DJI TERRA

User Manual

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Introduction

DJI Terra is 3D modeling software equipped with next-generation reconstruction technologies, including 3D Gaussian Splatting. It supports accurate and efficient 2D and 3D reconstruction from visible light imagery, and processes data collected by DJI LiDAR. When integrated with DJI drones, Terra delivers a unified hardware and software solution for data acquisition, processing, and application, streamlining aerial surveying workflows for greater efficiency and accuracy.

DJI Terra is available in Agriculture, Standard and Flagship versions based on available features. Users can purchase through the DJI official store or authorized dealers, then activate and bind in DJI Terra. See More Functions for details.

Agriculture Version: Includes 2D reconstruction for farmland and fruit tree scenarios, 2D multispectral reconstruction, and agricultural applications.

Standard Version: Builds upon the Agriculture version by adding KML file import, output coordinate system selection, 2D reconstruction for urban scenarios, image POS import, ROI mapping, 3D reconstruction, multi-GPU reconstruction, LiDAR point cloud accuracy optimization, GCPs, and scale constraints.

Flagship Version: Further expands the Standard version by introducing specialized tools for power line scenarios, detailed inspection, and advanced 3D Gaussian splatting reconstruction.

* Support for DJI devices will be added as testing and development continues. Visit the DJI Terra product page on dji.com for a complete list. https://www.dji.com/dji-terra

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Download and Launch

DJI Terra is supported on Windows 10 (64-bit) or later.

Your computer should meet certain hardware requirements for optimal use of some of the advanced functions such as reconstruction.

Hardware	2D Map Reconstruction / 3D Model Reconstruction / LiDAR Point Cloud Processing
CPU	i5 or later
GPU	NVIDIA graphics cards with a compute capability of no less than 6.1*
VRAM	No less than 4GB
RAM	No less than 32GB
HDD	200GB Free (basic requirement) or SSD+200GB Free (better)

NOTE:

- If using an NVIDIA graphics card, the processing speed will be faster. Computing power is a key metric of a graphics card's performance. For more information about the NVIDIA graphics card computing power, go to https://developer.nvidia.com/cuda-gpus#compute.
- It is recommended to use the graphics cards listed above. If using other models, please contact DJI Support before use.
- Make sure that the graphics card driver is up-to-date regardless of the models.
- Refer to Preparation Before Using DJI Terra on the official DJI website for more information on hardware and other configuration requirements when using the Cluster function. https://www.dji.com/downloads/products/dji-terra

1. Visit the DJI Terra product page on dji.com using your computer to download and install the software.
2. Launch DJI Terra and log in with your DJI account. If an offline license was purchased, offline login is required. Refer to Preparation Before Using DJI Terra for more information.

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Mission Type

Reconstruction Missions

Visible Light



Use the original photos captured by the camera to obtain a high-precision 2D map or 3D model. After a map or model has been produced, users have the option to add annotations and perform a variety of measurements.

Multispectral



Use the original photos captured by the multispectral cameras to obtain a high-precision 2D multispectral map. After a map has been produced, users have the option to add annotations and perform a variety of measurements and agriculture applications.

LiDAR Point Cloud



Use the point cloud data captured by the Zenmuse Lidar to obtain a high-precision true-color point cloud. After the point cloud has been reconstructed, users can add annotations and perform a variety of measurements.

Flight Route Missions

Detailed Inspection

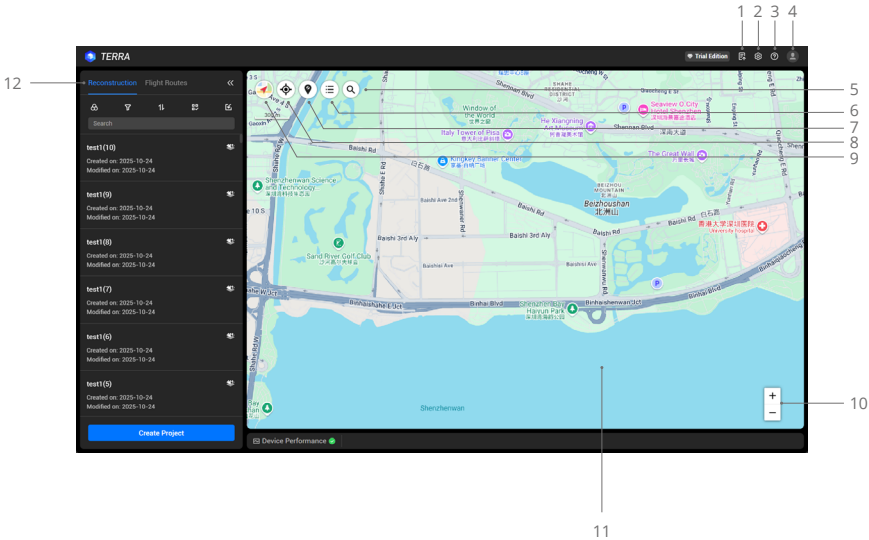


DJI Terra automatically generates waypoints to make up the inspection flight path after the user has imported models from 3D reconstruction results using DJI Terra or third-party LAS point cloud files, added target points on the model, and set shooting distance, flight route speed, and other parameters. After planning the flight route, users can choose from: 1. Export a KML file and upload it to the DJI Pilot app and perform the mission (requires Phantom 4 RTK (SDK), Matrice 300 RTK, or Mavic 2 Enterprise Advanced); 2. Export a KMZ file and upload it to the DJI Pilot app and perform the mission (requires Matrice 30 series or DJI Mavic 3 Enterprise series).

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Interface Introduction

Main Screen



1. **Bug Report**
   Enter a mission and click to upload the bug report of a reconstruction mission. DJI Terra will perform reconstruction on the cloud for failed reconstruction missions, and the reconstruction output will be returned after the reconstruction is successful (only supported by certain licenses).

2. **Settings**
   Click to enter the Settings menu.

3. **Help Center**
   Click ⓘ to enter the Help Center for solutions on the most frequently asked questions.

4. **Account Information**
   : Log into/out of your account, activate license(s), check the unlocking license(s), version number, read the privacy policy, and configure privacy data settings.

5. **Search**
   ⓘ : Input names to search on the map.

6. **Self Mapping List**
   ⓘ : Click to show a self mapping list. Choose a map or multi maps to display in the map view. Maps will not display if not chosen.

7. **Show/Hide GEO Zones**
   ⓘ : Click to show or hide the DJI GEO Zones on the map.

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8. Positioning

: If the aircraft is connected, click the icon to center the map around the aircraft's location.

If the aircraft is disconnected, the map will be centered around the current network location. If there is no available internet connection, it will be centered around the defaulted initial location or the location when quitting from the software.

9. Map Mode

: Tap to switch bettwen Regular Map, Satellite Map, and Road Map.

10. Map Zoom

Click +/- to zoom in or out of the map.

11. Map View

Displays the map. Scroll the scroll wheel on the computer mouse to zoom in/out. Press and hold the left button on the computer mouse to move the map.

12. Mission Library

Missions will be assorted by types in mission library. Click each tag to display all missions of the corresponding type. Click the arrow « / » on the right of the library to collapse or expand it.

: Reconstructon and Device — Click to enter reconstruction mission management to view the status of all reconstruction missions. When using cluster reconstruction, users can also view the status of worker devices.

: Filter — Filter missions by type.

: Sort — Sort missions by name, time created, or last update.

: Select — Select multiple missions and export or delete. The export function here is the same as the one mentioned in the text below regarding the export function for a selected mission.

: Import — Click to import missions.

Search: input keywords in the text box to search a mission.

PC 3D AT 2D 2DM LPC GS Mesh : for a Reconstruction mission, the marks of reconstruction results will appear in the lower left corner of a mission if reconstruction is performed. See the details below for the meaning of the marks.

AT: Aerotriangulation	2D: 2D map	3D: 3D Model
2DM: 2D Multispectral Map	PC: Point Cloud	LPC: LiDAR Point Cloud
GS: Gaussian Splatting	Mesh: 3D Mesh	

New Mission: click to choose a mission type and create a new mission.

Click a mission to select and:

Name: click the mission name and change it in the text box.

: the icon of the corresponding mission type will appear on the right of the mission name. Here the icon of a Visible Light Reconstruction mission is used as an example. Click to enter the mission editing view.

For a Flight Route mission, the icon mentioned above has three statuses. The description below uses a Mapping mission as an example.

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: Copy — Click to create a copy of this mission. This will copy the photo list, parameter settings, and aerotriangulation result (if any) in a Reconstruction mission or the flight path and parameter settings in a Flight Route mission.

: Open Folder — Click to open the folder where the current mission is located.

: Delete — Click to delete the mission.

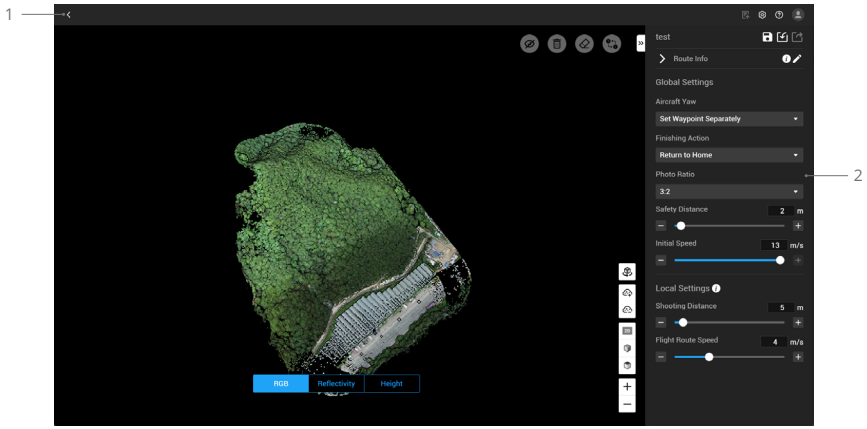
: Export — Click to export the mission with the current settings and its files such as photos, 2D maps, and 3D models. The exported file can be used to create a mission via “Import”. The mission name of the exported mission is the same as the one in DJI Terra. It will not be changed when importing it to create a mission even if the exported file’s name is changed.

: Edit Model in DJI Modify: If the latest version of DJI Terra is installed, click to import the 3D model into DJI Modify for editing. Before import, it is necessary to generate the files required by DJI Modify. It is recommended to enable Output Editable in DJI Modify before reconstruction to generate the required files.

Double click a mission to enter the Mission Editing mode directly.

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Flight Route Mission Editing View

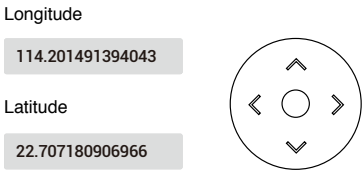


1. **Back**
   Click to return to the main screen.

2. **Parameter List**
   This list includes the common screen elements below. The other settings vary according to different mission types. Refer to Parameter Setting Introduction for details.
   « / » : Collapse / Expand — Click to collapse or expand the list.
   Mission Name: Click the button on the right to edit the mission name.
   : Save — Click to save current settings.
   KML : KML Import — Click to import a KML file. The data in the KML file will be converted to waypoints or edge points and displayed on the map for planning. Refer to Create a Mission for details.
   KML : KML Export — This icon will appear only in Waypoints and Detailed Inspection missions. Click to export the current flight route as a KML file. The exported file can be used to plan the flight path in a Waypoints mission via “Import KML”. For KML files exported from Detailed Inspection missions, users can also import the file into the Library in the DJI Pilot app to perform the mission.
   Mission Information: Information varies according to different mission types. These include: route distance, estimated flight route time, estimated total flight route time, waypoint count, cover area, estimated photo count, etc.

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Sliders and -/+: Move to the left or right to adjust values. Click -/+ for fine-tuning.
Waypoint / Edge Point Edit:



Click the box to input values. Click the arrow keys on the right for fine tuning. Up and down adjust latitude while left and right adjust longitude.

Mission Button (aircraft connection is required):

a. Start: Click to start the mission after parameters are set.
b. Stop: During the mission, click to stop the mission. The aircraft hovers and records its location as a breakpoint and users can control the aircraft manually. Users can then choose an operation after stopping the mission from the prompted list in the software.
c. Pause / Continue: During a Waypoints mission, click to pause the mission, and the aircraft will hover. Users can control the aircraft to fly forward or backward along the flight path, but the aircraft heading cannot be controlled. Click “Continue,” and the aircraft continues the mission from its current position.

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Reconstruction Missions

Users can use the Reconstruction function with the original photos captured by the aircraft to obtain a high-precision 2D map or 3D model. After a model has been produced, users have the option to add annotation and perform a variety of measurements. For photos captured in Mapping and Corridor missions, both 2D reconstruction and 3D reconstruction are achievable, and agriculture-specific functions can be done based on a 2D map. For photos captured in Oblique missions, only 3D reconstruction is available. If the imported photos include a PPK result file from the Cloud PPK Service of the Phantom 4 RTK, this PPK file can be used for 2D or 3D reconstructions at a higher accuracy. If the imported photos are captured using the P4 Multispectral, you can reconstruct 2D multispectral maps. You can also import image POS data and generate reconstructions in the designated coordinate system.

Reconstruction mission types also include LiDAR point cloud processing. Use the point cloud data captured by the Zenmuse Lidar to obtain a high-precision true-color point cloud. After the point cloud has been reconstructed, users can add annotations and perform a variety of measurements.

Importing Image POS Data

Click + to select a file or folder for import. After importing, the total number of images will be displayed.

Image POS

If ✓ is displayed after importing, it indicates that the imported images contain POS data. You can view, export, and import POS data.

a. Click to view image POS data, including latitude, longitude, and altitude.
b. Click to export POS data to your local device.
c. Click to import POS data. Note: Importing new POS data will overwrite any existing POS data.

File Format

Lines to Skip From Top: Select the number of the lines to skip from the top when reading the data.

Decimal Separator: Select the decimal separator of the data. Choices are: period (.) and comma (,).

Column Separator: Select the separator of the data columns. Choices are: comma (,), period (.), semicolon (;), space ( ), and tab.

Treat combined separators as one: If the box is checked, the software will treat combined decimal separators or column separators as one when they exist in the data.

Preview

Preview the content of the imported file. Click on the upper right corner to add another POS data file.

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Data Properties

POS Data Coordinate System: Select the coordinate system the POS data used and set the elevation and height offset.

Euler Angles: Set the euler angles of the POS data.

a. N/A: The imported POS data does not include euler angles. Default settings from DJI Terra will be used.
b. Omega, Phi, Kappa: The imported POS data includes euler angles of Omega, Phi, and Kappa.
c. Yaw, Pitch, Roll: The imported POS data includes euler angles of Yaw, Pitch, and Roll.

POS Data Accuracy: Set the accuracy of the POS data.

a. Use Default DJI Terra Accuracy: The imported POS data does not include accuracy. Default settings from DJI Terra will be used. When using images with RTK positioning, the horizontal accuracy is 0.03 m, and the vertical accuracy is 0.06 m. When using images with non-RTK positioning, the horizontal and vertical accuracies are 2 m and 10 m respectively.
b. Use Custom Accuracy: Use the horizontal accuracy and vertical accuracy in the POS data file.

Define Data Column

1. Define each column in the POS data file, including photo name, Latitude (X/E), Longitude (Y/N), Altitude (Z/U), Omega (Yaw), Phi (Pitch), Kappa (Roll), Horizontal Accuracy, and Vertical Accuracy.

Define Data Column Total Rows: 25

Undefined	Undefined	Undefined	Undefined	Undefined	Undefined	Undefined
Name	Latitude	Longtitude	Altitude	Yaw	Pitch	Roll
100_0001_171...	31.75678992	123.103553535	23.13423423	-179.9633456	-89.476576546	0
100_0001_172...	31.75689223	123.103689989	23.36525445	-179.9663678	-89.637746546	0
100_0001_173...	31.75646378	123.103469989	23.26243534	-179.9645676	-89.987976789	0
100_0001_174...	31.75711232	123.103359979	23.56464565	-179.9879788	-89.768798546	0
100_0001_175...	31.75699889	123.103345346	23.67648356	-179.5789868	-89.786586465	0
100_0001_176...	31.75677782	123.103398979	23.13443545	-179.9885777	-89.989605456	0
100_0001_177...	31.75669682	123.103422424	23.89876454	-179.9898599	-89.786965764	0

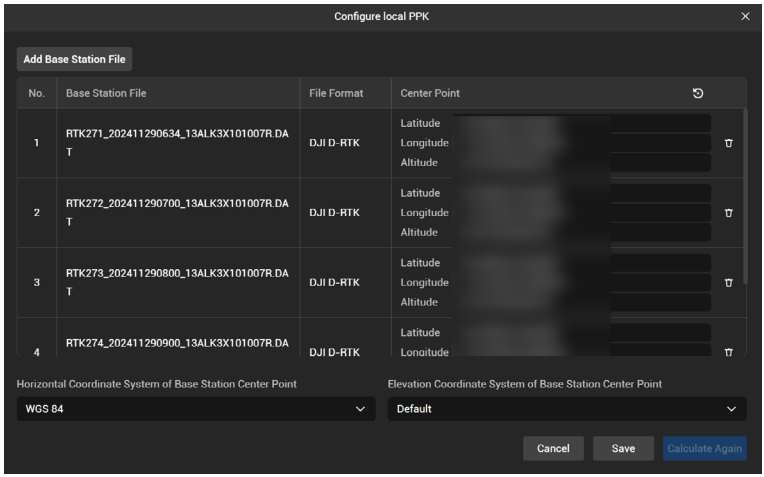
- Photo name, latitude (X/E), longitude (Y/N), and altitude (Z/U) are required.
- You cannot select the same definition for multiple columns.

2. After setting the format and properties, click the preview button to view the configured data, and click the import button after checking the data to import the data for reconstruction.
3. Users can also click on the right of the Image POS Data section in Reconstruction page to view the POS data after import. If any setting is incorrect, click the edit button in the preview page to make changes.
4. Refer to the section below for the remaining instructions on reconstruction.

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Local PPK

If ⚠ is displayed after importing, it indicates that not all images have POS data. You can use Local PPK to calculate and obtain POS data via PPK. After selecting Local PPK, click ⚙ to configure local PPK settings.



The specific configuration items are shown in the figure below:

a. Load base station files.
b. Set the latitude, longitude, and altitude of the base station center point.
c. Select the horizontal coordinate system for the base station center.
d. Select the elevation coordinate system for the base station center.
e. Start the calculation.

Third-Party Camera Adaptation

Users can import third-party camera data to DJI Terra to perform visible light reconstruction.

1. Create a mission based on the steps provided in the "Visible Light Reconstruction" section, and then import photo data from a third-party camera.
2. Refer to the "Importing Image POS Data" section to import a file.
3. Click 👁 on the right side of "Camera Info," enter camera information (such as camera name and 35 mm Equivalent Focal Length,) and then click "Apply" to perform the reconstruction.

💡 When photo data is captured from a camera that has multiple lenses (such as a five-lens camera), the photos of different lenses are saved in different file folders. Go to "Group By" and then select "Folder" to set the corresponding lens info.

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Pre-Setting or Fixing Intrinsic Camera Parameters

Pre-set or fix intrinsic camera parameters to obtain high-accuracy reconstruction results.

1. Import photo data, enter 35 mm Equivalent Focal Length based on data provided by the manufacturer on the “Camera Info” page, and then start the reconstruction.
2. Click “Apply” to save the camera configuration after the camera info is entered. Saved camera info can be found under “Camera Name” and selected for application next time.

- Click ⓘ to view camera information and import or export camera information.
- To obtain high-accuracy reconstruction results, fill in the data under “Advanced Settings” based on actual data provided by the manufacturer. Refer to https://www.dji.com/dji-terra/info#faq for instructions on how to obtain camera parameters. Click “Aerotriangulation” in DJI Terra to perform the aerial triangulation calculation. The optimized camera data shown in the aerial triangulation quality report can be used to update the camera parameters. The updated intrinsic camera parameters can be used for future reconstruction to obtain high-accuracy reconstruction results. Repeating the above process multiple times can help users obtain more accurate intrinsic camera parameters and reconstruction results of higher accuracy.

Visible Light Reconstruction

Reconstruction Procedure

1. Create a mission via the following two methods:
   a. Click the Reconstruction tag in the mission library, click Create Project in the lower left corner, choose the mission type, input the mission name, and click OK to enter Mission Editing mode.
   b. Click in the right section of the mission library to import a mission file from the computer. Click to select the imported mission and click the icon on the right of the mission name to enter Mission Editing mode. The imported mission cannot be edited if it has already been finished before exporting.
2. Click "Select File" or "Select Folder." Select photos corresponding to the Mapping mission to add photos. Currently supported photo formats are JPG, JPEG, and HEIF.

⚠ It is recommended to select at least ten photos on two main paths for reconstruction.

3D reconstruction occupies more computer resources. To ensure smooth 3D reconstruction processes by adding an adequate amount of photos, refer to the number of photos corresponding to the following computer configurations.

Available RAM	Max Photo Amount for Standalone Computation	Max Photo Amount for Cluster Computation
32GB	12800	192000
48GB	19200	288000
64GB	25600	384000
128GB	51200	768000

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3. After import, the icon will appear on the upper right corner of the map view. Click to turn it blue indicating that capture location display is enabled. The corresponding location of the photos captured will be displayed on the map as a dot. Click on the right to manage the photos. The photos are grouped by the folders they are located. Expand the list to view and manage photos.
   If capture location display is enabled, click the name of the photo to turn it blue and the corresponding dot on the map will turn orange. Similarly, when you click the dot on the map, its corresponding photo name in the list will turn blue.
   Double-click a photo to view in a large size and zoom in or out.
   Click the name of the photo to select it and click Delete to delete the photo.
   Users can also draw a selection box to select photos using the buttons on the upper right corner of the map view. Follow the instructions below.
   a. Add the edge points of the area
      : Click the icon and click the left mouse button on the map to add the edge points of the selection box.
      : Click to import a KML file. The data in the KML file will be converted to the edge points of the selection box.
   b. Edit edge points
      Click the left mouse button on the edge point to select it. Press and hold the left mouse button and drag to adjust the position of the edge point. Click the left mouse button on the boundary to add a new edge point on the boundary.
      : delete the selected edge point.
      : delete all edge points.
   c. After the selection box is added, click the right mouse button and select to delete the photos inside or outside of the box in the pop-up menu.
   Click to return to the reconstruction page.

4. Image POS Data: Refer to Importing Image POS Data for more information.

5. Click the icon on the right side of Camera Info, enter camera information such as camera name and 35 mm Equivalent Focal Length, and then click Apply to perform the reconstruction.

6. Templates
   Six preset templates are available for visible light reconstruction, each tailored for different scenarios to enable quick parameter configuration. The templates are as follows:

Type	Name	Description
Custom Template	User-defined	Configure parameters and click Save Parameters as Template to create a custom template for future use.
System Template	General	Includes 2D Map, 3D Mesh, and Gaussian Splatting.
	Rapid 2D Mapping	Includes only 2D Map.
	Rapid 3D Reconstruction	Includes only 3D Mesh.
	Terrain Result	Includes Point Cloud, DEM, Contour Lines, Grid of Points, and TIN.
	Power Lines	Includes only Point Cloud.
	Agriculture	Includes only 2D Map.

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7. Preprocessing (Aerotriangulation) Settings
   Aerotriangulation is always included in the reconstruction output. If neither the 2D map nor 3D model option is enabled, only aerotriangulation results will be generated. Click Aerotriangulation to expand the settings menu.

   Scenarios:
   Normal: Suitable for most cases, including oblique and orthophoto scenarios. Circle: Ideal for circular flight paths and reconstruction of small, vertical objects (e.g., base stations, towers, wind turbines). Power Lines: Optimized for power line reconstruction; outputs only point cloud results and does not support model output. The mapping scene setting for aerotriangulation will be updated to 3D model settings automatically. Refer to the table below for aerotriangulation configuration items.

Item	Options/Parameters	Description
Computation Method	Standalone Computation	Cluster computation can be selected for reconstruction when using the Cluster function. Refer to Cluster Reconstruction for cluster reconstruction settings.
	Cluster Computation	
Route Type	Normal	Applicable to most scenarios, including oblique photography and orthophoto.
	Circle	Applicable to circling scenarios and especially for reconstructions of small and vertical objects, such as base stations, tower, and wind-driven generator.
	Power Lines	Applicable to scenarios focused on power line reconstruction, only outputting point cloud results and not supporting model output.
Feature Point Density	High (recommended), Low	High: Moderate processing time. Low: Faster processing.
GCP and Constraints	Click to enter the GCP and Constraints page. Detailed operations are described later.	
XML Output	XML, XML with tie points	The default output is in the XML format supported by DJI Terra. You can also select ContextCapture Blocks Exchange format and define the output coordinate system. Users can also choose the XML format, i.e., ContextCapture Blocks Exchange, and define its output coordinate system.

8. 2D Map Settings
   When 2D map is enabled, the reconstruction results will include a 2D map. Click 2D Map to expand the settings menu.
   Resolution: High refers to the original resolution, Medium refers to 1/2 of the original resolution (the length and width are both 1/2 of the original photo), and Low refers to 1/4 of the original resolution (the length and width are both 1/4 of the original photo). For example, if the resolution of the original photo is 6000×6000 pixels, it will be the same in High, 3000×3000 pixels in Medium, and 1500×1500 pixels in Low.

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Mapping Scenes: Field is suitable for open areas with objects of small height difference such as farmland, Urban is suitable for areas with more buildings and will produce a downsampled DSM result with a GSD of 5 m/pixel. Fruit Tree is suitable for areas with objects of large height difference such as orchard. DJI Terra will recognize objects in the reconstruction result to mark different areas such as fruit trees, buildings, and ground. After reconstruction, in the Agriculture Application page, users can add boundary points of a flight area and calibration points and DJI Terra can automatically generate a flight path according to the recognition results. Refer to Agricultural Application for more information.

Computation Mode: Supports standalone computing and cluster computing.

Advanced Settings:

a. Region of Interest: Click to enter the Region of Interest (ROI) page. Refer to the related section for more information.

> Aerial triangulation should be performed before entering the ROI page. Make sure that 2D map and 3D model options are disabled. Click Aerotriangulation at the bottom to start aerial triangulation and wait until it is completed. Click Quality Report to view the report and make sure that the data is correct.

b. Output Coordinate System: Output coordinate system settings. Refer to the related section for more information.
c. Map Tilting: Enable and set the maximum grid length for map tiling.
d. Light Uniformity: In a strong light environment, the glossy surfaces of land or crop canopies may cause mirror-like reflections leading to brightness on one side and shadows on the other. The reconstructed map will show stripes in gradients. Enabling this feature will improve reconstruction effects for the field scene.

Refer to the table below for 2D map configuration items.

Item	Options/Parameters	Description
Computation Method	Standalone Computation	Supports standalone computing and cluster computing.
	Cluster Computation	
Scenario	Field	Suitable for open areas with small height differences, such as farmland.
	Mapping	Suitable for areas with more buildings and will produce a downsampled DSM result with a GSD of 5 m/pixel.
	Fruit Tree	Suitable for areas with large height differences, such as orchards.
Resolution	Automatic, Custom	If you select resolution(Auto), you can set it to high, medium, or low. If you select resolution(custom), you can configure its parameters in m/px.
Output Format	GeoTIFF	Default generation for display in DJI Terra
	GeoTIFF (COG)	A raster data storage format based on TIFF with geospatial reference information

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Region of Interest	Click to enter the Region of Interest/ Block page. Detailed operations are described later.	Before entering the ROI (Region of Interest) page, aerial triangulation must be performed first. Make sure that 2D map and 3D model options are disabled. Click Aerotriangulation at the bottom to start aerial triangulation and wait until it is completed. Click Quality Report to view the report and make sure that the data is correct.
Map Tilting	Enable/Disable	Digital Orthophoto Maps (DOM) and Digital Surface Models (DSM) will be divided into grids if Map Tilting is enabled.
Fill Hole Intelligently	Enable/Disable	When enabled, holes will be intelligently filled on 2D reconstruction models. It is recommended to enable current feature when Smart Oblique is enabled for data collection.

9. 3D Mesh Settings

Usage Scenario: Same as aerotriangulation scene settings.

Computation Mode: Supports standalone computing and cluster computing.

Resolution: High refers to the original resolution, Medium refers to 1/2 of the original resolution (the length and width are both 1/2 of the original photo), and Low refers to 1/4 of the original resolution (the length and width are both 1/4 of the original photo). For example, if the resolution of the original photo is 6000×6000 pixels, it will be the same in High, 3000×3000 pixels in Medium, and 1500×1500 pixels in Low.

Refer to the table below for 3D mesh configuration items.

Item	Options/Parameters	Description
Computation Method	Standalone Computation	Supports standalone computing and cluster computing.
	Cluster Computation	
Quality	High, Medium, Low	High is the original resolution, Medium is 1/2 of the original resolution (i.e., both the length and width of the image are 1/2 of the original), Low is 1/4 of the original resolution (i.e., both the length and width of the image are 1/4 of the original)
Reduce Model to	Percentage (%)	Use this feature to reduce the size of the model, which can facilitate the browsing of the model with a third-party browser, or better support other model editing software. At least 20% is recommended.
File Format	B3DM	Default generation for display in Terra (LOD model format, suitable for display in Cesium)
	OSGB	LOD model format
	PLY	Non-LOD model format
	OBJ	Non-LOD model format
	S3MB	SuperMap LOD model format

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File Format	I3S	Non-LOD model format
	FBX	Non-LOD model format. LOD switching can be achieved through external software.
ROI (Region of Interest)/ Block Splitting	Click to enter the Region of Interest/ Block page. Detailed operations are described later.	Before entering the ROI (Region of Interest) page, aerial triangulation must be performed first. Make sure that 2D map and 3D model options are disabled. Click Aerotriangulation at the bottom to start aerial triangulation and wait until it is completed. Click Quality Report to view the report and make sure that the data is correct.
Refine Water Surface	Enable/Disable	When enabled, water surfaces identified during reconstruction will be refined.
Output Editable in DJI Modify	Enable/Disable	When enabled, 3D model output formats compatible with DJI Modify will be generated, and a project file for DJI Modify will be created automatically.

Gaussian Splatting

Usage Scenarios: 3D Gaussian Splatting (3DGS) reconstruction technology is applicable to engineering, highways, and construction projects, protection and restoration of ancient buildings and cultural relics, key subject reconstruction in security, substation reconstruction in the power industry, and scene reconstruction in film and game production. 3DGS enables image-level restoration, effectively addressing poor reconstruction results for complex structures in traditional photogrammetry.

Refer to the table below for Gaussian splatting configuration items.

Item	Parameters	Description
Quality	Extra high, High, Preview	
Region of Interest	Click to enter the Region of Interest/ Block page. Detailed operations are described later.	Before entering the ROI (Region of Interest) page, aerial triangulation must be performed first. Make sure that 2D map and 3D model options are disabled. Click Aerotriangulation at the bottom to start aerial triangulation and wait until it is completed. Click Quality Report to view the report and make sure that the data is correct.

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Point Cloud:

Usage Scenario: Same as aerotriangulation scene settings.

Refer to the table below for point cloud configuration items.

Item	Parameters	Description
Computation Method	Standalone Computation	Cluster computation can be selected for reconstruction when using the Cluster function.
	Cluster Computation	
Quality	High, Medium, Low	
Density	High, Medium, Low.	High density is 100%, medium density is 25%, and low density is 6.25%.
Point Cloud Format	PNTS	Default generation for display in Terra (LOD point cloud format, suitable for display in Cesium)
	LAS	ASPRS LASer, three-dimensional point cloud format
	PLY	Non-LOD point cloud format
	PCD	Non-LOD point cloud format
	S3MB	SuperMap LOD point cloud format
	LAZ	LAZ is the lossless compressed version of LAS, defined by ASPRS
Merged Output	Enable/Disable	When enabled, merges point cloud outputs from multiple flights. Can be enabled before or after reconstruction.
Noise Reduction and Accuracy Improvement	Enable/Disable	The default setting is enabled. When enabled, system will optimize point cloud thickness and accuracy in weak texture areas (e.g., walls and floors) and reduce noise and optimize color rendering.
Ground Point Classification	Enable/Disable	When enabled, parameters should be configured.
Ground Type	Flatland	Default angle: 3°
	Gentle Slope	Default angle: 6°
	Steep Slope	Default angle: 10°
Building Max Diagonal	1–1000 m (default: 20 m)	Maximum diagonal length of a building in the top view.
Iteration Angle	0.1° to 60°	Used to determine ground points. When the angle between the point and the triangular surface is within the configured value, the point is regarded as a ground point. Default: Flatland 3°, Gentle Slope 6°, Steep Slope 10°.
Iteration Distance	0.01 m to 10 m	Used to determine ground points. When the angle between the point and the surface is within the configured value, the point is regarded as a ground point. Default: Flatland 0.3 m, Gentle Slope 0.5 m, Steep Slope 0.7 m.

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Digital Elevation Model (DEM):
Usage Scenario: Same as aerotriangulation scene settings.

Refer to the table below for DEM configuration items.

Item	Parameters	Description
Size	GSD	By GSD: Each pixel in the GeoTIFF DEM output represents a specific ground distance (m/px). The output format is GeoTIFF by default.
	Scale	Options include 1:500, 1:1000, 1:2000.

Contour Lines
Usage Scenario: Same as aerotriangulation scene settings.

Refer to the table below for contour line configuration items.

Item	Parameters	Description
Interval	Configurable (m)	Difference between adjacent contour lines.
Datum	Configurable (m)	Elevation of contour lines is calculated based on elevation datum and interval. For example, if datum value is 0 and interval is 10, elevation of contour lines will be -30, -20, -10, 0, 10, 20, and 30.
Elevation Annotation Radius	Configurable (m)	Used to generate elevation points for topographic mapping.
Discard Invalid Contour Lines	Enable/Disable	When enabled, the following parameters should be configured.
Min Contour Length	Configurable (m)	Contour lines with length smaller than this value will not be displayed.

Grid of Points & TIN
Usage Scenario: Same as aerotriangulation scene settings.

Advanced Settings:

a. ROI / Block Splitting: Click to enter the Region of Interest/Block page. Detailed operations are described later.

> Aerial triangulation should be performed before entering the ROI (Region of Interest) page. Make sure that 2D map and 3D model options are disabled. Click Aerotriangulation at the bottom to start aerial triangulation and wait until it is completed. Click Quality Report to view the report and make sure that the data is correct.

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b. Output Coordinate System: Output coordinate system settings. Refer to the related section for more information.
c. Custom model origin: Enable and set the model origin coordinates. The model origin of the OSGB, OBJ, PLY output obtained after reconstruction will be set to the entered coordinate values. Use cases:
   To display multiple reconstruction outputs on one model presentation platform, set the same model origin for all tasks.
   For large models that require updates, you can efficiently update only a specific region by setting both the model origin and the block origin to the same coordinates as in the previous task. This ensures that the block filenames in the updated area will match those from before, allowing you to simply copy and paste the new block files to replace the old ones for seamless and efficient local model updates.

Refer to the table below for grid of points and TIN configuration items.

Item	Parameters	Description
Mode	Standard	Retains more original point cloud details.
	Smart	Generates smaller grid of points outputs.
Sample Distance	Configurable (m)	Set the distance between original points.

10. Click Start Reconstruction or Aerotriangulation if 2D map and 3D model are disabled. Check the settings in the pop-up reconstruction parameter checklist. Check the box “Do not show again” and the checklist will not pop up after starting reconstruction. Users can enable the checklist in general settings in the Settings menu on the main screen. Click OK to start reconstruction. The progress bar at the bottom will show the reconstruction progress. Click Stop to stop reconstruction and the progress will be saved. If reconstruction is restarted after stopping, DJI Terra will track back slightly from the saved progress before continuing.
11. Multiple reconstruction missions can be started, but only one reconstruction mission can be processed at once. Any remaining missions will be queued. To view the mission progress, click in the main screen to enter the reconstructon and device page.
12. After reconstruction is completed, click AT, 2D, or 3D to view the corresponding aerotriangulation, 2D map, or 3D model reconstruction result in different views. Annotation and measurement and agriculture applications are also available in the Application menu. Refer to the related sections for more information.

Click on the upper right corner on the map to show or hide the capture location.

In 2D or 3D view, click for single measurement. The measurement operations are the same as those in the annotation and measurement page with the only difference being that the data of single measurement cannot be saved.

In AT or 3D view, users can view the reconstruction result from different angles using the buttons below, translate and rotate the model, and zoom in or out.

: click the button and the model will rotate automatically. Click the button for other angles to stop the rotation.

/ : displays the model in top view or front view. In either view, hold down the left mouse button and drag to translate the model, scroll the mouse wheel or hold down the right mouse button and drag to zoom in or out, and hold down the mouse wheel and drag to rotate.

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13. Click Quality Report to view and save a report. The report includes an overview of the reconstruction result, RTK status, camera calibration information, and process information. Refer to the document How to Read a DJI Terra Quality Report on the official DJI website for more information.

File Format and Storage Path of 2D Maps

The 2D map reconstruction result is raster data in GeoTIFF format which can be used in third party software compatible with GeoTIFF format.
The default storage path of the 2D map files is as below. This cache directory can be changed in Settings.
C:\Users\<computer name>\Documents\DJI\DJI Terra\<DJI account name>\<mission name>\map\result.tif
In the reconstruction page, users can open the current mission folder using the keyboard shortcut “Ctrl+Alt+F”.

If PC GS Pro has been used on your computer, after DJI Terra has been installed, the cache directory will still be as follows:
C:\Users\<computer name>\Documents\DJI\Groundstation\Missions\<DJI account name>

File Format and Storage Path of Aerial Triangulation and 3D Reconstruction Results

DJI Terra can output aerial triangulation results in the following formats: Terra and XML.

DJI Terra can output 3D point clouds in the following formats:
1. Non-LOD point cloud file in the las, ply, and pcd formats.
2. LOD cloud file in pnts and s3mb formats. Format conversion is not supported.

DJI Terra can output 3D models in the following formats:
1. Texture mesh file in ply, obj, and i3s formats.
2. LOD model file in b3dm, osgb, and s3mb formats. Format conversion is not supported.

The default storage path of the 3D reconstruction files is as follows:
C:\Users\<computer name>\Documents\DJI\DJI Terra\<DJI account name>\<mission name>\models\pc\0
In the reconstruction page, users can open the current mission folder using the keyboard shortcut “Ctrl+Alt+F”.
NOTE: This cache directory can be changed in Settings.

If PC GS Pro has been used on your computer, after DJI Terra has been installed, the cache directory will still be as follows:
C:\Users\<computer name>\Documents\DJI\Groundstation\Missions\<DJI account name>

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Multispectral Reconstruction

Multispectral reconstruction is supported when using DJI multispectral aircraft. The reconstruction procedure is similar to that of 2D map reconstruction. Users can view the supported vegetation index outputs. Radiometric correction is available before reconstruction to improve the reliability of the output index when images of the calibration board and the camera reflectance factor can be obtained.

Annotations and measurements can be done after reconstruction. Enter the agricultural application page to plan operations on the 2D multispectral map. Refer to the related section for more information.

Radiometric Correction

Radiometric correction can reduce the effects on images caused by weather and time and helps to output more reliable indexes in reconstruction missions. Multispectral images with radiometric correction can be reconstructed to a 2D multispectral map with an output of reflectance. Click Advanced in the 2D map setting menu and then Radiometric Correction to enter the page. After configuration, return to the reconstruction page to start reconstruction with radiometric correction.

Template

The multispectral reconstruction system comes with 2 preset templates, allowing for quick parameter configuration. The specific template parameters are as follows:

Template Type	Name	Description
Custom Template	User-defined	Configure parameters and click Save Parameters as Template to create a custom template for future use.
System Template	General	Includes 2D Map and Aerotriangulation.
	Rapid 2D Mapping	Includes only 2D Map.

Importing Calibration Board Data

Users should import at least one group of images of the calibration board in each band and up to three groups. The groups are named Calibration Board 1, 2, and 3.

1. Select Calibration Board 1, 2, or 3.
2. Click Import Calibration Photo and select photos including the calibration board in blue, green, red, red edge, and near infrared bands to import.
3. Click the photo in the desired band and the photo will be displayed on the main screen on the left.
4. Click  or  to replace or delete the selected photo.
5. Input the corresponding reflectance factor in the text box for each band.

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Marking the Calibration Board

1. Click the photo displayed on the main screen on the left to add a point as a mark of the edge of the calibration board in the photo.
2. Drag the edge point to adjust the position.
3. Click to delete all the points in the selected photo.
4. Mark the calibration board for each photo accordingly.
5. The marks of the calibration board will be applied to the next group of images of the calibration board. Drag the edge points to adjust if needed.

Vegetation Index Outputs

DJI Terra supports 5 types of vegetation indices: NDVI, LCI, GNDVI, OSAVI, and NDRE, each requiring photos from different spectral bands. DJI Terra will display the indices that can be calculated according to the imported photos. There will be notifications under output index if any photos are missing in the required band. After reconstruction, click the buttons for different indices to view the results.

Even if only one photo is missing from a required band for the desired vegetation index, it is considered that the information of that whole band is missing. Users can view which photos are missing in the required band in the photo list.

File Format and Storage Path of 2D Multispectral Maps

The 2D multispectral map reconstruction results are raster data in the GeoTIFF format which can be used in third party software compatible with GeoTIFF format. The results include multispectral index maps for each index, 2D orthographic maps in RGB and for each of the spectral bands. The default storage path of the 2D multispectral map files can be found below. In the reconstruction page, users can open the current mission folder using the keyboard shortcut “Ctrl+Alt+F”. This cache directory can be changed in Settings.

The default storage path of the multispectral index maps is
C:\Users\<computer name>\Documents\DJI\DJI Terra\<DJI account name>\<mission name>\map\index_map

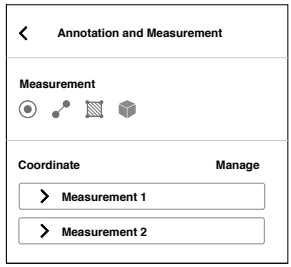
The default storage path of the 2D orthographic maps in RGB and for each of the spectral bands is
C:\Users\<computer name>\Documents\DJI\DJI Terra\<DJI account name>\<mission name>\map
The result.tif file is the RGB 2D orthographic map. The result_XXX.tif file is the 2D orthographic map for the spectral band corresponding to “XXX” in the file name.

If PC GS Pro has been used on your computer, after DJI Terra has been installed, the cache directory will still be as follows:
C:\Users\<computer name>\Documents\DJI\Groundstation\Missions\<DJI account name>

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Annotation and Measurement

Click ❯ on the right of the Annotation and Measurement bar to enter the page.



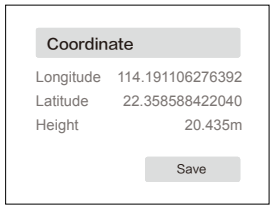
2D View

In 2D view, users can add coordinates and measure distance and area.

Coordinate

The three-dimensional coordinate of the added coordinate point, including latitude/X/E, longitude/Y/N, height/Z/U. The height corresponds to the elevation in the coordinate system that the photos use.

1. Click ◉ to enter Coordinate Adding mode.
2. Click on the map to add a coordinate. Drag to adjust its position. Click 🗑 on top to delete the coordinate. The box below the coordinate shows the name, latitude/X/E, longitude/Y/N, and height/Z/U, indicating that the coordinate is in editing status. Click the text box of the name to input the name, then click “Save” to exit editing.



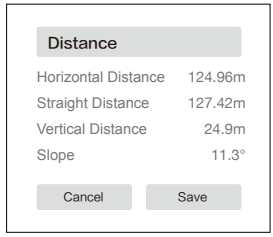
3. The coordinate list displays the added coordinates. Click ⌄ to expand the information to view coordinate values or change the name.
4. Make sure that there is no coordinate in editing status. Click “Manage,” and select coordinates (the outer box of the coordinate will turn blue when selected) to export or delete them.

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Distance

The horizontal distance is the length of the horizontal projection of the line segment between the two added measurement points, the vertical distance is the height difference between the two points, and the straight distance refers to the spatial distance between the two points, i.e., the length of the line segment between two points. If a polyline is added, the straight distance is the sum of the straight distances for each segment. The slope refers to the angle between the horizontal plane and the line segment generated by the two added measurement points.

1. Click to enter distance measurement mode.
2. Click the left mouse button on the map to add measurement points. Drag to adjust the position. The selected point is red, while the unselected point is gray. Click on top to delete the selected point. Click to delete all the points in this measurement. Click the right mouse button to end measurement. The box below the line shows the name, horizontal distance, straight distance, vertical distance, and slope. Click the text box of the name to input the name, then click "Save" to exit editing. A distance measurement is in editing status when the measurement is not ended or saved. To exit editing status, end the measurement and save.

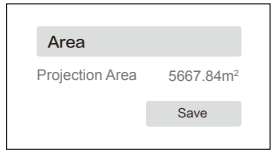


3. The process to view and manage distance measurements is the same as the one used for coordinates.

Area

The projection area refers to the projected area of the polygon area formed by the added measurement points along the elevation direction.

1. Click to enter area measurement mode.
2. As with distance measurement, the procedure to add measurement points for area is similar. The only difference is that there are three measurements points required before ending the measurement, which is achievable by clicking the right mouse button.



3D View

In 3D view, users can add coordinates, measure distance, area and volume based on a specified coordinate system. For example, when using the photos captured by a Phantom 4 RTK aircraft in WGS84 coordinate system, the altitude involved in Annotation and Measurement refers to the

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ellipsoidal height. If using other coordinate systems, the altitude corresponds to the elevation in the coordinate system that the photos use.

The method for adding coordinates and measuring distances and areas is similar to the one used in 2D reconstruction, but the data included in area measurements will be different. When measuring the volume, it is required to select the base plane. The following is a description of the data of area and volume in 3D reconstruction.

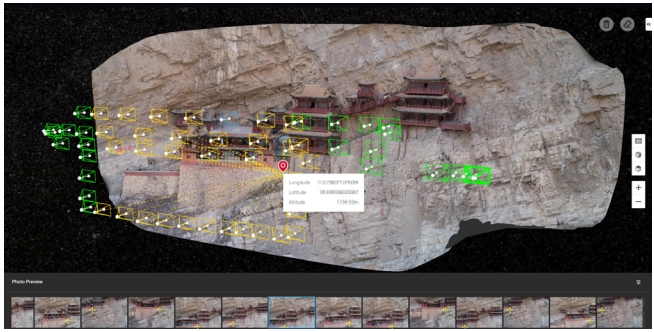
Area: The projection area refers to the projected area of the polygon area formed by the added measurement points along the elevation direction. The fitted area refers to the area value for the polygonal area on the plane fitted using the added measurement points.

Volume: When projecting the polygon area formed by the added measurement points along the elevation direction, a polyhedron is produced. With reference to the specified base plane, the volume refers to the cut and fill volume of the model. The portion above the base plane (the direction in which the elevation is increased) is the cut, and the portion below the base plane (the direction in which the elevation is reduced) is the fill. There are two options for the base plane, the Mean Plane and the Lowest Point.

- Mean Plane: A plane (possibly an inclined plane) fitted with multiple measurement points as the reference plane.
- Lowest Point: Use the plane of the lowest elevation point among the measurement points as the base plane.

The Annotation and Measurement of the 3D model also includes the function to display the camera pose when adding coordinates.

1. Enable “Camera Pose” and the green patterns indicates the camera pose when the photo was captured.
2. Click ◉ to enter Coordinate Adding mode.
3. Click on the model to select a point. The camera pose display of the photos including the selected point will turn yellow, and a photo preview from the camera's perspective will be displayed at the bottom of the screen.



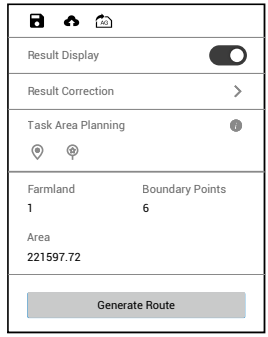
4. The yellow cross in the preview photo indicates the position of the point on the model in the photo. Click the photo, and the corresponding camera pose display will turn blue. Double-click the photo to view in a large size and zoom in or out.

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Agricultural Application

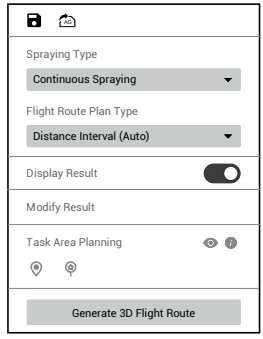
For 2D map reconstruction (Field and Fruit Tree) and 2D multispectral map reconstruction, click > on the right of the Agricultural Application bar to enter the page. Users can plan operations for fields or fruit trees on the map.

Field



1. If Display Result is enabled, recognition for different areas such as fruit trees, buildings, ground, water, and poles will be displayed on the map.
2. Click Modify Result to use the corresponding brush for each type of area to paint on the map to modify the recognition result.
3. Click and to add boundary points and calibration points in the area that includes fields.
4. Click "Generate Route." DJI Terra will automatically generate a route for field operations. Users can enable or disable route display and obstacle avoidance, and configure altitude, route width, and route angle.
5. Click to save the mission. Click and the mission will be uploaded to DJI Agras Management Platform. Agras aircraft users can download the mission from the platform to the compatible app. Click and the mission will be exported to the microSD card in the remote controller connected to the computer. Insert the card into the Agras remote controller and import the mission in the pop-up menu in the app.

Fruit Tree



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1. Select Spraying Type. When using an Agras aircraft to perform the flight mission generated by DJI Terra, the aircraft will spray according to the selected type.
   Continuous Spraying refers to spraying when flying within a recognized fruit tree area and is suitable for orchards with moderately sized and evenly distributed fruit trees.
   Spot Spraying refers to spraying only when flying to the center of the tree crown in the recognized fruit tree area and is suitable for orchards that have scattered trees with thick crowns.
2. Select Flight Route Plan Type. The plan type varies for different spraying type. Continuous spraying corresponds to Distance Interval (Auto), Tree Crown Center (Auto), Semi-automated, and Manual, while Spot spraying corresponds to Tree Crown Center (Auto) and Semi-automated.

Six planning methods are available for different operation scenarios when combining the parameters above: Continuous Spraying - Distance Interval (Auto), Continuous Spraying - Tree Crown Center (Auto), Continuous Spraying - Semi-automated, Continuous Spraying - Manual, Spot Spraying - Tree Crown Center (Auto), and Spot Spraying - Semi-automated. Refer to the descriptions below.

3. If Display Result is enabled, recognition for different areas such as fruit trees, buildings, ground, water, and poles will be displayed on the map.
4. Click Modify Result to modify the recognition result manually. Operation varies for different spraying types:.
   - When Continuous Spraying is selected, use the corresponding brush for each type of area to paint on the map to modify the recognition result.
   - When Spot Spraying is selected, circles will be displayed on the map to mark the tree crown centers. Click to edit them. Click the recognized tree crown center to select it, then click to delete. Click on the map to mark a new tree crown center.
5. Click and to add farmland points and calibration points in the area that includes fruit trees.Click the icon or to show or hide the planned farmland and calibration points. The farmland points that can be added vary for different flight route plan type, such as boundary points and waypoints. Refer to the description below.
6. Click “Generate 3D Flight Route.” DJI Terra will automatically generate a route for fruit tree operations. Users can enable or disable route display and obstacle avoidance, and configure route altitude, route width, route angle and terrain follow accuracy.
7. Click to select a waypoint to adjust waypoint location and altitude. Click to delete selected waypoint.
8. Click to save the mission. Click and the mission will be exported to the microSD card in the remote controller connected to the computer. Insert the card into the Agras remote controller and import the mission in the pup-up menu in the app.

Continuous Spraying - Distance Interval (Auto)
After adding boundary points and calibration points, click “Generate 3D Flight Route.” DJI Terra will automatically generate a zig-zag route with a same line spacing in the field. This function fits the needs of most large orchards.

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Continuous Spraying - Tree Crown Center (Auto)
After adding boundary points and calibration points, click “Generate 3D Flight Route.” DJI Terra will automatically generate a route including all the tree crown centers. This is suitable for orchards with evenly distributed trees and where continuous spraying is required.

Continuous Spraying - Semi-automated
Click on the map to add waypoints along the fruit trees. The flight route will contain the waypoints. Click “2D Flight Route Preview.” DJI Terra will adjust the waypoints according to the location of the tree crown centers. Click “Back” after the preview, then click “Generate 3D Flight Route” to generate the final flight route. This is suitable for orchards with trees distribution following some kind of pattern and where continuous spraying is required.

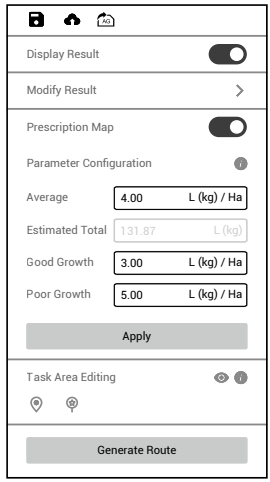
Continuous Spraying - Manual
Click on the map to add waypoints along the fruit trees. The flight route will contain the waypoints. Click “Generate 3D Flight Route.” DJI Terra will automatically generate a route. This is suitable for orchards with unevenly distributed trees and where a custom flight route is required.

Spot Spraying - Tree Crown Center (Auto)
After adding boundary points and calibration points, click “Generate 3D Flight Route.” DJI Terra will automatically generate a route including all the tree crown centers. This is suitable for orchards with evenly distributed trees and where only spraying on the top of the trees is required.

Spot Spraying - Semi-automated
Click on the map to add waypoints along the fruit trees. The flight route will contain the waypoints. Click “2D Flight Route Preview.” DJI Terra will generate a route that connects all the tree crown centers within 1.5 m of the waypoints. Click “Back” after the preview, then click “Generate 3D Flight Route” to generate the final flight route. This is suitable for orchards with a tree distribution following some kind of pattern and where only spraying on the top of the trees is required.

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2D Multispectral Map



1. If Display Result is enabled, recognition for different areas such as fruit trees, buildings, ground, water, and poles will be displayed on the map.
2. Click Modify Result to use the corresponding brush for each type of area to paint on the map to modify the recognition result.
3. Click and to add boundary points and calibration points in the area that includes fields.
4. Select a planned field and set the material amount for average, good, and poor growth in Parameter Configuration. Click to view the detailed descriptions for the parameters.
5. Click Apply and wait for the software to generate the prescription map. Users can select to show or hide the prescription map.
   The prescription map is used for Agras aircraft to conduct variable rate fertilizer application. Users can adjust the parameters to change the prescription map. When a prescription map is shown in NDVI view, each field on the map will be displayed in a color corresponding to its material amount according to the color bar on the left. Hover the mouse on the map to view the specific amount.
6. Click "Generate Flight Route." DJI Terra will automatically generate a route for field operations. Users can enable or disable obstacle avoidance and configure route altitude, route width, and route angle.
7. Click to save the mission. Click to upload flight route output or 2D reconstruction output to DJI Agras Management Platform. Agras aircraft users can download the mission from the platform to a compatible app. Click and the mission will be exported to the microSD card in the remote controller connected to the computer. Insert the card into the Agras remote controller and import the mission in the prompted menu in the app.

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Region of Interest/Block

When configuring 2D reconstruction, 3D reconstruction, and Gaussian splatting, users can select the ROI after adding photos to the model, saving modeling time and improving efficiency. To define the ROI, click ❯ on the right side of the ROI section to enter the ROI page. The specific operation is as follows. After setting the ROI, return to the reconstruction page to begin processing within the defined area.

Define ROI

There are four methods to define the ROI for reconstruction. The coordinate system used here is the same as the one in Output Coordinate System settings.

1. Click "KML Import" to convert the points in the KML file into the edge points of the ROI.
2. Input the min and max latitude, longitude, and height or XYZ values of the ROI in the text boxes, and then click "Apply" to define the ROI.
3. In the "Reset Region" option, click "Auto" or "Max Region", and DJI Terra will generate the corresponding ROI automatically.
   Auto: DJI Terra will calculate a proper cuboid region automatically according to the point cloud distribution.
   Max Region: The cuboid region covering the whole point cloud.
4. Click ⓒ on the top of the screen to enter editing mode. Click on the map to add the edge points of the ROI, and then input the height in the height text box to define the ROI.

Translate ROI

Click ⓒ to enter translation mode, and then drag the defined ROI to translate it.

Edit ROI

Click ⓒ to enter editing mode.

1. Click on the map to add edge points of the ROI.
2. Drag the edge point to adjust its location and the shape of the ROI.
3. Click ⓒ to align blocks automatically. The ROI will automatically align with intersecting blocks.
4. Select the edge point, and then click ⓒ to delete it.
5. Click ⓒ to delete all the edge points.
6. Click ⓒ to save settings and exit from the editing mode.

Other Information and Settings

1. When the ROI is a cuboid, its length, width, and height will appear on the top of the page.
2. ⓒ : Show or hide the camera pose of the added photos.
3. Display Region: Show or hide the defined ROI.

Block Splitting Options

For 3D reconstructions, users can select the block splitting mode for efficient data management and updates.

Auto

The software will obtain the current available RAM of the computer and split the ROI into blocks accordingly.

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Custom Size

Enter the single block memory limit. The software will split the ROI according to the input memory value.

Custom Side Length

The software will split the ROI according to the splitting origin and side length.

Side Length

Enter the side length. The software will split the ROI into blocks in a grid and display the estimated memory usage and block count depending on the length.

Splitting Origin

Disabled: The software will set a splitting origin automatically.

Enabled: Users can set the splitting coordinate system and the coordinates of the splitting origin.

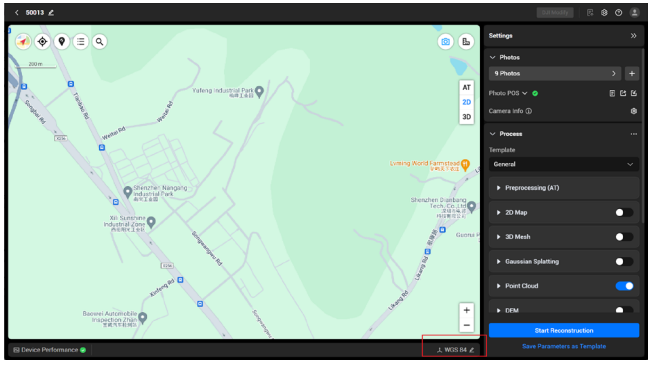
Output Coordinate System Settings

When generating 2D or 3D reconstructions, users can set the output coordinate system after importing images. The coordinates in the reconstruction result will be converted to the designated coordinate system.

If the images do not include GPS information, the output coordinate system will be automatically set to “Arbitrary Coordinate System” defined by DJI Terra.

If the images include GPS information, the output coordinate system will be automatically set to “Known Coordinate System” and converted to a projected coordinate system in WGS 84 under 2D Map Reconstruction. In 3D Model Reconstruction, if the images include GPS information, the output coordinate system will be automatically set to “Arbitrary Coordinate System”. Users can select other known coordinate systems.

Coordinate system information is displayed at the bottom left of the user interface, as shown below.



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Arbitrary Coordinate System Settings

Seven-Parameter Transformation: If multiple mapping areas exist in a small area (normally within 50 km²) or a single mapping area needs to be mapped repeatedly, users can use the Seven-Parameter Transformation function to convert the coordinates in the reconstruction result to the designated coordinate system without adding or marking GCPs. Click to start Seven-Parameter Transformation process. On the displayed dialogue box, users can directly add coordinate information or import files.

1. Adding coordinate information directly: Input coordinate data, click “Calculate”, and then click “Apply”.

2. Importing files:
   a. Import coordinate files (in TXT or CSV format), click “Calculate”, and then click “Apply”. Coordinate data in the file should be in this order: name of the coordinate pair, latitude, longitude, and height of the source coordinates, X/E, Y/N, and Z/U of the target coordinates. Source coordinates only support the geodetic coordinate system. Separate the data with commas (TXT file) or fill data in different columns (CSV file).

      TXT file example is as shown below:
      1,22.56789101,114.0056789,37.89,192345.678,2501234.56,37.89
      2,22.56789101,114.0056789,37.89,192345.678,2501234.56,37.89
      3,22.56789101,114.0056789,37.89,192345.678,2501234.56,37.89

      CSV file example is as shown below:

Name	Latitude	Longitude	Height	X/E	Y/N	Z/U
1	22.56789101	114.0056789	37.89	192345.678	2501234.56	37.89
2	22.56789101	114.0056789	37.89	192345.678	2501234.56	37.89
3	22.56789101	114.0056789	37.89	192345.678	2501234.56	37.89

   b. Import the result file (JSON format) of the Seven-Parameter Transformation and then click “Apply”.

      Click “Start Reconstruction” and wait for the reconstruction to complete.

Known Coordinate System Settings

There are two methods to set the known coordinate system, importing a PRJ file and searching in DJI Terra.

1. Importing a PRJ file: Search and download the .prj file for the desired coordinate system on the website https://spatialreference.org. Then click PRJ in DJI Terra to import.
   Searching in DJI Terra: Click “Search”, input the coordinate system name or authorization code, select the desired coordinate system in the searching results. Then click “Apply”.
2. Searching in DJI Terra: Select “Horizontal coordinate system database” and “Vertical coordinate system database” from the “Horizontal Datum Settings” and “Geoid Settings” in the drop-down menu. Input the coordinate system name or authorization code, select the desired coordinate system in the searching results. Then click “OK”.

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GCP and Constraints

Feature Introduction

Ground Control Points (GCPs) are marked points on the ground that have known geographic coordinates and are clearly visible in images. Introducing GCPs into reconstruction can significantly improve the accuracy and robustness of aerotriangulation, ensuring that the model has precise absolute geographic coordinates.

In DJI Terra, GCPs are mainly divided into two categories:

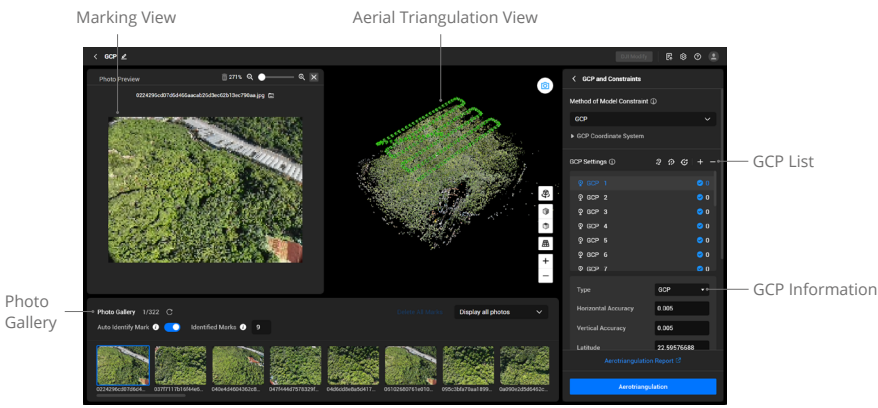
Control points: used in aerotriangulation calculation to correct the position and attitude of models.

Check points: not used in aerotriangulation calculation. Only used to verify and evaluate the accuracy of the aerotriangulation output.

Instructions

1. After importing photos in a reconstruction task, click "Not Set" in the GCP and Constraints section under Preprocessing (AT) to open the management page.

2. Page layout overview:
   a. GCP list: displays all imported points and their types (GCP or check point).
   b. Aerial triangulation view : displays camera POS, sparse point cloud, and GCP positions in 3D space.
   c. Photo gallery: displays all images included in the current task.
   d. Marking view: an independent window that appears after you select a photo. Used to precisely mark GCP positions.



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3. Import GCP
   Before marking points, you need prepare and import a GCP coordinate file that meets the specification.
   a. Prepare the GCP file
      DJI Terra allows you to import GCP files in TXT and CSV formats. Data need to be arranged in rows, and columns can be separated with spaces, tabs, commas, or semicolons.

Define key data columns:
The required data columns vary based on the task scenario. Prepare the GCP file by referring to the following table.

Scenario	Coordinate System Type	Accuracy Mode	Required Data Columns (In Recommended Order)	Description
Manual marking or auto GCP using a known coordinate system	Known coordinate system (such as WGS84)	Default accuracy	Name, longitude or X/E, latitude or Y/N, and altitude or Z/U	The most commonly used standard format.
		Custom accuracy	Name, longitude or X/E, latitude or Y/N, altitude or Z/U, horizontal accuracy, and vertical accuracy	Used when precise error control is required.
	Arbitrary coordinate system (manual marking)	Default accuracy	Name, X/E, Y/N, and Z/U	
		Custom accuracy	Name, X/E, Y/N, Z/U, horizontal accuracy, and vertical accuracy	
Auto GCP using an arbitrary coordinate system	Arbitrary coordinate system	Default accuracy	Name, X/E, Y/N, Z/U, WGS84 longitude, WGS84 latitude, and WGS84 altitude	Note: For automatic marking using an arbitrary coordinate system, you need provide the corresponding WGS84 coordinates to assist positioning.
		Custom accuracy	Name, X/E, Y/N, Z/U, WGS84 longitude, latitude, and altitude, horizontal accuracy, and vertical accuracy	The most complex format that includes local coordinates, GPS coordinates, and accuracy information.

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Sample files:

The following tables provide sample file content for four typical business scenarios. (It is recommended to keep the header row as the first line in the file. You can configure the number of lines to skip from top.)

Scenario 1: Use a known coordinate system (such as WGS84) and default accuracy to perform manual or automatic marking.

GCP Name	Latitude (or X/E)	Longitude (or Y/N)	Altitude (or Z/U)
GCP_01	22.123123	114.321654	38.05
GCP_02	22.123125	114.321659	38.10
CHK_01	22.123127	114.321695	37.95

Scenario 2: Use a known coordinate system and precisely specify the horizontal and vertical accuracy of each GCP.

GCP Name	Latitude (or X/E)	Longitude (or Y/N)	Altitude (or Z/U)	Horizontal Accuracy	Vertical Accuracy
GCP_01	22.123123	114.321654	38.05	0.02	0.05
GCP_02	22.123125	114.321659	38.10	0.01	0.04
CHK_01	22.123127	114.321695	37.95	0.02	0.05

Scenario 3: Use an arbitrary coordinate system and default accuracy to perform manual marking.

GCP Name	X/E	Y/N	Z/U
GCP_01	500.444	2500.000	102.89
GCP_02	550.333	2750.111	103.00
CHK_01	600.555	2560.222	102.41

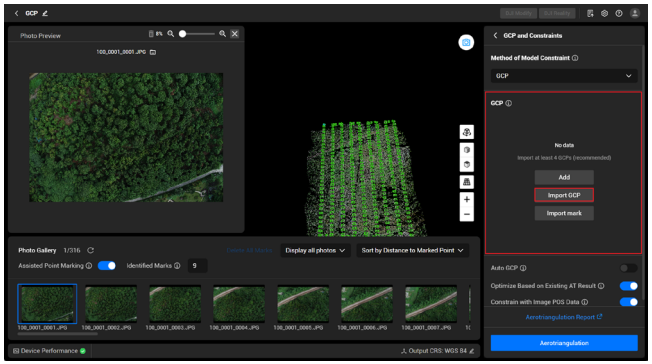
Scenario 4: Use an arbitrary coordinate system to perform auto GCP. The imported file needs to include the corresponding WGS84 coordinates to help the system with photo positioning.

GCP Name	X/E	Y/N	Z/U	WGS84 Longitude	WGS84 Latitude	WGS84 Altitude
GCP_01	500.444	2500.000	102.89	114.321654	22.123123	10.5
GCP_02	550.333	2750.111	103.00	114.321659	22.123125	12.1
CHK_01	600.555	2560.222	102.41	114.321695	22.123127	13.5

⚠ When importing configuration in Scenario 4, you must map the last three columns to WGS84 Longitude, WGS84 Latitude, and WGS84 Altitude respectively in the Define Data Column section.

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b. Import the GCP file
Click "Import GCP" in the GCP section and select a local TXT or CSV file.



Configure import parameters:
After you select a GCP file, the Format and Properties dialog box appears. Follow the instructions below to complete the configuration in three steps:

1. Set the file format in the upper left section
   This section is used to define how the software reads your text file and ensures that the data is correctly separated into columns.

Parameter	Description	Remarks
Lines to Skip From Top	Set the number of rows to skip when reading the file.	If the first line of the file contains headers (such as Name, Lat, and Lon), set this parameter to 1. If the file does not contain headers, set the parameter to 0.
Decimal Separator	Define the decimal point symbol used in the data.	In most cases, select period (.).
Column Separator	Define the delimiter used to separate data columns.	Select comma, period, semicolon space or tab based on the delimiter actually used in the file.
Treat combined separators as one	When selected, multiple consecutive delimiters are treated as a single delimiter.	It is recommended to select this option. This prevents incorrect column separation caused by multiple spaces added to ensure text alignment.

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2. Set the data properties in the lower left section
   This section is used to define the coordinate reference and accuracy standard for GCPs.

Parameter	Value	Description
GCP Coordinate System	Arbitrary Coordinate System	Suitable for relative coordinates or mapped coordinate system data.
	Known Coordinate System	Suitable for data with an absolute geographic reference (such as WGS84). When selected, you must configure the Horizontal Datum Settings and Vertical Datum Settings parameters below.
Data Accuracy	Use Default DJI Terra Accuracy	The system automatically applies a default accuracy, which is usually 0.005 m. You do not need to provide an accuracy column in the file.
	Use Custom Accuracy	The accuracy data specified in the file is used. You must specify the Horizontal Accuracy and Vertical Accuracy columns in the data columns on the right.

3. Define data columns in the right section
   The right side of the dialog box displays a file preview and the parsed table. Click the drop-down lists in the first row of the table to configure data mappings.

Data column mapping table:

Column Header	Required	Description
Name	Required	The unique identifier of the GCP.
Longitude, Latitude, and Altitude	Required	The three-dimensional coordinate data of the GCP. Make sure to double-check the order of the longitude and latitude to avoid reversing them.
Horizontal and Vertical Accuracy	Conditionally required	Required only when Use Custom Accuracy is selected on the left.
WGS84 Longitude, Latitude, and Altitude	Conditionally required	The auxiliary WGS84 data. Required only when Arbitrary Coordinate System is selected and auto GCP is required.

Validation tips:

- If the configuration is incomplete (e.g., a required column is missing), a red error message will appear at the bottom of the dialog box (e.g., Column headers must include...) and the Import button will be disabled.
- If the configuration is valid, confirm the configuration and click "Import."

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4. Mark points
   After importing the GCPs, you need to associate the coordinate data with the actual locations in the photos. This process is called marking points. DJI Terra supports the following three marking methods:
   a. Auto GCP
   The system automatically recognizes standard black-and-white diagonal markers in the photos and marks points.

   - Prerequisites: The photos must contain valid POS information, and the markers must be clearly visible. The following figure shows the currently supported markers.



   - For auto GCP using an arbitrary coordinate system, the imported file must contain the corresponding WGS84 coordinate information. Otherwise, this feature is unavailable. For details, see Substep a) in Step 3.

   b. Manual marking
   i. Select a GCP from the GCP list.
   ii. In the Photo Gallery, filter for Only display photos with GCPs.
   iii. Mark points in the marking view.
      - Use the scroll wheel to zoom the photo. Press and hold the left mouse button to drag the photo.
      - Press the left mouse button to mark a point.
      - Shortcut keys: Use the ← and → keys to switch photos, and the ↑ and ↓ keys to switch GCPs.
      - Note: It is recommended to mark each point on at least nine photos captured from different angles.

   c. Assisted point marking
      - Prerequisite: Aerotriangulation output is available.
      - When enabled, you only need to mark points on one photo. The system automatically predicts and marks the matching points on the other photos based on the aerotriangulation results.

5. Optimize based on existing AT result
   When enabled, the system will optimize aerotriangulation based on existing AT result. When not enabled, the system will remove existing AT result and optimize aerotriangulation from scratch.

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6. Constrain with image POS data
   If image POS data has been imported, you can turn on the Constrain with Image POS Data switch at the bottom of the page. Then, the image POS data will be used as a prior condition to constrain the aerotriangulation adjustment results.

⚠ When disabled, more GCPs are required to improve accuracy. Feature can be disabled in following situations: 1) Unable to precisely convert coordinates among GCPs, outputs, and photo POS. 2) GCPs, outputs, and photo POS use arbitrary coordinate systems

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Constraint Line Drawing

1. Move the mouse into the image area.
2. Left-click to create a start point (S), drag to draw a line. Right-click to cancel. When the constraint list on the right is not empty, clicking will automatically add a new record, and GCPs will be adjusted accordingly.



3. Left-click again to create an endpoint (E) and finish the line.
4. Left-click a third time to start a new line. The previous line will be cleared.

LiDAR Point Cloud Processing

Similar to visible light reconstruction, users can create a new LiDAR point cloud processing task by creating a new project or importing an existing one. LiDAR point cloud processing consumes significant computer resources. It is recommended to add raw LiDAR point cloud data according to the computer configurations and corresponding point cloud sizes listed below to ensure a smooth processing experience. DJI Terra v5.1.0 and later versions support block reconstruction for point cloud data that exceeds the recommended memory limits, but this will reduce the reconstruction speed.

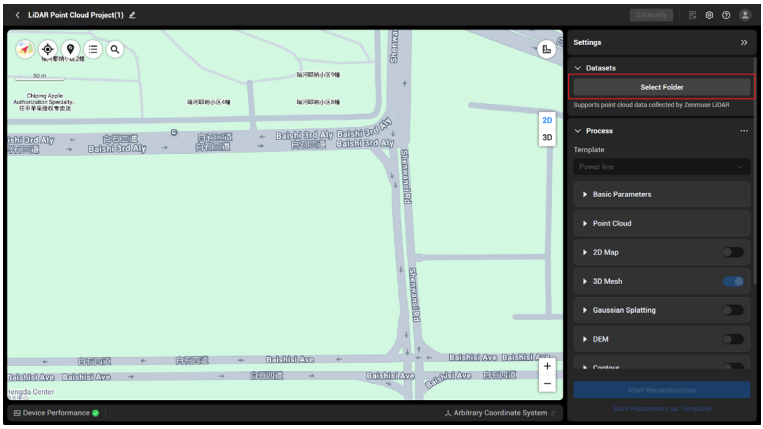
Available Memory (RAM)	Max Raw Point Cloud Size (versions below v4.0)	Max Raw Point Cloud Size (v4.0 and later versions)
16 GB	4 GB	15 GB
32 GB	8 GB	30 GB
64 GB	16 GB	60 GB
128 GB	32 GB	120 GB

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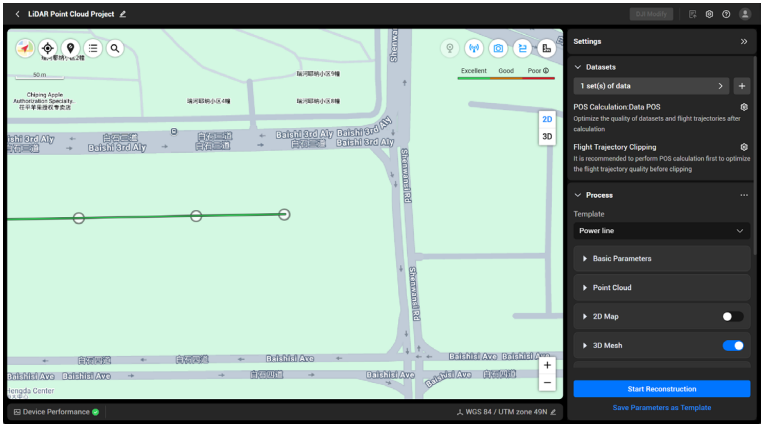
Datesets

Reconstruction Process:

1. Click Select Folder and choose the folder named after the data acquisition time from your computer to add LiDAR point cloud data. The folder should contain files with the following extensions: CLC, CLI, CMI, IMU, LDR, RTB, RTK, RTL, and RTS. JPEG images are optional and can be imported as needed.



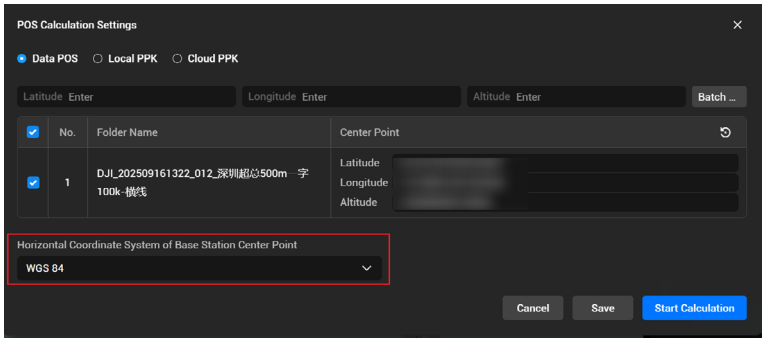
2. After importing, click ⚙ below the material to enter POS calculation, and select data POS, local PPK, or cloud PPK processing.
   (1) Data POS: Click Start Calculation and wait for it to complete to obtain the flight trajectory. If POS (position and orientation system) calculation is not performed, the displayed point cloud flight trajectory may be incomplete (e.g., for data collected via manual flight or Power Line Follow), but you can still edit the visible flight route trajectory.



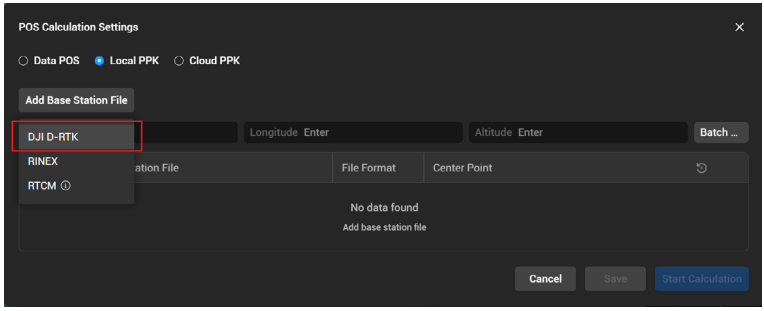
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Base Station Center Point Settings:

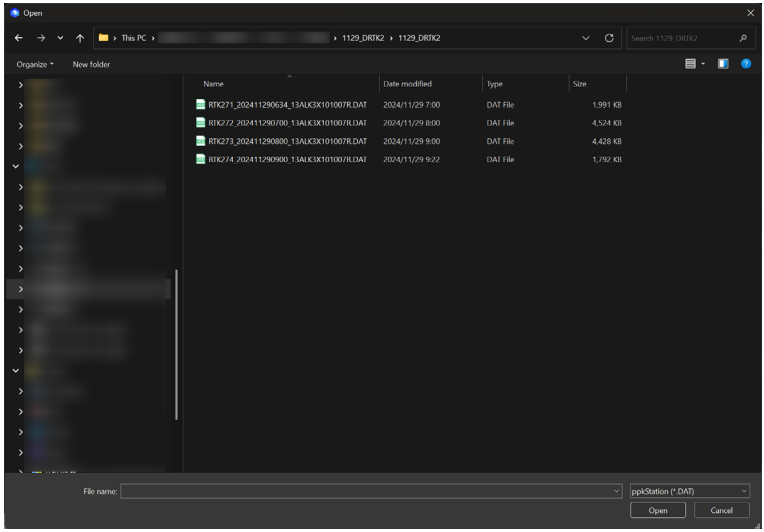
Search for a coordinate system and set it to the coordinate system of the base station's center point or a known point used during the operation. The data list will display the number, folder name, and the center point's Latitude (X), Longitude (Y), and Height (Z).
Modify Individually: Enter the data in the Latitude, Longitude, and Height input fields to modify them one by one.
Batch edit: Select the checkboxes in front of the numbers, enter the data in the latitude (X), longitude (Y), and height (Z) input fields above the table, then click Batch Edit.



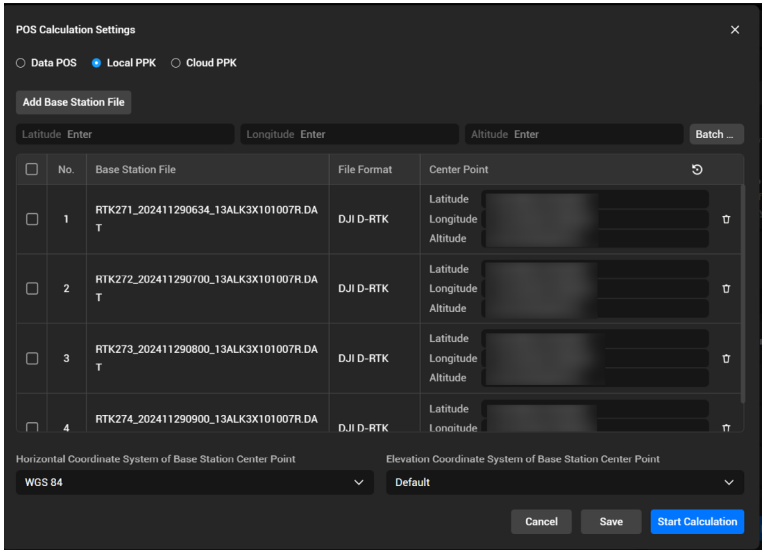
(2) Local PPK: Click Add Base Station File, select DJI D-RTK, and import the file. If D-RTK 3 is used as the flight base station, it is recommended to perform PPK calculation. Click PPK Calculation, select Add Base Station File, import the base station file exported from DJI D-RTK 3, and then click Start Calculation to achieve more accurate point cloud flight trajectory.



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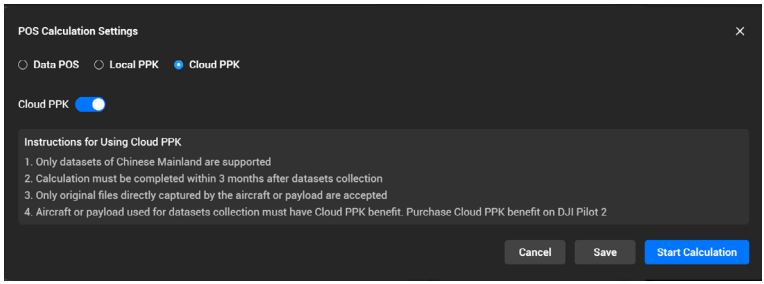
After importing the file, select the corresponding coordinate system based on the base station center coordinate system set in the DJI D-RTK. Once the import is complete, click Start Calculation.



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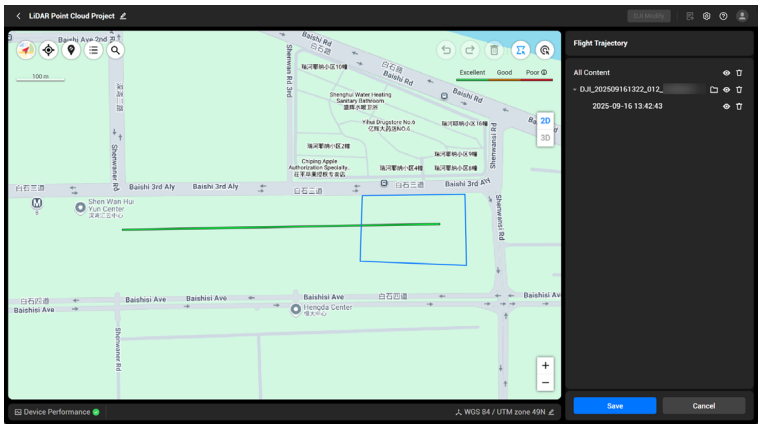
(3) Cloud PPK

When data collected by a Zenmuse L2 or Zenmuse L3 (Chinese mainland version) or other devices with PPK features is imported, you can enable the Cloud PPK option in the software. You can enable this feature for one-click PPK processing to improve operational efficiency. After processing is complete, the flight route trajectory of the LiDAR point cloud will be updated on the page.



3. Flight Trajectory Clipping: Supports clipping the trajectory of data collected by Zenmuse LiDAR. The clipped parts of the trajectory will not be used in the reconstruction. It is recommended to perform POS calculation before using the trajectory clipping function, as the trajectory of the aircraft before IMU calculation may have some inaccuracies.

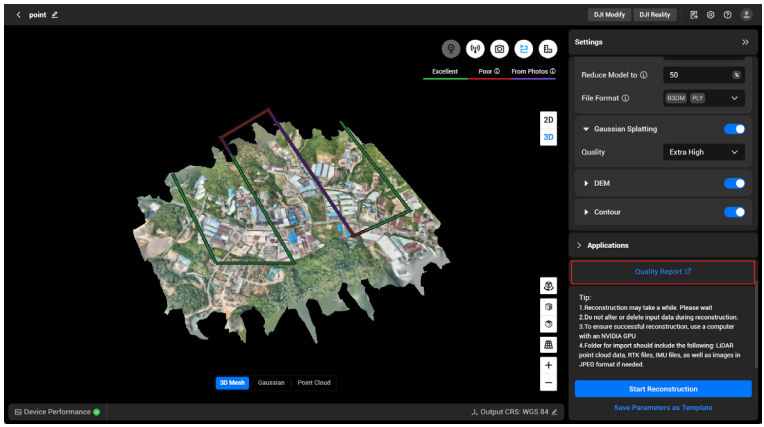
   a. Click the button to enter the trajectory clipping function. You can use the polygon or point selection tool to select the trajectory. After selecting, press the Delete key on your keyboard to quickly delete it, or click the delete button in the outline tree on the right to quickly delete a single trajectory. Trajectory clipping supports undo. Click Save after editing. Clipped flight trajectories will not be included in the reconstruction process.

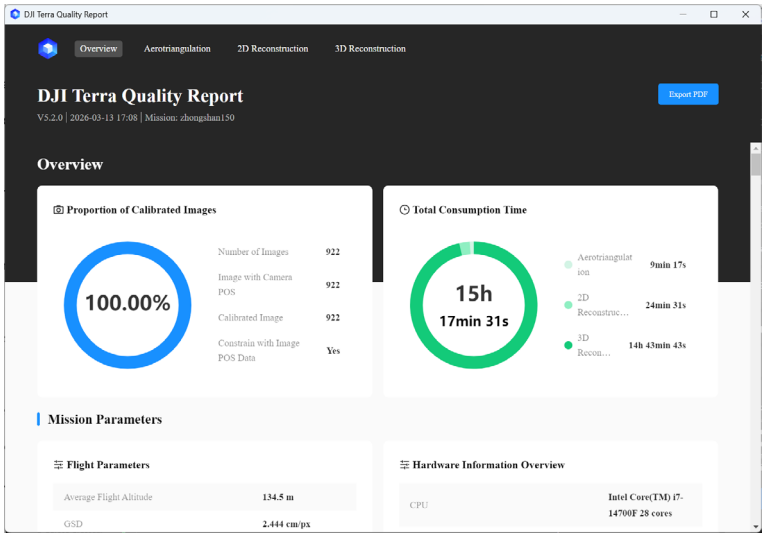


⚠ After clipping the LiDAR trajectory, the photos captured by the LiDAR will not be deleted simultaneously. These photos will be used to assist with point cloud colorization and will not affect the accuracy of the point cloud reconstruction.

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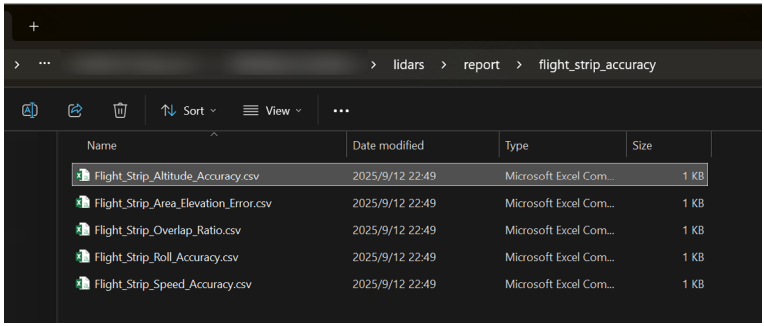
b. After reconstruction, click Quality Report to view the flight strip adjustment quality and check if it meets the standard parameter requirements of GB50167-2014, GHT 8024-2011, GBT36100-2018, etc.





c. Click View Details to open the flight accuracy folder. The CSV files in the folder correspond to the following: point cloud flight strip overlap area elevation error (average elevation difference details, Flight_Strip_Area_Elevation_Error), flight strip overlap rate (average overlap ratio details, Flight_Strip_Overlap_Ratio), flight strip altitude accuracy (altitude tolerance details, Flight_Strip_Altitude_Accuracy), flight strip speed accuracy (speed consistency details, Flight_Strip_Speed_Accuracy), and flight strip roll angle accuracy (flight route curvature details, Flight_Strip_Roll_Accuracy).

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Processing

1. Templates

   The LiDAR point cloud reconstruction system has 5 preset templates, offering configurations for multiple scenarios to quickly complete parameter settings. The specific template parameters are as follows:

Template Type	Template Name	Description
Custom Templates	Can be named by the user	Configure parameters and click Save Parameters as Template to create a custom template for future use.
System Templates	General	Includes Point Cloud and 2D Map.
	Rapid Point Cloud Generation	Includes Point Cloud.
	Terrain Results	Includes Point Cloud, DEM, and Contour Lines.
	Power Lines	Includes Point Cloud and 3D Mesh.
	LiDAR Calibration	Includes Point Cloud and calibration files

2. Preprocessing Settings
   - Computation Method: Supports Standalone and Cluster Computation.
   - Scene Select Point Cloud Processing for general LiDAR data; select Substation Reconstruction for more demanding power facility reconstruction needs.
   - Control and Check Points: Click > to enter the Accuracy Control and Check page, then import the control and check point files. Set the file format, data property, and data column definitions. You can click Type to select either a check point or a control point. After reconstruction, click the Quality Report to view the accuracy statistics for control and check points.

   When defining data columns, Name, Latitude (X/E), Longitude (Y/N), and Height (Z/U) are required fields. The same data column cannot be selected for different definitions.

   - ROI (Region of Interest)/Block Splitting:

   Feature Introduction

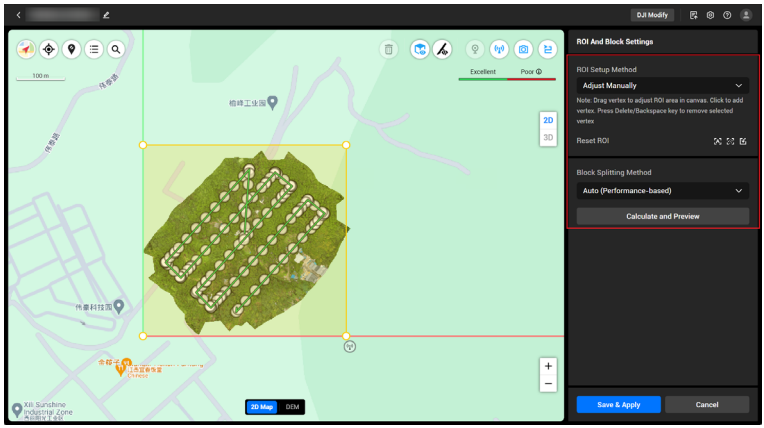
   Supports post-processing of data collected by Zenmuse L3 to reconstruct point clouds, 2D maps, 3D mesh models, Gaussian Splatting, DEMs, and contours. Supports defining an ROI

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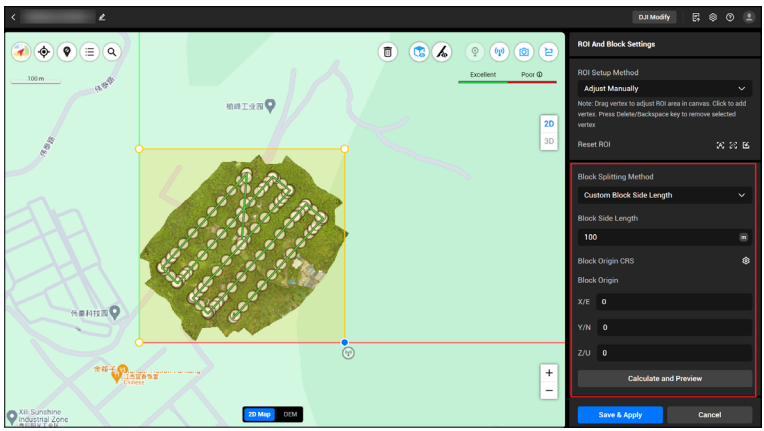
to determine the reconstruction area and setting block parameters to define the size of point cloud file blocks.

Instructions

a. Click to enter ROI/Block, where you can manually adjust the ROI. Options include default range, maximum range, and importing custom ranges via KML files. After setting, only the point cloud, 2D map, 3D mesh, 3D point cloud, Gaussian Splatting, DEM, and contours within the ROI will be reconstructed. Outputs outside the ROI will not be generated.

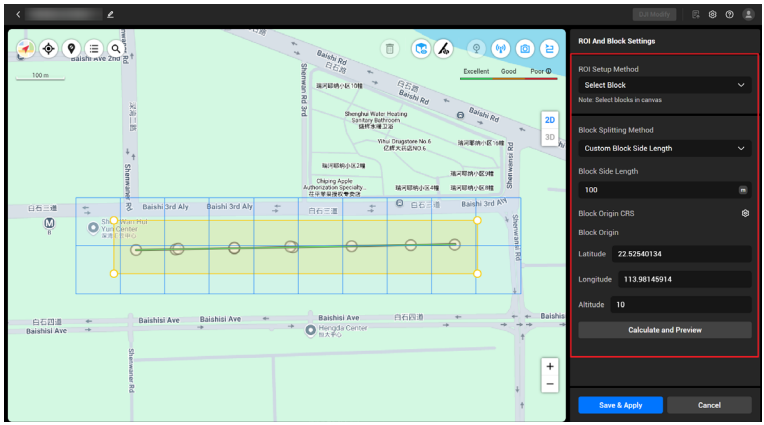


b. Block splitting settings are supported, with automatic block splitting (based on computer performance) enabled by default. Supports custom block memory and side length. Automatic and custom memory blocking will tile the point cloud based on computer memory, resulting in irregular block sizes. To generate regular blocks, use the custom block side length function. It allows you to set the block side length, corresponding coordinate system, and origin for neatly divided reconstruction data boundaries.



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c. After setting block parameters, click Calculate and Preview to quickly view the block boundaries.
d. Set the ROI selection method to Select Block. You can select the blocks to be reconstructed by clicking on them (selected blocks turn blue). Unselected blocks will not be reconstructed, which better supports local updates and replacement for large datasets.

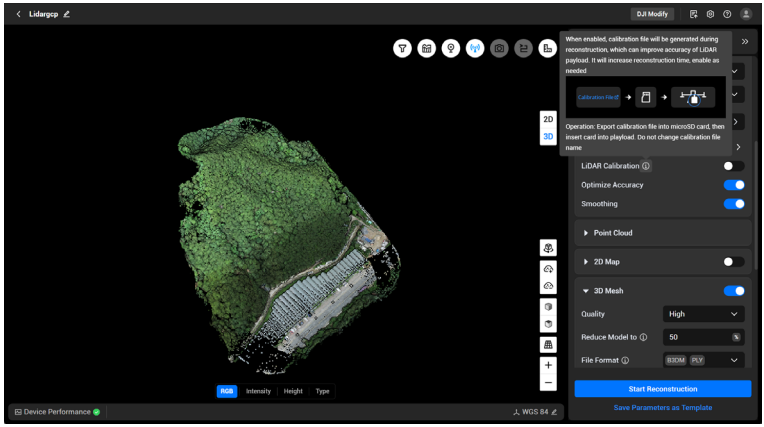


e. After setting the ROI and blocks, click Save & Apply to return to the main page. The reconstruction will use the saved ROI and block settings.

LiDAR Calibration

When enabled, a calibration file will be generated during reconstruction, which can be used to improve the accuracy of the LiDAR payload. This will increase reconstruction time, so enable it as needed.

Procedure: Import the calibration file to the root directory of a microSD card and insert the card into the payload. Do not change the filename of the calibration file.



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- Optimize Accuracy: Point Cloud Accuracy Optimization: When enabled, the point cloud data scanned at different times will be optimized during processing, resulting in higher overall point cloud accuracy. This is a feature of the Standard edition and higher; users need to purchase and activate a license to use it. For purchase and activation details, see More Functions.
- Smoothing: When enabled, it reduces point cloud thickness to remove discrete noise, making local structures clearer and improving the extraction of ground points. This function is not recommended for LiDAR point cloud tasks where it is necessary to preserve small surface elevation changes (< 5 cm), such as fine texture structures. In LiDAR point cloud reconstruction tasks, when the LiDAR flight trajectory quality is poor, while the photo POS quality is good, you can enable smoothing to correct the LiDAR flight trajectory using the photo POS data.

3. Point Cloud
   a. Point Cloud Density:
      By Percentage: High uses the original sampling rate, suitable for all point clouds, resulting in the highest quality but longest processing time. Medium uses 1/4 (25%) of the point cloud, resulting in medium quality and medium processing time. Low uses 1/16 (6.25%) of the point cloud, resulting in general quality and the shortest processing time.
      By Distance: When the point cloud density is uneven (e.g., locally too thick), you can set a point cloud sampling distance. A subset of points within this distance will be selected for calculation, which can reduce the number of points and make the density more uniform.
   b. Point Cloud Format: Includes PNTS, LAS, PLY, PCD, S3MB, and LAZ formats. The default output is an LOD point cloud file in PNTS format. Users can also select other formats: LAS refers to a 3D point cloud file in ASPRS LASer format; PLY is a non-LOD 3D point cloud file in PLY format, which can be opened in MeshLab; PCD is a non-LOD 3D point cloud file in PCD format used in Point Cloud Library (PCL), and can be viewed in CloudCompare; S3MB is a 3D LOD point cloud file in S3MB format for SuperMap. LAZ refers to the compressed format of LAS, a non-LOD 3D point cloud file. If you choose to output LAS, PLY, PCD, or LAZ format files, you can check the Merge Point Cloud option to merge multiple point cloud files into one.
   c. Merge Output: When enabled, the point cloud results will be merged into a single file. This can be selected before or after reconstruction.
   d. Ground Point Classification: Enable ground point classification and then select the ground type based on the actual situation. Flat Ground is suitable for areas with dense buildings or plains. Gentle Slope is suitable for areas such as common types of mountains and hills. Steep Slope is suitable for areas with great elevation changes such as high mountains and valleys. Then, set the maximum building diagonals, iteration angle, and iteration distance as needed.

4. 2D Map
   Enable the 2D Map switch to include a 2D map in the reconstruction results. Click 2D Map to expand the settings menu.
   Resolution: High is the original resolution, Medium is 1/2 of the original resolution (i.e., image length and width are half of the original), and Low is 1/4 of the original resolution

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(i.e., image length and width are a quarter of the original). For example, if the original photo resolution is 6000×6000, High is this resolution, Medium corresponds to 3000×3000, and Low to 1500×1500.

Resolution: You can select either Auto or Custom. If you choose Custom, you can configure its parameters in m/px.

Map Tilting: When enabled, the generated Digital Orthophoto Map (DOM) and Digital Surface Model (DSM) will be cropped according to the set tile edge length.

5. 3D Mesh

   During fieldwork, it is recommended to use L3 LiDAR for reconstruction. Select oblique collection, set flight altitude to 100 m and flight speed to 10 m/s, use repetitive scan mode, and set point cloud data rate in single return mode. Side overlap above 40% and forward overlap above 80% are recommended to ensure full coverage of mapping area.

   a. Model Format: Supports B3DM, OSGB, PLY, OBJ, S3MB, I3S, and FBX formats. The default output is an LOD model file in b3dm format. Users can also choose other formats: OSGB refers to LOD model files in OSGB format, OBJ refers to non-LOD model files in OBJ format, PLY refers to non-LOD model files in PLY format, S3MB refers to SuperMap LOD model files in S3MB format, and I3S refers to non-LOD model files in I3S format, which can be viewed in the ArcGIS Client or on the web. FBX refers to non-LOD model files in FBX format, which can be converted to LOD format through external software.

   b. Reduce Model to: The 3D model output generated by DJI Terra can be large, to ensure compatibility with third-party browsers for model viewing, and to better support other model editing software, you can use the model simplification feature to reduce the model output size. This function works by merging model triangular faces, with DJI Terra preserving model accuracy as much as possible.

Configuration Item	Configuration Parameter	Description
Quality	Configurable to High, Medium, Low	High is original resolution, Medium is 1/2 of original resolution, Low is 1/4 of original resolution.
Reduce Model to	Configurable percentage, unit "%"	Reduces the model's triangular faces to the set ratio, making the result smaller. This better supports downstream operations like online model viewing and editing. It is recommended to retain at least 20% of the triangular faces.
Model Format	B3DM	Default generation for display in Terra (LOD model format, suitable for display in Cesium).
	OSGB	LOD model format.
	PLY	Non-LOD model format.
	OBJ	Non-LOD model format.
	S3MB	SuperMap LOD model format.
	I3S	Non-LOD model format.
	FBX	Non-LOD model format. LOD switching can be achieved through external software.

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6. Gaussian Splatting

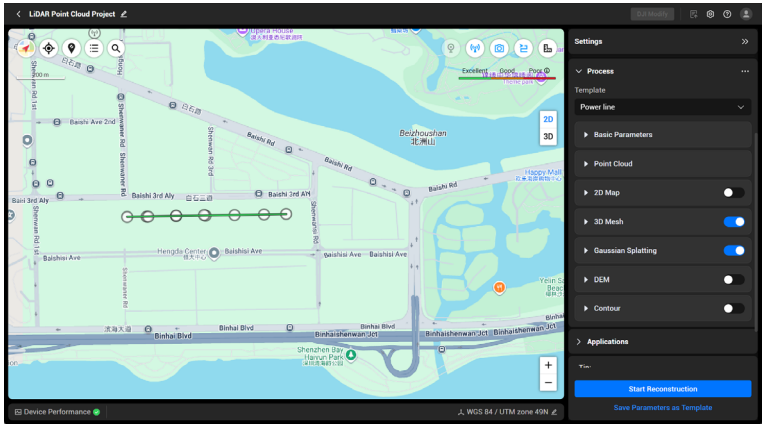
Usage Scenarios:

3D Gaussian Splatting (3DGS) reconstruction technology is applicable to engineering, highways, and construction projects, protection and restoration of ancient buildings and cultural relics, key subject reconstruction in security, substation reconstruction in the power industry, and scene reconstruction in film and game production. 3DGS enables image-level restoration, effectively addressing poor reconstruction results for complex structures in traditional photogrammetry.

Configuration Item	Configuration Parameter	Description
Quality	Extra High	Uses images up to 6K resolution for reconstruction.
	High	Uses images up to 1.6K resolution for reconstruction.
	Preview	Extremely fast, low quality.

Instructions

a) In a LiDAR point cloud reconstruction task, click to enable Gaussian Splatting.

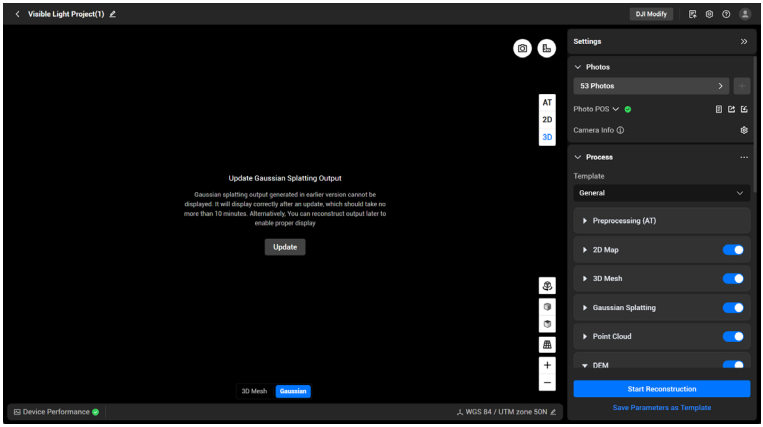


b) High mode delivers solid output, while Extra High mode offers greater clarity but significantly increases reconstruction time. Preview mode is only for quickly verifying whether the data can be used for reconstruction, and provides a basic preview to check if the materials meet the requirements for reconstruction. On a PC with an Intel i7-12700, 32GB RAM, and an RTX 4070s, the reconstruction speed for Extra High quality will be about 2.5 times slower than for High quality. This figure may vary with different configurations.

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c) Introduction to the new TerraGS result format:
The new TerraGS format achieves greater compression efficiency. For a model of the same scene, TerraGS occupies less storage space than PLY and 3DTiles, and the model displays more smoothly. It supports directly upgrading 3DTiles format results reconstructed in v5.0 to the new TerraGS format.

d) Old version result format conversion:
Since DJI Terra v5.1.0 switched to the latest TerraGS format for rendering, Cesium 3DTiles format results generated in older versions need to be updated to be displayed. After conversion, you can use the new Viewer in v5.1 to preview TerraGS format results. The original v5.0 results (3DTiles format) will be retained in the project's results directory.



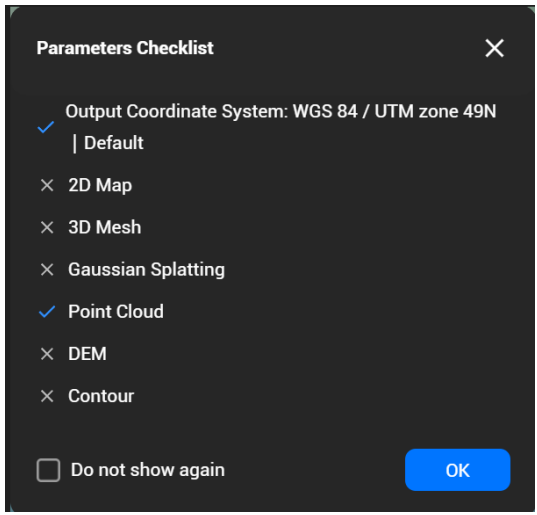
e) Result Paths:
Visible Light Task Output Path: Project Folder/3dgs/results/
LiDAR Task Output Path: Project Folder/lidars/
In the result path folder, folders prefixed with 3dgs_ are Gaussian Splatting results.
(1) 3dgs_terrags is the TerraGS format result.
(2) 3dgs_3dtiles is the 3DTiles format result.
(3) 3dgs_ply is the PLY format result.

7. Digital Elevation Model (DEM): Enable Generate DEM and select the DEM resolution by scale or GSD. Ground Point Classification will be automatically checked. If needed, you can set the ground point classification parameters based on the ground type.
8. Contour: Enable the contour lines function. After reconstruction is complete, open the project path. The generated contour line results are stored in the /lidars/terra_contour directory. Users can import them into third-party tools for viewing and editing.

After all the above sections are set, click Start Reconstruction. A reconstruction parameter check list will pop up to verify all settings. Check "Do not show again" to prevent this list from appearing after starting processing. Users can re-enable the reconstruction parameter check list in the general settings under the main interface's settings menu. Click OK to begin

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processing. The progress bar below will show the processing status. During processing, you can click Stop, and the software will save the current progress. If you resume processing after stopping, the software will resume from the saved progress and continue processing.



1. Multiple point cloud processing tasks can be started. Before the first task is completed, the remaining tasks will be in a queue. After one task is finished, the others will be processed sequentially in the order they were started.
2. After reconstruction, users can pan, zoom, and rotate the processed output, with operations identical to those for a 3D reconstruction model. You can select different display modes at the bottom of the interface to view the output.
   RGB: Displays in true color.
   Intensity: Displays colors corresponding to the object's reflectivity, represented from 0-255. 0-150 corresponds to diffuse reflection objects with a reflectivity between 0-100%, while 151-255 corresponds to total reflection objects.
   Height: Displays colors corresponding to the point cloud's height.
   Return: Displays colors corresponding to the different return numbers during data acquisition. Click or to zoom in or out of the point cloud.
   Trajectory: The point cloud is colored according to the trajectory at the time of acquisition. Point clouds collected along the same flight path are displayed in the same color, while those from different flight paths are shown in different colors. The LiDAR flight trajectory corrected using the photo POS data is displayed in purple.
3. Click Quality Report to view. The report includes information about the raw data, software parameters, output formats, and processing time. Users can refer to the How to read a DJI Terra Quality Report on the official DJI website for detailed information about the report's contents.

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4. In the application menu, go to the Annotation and Measurement page to annotate and measure the point cloud output. The operations are the same as those in the 3D view. See Annotation and Measurement for details.
5. After reconstruction, click Point Cloud - Type, and ⓣ will appear, allowing you to select which point cloud classifications to display.
6. Click ⓜ to enter the profile view function. The following operations can be performed on the interface:
   - Coordinate Point: Click ⓒ, then click a point on the model's profile to view its coordinate information.
   - Measurement: Click ⓜ, draw a line on the profile to view the direct distance, horizontal distance, vertical distance, and slope between the two points.
   - Gridlines: Click ⓖ to view auxiliary height and distance information.
7. Click ⓒ to display the center point of the first base station.
8. Click ⓣ to display the LiDAR's flight trajectory before reconstruction. Currently, only Zenmuse Lidars support displaying the flight trajectory. Trajectory information is obtained from the RPT file of the raw data. There is no trajectory display before reconstruction for flights following a path. Ensure that the Zenmuse Lidar is using the latest firmware version when collecting data. After reconstruction, the reconstructed flight path and pose information are displayed.
9. If the scenario is LiDAR Calibration, after processing is complete, click Export Calibration File, save the calibration file to the root directory of a microSD card, and then insert it into the Zenmuse Lidar.
10. Once powered on, Zenmuse Lidar will automatically use the calibration file to complete the calibration. Output Coordinate System: Same as for visible light reconstruction, users can set the output coordinate system, and the processed results will be converted to the user-specified coordinate system. See Output Coordinate System Settings for details. If a known coordinate system is selected, a height offset can also be set. The height offset value can be modified again after reconstruction is complete.

LiDAR Point Cloud Output File Storage Path

LiDAR point cloud result files are stored by default in the following path. Users can change the cache directory in the settings.

C:\Users\<username>\Documents\DJI\DJI Terra\<DJI_Account>\<Task_Name>\<lidars>

Users can also press the shortcut Ctrl+Alt+F on the reconstruction page to open the folder for the current task.

If you have previously used DJI GS Pro on the computer, the task cache directory will remain C:\Users\<username>\Documents\DJI\Groundstation\Missions\<DJI_Account> after installing DJI Terra.

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Flight Route Missions

Create a Mission

1. New Mission

Create a mission via the following two methods:

a. Click the Flight Route tag in the mission library, click Create Project on the lower left corner, choose the mission type, input the mission name, and click OK to enter Mission Editing mode.

b. Click in the right section of the mission library to import a mission file from the computer. Click to select the imported mission and click the icon on the right of the mission name to enter Mission Editing mode. The imported mission cannot be edited if it has already been finished before exporting.

2. Mission Settings

For a Detailed Inspection mission, there will be a prompt for route planning instructions after a mission is created to guide users throughout the basic procedure. Click “OK” after reading the instructions and enter the Mission Settings page to edit the mission name, select aircraft and desired model. The list in this page will list the models from 3D reconstruction results using DJI Terra. Users can also click “Import Point Cloud” to import third-party LAS point cloud files as the model to use. After configuration, click “OK” to enter Mission Editing mode.

⚠ Make sure that the accuracy of the imported models or point clouds meets the operation requirements.

3. Plan Flight Path

Detailed Inspection are flight paths with waypoints. When using a Phantom 4 RTK aircraft, the waypoint quantity should not exceed 199. While using other aircraft, the waypoint quantity should not exceed 99.

For Oblique missions, DJI Terra automatically generates flight paths after the user has set their required flight area and parameters.

For Corridor missions, DJI Terra automatically creates a flight area extending from the center line and generates flight paths after the user has set their required corridor points and parameters.

Add points via the following methods:

a. Click on the map to add a point.

b. Fly the aircraft to the desired position and then click on the upper right corner to set the aircraft position as a point.

c. Click in the parameter list to import a KML file. The data in the file will be converted to points and displayed on the map. This is a premium function included in DJI Terra Pro and more advanced versions. Please purchase a license and then activate it before use. For more information related to purchase and activation, refer to More Functions.

For Waypoints missions, users can plan flight paths based on a 2D map, 3D model or point cloud generated in DJI Terra. Make sure that there is no waypoint added, then click › on the right of the model type section in the parameter list, select a desired 2D map or 3D model,

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and click “Import.” The imported map or model will be displayed in the map view. Add waypoints based on the 2D map or 3D model using the above methods.

The functions for importing 2D maps or 3D models, flight path planning based on a 2D map, and flight path planning based on a 3D model (called “3D Mission Planning” in a Waypoints mission) are included in the DJI Terra Pro and more advanced versions. Please purchase a license and then activate it before use. For information related to purchase and activation, refer to More Functions.

During 3D mission planning, waypoints can only be added when the 3D model is displayed in top view. Click to switch to the top view automatically.

4. Edit Points

Click a point to select it and the selected point will turn from white to blue. Drag the point to change the area shape or flight path (except Detailed Inspection missions). In a Mapping mission or Oblique mission, click on the map, and a new point will be added between the two points. These points will be situated near the location you have clicked on.

For a Detailed Inspection mission, click the target point to select it and the selected point will turn from green to red. Drag the target point to change its position. Select a waypoint or target point, then click the desired position for a new target point on the model, and a new point will be added between the selected point and its next point.

Other operations can also be performed via the buttons below:

: Delete selected waypoint/edge point — Click a point to select it and it will turn to blue. Then click this button to delete it.

: Delete all waypoints/edge points — Click to delete all the waypoints or edge points in this mission.

: Switch start and endpoints — Click to swap the start and endpoints to reverse the flight path.

: Set your aircraft’s current position as a waypoint/edge point — Click to set the aircraft position as a waypoint or edge point.

During 3D Mission Planning, hold down the mouse wheel and drag to adjust the display view of the 3D model, and different icons will be displayed on the selected waypoint to indicate the directions in which this waypoint can be adjusted. indicates that the position in horizontal direction can be adjusted, and indicates that the position in vertical direction can be adjusted. Drag the waypoint in the corresponding direction to adjust its position. The image of viewing the model from the selected waypoint’s perspective is displayed on the lower right corner on the screen.

- Edge points of a flight area should not be too close. Otherwise, it will fail to generate flight path.
- The above requirements are also applicable when importing a KML file to plan a flight path.

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⚠
- There are different limits depending on the models of the aircraft when planning and editing a Waypoint mission.
  For Phantom 4 RTK, Phantom 4 Pro+ V2.0, and Phantom 4 Pro V2.0 aircraft: The distance between two waypoints should not exceed 200 km. The total distance of the flight path has no limits.
  For Phantom 4 Pro+, Phantom 4 Pro, Phantom 4 Advanced, and Phantom 4 aircraft: The distance between two waypoints should not exceed 2 km. The total distance of the flight path cannot exceed 40 km.

For a Detailed Inspection mission, users can also perform the operations below.
/ : To display or hide the target name. When the target name is displayed, click the text box near the target point on the map to edit its name.
In the 3D model view, hold down the mouse wheel and drag to adjust the display view of the 3D model. Click the buttons on the right of the screen to adjust the display of the 3D model in specific views and to zoom in or out.
In "Waypoint Settings", edit and configure each waypoint separately. Refer to Parameter Setting Introduction for more details.

5. Parameter Settings

Set each item in the parameter list and click to save when complete. Refer to Parameter Setting Introduction for more details.

Perform Mission

For a Detailed Inspection mission, if the Phantom 4 RTK aircraft is selected in the Mission Settings, import the flight route KML file to a Waypoints mission in DJI Terra or import the file into Library in DJI Pilot to perform the mission. If the Matrice 300 RTK aircraft is selected, to perform the mission, the flight route KML file can only be imported into Library in DJI Pilot.

⚠
- To perform the mission using KML files exported from Detailed Inspection missions, aircraft firmware and DJI Pilot app of the corresponding version are required. Pay attention to the release notes of the related products.
- Before performing the mission, make sure that the aircraft positioning is in the RTK FIX status to avoid accidents.

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Parameter Setting Introduction

Select a mission in the mission library. Click “Edit” to enter mission editing mode for parameter settings.

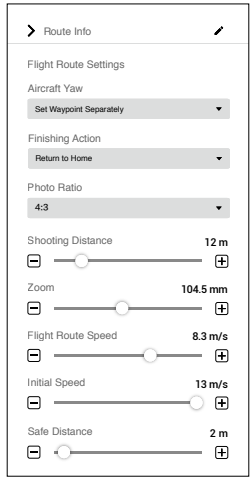
Detailed Inspection Settings

When none of target points are added, there will be a parameters list on the right screen, including flight route information and flight route settings. After a target point is added, there will also be a Waypoint Settings page on the left screen. Click « / » to collapse or expand the page.

Route Info

Click › to collapse the route information. Information based on the current parameter settings will be displayed, including flight route distance, estimated flight route time, waypoint count, estimated photo count, aircraft, height mode, and model. Click ✎ to enter the Mission Settings page again to change the mission name, aircraft and model.

Flight Route Settings



Unless otherwise specified, the flight route settings below will only be applied to the waypoints that are added after the configuration.

1. **Aircraft Yaw**
   Aircraft yaw when performing the mission.
   Set Waypoint Separately: The aircraft yaw will change gradually to the angle pre-set at the next waypoint if the values at the two consecutive waypoints are different.
   Follow Flight Route Direction: The front of the aircraft is always aligned to the direction of the two consecutive waypoints when flying between the two waypoints.

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2. **Finishing Action**
   Aircraft action after mission complete.
   Hover: The aircraft will hover at the final waypoint after mission completion. Then users can then control the aircraft directly.
   Return to Home: If the aircraft altitude is higher than this pre-set value, it will return to home at its mission completion altitude. If the aircraft altitude is lower than the pre-set value it will ascend to the RTH altitude after mission completion before returning to home. The RTH altitude can be set in Flight Controller Settings.
   Land: The aircraft will land at the final waypoint and stop motors automatically after mission completion.
   Return and Hover: The aircraft will return to the starting point of the flight path and hover after the mission is complete. The altitude when returning to the starting point is the same as RTH altitude.

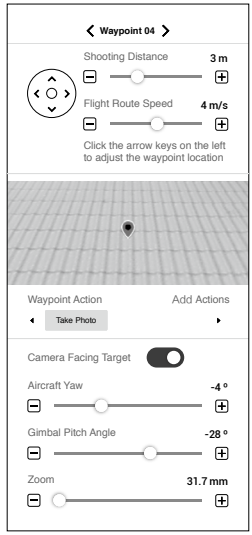
⚠ Make sure that the endpoint of the flight path is suitable for landing when finishing action is set to "Land" to avoid potential flight accidents.

3. **Photo Ratio**
   Set the photo ratio of the photos captured during the mission. 4:3 is the default setting for Matrice 300 RTK that cannot be changed by users.
4. **Shooting Distance**
   Set the distance between the aircraft and target point when shooting. The range is 1 to 100 m.
5. **Zoom**
   Set the focal length of the camera when shooting. The range is 31.7 to 200 mm. The parameter will appear only when the aircraft is set to Matrice 300 RTK.
6. **Flight Route Speed**
   The flight speed when flying along a waypoint flight path. The range can be set from 0.2 to 13 m/s.
7. **Initial Speed**
   Flight speed when not flying along the waypoint-determined flight path. This includes the flight speed from the aircraft position to the starting point of the flight path when starting a mission, or returning speed after mission completion.
8. **Safe Distance**
   After the safe distance is set, if the distance between the flight path produced by added waypoints and the model exceeds the preset safe distance, the flight path will be displayed in red and the nearest distance between the flight path and the model will also be displayed.

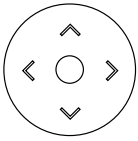
Waypoint Settings

Select a waypoint (it will turn blue when selected) then set waypoint parameters. Click ‹ or › to switch to the previous or next waypoint. The keyboard shortcut "Ctrl+ ← " or "Ctrl+ → " can also be used to switch accordingly.

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1. **Arrow Keys**
   Click to adjust the waypoint location on upward, downward, left and right directions.



2. **Shooting Distance**
   Set the distance between the aircraft and target point when shooting. The range is 1 to 100 m.
3. **Flight Route Speed**
   The flight speed when flying along a waypoint flight path. The range can be set from 0.2 to 13 m/s.
4. **Simulated Camera View**
   Displays the expected image from the camera's perspective with the current settings.
5. **Waypoint Action**
   Add actions the aircraft will perform at each waypoint. Name, delete, and order the added actions.
   Add Actions: Click the button and then select the desired action.
   a. Hover: The aircraft will hover at the waypoint. Set hovering time from 0 to 30 s.

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b. Take Photo: Capture on arrival at a waypoint. Users can set the parameters about taking photos below.

Camera Facing Target —

① When this is enabled, the camera will always face the target point whatever the other parameter settings are. Users cannot set the aircraft yaw and gimbal pitch angle. During mission, users can manually adjust the aircraft yaw and gimbal pitch angle at the waypoint. Note that the operations will change the aircraft position.

② When this is disabled, users can set the aircraft yaw and gimbal pitch angle here. During mission, if users adjust the aircraft yaw or gimbal pitch angle at the waypoint, the aircraft position will not change.

Zoom — Set the focal length of the camera when shooting. The range is 31.7 to 200 mm. The parameter will appear only when the aircraft is set to Matrice 300 RTK.

Name Actions, Delete Actions: Hover the mouse over the added action. Then click to edit the name of the action. Click × to delete the action.

Re-Order: Drag the added action to the desired position and release.

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More Functions

KML files can be imported onto DJI Terra to add waypoints or edge points of a flight area. In a Waypoints mission, 2D / 3D Mission Planning based on an existing or newly created reconstruction is available. For Reconstruction missions, there are various functions available such as 2D Map Reconstruction (urban scenes), Output Coordinate System, ROI, GCP and Constraints, 3D Model Reconstruction, and LiDAR Point Cloud Accuracy Optimization. These are premium features. Purchase a license according to the features you require.

See the table below which provides an overview of DJI Terra's more advanced features and functions.

Module	Function	Agriculture Version	Standard Version	Flagship Version
Import	Aerial and ground Images in JPG formats	√	√	√
	Third-party camera data	√	√	√
	Image POS data		√	√
	LiDAR data [1]		√	√
	Multispectral data [2]	√	√	√
	Projects	√	√	√
	KML files		√	√
	Reconstruction with over 500 Photos or 8GB point cloud	√	√	√
Reconstruction	Visible light aerotriangulation	√	√	√
	DSM and DOM reconstruction from visible light photos		√	√
	Mesh reconstruction from visible light photos		√	√
	Point cloud reconstruction from visible light photos		√	√
	Point cloud classification after visible light reconstruction		√	√
	DEM generation after visible light reconstruction		√	√
	Contour line generation after visible light reconstruction		√	√
	Grid of points generation after visible light reconstruction		√	√
	TIN generation after visible light reconstruction		√	√
	2D reconstruction (farmland) from visible light photos	√	√	√

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Reconstruction	2D reconstruction (fruit tree) from visible light photos	√	√	√
	Power lines reconstruction from visible light photos			√
	Gaussian splatting DOM from visible light photos			√
	Gaussian splatting 3D reconstruction from visible light photos			√
Reconstruction	LiDAR point cloud data post-processing		√	√
	LiDAR point cloud accuracy optimization		√	√
	LiDAR point cloud smoothing		√	√
	LiDAR point cloud mesh generation		√	√
	LiDAR substation reconstruction		√	√
	LiDAR point cloud classification		√	√
	LiDAR point cloud contour lines generation		√	√
	2D multispectral reconstruction	√	√	√
	Multi-GPU reconstruction		√	√
Flight Route Planning	Detailed inspection [3]			√
	Agricultural application	√	√	√
Tools	Annotation and measurement	√	√	√
	Custom coordinate system settings		√	√
	Region of interest		√	√
	Quality reports	√	√	√
	Control and check points		√	√
	Zoom constraints [4]		√	√
	Flight trajectory	√	√	√
	Cluster reconstruction		√	√
	Local PPK calculation of POS data from visible light photos		√	√
	Zenmuse LiDAR cloud PPK [5]		√	√
	Template with custom parameter	√	√	√
Support	Forum community [6]	√	√	√
	Error upload [7]		√	√
	License unbinding [8]	√	√	√
Language	9 multilingual options	√	√	√
	Imperial length units	√	√	√

[1] Only supports importing data collected by DJI Zenmuse LiDAR.

[2] Multispectral reconstruction supports importing photos collected by Mavic 3 Multispectral and Phantom 4 Multispectral.

[3] Only the following models support importing flight routes of detailed inspection projects:
(1) Phantom 4 RTK (remote controller without screen)
(2) Matrice 300 RTK + H20 series payload
(3) Mavic 2 Enterprise Advanced

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(4) Matrice 30 series
(5) DJI Mavic 3 enterprise series
(6) DJI Matrice 4T, 4D, 4TD, and 4E

[4] Scale constraints are only available for visible light reconstruction tasks.
[5] Only supports reconstruction tasks for Chinese mainland users, and the offline license does not include this feature.
[6] https://bbs.dji.com
[7] Only supports reconstruction tasks for Chinese mainland users, and the offline license does not include this feature.
[8] A license bound to one device can be unbound once per calendar year. Licenses bound to three or more devices can be unbound twice per year. All devices under the license will be unbound after applying. Free trial licenses do not support unbinding.

Purchase Licenses

To purchase DJI Terra Agriculture, DJI Terra Pro (Online Version) and Upgrade and Maintenance Fee, or DJI Terra Electricity (Online Version), visit the DJI Online Store (https://store.dji.com), search for "DJI Terra", and select the corresponding version.

To purchase DJI Terra Pro (Online and Offline Versions), DJI Terra Electricity (Online Version), or DJI Terra Education (Online Version), and Upgrade and Maintenance Fee, visit the DJI Terra product page at https://www.dji.com/dji-terra. Input your information on the contact form, and then wait for a DJI authorized dealer to respond to your request.

Refer to the Preparation Before Using DJI Terra for more information on how to activate the offline license and bind a device.

Launch DJI Terra > > Activated License(s) > Buy New License(s). Users will be redirected to the official DJI website to get the details about the functions of different versions. Users can also be redirected to the official DJI website by clicking the corresponding button where Reconstruction, Output Coordinate System, GCP and Constraints, Agriculture, KML File Import, or Model Type function is required.

[1] The education version does not support reconstruction of more than 500 photos or 8GB point cloud, nor error uploads. Other features are equivalent to the flagship version.
[2] Offline authorization cannot use the following online functions:
(1) GEO Zone unlocking
(2) Map loading and location search
(3) DJI Terra software control of aircraft will be restricted (without account login)
(4) Error data upload

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Activate Online Licenses and Bind Devices

To use the licenses with the desired DJI accounts and on the desired computers, license activation and device binding are required. Activate licenses in DJI Terra or via an activation link. The license can be bound to a computer after activation. Contact DJI Support to unbind the license if needed.

1. Enter the activation page via the two methods below:
   DJI Terra: Launch DJI Terra > > Activated License(s) > Activate a New License. A window prompt will appear.
   Activation Link: Visit https://license.dji.com/en
2. Input the activation code you received and the desired DJI account that you want to use the license with, then click “Activate.”
3. After successful activation, view the ID, expiry time, and device binding status of the license. If activating the license via the link, re-enter the Activated License(s) page to view the information.
4. Click “Device Binding” and then click “Bind” to bind the license to the current computer used. “Bound” will be displayed next to the license of the corresponding ID in Activated License(s).

Cluster Reconstruction

Feature Introduction

The Cluster Reconstruction function has been newly upgraded. It can utilize multiple computers on a local area network to reconstruct the same task, breaking through the data volume limitations of a single computer and significantly increasing the reconstruction speed for very large datasets. Visible Light Reconstruction: Aerial triangulation, 2D maps, 3D mesh models, and point clouds support cluster reconstruction. Gaussian splatting, DEM, contour lines, point grids, and TIN do not support cluster reconstruction. LiDAR Point Cloud Reconstruction: Preprocessing, point clouds, 2D maps, and 3D mesh models support cluster reconstruction. Gaussian splatting, DEM, and contour lines do not support cluster reconstruction. If a reconstruction task is initiated as a cluster reconstruction for a result type that does not support it, the reconstruction process will actually only use the local computer and will not call upon other nodes in the cluster environment.

In Terra v5.1.0 and above, both control and worker devices can initiate cluster reconstruction tasks. The control device is only responsible for maintaining the cluster's network connections and task scheduling. If the control device disconnects, DJI Terra will automatically designate a worker device as the new control device to maintain a stable network connection.

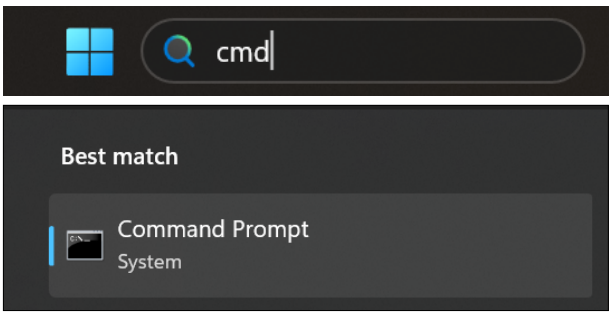
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Instructions

1. Before using the cluster feature, ensure the following configurations are met:

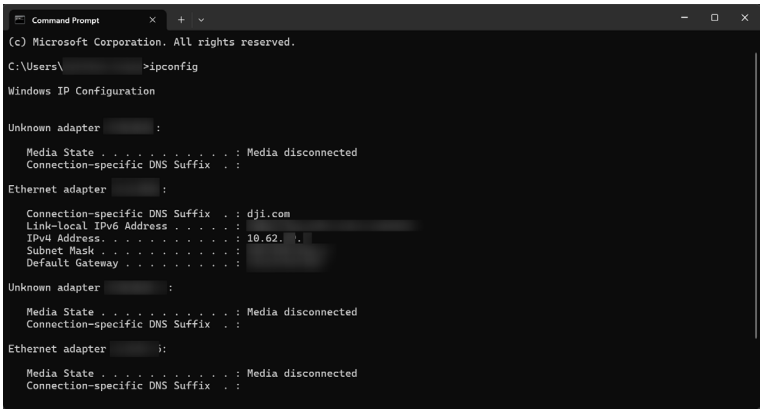
Configuration Item	Requirements
2 or more Windows computers	Operating System: Windows 10 or later Memory: 32 GB or higher Graphics Card: NVIDIA RTX 1650 or above Hard Drive: Mechanical hard disk with at least 500 GB of free storage
Smooth LAN Connection	Make sure all Windows PCs are connected to the same local area network.
Folder/Project file storage access rights	Make sure every device in the cluster can access the folders containing the original photos, LiDAR point cloud data, and project file storage locations for the reconstruction project. It is recommended to store the data on a NAS (mechanical hard drives are recommended for cost-effectiveness) and set the project file storage location to another NAS (an SSD is recommended, as cluster reconstruction has high demands on hard drive read/write speeds).
DJI Terra Standard Edition or higher license	Each computer must have the same version of DJI Terra installed and possess a DJI Terra Standard Edition license or higher. When performing cluster reconstruction, make sure all worker devices in the cluster have the required license permissions for the reconstruction task; otherwise, worker devices without the appropriate license will not operate. For example, if a computer with a Standard edition license initiates a cluster reconstruction task, computers in the cluster with an Agriculture edition license will not perform the reconstruction.

2. How to Verify LAN Connectivity
   (1) In the Windows search bar, type Command Prompt (or cmd) and open it.

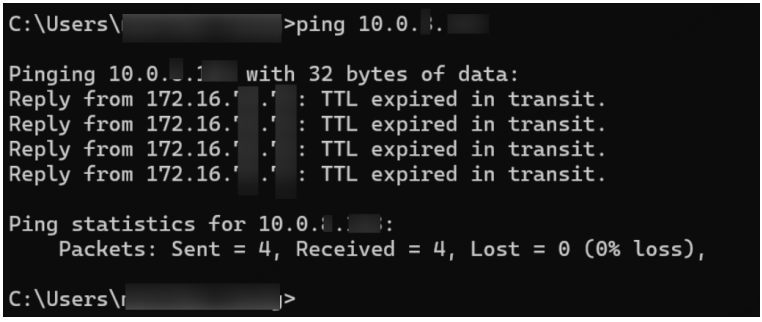


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(2) Type ipconfig to view the current computer's IP address.

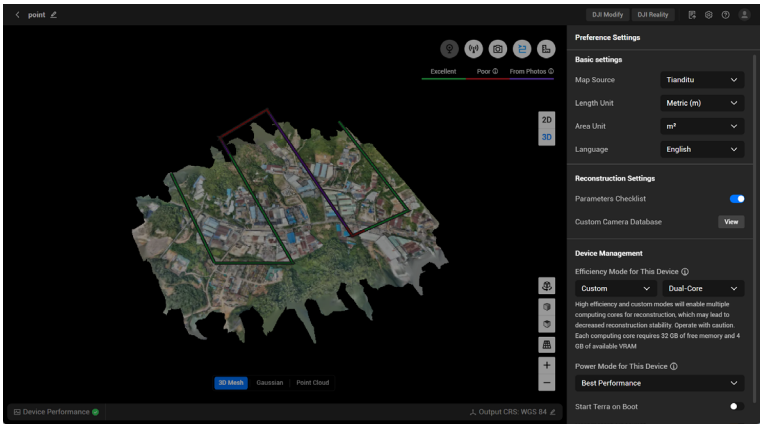


(3) On another worker device in the same cluster, open the Command Prompt as well, then enter ping xxx.xxx.xxx.xxx (where xxx.xxx.xxx.xxx is the IP address you just found). If the result shows Lost=0 as shown in the image below, it means the two computers are communicating properly.

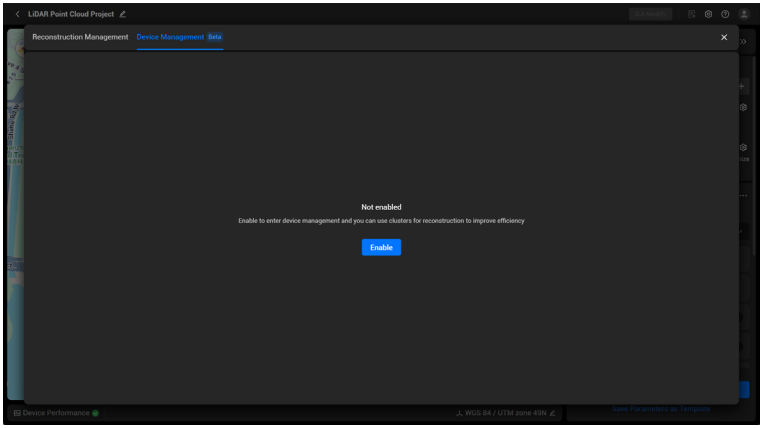


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(4) On the main interface, click in the upper right corner to open the Preferences page.

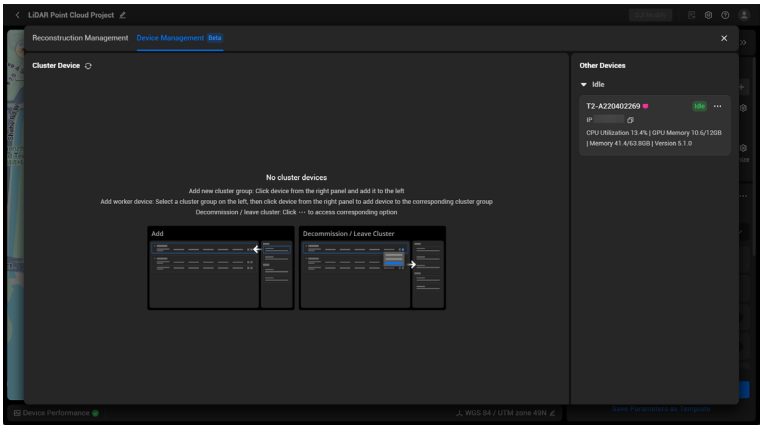


(5) Click Device Management > Cluster Device Management > Settings to enter the cluster device management panel.

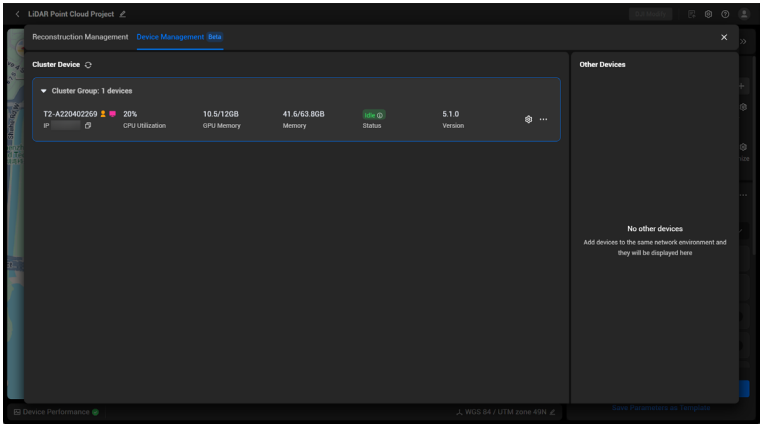


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(6) Click Enable to access the node management interface.

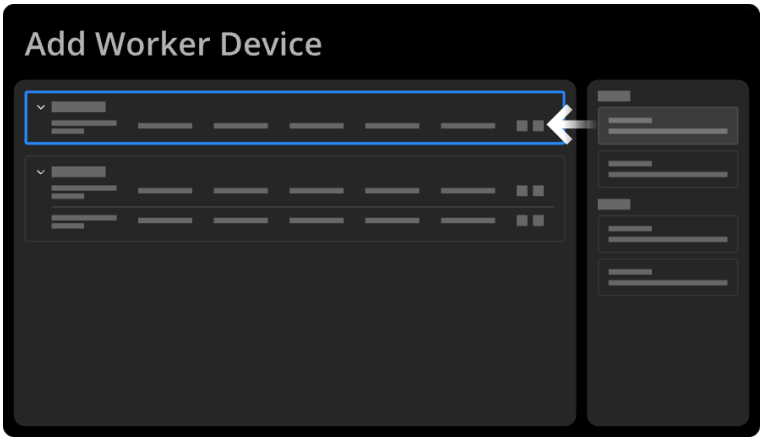


(7) Create a new cluster: From the right panel, click on a device to add it to the left.



(8) Add a worker device: Select a cluster group on the left, then from the right panel, click on a device to add it to that cluster group.

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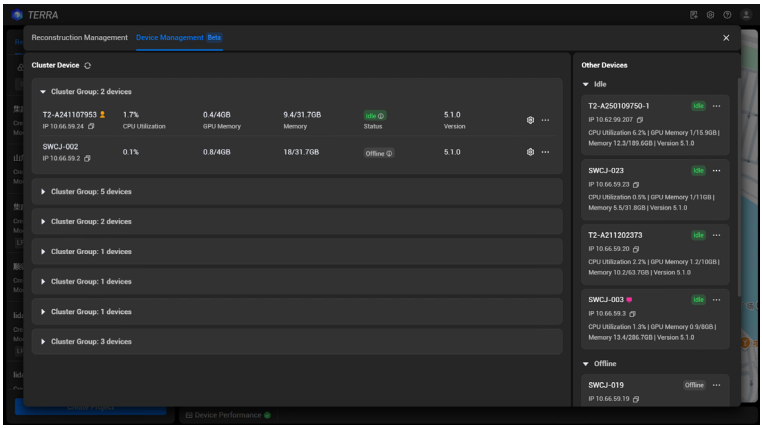


(9) Decommission / Leave cluster: Click ••• to perform the action.

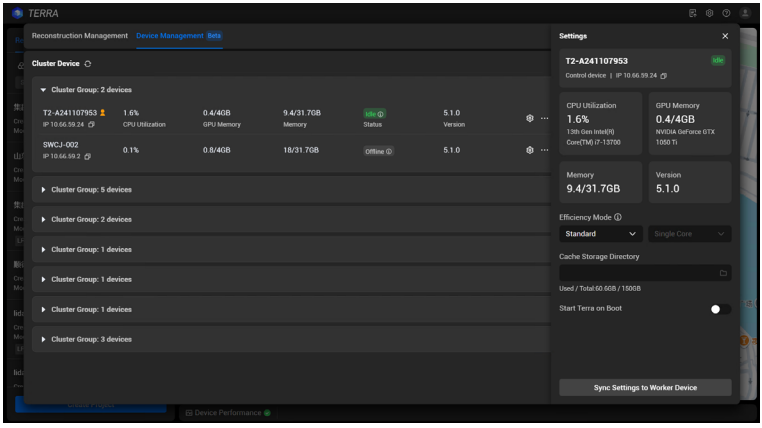


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(10) Multiple clusters can be created. Within a single cluster, all worker devices can initiate cluster reconstruction tasks. DJI Terra will automatically assign reconstruction blocks to each worker device based on its computer performance.



(11) Click ⚙ to configure the worker device's performance mode, cache path, and start on boot settings. The control device also supports one-click synchronization of the start-on-boot setting to other devices.



a) Efficiency Mode:
Standard Mode: DJI Terra will run one computing core and process one reconstruction block at a time. High-Efficiency Mode: DJI Terra will run multiple computing cores based on the computer's performance limits, processing as many blocks as possible at once, but with slightly reduced reconstruction stability. Custom Mode: You can force the current computer to run 2-5 computing cores. It is recommended to try different combinations of 2-5 computing cores multiple times before enabling this mode, to ensure the computer's reconstruction stability.

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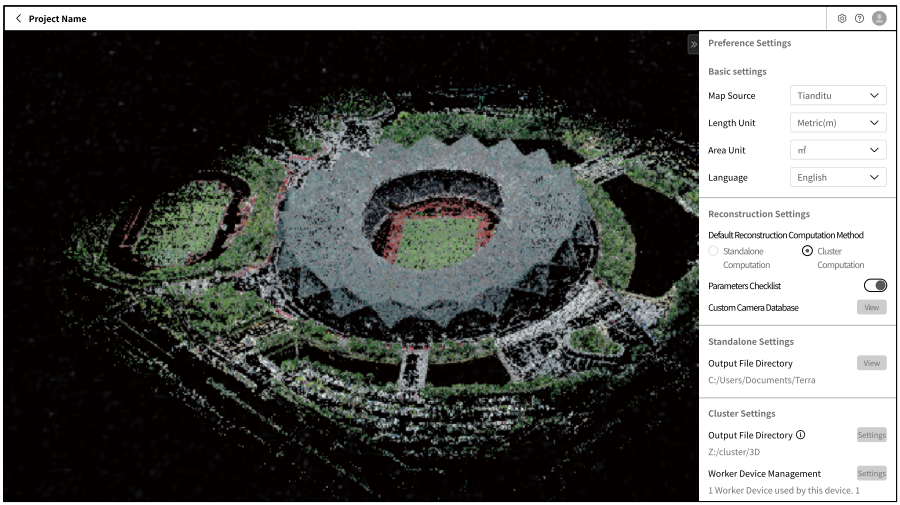
When a worker device's CPU has multiple cores and threads and a large amount of memory (e.g., 128GB or more), enabling computing cores can significantly increase reconstruction speed. When the computer has fewer cores and threads and insufficient memory (e.g., 32GB or less), enabling computing cores will only slightly increase speed, but stability will decrease.

b) Local Cache Path: Used to store temporary files for cluster reconstruction. It is recommended to choose a non-system drive (i.e., not the C drive) and preferably an SSD.

c) Start on Boot: When enabled, DJI Terra will run automatically every time the computer restarts, effectively reducing connection failures after other cores reboots from a power outage.

Environment Setup

Refer to Preparation Before Using DJI Terra for more information on required devices and how to set up Cluster version.



Preferences Settings

Click the Settings icon in the upper-right corner of the main interface to open the system settings page. This page includes the basic settings, reconstruction settings, and device management sections, allowing you to customize how the software works based on your habits and hardware environment.

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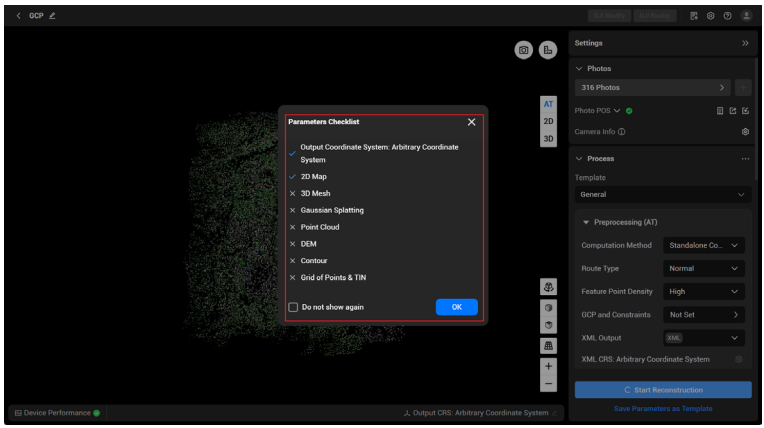
Basic Settings

This section covers general settings such as language, map source, and length units.

Parameter	Feature Description	Value or Remarks
Language	Switch the display language of the software interface.	Supports Chinese, English, Japanese, Korean, German, Russian, French, Spanish, and Italian.
Map Source	Switch the basemap service provider for the task map.	Supports Google Maps and Tianditu.
Length Unit	Set the unit of measurement for distance and elevation in the project.	Supports Metric (m) and Imperial (ft).
Area Unit	Set the area unit used in measurement results and reports.	Supports m^2, km^2, Mu, and Ha.
Start Terra on Boot	Set whether the software starts together with the operating system.	When enabled, DJI Terra will start automatically when Windows starts.

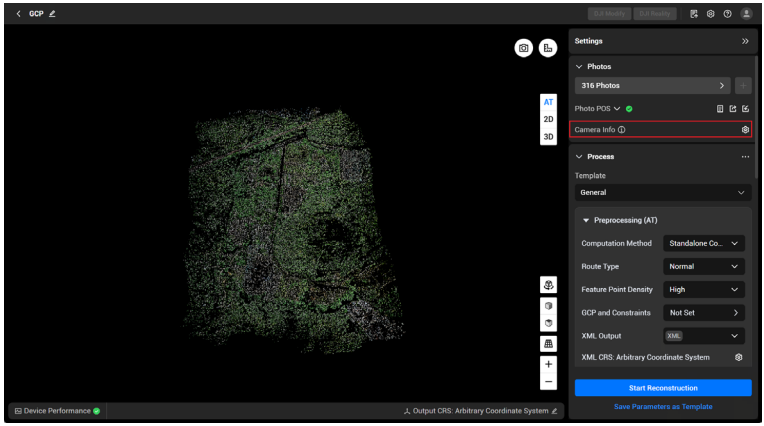
Reconstruction Settings

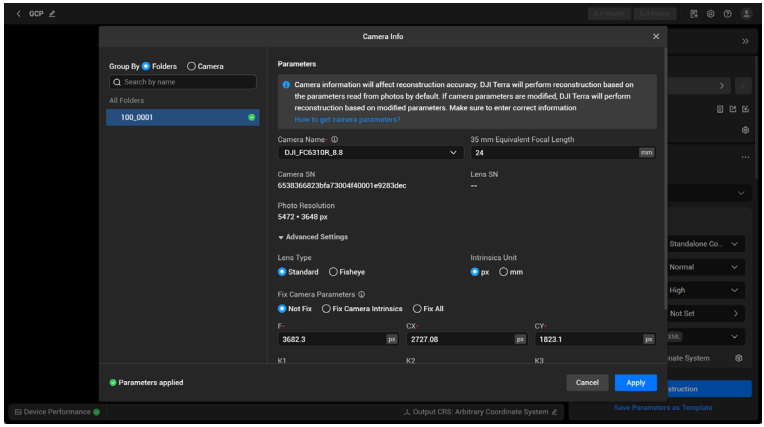
Parameter Checklist: You can enable or disable this feature. When enabled, a parameter checklist will appear for confirmation when you click "Start Reconstruction."



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Custom Camera Database:
In addition to the standard camera parameters built into the software, any new camera parameters that you import and use will be automatically saved in this database. You can easily use them in future tasks. You can click "View" to browse, manage, or clear saved custom camera data.





Device Management

Efficiency Mode for This Device: supports Standard, High Efficiency, and Custom modes. In High Efficiency and Custom modes, multiple computing cores are started for reconstruction. This makes efficient use of computer resources, reduces idle time for hardware such as the CPU, memory, and GPU, and improves processing efficiency. However, using too many computing cores may cause resource conflicts and lead to system instability. It is recommended to enable one computing core for every 32 GB of available RAM and 4 GB of available VRAM.

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Power Mode for This Device: supports Balanced, Best Power Efficiency, Best Performance, and Ultimate Performance. Note that modifying this setting will also update the power mode setting of the Windows system. Due to limitations in some Windows versions, modifications may not take effect. Refer to the actual system status.

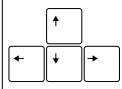
View and Export Logs

DJI Terra generates a log file every time a mission is performed. If an error occurs or the software crashes during the operation process, users can enter a mission and click > to export log files or use the keyboard shortcut Ctrl+Alt+L to open the log storage path after opening DJI Terra. Users can access the corresponding log file in the storage path below according to the time when the mission was performed. Then export it and send it to DJI Support for analysis.

Storage Path: C:\Users\<Computer User Name>\AppData\Roaming\DJI Terra\log

Software Shortcuts

In DJI Terra, users can perform some functions and operations using shortcuts. The table below lists the shortcuts that can be used in different pages in DJI Terra.

Page	Functions / Operations	Shortcuts
Mission Library	Create mission	Ctrl+N
	Switch mission type when creating a mission	Tab
	Switch mission type	Tab
	Switch mission	Up: ↑ , Down: ↓
	Switch operation for mission	Left: ← ,Right: →
	Delete mission	Delete
	Select all missions when deleting or exporting multi missions	Ctrl+A
Map	Map Zoom In/Out	Zoom In: +, Zoom Out: -
Mission Editing	Save the current mission	Ctrl+S
	Delete the selected waypoint	Delete
	Switch parameter	Tab
	Adjust parameter value	More: ↑ , Less: ↓
Waypoints or Detailed Inspection Mission Editing	Switch waypoint	Previous: Ctrl+ ← Next: Ctrl+ →
Detailed Inspection Mission Editing	Adjust waypoint location	
Reconstruction	Open the current mission folder	Ctrl+Alt+F

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3D Model Map	Switch model display view	Orthographic projection: F1 Front view: F2 Top view: F3
	Switch between aerotriangulation, point cloud, and model result	F4
Photo Management	Select the photos in series in the same folder	Shift+click the first and last photo
	Delete multi photos in the same folder	Delete
GCP and Constraints	Edit the name of the selected GCP	Enter
	Switch GCP	Up: ↑ , Down: ↓
	Switch parameter	Tab
Annotation and Measurement	Switch object for measurement	Tab
	Expand or collapse measurement results	Ctrl+Q
Measurement Result Management	Select results in series	Shift+click the first and last measurement results
	Select all results	Ctrl+A
Flight Route Plan in Agricultural Application	Delete the selected farmland point or calibration point	Delete
	Switch between farmland points or calibration points	Tab
	Save the current mission	Ctrl+S
	Show or hide recognition result	F5
	Modify fruit trees recognition result	Ctrl+Left Mouse Button
	Show or hide prescription map	F6
	Enable or disable obstacle avoidance	F7
	Show or hide flight route	F8
All Pages	Open the log storage directory	Ctrl+Alt+L

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