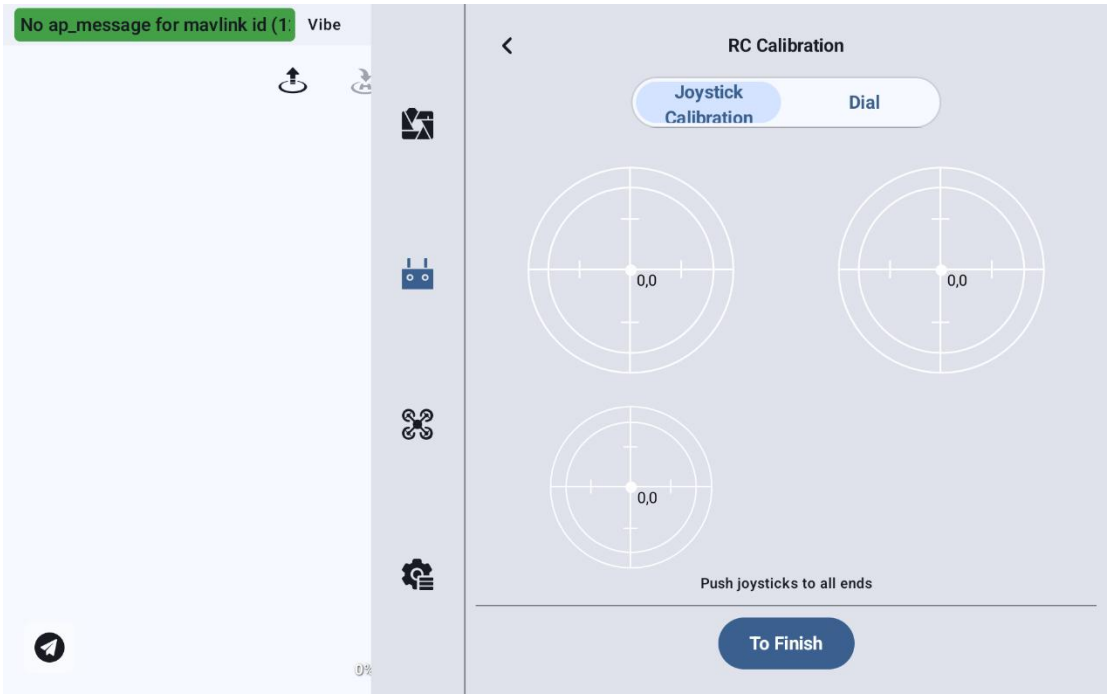
2.In the "Joystick Calibration" menu, click "Start Calibration" to enter the following interface:



3.If the joysticks are in their natural resting position but the channel output values are not zero, it indicates that the neutral point has drifted. At this stage, do not touch the joysticks, and wait for the system to complete the neutral point calibration automatically.

4.When the following prompt appears, the neutral point calibration is complete, and the system will proceed to maximum range calibration.

Follow the on-screen instructions to move each joystick to its maximum deflection in all directions one by one.



Up: (0, 100)

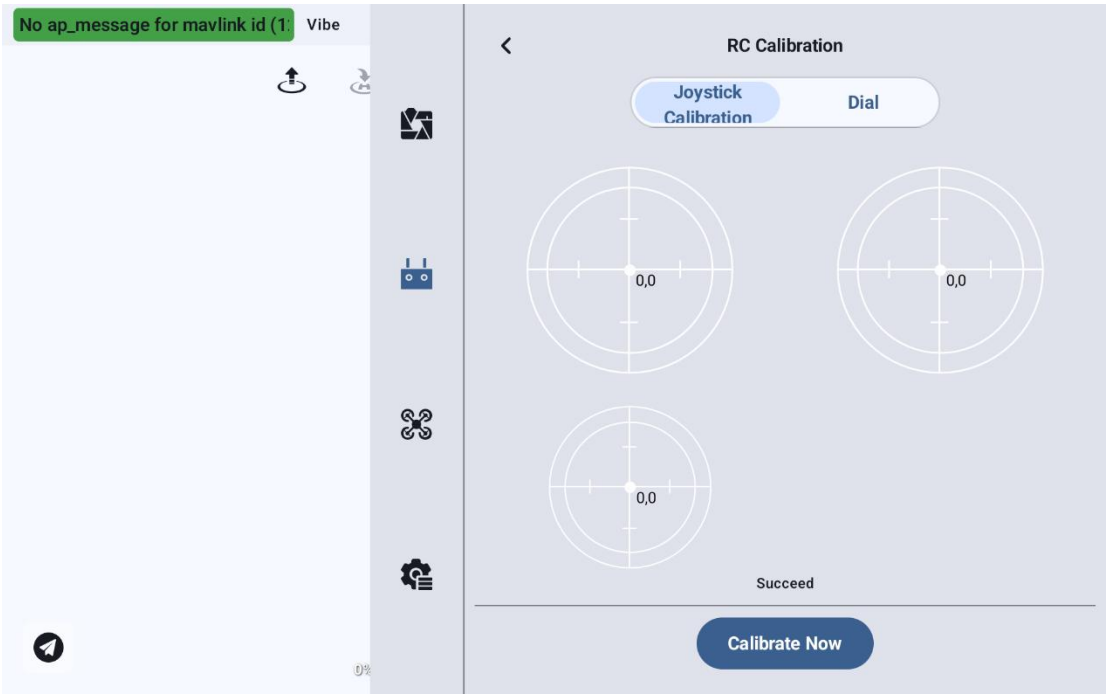
Down: (0, -100)

Left: (-100, 0)

Right: (100, 0)

Then click “Finish Calibration” to complete the process.

5.The "Joystick Calibration" menu will display a calibration successful message upon completion.



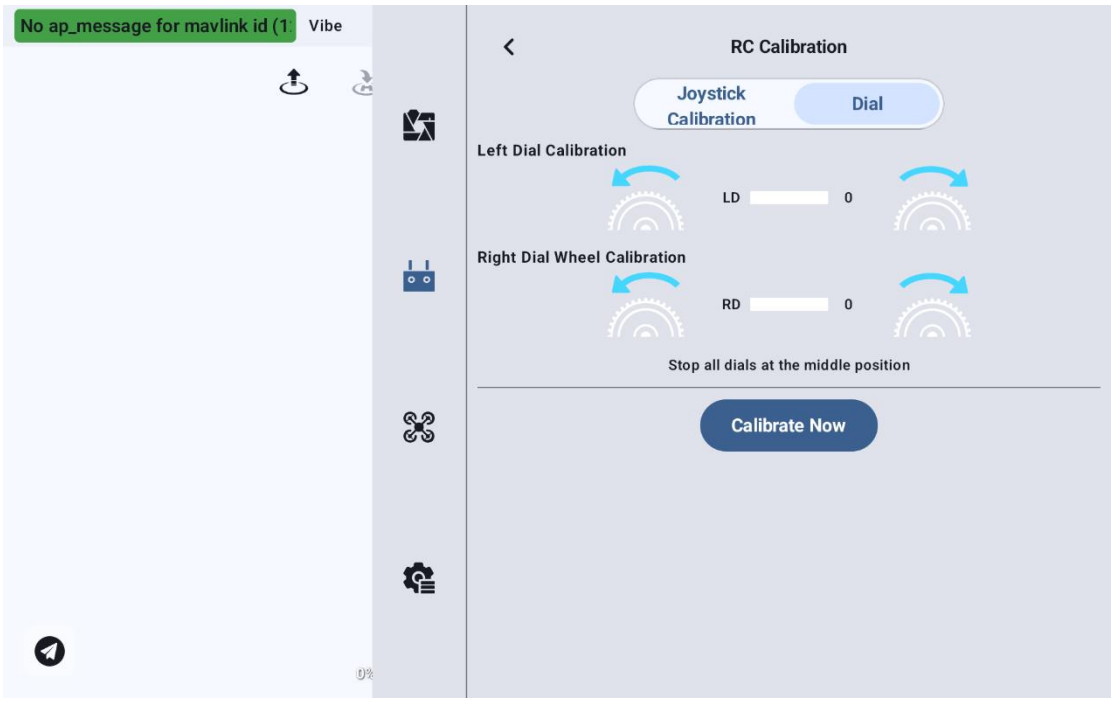
Note:

If the joystick does not return to the center position when at rest (i.e., the channel output value is not zero), or if it cannot reach the maximum or minimum values (-100, 100) when pushed to its limits, joystick calibration should be performed immediately.

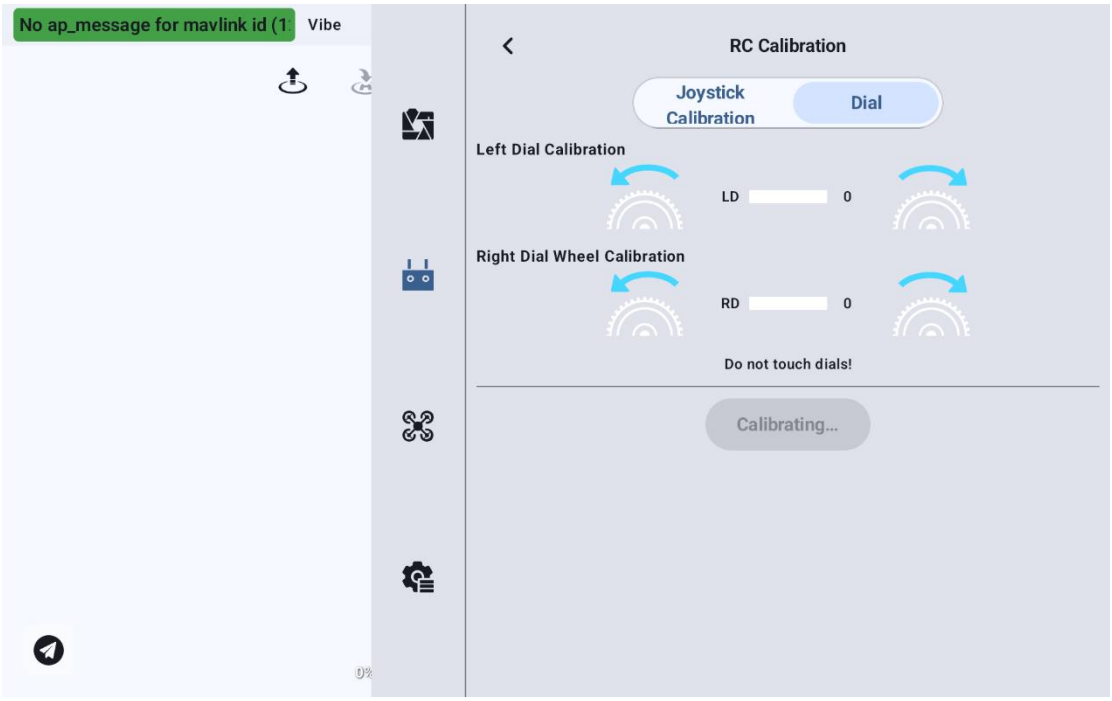
4.2.2.2 Dial Calibration Procedure

1. Before starting calibration, ensure that both dials on the handheld ground station are in their natural resting position, with no external force causing

displacement.



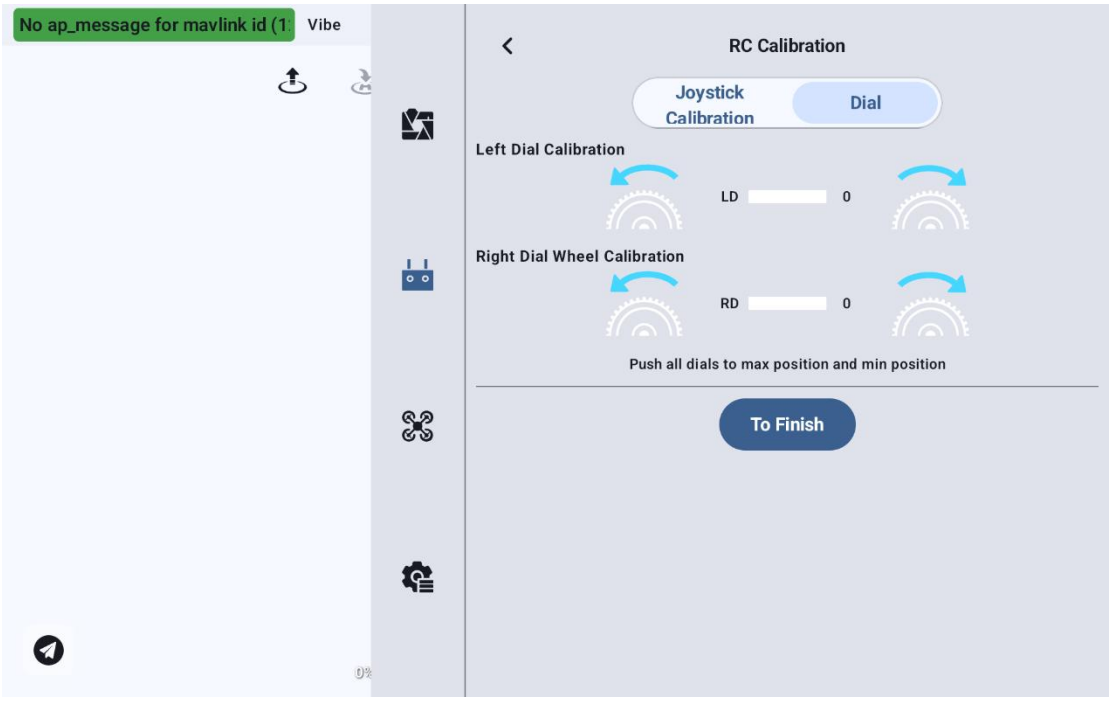
2. In the "Dial Calibration" menu, click "Start Calibration" to enter the following interface:



3. Follow the on-screen instructions. If the dials are at rest but the channel output value is not zero, it indicates that the neutral point has drifted.

4. At this stage, do not touch the dials, and wait for the system to complete neutral point calibration.

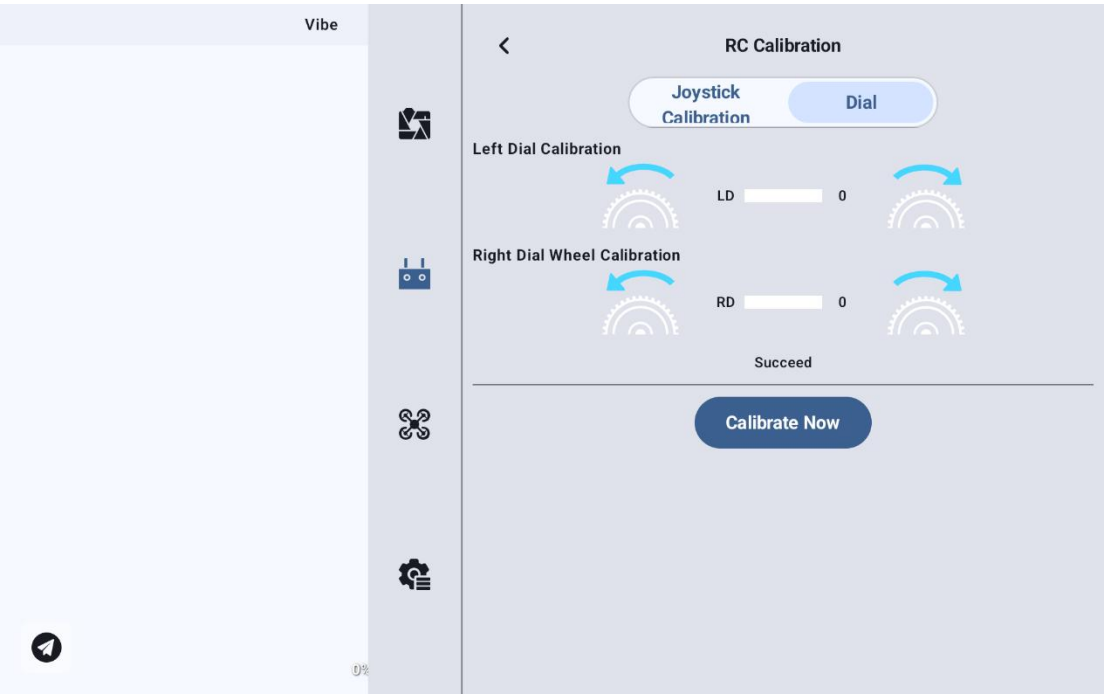
5.When the following prompt appears, it indicates that neutral point calibration is complete. The system will then proceed to maximum range calibration. As instructed, rotate each dial to its maximum range in both directions one at a time.



Left: -100

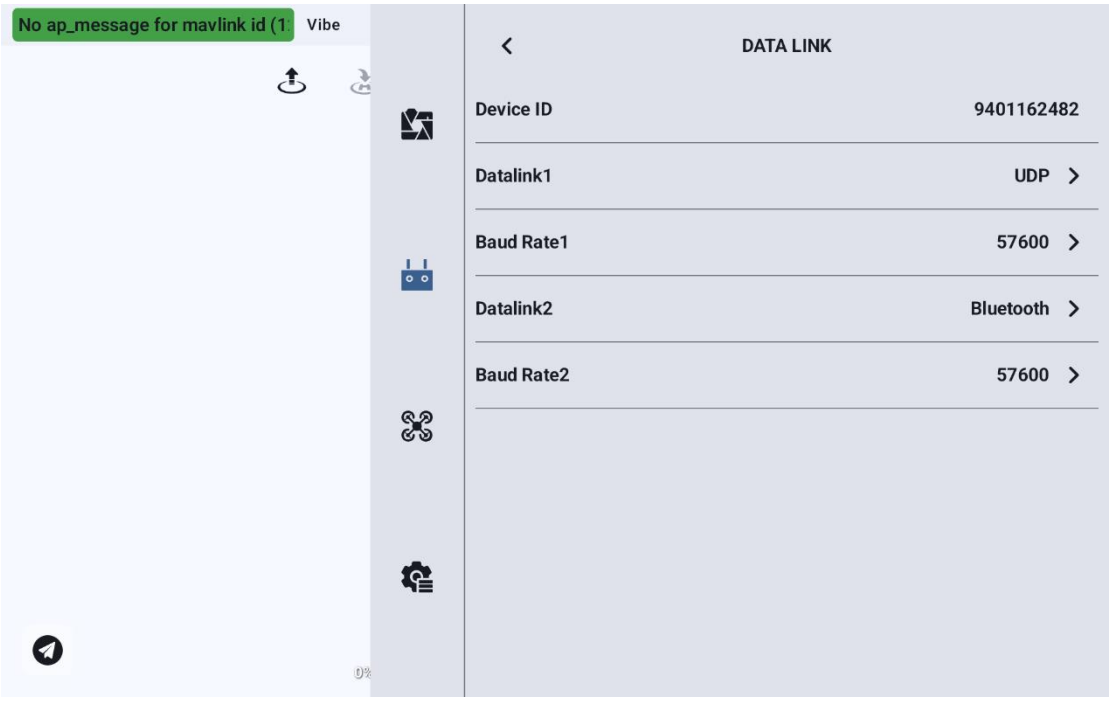
Right: 100

5.Click the "Finish Calibration" button. A message "Calibration Completed" will appear below.



4.2.3 Data Link Settings

The Data Link Settings menu allows users to identify the device ID of the handheld ground station, configure the data link connection method, and set specific serial port baud rates.



4.2.3.1 About Data Link Settings

Device: Displays the serial number of the built-in Bluetooth module in the handheld ground station. This serial number serves as the Bluetooth name when pairing and is unique to each ground station.

Data Link 1: The data link connection method for the device connected to the TELEM 1 port of the air unit.

Baud Rate 1: Should be set to match the serial port baud rate of the device connected to the TELEM 1 port of the air unit.

Data Link 2: The data link connection method for another device connected to the TELEM 2 port of the air unit.

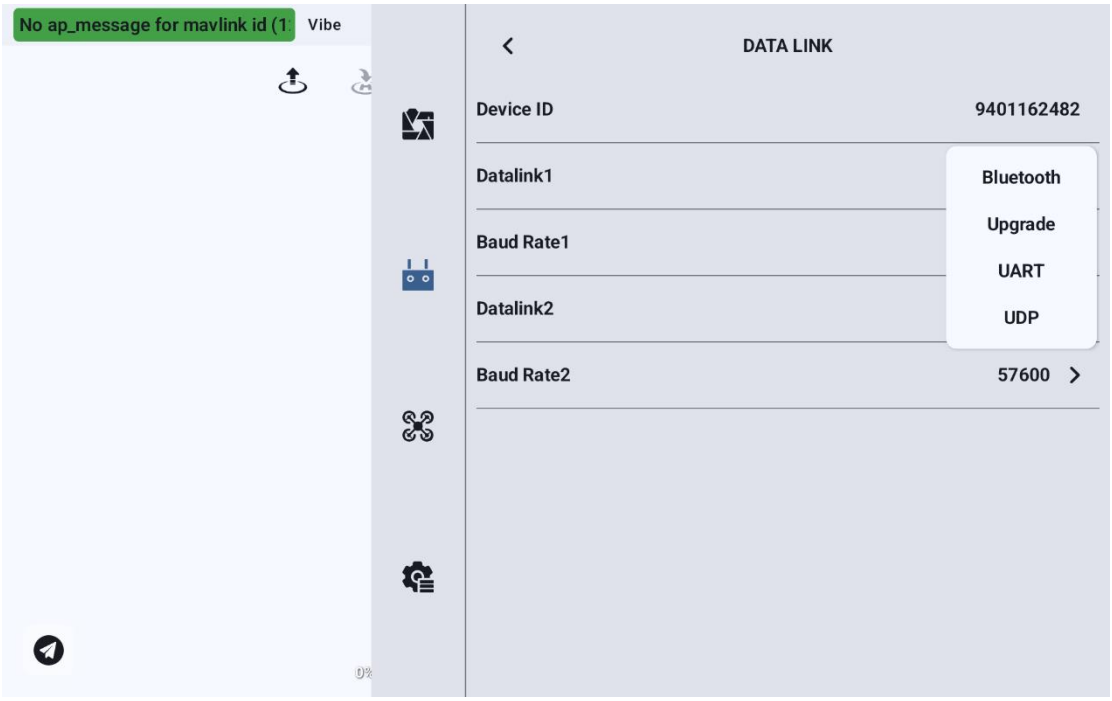
Baud Rate 2: Should be set to match the serial port baud rate of the device connected to the TELEM 2 port of the air unit.

Note

Currently, only the UniRC7 series supports dual data links, while the MK15 and MK32 models only feature a single data link.

4.2.3.2 Connection

The UniRC 7 handheld ground station supports the following optional data link connection methods: Bluetooth, Upgrade, UART serial port, and UDP.



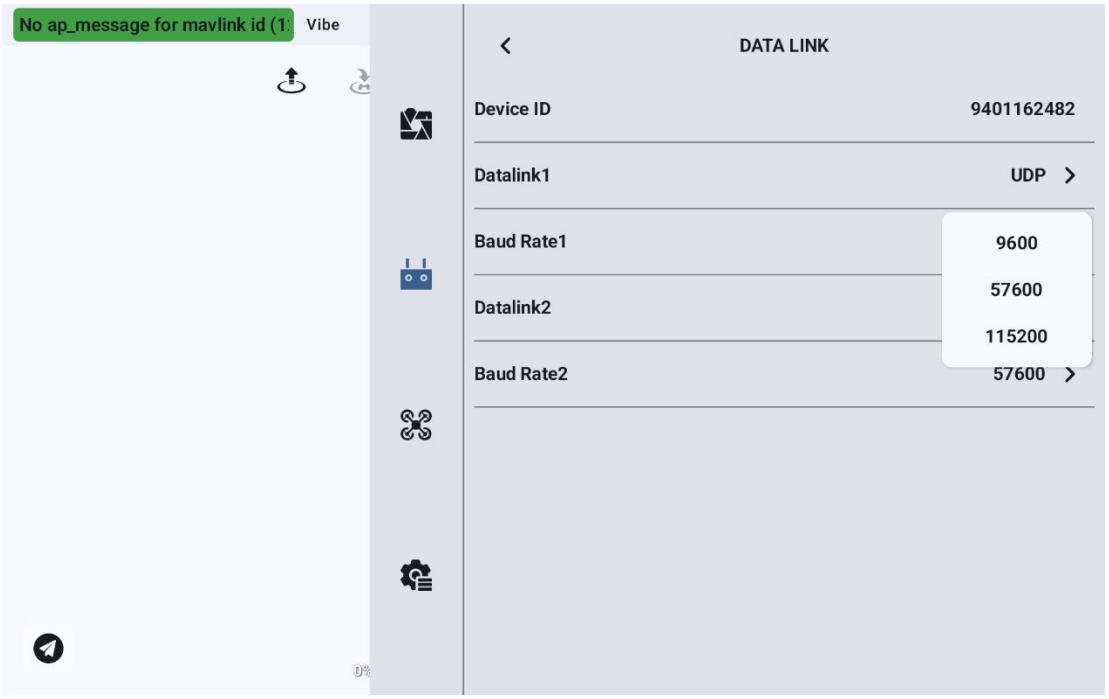
UART Serial Port: Data link communication is established via the built-in UART serial port of the ground station.

Bluetooth: Data link communication is established via the built-in Bluetooth wireless connection of the ground station. This method supports most ground station software and also enables communication with external devices, such as Windows-based ground station software.

Upgrade: Data link communication is established through the Type-C interface at the bottom of the handheld ground station, enabling communication with external devices like Windows-based ground station software.

4.2.3.3 Serial Port Baud Rate

Please manually select the appropriate serial port baud rate setting.



Note:

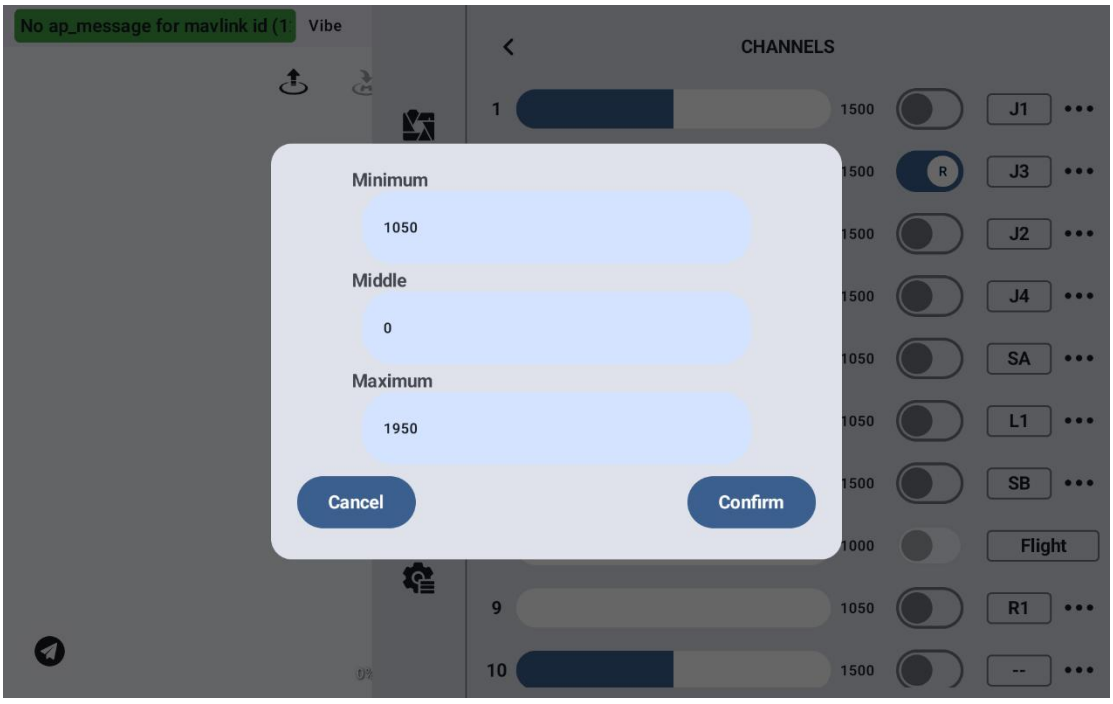
Before changing the serial port baud rate, please ensure that the ground station and air unit have successfully paired, otherwise the settings will not take effect.

4.2.4 Channel Settings

Through the channel settings function, users can configure the servo travel range, neutral point, servo reversal, and channel mapping for each channel of the handheld ground station.

4.2.4.1 Servo Travel Range

The default servo travel range for the UniRC 7 handheld ground station is from 1050 to 1950.



Select the target channel and enter the desired travel range value to

successfully modify it.

The default neutral point for the travel range is 1500.

Select the target channel and enter the desired neutral point value to successfully modify it.

Note:

The range for the travel range neutral point is ±500. To set the neutral point to 1700, the travel range neutral point should be set to +200. To set the neutral point to 1300, the travel range neutral point should be set to -200.

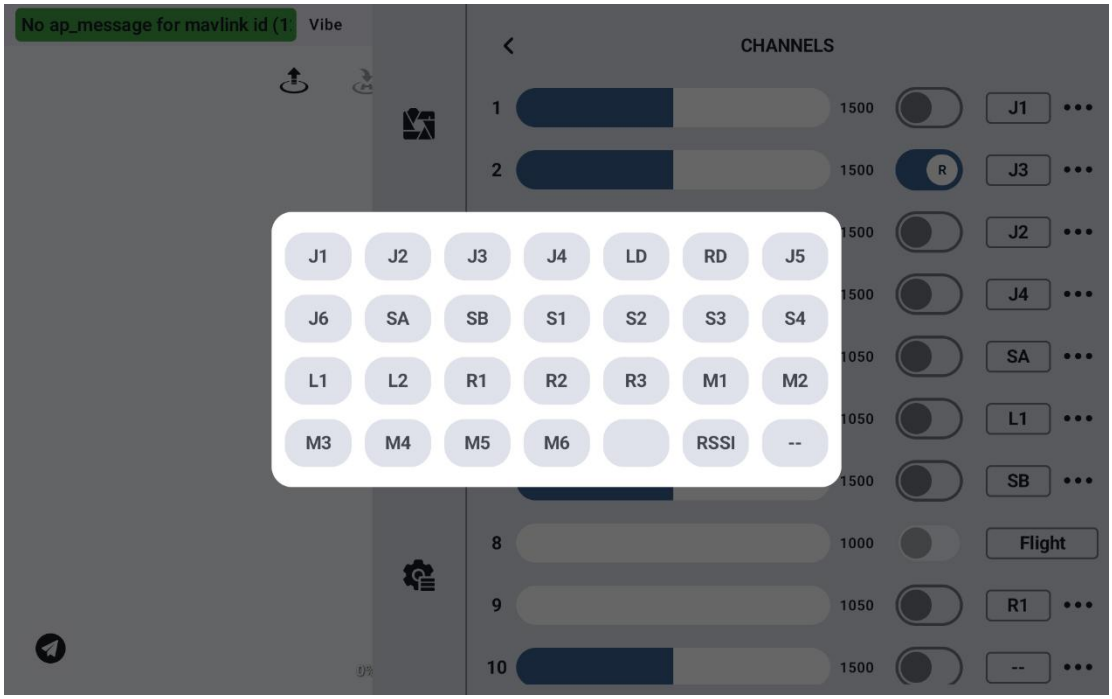
4.2.4.2 Servo Reversal

The servo reversal function is used to change the output direction of the channel's travel range.

Select the target channel and click the corresponding servo forward/reverse switch to successfully set the servo direction.

4.2.4.3 Channel Mapping

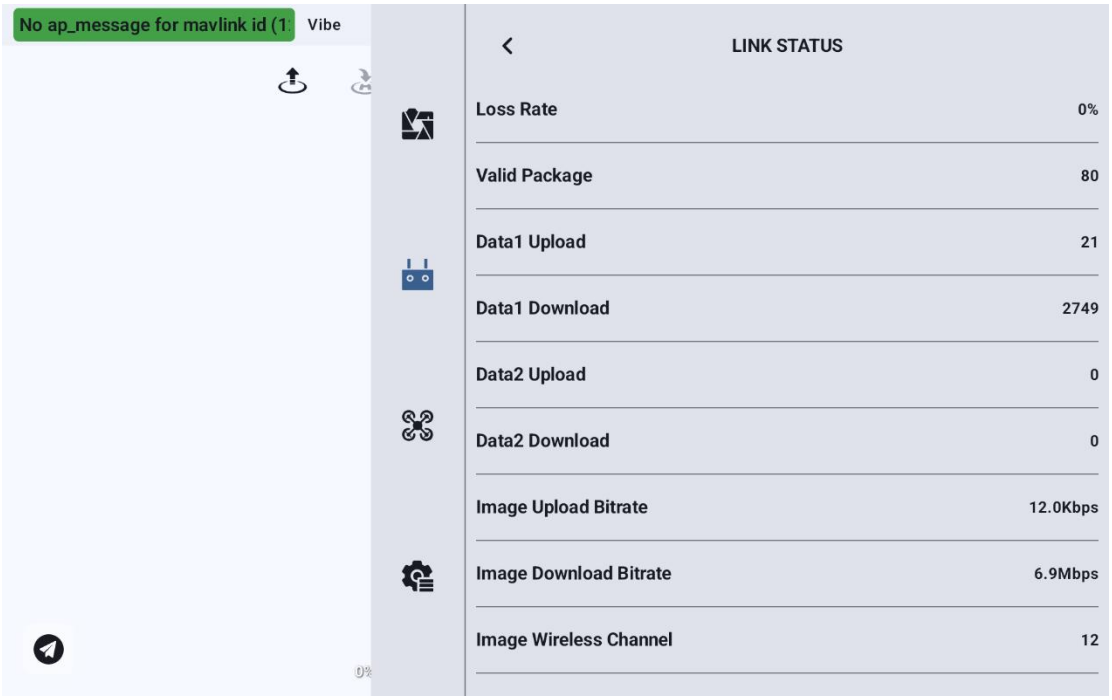
Taking the UniRC 7 handheld ground station as an example, the UniRC 7 supports 26 physical channels and 16 communication channels, and allows users to freely define the mapping between physical buttons, switches, joysticks, and communication channels through the channel mapping function.



Select the target channel, click the channel mapping button, and a switch list will appear. Choose the desired switch to successfully establish the connection.

4.2.5 Link Information

Displays real-time link status information to visually show the quality of wireless communication.



Link Information

Packet Loss Rate: The number of data packets that failed to return to the ground station per second.

Valid Packets: The number of data packets successfully transmitted back to the ground station per second.

Uplink Data: The amount of data uploaded to the air unit (in bytes) per second.

Downlink Data: The amount of data downloaded from the air unit (in bytes) per second.

Uplink Bitrate: The amount of data transmitted per second over the uplink video transmission.

Downlink Bitrate: The amount of data received per second over the

uplink video transmission.

Video Transmission Wireless Channel: The operating frequency point of the link under the current working frequency.

Signal Strength: The strength of the radio wave communication between the ground station and the air unit.

Signal Quality: The reliability and stability of the signal transmission between the ground station and the air unit.

4.2.6 Button and Dial Settings

The UniRC 7 handheld ground station supports customization of button and dial functionalities.

4.2.6.1 Button Settings

This function allows users to configure the working mode of each button.

Button Operation Modes

Latching Mode:

In this mode, when the latching button is pressed, the physical button will spring back, but the corresponding channel continues to output a value of 1950. Pressing the button again toggles the channel output to 1050.

Three-Position Switch:

This mode simulates a 3-way switch. A short press toggles the channel output between 1950 and 1050. A long press sets the channel output to

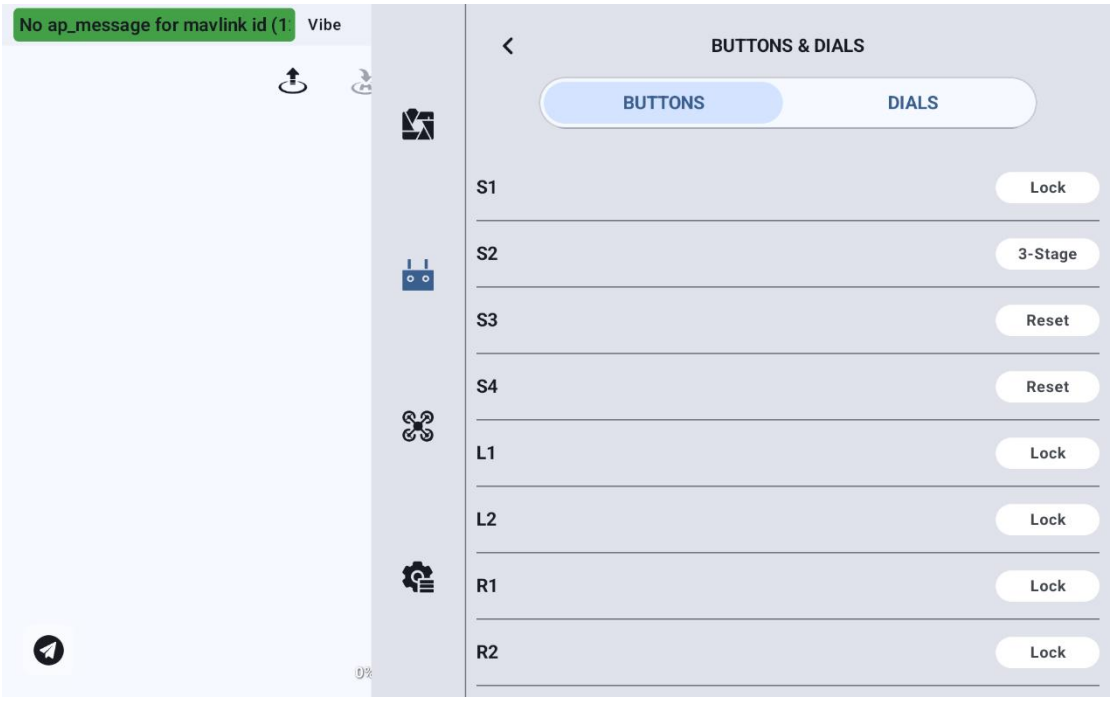
1500.

Momentary Mode:

In momentary mode, the channel outputs a signal only while the button is being pressed. Releasing the button returns the channel output to zero.

4.2.6.2 Dial Wheel Settings

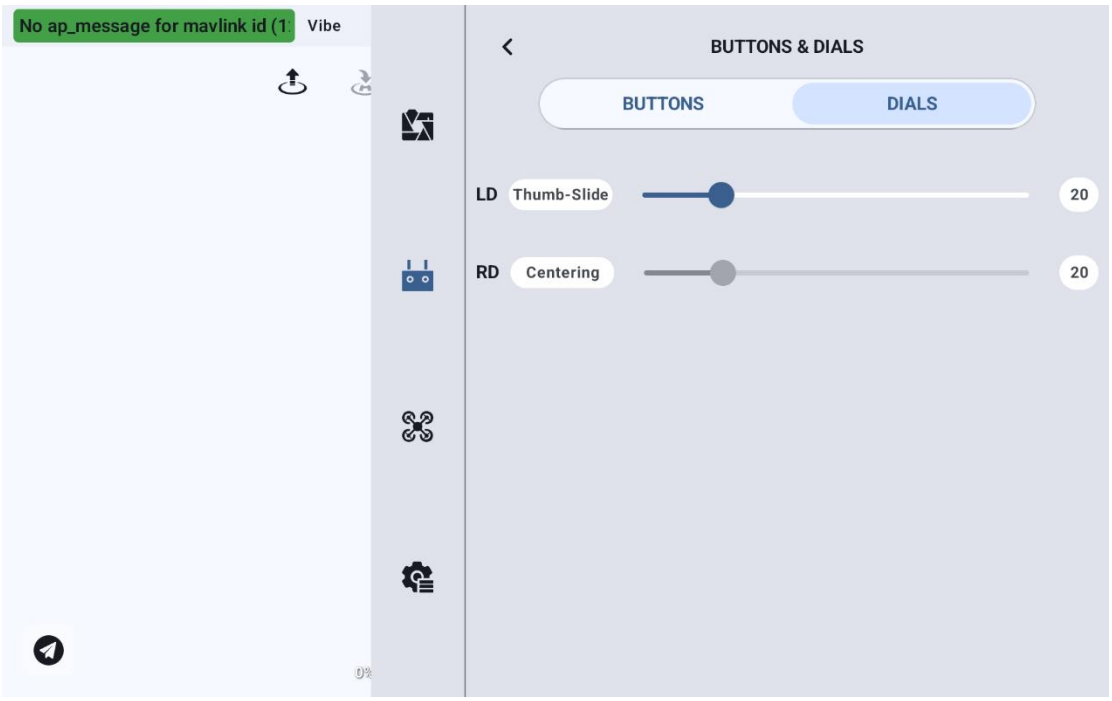
This function allows users to configure the operation modes of the left (LD) and right (RD) dial wheels.



Dial Wheel Operation Modes

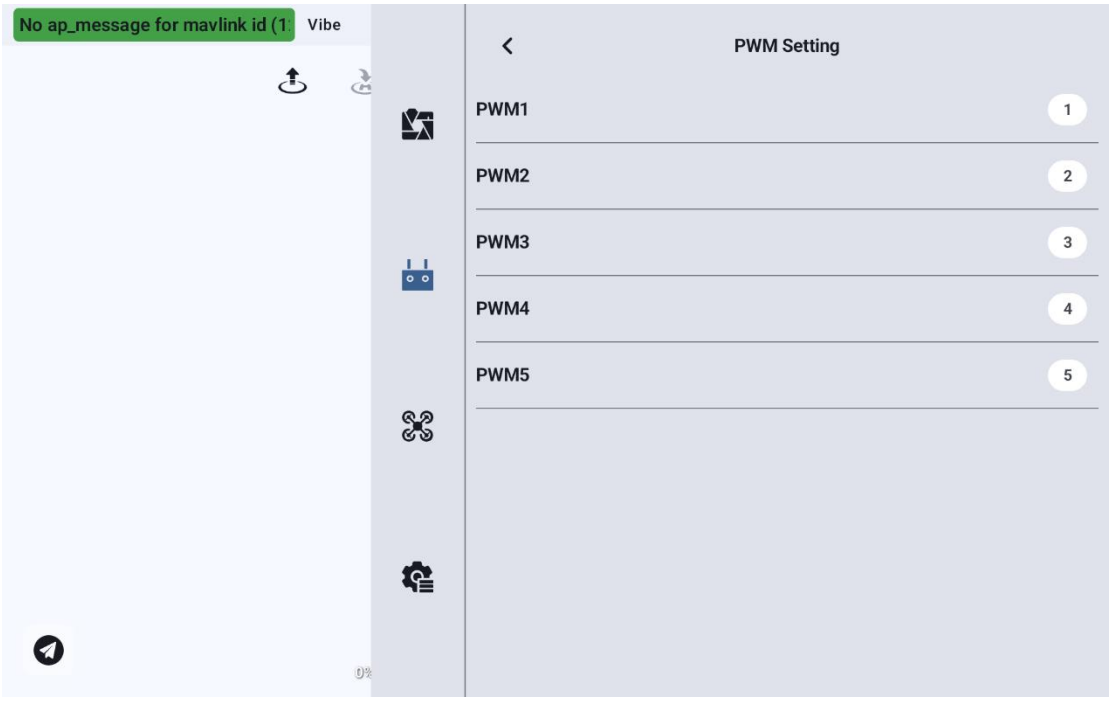
Auto-Centering: In this mode, when the dial wheel is turned and released, the output value will automatically return to its initial position (channel midpoint).

Non-Auto-Centering: In this mode, when the dial wheel is turned and released, the output value remains at the current channel output and does not return to the midpoint.



4.2.7 Receiver Settings

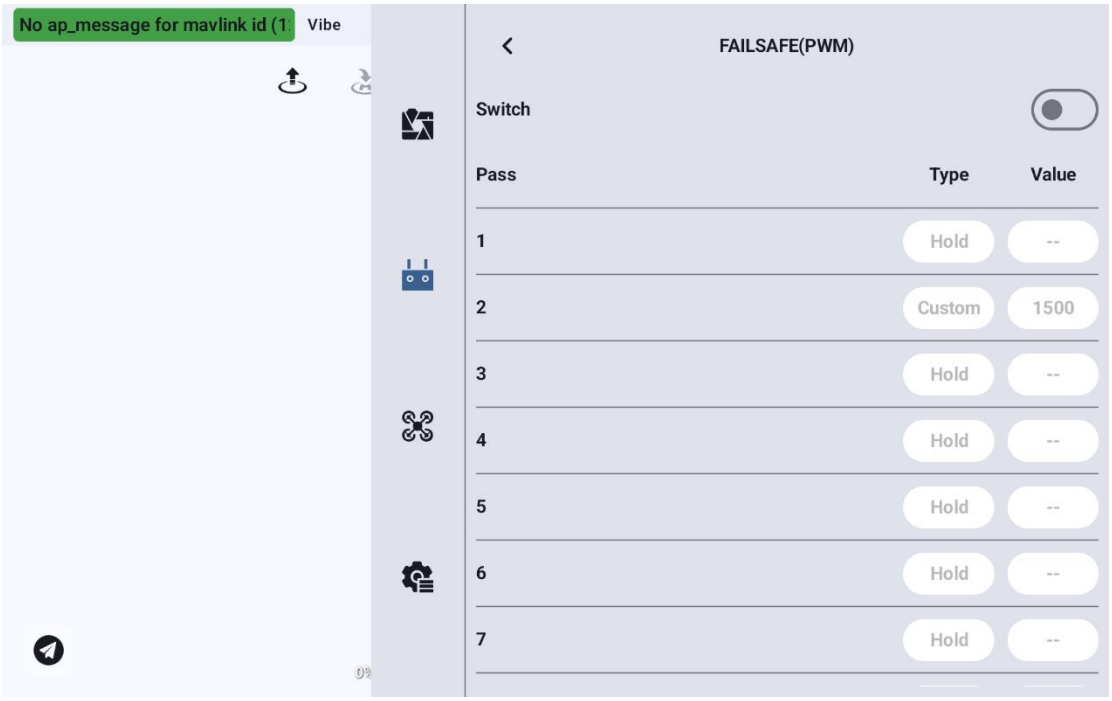
This function allows users to match the five PWM channels of the air unit (sky unit) to their corresponding communication channels.



4.2.8 Failsafe Protection

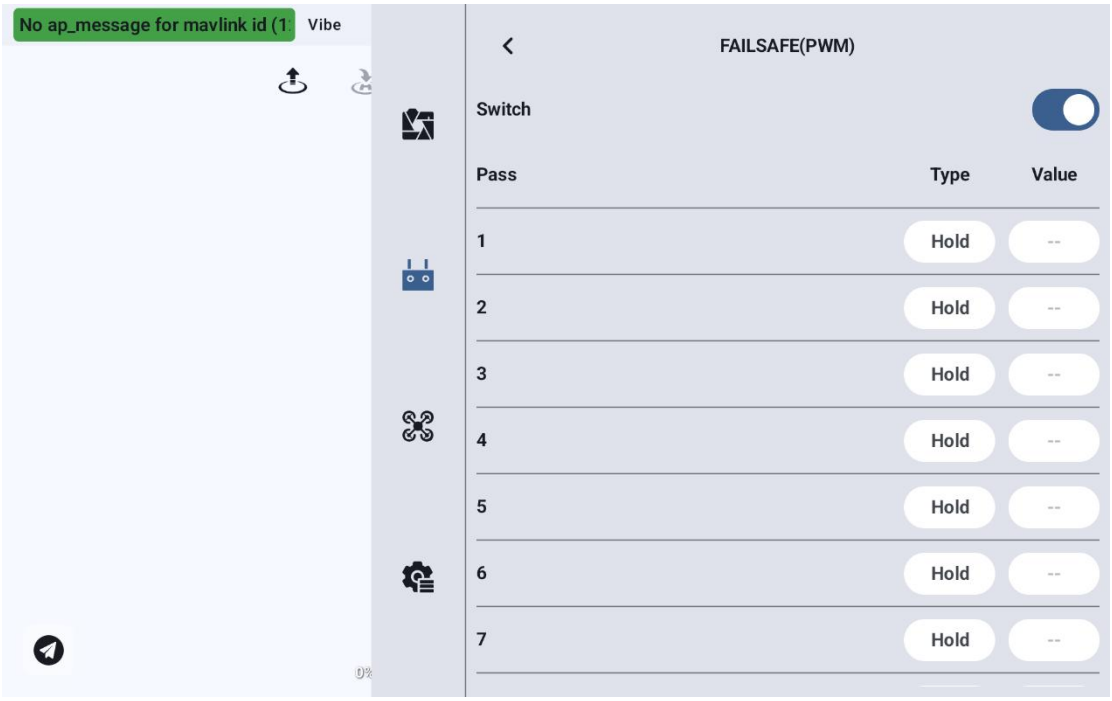
After the initial frequency pairing between the ground unit and air unit, it is essential to configure the failsafe protection feature.

Failsafe protection refers to the functionality that, in the event of a lost connection between the ground unit and air unit, the air unit's PWM will continue to output preset channel values, minimizing the risk of a crash.



Please follow the steps below to set up the failsafe protection for your handheld ground station:

1. Ensure that the ground unit has been successfully paired with the air unit.
2. Enter the "Failsafe Protection" menu, which will display the following interface:



3. The failsafe protection feature is turned off by default. The number on the left represents the communication channel. If the failsafe output value for a channel has not been set, the channel's output value will default to "Hold."
4. If you need a specific value to be output for a channel, first enable the failsafe protection switch. Then, click the "Hold" button next to the corresponding channel to enter "Custom" mode, and enter the desired range value.
5. Once the settings are complete, if the link is lost, the channel will output the configured range value.

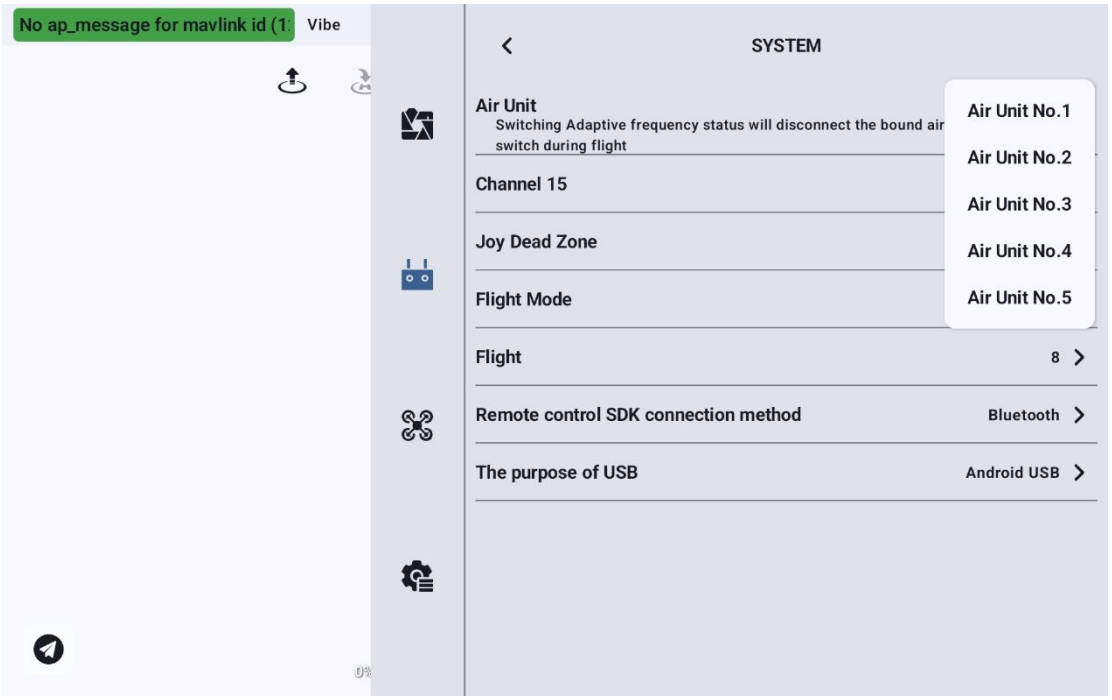
NOTE：

If the flight controller used with your handheld ground station communicates via the S.Bus protocol, you do not need to set up failsafe protection on the ground station (unless the flight controller specifically requires a certain channel to maintain a value during loss of control in order to trigger the failsafe and initiate return-to-home). You only need to set the corresponding protection measures in the flight controller's ground station software. The S.Bus communication protocol includes a failsafe flag to inform the flight controller of situations that should be considered as loss of control.

4.2.9 System Settings

4.2.9.1 Multiple Sky End Support

The Multiple Sky End feature allows the ground station to save frequency pairing information and corresponding channel settings for multiple sky ends. After the first frequency pairing between each sky end and the ground station, users can switch between them without needing to re-pair each time.

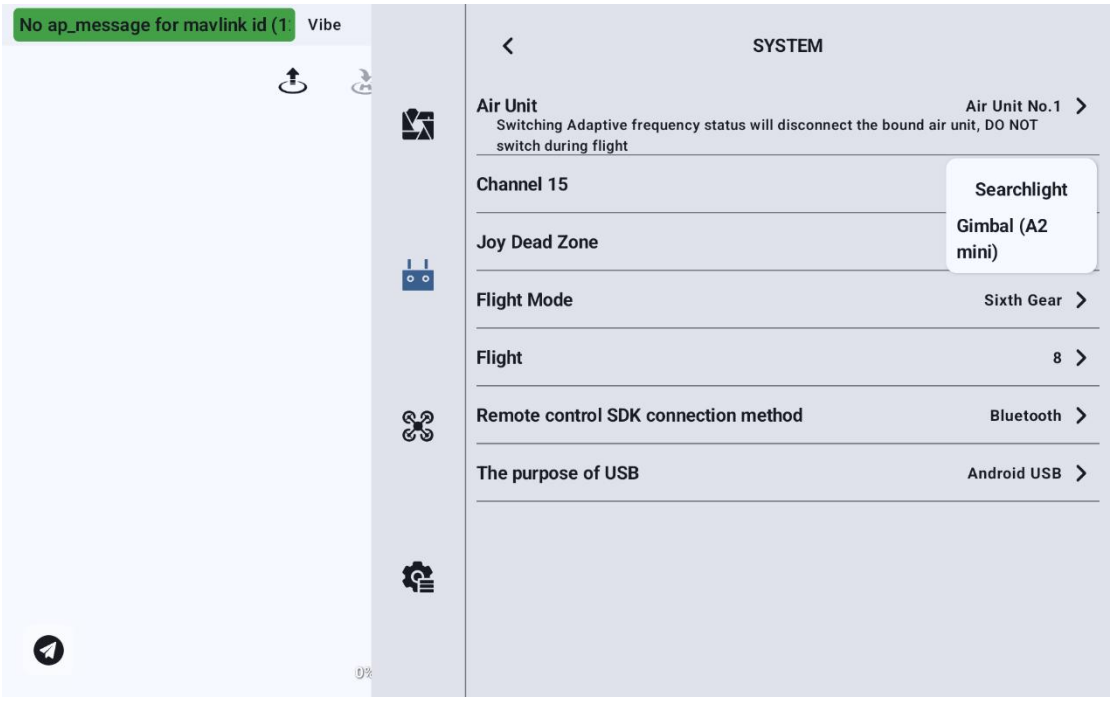


Danger

It is prohibited to switch sky ends during flight. Switching sky ends during flight may result in a loss of control of the communication link!

4.2.9.2 Channel 15

Switch control of the 15th communication channel to the spotlight switch of the rugged camera or the pitch rotation of the A2 mini gimbal.

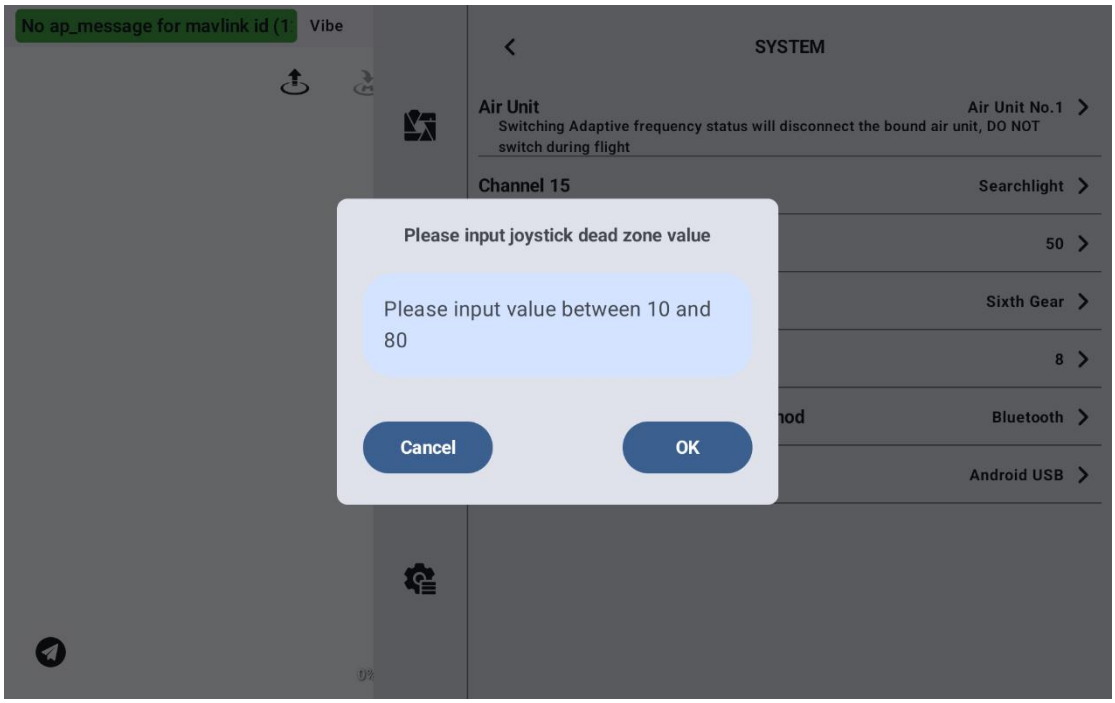


NOTE

The 15th channel corresponds to the device connected to the LAN 1 interface of the air unit, while the 16th channel corresponds to the device connected to the LAN 2 interface of the air unit. By default, the 16th channel is assigned to the searchlight.

4.2.9.3 Stick Dead Zone

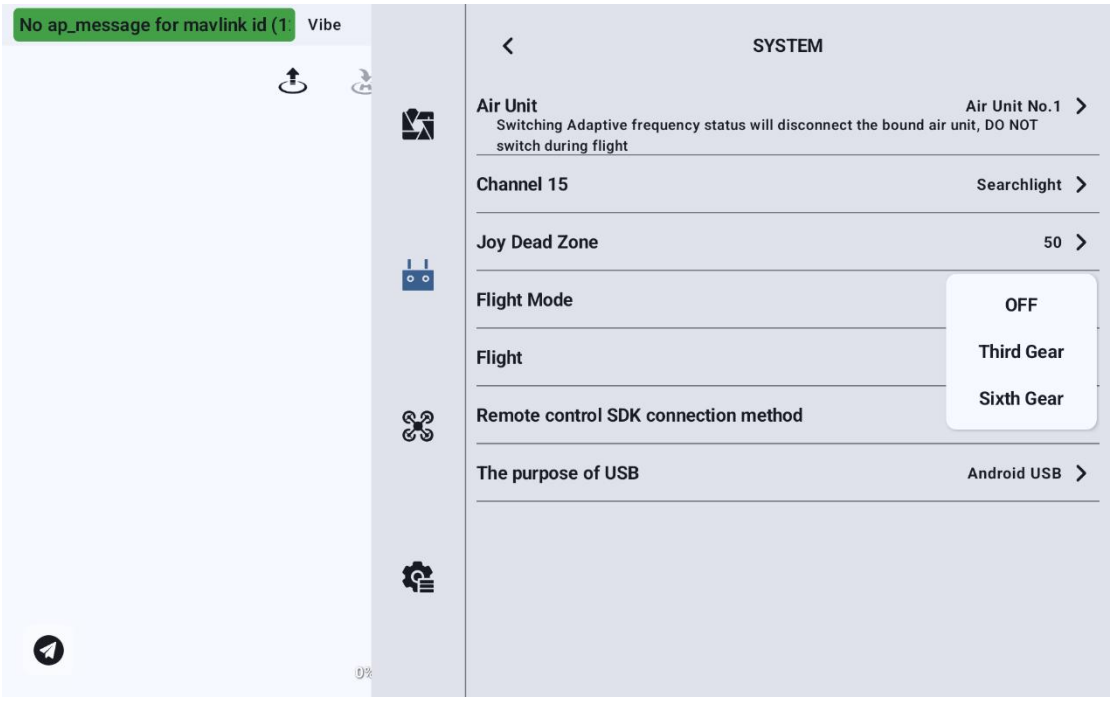
Adjust the stick dead zone to accommodate a variety of control sensitivities.



4.2.9.4 Flight Mode

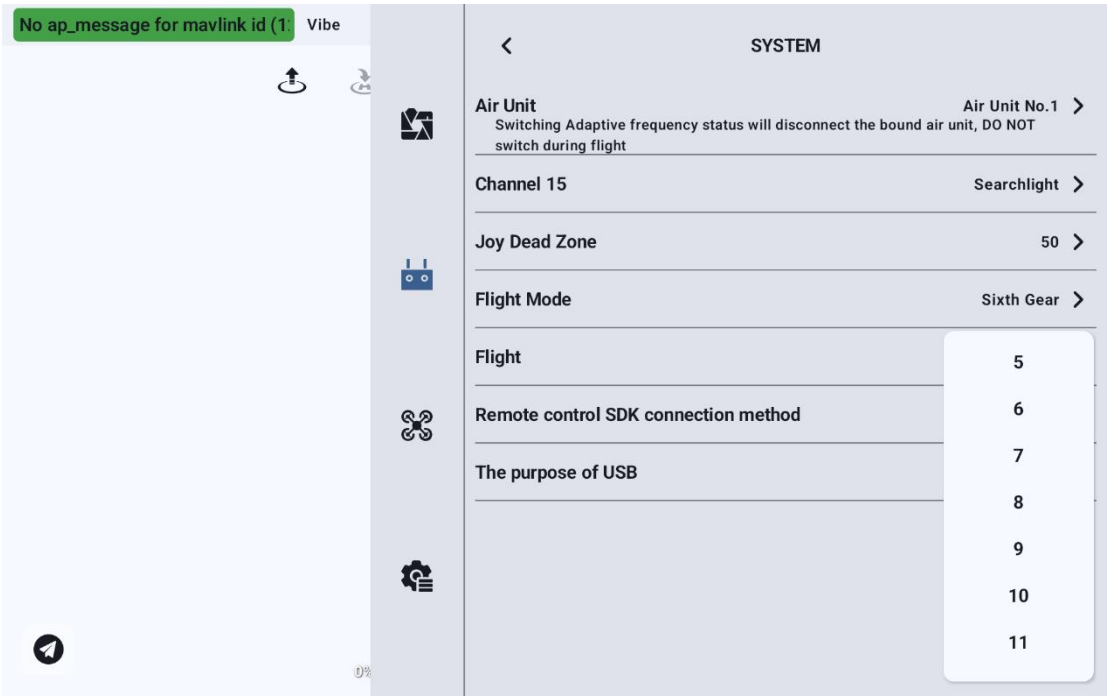
The flight mode can be set to 3-position mode, 6-position mode, or off.

- Off: Disables the flight mode function.
- 3-position mode: M1-M3 buttons are mapped to a single channel. Pressing M1 sets the channel output to 1050, M2 sets it to 1500, and M3 sets it to 1950.
- position mode: M1-M6 buttons are mapped to a single channel. Pressing M1 sets the channel output to 1000, M2 to 1250, M3 to 1425, M4 to 1575, M5 to 1700, and M6 to 2000.



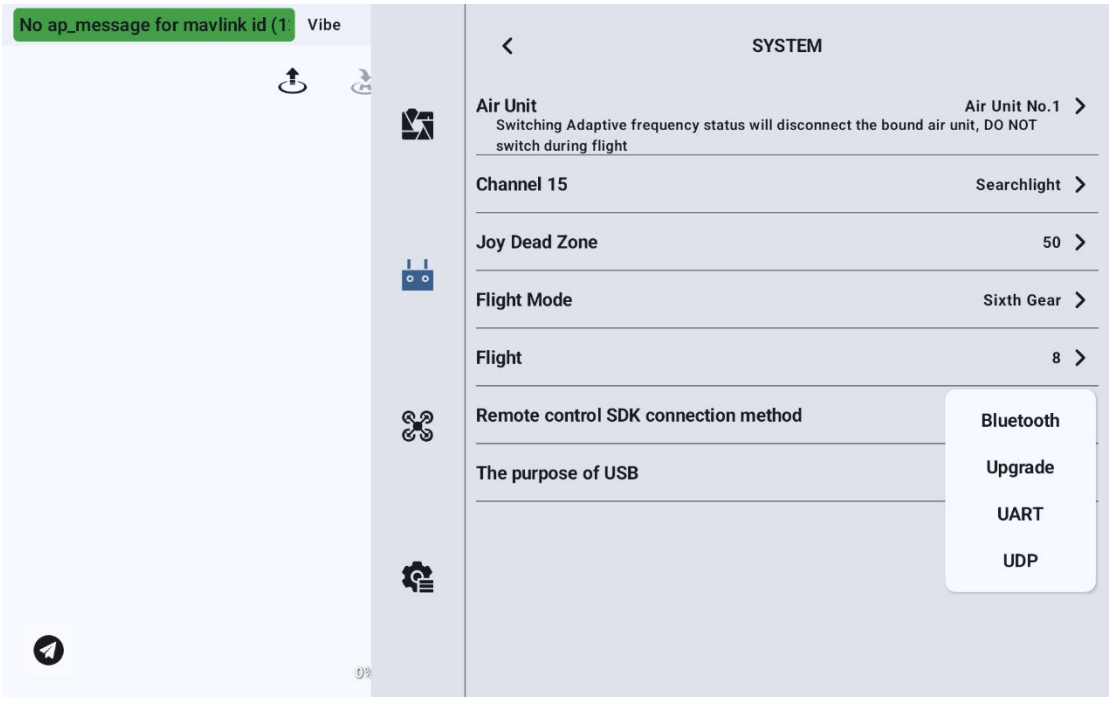
4.2.9.5 Flight Channels

The communication channels mapped to the flight mode, with M1-M6 mapped to the selected channels.



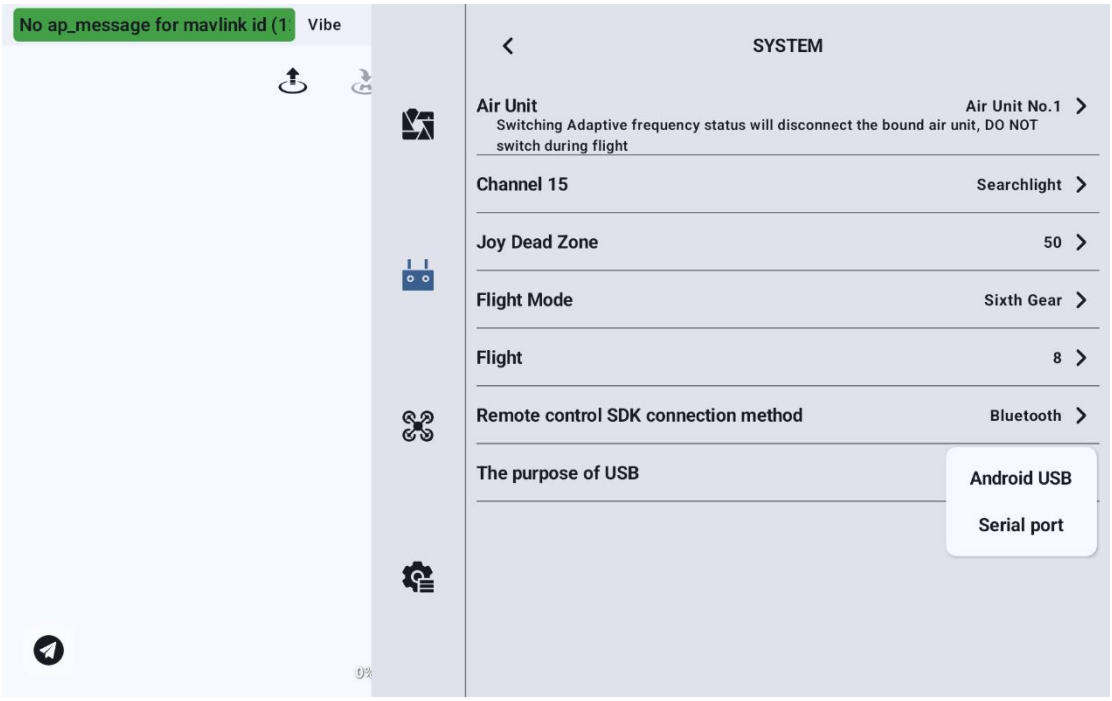
4.2.9.6 Remote Control SDK Connection Method

Users can integrate the link into their own network and connect to the ground station through the SDK.



4.2.9.7 USB Function of the Remote Controller

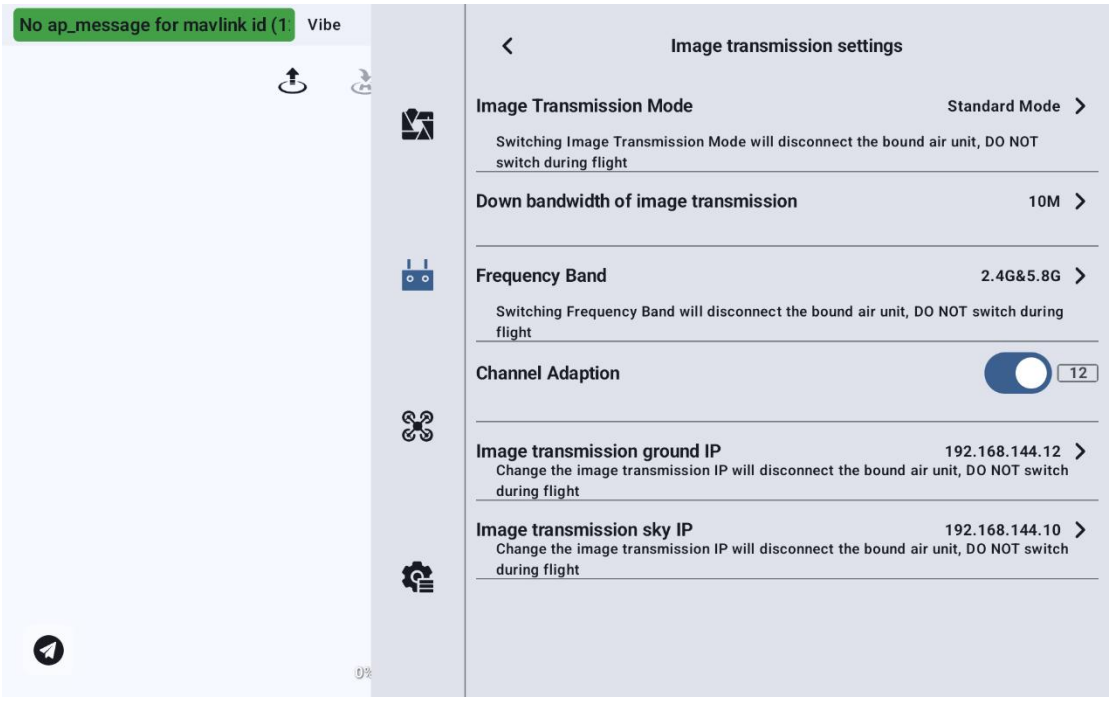
UniRC7 Professional Edition users can manually switch the working mode of the remote controller's internal USB.



4.2.10 Multi-Drone Interconnection

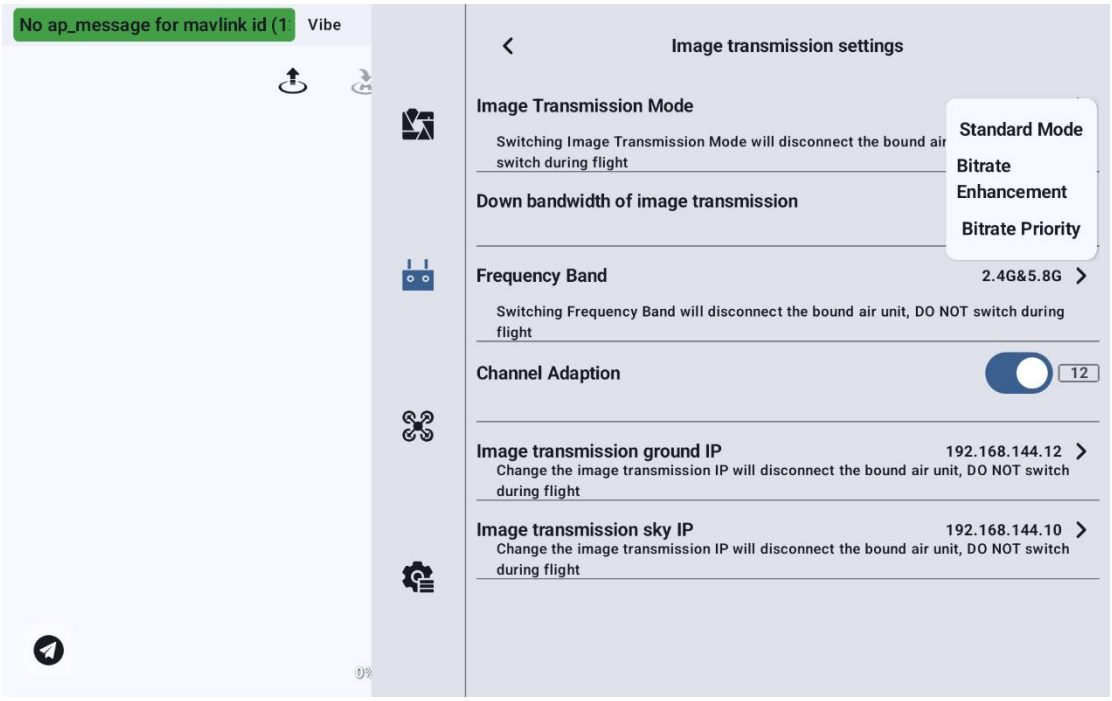
Feature under development, please stay tuned.

4.2.11 Video Transmission Settings



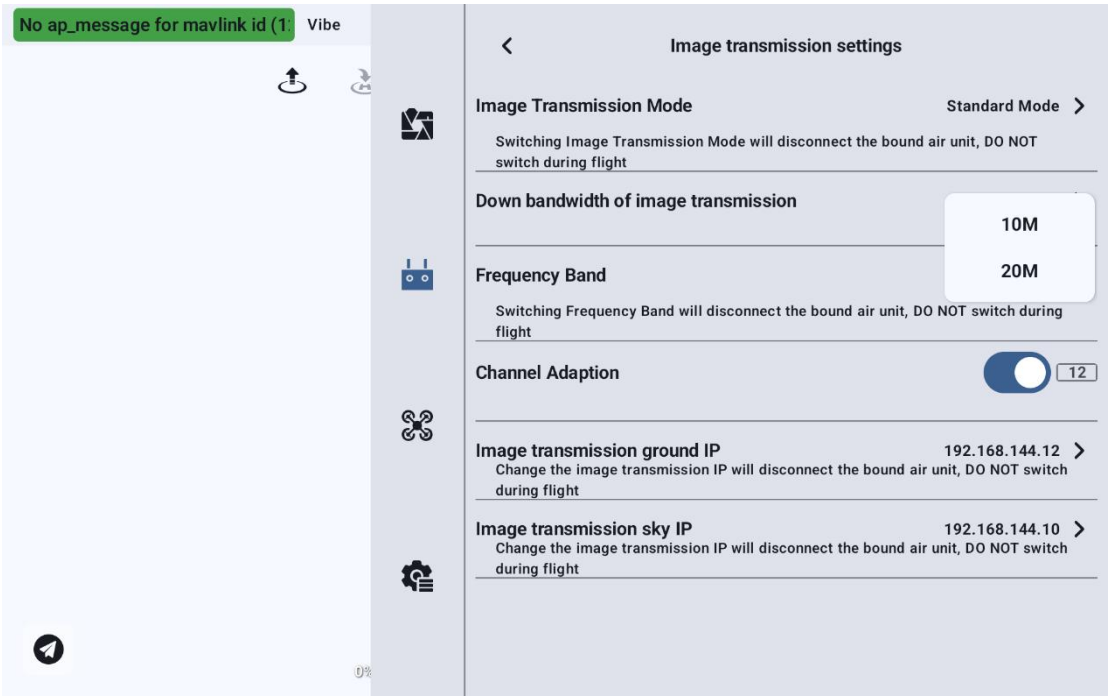
4.2.11.1 Video Transmission Mode

Change the video transmission bitrate mode.



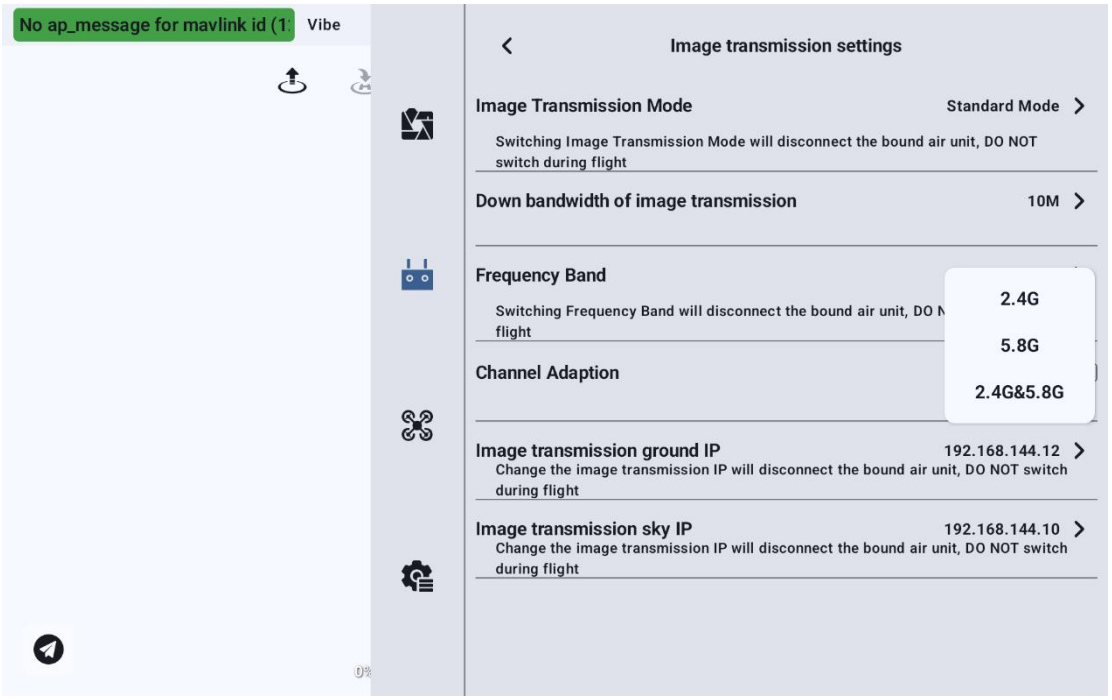
4.2.11.2 Video Transmission Downlink Bandwidth

You can switch the maximum bandwidth for the video transmission downlink.



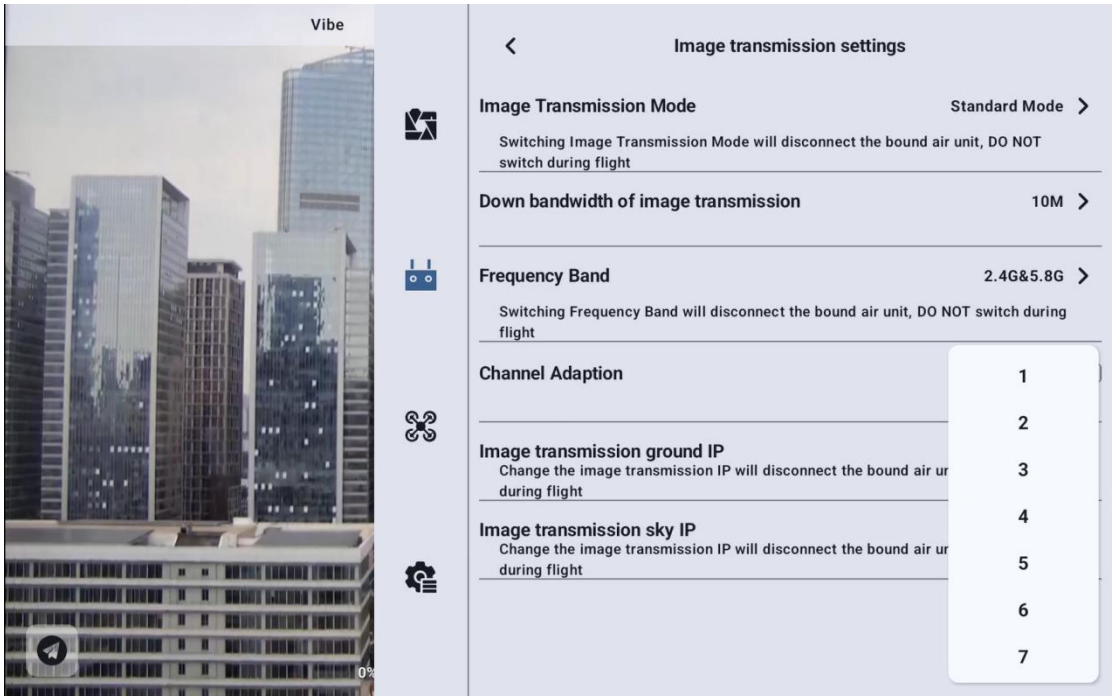
4.2.11.3 Operating Frequency Band

Manually switch the frequency band of the remote controller.



4.2.11.4 Adaptive Wireless Channel

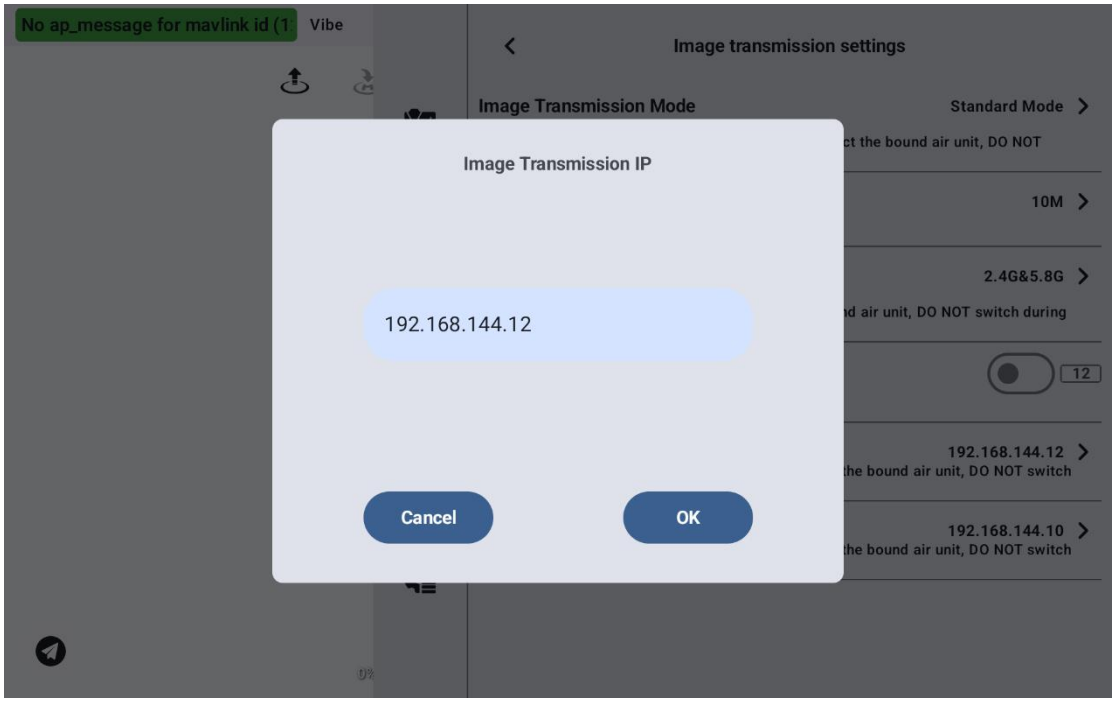
In environments with complex electromagnetic interference or noisy wireless signals, enable this feature, and the SIYI link will automatically search for the least-interfered wireless channel to establish the best conditions for wireless communication. When the adaptive wireless channel is disabled, you can manually select a wireless channel between 1 and 32.



4.2.11.5 Video Transmission IP

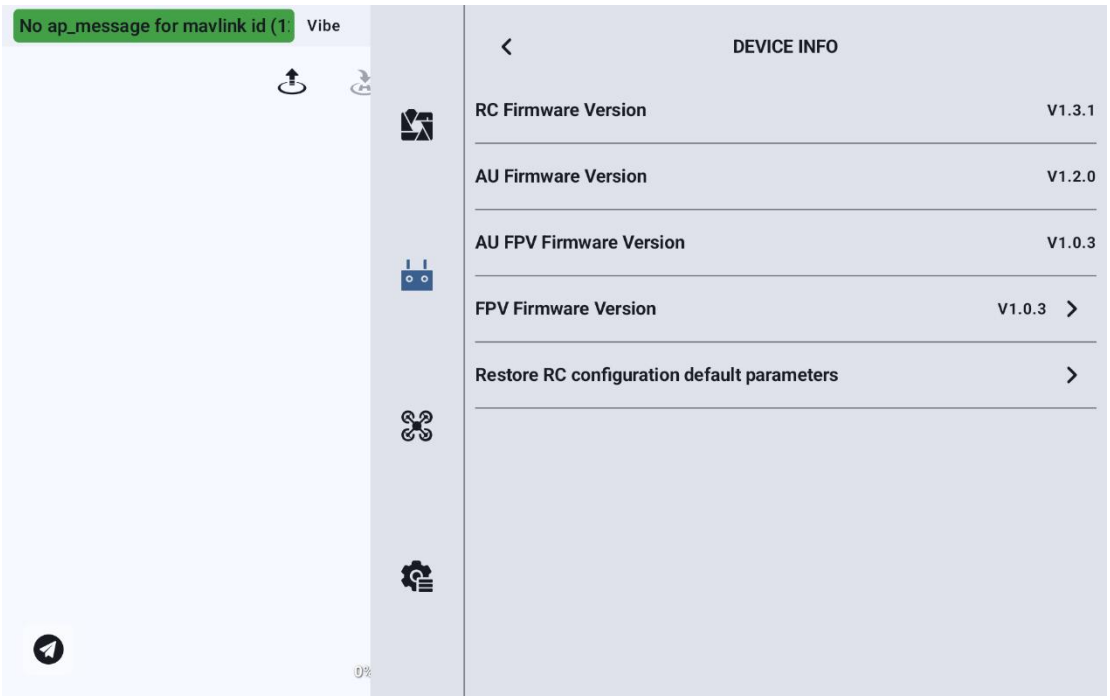
Supports users in setting different IP addresses to adapt to other products.

Currently, only the UniRC 7 series supports this feature.



4.2.12Device Information

Displays the version information of the current remote controller device.



Remote Controller Firmware Version: The current firmware version of the remote controller mainboard.

Air Unit Firmware Version: The current firmware version of the air unit.

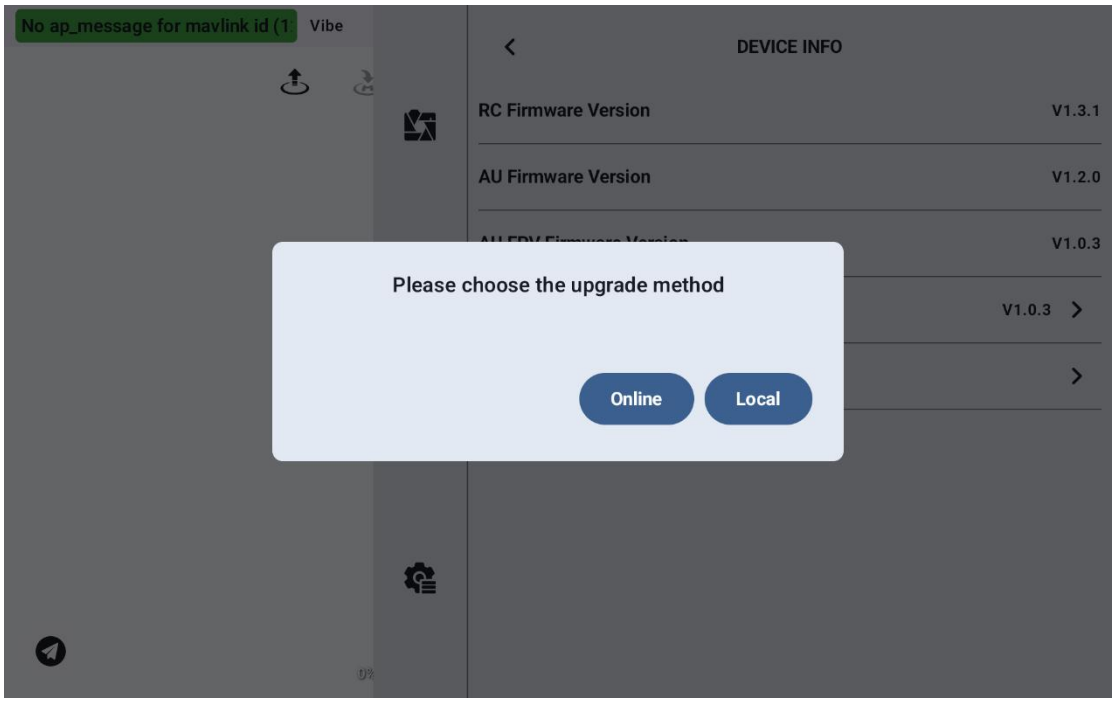
Air Unit Video Transmission Firmware Version: The current firmware version of the video transmission module on the air unit.

Video Transmission Firmware Version: The current firmware version of the video transmission module on the remote controller.

4.2.12.1 Video Transmission Firmware Upgrade

Click on the video transmission firmware version to manually select a

local firmware version to upgrade the video transmission firmware on both the air unit and remote controller.

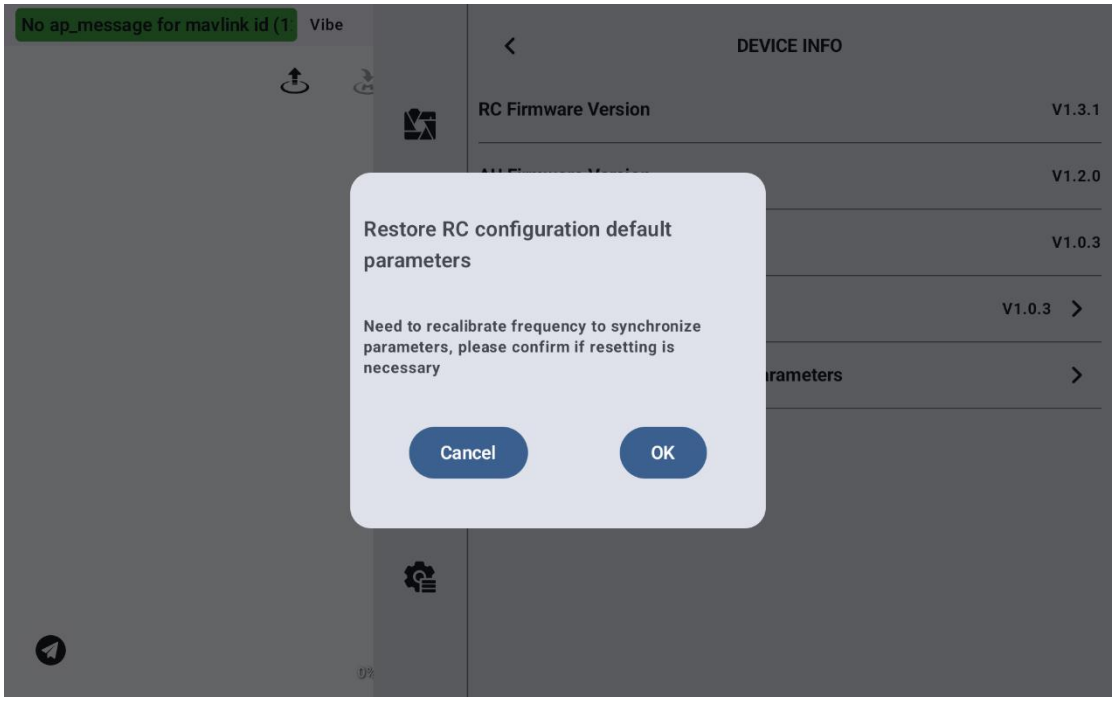


NOTE

The firmware versions of the video transmission modules on both the air unit and ground control station must be consistent in order to enable communication.

4.2.12.2 Reset Remote Controller Parameters

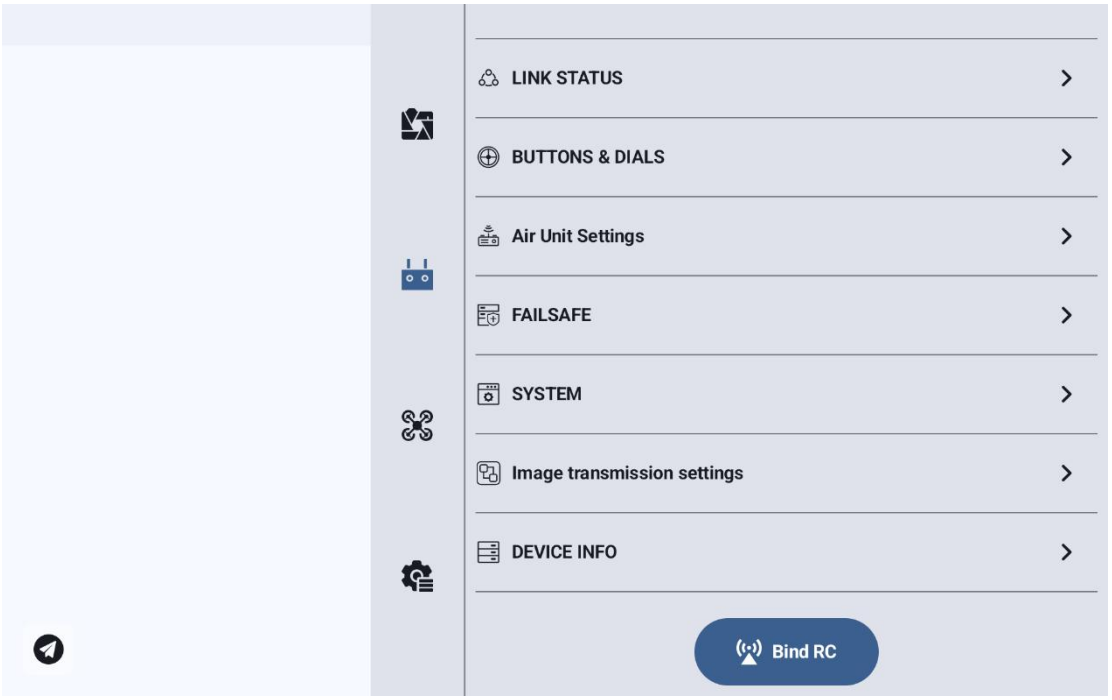
Reset to Default Parameters: This will restore the settings in the remote controller module to the factory default.



4.2.13 Binding

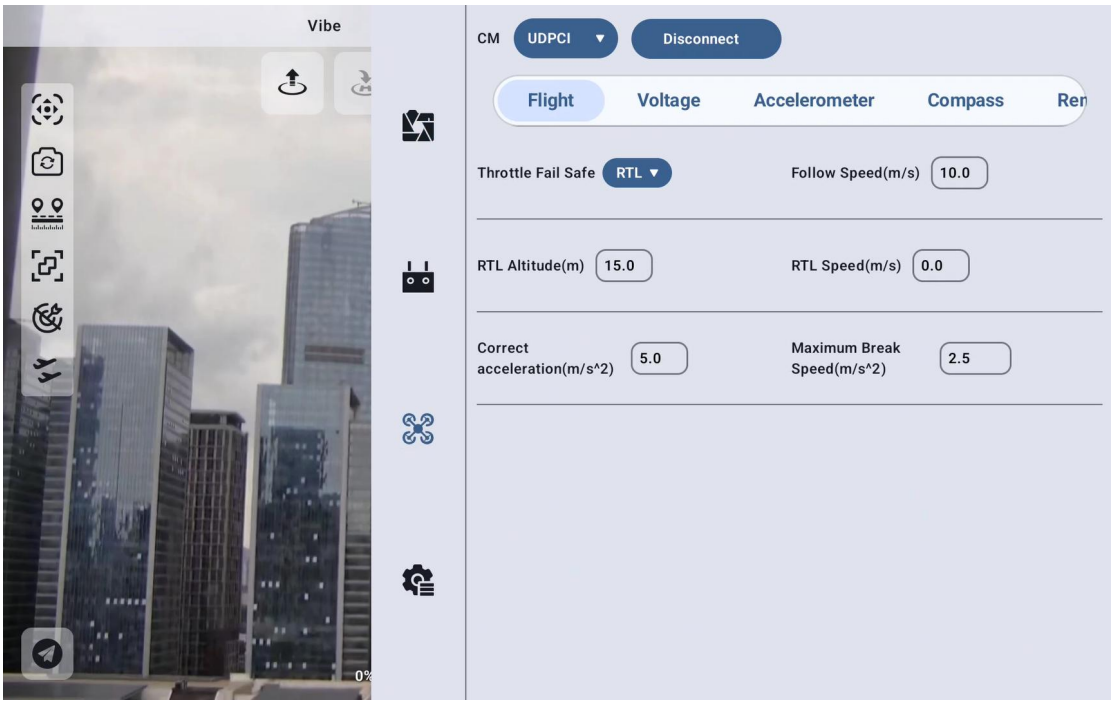
Follow the steps below to bind the ground control station and the air unit:

1. On the “UniGCS” interface, open the remote controller settings menu and tap “Bind Remote Controller”;
2. The status indicator on the ground unit will begin flashing red rapidly, the “Binding” menu will show “Binding in Progress,” and the handheld ground station will emit a beeping sound;
3. Press and hold the binding button on the air unit for 2 seconds. Its status indicator will also start flashing red rapidly;
4. Wait approximately 5 to 10 seconds. When both the ground unit and air unit status indicators turn solid green, the binding process is complete.



4.3 Flight Controller Module

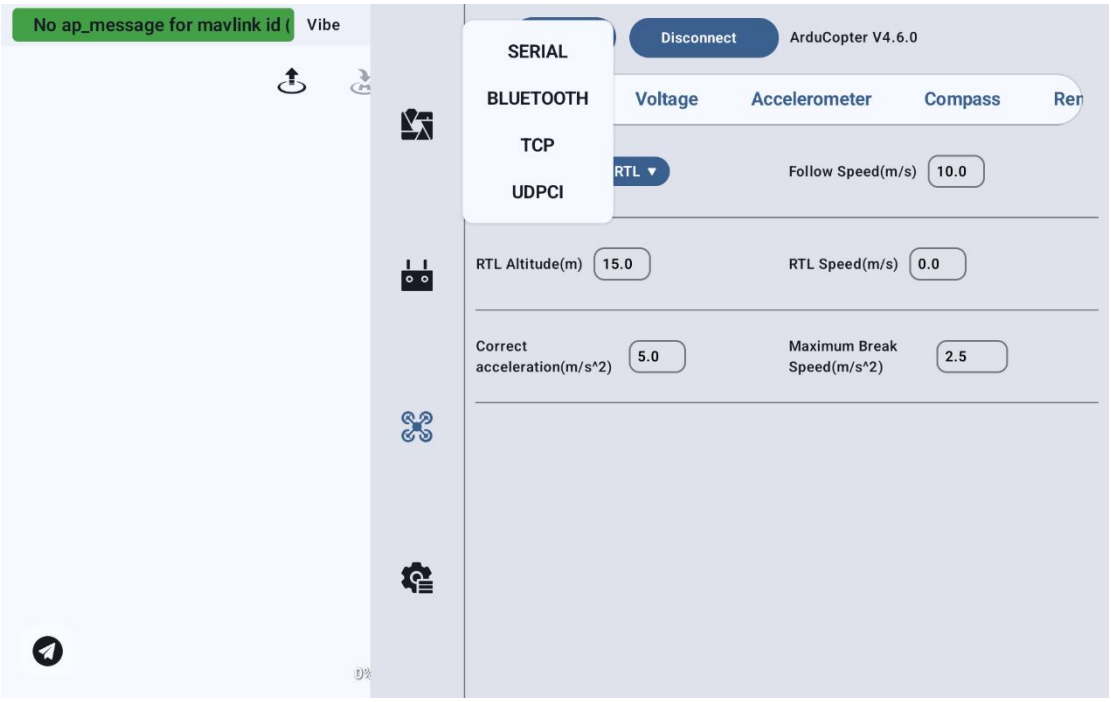
4.3.1 Main Menu



4.3.1.1 Connection Method

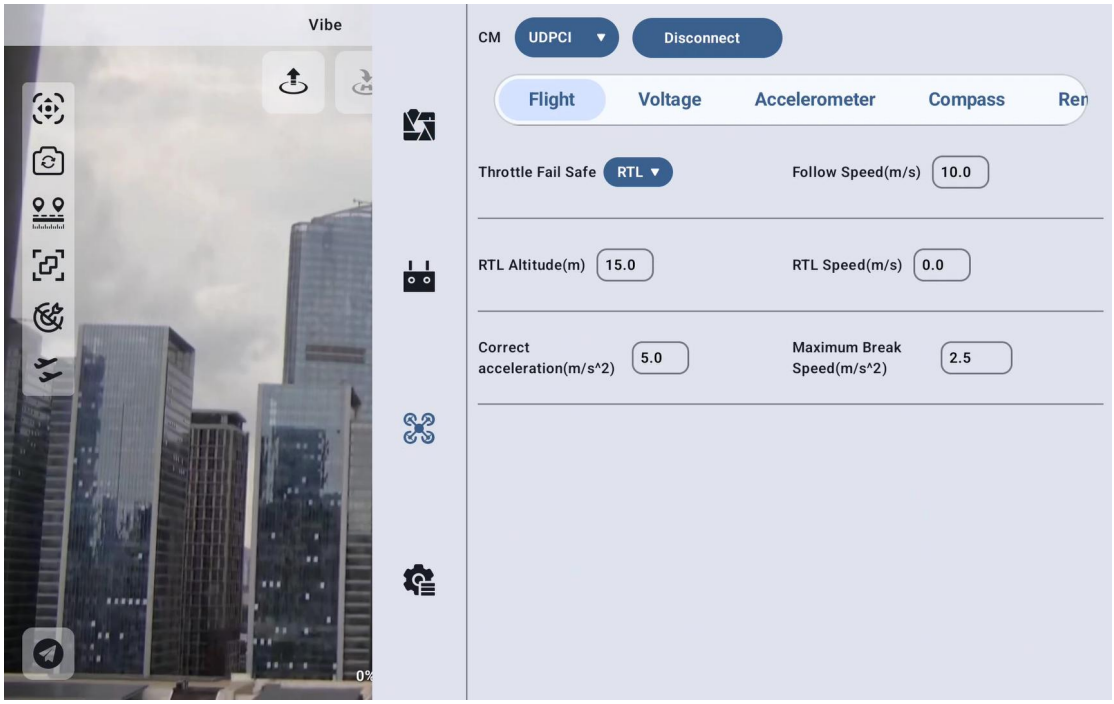
Switch the connection type within the flight controller module to the desired mode. Click “Connect” and follow the on-screen instructions to establish the connection.

If you intend to use the built-in telemetry function of the remote controller, ensure that the selected connection method matches the telemetry mode configured in the Remote Controller module (refer to section 4.2.3 Telemetry Settings).



4.3.2 Flight Settings

This section includes configurations such as speed limits, altitude limits, and failsafe behavior. After entering the desired parameters, click the “Send” button in the bottom-right corner of the on-screen keyboard to save your settings.



Quick Settings and Corresponding ArduPilot Copter Firmware Parameters:

Throttle Failsafe — FS_THR_ENABLE

Follow Speed — WPNAV_SPEED

Return-to-Home Altitude — RTL_ALT

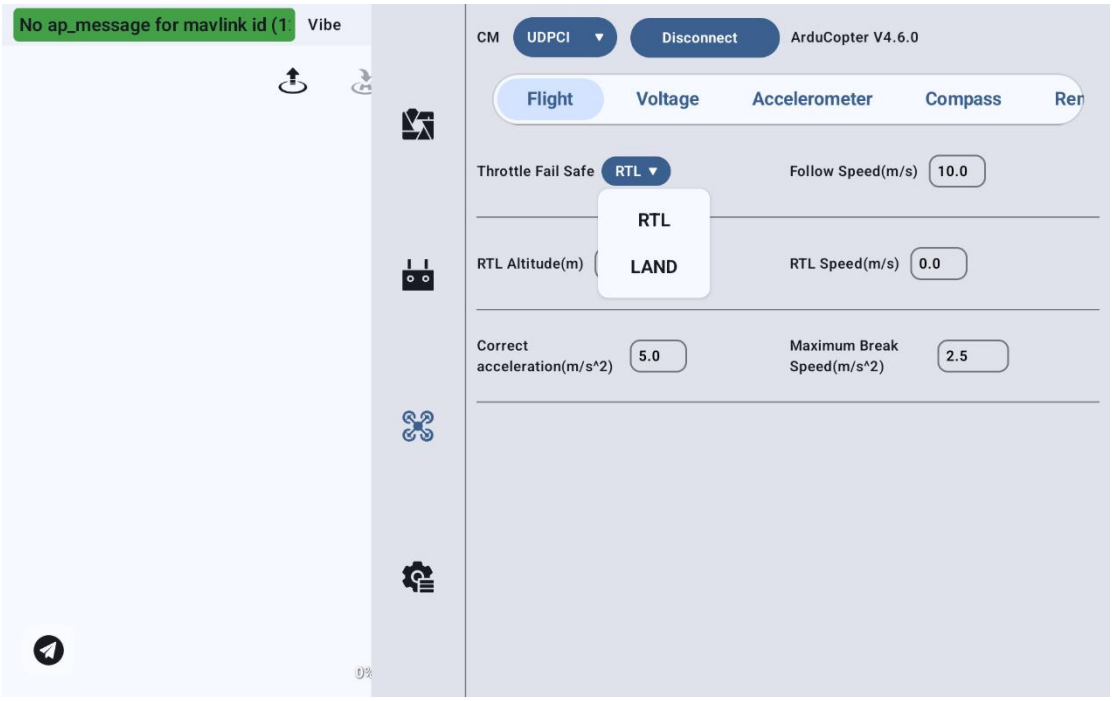
Return-to-Home Speed — RTL_SPEED

Loiter Acceleration Limit — LOIT_ACC_MAX

Maximum Braking Acceleration — LOIT_BRK_ACCEL

4.3.2.1 Failsafe Behavior

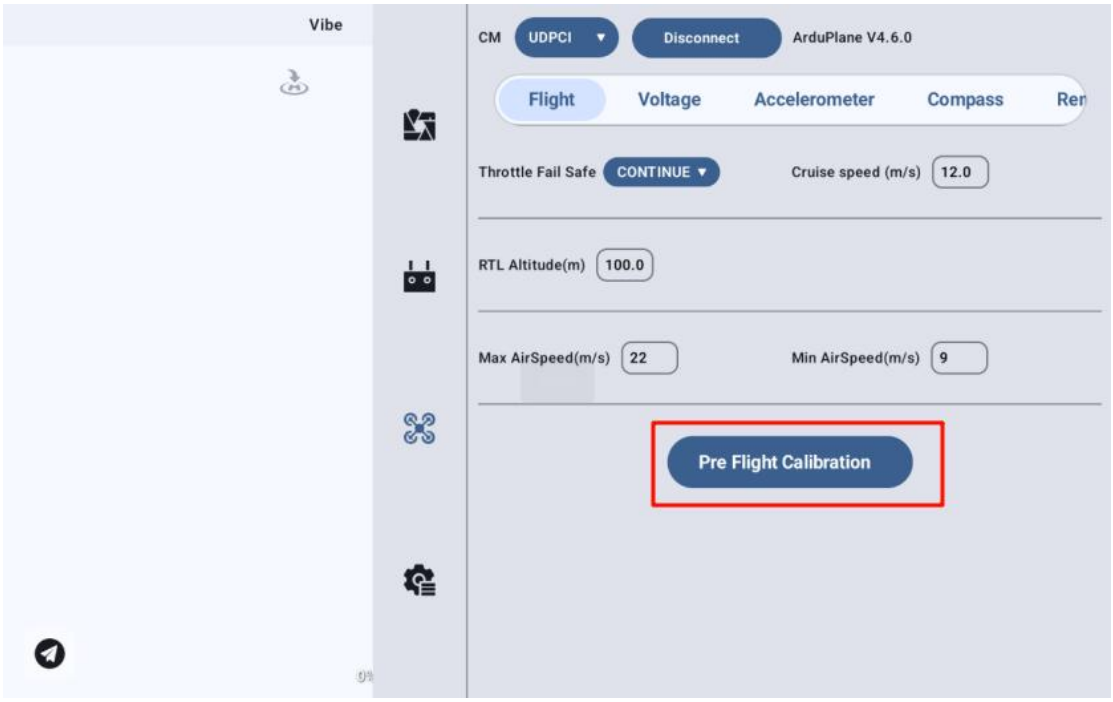
For ArduCopter firmware, the failsafe behavior supports two selectable modes: Return-to-Home (RTL) and Landing.

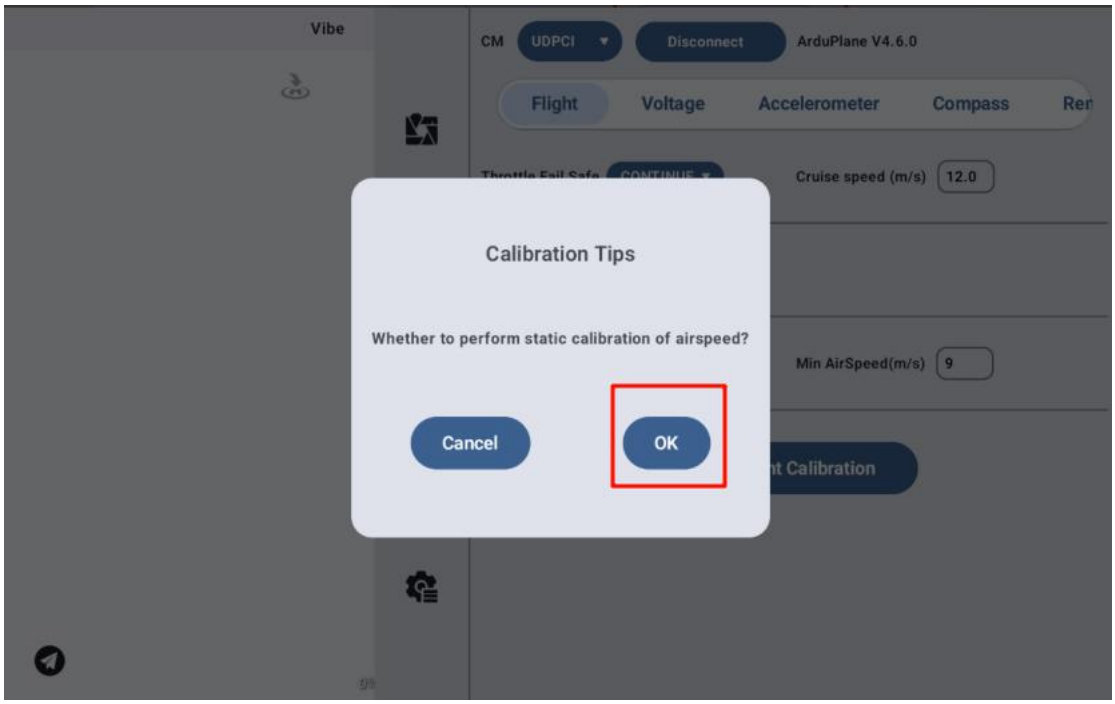


4.3.2.2 Pre-Flight Calibration

For fixed-wing firmware, a pre-flight calibration function is available to calibrate the airspeed sensor.

Tap "Pre-Flight Calibration", then confirm to start the airspeed sensor calibration process.

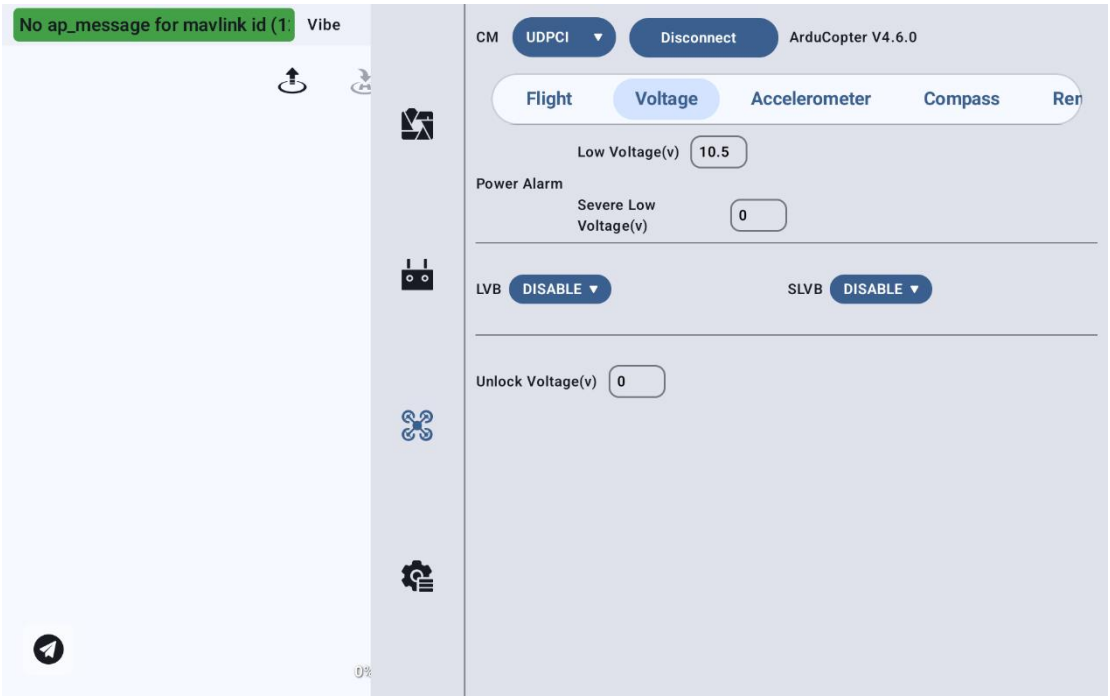




4.3.3 Voltage

Configure voltage alarm thresholds and low-voltage response behavior.

After entering the parameters, tap the “Send” button in the lower right corner of the keyboard to save the settings.



Quick Settings and Corresponding ArduPilot Copter Firmware Parameters:

Low Voltage — BATT_LOW_VOLT

Critical Low Voltage — BATT_CRT_VOLT

Low Voltage Action — BATT_FS_LOW_ACT

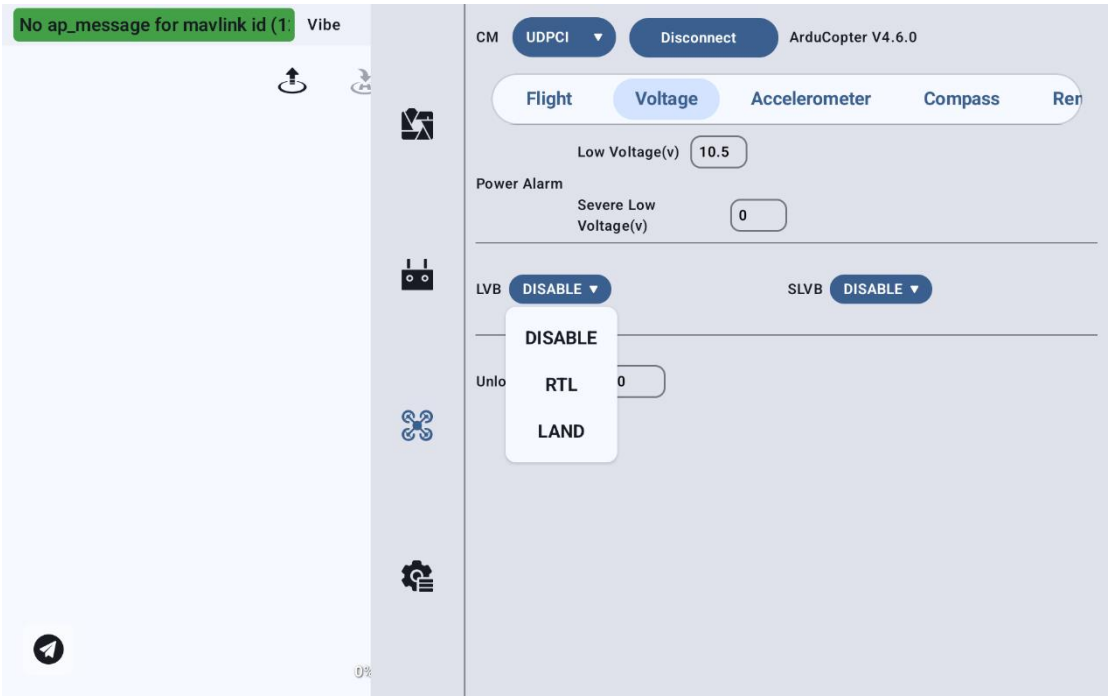
Critical Low Voltage Action — BATT_FS_CRT_ACT

Arming Voltage — BATT_ARM_VOLT

4.3.3.1 Low Voltage

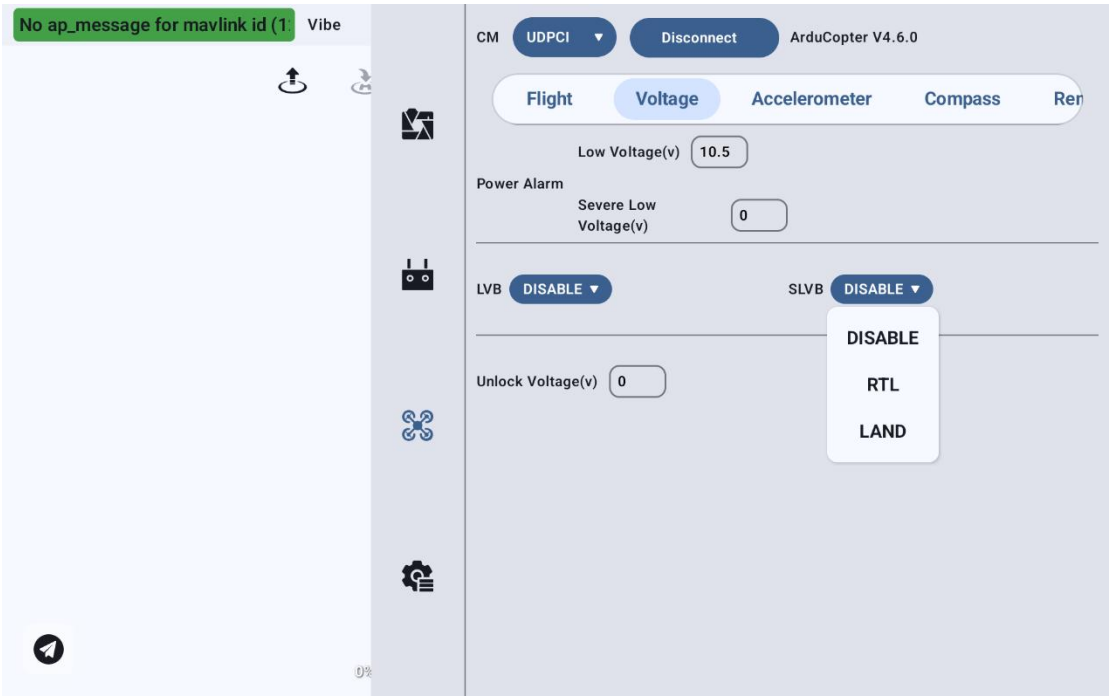
When the battery voltage remains below the configured low voltage threshold for more than 10 seconds (as per flight controller default), the system will trigger the action specified under the Low Voltage Action

setting.



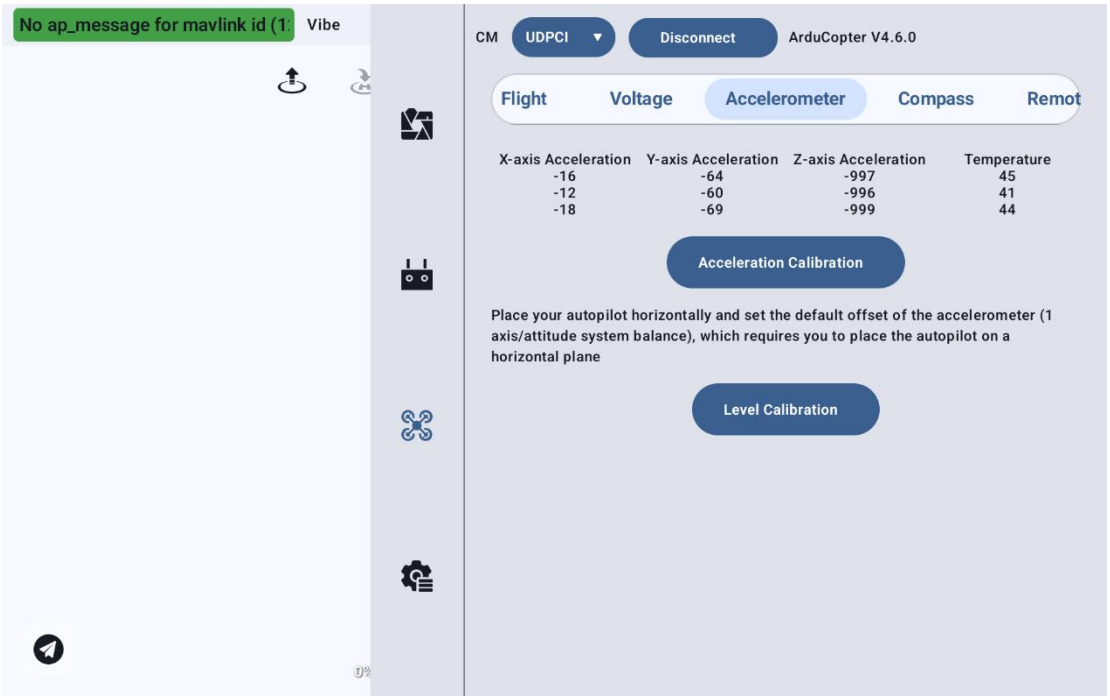
4.3.3.2 Critical Low Voltage

When the battery voltage drops below the configured critical low voltage threshold, the system will trigger the action specified under the Critical Low Voltage Action setting.



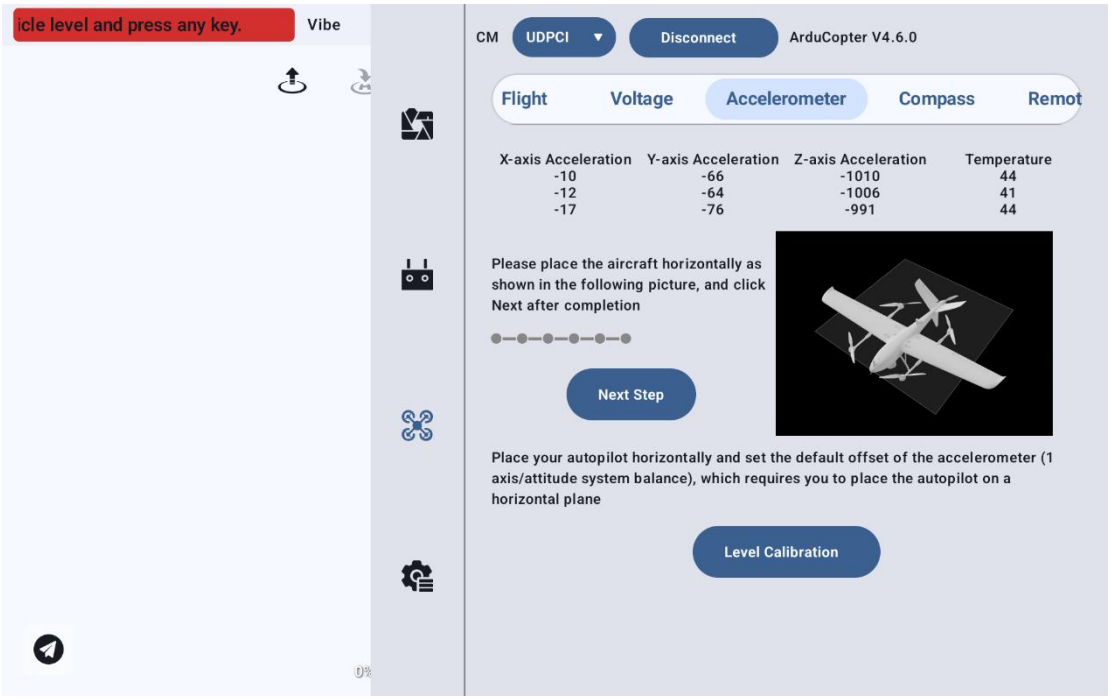
4.3.4 Accelerometer Menu

This menu displays the accelerometer data and IMU temperature from the flight controller. It also provides options for accelerometer calibration and flight controller leveling calibration.



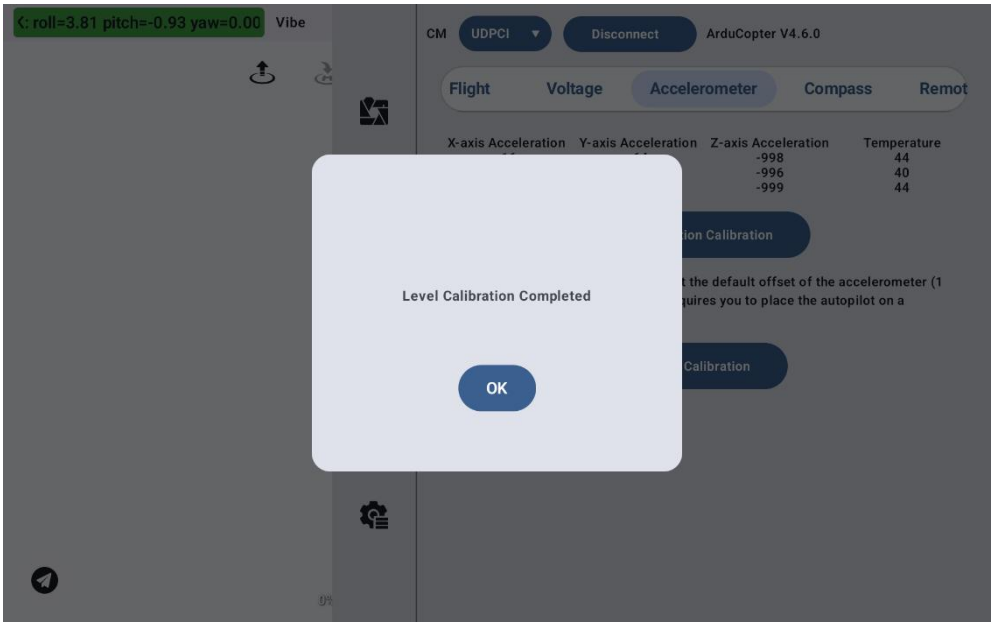
4.3.4.1 Accelerometer Calibration

Follow the instructions to place the drone as shown in the diagram. Click "Next" and proceed with calibrating the six faces of the drone. After completing the six-face calibration, restart the drone as prompted to finish the accelerometer calibration.



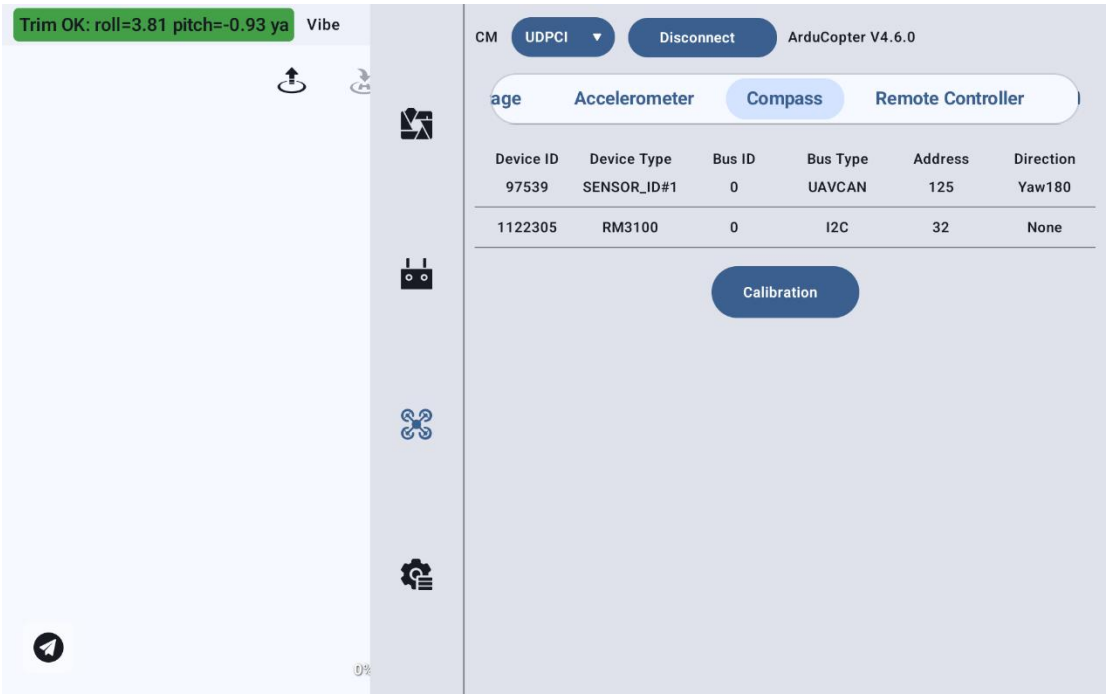
4.3.4.2 Horizontal Calibration

Place the drone on a flat, level surface and ensure it remains still. Click "Horizontal Calibration" to calibrate the drone's horizontal alignment.

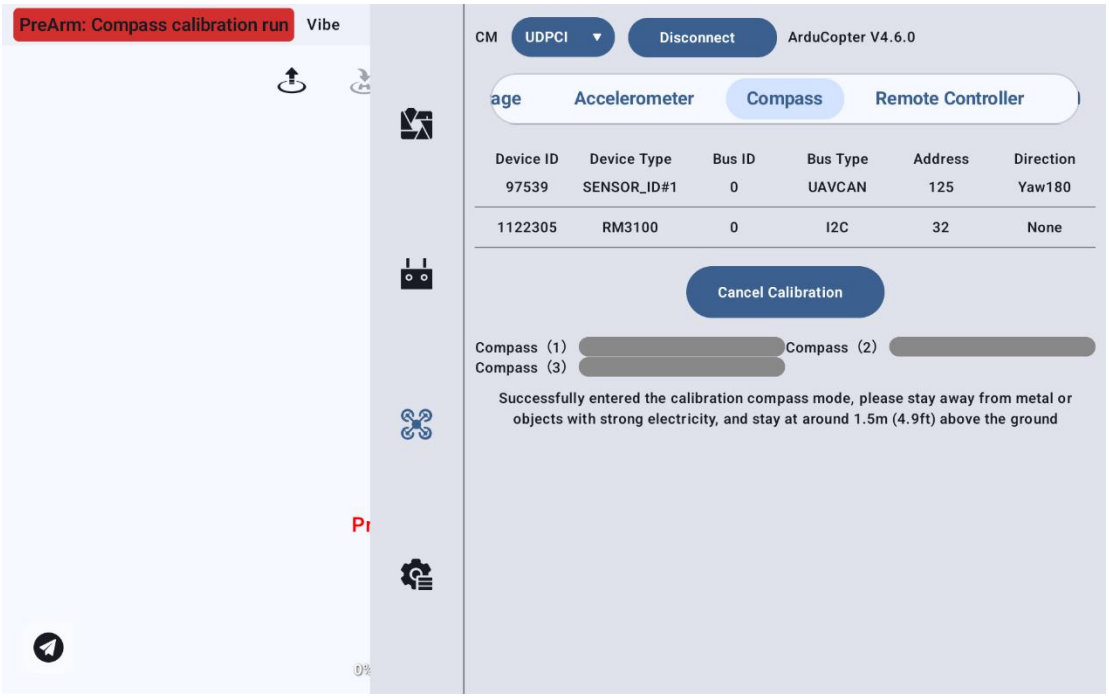


4.3.5 Compass Menu

This menu includes various compass-related information and calibration functions.



4.3.5.1Start Calibration



Note:

Do not calibrate in areas with strong magnetic fields or near large metal objects, such as magnetic minerals, parking lots, or areas with underground steel reinforcements.

Avoid carrying ferromagnetic materials like mobile phones during calibration.

Steps for Compass Calibration:

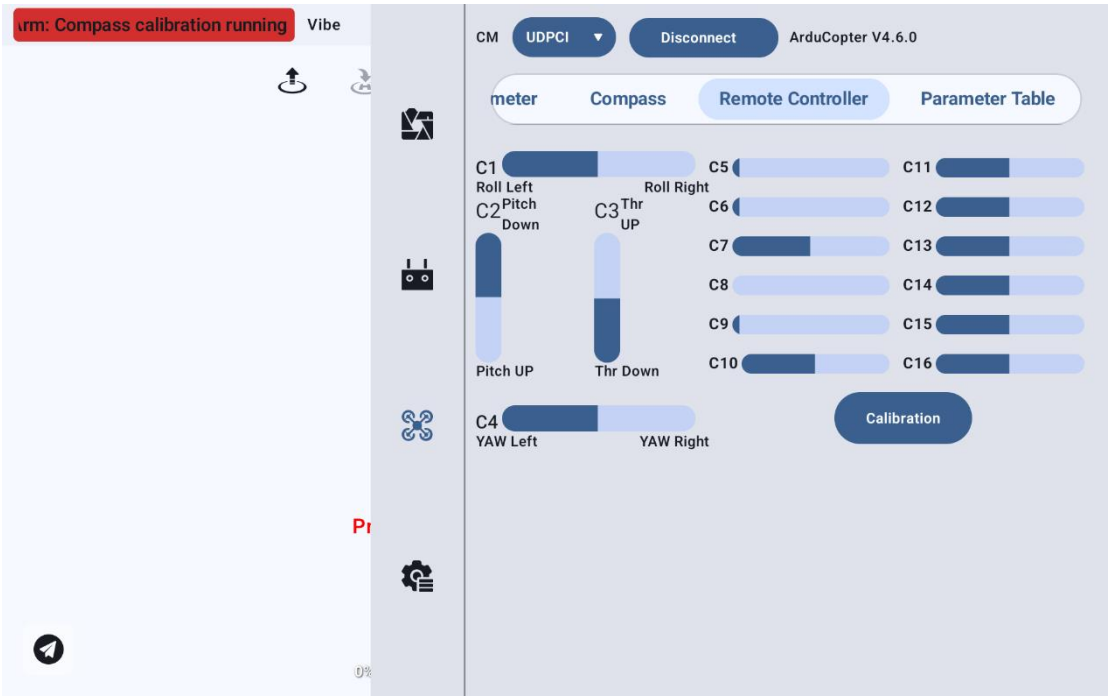
1. Open the compass calibration interface in the correct sequence.
2. Click "Calibrate."
3. Lift the drone and rotate it in different directions. Ensure each side (front, back, left, right, top, and bottom) points downward toward the Earth for a few seconds, until the compass progress bar completes.
4. Restart the drone.

4.3.6 Remote Control Calibration

Provides remote control calibration functionality and allows viewing of the current channel values recognized by the flight controller.

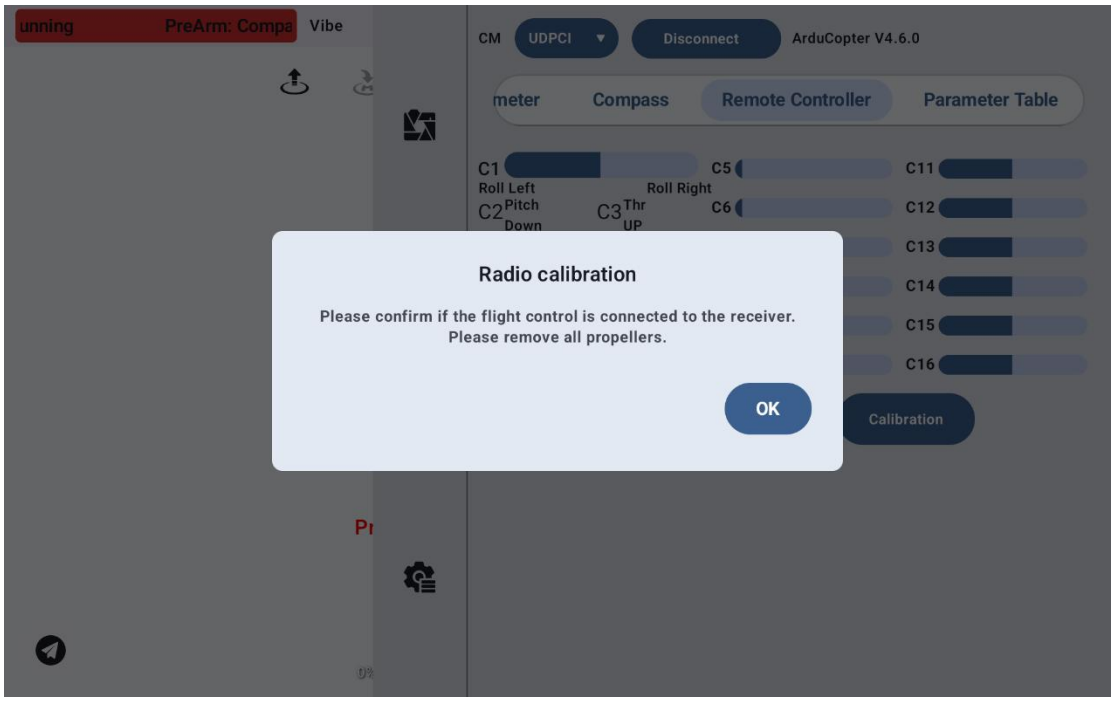
4.3.6.1 Stick Centering

Before calibration, ensure that all sticks are centered, confirm the correct polarity of the channels, and then click "Calibrate."



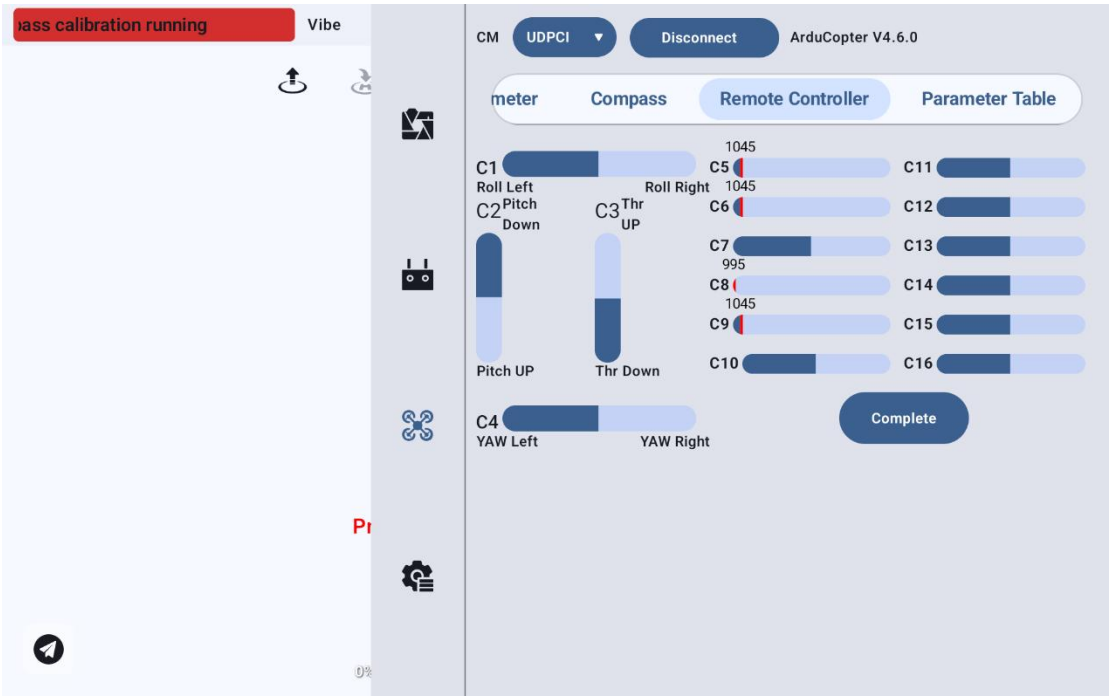
4.3.6.2 Safety Tips

Follow the instructions to remove all propellers, then click "Confirm."



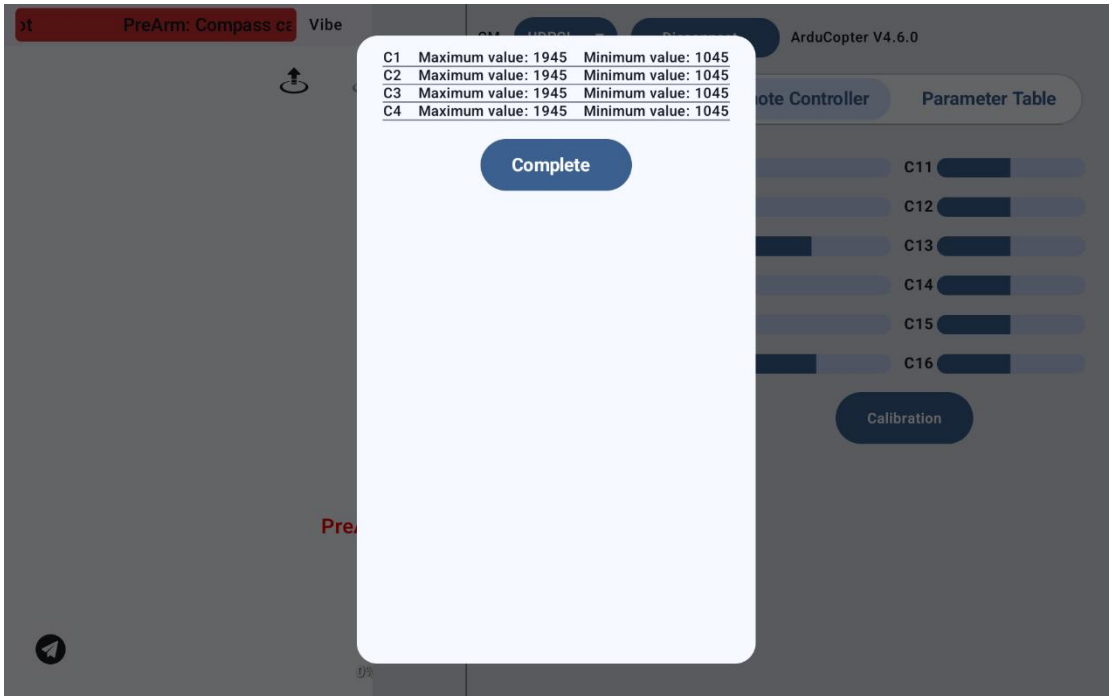
4.3.6.3 Channel Data Logging

Gradually move the joysticks and switches of each channel to their maximum and minimum positions in sequence, allowing the software to record the maximum and minimum values of each channel.



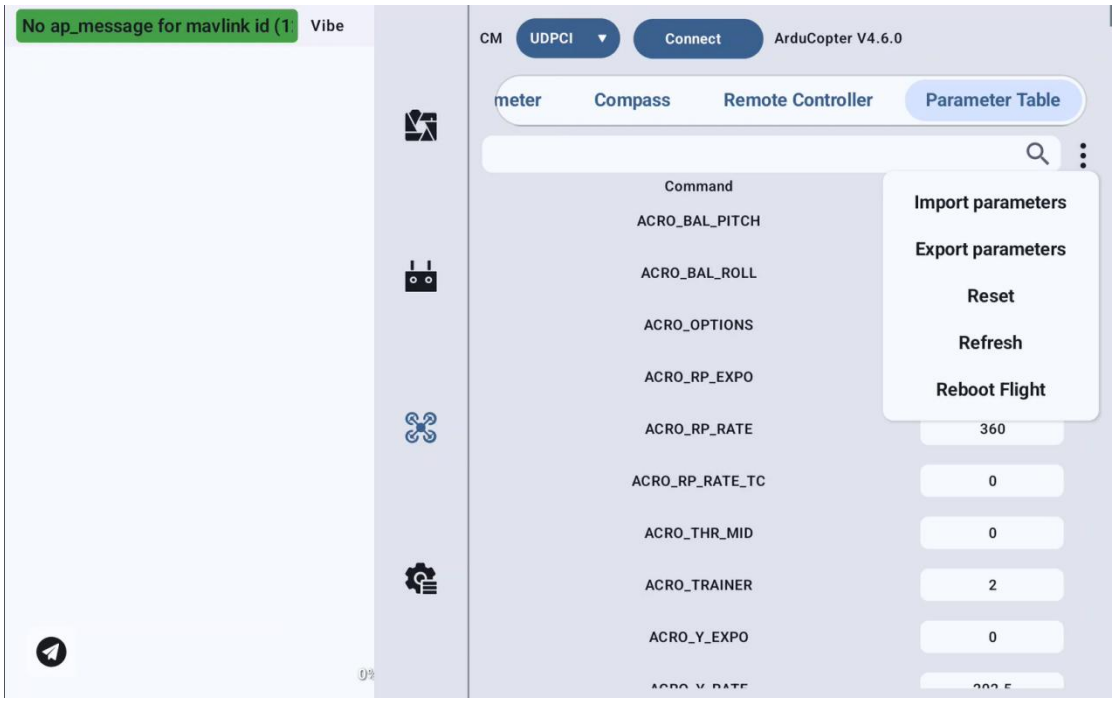
4.3.6.4 Calibration Complete

Click "Complete," and the software will display the recorded maximum and minimum values for each channel. Click "Complete" again to finish the remote control calibration.



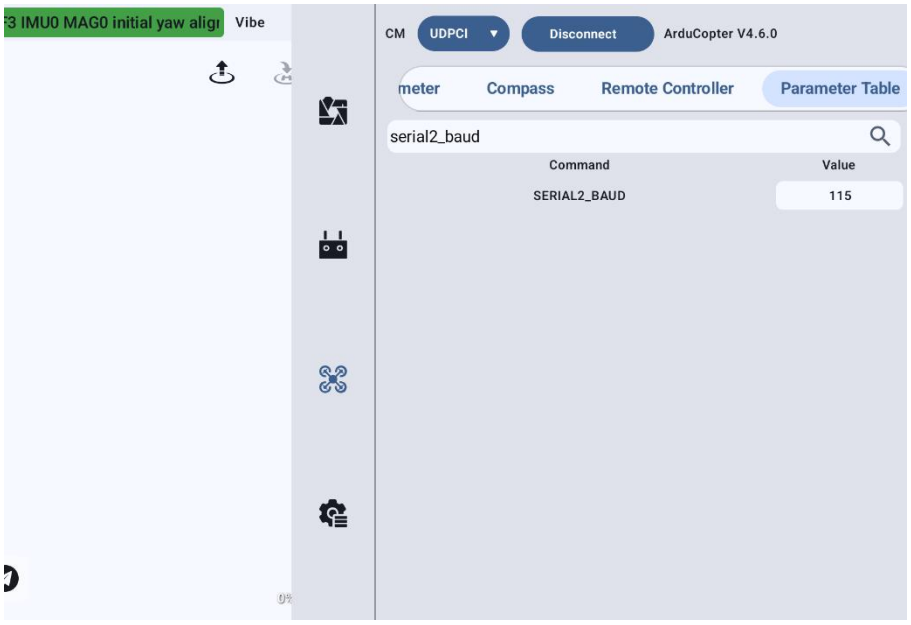
4.3.7 Parameter Table

Includes functions for importing, exporting, searching, modifying, refreshing, resetting, and rebooting the flight controller.



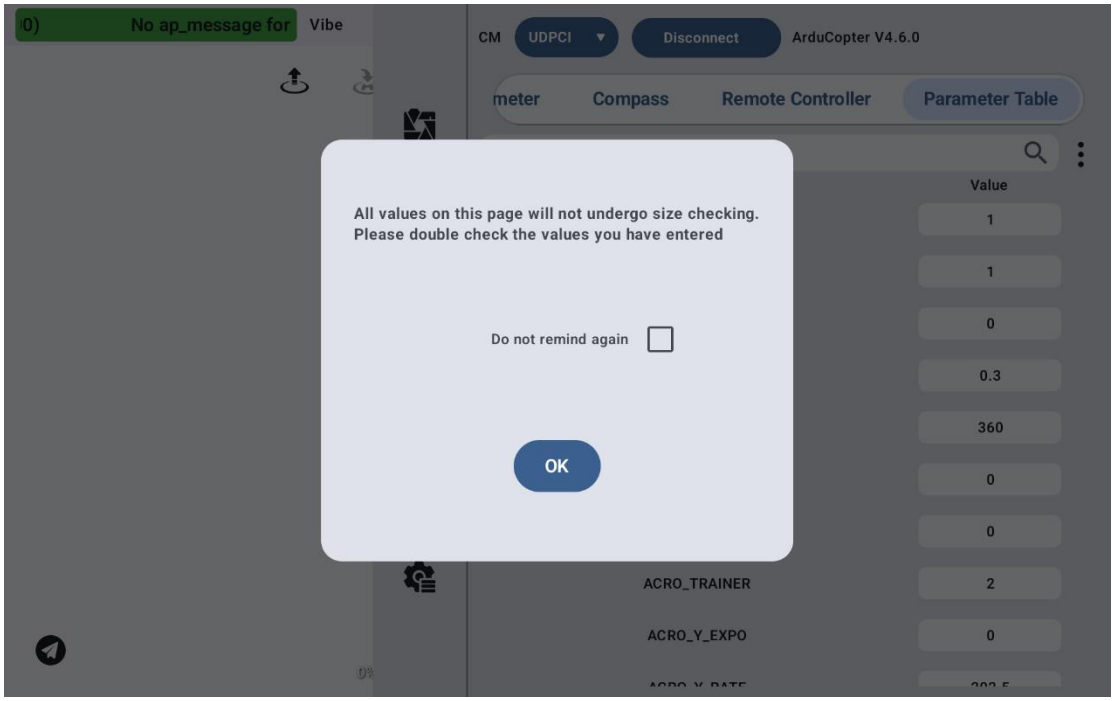
4.3.7.1 Parameter Search

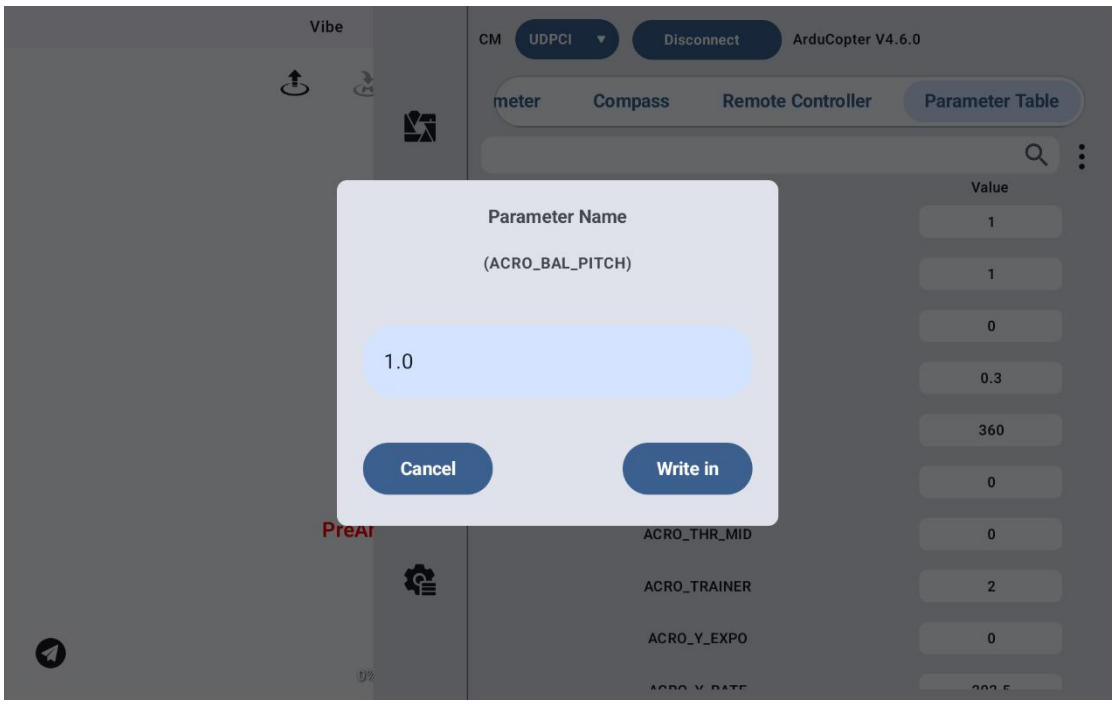
Enter the parameter name you want to search for and click the search button. The system will search for the exact name or parameters that contain the entered name.



4.3.4.2 Parameter Modification

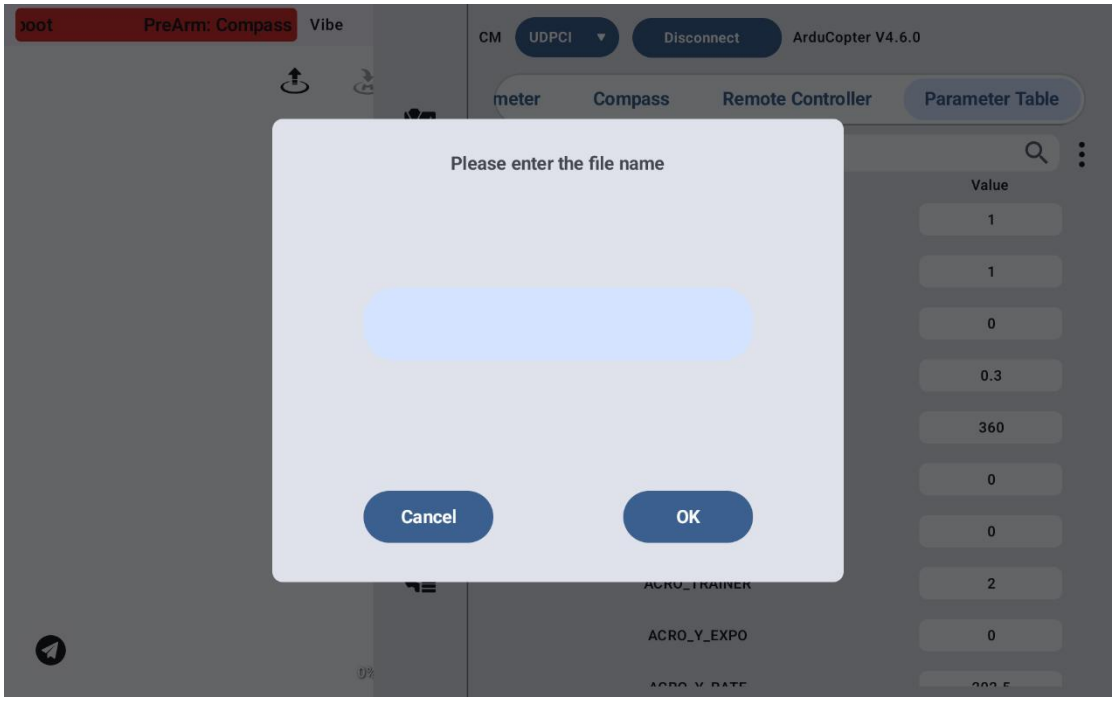
Before making any modifications, please double-check the parameters to be changed and make a backup if necessary. In the value box of the parameter you want to modify, enter the desired value and click "Write" at the bottom right of the input field to complete the parameter modification.





4.3.7.3 Parameter Export

Click "Export Parameters" to save all the parameters from the parameter list to the remote controller.

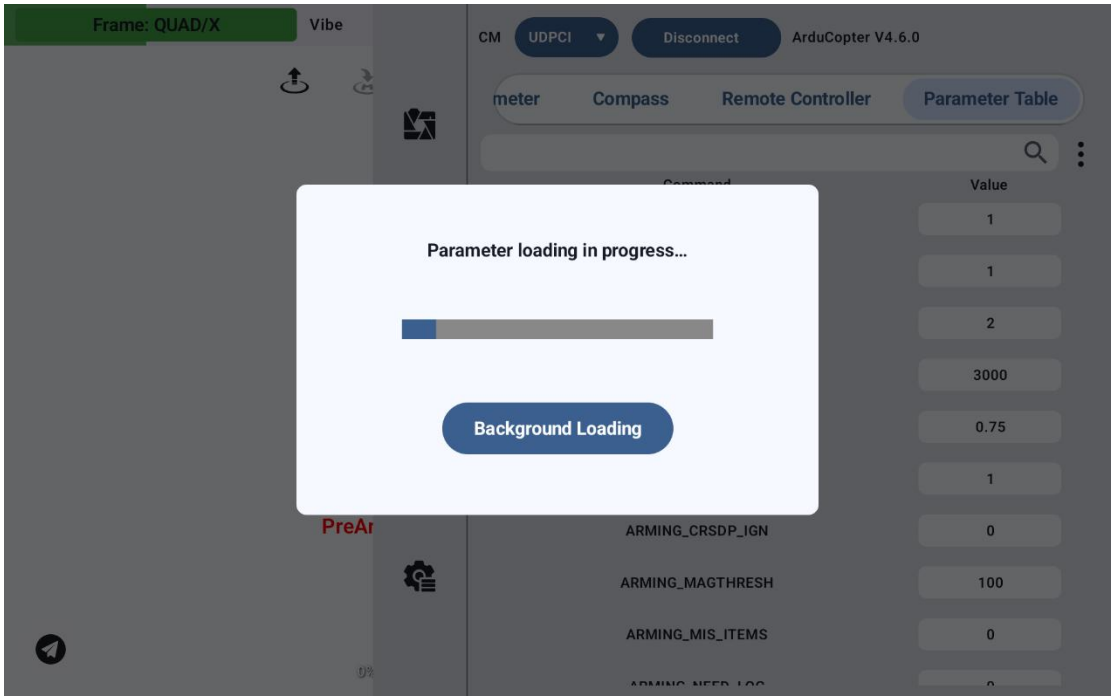


4.3.7.4 Parameter Import (Image Supplement)

Click "Import Parameters" and follow the prompts to import the parameters to the flight controller. It supports importing flight controller parameters saved by UniGCS and parameters saved from other devices.

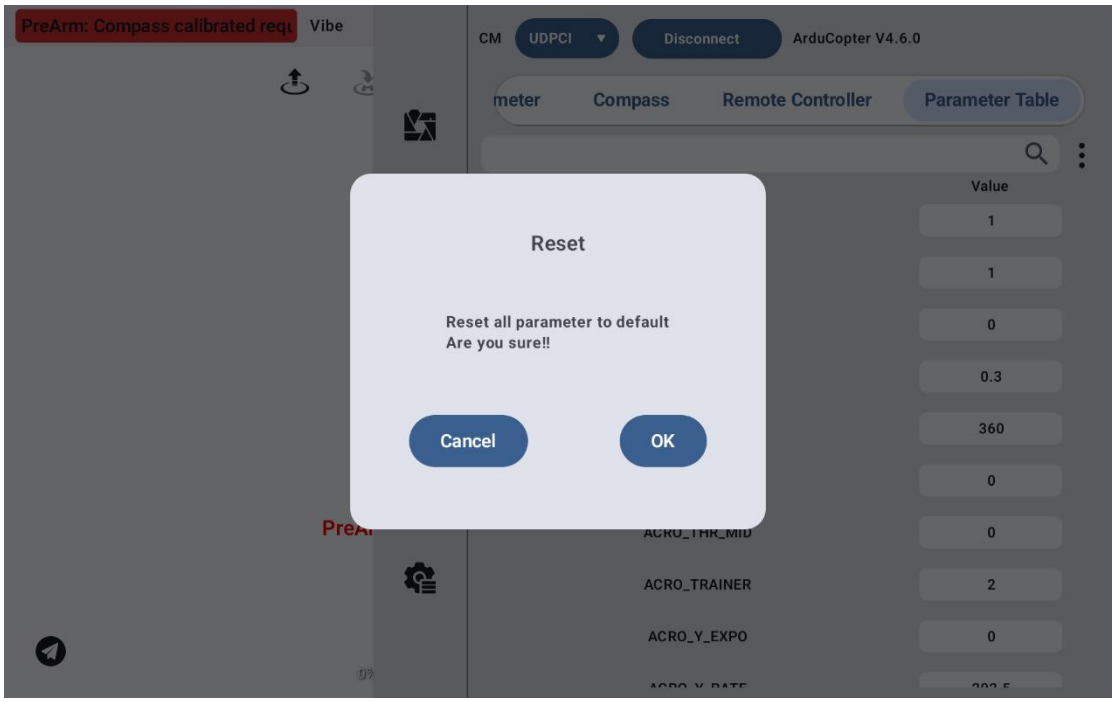
4.3.7.5 Parameter Table Refresh

Click "Refresh" to refresh the current parameter table. You can choose to click "Hide to Background" to hide it to the title bar, where a progress bar will appear. Once the refresh is complete, the progress bar will disappear. It is not recommended to refresh the parameter table during flight.



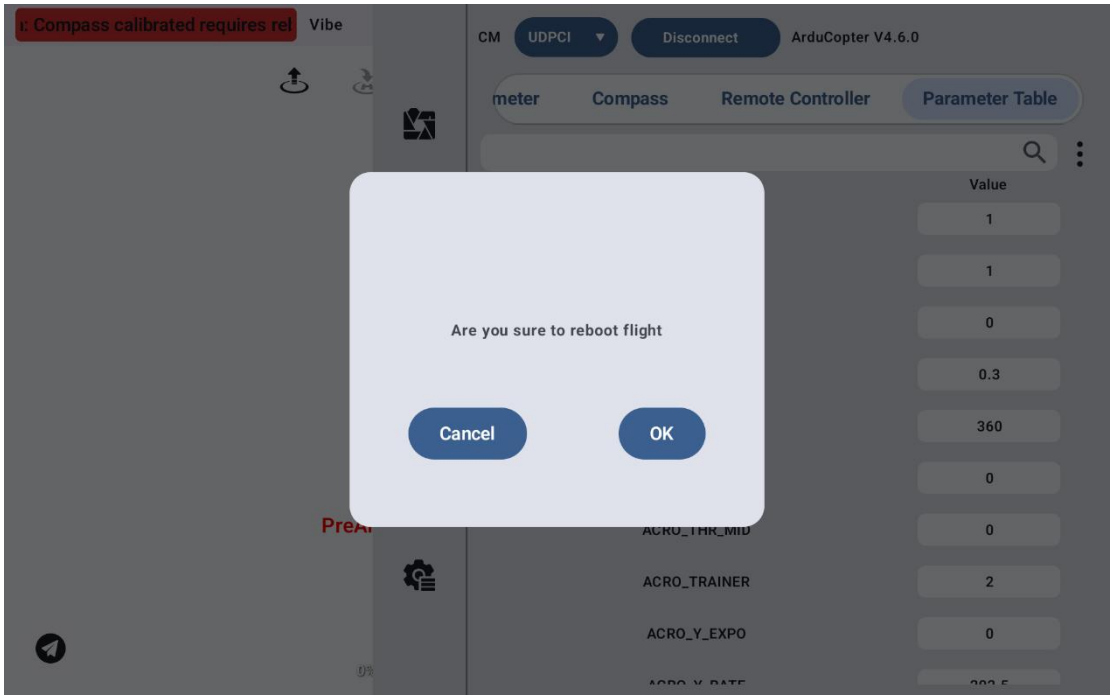
4.3.7.6 Parameter Reset

Click "Reset" to restore all parameters in the parameter table to the default settings of the current firmware.



4.3.7.7 Flight Controller Restart

Click the "Restart Flight Controller" button to remotely reboot the flight controller. The flight controller must be in an unlocked state to perform the restart.



4.3.8 Parameter Mapping

Here is the mapping of the shortcut parameters to their corresponding Ardupilot firmware parameters:

ArduCopter 4.7.0 Firmware:

Throttle Fail-safe Protection — FS_THR_ENABLE

Follow Mode Speed — WPNAV_SPEED

Return to Launch (RTL) Altitude — RTL_ALT

Return to Launch (RTL) Speed — RTL_SPEED

Loiter Acceleration — LOIT_ACC_MAX

Maximum Brake Speed — LOIT_BRK_ACCEL

Low Voltage — BATT_LOW_VOLT

Critical Low Voltage — BATT_CRT_VOLT

Low Voltage Behavior — BATT_FS_LOW_ACT

Critical Low Voltage Behavior — BATT_FS_CRT_ACT

Arm Voltage — BATT_ARM_VOLT

ArduPlane 4.7.0 Firmware:

Throttle Fail-safe Protection — FS_LONG_ACTN

Cruise Airspeed — AIRSPEED_CRUISE

Maximum Airspeed — AIRSPEED_MAX

Minimum Airspeed — AIRSPEED_MIN

Return to Launch (RTL) Altitude — RTL_ALTITUDE

Low Voltage — BATT_LOW_VOLT

Critical Low Voltage — BATT_CRT_VOLT

Low Voltage Behavior — BATT_FS_LOW_ACT

Critical Low Voltage Behavior — BATT_FS_CRT_ACT

Arm Voltage — BATT_ARM_VOLT

ArduRover 4.7.0 Firmware:

Throttle Fail-safe Protection — FS_THR_ENABLE

Waypoint Speed — WP_SPEED

Low Voltage — BATT_LOW_VOLT

Critical Low Voltage — BATT_CRT_VOLT

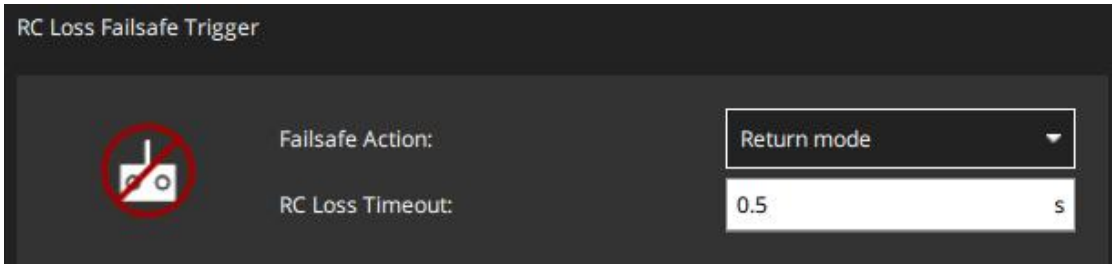
Low Voltage Behavior — BATT_FS_LOW_ACT

Critical Low Voltage Behavior — BATT_FS_CRT_ACT

Arm Voltage — BATT_ARM_VOLT

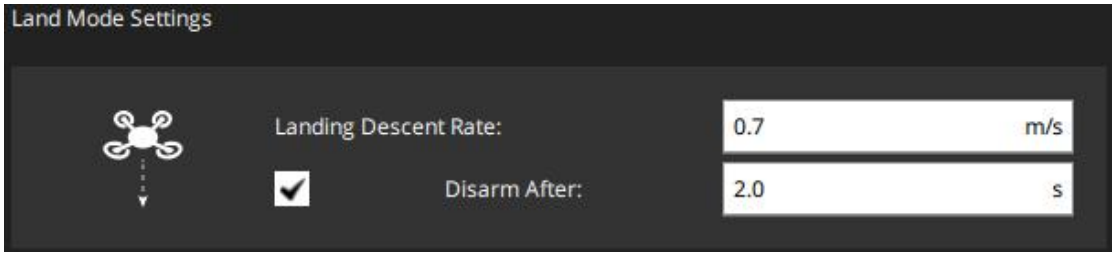
Px4 Multirotor 1.15.4

- Remote Control Failsafe Protection

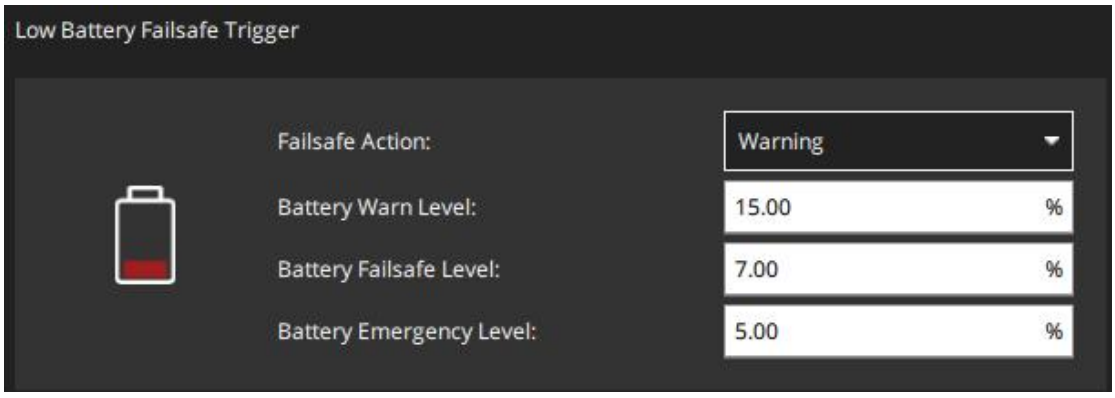


- Return-to-Launch (RTL) Altitude

- Landing Descent Rate

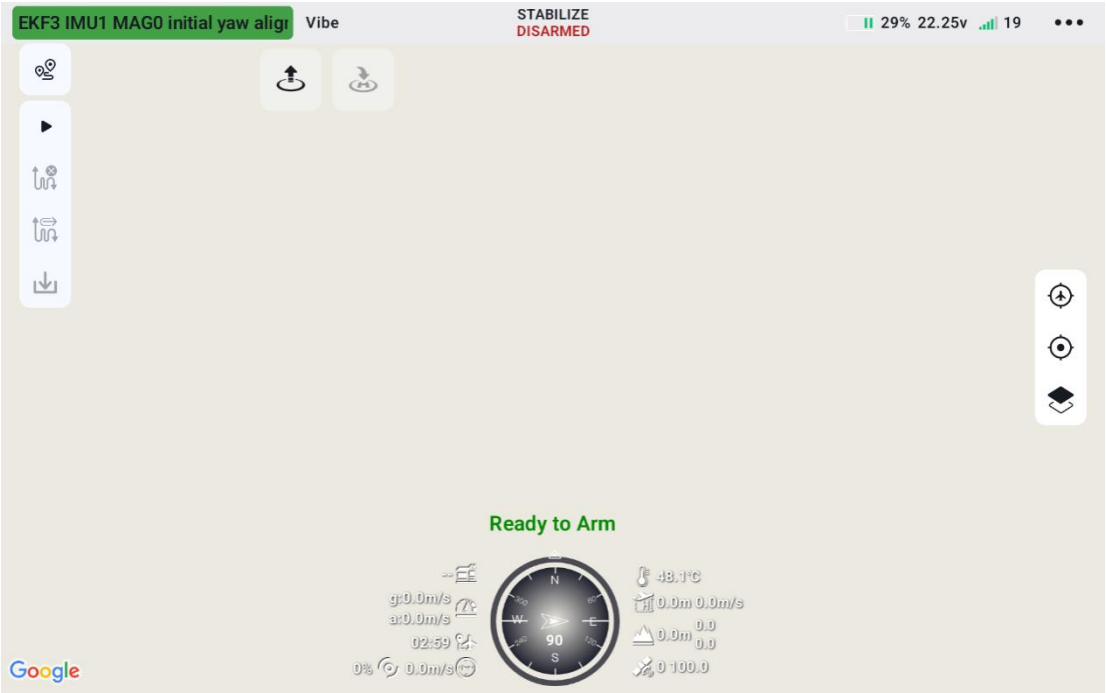


- Low battery fail-safe protection, battery warning level, battery critical level, and battery emergency level.



4.4 Waypoint Module

Main Menu of the Waypoint Module



- View and Plan Waypoints: View the waypoint library, plan standard waypoint missions and mapping missions.
- Start/Pause Mission: After planning and uploading the waypoint mission, click this button to start the mission. During execution, clicking this button will pause the mission. At this point, multirotors will hover, fixed-wings will enter Loiter mode, and rovers will enter Hold mode. Click again to resume the mission.
- Clear Mission: Clears the current mission from both the interface and the flight controller. When this button is clicked during mission

execution, a confirmation prompt will appear. Upon confirmation, multirotors will hover, fixed-wings will enter Loiter mode, and rovers will enter Hold mode.

Note:

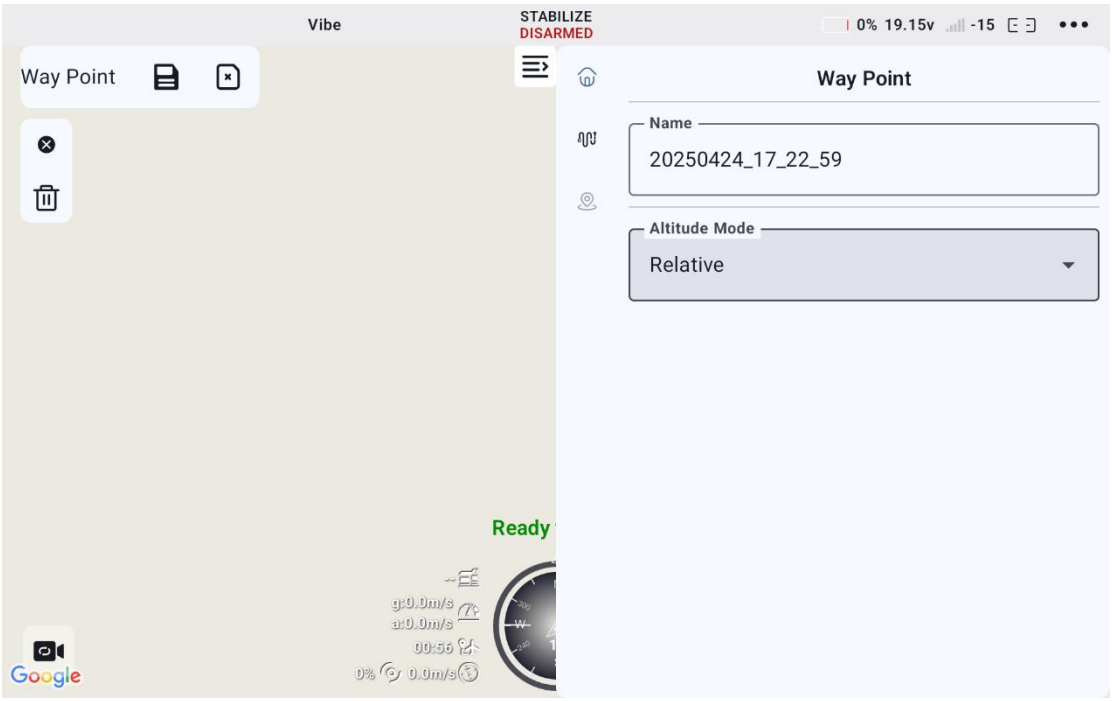
After clearing the mission, there will be no waypoint tasks remaining in the flight controller. The mission cannot be resumed unless a new waypoint mission is uploaded.

- Exit Mission:During mission execution, tap this button to exit the mission. The multirotor will enter hover mode, the fixed-wing will switch to loiter mode, and the rover will switch to hold mode. Tap the mission start button again to resume the mission.
- Download Mission:Tap this button to download the mission stored in the flight controller.
- Locate Aircraft:Tap this button to center the aircraft on the map. When highlighted, the map will follow the aircraft in real-time during flight. If the user manually drags the map, the map-following function will be disabled.
- Locate Remote Controller:Tap this button to center the remote controller on the map.
- Note: This feature requires an internet connection.
- Map Type:Tap this button to switch between street map and satellite map based on your preference.

Note: Internet connection is required to load the map.

- No-Fly Zone Display:When the device is connected to the internet and the map interface is opened, the software will automatically load and display no-fly zones.

Mission Planning Main Menu

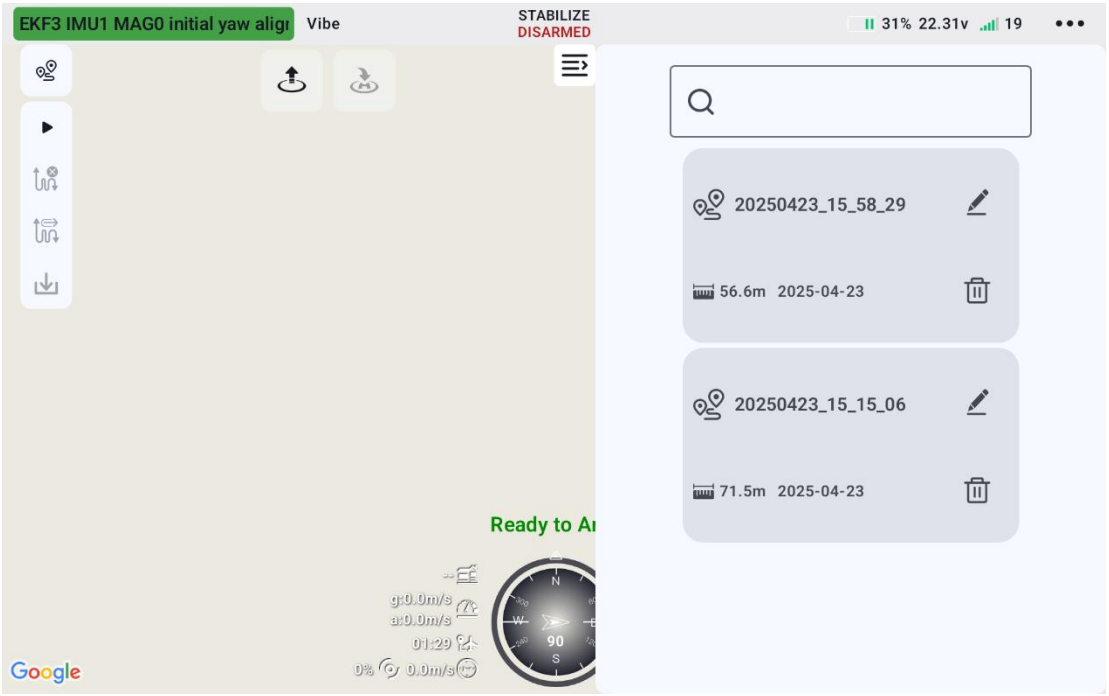


- Delete Waypoint:Tap this button to automatically delete the last waypoint added during mission planning.
- Clear All Waypoints:Tap this button to remove all waypoints planned on the current page.

- Cancel Save:Tap this button to cancel saving all waypoints currently planned on the page.
- Save Mission:Tap this button to save all the waypoints planned on the current page into the mission library.
- Show/Hide Waypoint Parameters:Tap this button to hide waypoint parameters for better visibility and ease of dragging waypoints. Tap again to expand and show the parameters.

4.4.1Mission Library

The mission library stores the missions that the user has planned and saved, making it easy to view and make modifications as needed.

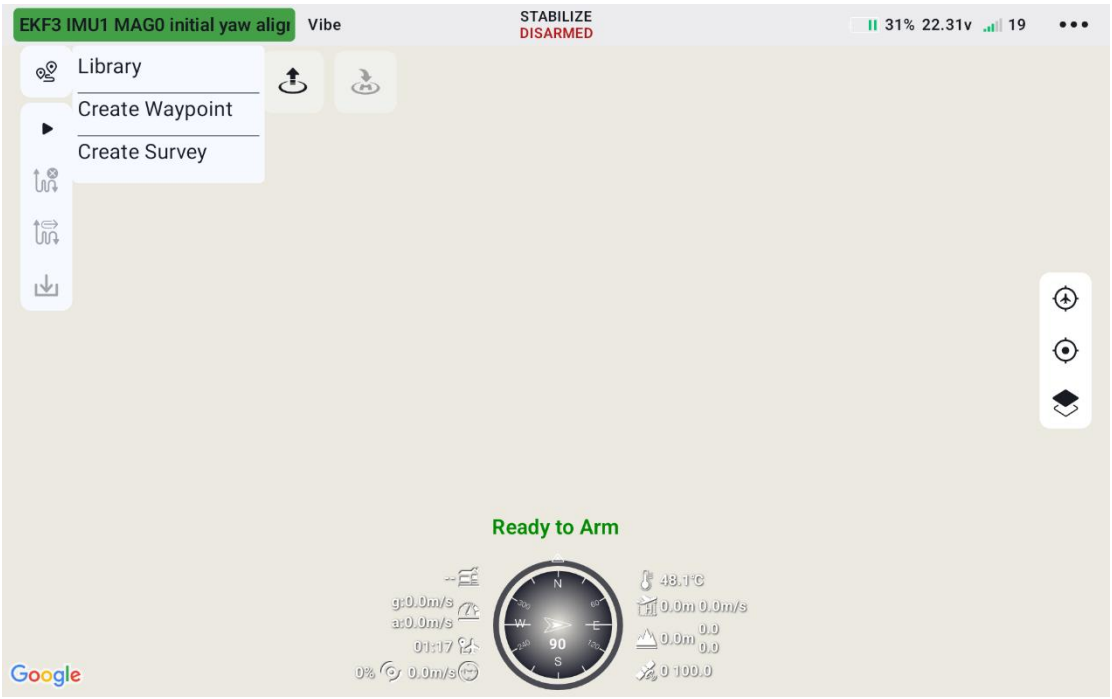


4.4.2 Waypoint Mission

To plan a waypoint mission, each point's location must be manually selected. The altitude, speed (which defaults to the values in "4.4.2.3 Mission Settings" unless modified), and the action to be executed upon reaching each waypoint can be adjusted. The action to be performed upon completion of the mission can also be modified

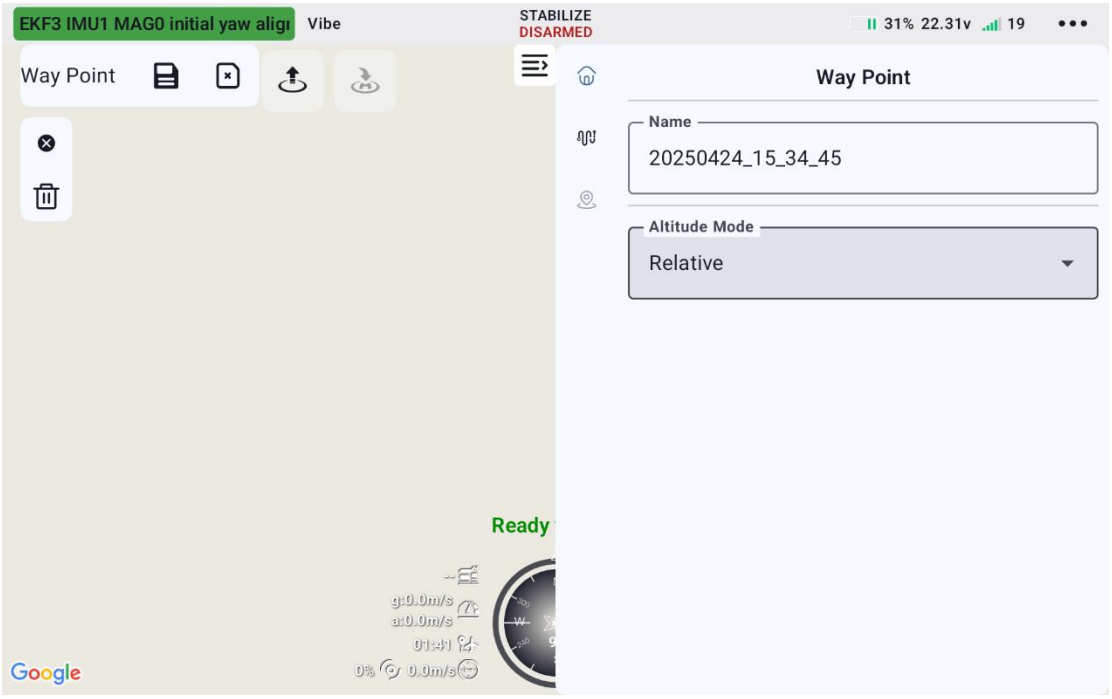
4.4.2.1 Create Mission:

Click the "Mission Planning" button and select "Create Waypoint Mission" to start planning the waypoint mission.



4.4.2.2 Waypoint Flight

In the "Waypoint Flight" tab, you can assign a name to the current mission. Additionally, it supports switching between different altitude modes for the mission.



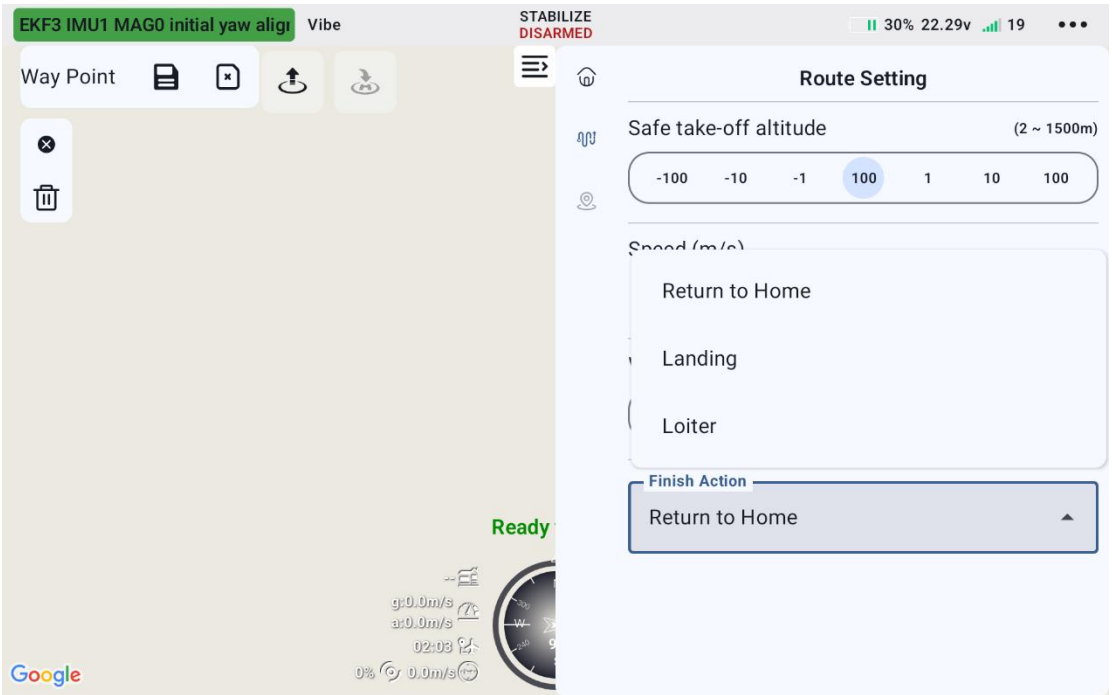
- Flight Route Name: After entering the desired name in the input box, save the flight route, and it can be viewed and managed in the flight route library.
- Altitude Mode: Switch the altitude mode for all waypoints in the route, including:

① Absolute Altitude: The height of the drone relative to mean sea level (MSL).

② Relative Altitude: The height of the drone relative to the takeoff point or the ground reference level.

4.4.2.3 Route Settings

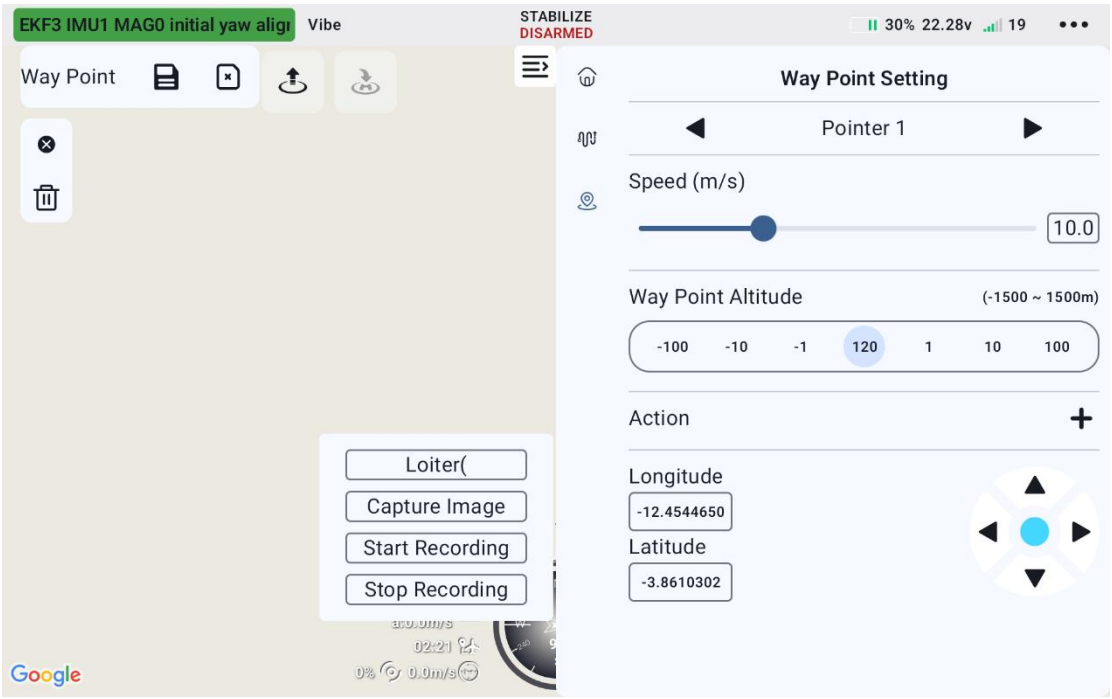
In the Route Settings tab, you can modify the safe takeoff altitude, speed for all waypoints, route altitude, and the action to be taken upon task completion.



- Safe Takeoff Altitude: Set the altitude to be reached during takeoff before proceeding to the first waypoint.
- Speed: Set the horizontal speed during waypoint route flight.
- Route Altitude: Set the flight altitude after reaching the safe takeoff altitude when continuing the mission.
- Completion Action: Set the action to be taken after completing the waypoint route task.
    1) Return to Home: Return to the home location from the last waypoint of the mission.
    2) Landing: Perform a landing at the location of the last waypoint.
    3) Hover: Hover at the location of the last waypoint.

4.4.2.4 Waypoint Settings:

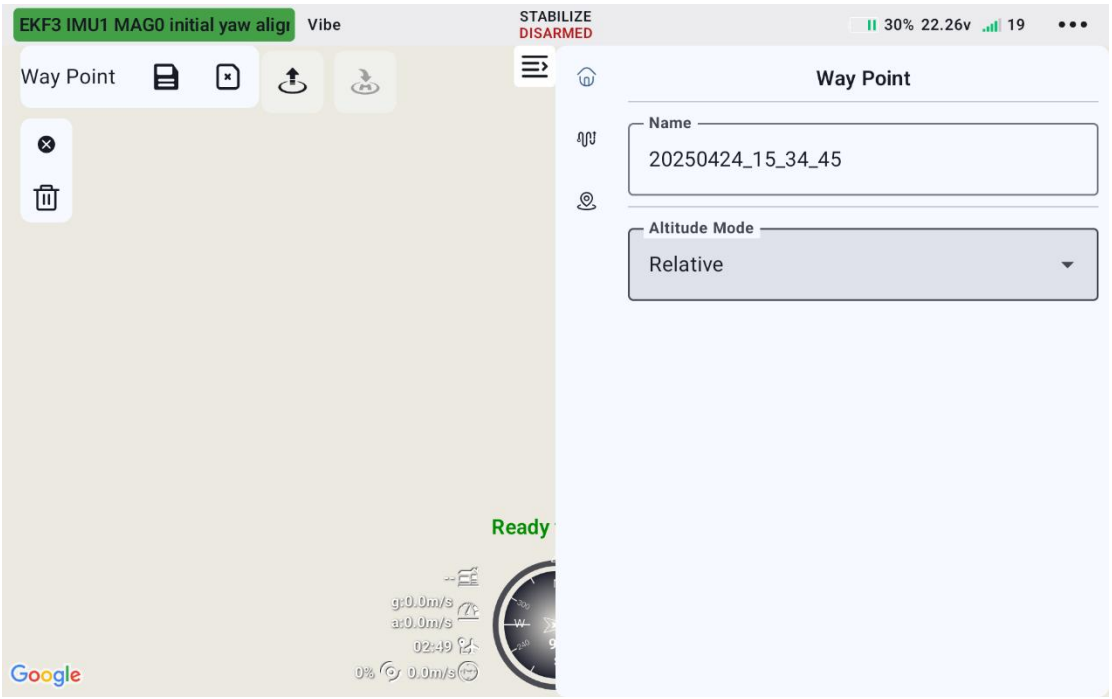
Enter the waypoint settings tab to adjust the height, speed, waypoint actions, and fine-tune the latitude and longitude of each individual waypoint.



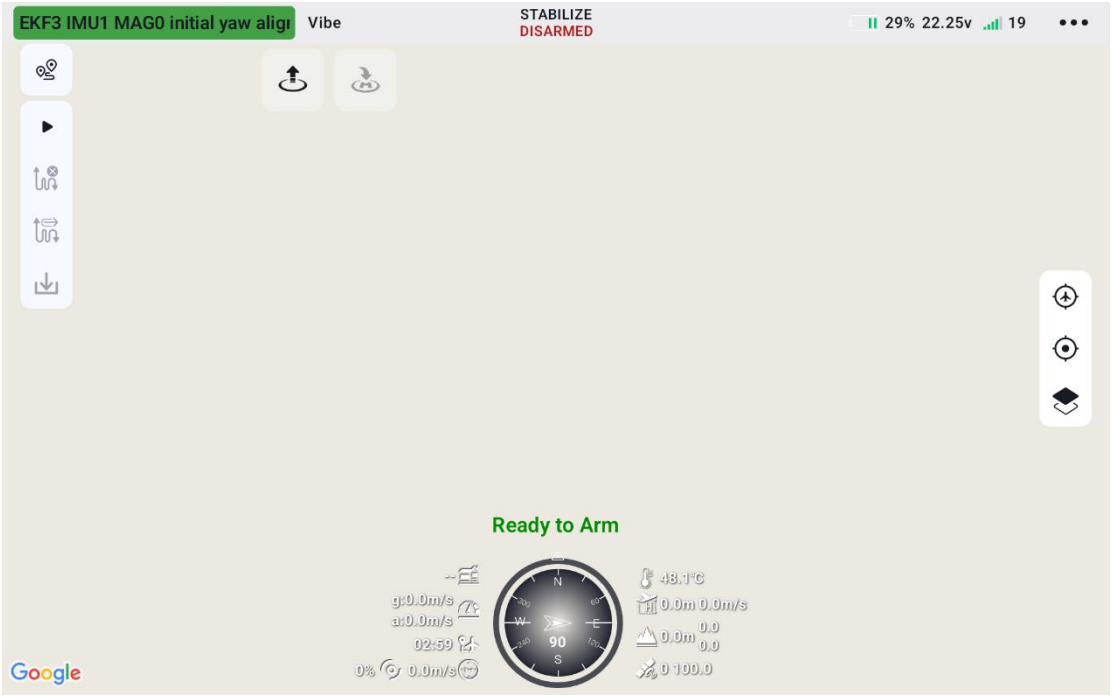
- Speed: The flying speed after reaching the waypoint.
- Height: The required flying altitude before reaching the waypoint.
- Waypoint Action: The actions to be executed after reaching the waypoint, with support for combining multiple actions.
- Hover: Hover at the waypoint for the set duration.
- Latitude/Longitude Fine-tuning: Fine-tune the latitude and longitude of the current waypoint, adjusting longitude left or right, and latitude up or down.

4.4.2.5 Task Execution

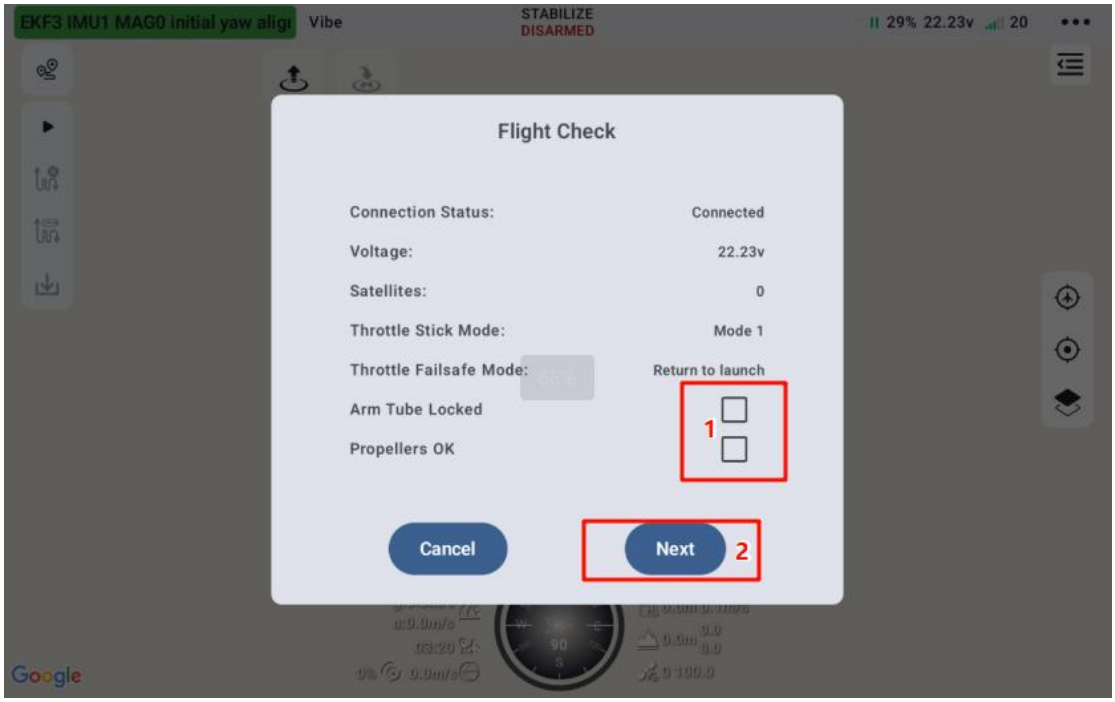
Step 1: After planning the flight route, click the save button.



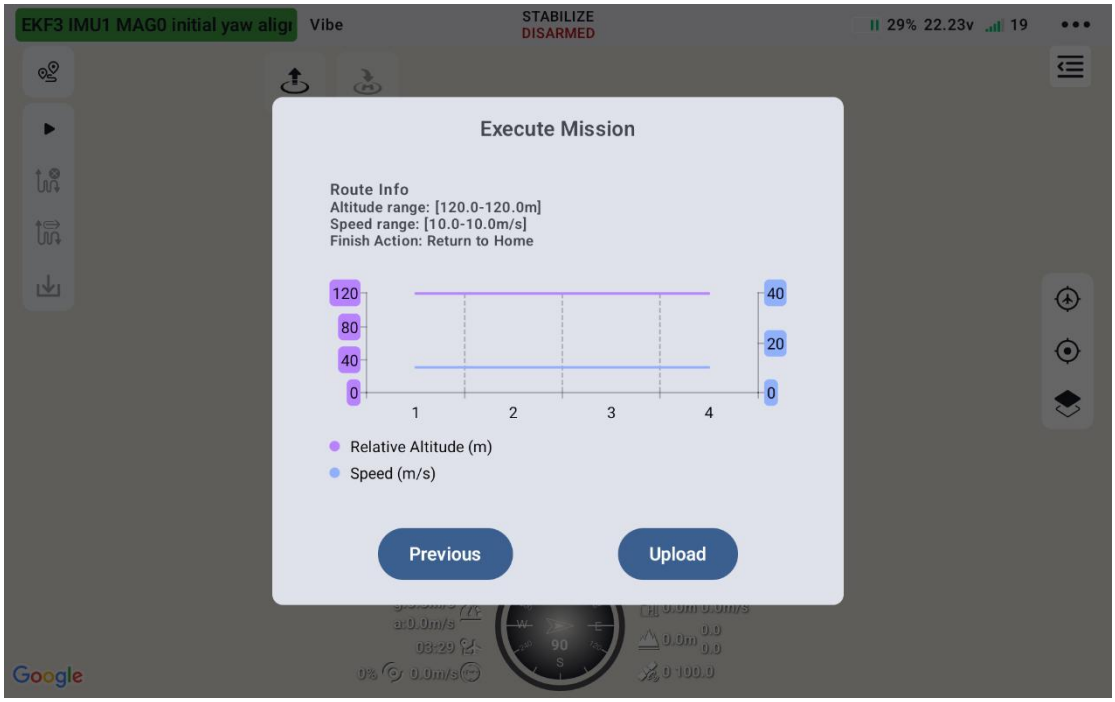
Step 2: Click the start button to upload the flight route.



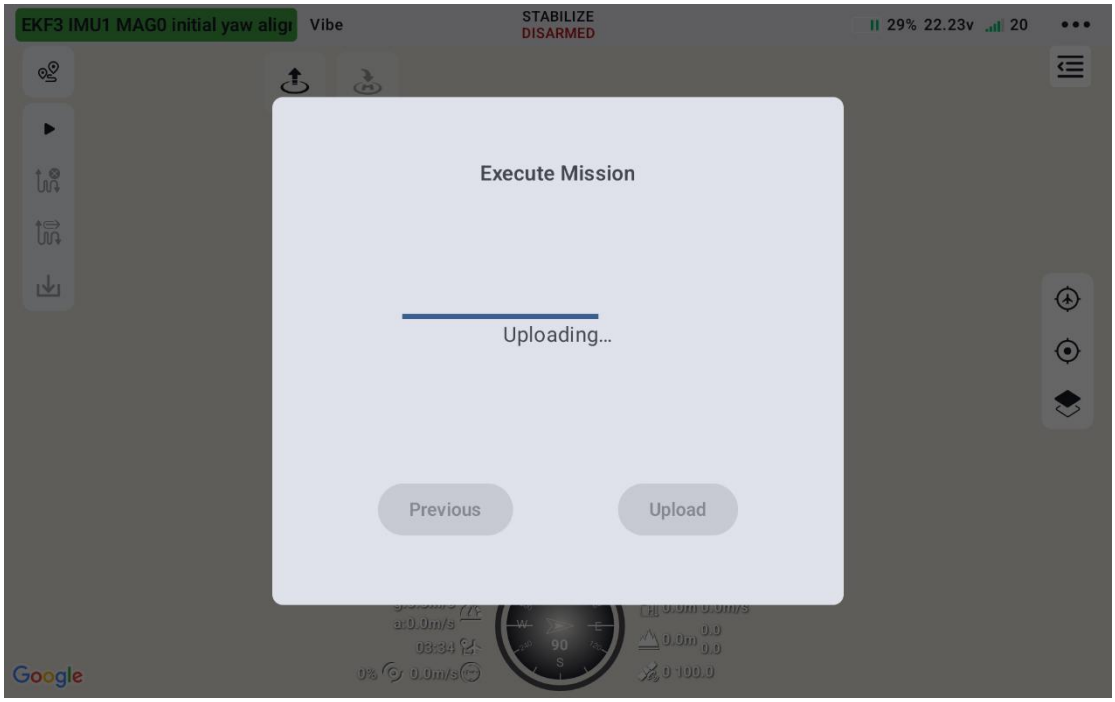
Step 3: Confirm the flight checklist, and after confirming, click the next step.



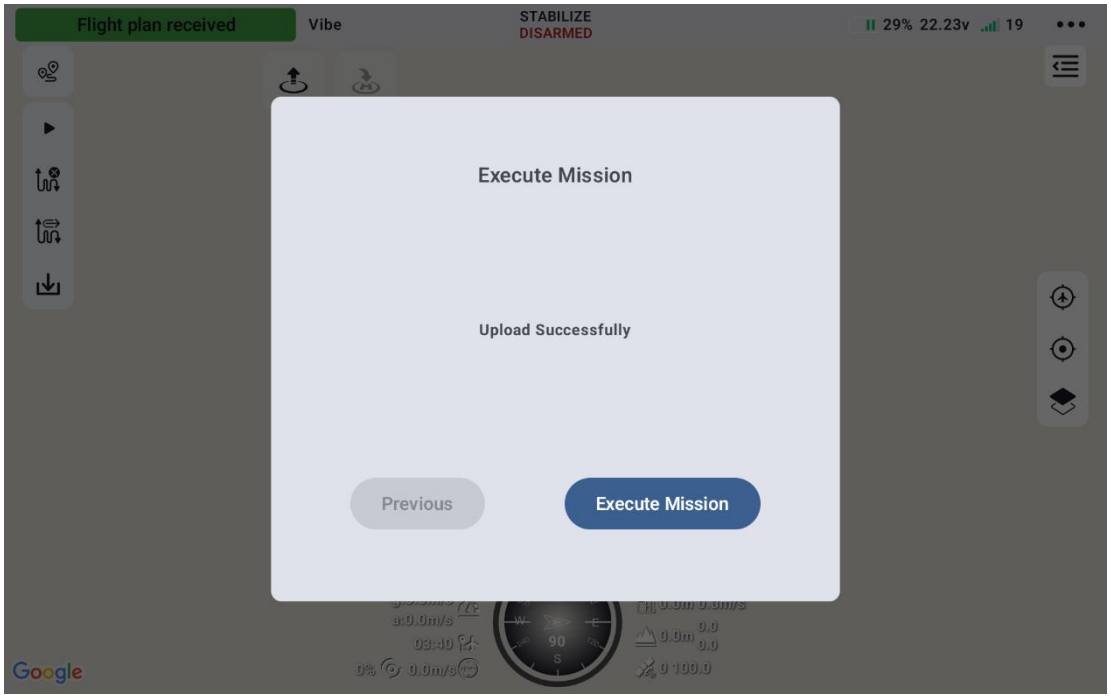
Step 4: Check the route information, where you can view the current task's route speed, altitude range, and route completion actions. After checking, click to upload the route.



Step 5: Wait for the route to finish uploading.

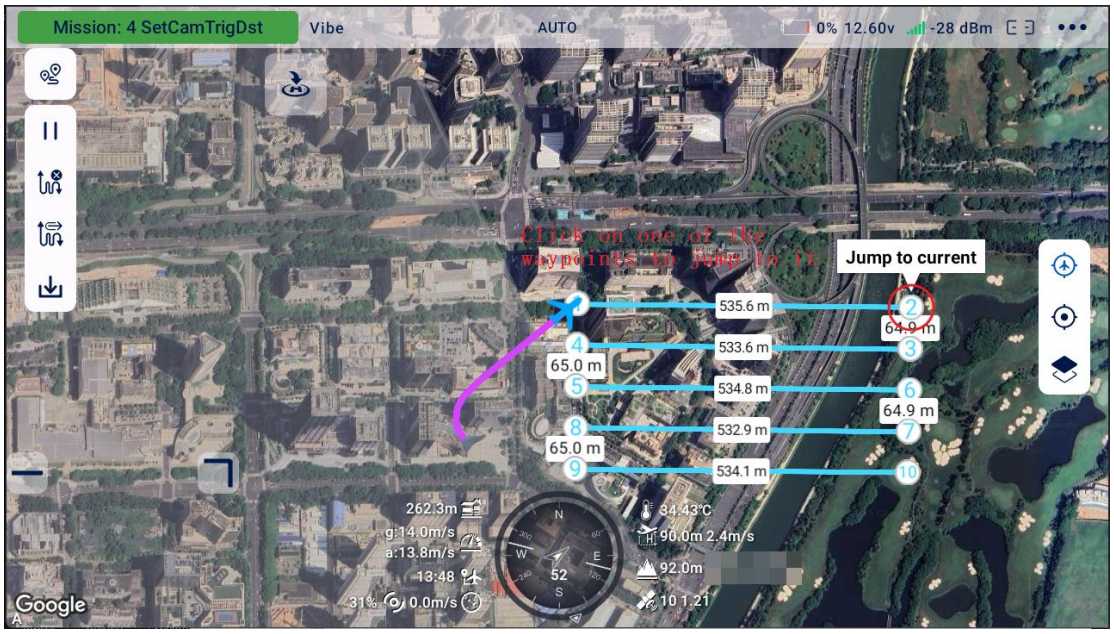


Step 6: Unlock the drone and click "Execute Task" to begin executing the waypoint mission.



4.4.2.6 Jump to current

Under the current flight route, click on a specific waypoint and then click "Jump to current " The drone will fly directly to the selected waypoint.



Note

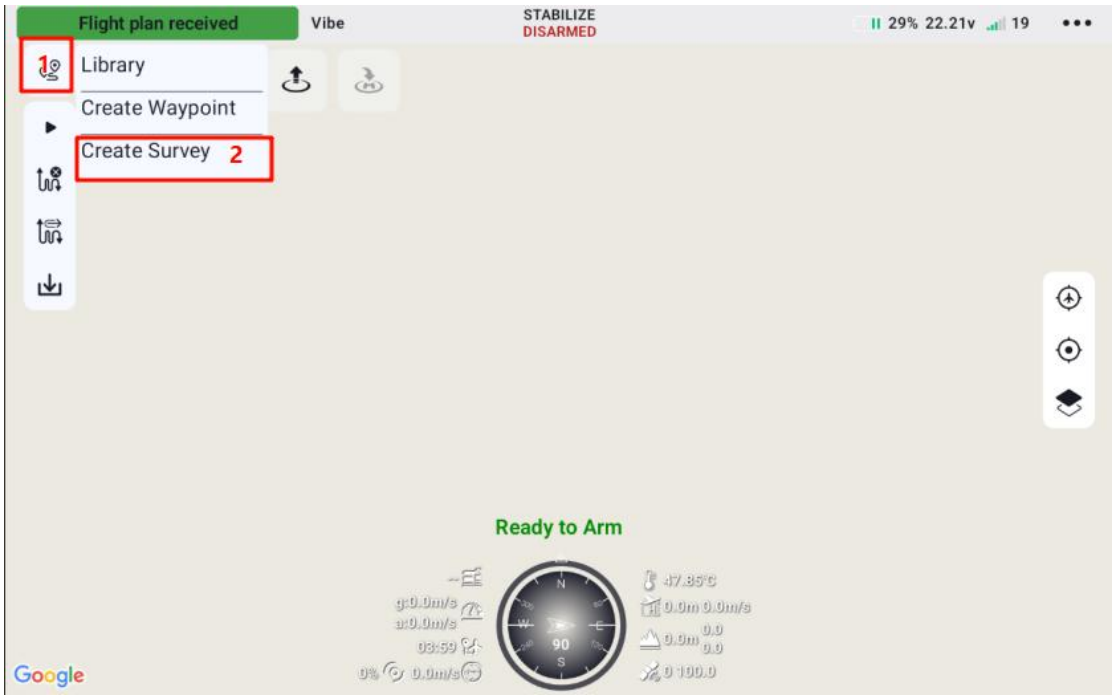
If clicking has no effect, please check whether the waypoint jump is being performed within the current flight mission. You can download the flight route first, then select a waypoint to execute the jump-to-waypoint action.

4.4.3 Mapping Route

To plan a mapping route, manually select the points defining the boundaries of the mapping area. You can also modify the height and speed during the mapping task (if not modified, it will be the same as the height and speed in "4.4.3.2 Route Settings") and the actions to be performed when the route is completed.

4.4.3.1 Route Planning

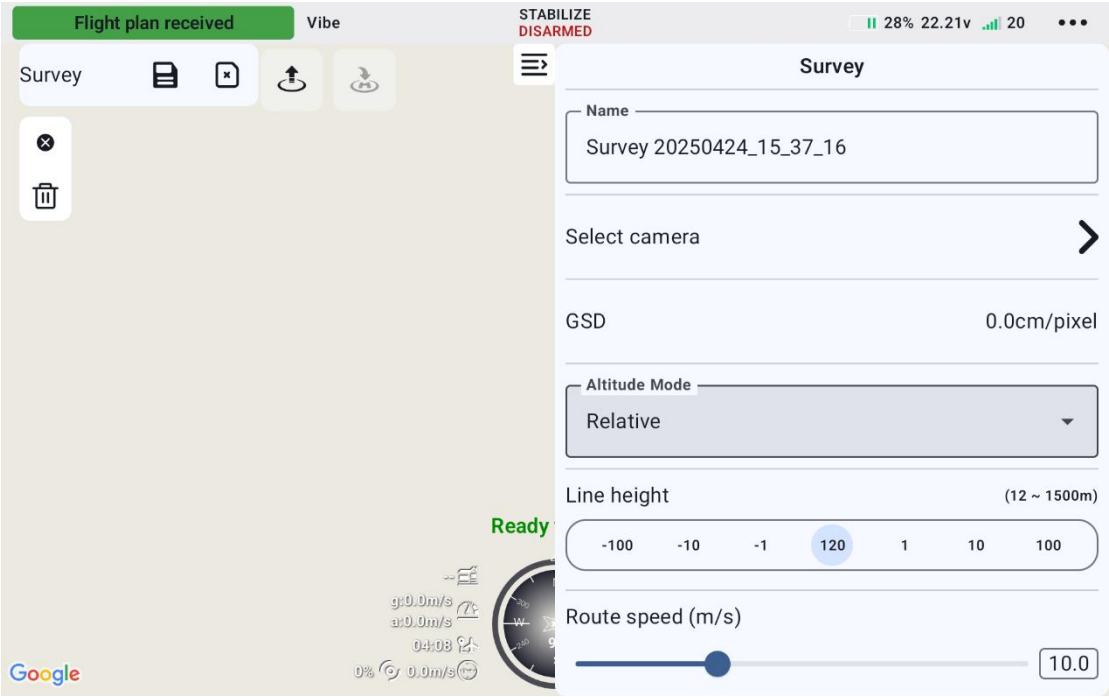
Click the "Route Planning" button and select "Create Mapping Route" to plan the mapping route.



4.4.3.2 Mapping Route

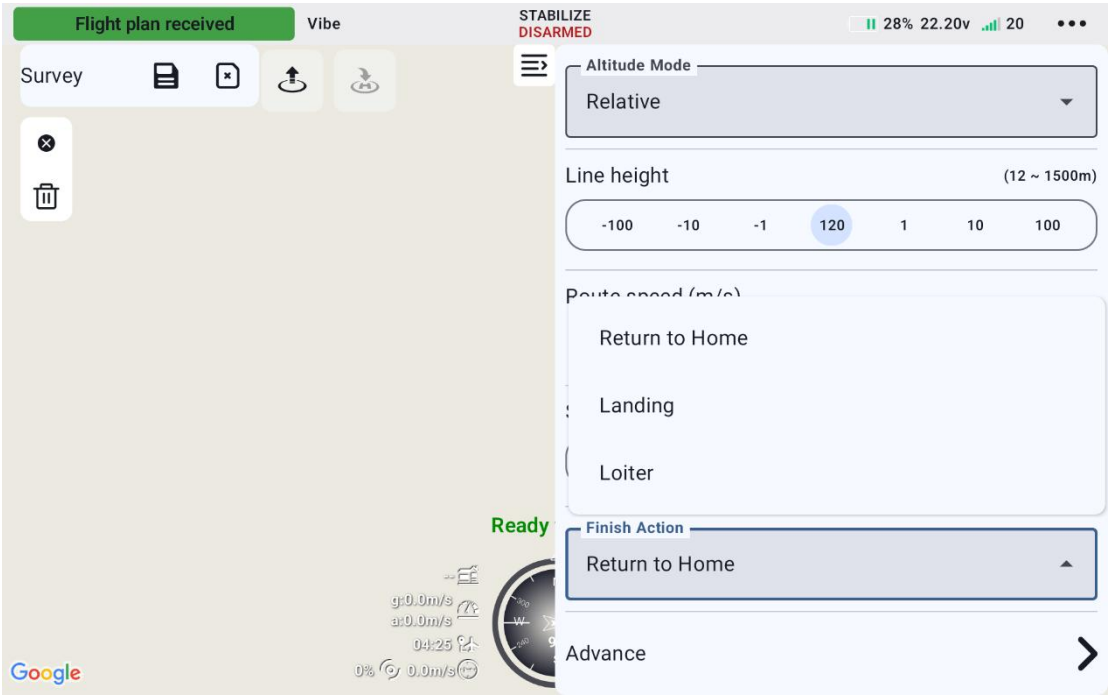
In the Mapping Route tab, you can name the task, select the camera, view

the resolution, set the route height, speed, safe takeoff height, altitude mode, completion actions, and configure advanced settings.



- Route Name: After entering the desired name in the input box, save the route, and you can view the current route in the route library.
- Select Camera: Choose a different camera for mapping tasks, including the wide-angle/thermal infrared lens of the ZT30 camera, the wide-angle/thermal infrared lens of the ZT6 camera, and the A8mini camera.
- GSD: GSD (Ground Sample Distance) refers to the actual ground distance corresponding to a single pixel in the image. After selecting the camera, the GSD data will be displayed.
- Altitude Mode: Switch the altitude mode for all waypoints in the route.

- Absolute Altitude: The altitude of the drone relative to sea level (MSL, Mean Sea Level).
- Relative Altitude: The altitude of the drone relative to the takeoff point or ground reference.
- Route Speed: Set the horizontal speed during the execution of the mapping route.
- Route Height: Set the flight height when executing the mapping route, after reaching the safe takeoff altitude, to continue with the task.



- Safe Takeoff Altitude: Set the altitude the drone must reach before proceeding to the next point in the route.
- Completion Action: Set the behavior after completing the mapping route task.

  1) Return to Home: Return to the home location from the last

waypoint of the task.

2) Landing: Perform a landing at the last waypoint of the task.

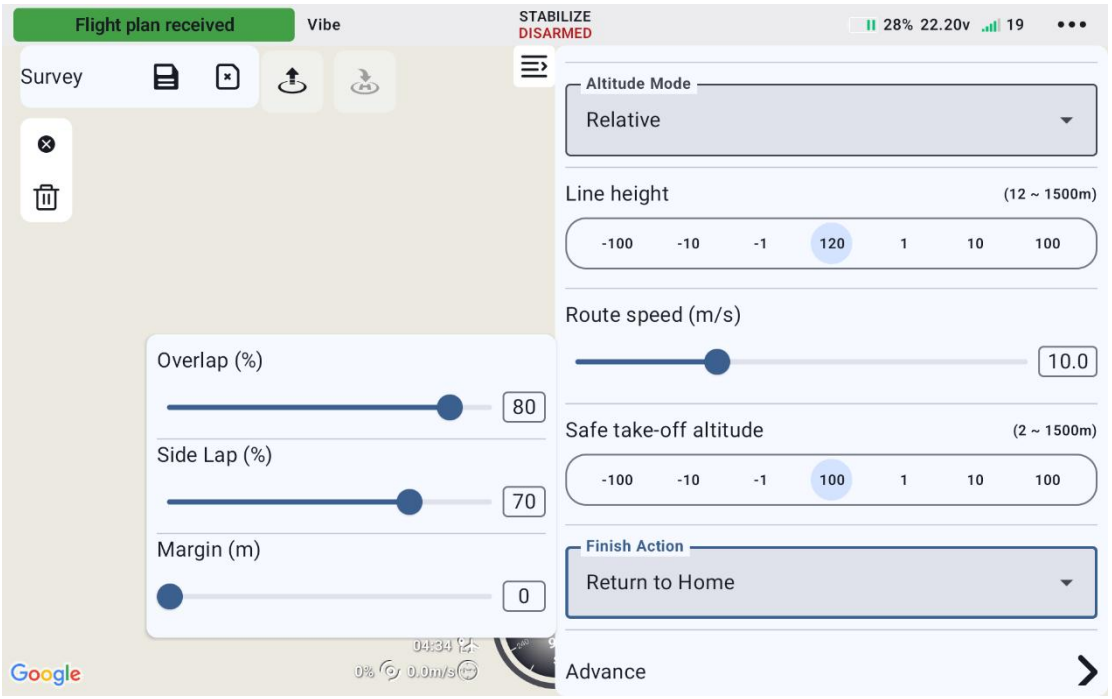
3) Hover: Hover at the last waypoint of the task.

- Advanced Settings: Set heading, sidelap, and external margin.

1) Heading Overlap: The percentage of the overlap area between two adjacent images on the same flight path, relative to the length of a single image.

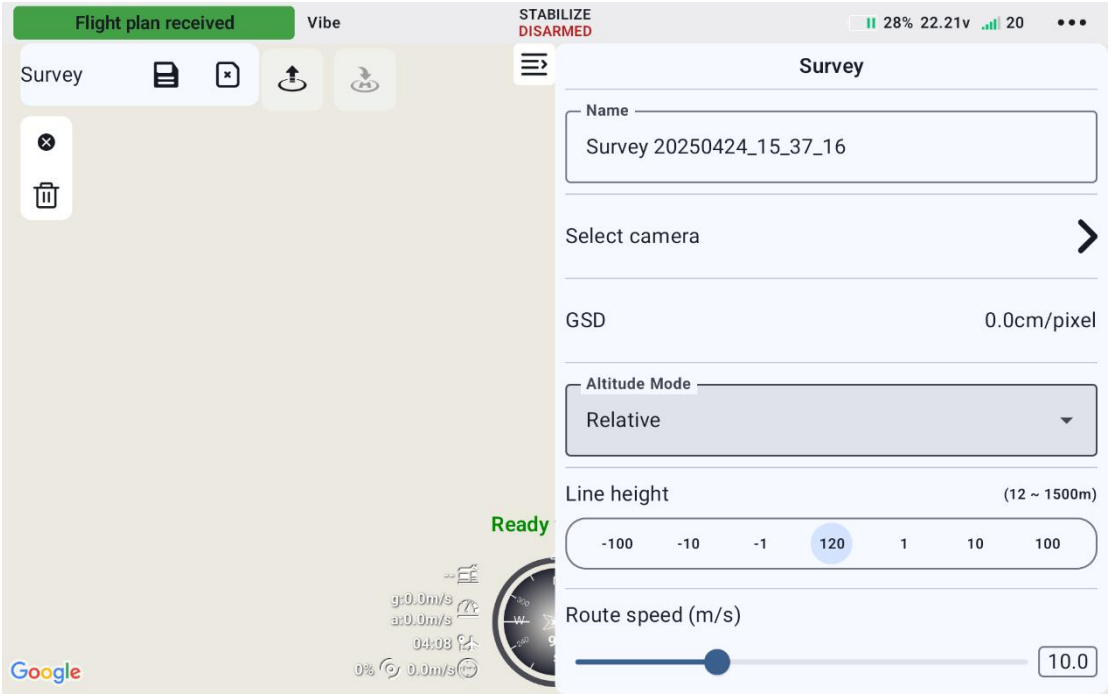
2) Sidelap Overlap: The percentage of the overlap area between two adjacent flight lines, relative to the width of a single image.

- Margin: In mapping tasks, the external margin (also known as buffer zone or extension area) refers to the additional planned flight and data collection area outside the target measurement area. In fixed-wing or vertical takeoff fixed-wing flights, the drone's turning path can be planned within the margin area.

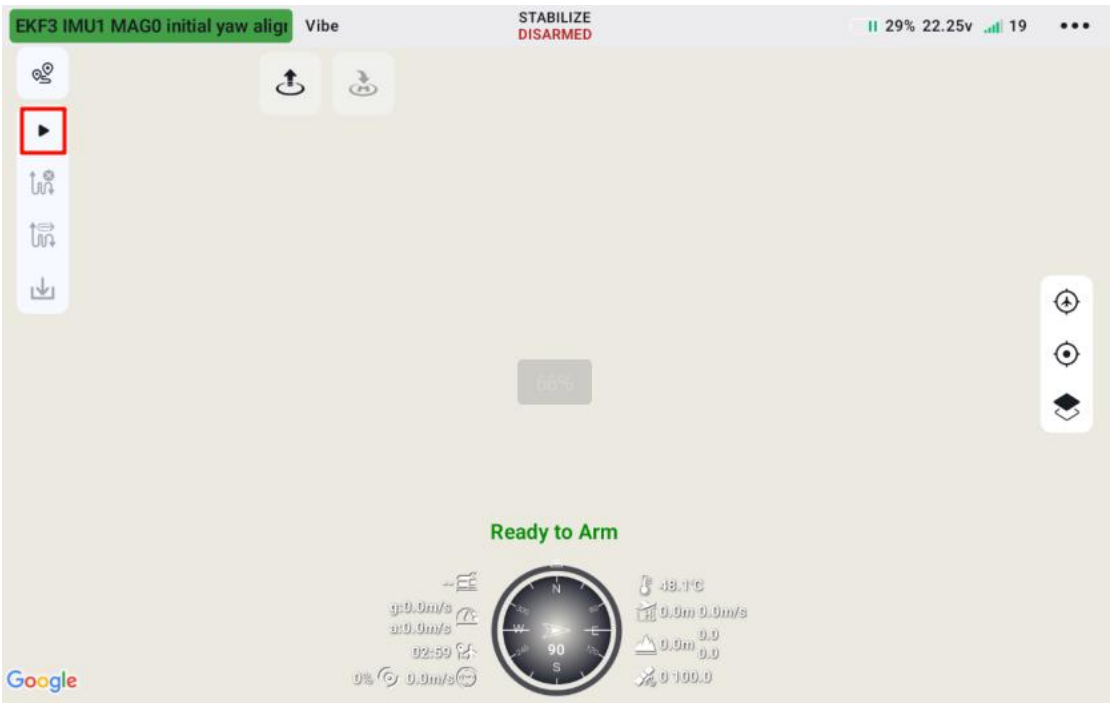


4.4.3.3 Task Execution

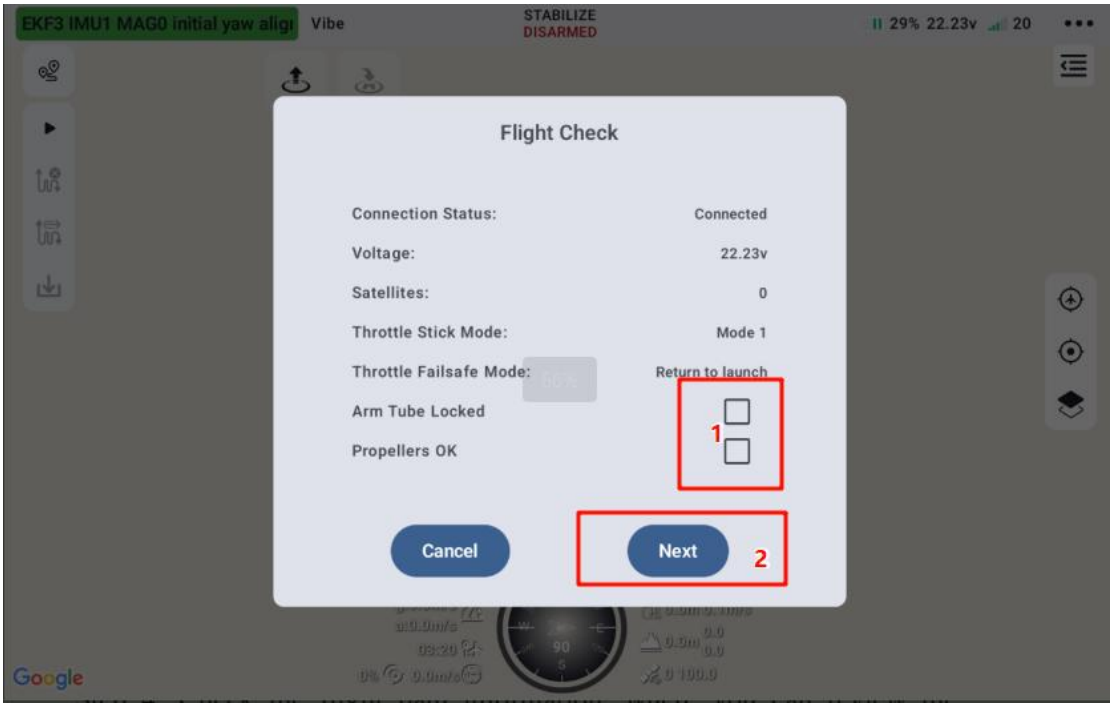
Step 1: After planning the route, click the save button.



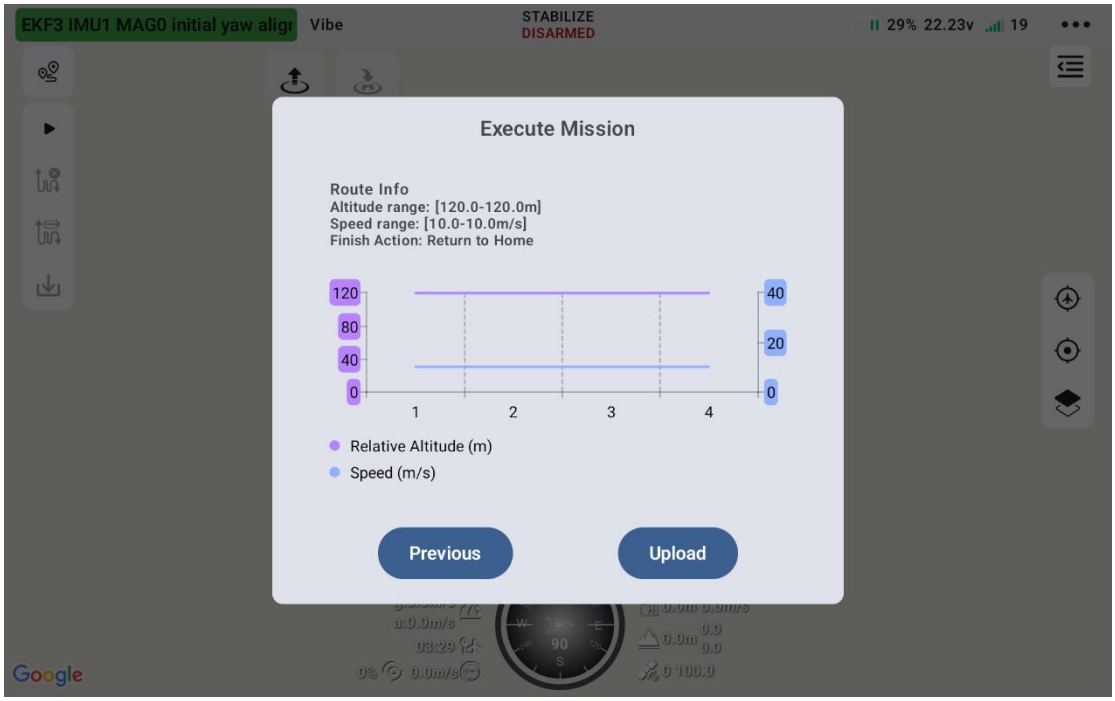
Step 2: Click the start button to upload the flight path.



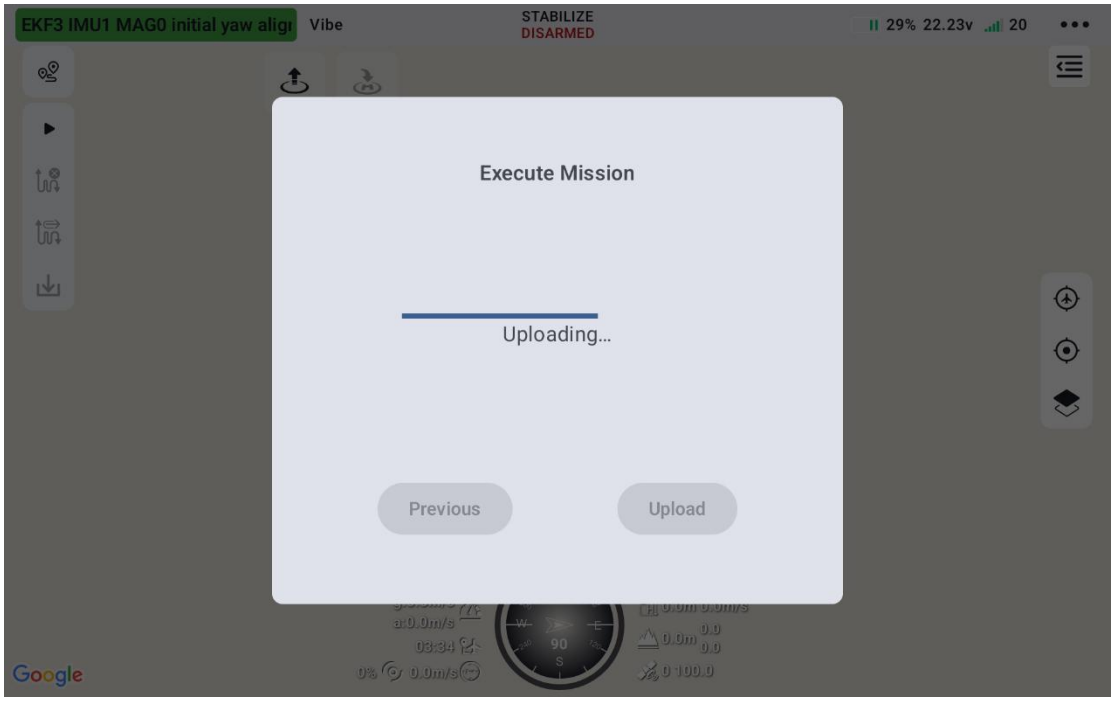
Step 3: Confirm the flight checklist, and once confirmed, click "Next."



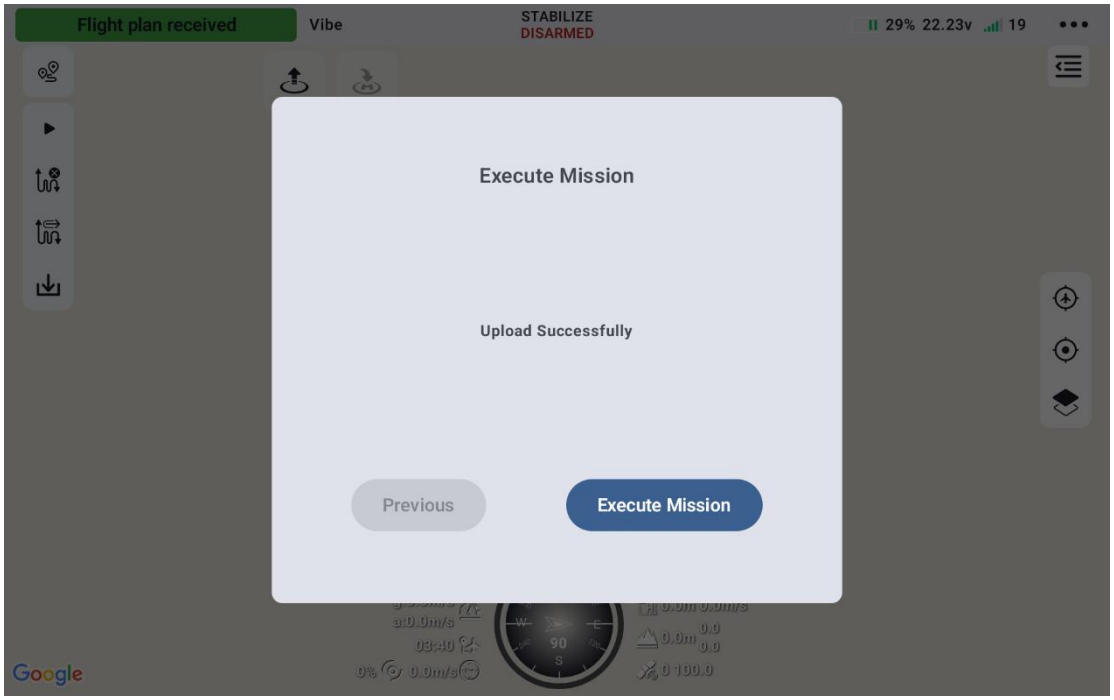
Step 4: Check the flight path information, where you can review the current task's speed, altitude range, and completion actions. Once reviewed, click "Upload Flight Path."

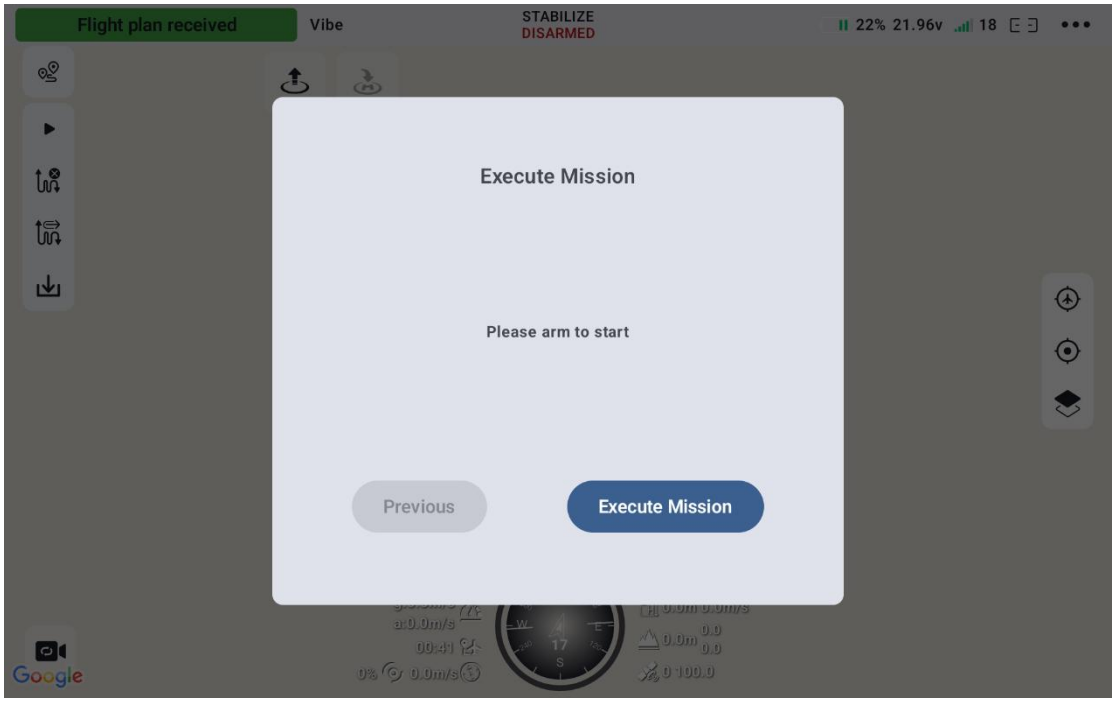


Step 5: Wait for the flight path upload to complete.



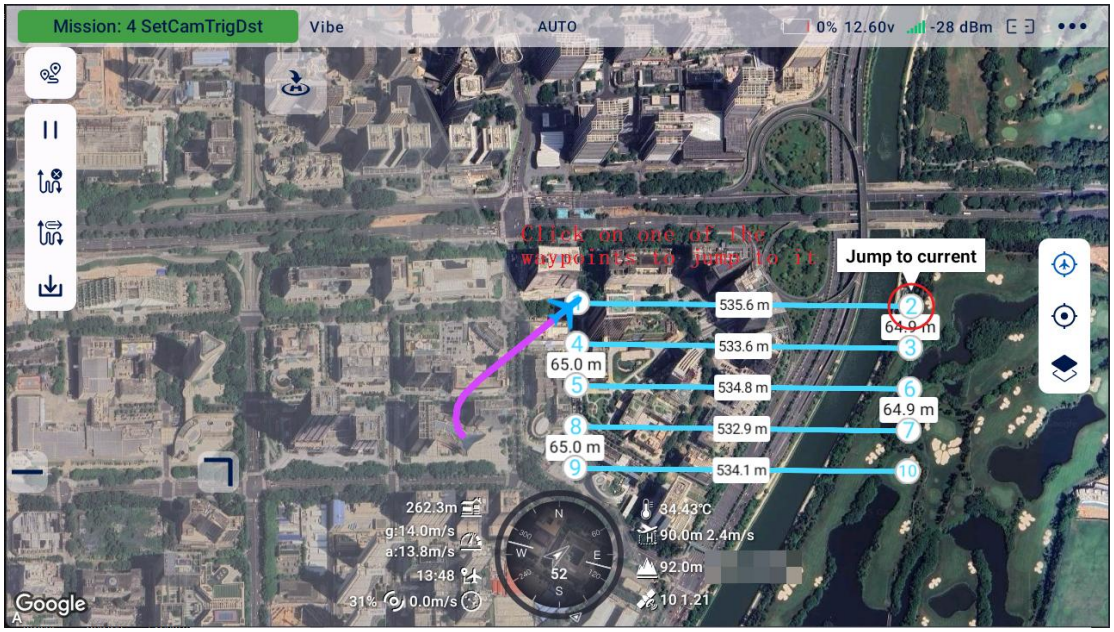
Step 6: Unlock the drone, click "Execute Task," and begin executing the waypoint flight mission.





4.4.3.4 Jump to current

Under the current flight route, click on a specific waypoint and then click "Jump to current." The drone will fly directly to the selected waypoint.

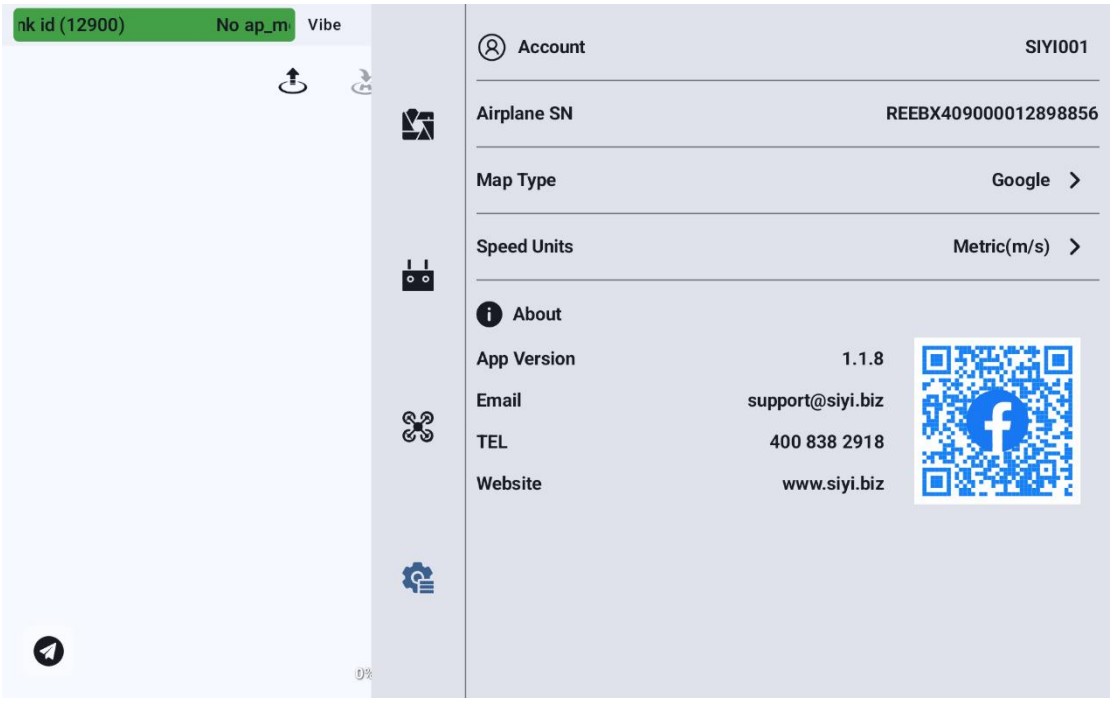


Note

If clicking has no effect, please verify that the waypoint jump operation is being performed within the current flight mission. You can download the flight route first, then select a waypoint to execute the jump-to-waypoint action.

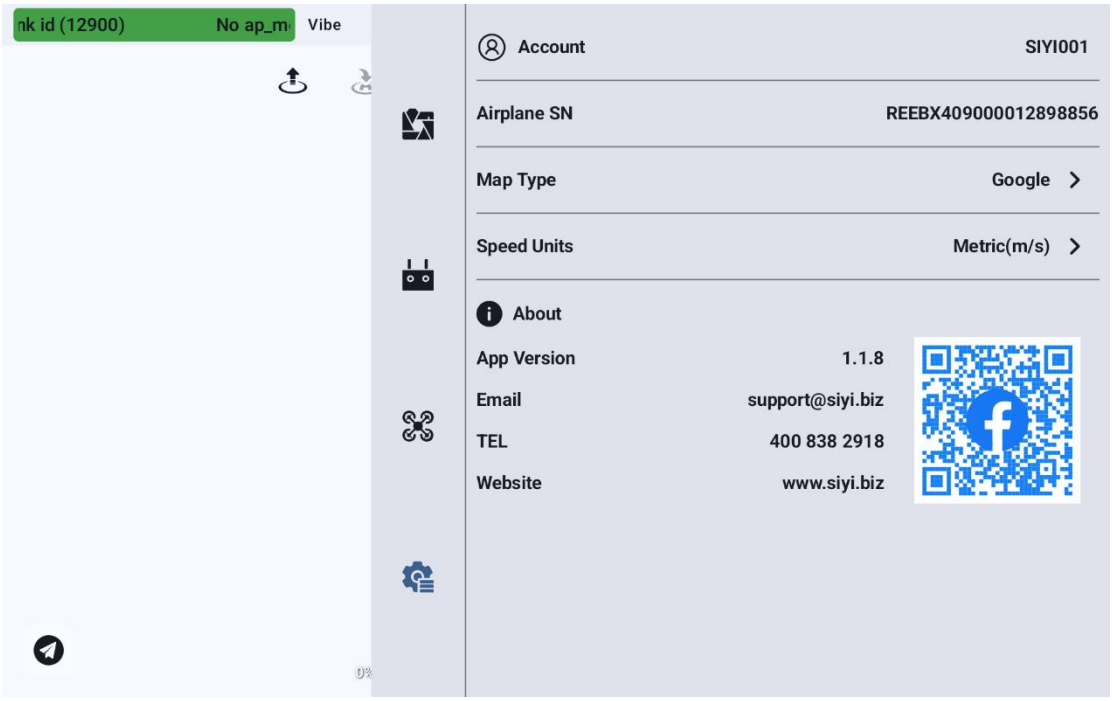
5 Settings and Preferences

- Map Type: Click on the map type to select either Gaode or Google Maps. The changes will take effect after restarting the app.
- Speed Unit: Click on the speed unit to choose different units of speed.
- Language: The default language for UniGCS is set to the system language.



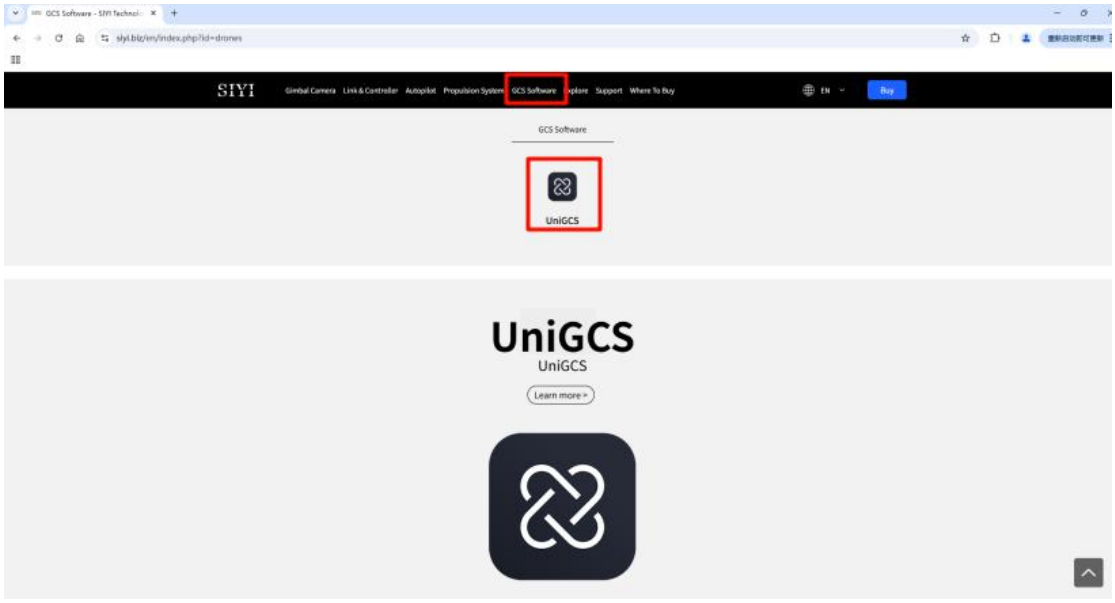
5.1 Software Version Information

In the software settings menu, under the "About Us" tab, you can find the current version number of the software.



6 Maintenance and Updates

- Log in to the SIYI official website and select the Ground Station Software section to access the latest version of UniGCS.



- When the remote controller is connected to the internet, if there is a newer version of UniGCS available, opening the UniGCS software will prompt a notification for the update.

7 Troubleshooting

7.1 Common Errors

Steps to troubleshoot common issues such as data link connectivity problems and camera display issues.

7.1.1 Unable to Connect to Data Link

Solution for when the data link fails to connect (using UniRC7 as an example):

If the ground and air units are in normal communication, but you are unable to establish a successful data link connection with the ground station software, follow these steps for troubleshooting:

1. First, ensure that the air unit is properly connected to your flight controller using the correct data link cable.
2. If you are using a DIY data link cable to connect the air unit and your flight controller, please check:

- Is the wiring sequence correct?
- Are the TX and RX pins in the flight controller and air unit data link serial ports properly crossed?
- Are Data Link 1 and Data Link 2 configured correctly?

3. In the "UniGCS" app, go to the "Link Information" menu and check the values to determine if the communication between the flight controller and the air unit is normal. When the communication is

normal, the "Data Link Downlink" value will be greater than 0. If the value is 0, please go back to steps 1 and 2 to check the connection cables.

4. In the "UniGCS" app, go to the "Data Transmission Settings" menu and check the following:

- Is the data transmission connection method set correctly?
- If using PX4/ArduPilot open-source flight control or a custom flight controller, is the baud rate set correctly?
- Check the data transmission connection settings in the flight control ground station software.

5. If using PX4/ArduPilot open-source flight control or a custom flight controller, try switching the data transmission cable to the TELEM 1 or TELEM 2 port.

6. Are both the ground station and sky end running the latest firmware?

7. If using a wireless hotspot for UDP data transmission, disable the Ethernet on the computer and try connecting again.

Note: If you have followed the above steps and are still unable to identify the issue, please immediately contact your distributor or reach out to SIYI Technology for further troubleshooting and resolution.

7.1.2 Unable to Display Image

Troubleshooting for not displaying video images (using UniRC7 as an example)

If you are unable to view the video transmission via the SIYI link, please follow these steps to troubleshoot:

1. Check the connection:

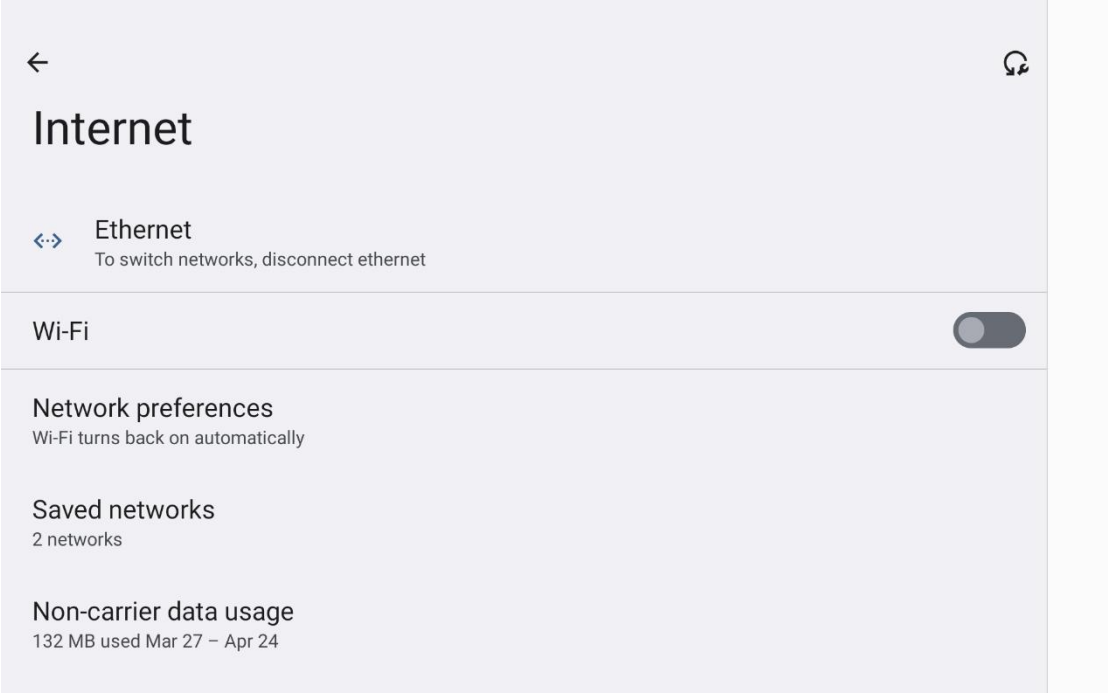
- Ensure that the ground end and sky end are properly synchronized (i.e., the status indicator light on either the ground end or sky end is green).
- Verify that the camera is correctly connected to the sky end (check if the link and camera can be reached via Ping Tools).

2. Check software settings:

    - UniGCS Application: Verify that the camera address field is correctly set.

If you're unable to view the video feed through the SIYI handheld ground station, please check the network status of your Android system:

Ethernet switch: Check if the Ethernet icon is displayed on the Android home screen. If not, go to the Android system settings and enable the Ethernet function.



Note: If you have followed the above steps and still haven't identified the issue, please contact your dealer or directly reach out to SIYI Technology for further troubleshooting and resolution.

7.2 Contact the support team

Please visit SIYI Technology's website at https://www.siyi.biz/index.php?id=support for the latest updates.

8 Appendix

8.1 Glossary

- RCU: In the UAV system, RCU (Remote Control Unit) usually refers to the remote controller, which is the core device for operator interaction with the drone. It is responsible for sending flight commands, receiving real-time data, and monitoring the drone's status.
- UDPCI: Refers to the UDP-based Communication Interface, which is primarily used to achieve efficient data transmission between the UAV and the control terminal or network nodes.
- RTSP: RTSP (Real Time Streaming Protocol) is a network protocol used to control the transmission of real-time streaming media.

8.2 Version Update Log

UniGCS 1.1.6 Update Summary

1. Fixed some known issues.
2. Optimized certain features.
3. Added infrared camera high-temperature alarm feature.

UniGCS 1.1.4 Update Summary

1. Added mapping flight path functionality.
2. Added flight control parameter settings.
3. Added one-click takeoff, landing, and return-to-home functions.
4. Fixed some known issues.

9 After-Sales and Warranty

Please visit the SIYI Technology support page at Service and Support - SIYI Technology | Empowering and Building an Intelligent Robot Ecology for the latest after-sales and warranty information.