

U|g|CS for DJI Phantom 2 Vision+

Mobile companion application



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Preface

U|g|CS is a fully functional ground control software for your drone which runs on your PC. U|g|CS gives you all the tools required to plan aerial surveys, control your drone directly, monitor telemetry, view and record online video and do post-flight analysis. For more information please visit www.ugcs.com.

U|g|CS for P2V+ mobile companion application (U|g|CS mobile companion) is an android application specific to DJI Phantom 2 Vision+ drone. It bridges the gap between the drone and full featured U|g|CS desktop application but can also be used standalone.

For DJI Phantom 4, Phantom 3, Inspire 1 and M100 drone series please use **U|g|CS for DJI** application from [Googe Play](#).

Drone connection and first run

Before you begin

To continue you need the following items:

- DJI Phantom 2 Vision+ drone;
- U|g|CS for P2V+ mobile companion – get the latest app [from Google Play](#)
- U|g|CS desktop application – get the latest version [here](#).
- Android 4.4+ compatible device (Smartphone). It is recommended to use 4.5’’ display or larger.

First run

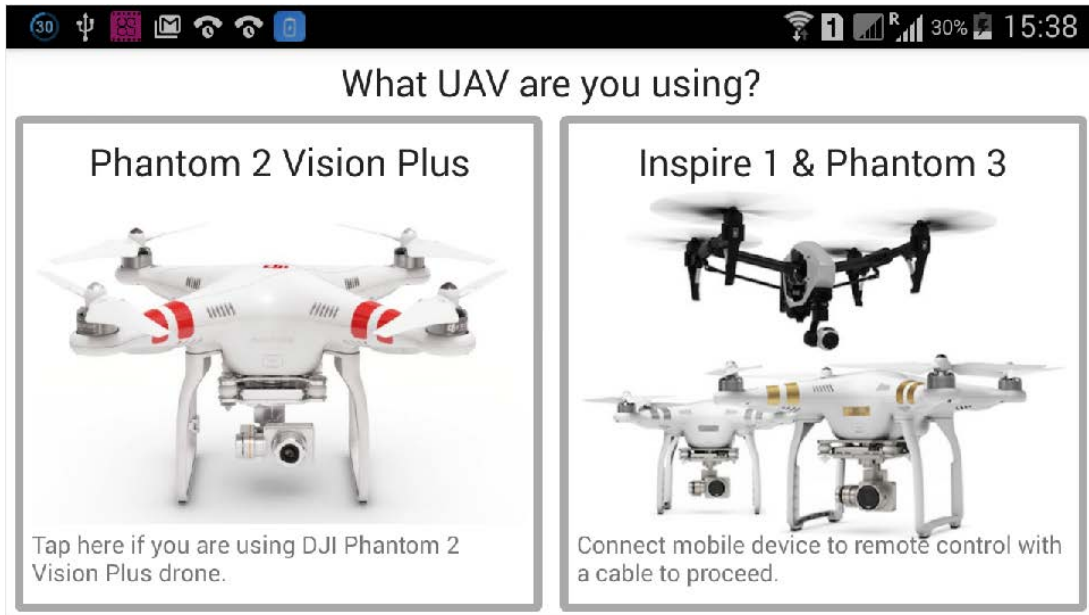
When launching the application for the first time, your smartphone must be connected to the internet, in order to pass DJI verification. This is an automatic process and does not need any input from the user.

Connecting smartphone to DJI Phantom 2 Vision +


DJI Phantom 2 Vision+ has a range extender, that extends the effective range of communication between a smartphone and the Phantom 2 Vision+.

Connect your smartphone to the wireless network generated by this device. Connect your laptop / PC with the installed U|g|CS desktop application to the same network.

Launch U|g|CS for P2V+ mobile application and select Phantom 2 Vision Plus category.



When both mobile application and desktop application are in the same network they should detect each other.

	<p><i>The drone won't be detected if you already have any connected applications like DJI Vision App, Litchi, etc. as multiple connections are not supported. In this case, close active applications and restart U g CS for P2V+ mobile application.</i></p>
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Connecting U|g|CS mobile companion and U|g|CS desktop application

Once both devices are on the same network, connection will be established automatically. In the mobile app a green light in the window footer will confirm this.



Creating the route for your drone



When all previous steps are done and your drone connected to remote control, U|g|CS desktop application and U|g|CS mobile companion are in the same WiFi network you should see your drone available to in U|g|CS desktop software.









Please follow the instructions in [UgCS User Manual](#) to draw the route for the appropriate drone profile (Phantom 2 Vision+). After drawing the route calculate it and after successful calculation upload it to the drone.

Operation list of U|g|CS desktop and U|g|CS mobile companion

Below you can find the basic procedures for the flight route:

№	Step	Where step is performed	Notes
1	<i>Create route</i>	U g CS desktop	Use U g CS desktop client for creating, planning and calculate mission and route.
2	<i>Upload route</i>	U g CS desktop	<p>Use U g CS desktop client to upload route to the drone:</p> <ul style="list-style-type: none"> • Calculate route  • Select drone • Press “Upload” button  <p>Also user should be careful when set a new home point location (see route settings home location source). A home location is valid if it is within 30m of:</p> <ul style="list-style-type: none"> • initial take-off location • aircraft's current location • remote controller's current location as shown by RC GPS • mobile device's current location

			<p> Route will not be uploaded if drone have executing the mission. In this case you need to send “hold” or “manual mode” command.</p> <p> Don’t upload mission to the armed drone that stayed on the ground and press “Auto Mode” button. It will lead to drone crashing!</p>
3	Auto – Launch route	U g CS desktop OR U g CS mobile companion	<p>Use U g CS desktop client or U g CS mobile companion to launch route. Press “Auto mode” commands for the drone in U g CS desktop or button on Android.</p> <p></p> <p>If drone finishes the route, “Auto Mode” button will be enabled again and user can repeat the route.</p>
4	Manual mode	U g CS desktop	Switches the vehicle to manual mode. User can control vehicle with RC. This command interrupts mission execution and erases it from drone memory. User can upload new route to execute.
5	Hold	U g CS desktop OR U g CS mobile companion	Puts mission execution on hold. In case of Click & Go flight stops the vehicle and clears current target point.
6	Continue	U g CS desktop OR U g CS mobile companion	Continues mission execution from point where mission was put on hold.
7	Track mission execution	UgCS desktop OR U g CS mobile companion	<ol style="list-style-type: none"> 1. Use U g CS desktop client for track telemetry information of the vehicle. 2. Use U g CS mobile companion for control camera. 3. Use both application for change control mode or failsafe command execution (return to home).

8	<i>Make pictures</i>	U g CS mobile companion	<p>Use your remote control or dedicated buttons in U g CS mobile companion application to make shot or start/stop video recording.</p>  <p>For photo, user can select between single capture or capture by time interval. Please see „more camera settings”.</p> <p> <i>Minimal time interval is different for different DJI drones. If the time interval is too shot, you will receive an error msg.</i></p>
9	<i>Return Home</i>	UgCS desktop OR U g CS mobile companion	<p>Return to Home command in U g CS mobile companion.</p> 


Mission execution specifics

Current part of article relates to U|g|CS desktop application and vehicle behavior.

Mission waypoint actions supported by DJI:

Flight plan element / action	Support	Notes
Takeoff	No	
Landing	No	At landing waypoint drone stays in the sky.
Wait	Yes	Only one wait action per waypoint is allowed.
Yaw	No	
Point of Interest	No	
Camera by time	No	
Camera by distance	No	DJI drone will start continues photo capturing with a specific distance till next waypoint. You

		can add number of photos and a delay before the shot series are started.
Camera attitude with tilt / zoom	No	


	<u>Acceptance radius parameter for waypoint is not supported!</u>
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Failsafe actions

You should configure the behavior of the drone operation in the Failsafe cases with DJI Assistant software.


A point «Home location» is valid if it is within 30m of:

- initial take-off location
- aircraft's current location
- remote controller's current location as shown by RC GPS or
- mobile device's current location

	<i>Fail-safe settings in mission properties in UGCS software are ignored!</i>
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The default settings in the DJI Assistant software are as follows:

Condition	Behavior	Notes
On GPS signal loss	Land	Happens when there are less than 6 satellites visible for more than 20 seconds
On RC signal loss	Finish mission if the drone is in auto mode and return to home position.	Return home altitude is defined in route settings tab.
On low battery	Land	See autopilot User Manual for more information.


	<i>When you create a flight route, please, pay special attention to location of a point «Home location» regarding to the route! Point «Home location» must be specified so that if «Fail-safe» mode is switched on the drone from any point of the route is able to fly in a straight and not face with obstacles (buildings, terrain features).</i>
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Command execution specifics

Current part of article is about vehicle behavior. Some commands you can find in the U|g|CS desktop application, some in the U|g|CS mobile companion. See table below for more information.

Supported commands:

Command	Support	Application	Notes
ARM	No		
DISARM	No		
AUTOMODE	Yes	U g CS desktop OR U g CS mobile companion	Take off and start the mission
HOLD	Yes	U g CS desktop OR U g CS mobile companion	Pause mission. Vehicle will hover in current position until CONTINUE command issued. Vehicle can be moved along mission path using Remote controller during Hold.
CONTINUE	Yes	UgCS standalone / UgCS mobile companion	Resume mission
MANUALMODE	Yes	UgCS desktop	Interrupt current mission
RETURNHOME	Yes	UgCS standalone / UgCS mobile companion	Vehicle will gain the pre-configured altitude (default is 20m) and return to launch position and land. See warning below.
TAKE-OFF	No*	UgCS standalone / UgCS mobile companion	Drones can be take off by switching to auto mode.

	<i>If within the distance of 20 meters from the home point, you execute Go Home command, the aircraft will directly land in the current location instead of returning back to the home Point!</i>
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If predefined route Emergency Return Altitude is less than vehicle current altitude, vehicle returns home with vehicle altitude at which Return Home button/command was used.

Command availability

U|g|CS Desktop can show command buttons in different shades. You can always press all buttons disregarding of shade. Highlighted buttons suggest recommended commands, depending on current status of the vehicle.

Command availability:

State	Button highlighted	Button shaded
Armed	AUTOMODE, RETURNHOME	
Disarmed	AUTOMODE, RETURNHOME	

Telemetry information specifics

Vehicle state (armed/disarmed) is controlled from RC transmitter. (Phantom 2 Vision+ vehicle is armed automatically when "Auto Mode" command is issued).

Flight mode meaning:

Auto: Vehicle is executing mission or is returning to launch position.

Manual: Vehicle is holding position.



User can take over the control from any mode at any time by flipping the S1 switch.



If you see strange altitudes in U|g|CS desktop client telemetry window, please check your vehicle "Take-off point altitude".

Waypoint turn types

U|g|CS desktop route planning allows you to specify different turn types – i.e. the way drone passes the waypoint. There are 3 different routing planning modes for DJI autopilots, but Phantom 2 Vision + support only 2 turn types: fixed-point turn mode (Stop and Turn) and adaptive coordinated

turn mode (Adaptive Bank Turn). You can choose turn type for each Waypoint, Circle, Perimeter. The default turn mode in the system is Stop and turn.

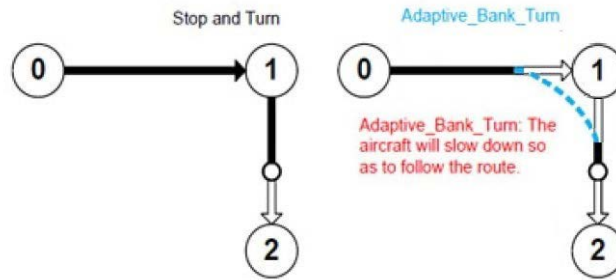


Figure 1: Turn type

Turn type	Support	Notes
Stop and Turn	Yes	Aircraft flies to the first fixed point accurately, stops at the fixed point and then flies to the next fixed point.
Adaptive Bank Turn	Yes	Aircraft will not stop at the fixed point, but will “cut the corner” and pass through without a stop. The corner radius can be adjusted in UgCS for DJI mobile application in “drone specific settings”.

You can find more information about turning mode and supporting autopilots on the site <http://wiki.dji.com/>.

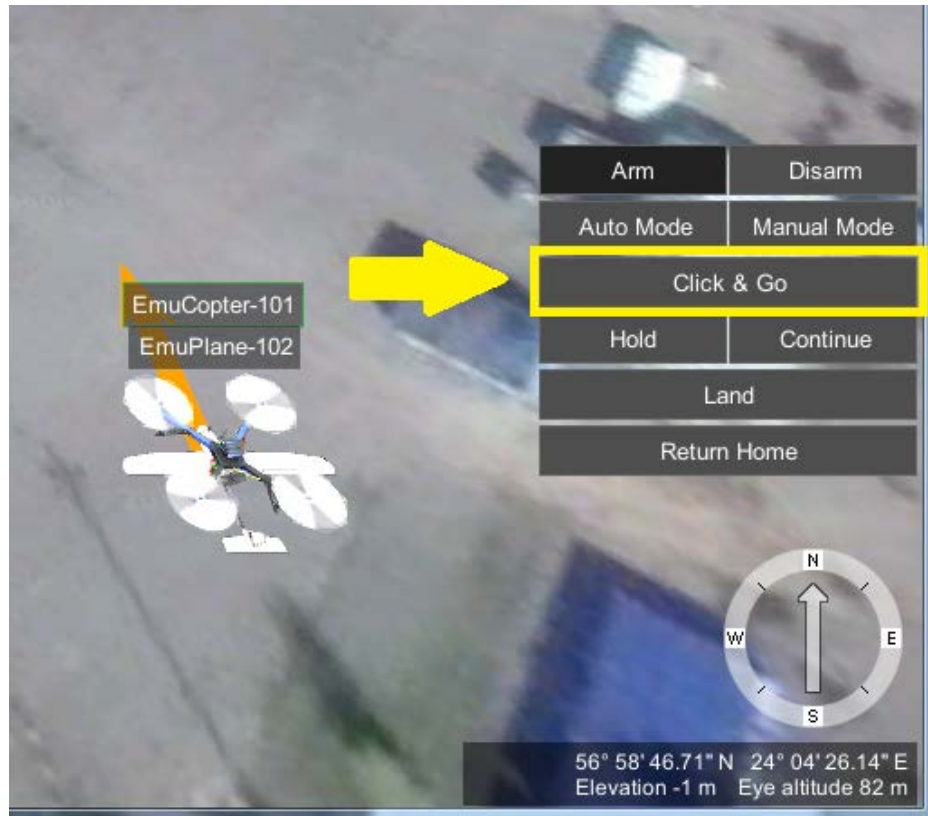
Click & go

Click & GO mode allows you to interactively command the copter to travel to a target location by clicking on a point on the map. Once the location is reached, the copter will hover at that location, waiting for the next target. This behavior implemented as a mini mission containing two waypoints: current drone position and target point.

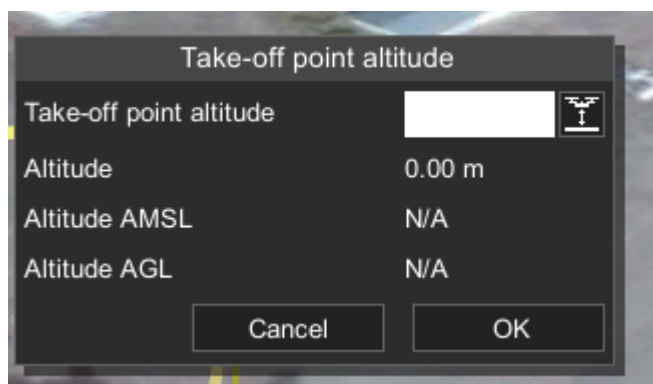
In order to start Click & GO mission you need to interrupt current (main) mission by selecting a point where you want to fly and pressing Click & Go button. At the end of Click & Go mission press Continue button and drone flies to the point where it breaks the main mission. After main mission drone flies to the First waypoint and starts mission from the begin and till the end.

Steps:

- Press "Click & Go" commands

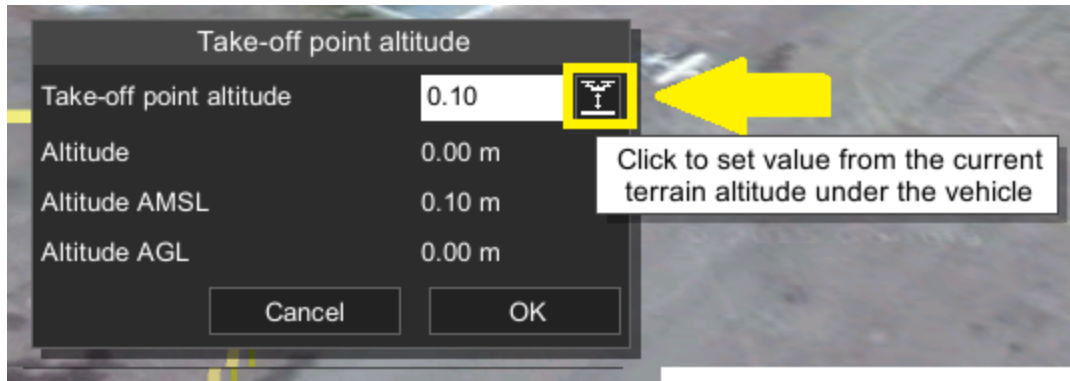


- Take-off point altitude



- You can click to set value from the current terrain altitude under the vehicle





- Click on the map to define target point
- Adjust additional parameters “AGL alt”, “Speed” and “Heading” if needed and press confirm to send command to the drone
- Press “OK” button

U|g|CS mobile companion user interface

The mobile companion interface includes [Main Screen](#) and [Settings Menu](#).




Main screen

The Main application screen has live video preview on the background.



Main application screen could be divided in four zones, as shown on image: system bar (1), camera position control panel (2), vehicle control panel (3) and application status bar (4).





System bar (1) display standard Android device bar. Usually this part of screen includes status of network connection (Wi-fi, 3G/LTE etc.), device battery level and time.

The camera position control panel (2) consist of the following buttons and an indicator:  - tilt the camera up,  - tilt the camera down,  - camera gimbal angle.

The application status bar (3) displays main status indicators from the vehicle and UCS connection status.



You can see SD card remaining memory percent (a), number of visible satellites (b), range extender or remote control battery voltage (c). You need to have connection from UCS to UgCS mobile companion to upload mission, control vehicle from UgCS client and record telemetry. Status of this connection displays in the part (d). Drone battery status displays in the part (e). In the bottom-right corner of the main screen are three flight status indicators: distance to home position* (f), altitude above ground (g) and airspeed (h).

The vehicle control panel (4) consists of the following buttons:  - options button for navigation to [Settings Menu](#),  - make a shot,  - start/stop camera recording,  - go home or reset home position.

In the settings page you can select photo camera working mode: single photo, multiple photos, continuous photo capturing**

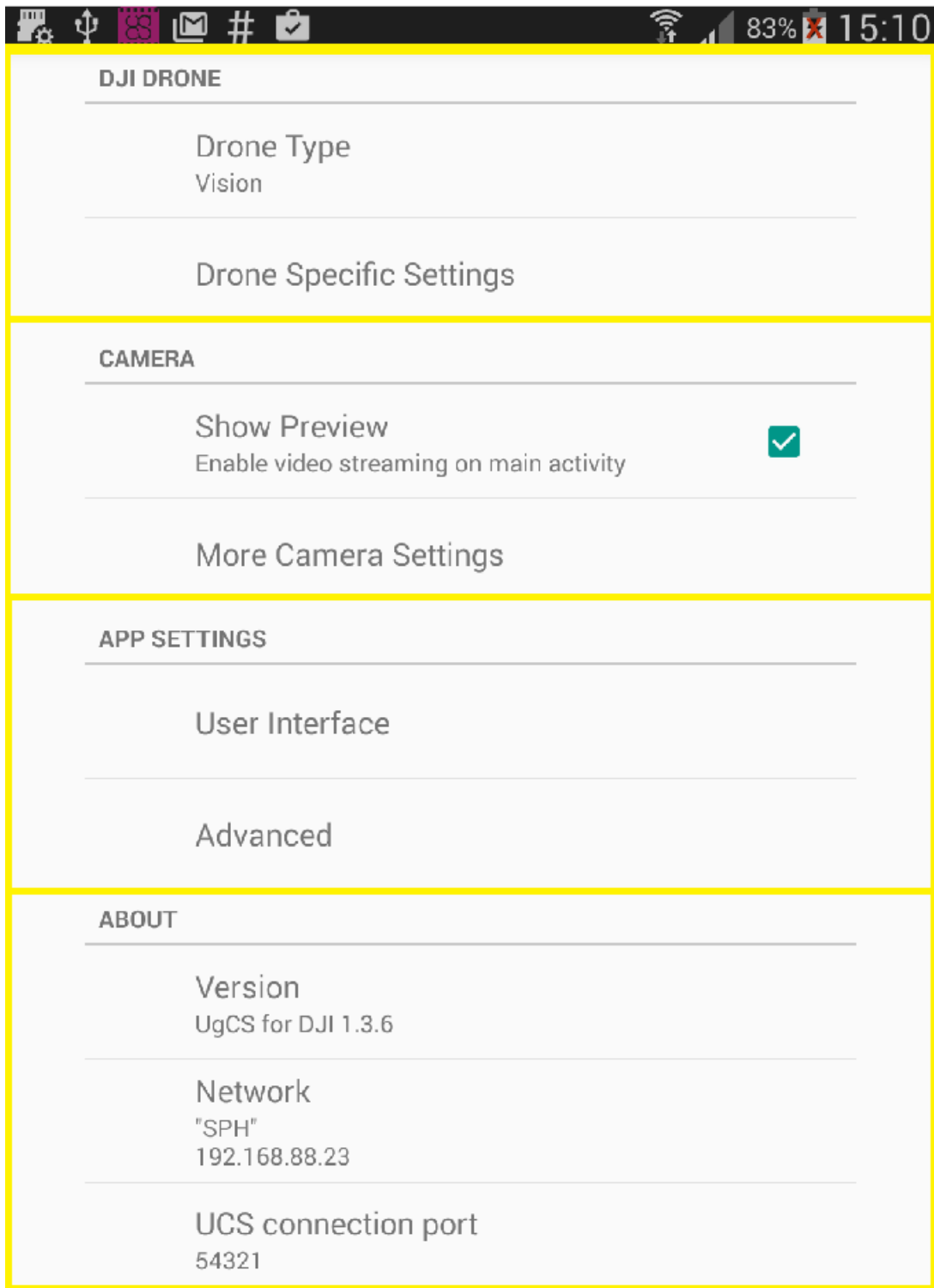
<p>* - <i>“Dist.” (distance from home position) indicator displays distance projected to the ground, not actual (vertical + horizontal distance).</i></p>
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<p>** - <i>Continuous photo may not work for Inspire 1.</i></p>
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Settings menu

Settings Menu has four sections:

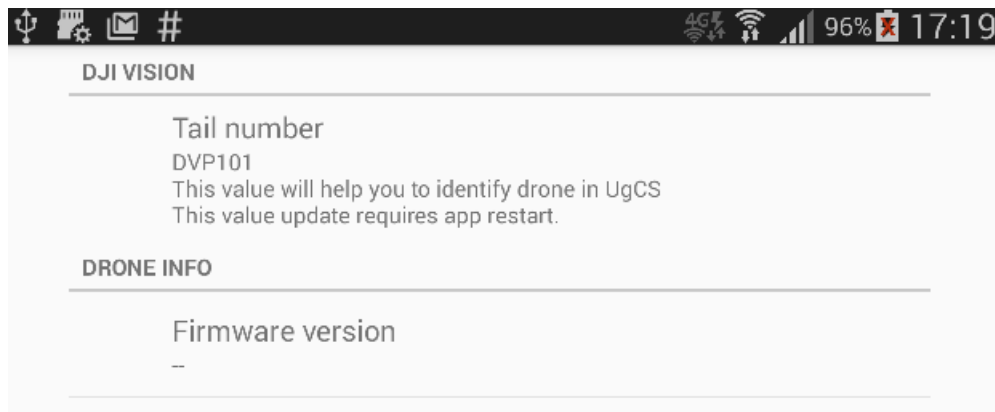
- DJI Drone
- Camera
- App Settings
- About area.



“DJI Drone” area includes:

1. Drone Type field. Here the connected drone type will be displayed.
2. Drone Specific settings

Phantom 2 Vision Plus specific settings:

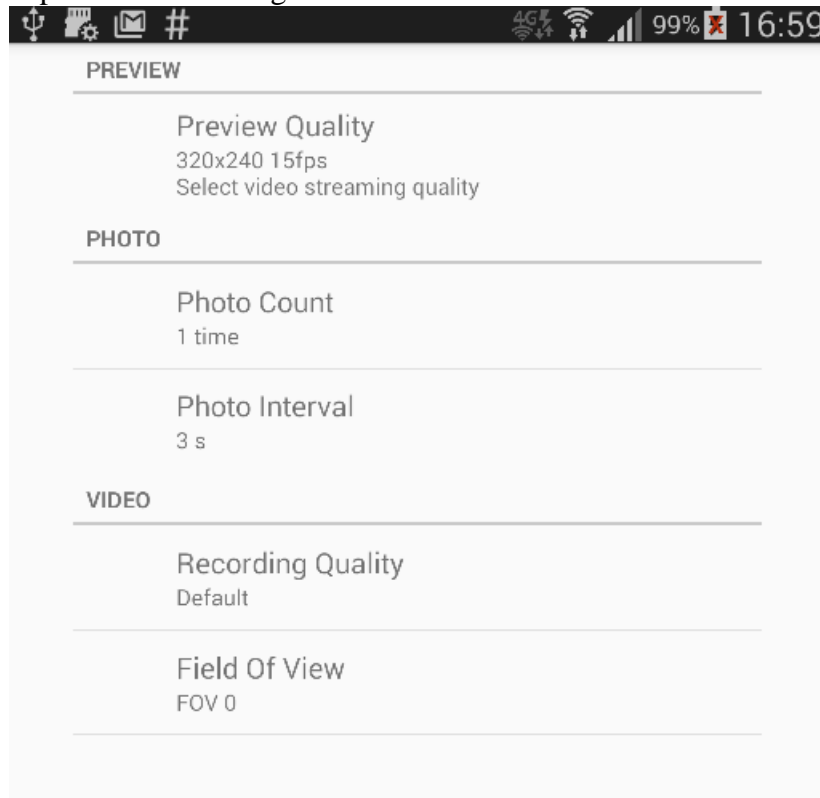


Tail number field allows you to enter drone unique name, this name will help you to identify the drone in UgCS client view in case if you have multiple drones connected

“Camera” area includes the following fields:

- Show Preview field allows to enable or disable video streaming in main view;
- More Camera Settings – advanced settings based on selected drone type.

Vision plus camera settings:



- Preview Quality field allows to choose quality of video preview in main view.

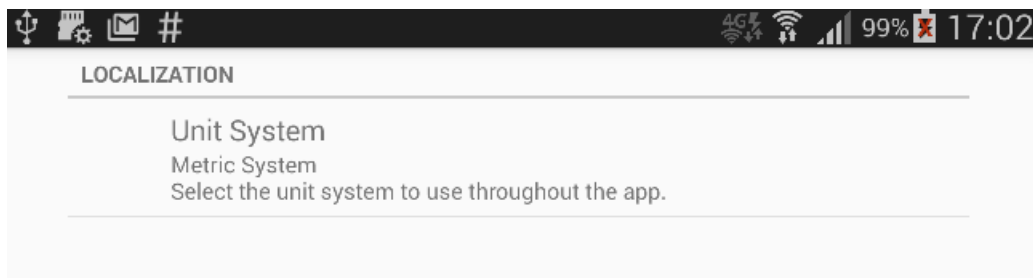
- Photo count allows you to select between single photo, multiple photos, continuous photo capturing.
- Photo interval allows to adopt time between sequential photos.



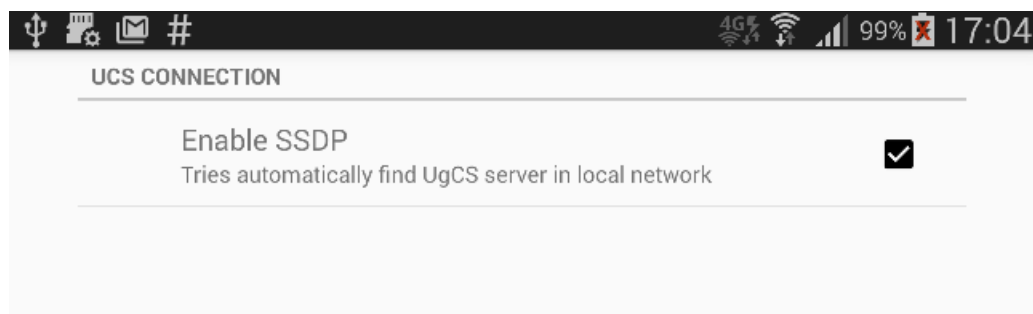
Minimal time interval is different for DJI drones. If the time interval is too short, you will receive an error message when pressing photo button. In this case try to increase time interval.

“App Settings” area has two fields:

- User Interface field allows to change user preferences settings, for example Localization setting: Select the unit system to use throughout the app.



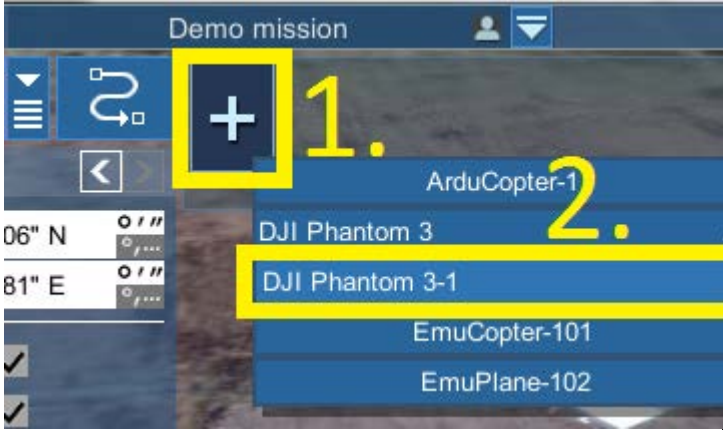
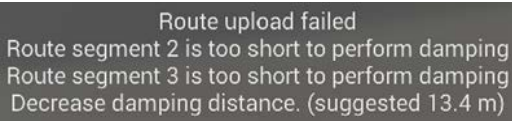
- Advanced field allows to configure application settings which are necessary for normal functionality of application, it includes Enable/Disable SSDP for automatic searching of U|g|CS desktop application in local network.

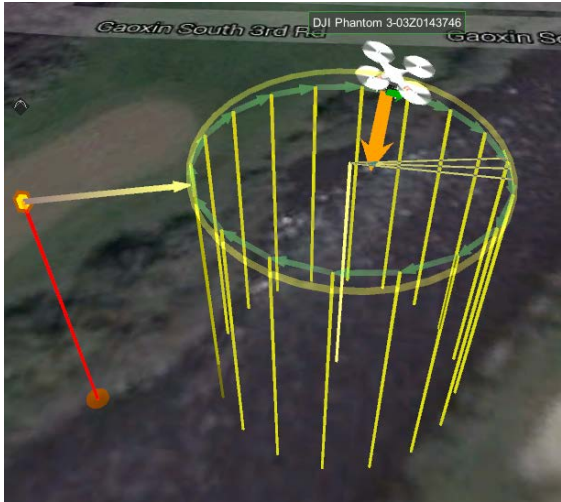


“About” area has the following fields:

- Version field shows current version of this mobile application.
- Network settings field shows current network information.
- UCS connection port shows port which currently is selected.

TROUBLESHOOTING

Problem	Solution
If you can't launch U g CS mobile application	It closes just after start, try to restart your mobile device.
Drone reject the flight	Difference in altitudes of your route is more than 120 meters
Experience problems with drone connection	Check out native “DJI GO” application is not installed
Your device does not appear on map view screen	Specify your dron the in vehicle list: 
No connection to the mobile application UGCS between your PC and mobile devices	Try to restart PC U g CS
If the U g CS mobile application is connected to your drone and shows that U g CS desktop application (green light besides UCS text on bottom) is also connected, but You cannot find Your device in PC application.	Try the following steps: <ul style="list-style-type: none"> ○ Restart PC application (UGCS standalone client). ○ Make sure both device, your smartphone and PC, is in same network.
If your receiving “Route upload failed” message like this: 	This situation can happen if you are using waypoints with Adaptive bank turn and the distance between two points is too small to perform nice curve. Open Drone Specific settings and decrease damping distance. In case of any issues with the software, please report them to support@ugcs.com. Please send us a detailed description of the problem and your version number which you can find in the settings menu. Please try to provide screenshots and logs together with a

	<p>description of the issue – Logs can be found in the following locations:</p> <p>Device storage > Android > data > com.ugcs.android.vsm.dji > files > logcat directory.</p>
<p>If your receiving “Route upload failed” message like this:</p> <div data-bbox="204 491 719 636" style="background-color: #cccccc; padding: 5px; margin: 10px 0;"> <p>Route upload failed Set home location FAILED Error! A location is valid if it is within 30M of initial take-off location OR current RC location as shown by RC GPS or mobile device GPS.</p> </div>	<p>The user should be careful where they set a new home point location (see route settings home location source) as in some scenarios the product will not be in control of the user when going to this location.</p> <p>A home location is valid if it is within 30m of:</p> <ol style="list-style-type: none"> 1. initial take-off location 2. aircraft's current location 3. remote controller's current location as shown by RC GPS or 4. mobile device's current location
<p>Your receiving “Route upload failed” when trying to upload route with Circle item</p>	<p>Ensure your route start point is not at the same place as route end point. You can add one extra WP before or after circle or add takeoff or land command.</p> 
<p>You always see “Permission Check Failed” dialog</p>	<p>Check your network connection. Some proxy servers may block verification request.</p> <p>You need to be connected to the internet when starting your application first time in order to perform DJI verification. You also can try to reinstall application.</p>
<p>Video preview is not shown.</p>	<p>This issue could happen if you previously changed video resolution in DJI GO application. In order to fix it, please close U g CS mobile application, start DJI</p>

	<p>GO and close it. Now you should be able to see video preview in U g CS mobile.</p>
<p>Some waypoint actions are ignored and you receiving message like this:</p> <div data-bbox="204 394 719 512" style="background-color: #cccccc; padding: 5px; text-align: center;"> Route Uploaded With Warning Some waypoints have too many actions. Nr: 2 </div>	<p>This warning is related to DJI drone waypoint actions limits – you can use maximum 15 action for 1 waypoint. Note: photo panorama uses 2 actions for one segment (rotate aircraft and make photo)</p>
<p>During mission execution you receive message like this:</p> <div data-bbox="204 642 719 718" style="background-color: #cccccc; padding: 5px; text-align: center;"> Camera is busy or the command is not supported in the Camera's current state </div>	<p>That means the time interval between two shots is too small, try to decrease flight speed (if you are using camera trigger by distance) or increase time interval.</p>
<p>Drone does more pictures than specified</p> <p>Or</p> <p>Filming continued after reaching the last point in the complex algorithms (eg – Area Scan)</p>	<p>When planning a route, after the passage of a complex algorithm, you must install the Waypoint no Actions.</p> <p>After the device will make the designated or calculated number of shots, shooting stops.</p>