

DJI GS PRO

User Manual

V1.2 2017.01



Video Tutorials



Virtual Fence Mission



3D Map Area Mission



Waypoint Flight Mission

Contents

Video Tutorials	2
Disclaimer	4
Warning	4
Introduction	4
Download DJI GS Pro	5
Connect the Aircraft	5
Mission Type	5
Virtual Fence	5
3D Map Area	5
Waypoint Flight	5
DJI GS Pro Interface	6
Create Mission	8
Perform Mission	9
Pre-flight Checklist	9
Start to Fly	9
Pause Mission	9
Special Cases	10
Mission Complete	10
Parameter Setting Introduction	11
Screen Elements	11
Virtual Fence	12
3D Map Area	13
Waypoint Flight	16

Disclaimer

Read this disclaimer and the Terms of Use in DJI GS Pro (hereinafter referred to as “product”) carefully before using this product. By using this product, you hereby agree to this disclaimer and the Terms of Use and signify that you have read it fully. Please install and use this product in strict accordance with the User Manual. SZ DJI TECHNOLOGY CO., LTD. and its affiliated companies assume no liability for damage(s) or injuries incurred directly or indirectly from using this product improperly.

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This disclaimer is produced in various languages. In the event of variance among different versions, the Chinese version shall prevail when the product in question is purchased in China, and the English version shall prevail when the product in question is purchased in any other region.

Warning

1. Ensure your flight area is safe before each flight.
2. The aircraft will continue its mission, meaning Failsafe RTH will not be triggered, if the remote controller signal is lost during the mission.
3. When the GNSS signal is strong, if the RTH button is pressed and held during a mission, the aircraft will stop the mission immediately and begin RTH. The mission cannot be continued and will need to be restarted.
4. When the battery level or voltage is low during mission, the DJI GS Pro will prompt a Low Battery Level Warning, and the aircraft will pause the mission and begin RTH or landing. The mission can be continued after replacing battery. The low battery threshold is the value pre-set in DJI GO™ / DJI GO 4 app.
5. Enabling iPad sound is strongly recommended to avoid missing important hints and warnings that help ensure a safe flight.
6. Aircraft with obstacle avoidance will have this capability enabled by default in DJI GS Pro to ensure flight safety. Check that the Sensing System is operational in the current surroundings. If it is not, disable it in the “Prepare for Flight” checklist, or the mission will not be able to start.
7. All of the altitude values in DJI GS Pro are relative to the altitude of the take-off point. In the same mission, the altitude above sea level for the same point during the mission will vary if taking off at different altitudes.

Introduction

DJI GS Pro (also known as Ground Station Pro) is an iPad app designed for industrial applications including but not limited to, aerial imaging, architecture, precision agriculture, electrical inspections, search and rescue, safety control, and more. It provides easy mission planning and automated aircraft control during the planned mission. DJI GS Pro is compatible with the iPad product line and many DJI aircraft, flight controllers, cameras and accessories*.

* Support for DJI devices will be added as testing and development continues. Visit the DJI GS Pro product page on [dji.com](http://www.dji.com) for a complete list.

<http://www.dji.com/ground-station-pro>

Download DJI GS Pro

Search for “DJI GS Pro” on the App Store, and install the app on your iPad.



- DJI GS Pro is supported on iOS 8.1 (or later)
- First-time use requires an internet connection for activation.



Aircraft or flight controller must be activated before using DJI GS Pro.

Connect the Aircraft

1. Using the Phantom 4 series, Inspire 2 or Mavic Pro: Toggle Flight Mode Switch to P-mode, then connect the aircraft to DJI GS Pro as if using the DJI GO / DJI GO 4 app.
2. Using the Phantom 3 series, Inspire 1, Matrice series, N3 or A3 series: Toggle Flight Mode Switch to F-mode, then connect the aircraft to DJI GS Pro as if using the DJI GO app.

Mission Type

Virtual Fence



A virtual fence defines a specific area of flight and is useful in scenarios where some areas of a site are no-fly zones or if flight should only happen within one area, such as during manual pesticide spraying or flight training. As the aircraft approaches the boundaries of the virtual fence it will slow to a hover, ensuring it stays within the flight area.

3D Map Area



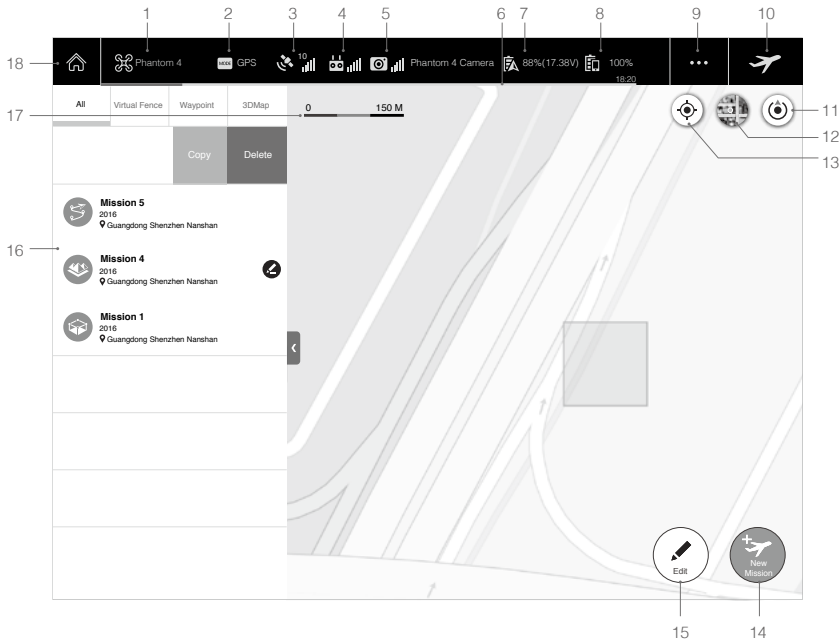
DJI GS Pro automatically generates efficient flight paths after the user has set their required flight area and camera parameters. The aircraft will then follow this route throughout its mission. The image data captured during these flights can be input into 3D reconstruction software to generate 3D maps.

Waypoint Flight



Set a waypoint flight path, define waypoint actions then start flying with a tap.

DJI GS Pro Interface



1. Aircraft / Flight Controller Connection

 : Shows the current connection status between DJI GS Pro and the aircraft or flight controller.


2. Flight Mode

 : Shows the current flight mode of the aircraft.


3. GNSS Signal Strength

 : Shows the current GNSS signal strength and number of connected satellites.


4. Remote Controller Signal Strength

 : Shows the strength of the remote controller signal.


5. Camera Model

 : Shows the camera model used and the strength of the video downlink.


6. Battery Level Indicator

 : Provides a dynamic display of the remaining flight time if using DJI Intelligent Flight Batteries. The red zone represents critically low battery level.

7. Aircraft Battery Level

 88%(17.38V) : Shows the current battery level and battery voltage if using DJI Intelligent Flight Batteries, or it shows the current battery voltage if using other batteries.


8. iPad Battery Level


 100% : Shows the current battery level of the iPad.

9. General Settings


• • • : Tap for compass calibration, stick mode, measurement unit settings, and Terms of Use.
Tap Help for app or flight controller version (tap to switch) and usage.

10. Prepare for Flight / Pause Mission / Resume Mission / End Mission


 /  Prepare for Flight: Tap to enter the checklist after setting parameters.

 Pause Mission: Tap to pause the mission during 3D Map Area or Waypoint Flight missions. A menu for further actions will appear.

▶ Resume Mission: After pausing a mission, enter Edit mission, and tap this button. A menu will appear allowing you to resume a mission or carry out a different operation.

 End Mission: Tap to end a Virtual Fence mission, disabling the fence.


11. Rotation Lock

 : Rotation is locked by default, i.e. the map view will not follow iPad rotation, and North is at the top. Tap the Rotation Lock button during mission editing to unlock rotation and have the map view follow the iPad rotation.

12. Map Mode

 : Tap to switch between Standard Map, Satellite Map or Hybrid Map.

13. Location

 : Tap to center the map around the iPad location.

14. New Mission

 : Tap to add a new mission then select mission type and waypoint setting method. Refer to Create Mission for more details.


15. Edit Mission

 : Choose one mission in the mission list then tap this button to enter parameter settings.


16. Mission List

Shows available missions. View all missions or sort by type, and tap a mission to select it. The Edit button will appear in the bottom right corner of the screen. To copy or delete a mission, swipe it to the left and choose the appropriate option. Tap the arrow on the right of the list to collapse or expand it.

17. Scale

 : Shows the current scale of the map.

18. Back

 : Tap to return to the main menu.

Create Mission

1. New Mission

Tap the New Mission button on the bottom right corner of the screen.



2. Choose Mission Type

Choose an appropriate mission type.



3. Choose Point Set Method



There are two methods to set Virtual Fence boundaries, 3D Map Area or flight waypoints. Up to 99 waypoints can be set for a Waypoint mission, and there is no limit for other missions.







/



Tap: Tap on the map to create waypoints.

Tapping on the map once in Virtual Fence or 3D Map Area will create a rectangular flight zone around that point, while tapping in Waypoint mission will create a single waypoint. Tap any point to select it, and it will go from white to blue. Drag the point to change the area shape or the flight path. Drag  onto the map to add a point. Tap  on the bottom left corner of the parameter settings page to delete a selected point.

Aircraft: Fly the aircraft to the desired position to set the location as a boundary point in the Virtual Fence or 3D Map Area missions or as a Waypoint in Waypoint mission.

Tap  to set the current position of the aircraft as a boundary point or waypoint. Tap  under the "Set" button  to delete the last point. After setting all the required points, tap .

The flight area will be generated according to the order the points were set.



The area generated according to the order that the points were set cannot intersect otherwise a flight area cannot be generated. DJI GS Pro will decide if points can be used to generate a flight area. If not, the "Finish" button will be grayed out and cannot be tapped.

4. Parameter Settings

Set each item in the parameter setting list and tap the "Save" button on the top left corner of the screen when complete. Refer to the Parameter Settings Introduction for more details.

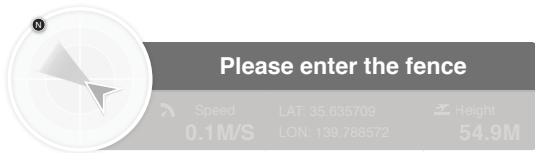
Perform Mission

Pre-flight Checklist

Choose a mission in the mission list, tap “Edit” then tap “Prepare for Flight” in the top right corner of the screen. Check and adjust the aircraft according to the checklist that appears until all items are green, indicating that takeoff is permitted. Items in yellow require adjustment but the aircraft can take off without doing so. Only flying when all items are green is highly recommended.

Start to Fly

Tap “Start to fly” at the bottom of the checklist when ready. An aircraft’s actions will vary depending on its mission. The Aircraft Status Bar will show the current aircraft status, mission progress, etc.



Virtual Fence

After starting, if the aircraft’s latitude, longitude or altitude is outside of the fence boundaries, there will be visual and audio prompts on the iPad. The Virtual Fence will be disabled at this time and the aircraft can be flown freely. The Virtual Fence will be automatically enabled when the aircraft enters fence boundaries. Once inside, if the aircraft approaches the boundaries of the fence, it will slow to a hover and audio prompts will sound from the iPad.

3D Map Area / Waypoint Flight

After starting, the aircraft will fly to the start point automatically.

Pause Mission

During 3D Map Area or Waypoint Flight missions, tap the “Pause Mission” button on the top right corner of the screen to pause the mission. The aircraft will hover in place and record the last performed waypoint. The aircraft can then be flown freely and a menu will pop up with additional control options.

Resume from Last Stopped Point: The aircraft will continue the mission from the point where recording stopped.

Start Over: The aircraft will fly to the start point and restart the mission.

Cancel Current Mission: The aircraft will stop and exit from the current mission. The mission cannot be continued.

Back to Mission List: Back to the mission list. To check this menu again, select the required mission and tap edit then tap “Resume Mission”.

Special Cases

1. During a Virtual Fence mission, if the aircraft flies out of the fence due to external forces i.e. strong wind, a prompt will appear in the Aircraft Status Bar, an audio prompt will sound from the iPad, and the fence will be disabled. Users must stop the mission and restart it.
2. During a Virtual Fence mission if the flight mode switch on the remote controller is toggled, the fence will be disabled immediately. The aircraft will stop and exit from the current mission, a prompt will appear in the Aircraft Status Bar, and an audio prompt will sound from the iPad.
3. During any mission, the aircraft will exit from its mission and enter a normal flight mode if positioning is not available due to a weak GNSS signal. Users can choose to continue the mission if the signal is strong. When continuing, the aircraft will continue from its last recorded point.
4. Low Battery Level Warning: When the battery level or voltage is lower than the value pre-set, an audio prompt will sound from the remote controller. After a few seconds, the aircraft will pause the mission and begin RTH. Users can cancel the RTH by pressing the Smart RTH button on the remote controller. The mission can be continued and the aircraft will continue the mission from the point where recording stopped after replacing battery.
5. Critically Low Battery Level Warning: When the battery level or voltage is lower than the value pre-set, an audio prompt will sound from the remote controller. The aircraft will pause the mission and land automatically. The mission can be continued and the aircraft will continue the mission from the point where recording stopped after replacing battery.

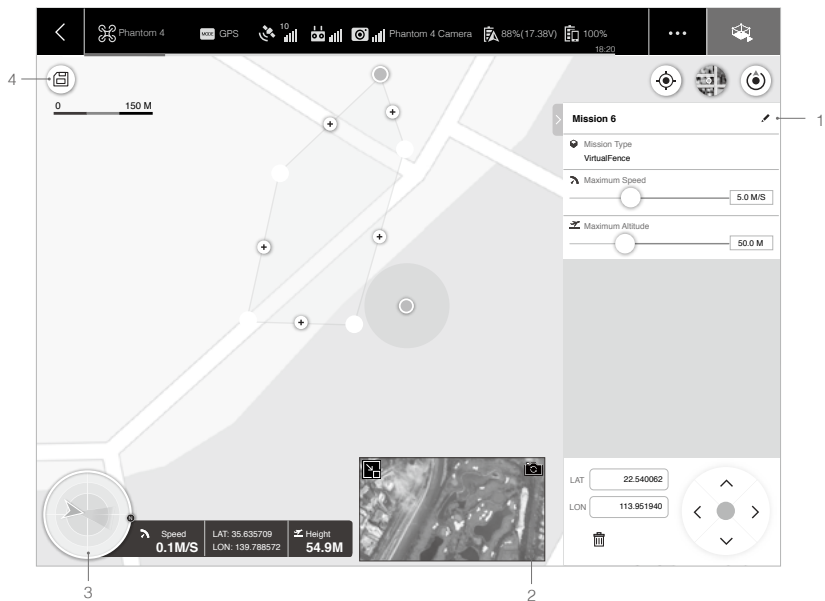
Mission Complete

After finishing a Virtual Fence mission, tap "End Mission" in the top right corner of the screen. After a 3D Map Area or Waypoint Flight mission is complete, the aircraft will perform the pre-set "End-Mission Action". After the action, the aircraft can be controlled freely.

Parameter Setting Introduction

This section introduces the common screen elements for all mission types, then introduces separate parameters for each mission type.

Screen Elements



1. Parameter List

Collapse / Expand: Tap to collapse or expand the list.

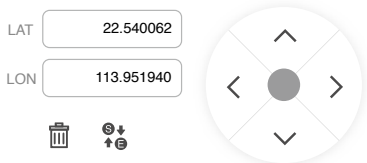
Mission 6 Mission Name: Tap the button on the right to edit the mission name.

Mission Information: Displays mission type. In 3D Map Area or Waypoint Flight missions, it also shows estimated flight time, flight length and waypoint quantity.

Sliders: Slide left or right to adjust values.

Text Box: Tap and hold to show fine tuning buttons. Tap to adjust.

Boundary Point / Waypoint Edit



- a. Latitude & Longitude: Tap the box to input values. Tap the arrow keys on the right for fine tuning. Up and down adjust latitude while left and right adjust longitude.
- b. Delete: Select a point then tap this button to delete it.

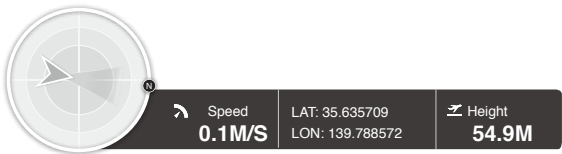
- c. Reverse Path: This option will appear in Waypoint Flight missions. Tap it to swap the start and end points to reverse the flight path. "S" refers to the start point.

2. Camera Preview

/ : The real-time camera view will be shown here once the image feed is received. Double-tap the windows to switch between double / single size display. Tap to minimize the preview.

: If using a DJI A3 or Matrice 600 series device equipped with a DJI gimbal, camera, or other HDMI/AV camera, tap this icon to configure available preview sources and the bandwidth ratio between sources.

3. Flight Telemetry



Flight Attitude and Radar Functions

- The aircraft's flight attitude is indicated by the circular icon.
- a. The blue arrow indicates the aircraft and shows the direction it is facing.
 - b. The ratio of the grey and blue areas indicate aircraft pitch.
 - c. The horizontal level of the grey area indicates the aircraft's roll angle.

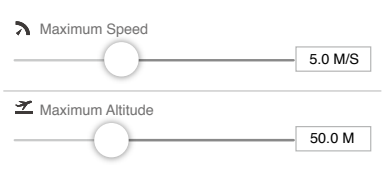
Flight Parameters

- Speed:** Movement speed of the aircraft.
- Latitude & Longitude:** Two values that define aircraft location.
- Altitude:** Vertical distance from the takeoff point.
- North:** indicates North according to the iPad location. This North is unrelated to North on the map.

4. Save

: Tap to save current settings.

Virtual Fence



- 1. **Maximum Speed**
Aircraft speed limit. This is 5m/s by default. The range is 1 to 12m/s.
- 2. **Maximum Altitude**
Aircraft altitude limit. This is 50m by default. The range is 2 to 200m.

3D Map Area

Flight Path Display



Displays the generated flight path if enabled. The path will be hidden if disabled.

Basic

Basic		Advanced
Camera Model	Phantom 4 Camera >	
Shooting Angle	Parallel to Main Path >	
Capture Mode	Hover&Capture at Point >	
Flight Course Mode	Scan Mode >	
Speed	<input type="range"/> 9.7 M/S	
Altitude	93.3 M	Resolution 4.0 CM/PX

1. Camera Model

Always set parameters according to the camera and lens used in order to calculate the optimal flight path.

Fixed Lens: Includes DJI Phantom 3 series, Phantom 4 series and Mavic Pro, Zenmuse X3, and Zenmuse X4S cameras. The app will choose the corresponding camera when an aircraft is connected.

Variable Lens (Zenmuse X5 / Zenmuse X5R / Zenmuse X5S / Zenmuse Z3): Tap to enter, set the parameters according to the lens or zoom level used then tap "Add Camera".

Custom Camera: Tap "New Custom Camera", set the parameters according to the camera and lens used (input "1", if you're not sure about distortion) then tap "Add Camera".

2. Shooting Angle

Choose the direction of the camera when flying along the path.



Main Path: The flight path on which shooting is required is called the Main Path in a 3D Map Area mission.

Parallel to Main Path: The camera is parallel to the main path, i.e. the angle of the camera pan axis is the same as the angle of the main path. The pictures captured on the main path will be put in order as shown.



Vertical to Main Path: The camera pan axis is vertical to the main path. The pictures captured on the main path will be put in order as shown.



3. Capture Mode

Hover & Capture at a Point: The app will calculate the flight path and waypoint quantity according to the parameters. When performing a mission, the aircraft will hover and capture at each waypoint. In this mode, shooting is stable, but the time required will be long. The number of waypoints required may be large, which will also make mission times longer.

Capture at Equal Dist. Interval / Time Interval: In Capture at Equal Dist. Interval / Time Interval Modes, the aircraft will not hover during capturing as it flies along the main path. The capture interval is calculated automatically according to the overlap ratio and other parameters. The flight speed is calculated automatically according to the camera features and the altitude (resolution) setting. In this mode, operation is fast. However, short exposure times are required.



If the interval is too small, Equal Dist. Interval / Time Interval are not be available due to the short shooting interval or the minimum speed of the aircraft. If this occurs, a warning will pop up and the aircraft will switch to Hover & Capture at a Point automatically.



Flight controller version 3.2.10 or later is required for Distance Interval / Time Interval. If using an older version, a prompt will appear warning that this is not available. This capture mode can be used after a firmware update. Go to General Settings > Help > App Version, to check the current flight controller version.

4. Flight Course Mode

Scan Mode: Generate a flight course by scanning line by line. For a concave polygon, the course may be beyond the area boundaries.

Inside Mode: Every part of the flight course generated will be inside the area. For a convex polygon, the course will be the same as the one generated in scan mode. For a concave polygon, the course will be optimized for accuracy so the flight course may intersect.

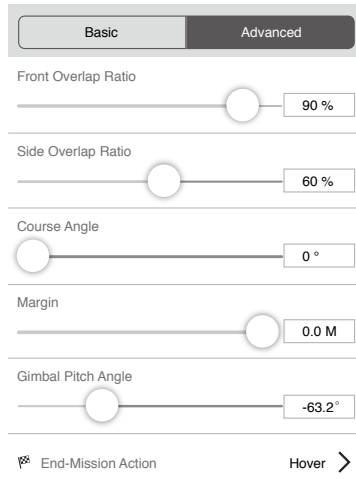
5. Speed

Flight speed can only be set in Hover & Capture at a Point. Speed is defined as 5m/s by default and can be set between 2 to 15m/s. In Distance Interval / Time Interval, the speed is calculated automatically, so it cannot be adjusted here.

6. Altitude

Adjust the flight altitude or the corresponding resolution. It is defined as 50m by default and can be set between 5 to 200m.

Advanced



1. Front Overlap Ratio

The overlap ratio of two consecutive pictures captured along the same main path. This is defined as 90% by default and can be set from 10% to 99%.

2. Side Overlap Ratio

The overlap ratio of two pictures on two parallel main paths. This is defined as 60% by default and can be set from 10% to 99%.

3. Course Angle

The angle of the main path. East is 0°, with a positive value when it is counterclockwise and a negative value when it is clockwise. The range can be set from 0° to 360°.

4. Margin

Expand (positive value) or narrow (negative value) the area margin for control over the area of flight. The margin range is defined as -30 to +30m in scan mode and -30 to 0m in inside mode.

5. Gimbal Pitch Angle

The gimbal pitch angle at the selected waypoint. Pitch angle can range from -90° to 0°, with downward represented by -90° and forward represented by 0°.

6. End-Mission Action

Aircraft action after completing a mission.

Return to Home: Tap to enter and set the RTH altitude. 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 is defined as 50m by default and can be set from 20 to 150m.

Hover: The aircraft will hover at the final waypoint after mission completion. Then users can then control the aircraft directly.

Land: The aircraft will land at the final waypoint and stop motors automatically after mission completion.

Waypoint Flight

All Points

1. Speed

Maximum speed. This can be set from 2 to 15m/s. The aircraft will fly at this maximum speed except when accelerating or decelerating.

2. Altitude

The relative altitude between the aircraft and the takeoff point during flight. This can be set from 1 to 200m. You can also set the altitude of each point in "Each Point" settings.

3. Aircraft Heading

Course Aligned: The aircraft's nose is always aligned to the direction of the next two waypoints.

Defined Per Point: Set aircraft heading at each waypoint in "Each Point" settings.

Manual: Users manually control the aircraft heading using the control sticks.

4. Gimbal Pitch Angle

Manual: Users manually control gimbal pitch through the gimbal dial.

Defined Per Point: Set gimbal pitch angle at each waypoint in "Each Point" settings.

5. End-Mission Action

Aircraft action after mission complete.

Return to Home: Tap to enter and set the RTH altitude. 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 is defined as 50m by default and can be set from 20 to 150m.

Hover: The aircraft will hover at the final waypoint after mission completion. Then users can then control the aircraft directly.

Land: The aircraft will land at the final waypoint and stop motors automatically after mission completion.

Each Point

The screenshot shows the 'Each Point' configuration screen. At the top, there are two tabs: 'All Points' and 'Each Point'. Below the tabs, there are five settings sections:

- Altitude:** Includes an 'Altitude' icon, an 'Enable' button, and a slider set to 50.0 M.
- Aircraft Heading:** Includes an 'Aircraft Heading' icon and a slider set to 0°.
- Aircraft Rotation Direction:** Includes an 'Aircraft Rotation Direction' icon and two buttons: 'Clockwise' and 'Counter Clockwise'.
- Gimbal Pitch Angle:** Includes a 'Gimbal Pitch Angle' icon and a slider set to 0°.
- Waypoint Action:** Includes a 'Waypoint Action' icon, a 'No Action' button, and a right-pointing arrow.

Select a waypoint (it will turn blue when selected) then set waypoint parameters.

1. Altitude

If disabled, the altitude will be set according to "All Points" settings. If enabled, the altitude of each waypoint can be set separately. Then range can be set from 1 to 200m. The aircraft will ascend and descend automatically during flight according to the value of each waypoint.

2. Aircraft Heading

This option will be available only if "Defined Per Point" is set for "Aircraft Heading" in "All Points" settings. North is 0°, with a positive value indicating clockwise. The available range is from -180° to 180°.

3. Aircraft Rotation Direction

The aircraft rotation direction when flying to the next waypoint. This option will be available only if "Defined Per Point" is set for "Aircraft Heading" in "All Points" settings. Choose from Clockwise and Counter Clockwise.

4. Gimbal Pitch Angle

The gimbal pitch angle at the selected waypoint. This option will be available only if "Defined Per Point" is set for "Gimbal Pitch Angle" in "All Points" settings. Pitch angle can range from -90° to 0°, with downward represented by -90° and forward represented by 0°. The gimbal will tilt gradually to the angle pre-set at the next waypoint if the values at the two consecutive waypoints are different.

5. Waypoint Action

Tap to enter. Up to 15 actions can be added. Delete actions, re-order them or copy them to other waypoints.

Add Waypoint Actions: Tap to add. Actions will be performed in the order they are added unless re-ordered.

- Hover: The aircraft will hover at the waypoint. Tap to set hovering time.
- Photo Capture: Capture on arrival at a waypoint. Note that Photo Capture cannot be added if the camera is recording.

- c. Start Recording: Start recording on arrival at a waypoint. Note that Start Recording cannot be added if the camera is already recording.
- d. Stop Recording: Stop recording on arrival at a waypoint. Note that Stop Recording cannot be added if the camera is not recording.
- e. Aircraft Rotation: Adjust the aircraft heading on arrival at a waypoint. Tap to set the rotation angle. North is 0° with a negative value representing clockwise and the range is -180° to 180°.
- f. Gimbal Pitch Rotation: Adjust the gimbal pitch angle on arrival at this waypoint. Pitch angle can range from -90° to 0°, with downward represented by -90° and forward represented by 0°. If "Gimbal Pitch Angle" is set as a value in "Each Point" settings, the aircraft will fly to the waypoint with the defined Gimbal Pitch Angle then adjust it according to the Gimbal Pitch Rotation settings defined when adding a Waypoint Action for the current waypoint.

Delete Action: Slide the desired action in the action list left then tap Delete.

Re-Order: Tap to enter. Tap and hold the desired action, drag it to the desired position and release. After all the actions are in the desired position, tap Re-Order Finished.

Propagate Actions: Tap to copy all actions to all other waypoints.

This content is subject to change.

Download the latest version from
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