SHARE 4500X

Operation Manual V1.0

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SHAREUAV Ltd.

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1 Camera

1.1 Product Overview

SHARE 4500X with gimbal is a high efficiency, high performance and multi-purpose aerial survey camera. By mounting 45M pixels sensor and standard professional full format mapping lens, improving the imaging quality and greatly improve the efficiency of aerial survey operations.

The camera can be applied in various aerial survey scenarios, such as application of three-dimensional, two-dimensional, monomer modeling, urban high-rise buildings and other aerial survey scenes. It provides integrated, high-precision and high-efficiency aerial survey solutions for UAV aerial survey when cooperates with mainstream UAV on the market.

1.2 Parameters

Overall	Name	SHARE 4500X
	Size	75.5*60*107.5 mm(without gimbal) ； 128.5*181.5*153.3 mm(with gimbal)
	NW.	≈280 g (without gimbal)　≈640 g (with gimbal)
	IP rate	IP53
	Compatible Platform	M350 RTK, Other Multi-rotor and fixed-wing UAV
	Working Temperature	-20℃ ~ 50℃
	Storage Temperature	-20℃ ~ 60℃
	Power Supply	External Power supply with DC 12-50V
	Interface	Gimbal interface & General interface
Camera	Effective Pixels	45Million pixels
	Sensor Size	Sensor size：36*24mm(Full format)； Pixel size：4.4 μm；
	Image Resolution	(3:2) 8192 x 5456 px
	ISO Range	AUTO：50-200/50-400/50-640/50-800/50-1000/50-1600； Fixed ISO：100、200、400、640、800、1000、1600
	Shutter Speed	1/1250,1/1000,1/800,1/640,1/500
	Storage Capacity	512GB

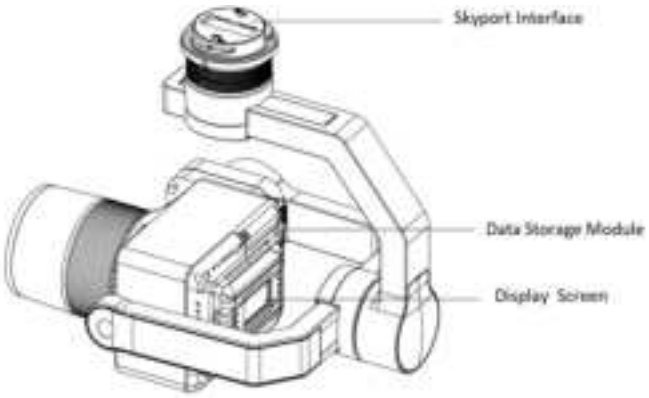
	Exposure Interval	≥0.9s
	Parameter Adjustment	DJI Pilot
	Data Storage	Integrated Data Storage Module
	Operating Mode	Flight Controller Trigger /Isometric Trigger / isochronous Trigger
	Image Transmission	Dynamic bitstream HD image transmission
Lens	Focal length	Standard：40mm； Customizable：56mm
	Aperture Size	Fixed ：F5.6
	Shooting Distance	≥20m
Video	Video Formats	MP4
	Video Size	[4K(3840×2160)], Frame Rate：30fps
Gimbal	Stabilization	3-axis (Pitch Yaw Roll)
	Installation Method	Quick release gimbal interface
	Mechanical Range	Pitching: -130° to +40° Yawing: -320° to +320° Rolling: ±55°

1.3 In the box

Name	Camera	Skyport Cover	Shipping Box	Data Storage Module	Data Reading Module
Quantity	1pc	1pc	1pc	1pc	1pc
Name	Warranty Card	User Manual	Lens Cover	Wipe Cloth	Data Cable
Quantity	1pc	1pc	1pc	2pcs	1pc

2 Camera Module Overview

2.1 Camera Features



Pic 1 Camera Interface

- Three-axis stable gimbal can ensure the stability of camera , and take pictures from multiple directions.
- Full format camera, high pixels, high photo quality
- SHARE HD color screen can display real-time camera status which includes environmental information, number of photos, shutter speed, shutter times
- Support DJI Terra, achieving GCP free with high precision
- Standard configured with SHARE own designed software SHARE Data Manager, it can realize to upgrade the firmware online, and flight management.
- Real-time image transmission display, the data can display on the ground station synchronousl
- 12-50V wide voltage can be compliant to more drones
- The gimbal can be disassembled, and the camera can be used separately to be compatible with a variety of flight controllers
- It can automatically identify UAV signals and support serial port communication and deep adaptation development;
- Professional mapping level lens, much closer focus distance, can realize fining modeling

2.2 Data Storage Module

Pic2 Data Storage Module

Storage：512GB

Usage：Store camera distortion parameters and basic information, and store photos and POS data during operation.

Installation:Insert the camera with the "▬" icon facing rear. A " dah "sound indicates that the installation is finished.

Remove the storage module：Gently pull outward from the icon end to remove be careful to move slowly and parallel.

Note：

1. The data storage module must be inserted before turning on the camera so that the camera can be started normally.
2. Insert the camera with the " ▬ " icon facing rear

2.3 Data Reading Module

Pic3 Data Reading Module

The data storage module is used to read and copy the data which is taken by the camera. When in use, remove the data storage module from the camera , connect the data reading module, and then connect the computer for data copying by Type-C cable.

2.4 Type-C Cable

Pic 4 Type-C Cable

The USB 3.1 high-speed Type-C data cable is used to connect the data storage module and the computer for data copy.

3 SHARE 4500X Aerial Survey Solution

	SHARE 4500X	The camera is equipped with 3-axis stabilized gimbal, the camera parameters are adjustable ,and the operation is convenient
	M350 RTK	M350 RTK is the latest flagship flight platform of DJI industry application, and the Pilot APP of the remote control can execute the mapping mission automatically
	SHARE Data Manager	Integrates data copy, flight management, shutter inquiring, camera setting, firmware upgrade, reading field photos and POS data, and other operations in just one software. Deeply adapts to DJI Terra, Context Capture and other modeling software.
	DJI Terra	DJI self-developed high efficiency, low cost, high precision modeling software

4 Camera Operation

4.1 Installation

Take out the camera, turn the camera downwards vertically, hold the upper arm of the gimbal with your left hand, and place it flat to the gimbal interface of UAV. The white point of DJI Skyport adapter ring should be aligned with the red point of the UAV. Hold DJI Skyport adapter ring in your right hand and rotate counterclockwise ninety degrees until the red point of the adapter ring is aligned with the red point of the gimbal interface.

Pic 5 Camera Interface

4.2 Powering On

Turn on the power of the drone, the camera shows that it is starting up, and the three-axis gimbal completes self-check and calibration. After the self-check is completed, the direction of the camera lens is consistent with the direction of the drone nose; The SHARE color screen display interface is shown in the figure below.

Pic 6 Camera Display Screen

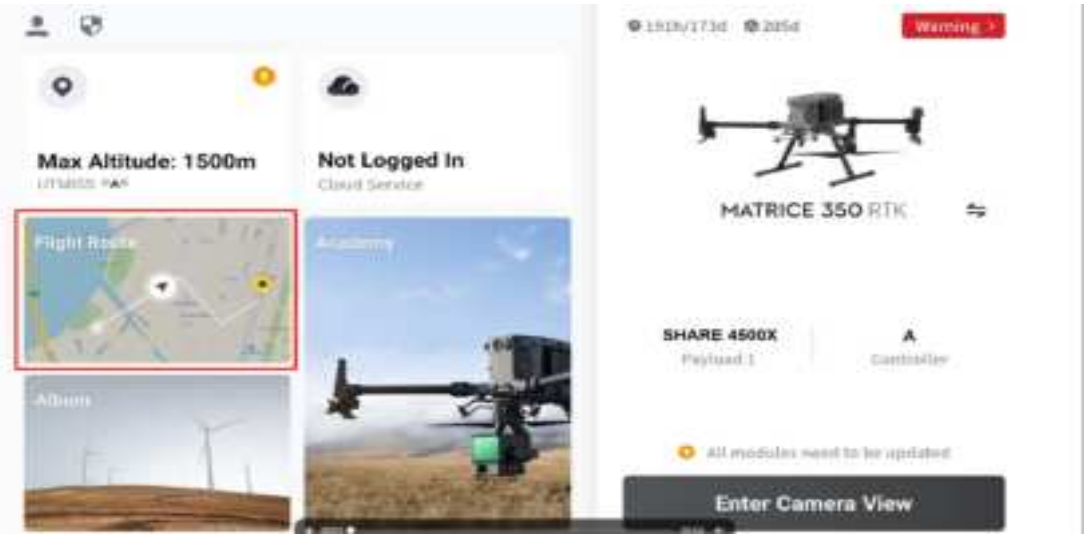
Color Display	Meaning	Remark
	UAV model	Display the UAV model when using Skyport
	ON/OFF status	Display when power off
	Camera Firmware Version	Current camera firmware version
	The current number of received shooting commands	The trigger commands that camera has received
	Actual shooting numbers of the camera	Actual shooting numbers of the camera , zero after power off
	Camera temperature	＜30℃blue；＜50℃yellow；＞50℃red
	RTK status	RTK has 3 display modes Red-- -No solution Yellow -Single point solution/ Floating point solution Green -Fixed solution
	Camera humidity	＜0.5 blue；＜0.9 yellow；＞0.9 red
	Bluetooth status	Green color when connect
	Storage capability	Display the used storage
	Shutter life	Display the used shutter times
Shutter	Shutter speed	5 options : 1/500;1/640;1/800;1/1000;1/1250
ISO	ISO setting	6 options: 50-200；50-400；50-640；50-800；50-1000；50-1600
WB	White balance	Auto, Sunny day, Cloudy day
Color	Color mode	Standard, Vivid

4.3 Parameter Setting

4.3.1 Parameter Setting on DJI Pilot

Take working with DJI M350 RTK for example,using DJI Pilot for route planning and set flight parameters.

Open DJI Pilot→ Select Flight Route →Select Ortho Collection→Create a route (Or KMZ Import , Import the route planned by the third-party software)→Select Area Route→ Select Aircraft Model→Select Camera Model

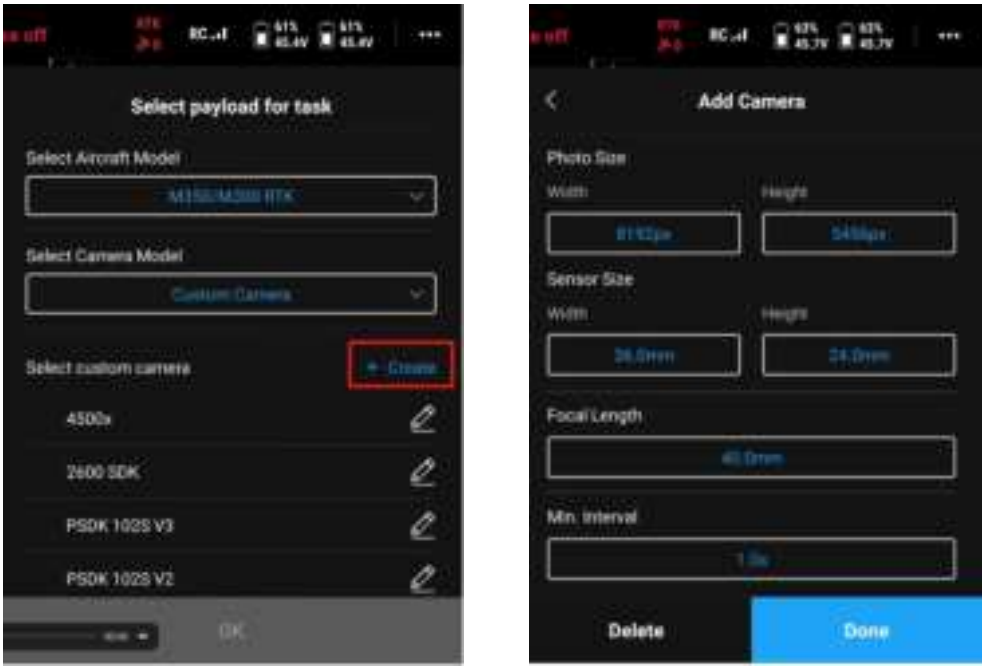


Pic 7 DJI Pilot

4.3.2 Custom Camera

To connect camera with DJI M350 RTK for the first time, users need to create a new camera in Custom Camera interface of DJI Pilot,then input camera parameters and save it. Then select the edited camera.

SHARE 4500X		
Photo resolution (W)	Sensor size (W)	Focal length
8192 px	36mm	40.0 mm
Photo resolution (H)	Sensor size (H)	Minimum interval
5456 px	24 mm	1.0s



Pic 8 Custom Camera

4.3.3 Camera Parameter Setting

Click the three dots in the upper right corner of the DJI Pilot screen and select “Payload Settings” to set following items:

Pic 9 Payload Setting

Item	Functions
Display Real-time Data	Real-time data window hide/show 【default: hide】
ON/OFF	Control camera on/off
Video Mode	Control the camera to turn on the video mode
One Key Back	Click to restore gimbal to -90° vertically.
Shutter	Change shutter speed (1/500,1/640,1/800,1/1000,1/1250 5 options)
White Balance	Set White balance (Auto, Sunny day, Cloudy day 3 options)
Color Mode	Set Color mode (Standard and Vivid 2 options)
ISO	Set the ISO range（Auto 50-200/50-400/50-640/50-800/50-1000/50-1600 6 options)
Burst Mode	Set trigger mode (Flight Controller, isometric trigger and isochronous trigger 3 options)
Gimbal Pitching Angle	Adjust the gimbal angle from -120° to 45°. Define the down-view lens vertically downward as -90 degrees, and horizontally forward as 0 degrees
Photo Interval/Distance	Set the interval for isochronous shooting /set distance for isometric shooting
Start Fixed ISO	After opening, the camera will start the fixed ISO mode
Fixed ISO	Enter the fixed value, camera will take photos with the fixed ISO value

4.3.4 Recommended Camera Parameter Setting

White Balance	The sunny day is recommended for sunny day or scorching sun. Set cloudy day when the light environment is weak.
Color Mode	Vivid：Colors are bright Standard：Standard Color
Shutter Speed	In sunny day or strong light：1/1250-1/1000 In weak light：1/800-1/640 (reduce the flight speed accordingly)
ISO	Scorching Sun：50-200；Sunny：50-400；Cloudy：50-800；Weak Light：50-1600

4.3.5 Setting Flight Parameters

Set flight altitude, flight speed, upon completion in basic setting interface.

Set overlap ratio,course angle,margin in the advance settings interface.

Pic 14 Setting Flight Parameters Interface

4.3.6 Recommended Flight Parameters Settings

- Flight Altitude

Flight height is determined by project requirements and height of the terrain and buildings in the survey area(At least 20meters taller than the tallest building in the survey area） . The lower altitude, the higher resolution.

- Overlap Ratio

Recommending to set frontal overlap ratio as 80% and side overlap ratio as 70%, which are suitable for most scenarios. When the height difference of the survey area is large, it suggesting to increase overlap ratio to ensure that overlap ratio at the height of the survey area meets the modeling requirements.

- Margin

The oblique photography need to set margin at least one flight altitude to ensure that overlap ratio of photos taken at the edge of the survey area meets the requirements of modeling; otherwise, the modeling effect will be affected. Ortho photography need to set margin at least half flight altitude .

- Timed /Distance interval shot （Photo Mode）

Recommending to use Distance interval shot , which is better than Timed Interval shot.

4.4 Real-time Data Window

Item	Functions
Photo Mode	Display camera work mode(Photo Mode/No Photo/Video Mode 3 options)
28℃	Display camera operating temperature
RTK	Display RTK status during flight(Fixed Solution/Float Solution/Single Point/No Solution 4 options)
Photographing Instruction	Display the number of photo instructions given by the aircraft to the camera
Down	Display the actual number of the down-view lens take
Shutter	Displays shutter speed(1/500,1/640,1/800,1/1000,1/1250 5 options)
Color Mode	Display color mode(Standard / Vivid 2 options)
WB	Display white balance(Auto/Sunny day/Cloudy day 3 options)
ISO	Display ISO range(Auto 50-200/50-400/50-640/50-800/50-1000/50-1600 6 options)
Camera Firmware	Display the current firmware version of the camera

【Precaution】

During the camera start up process, “Display Real-time Data” window of the DJI Pilot screen shows the photo-unavailable status, and displays “Photo Mode” after normal booting.

When operating without ground control point, the drone must use RTK to make the POS accuracy be obtained by the camera to meet the requirements.

To open the network RTK on the DJI Pilot before the operation, you can use the network RTK or customized RTK.

If the RTK connection is successful, the real-time data window would show the Fixed Solution, indicating that the RTK link communication between the camera and the drone is successful, then the camera can record the location information normally.

4.5 Check Before Takeoff

Take five photos manually before takeoff, and check whether the number of shots from the camera display and the real-time data window of the ground station is consistent.
Take working with DJI M350 RTK for example, camera is on, the window shows the real-time image. User can press the ‘photo’  button on controller to test the photo function.

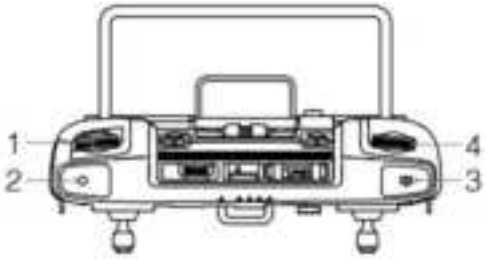
Check whether the RTK state of the camera's real-time data window is “Fixed Solution”, and restart the drone if it is a non-solution state.

4.6 Operation Monitoring

In the process of flight operation, the environment of shooting area and the working state of aircraft and camera can be monitored in real-time through the FPV diagram transmission of aircraft and down-view image transmission of the camera. The number of photographing instructions of the flight control, the number of photographing from camera and RTK status can be displayed in real-time through DJI Pilot.
After flight finished, user need to check if camera display and the camera information window of DJI Pilot interface have the same number of photos.

4.7 Video Recording

4.7.1 Operation

Turn on the video mode through the video mode button in the payload setting interface of DJI Pilot, and click it again to turn off	
Turn on the video mode through the remote control video button (key 2 in the picture), click again to turn off the video	

The user can judge whether the camera is in the photo mode or the video mode through the real-time display window. The top of the interface displays the remaining recording time.

【Precaution】
It should be noted that the camera may fail to switch from photographing to recording mode if the camera is switched too fast. It is recommended that users wait for 1-2 minutes after finishing photographing.
Video are stored as .MP4file format , stored in:

4.8 Gimbal Setting

4.8.1 Adjust the Angle of Gimbal

SHARE 4500X camera is equipped with a three-axis stabilized gimbal.
Pitching: -130° to +40° Yawing: -320° to +320° Rolling: ±55°

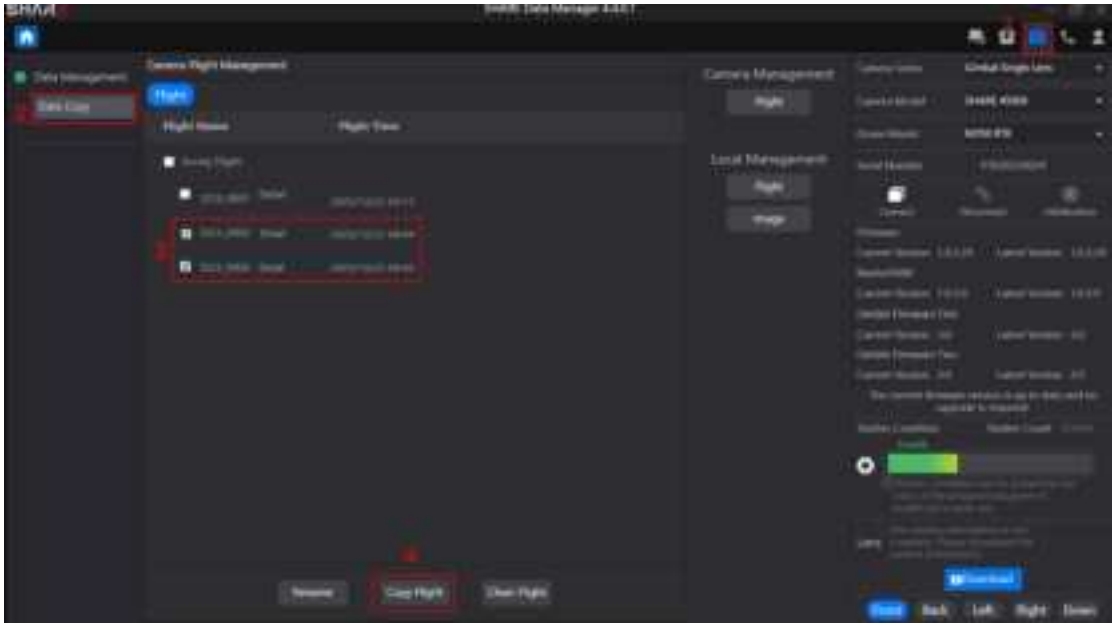
Adjust the Angle of gimbal by remote controller -Left wheel to adjust the pitching angle -Right wheel to adjust the yawing angle	
The icons on the left side of the flight interface are, from top to bottom, returns the gimbal to the center, vertically downwards the gimbal, returns the yawing angle of the gimbal to the center, vertically downwards the pitching angle of the gimbal	
The direction of the arrow in the circular keyboard button on the right side of the flight interface is the adjustment direction of the gimbal	

6 Data Copying and Delete

Camera uses a pluggable data storage module to store data. The photos and POS information ,which are collected by the camera ,are stored in the data storage module.
When reading data, users only need to plug the storage module into the reading data module and connected to the computer USB3.0 through the Type-C cable to view and copy the data. Connecting to the computer will display “Down “ and “GPS “drive letter.

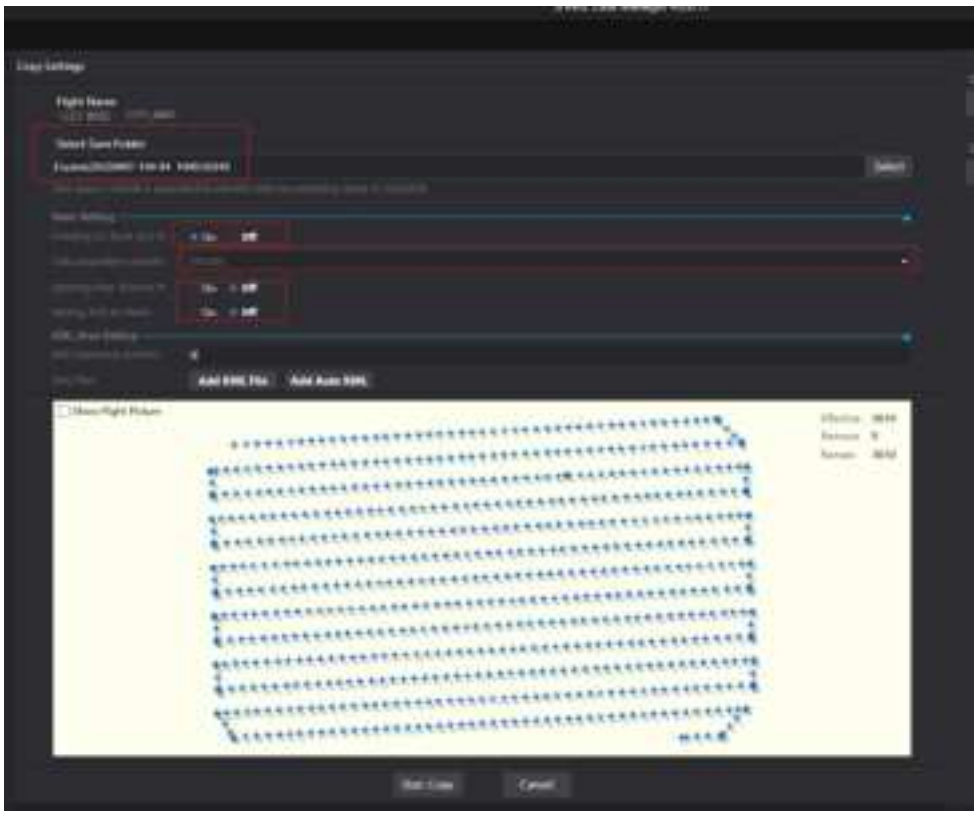
Pic 12 Data Copying

(1) Open the SHARE Data Manager software, select the corresponding camera and drone model, and enter the flight-copy interface;



Pic13 Flight Management Interface

(2) Select the needed flight and check the details to ensure that the photos match the POS correctly;



Pic 14 Copy Setting Interface

(3) Select a copy path, modify the copy settings as required, and click copy. It is recommended to copy the data to computer local drive letter;

(4) After the copy is completed, click view data to check whether the data is normal.

(5) Delete the data: select the flights which need to be deleted, click clear flights, and wait for completed clearing ; or select initialize camera

(6) Click disconnect, the drive letter pops up to disconnect the data line.

【 Precaution 】

(1) Please delete the drive letter file by using SHARE Data Manager. The drive letter file cannot be deleted arbitrarily

(2) The data cannot be restored after being deleted or initialized, please operate carefully. Before performing this operation, ensure that data is correctly backed up on the computer.

(3) Before powering on the camera, insert the storage module into the camera; otherwise, the camera will fail to start.

(4)After using SHARE Data Manager to complete the copy,click the disconnect button to Automatically popup each drive letter.Do not unplug the storage module directly, otherwise It is easy to reduce the life.

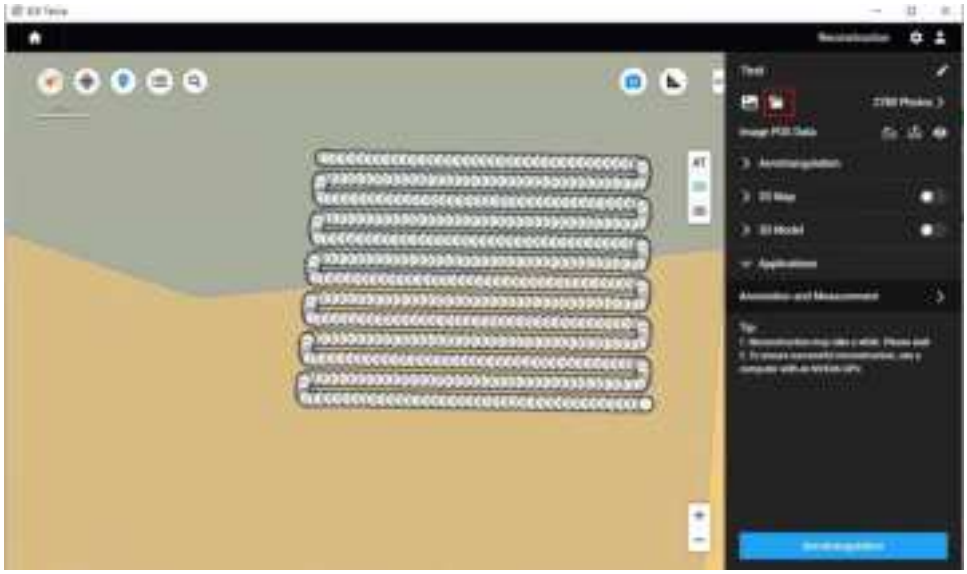
7 DJI Terra

7.1 New Mission

Open DJI Terra-Choose visible light-Enter mission name

7.2 Import Photos

Import the folder of valid photos copied by SHARE Data Manager



7.3 Aerotriangulation

Select the 2D model/3D model according to the task needs, and then click Aerotriangulation - Advanced -GCP Management - Aerotriangulation.
If the accuracy of the puncture point is required, click the GCP to stab the point after the end of Aerotriangulation and optimization.

7.4 Setting Parameters

(1) Select the corresponding resolution, scene mode, and calculation method according to actual needs

(2)Select the coordinate system which is required by the model (if there is a image control point, enter the "GCP Management" interface and perform Aerotriangulation first)

(3)If it is a surround flight, 3D modeling can be performed, and the settings are similar to the above settings, and the model format is mostly OSGB and OBJ format

(4)Click Start Reconstruction