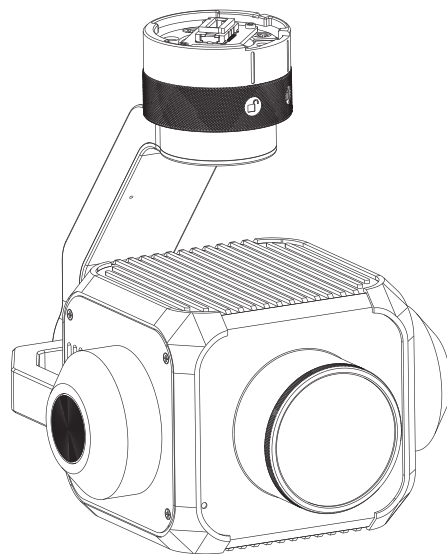


YUNEEC

A COMPANY OF ATL DRONE 

Manual

E45S





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General Description

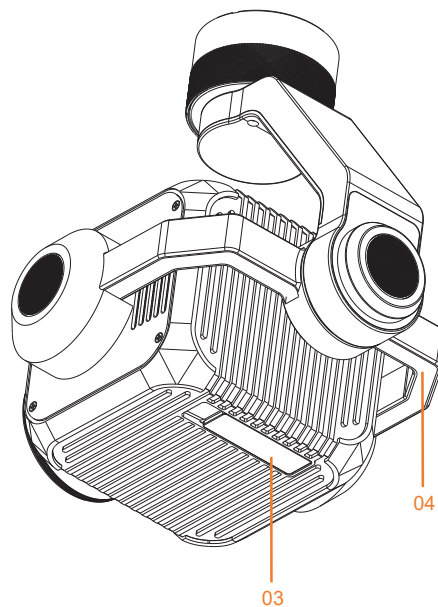
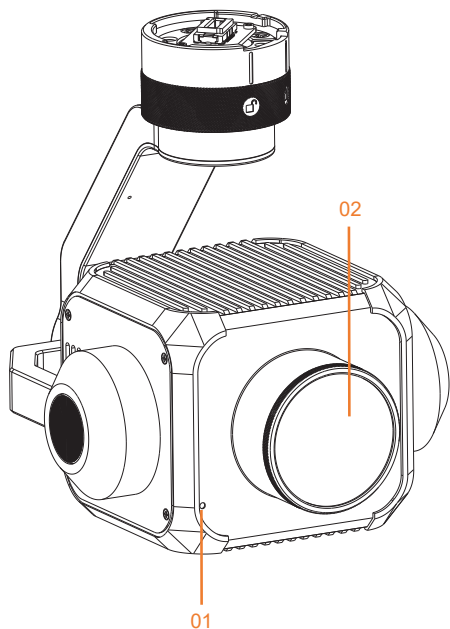
The E45S camera is a high-resolution gimbal stabilized image surveying system ideally suited for applications requiring high-precision surveying.

The E45S utilizes a 45 MP full-frame sensor and a 35 mm focal lens. Thanks to the mechanical shutter, the E45S can capture a photo without distortion, even at a high flight speed. This greatly improves the efficiency of surveying.

Highlights of the E45S camera system

1. 45MP full frame CMOS camera sensor.
2. Mechanical shutter.
3. Real-time video feedback when surveying.
4. Full control of the camera via transmitter.

Overview



- 01: LED Status Indicator
02: Camera Lens

- 03: Micro SD Card Port
04: Gimbal

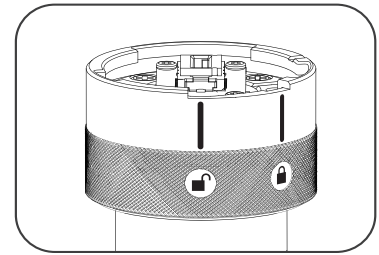


Gimbal Installation

Assembling

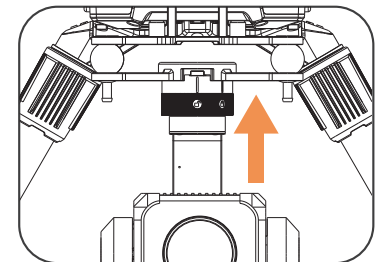
Step 1

Find the Unlocked Mark etched on the Gimbal Yaw Motor and align the Mark Line with the front of the damping plate.



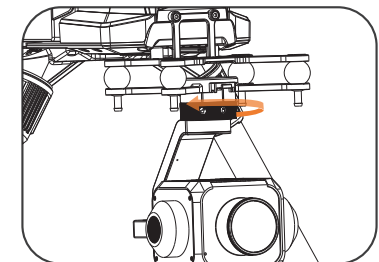
Step 2

Insert the Gimbal Yaw Motor into the damping plate and rotate it counterclockwise until the Mark Line of the Locked Mark aligns with the front of the damping plate to secure the gimbal.



Step 3

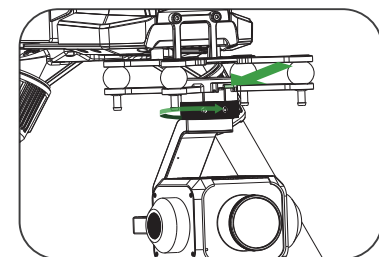
Remove the lens protector and open the Micro SD Card Slot Cover to insert the SD card.



Disassembling

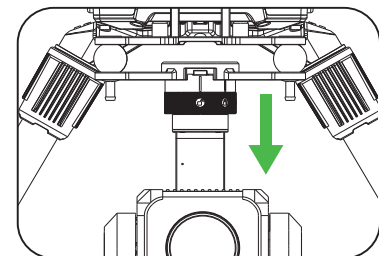
Step 1

Hold the gimbal release button and rotate the Gimbal Yaw Motor clockwise until the Mark Line of the Unlocked Mark aligns with the front of the damping plate.



Step 2

Pull the gimbal out from the damping plate.



Notice:

The X-connector series gimbal does not need a separate binding. If a re-binding is required, please refer to the corresponding section in the Drone Quick Start Guide.

Danger:

Do not hot-plug the device while powered on, as it might cause electrical damage.



Main User Interface Overview



1. Camera quick-access menu
2. Gimbal attitude indicator (Pan and Tilt)
3. Gimbal type and SD card remaining capacity
4. Video/Photo mode switch button
5. Shutter or Start/Stop recording button
6. Counter in photo mode/ Timer in video mode
7. Gallery button
8. Camera Setting Menu button
9. Lens direction indicator

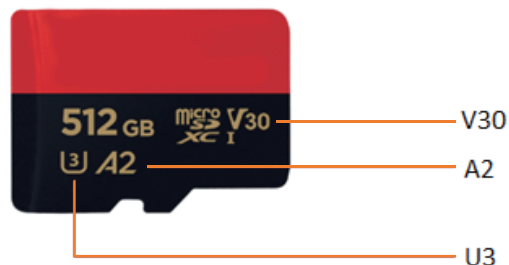
SD Card Requirement

Format

ExFAT or FAT32

Speed Level

Recommended to use U3A2V30 or above





User interface Introduction

Camera quick-access menu

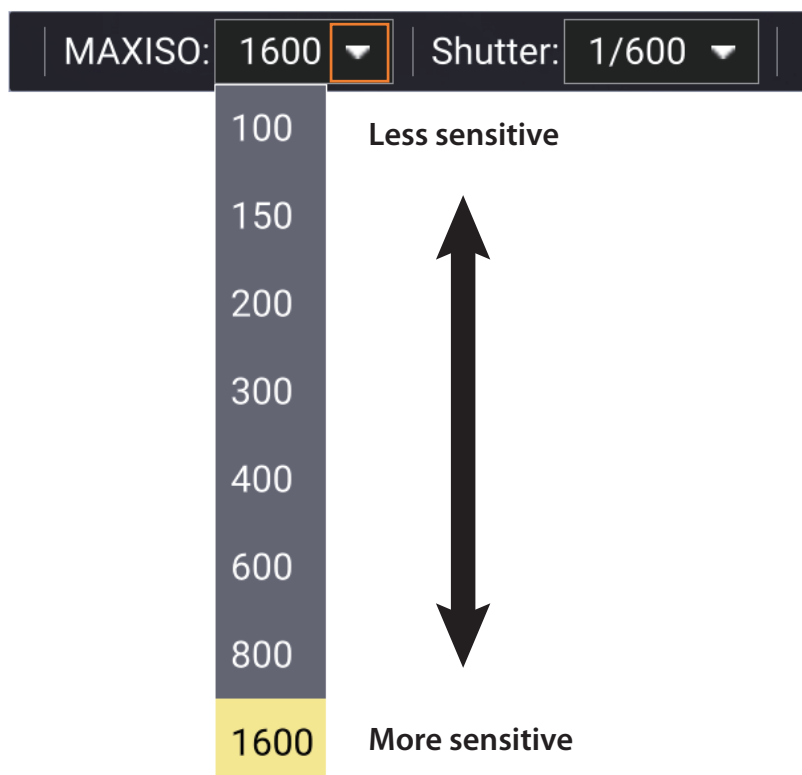
The user can view and change essential camera parameter settings in the main user interface. To change the setting in the quick-access menu, tap on the item you want to change. It will pop up a sub-menu for selection.

MAX ISO

Tap the white down arrow to open the sub-menu then the user can select the MAX ISO setting for the camera. The camera will prioritize the current shutter speed setting. Usually, the ISO will be the MAX ISO value set by the user at most, under the condition that proper exposure can be maintained.

However, if proper exposure cannot be maintained, the camera will break through the MAX ISO setting and increase the ISO value to achieve proper exposure.

The larger the ISO value, the more sensitive the CMOS is to light, while the smaller the ISO value, the less sensitive the CMOS is to light.

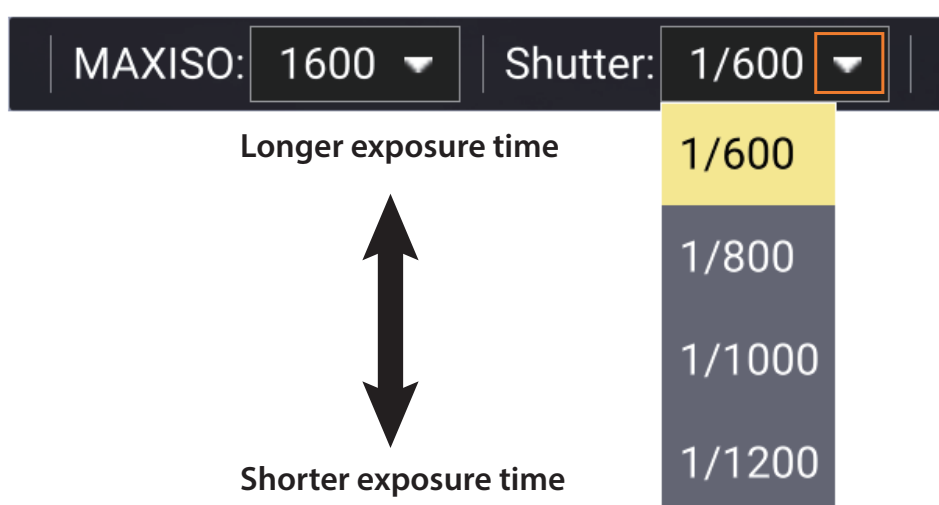




Shutter

Tap the white down arrow to open the sub-menu then the user can select the shutter speed to adjust the exposure duration. If proper exposure can be achieved when the ISO value is at or below 1600 (the MAX ISO for the E45S), the camera will perform exposure according to the users shutter speed setting. However, if proper exposure cannot be maintained even if the 1600 ISO value is achieved, the camera will extend the exposure time set by the user to achieve proper exposure.

The longer the exposure time, the brighter the image will be, and the shorter the exposure time, the darker the image will be.



Gimbal positioning indicator (Pan and Tilt)

A black arrow in the yellow dot shows the direction of the gimbal lens. When the arrow is straight up, it indicates the gimbal lens is pointing to the front of the drone.

Also, the position of the yellow dot in the gimbal tilt indicator bar shows the gimbal tilt position. The red marks in the bar show the gimbal is tilted up. Meanwhile, the green mark shows the gimbal is tilted down.

The user can read the gimbal tilt angle in the rectangle under the Vertical bar for further accuracy.



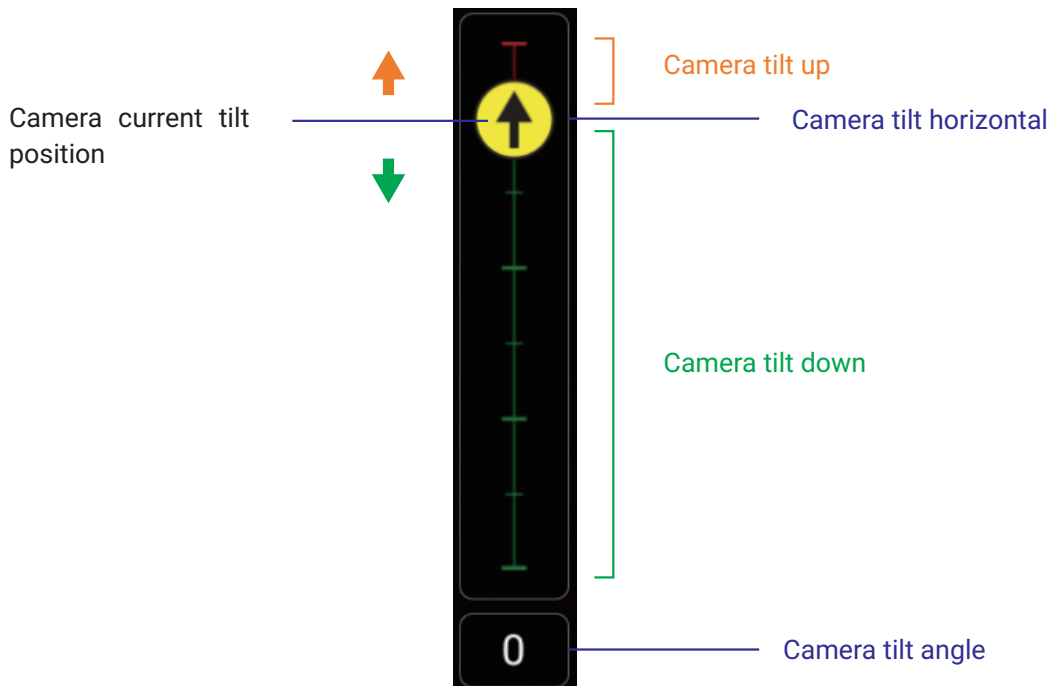
Camera turn Left



Camera toward Front

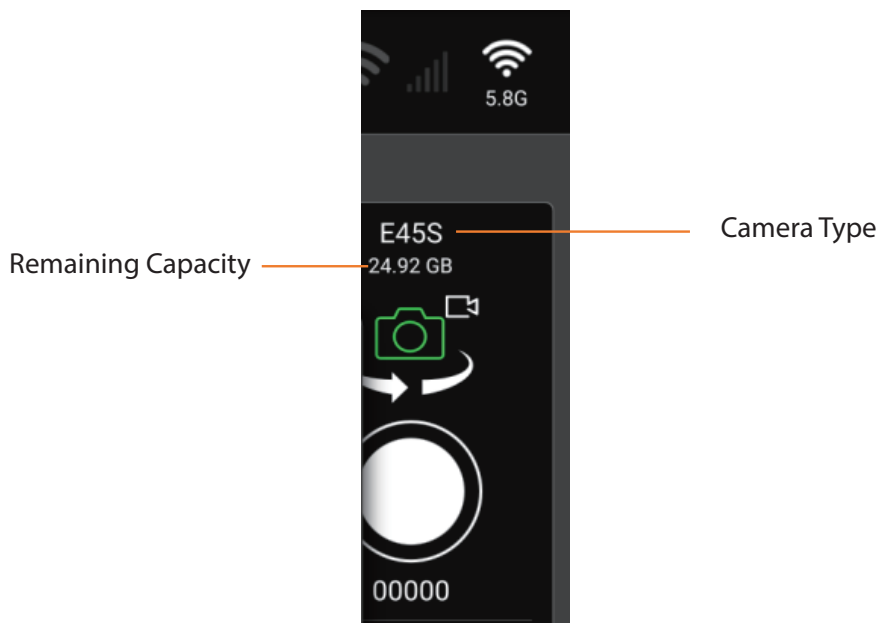


Camera turn Right



Gimbal type and SD card remaining capacity

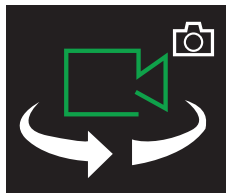
The drone can be attached with different gimbal payloads. This Indicator shows which one the drone is carrying and the SD card remaining capacity.



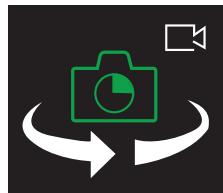


Video/Photo mode switch button

Switch the Camera mode between the Photo capturing mode with the Videorecording mode. Just tap the Icon to switch the working mode.



Camera in video recording mode



Camera in photo capturing mode

Shutter or Start/Stop recording button

1. In the Video Recording mode, the icon is a red dot. Tap it to start recording the video and tap again to stop recording.
2. In the Single Photo mode, the icon is a white dot. Tap it to capture a photo.
3. If the SD card is full or the camera is without an SD card, the icon is a grey dot, which means you cannot record anything.

Four different statuses of the Shutter or Start/Stop recording soft button:



Tap to start recording video



Tap to take a photo



Tap to stop recording



No SD card or SD card full

Counter in photo mode/ Timer in video mode

In the photo mode, the counter shows how many photos you have recorded within one recording period. Once you have powered off the drone, the number will be automatically reset.

In video mode, the timer shows the recorded time in each video.

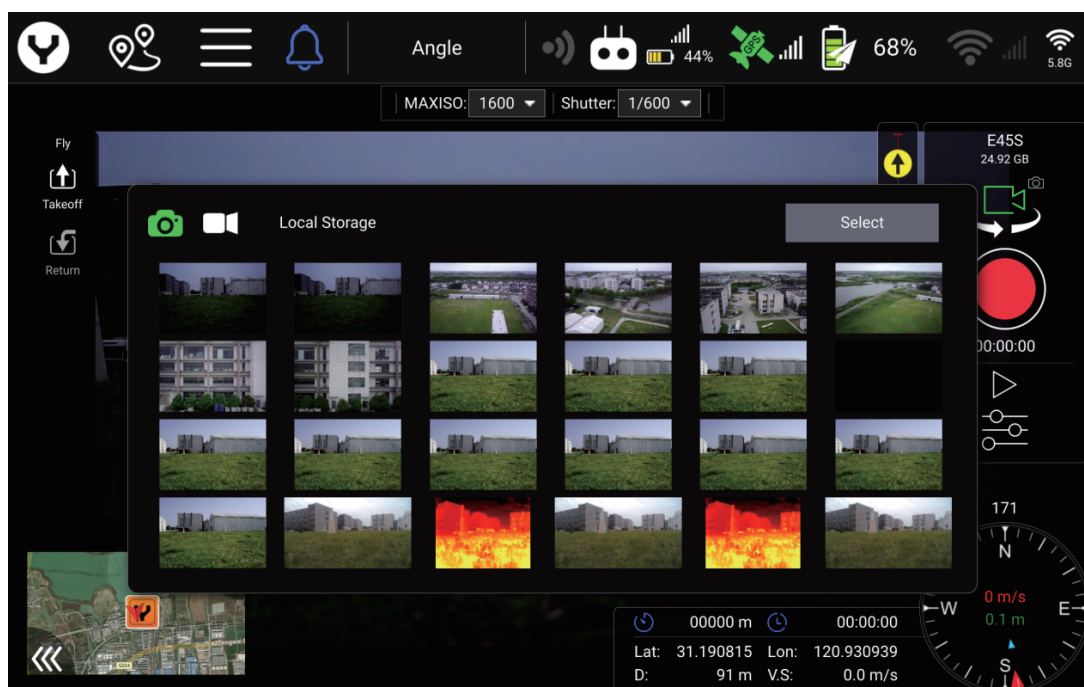
Gallery button

The primary function of Gallery Preview is to check the pictures and videos taken on the remote control without pulling out the SD card from the camera. Aerial photos can be reviewed without landing the drone, so users can quickly reshoot the unsatisfactory images or videos, significantly improve the efficiency of aerial pictures or video taken by the drones.”

The photos or videos also can be deleted in the gallery function to save the storage capacity of the Remote Controller.



Tap the Gallery button to switch to the gallery menu.



The gallery menu will display the thumbnails of captured photos and videos.



Gallery function

1. Photo and Video switch

Tap the camera or video recorder icon to switch between captured photos or recorded video lists. The icon of the selected list will be marked with green colour.

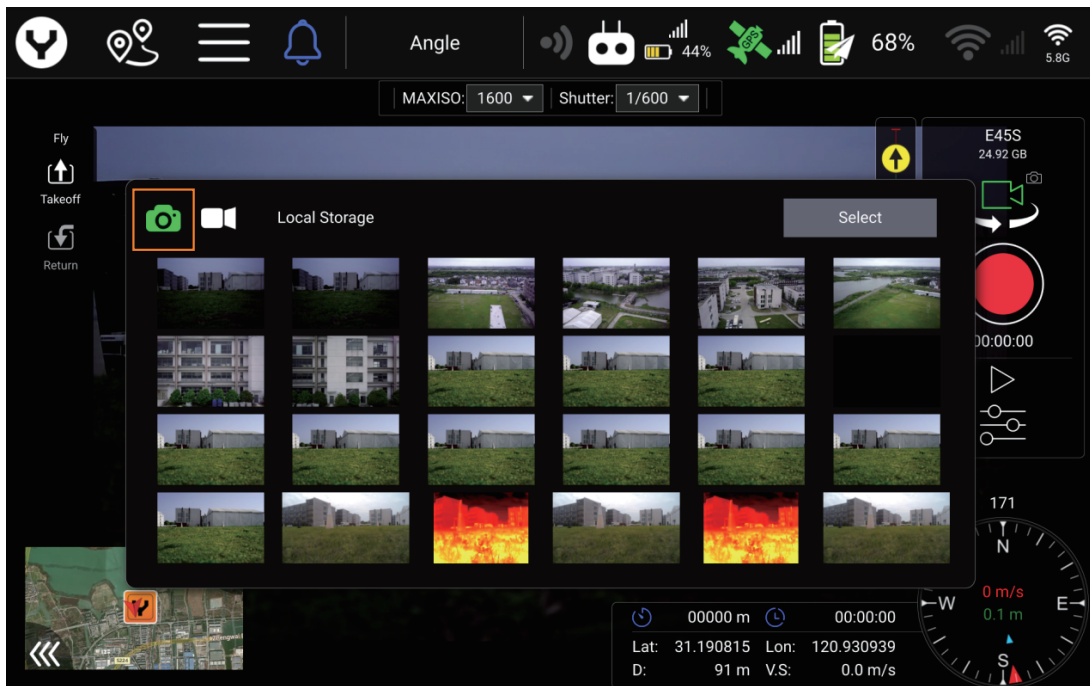


Photo list



Video list



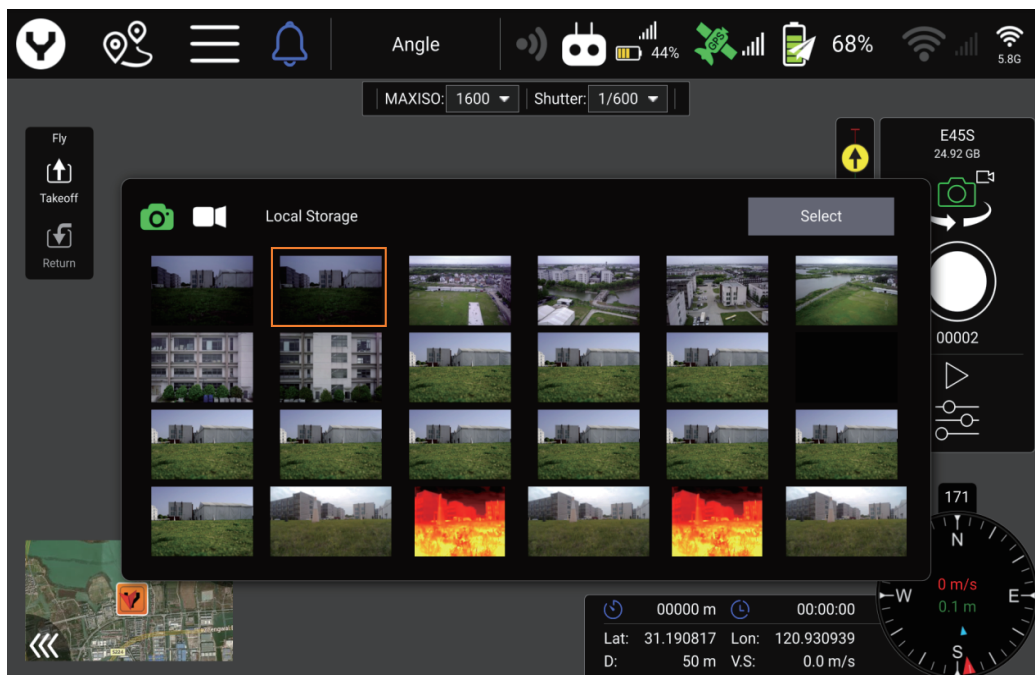
2. Browse function

Photo browse

Tap the thumbnails to enlarge the corresponding photo for checking;

Tap the left or right arrow to switch to the previous or next image;

Tap the area out of the browse interface to return to the list.



Previous photo

Next photo

Return to photo list



Video browse

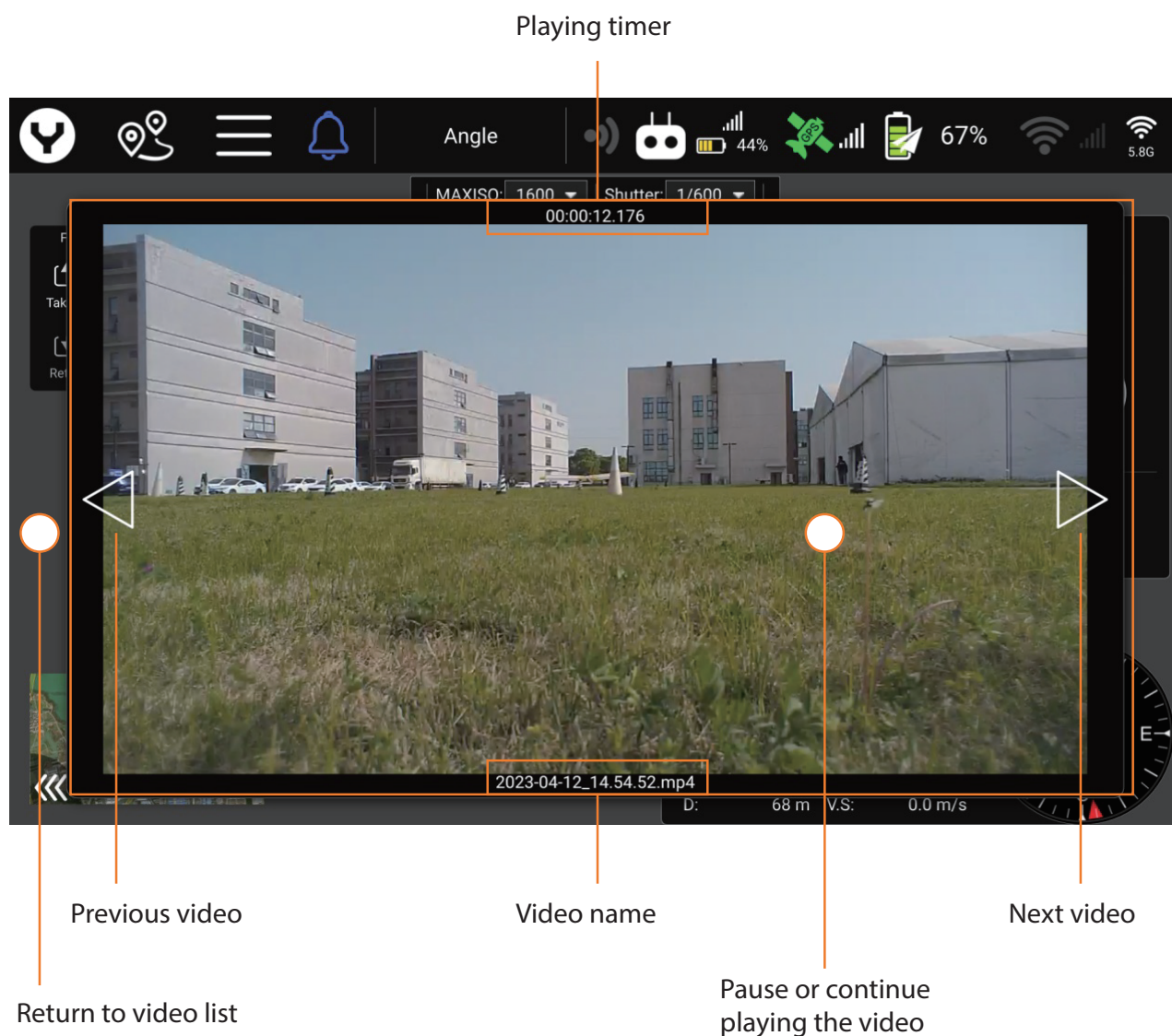
First, switch to the video list, then tap the thumbnails to enlarge the corresponding video for checking. Once enlarged, the video will be played automatically;

Tap the playing video to pause the video. If you tap again, the video will be continued;

Similar to photo browsing, the user can switch to the previous video or the next video by tapping the left or right arrow beside;

Tap the area out of the browse interface to return to the list.

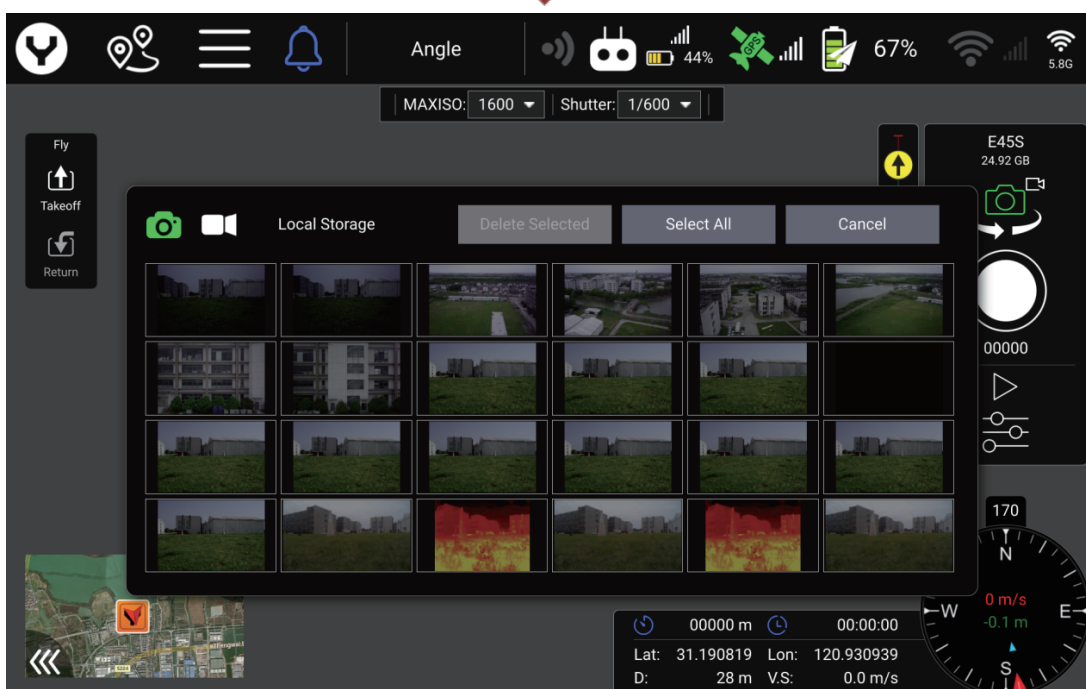
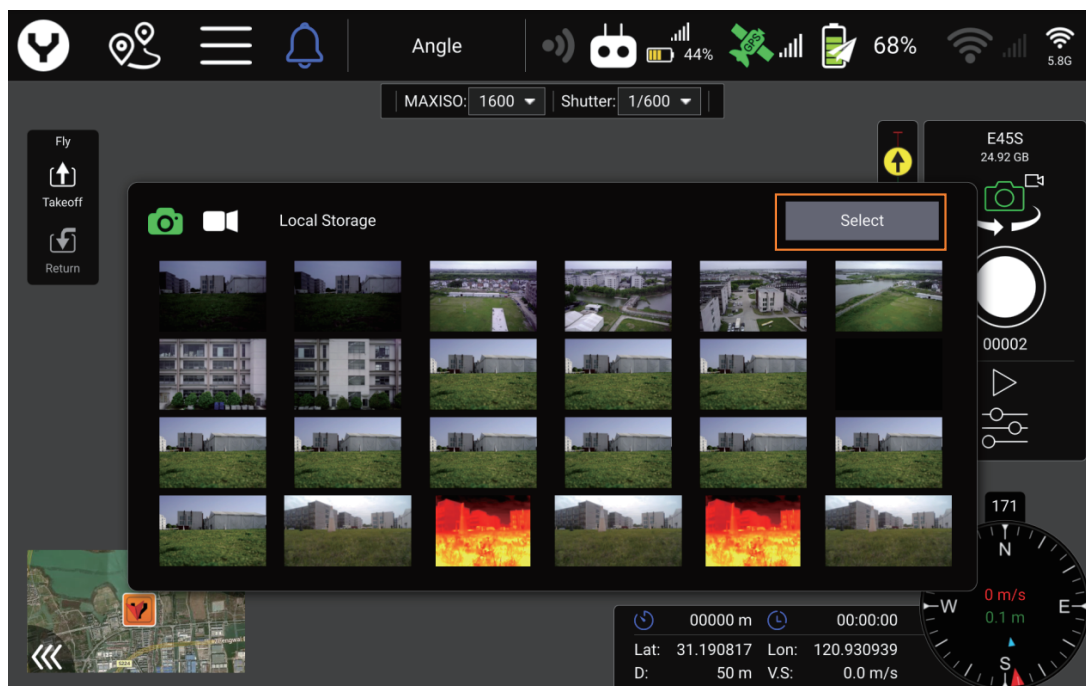
Video browse interface overview





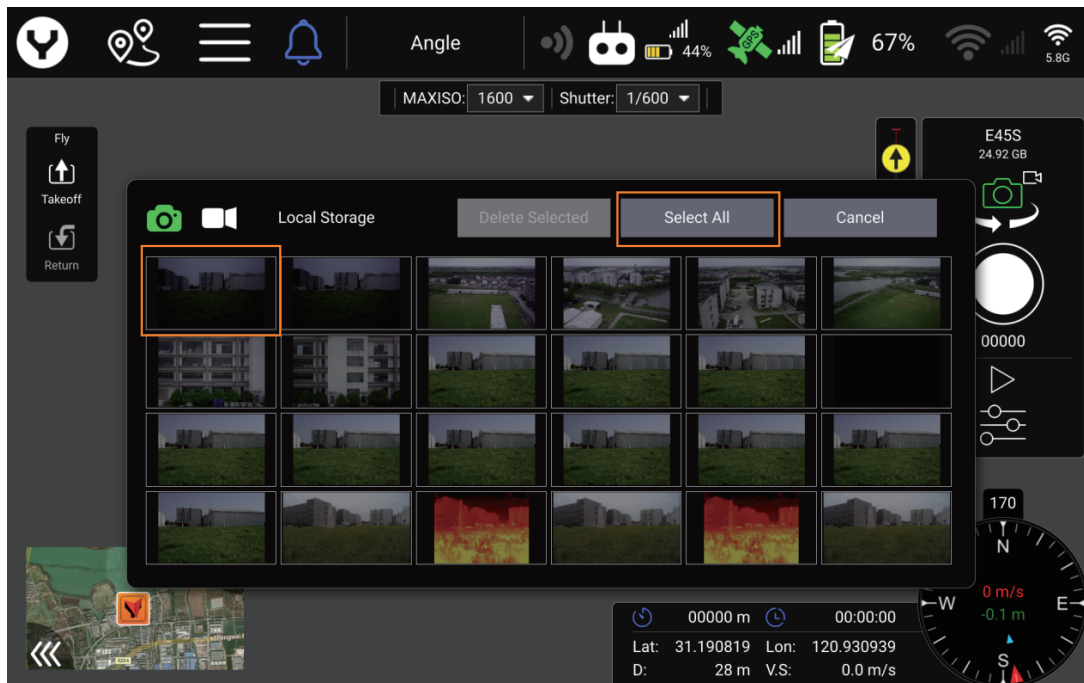
Delete

To delete the unwanted photo or video in the transmitter, please choose the photos or videos first. Tap the Select button to enter the selecting mode.



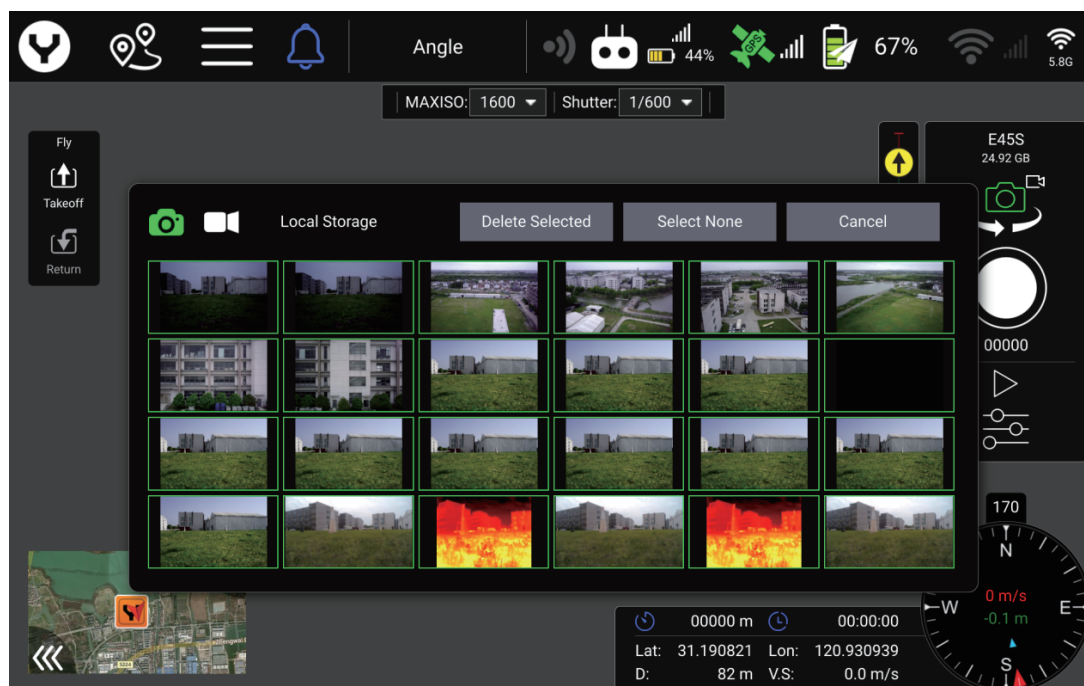


The user can manually select the photos or videos by tapping the thumbnails or the Select All button to choose the whole list.



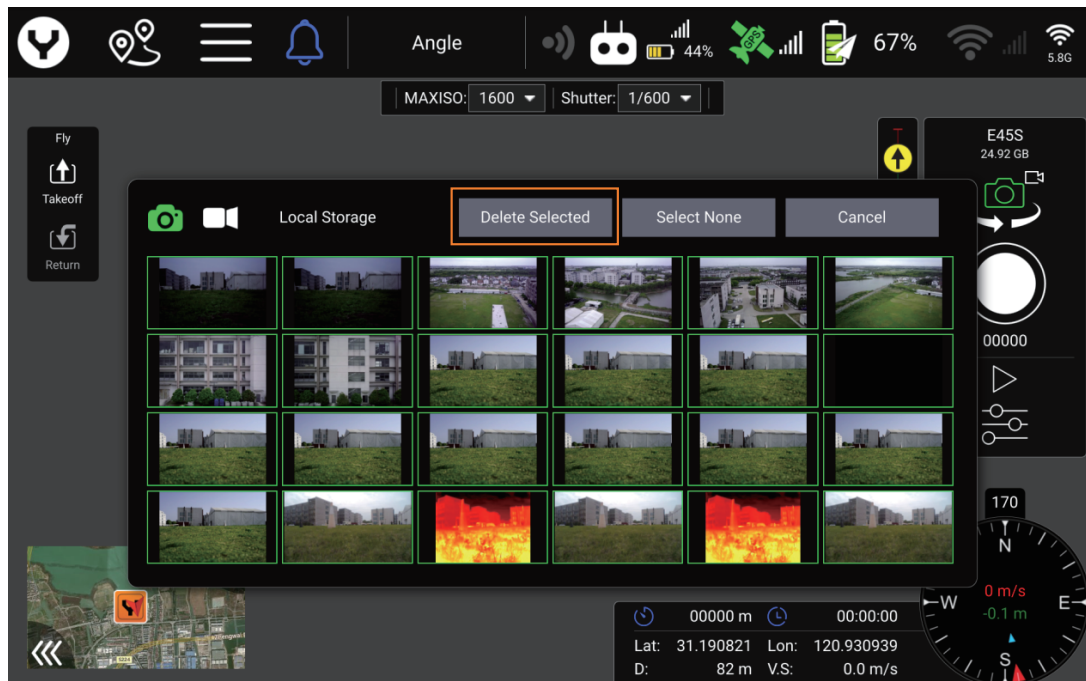
The selected files will be marked with green edge. If there are any thumbnails selected in the list the Select All button will change to Select None button.

Users can cancel all the selections by tapping the Select None button.





Tap the Delete Selected button to delete the selected files.



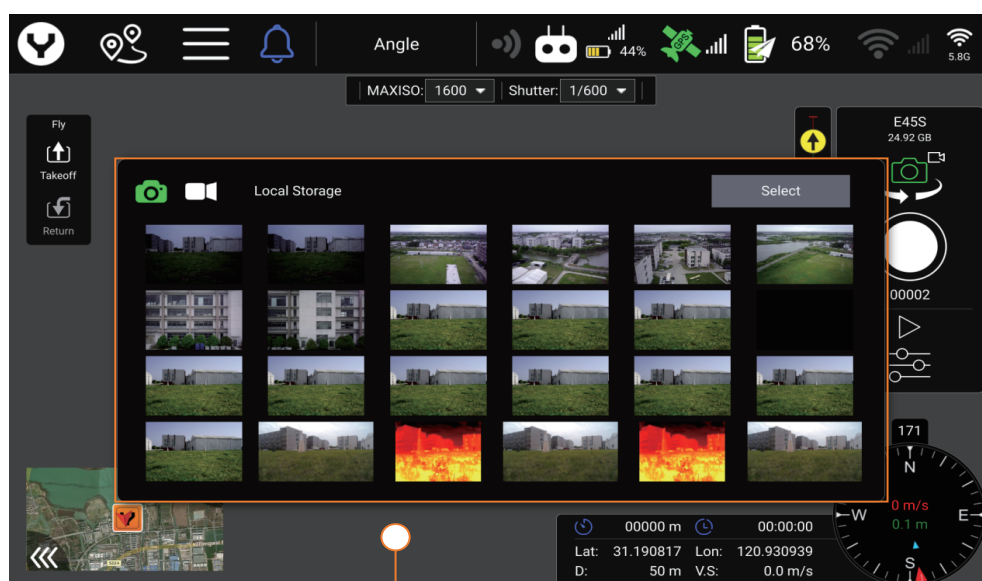
Tap the Cancel button to quit the selecting mode.

Notice:

When deleting in the Gallery, the device will only delete the file in the Remote Controller, not in the Micro SD card inserted in the Gimbal Camera.

Quit Gallery

Tap any area out of the gallery menu to quit the Gallery.



Tap to quit gallery



Lens direction indicator

The blue pointer indicates the direction in which the camera lens is pointing.



Lens direction indicator

Camera Setting Menu Introduction

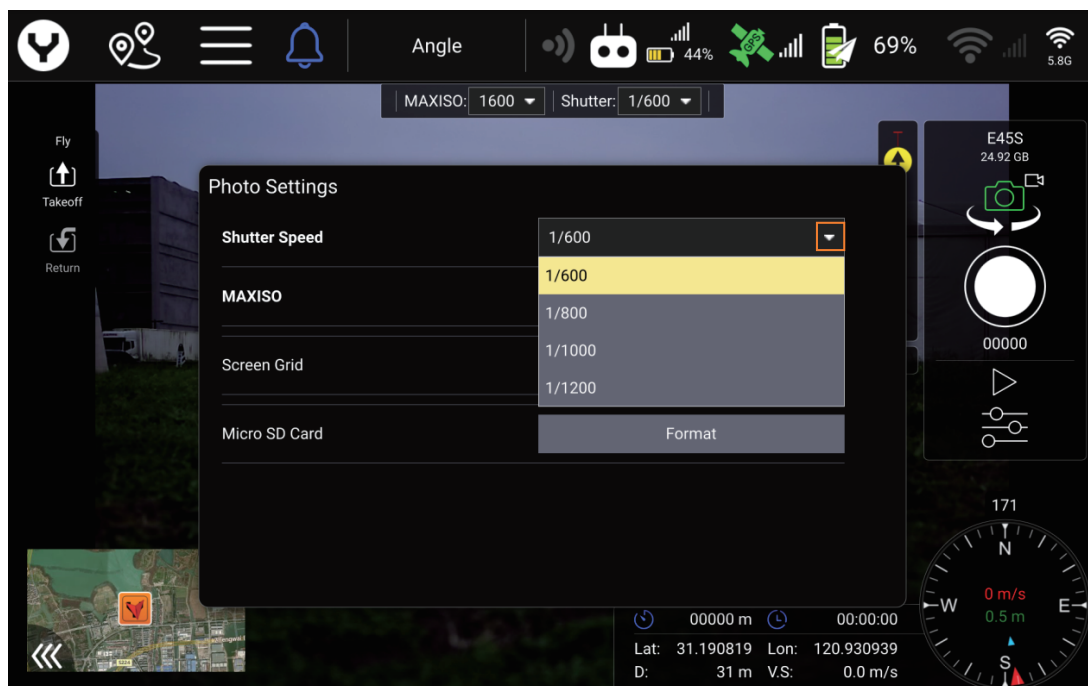
Tap to open the Camera Setting Menu.





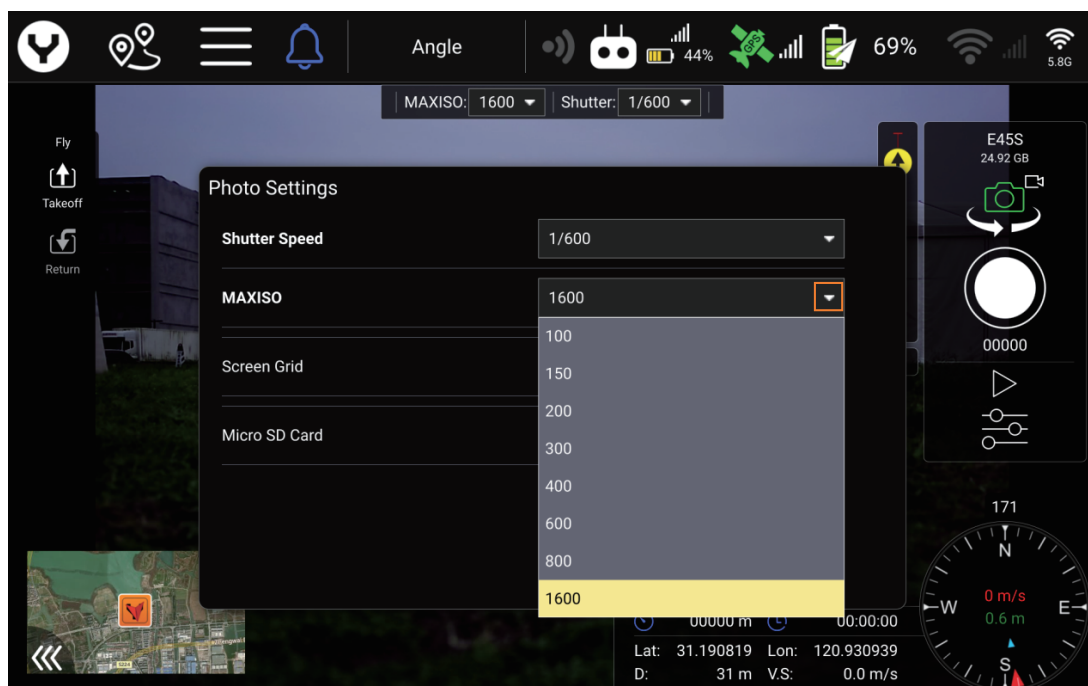
Shutter Speed

Like the Shutter item in the Camera Quick-Access menu, the user can set the shutter speed via this item. Tap the white down arrow to open the sub-menu for choosing.



MAX ISO

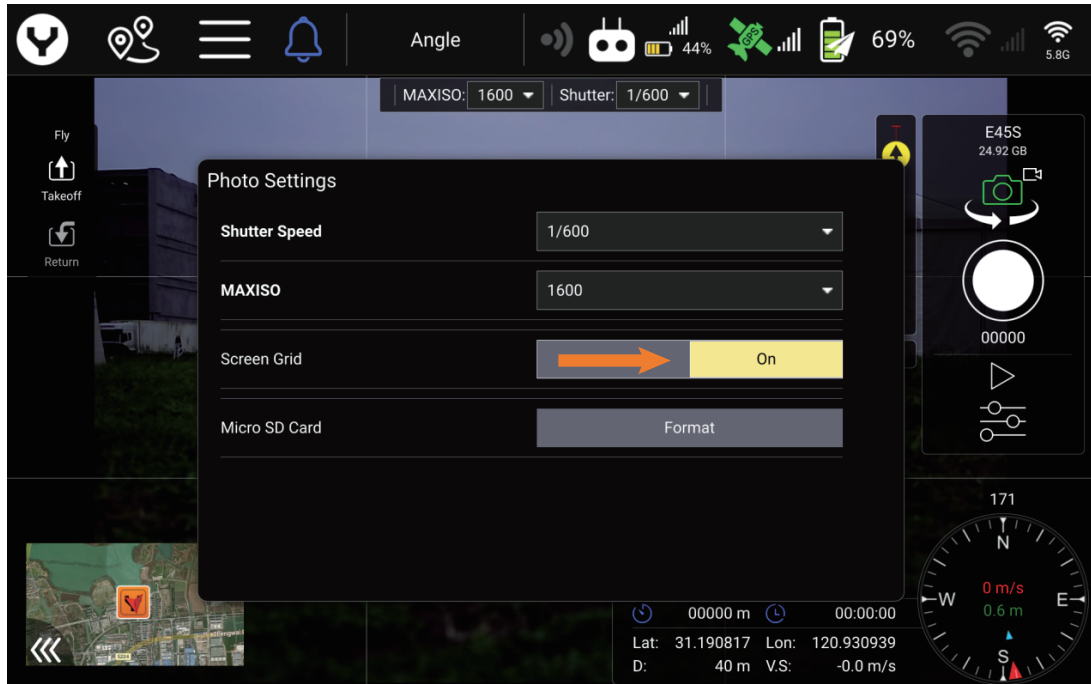
Same as the MAX ISO item in the Camera Quick-Access menu, the user can set the value via this item. Tap the white down arrow to open the sub-menu for choosing.





Screen Grid

Turn on the Screen Grid switch, and the gridlines help the user with composition by appearing on the screen.



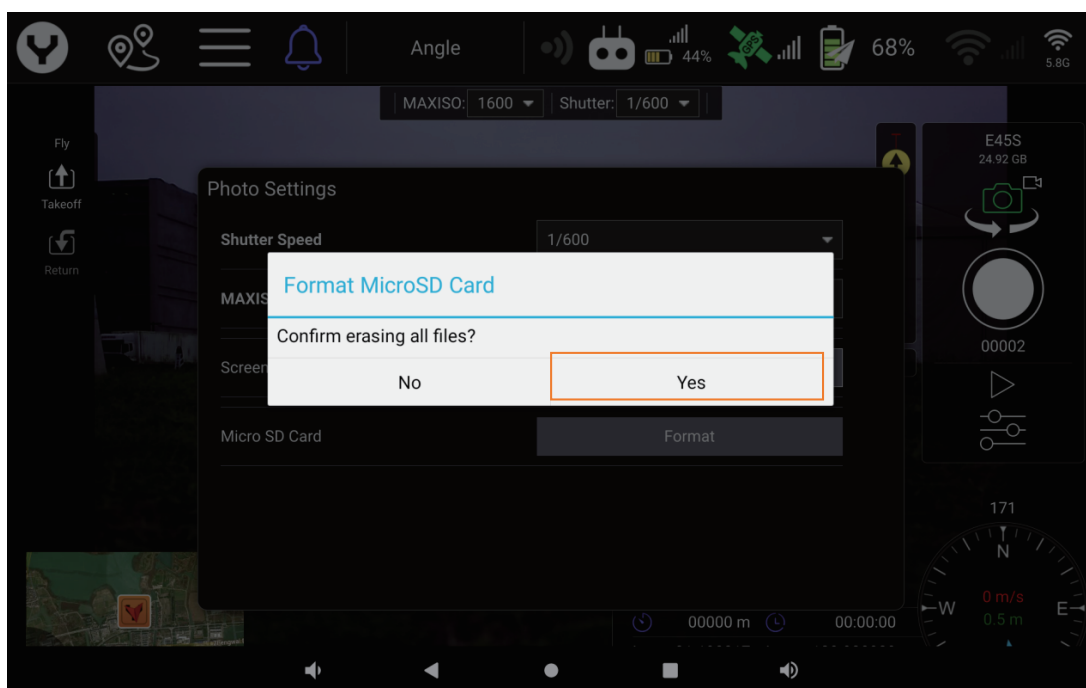
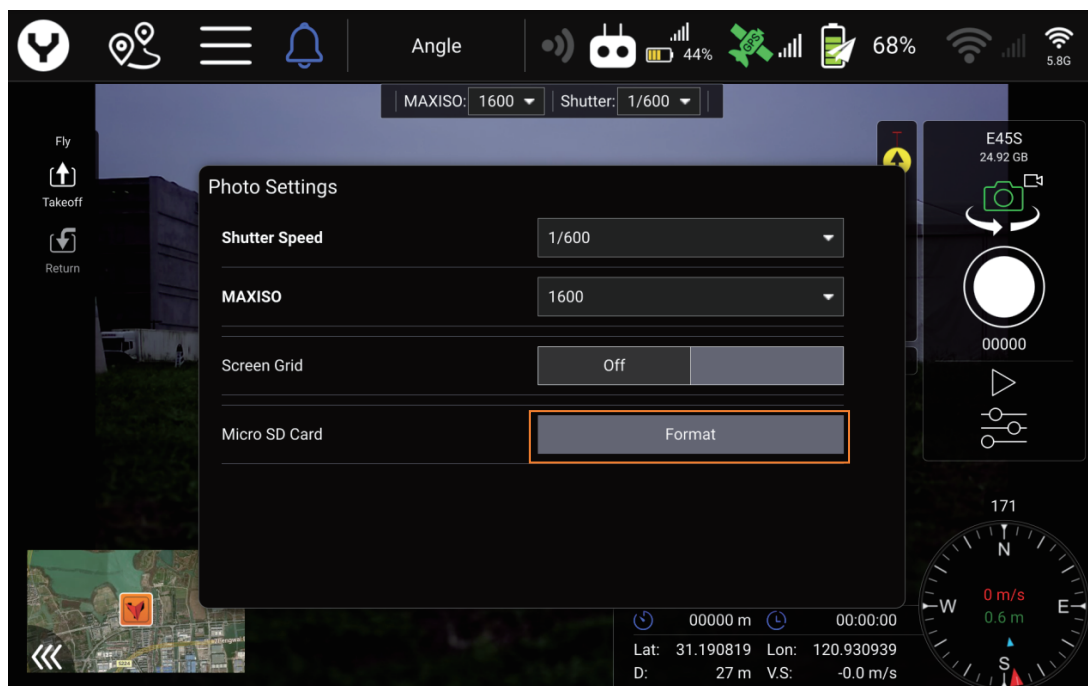
The gridline effect





Format Micro SD card

Tap the Format button and tap Yes to confirm. The camera will format the Micro SD card.

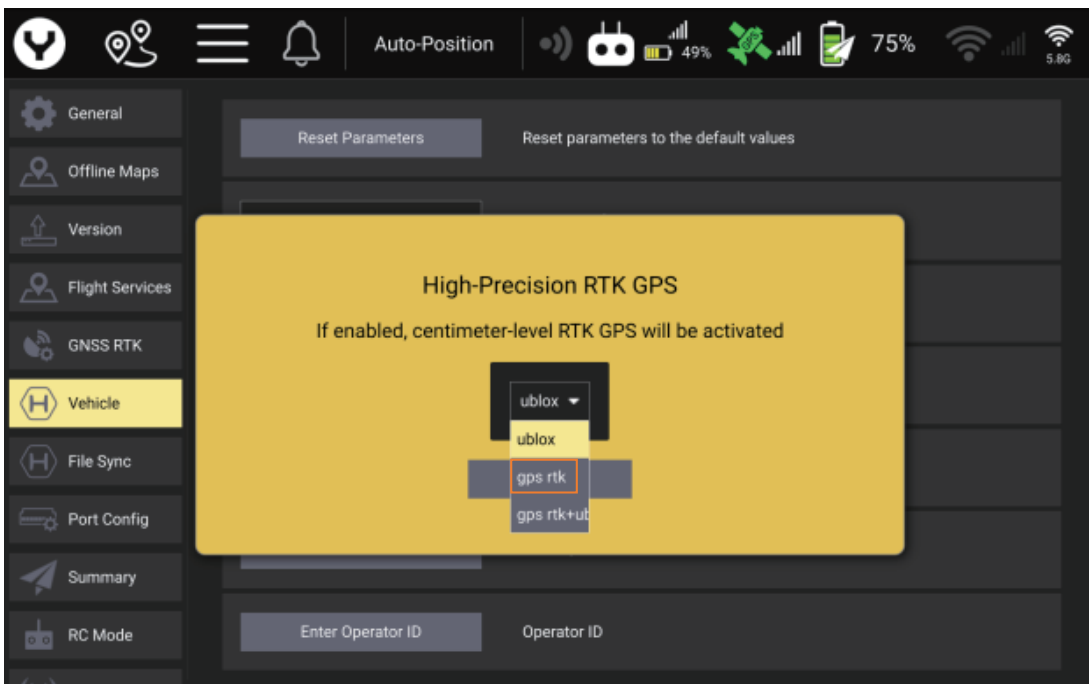
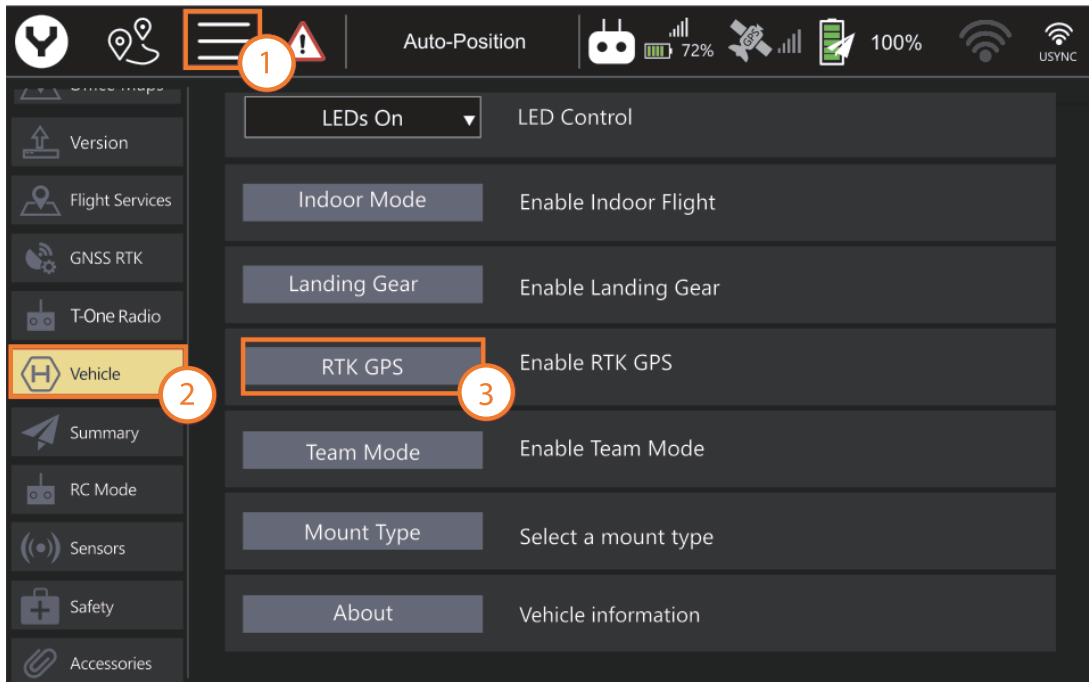




Survey Suggestions

GPS module selection

Power on the drone and the transmitter, and wait until the connection is established. Tap the Settings icon and enter the Vehicle item. Then tap the RTK GPS button to open the GPS module selection menu. Make sure the GPS RTK is selected.



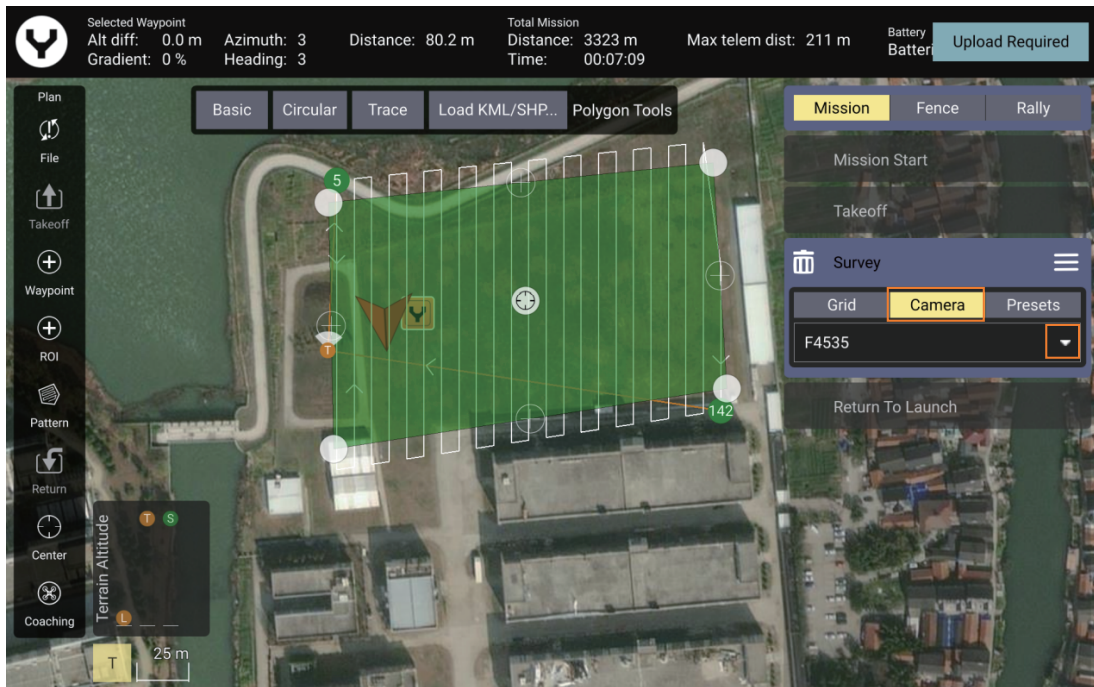


Survey parameter suggestion

Camera Selection

After the survey area is set, the user must select the correct camera to generate the correct distance between flight paths.

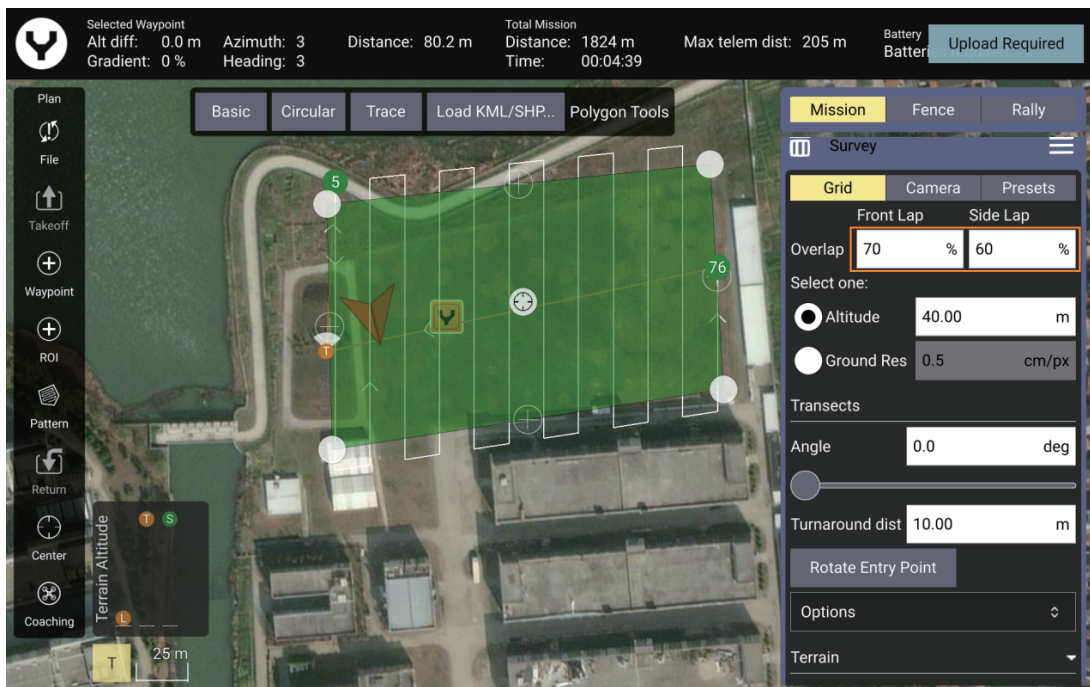
Tap the camera item under the Survey tab and tap the white down arrow to open the camera selecting menu, then choose F4535.





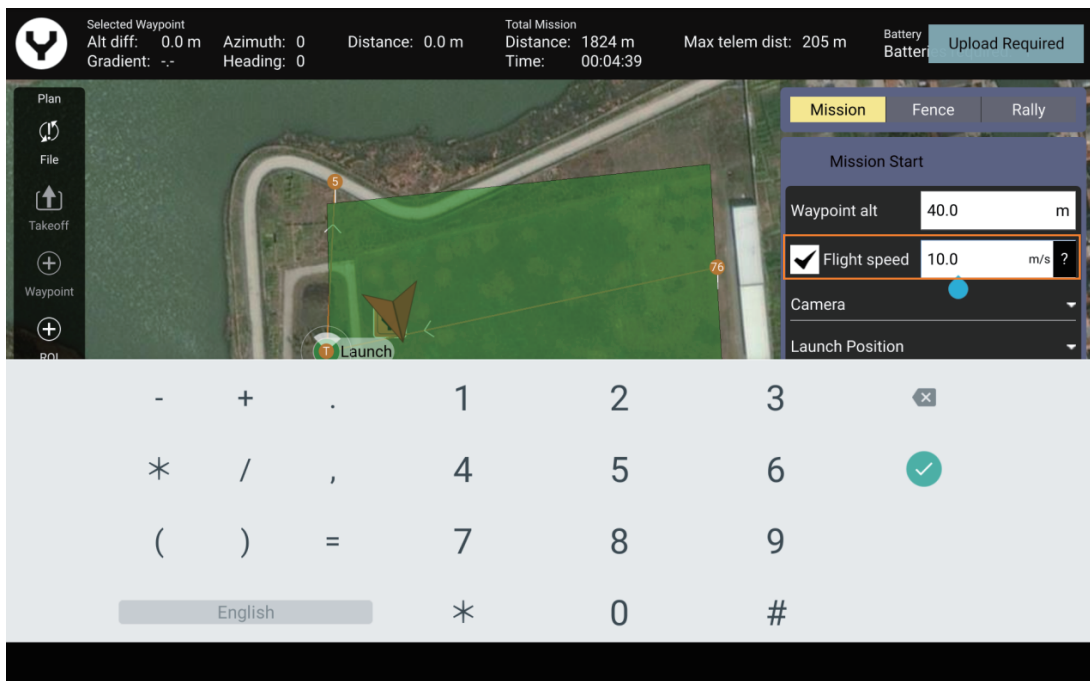
Overlap

Tap the Grid item under the Survey tab, 70% for the Front Lap, and 60% for the Side Lap as suggested.



Flight speed

Due to the mechanical shutter installed in the E45S camera, the flight speed can reach 10 m/s as the default setting when surveying. If another rate is wanted, open the Mission Start tab and tick the box before the Flight speed, then enter the desired speed.

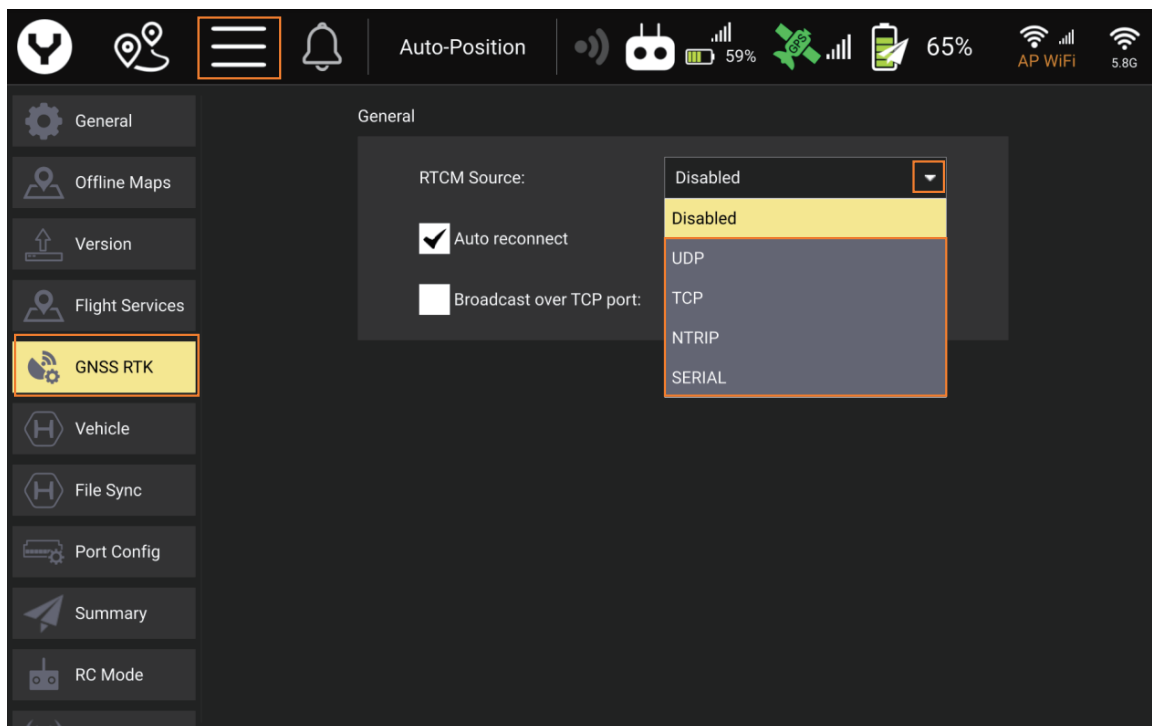


Notice: The suggested speed is no more than 10m/s.



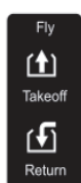
RTK Survey Operation

Enter the GNSS RTK interface under the Settings menu and select the RTCM Source, then finish the configuration for the RTCM Source for connection.



Notice:

The users may need to connect to the Wi-Fi to get the RTCM Source. Tap the Wi-Fi icon and select the Wi-Fi hotspot if necessary.

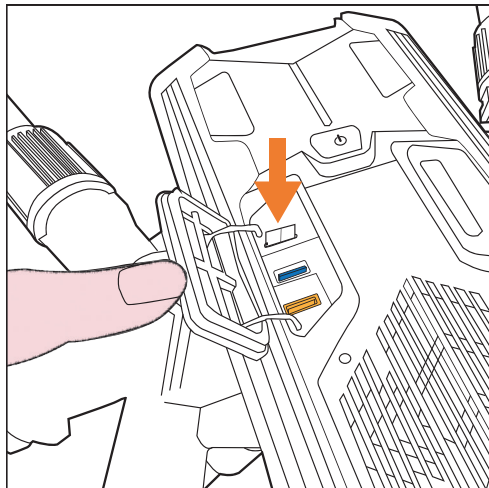


After the RTCM Source is connected, the high-precision POS data will be written to the photo EXIF info when capturing.



PPK survey operation

If the user wants to perform a PPK survey operation, insert another Micro SD card into the RK3568 module (I/O Board) to record the rover data, and timestamps are needed.



After the survey flight, the user needs the following data for the PPK processing.

Rover data and timestamps

Recorded in the Micro SD card, inserted in the RK3568 module (I/O Board)

Survey photos

Recorded in the Micro SD card inserted in the E45S camera

GNSS base data

Recorded in the GNSS RTK Receiver (GPS Base Station)

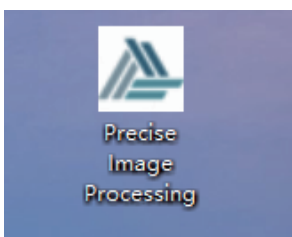
When processing PPK data, please import the data mentioned above into the PPK software to calculate high-precision POS data for each photo.

Recommended GNSS RTK receiver (GPS Base Station)



Satlab Freyja GNSS Receiver

Recommended PPK Software



ATL Precise Image Processing



Specifications

| Item | E45S |
|------------------------|------------------------------|
| Gimbal | |
| Weight | 440g |
| Dimensions | 138×133×113 mm |
| Control Angle Accuracy | ± 0.02° |
| Maximum Control Range | Tilt: -90°~ 0° Pan: ±165° |
| Maximum Control Speed | Tilt: 30°/s Pan:120°/s |
| Environmental | |
| Operating Temperature | -10°C to 50°C |
| Camera | |
| Sensor Type | CMOS |
| Sensor Size | Full Frame 36×24 mm |
| Effective Pixels | 45MP |
| Aperture | F 5.6 |
| Focal Length | 35 mm |
| Diagonal FOV | 63° |
| ISO Range | 100 – 1600 |
| Shutter Range | 1/600--1/1200s |
| Photo Resolution | 8192×5460 |
| Video Resolution | 3840×2160 30fps |
| Photo Formats | JPEG |
| Video Formats | MP4 |
| Operation Mode | Capture Record |
| White Balance | Auto |



NOTICE

- 1 Ensure that the gimbal's firmware has been updated to the latest version.
- 2 For the latest product information, please check our official website www.yuneec.com

WARNING

- Do not try to repair the gimbal camera.
- Do not expose the lens of the gimbal camera to extreme light sources.
- Do not operate the gimbal camera in the rain or environments with high humidity.
- Do not touch or move the gimbal camera until the initialization process has been completed.

The following particular language terms are used throughout the product literature to indicate various levels of potential harm when operating this product:

NOTICE

If the procedures are not correctly followed, there is a possibility of damage and chance of personal injury.

CAUTION

If the procedures are not correctly followed, there is a likelihood of property damage and serious personal injury.

WARNING

If procedures are not correctly followed, there is the likelihood of property damage, collateral damage, and severe injury.

WARNING

Read the entire instruction manual to become familiar with the product's features before operating. Do not use with incompatible components or alter this product in any way outside of the instructions provided by Yuneec. Failure to use this product in the intended manner as described in the instruction manual can result in damage to the product or property and/or cause serious injury.

Disclaimer

Yuneec cannot be held liable for any damage, injury or use of the product in violation of legal regulations, especially in the following circumstances:

Damage and/or injury and violation of legal regulations resulting from a failure to comply with the operating instructions or the instructions at www.yuneec.com, product information, user manual and other legally binding information.

Damage and/or injury and violation of legal regulations brought about by the influence of alcohol, drugs, medication or other narcotics may impact the user's concentration.

The same applies to illnesses affecting the user's concentration (dizziness, tiredness, nausea etc.) or other factors compromising mental and physical capabilities.

User intentionally caused damage, injury or violation of legal regulations.

Any request for compensation caused by an accident resulting from the use of the product.

Damage and/or injury, as well as violation of legal regulations caused by the use of the product in a no-fly zone, e.g. next to an airfield, above a motorway or a natural conservation area.

The malfunction of the product was caused by retrofitting or replacing components that did not come from Yuneec.

Damage and/or injury caused by replica parts (non-original parts).

Damage and/or injury and violation of legal regulations caused by incorrect operation or misjudgment.



Damage and/or injury caused by damaged spare parts or not using original Yuneec spare parts.

Damage and/or injury and violation of legal regulations caused by ignoring the low voltage battery warning.

Damage and/or injury, as well as violation of legal regulations caused by operating the model in a magnetic field (e.g. high voltage lines, electricity/ transformer stations, radio towers, mobile phone masts etc.), a robust wireless signal environment, no-fly zones, poor visibility and in the event of vision impairments or other impacts on the pilot which are left unchecked etc.

Damage and/or injury brought about through a violation of the legal regulations for operating the model in unsuitable weather conditions, e.g. rain, wind, snow, hail, storms, hurricanes etc.

Damage and/or injury and violation of legal regulations caused by force majeure, e.g. collision, fire, explosion, flooding, tsunami, landslide, avalanche, earthquake or other forces of nature.

Damage and/or injury, as well as violation of legal regulations caused by the illegal or immoral use of the model, e.g. capturing videos or recording data which infringes upon/harms other people's privacy.

Damage and/or injury and violation of legal regulations caused by incorrect use of the batteries, protection systems, chargers or aircraft.

Consequential damage is caused by the incorrect operation of system components and accessory parts, especially memory cards, whereby image or video material from the camera can become defective.

Any non-compliance with legal obligations, personal injury, material damage and environmental damage caused by use and a failure to comply with the local laws and regulations.

Damage and/or injury and violation of legal regulations caused by hazardous use without sufficient practical experience.

Damage and/or injury and violation of legal regulations caused by flying in legally defined no-fly zones. Yuneec defines further losses which fall outside the scope of use as improper.

This product is designed for both professional use and personal private use.

When taking off, the national and international laws and regulations must be adhered to.

Regulation Information

FCC Statement

This equipment has been tested and found to comply with the limits for Part 15 of the FCC rules. These limits are designed to protect reasonably against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used following the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

This equipment may cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on. In that case, the user is encouraged to try to correct the interference by one or more of the following measures:

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

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



EU Compliance Statement

As a result, Yuneec declares that this device complies with the essential requirements and other relevant provisions of the RED Directive 2014/53/EU. The full text of the EU Declaration of Conformity is available at the following internet address: www.yuneec.com

Customer Service

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www.yuneec.com

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YUNEEC

A COMPANY OF ATL DRONE 