



SidePilot

User Manual

App Version 2.0.4

[Link to 3DR Solo Firmware Update Instructions](#)

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Overview

This is the app for drone enthusiasts who wish to have a more portable ground station.

It works with the 3DR Solo and ArduPilot (Copter/Plane/Rover) platforms via Wi-Fi or BLE.

Features:

- GPS Location of drone
- Set, edit and delete waypoints
- Arm/Disarm
- Display VFR information such as altitude, yaw, pitch and roll.
- Voice alerts for mode changes and other important information
- Edit, save and load Parameters
- Geo-tag Solo images
- GPS Status of drone
- Distance from home/device
- Battery voltage display and warnings
- Calibration of battery monitor, accelerometer, compass and radio limits
- Set performance settings quickly with speed sliders
- Live Stream directly to Facebook, Youtube and custom RTMP
- View advanced statuses about your drone such as IMU, vibration, RC input and output, etc.
- Download Data flash and telemetry logs from your drone to view on PC
- Follow Me - Use your devices GPS to follow you at a set distance
- Pre-Flight checklist current weather (wind direction, temperature and chance of rain) information and alerts based on your location
- Grid Waypoints - Create a survey grid to fly
- Tap to fly to point - Tap a location and your drone will fly there!
- 3DR Solo LED control
- 3DR Solo OpenSolo firmware update
- MAVLink 2.0 support
- And many, many more

Getting Started

1. If using Wi-Fi, first connect to your drone's network using your iOS device's Wi-Fi settings.
2. Turn on your drone and open the SidePilot app
3. You will be presented with a screen for choosing your drone. Follow the prompts.
4. When launched, SidePilot will attempt to connect to your drone if already connected via WiFi. To connect manually, tap the connect button in the top right corner. You should begin receiving telemetry data. If not, you may need to change the connection settings in the settings menu.

Please post suggestions and bug reports on the SidePilot facebook page.

WARNING: Continued use of GPS running in the background can dramatically decrease battery life.

NOTE 1: iPads without cellular do not have GPS capability unless tethered to an iOS Device with cellular, and even then, it can be poor and not suitable for navigation.

NOTE 2: SidePilot collects anonymous analytics data regarding how the app is used and if any errors occur. All of this data is anonymous and stored securely. If you wish to opt out of these analytics, tap the 'Analytics' item in the settings menu, and follow the instructions. By allowing the use of these analytics, you help SidePilot become a better app!

FAQ

Just some of the most common questions asked

Q – What drones does this app support?

A – Any that run the ArduPilot flight controller firmware, such as ArduCopter, ArduPlane or ArduRover! Mainly DIY copters and the 3DR Solo.

Q – How does the app connect to the drone?

A – Through either a bluetooth 4.0 (BLE) repeater which takes the serial telemetry signal from the drone and redistributes it over bluetooth, or through a WiFi TCP/UDP connection.

Q – How come your ‘Shots’ are different to Solo’s stock shots?

A – SidePilot is designed for not just Solo, but other, DIY copters without a companion computer. Therefore instead of using the Solo’s companion IMX computer to control the shots, SidePilot uses your iOS device to control the shots. As I am developing these myself, they might not be as good in some ways as the stock Solo app, but trust me, improvements are always being made, and your feedback is much appreciated! If you want to use the old shots, you can use the stock 3DR app together with SidePilot.

Q – How can I access telemetry logs?

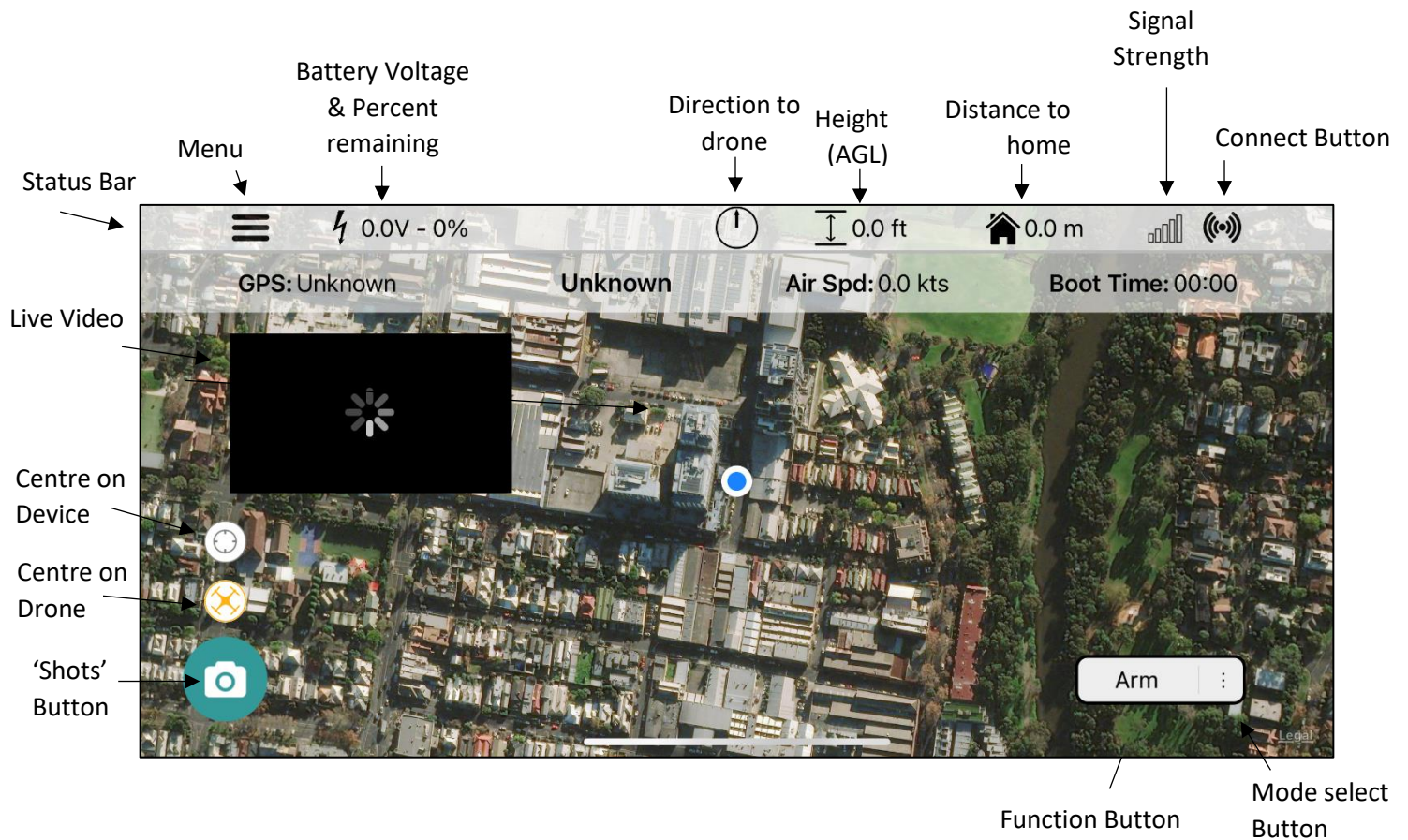
A – Each time SidePilot connects to your drone, it will create a .tlog file containing all mavlink data received during the connected period. This file can be found using the Files app under ‘On My iPhone’ in the SidePilot->tlog folder. You can visualise these files using mission planner on PC or another mavlink log visualiser.

Q – I want feature X, why doesn’t SidePilot have feature X?

A – As you can imagine, there’s only so many hours in a day to get features added, or I might have just not thought about it yet! Feel free to post any suggestions or improvements to the facebook page or email me at tom@sidepilot.net

Main Screen

User Interface



The Menu button will turn blue when connected to your drone and black when disconnected, same with the connection button.

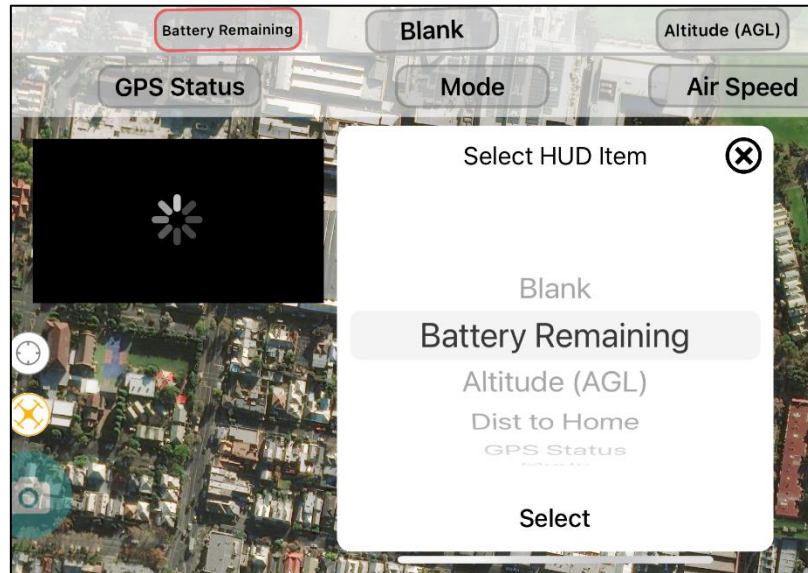
Connecting to your Drone

To connect to your drone, tap on the connect button (📶) in the top right corner. Once connected you should begin seeing the sensor values change on the main screen and the connect button will turn blue,

Status Bar

The top status bar can be tapped to show more information such as GPS status, current mode and arm status, current speed and time since boot. Tapping the status bar will show a dropdown that shows more status's.

To modify what the top bar shows, tap and hold on the bar, then tap the position that you want to change. A dropdown with all options will appear:



Live Video (3DR Solo only)

Live video can be seen on the main screen when 'Show on Main' is enabled in the Video settings menu.

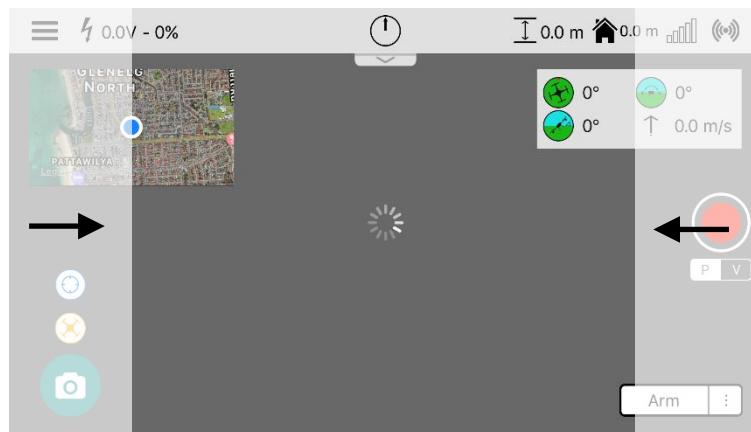
Enlarge Video

If you wish for the video feed to cover the whole screen, simply **TRIPLE** tap the video feed. It will then swap places with the map. To return just triple tap the VIDEO feed again.

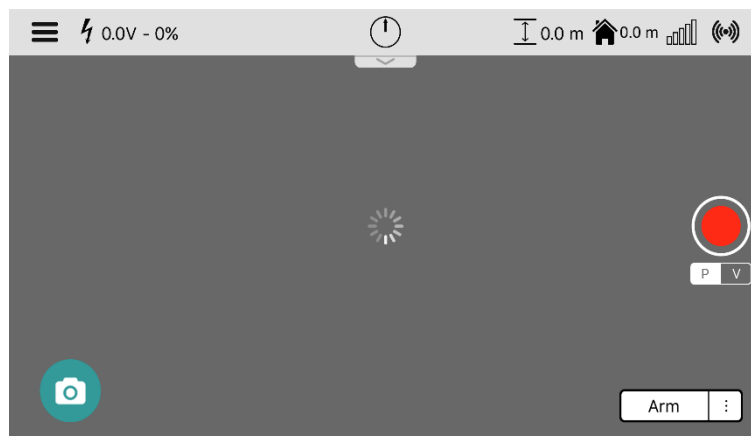
Cluttered Screen

If you are using a smaller device, or simply have no need for the map or VFR, you can easily remove them! When your video is enlarged, simply swipe in from the right edge and they will slide off the screen, giving you full screen video! To get them back, swipe in from the left edge. This will only work when the video feed is full screen.

Swipe in from
the left to restore
map and VFR



Swipe in from
the right to remove
map and VFR

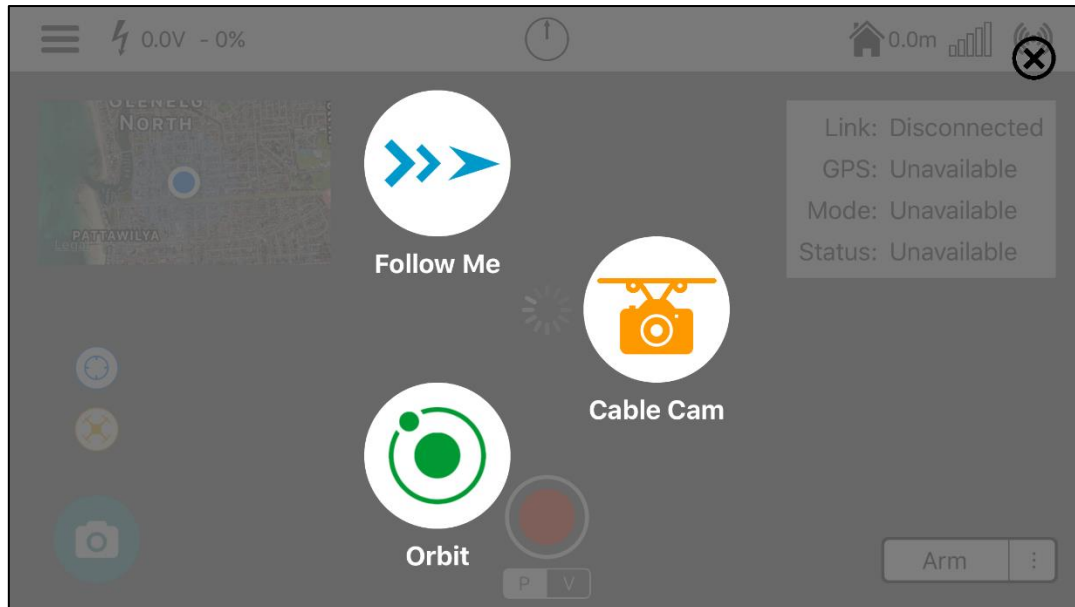




Shots

SidePilot has advanced autopilot manoeuvres called 'Shots' these are similar to the 'Smart Shots' seen in the 3DR Solo app. To access the Shots functionality, tap the camera icon in the bottom left corner.

This brings up the Shots menu.



As of version 1.36.5+, SidePilot has Four Shot modes, Follow Me, Orbit, Cable Cam and Panorama. More Shots are being developed!



Orbit

This Shot enables you to orbit around a subject.

When selected, you have two parameters you can edit:

1. Orbit Radius (Between 0 and 100m)

You can set this to either 0 (Centre position will be where the drone is currently positioned), or to a distance that is extended from the front of the drone. Eg. The drone is 10m from a building that you wish to orbit, point at the building and set the radius to 10.

2. Orbit Rate (from -90 to 90 deg/s)

The orbit rate defines the rotational motion of the craft. When set to 0, the drone will stay still at the set radius from the centre.

10-20 deg/s is a nice cinematic speed.

When Orbit mode is activated, you can control the Radius by dragging the handle of the circle displayed on the map screen. You can control the Rate by using the on-screen arrows. These increase/decrease the rate by 5deg/s per touch. You can also set the rate to 0 (pausing the drone) by using the pause button.



Follow Me

This mode enables Follow me! Ensure you have an accurate GPS lock on yourself before using.

There are three types of follow me:

Static

Static altitude will hold the set altitude at all times, this is great if you are on flat ground.

Dynamic

Dynamic altitude will hold the current altitude above the user with the iOS device. This is useful if you are traversing steep terrain.

When selected, you must choose a height to follow you at, and a 'leash' distance which the drone will keep from you. To tune the speed that your drone follows you at, change the values of the WPNAV_SPEED_ parameters.

The drone will automatically try to yaw to 'look' at what it is following, however it can be jittery. For smoother, better looking video, you can control the yaw of the drone using your transmitter. This enables you to better frame your Shot without having to worry about controlling the drones flight.

Visual

Visual Follow me tries to follow you using the camera feed and object tracking. It will not work well with fast moving objects or if you are low to the ground and have the camera pointing directly forward.

When selected, you can start by using a finger to 'draw' a box around the object you wish to track. Once you let go, follow me will begin and you will see the red box move with the object/person.

The drone flies based on where in the screen the object is. If the object is in the centre of the screen, it will stay still. If near the top edge of the screen it will fly forward, bottom edge then it will fly backward. If it's is near the left edge it will yaw left, right edge and it will yaw right.

Cable Cam

This mode enables your drone to act as though it is riding on a virtual cable in the sky!

When selected, a button will appear on your screen saying 'Point 1'. Simply fly to where you want one end of your cable cam to be and tap this button. Then fly to the other end of the flight and tap the 'Point 2' button. Continue adding points until you are satisfied, then tap the finish button.

Each point will have a waypoint icon added to the map, showing its location. These can be moved by tapping and dragging them. The yaw position of the drone at each point is recorded and will move to that yaw angle each time it reaches the point.

On the screen, a red bar will appear. This indicates the distance between the first and second points, and where your craft is relative to them. The speed of the movement is also shown.

Below this red line, are arrows indicating forward (towards point 2) and backward (towards point 1) as well as a pause button. If you tap the pause button, the craft will stop where it is, however the set speed will not change. Simply tap either arrow or use the roll stick to start moving again.

It is possible to tap and drag the points displayed on the map to move them, however they will retain their original yaw orientation.

To exit Cable Cam mode simply click the Fly button.



Panorama

There are three different panorama modes, similar to the stock 3DR app.



Cylindrical

In this mode, you set how many photos you want taken in one full 360° rotation, then it will automatically take a photo, yaw to the next position then snap another photo. It will continue this until complete.



Hemisphere

In this mode, it will set the camera to point directly forward, then begin the exact same as the cylindrical mode, however once one full rotation is complete, it will tilt the camera to 45° angle and do the same. Once that is complete it will tilt the camera directly downwards then snap a final image.

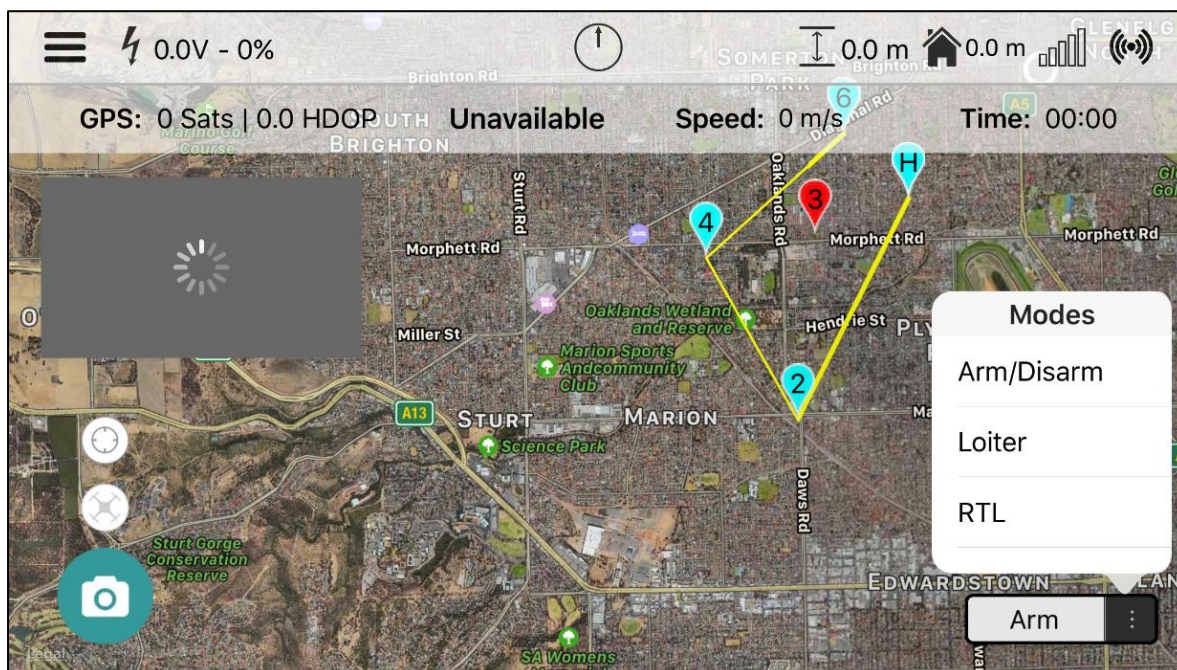


Video

Video mode will begin recording a video, then do a slow, smooth 360° rotation before going back to loiter mode.

Flight Modes

To select a mode, tap the mode select button and a menu will appear. Then select your desired mode. To perform the function of that mode, tap the function button which will be displaying the name of the mode. The modes available differ by vehicle. The copter options are explained below.



Arm/Disarm:

This will do as the title says, Arm if disarmed, or Disarm if armed. If arming, a check is performed to see if you have completed your pre-flight checklist and will give you a warning if not. You can disable this check under *Settings->App Behaviour -> Pre-flight checklist warning on arm*

RTL:

Will perform the Return to Land function of your drone.

Auto:

Will enable auto mode to begin waypoint following.

Take off:

Takes off to a desired height.

Stabilize:

Enabled stabilize mode. This mode has no GPS hold or altitude hold and should be used by advanced operators.

Drift:

Drift mode changes the stick inputs to behave similar to an RC aircraft. Read more about this mode on the Arducopter website.

Alt Hold:

Will hold your current altitude.

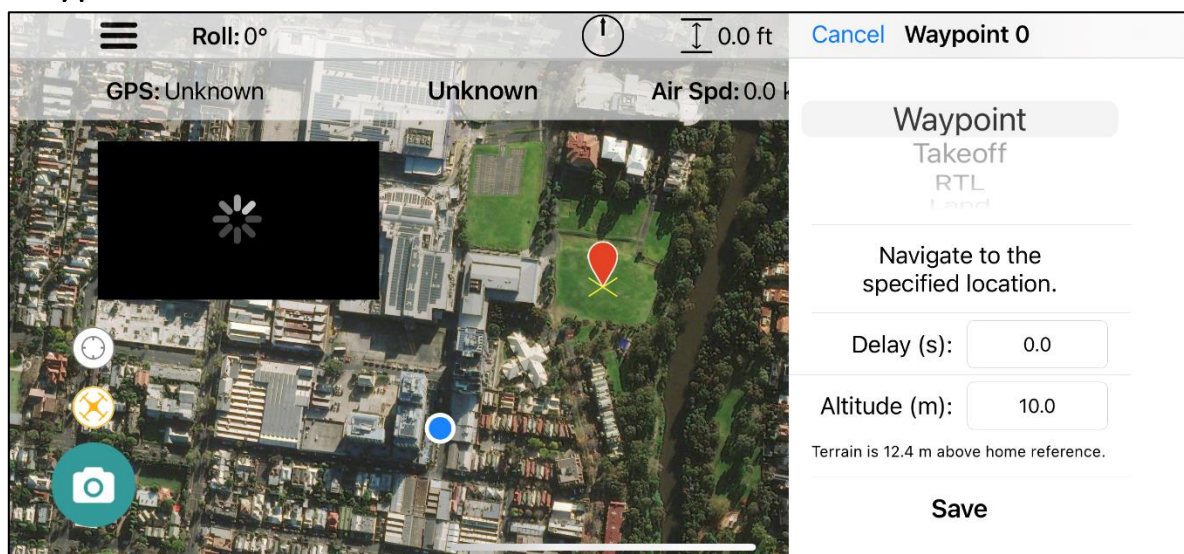
Loiter:

Enables Loiter mode. Your drone will hold its current position based off GPS and altitude readings.

Boat Mode:

Boat mode changes the INS_GYR_CAL parameter to disable gyro calibration confirmation on start-up. This means that you can arm while the drone is moving (useful for boat launches). Be very careful, if your drone enters RTL mode, it will fly back to its initial launch location (most likely in water).

Waypoints



To begin adding waypoints:

1. Tap and hold on the map on the location where you wish to place a waypoint.
2. Select the type of waypoint you wish to add
3. Select the Altitude of the waypoint, and if applicable the time to loiter at that waypoint.
4. Select save. Your waypoint will be sent to the drone.

NOTE: ArduPilot does not climb to the set altitude first, it will move diagonally upwards/downwards to the first waypoint. If you must get to the correct height first, use the takeoff waypoint or a regular waypoint but at the same location.

To edit a waypoint:

1. Select the waypoint you wish to edit. If it is one of the supported waypoints (Normal, Loiter, Take-off, Land or RTL), Tap the blue gear icon on the right.
2. Edit the waypoint as you wish, making sure to press save. The new waypoint/s will be sent to the drone. You can move the waypoint by tap, hold and dragging the waypoint on the map.

To delete a waypoint:

1. Select the waypoint you wish to delete.
2. Tap on the red X on the left side. Your waypoint will be immediately deleted and all your existing waypoints will refresh from the drone.

To delete ALL waypoints:

1. Navigate to the settings page
2. Select Clear all waypoints. Confirm and all waypoints will be removed.

To fly your mission:

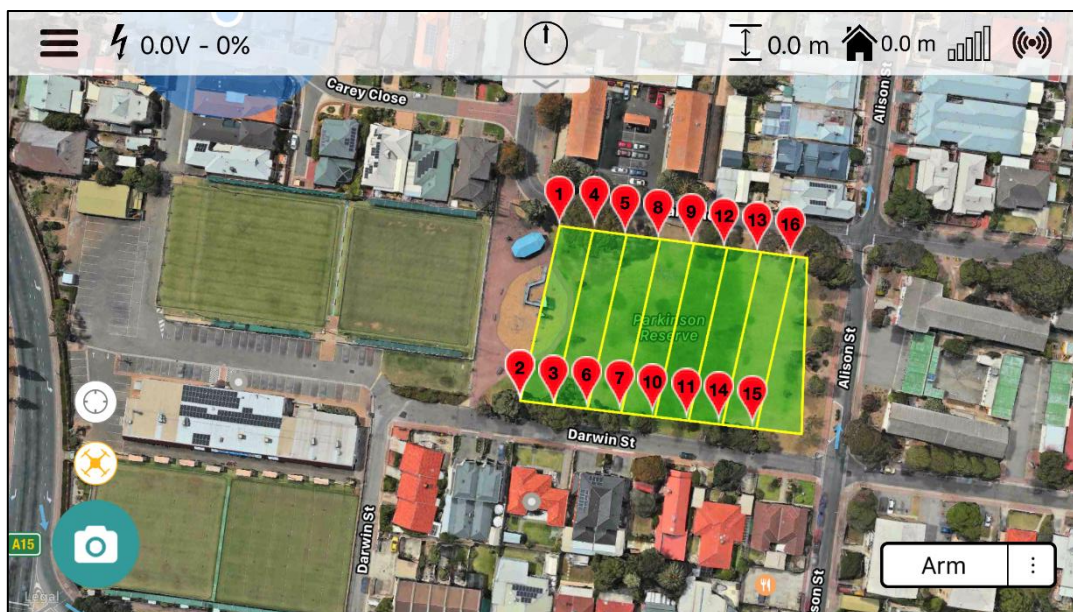
1. Select Auto in the mode menu
2. Tap the Auto function button
3. The drone will then begin to fly the mission. Be careful! It will not first climb to the desired height for the first waypoint and may fly at an angle!

Fly To

To enable automatic fly to a desired point:

1. Tap and hold on the map where you wish to fly to just as if you were adding a waypoint.
2. Select the first option of Go to Point.
3. Enter the desired height (Default is the current height) and tap Go.
4. Your drone will then fly to the desired point. Be careful! It will not first climb to the desired height first and may fly at an angle!
5. When the point is reached, your drone will transition back to Loiter mode. If for some reason it doesn't, just manually change modes.

Grid (Survey)



Grid mode is a great way to setup a grid of waypoints for your drone to follow automatically.

To create a grid:

1. Tap and hold on the map where you wish to place your first point, just as if you were adding a waypoint.
2. Select the last option, Grid.
3. Select your desired distance between grid lines and tap Create
4. Place your next 3 points to create a polygon. Your drone will begin the survey from the first point to the last point, moving towards the second and third as it goes. If you wish to change any of these points, hold and drag them.
5. Tap Finish. A window will appear with your desired distance between camera triggers. If you do not wish to trigger the camera enter a value of 0. Tap continue.
6. Your grid will be displayed. It is recommended that if you wish to edit any of these points or add anything afterwards to disconnect and reconnect to the drone, this reloads them as regular waypoints.
7. To fly tap auto on the mode menu and tap auto on the function button. The drone will fly the grid.

Messages

The messages view contains status messages sent from the drone to your device, these include things such as autopilot errors, waypoint notifications, mode changes etc. When [debug](#) mode is enabled, it will also display verbose information on what SidePilot is doing, showing warnings and errors from the application.




This can be incredibly useful to keep an eye on how things are going. To clear the messages from the screen just tap the clear button!

The 'Email' button will create a *.sidepilot* file with detailed logging information. When 'Debug' mode is enabled, verbose details will also be included, and it is possible to export up to 14 days of messages.

Detailed message log files are created each time the SidePilot app is launched and can be found in the SidePilot -> debug-logs folder in the files app. When debug mode is enabled, these contain even greater debug information that may be useful in determining issues with the app if experienced.

Pre-Flight Checklist

The Pre-Flight Checklist view allows you to customise what you require before your flights!

	Pre-Flight Checklist	Edit
	15°C, Wind: 11m/s Est 	
Batteries Charged?		<input type="radio"/>
Equipment in good repair?		<input type="radio"/>
Clear of people?		<input type="radio"/>
Any nearby obstructions/airports?		<input type="radio"/>
Strong WiFi/Radio signal?		<input type="radio"/>
Propellers on correctly?		<input type="radio"/>
Strong GPS signal?		<input type="radio"/>
Weather powered by Dark Sky		


By alerting you before arming if not completed, this checklist enables both hobby and commercial pilots to safely perform their flights to regulation.

The top of the view displays the current weather information pulled from the DarkSky.net database and displays it for the user. The current temperature, Wind speed and direction (relative to your devices direction! Just turn your phone and the arrow will always point in the direction the wind is blowing!) and if there is a chance of rain or snow, it will also display this.

If there are weather alerts, these will pop up and need to be dismissed before the user can continue, ensuring you have the best information possible.

Below the weather is the Pre-Flight Checklist. Each item can be tapped to be checked and unchecked. To customise this list, tap the edit button. Items can be added, deleted and rearranged as you like.

Parameters

	Parameters	Load Params
<input type="text" value="Search here..."/>		
ACCEL_Z_D		>
ACCEL_Z_FILT		>
ACCEL_Z_I		>
ACCEL_Z_IMAX		>
ACCEL_Z_P		>
ACRO_BAL_PITCH		>
ACRO_BAL_ROLL		>
Load		Save

Load Parameters from Drone

Simply tap the 'Load from Vehicle' button, and all the parameters will be downloaded and displayed. To search for a parameter, pull down on the list and a search box will appear

Editing

To change a parameter, tap on it and you will be given a description and a box with the current value in it. Tap the box to change the value and then hit save. This will then be sent back to the drone and enabled.

Saving Parameter set

To save the current set of parameters, tap the 'Save to file' button on the lower right of the screen. Enter a name to remember the set by and tap save. These will be saved to your device.

Load Parameter set

To load a saved parameter set, tap the 'Load from file' button on the lower left of the screen. You will then be presented with a list of parameter sets that are saved to your device. Tap the one you wish to load and then wait for all parameters to be transferred to the drone. This may take a few minutes


Export

You can export all of the saved parameter sets via email where you can then edit using a text editor/mission planner on a PC or import to SidePilot running on another device.

Import

To import parameters, send to your device via email or similar, then tap the share button on the attachment (Must be a .param file). SidePilot will show up as an option. Once tapped, it will add the parameter set to the saved sets. If a set exists with the same name, it will be renamed with the current date and time.

Waypoints Menu

	Waypoints	Edit
Home Position - Will be set on arm		
1 - Normal, Alt:10 m, Delay:0.0s		>
2 - Camera Trigger for 50 m		>
3 - Normal, Alt:10 m, Delay:0.0s		>
4 - Camera stop Triggering		>
5 - Normal, Alt:10 m, Delay:0.0s		>
6 - Camera Trigger for 50 m		>
7 - Normal, Alt:10 m, Delay:0.0s		>
Load		Save

Here you can save and load waypoint sets, as well as see the order of the current waypoints.

Edit

Tap the edit button to delete or reorder any waypoints that are currently loaded onto the drone.

Modify

To modify a waypoint, tap on it. This will bring up a page with many more options than when you initially added the waypoint. Note that most of these parameter functions are not available on all flight controller firmwares.

Save

Tap this button to save the current waypoint set. Simply give the set a memorable name (Date, location etc.) and tap save. It will store the waypoint set in the devices memory. If creating waypoints offline, make sure you save them before connecting to the drone otherwise they will be overwritten.

Load

Tap this button to load any previously saved waypoint sets. When you load a waypoint set, it will override the entire current one, so make sure to save it if needed. To delete any saved waypoint sets, tap the edit button on this screen and delete.


Select for Export

Allows you to select which saved waypoint sets you would like to export, and then allows you to email them. These exported files are compatible with Mission Planner for editing/viewing.

Import

To import a waypoint set, send to your device via email or similar, then tap the share button on the attachment (Must be a .waypoints file). These files can be created using Mission Planner. SidePilot will show up as an option. Once tapped, it will add the waypoint set to the saved sets. If a set exists with the same name, it will be renamed with the current date and time.

Logging

 **Logging** Save

Date: 01/01/2016

Model Name: Quadcopter

Flight Time: 00:10:32

Weather: Raining

Time: 17:55

Description:

This is an example of how to log. Here you would write a quick description of the flight, such as battery's used, any incidents or issues and how you feel it went.

01/01/2016 @17:55 - Model: Quadcopter

Vehicle Logs Export

Flight Logs

Flight logs are a simple way to keep track of your flights. It enables you to enter details on your flight such as the date, time, which drone you were flying, the total flight time (Automatically updates with the current life time that your drone has been turned on), the weather and a simple description of the flight.

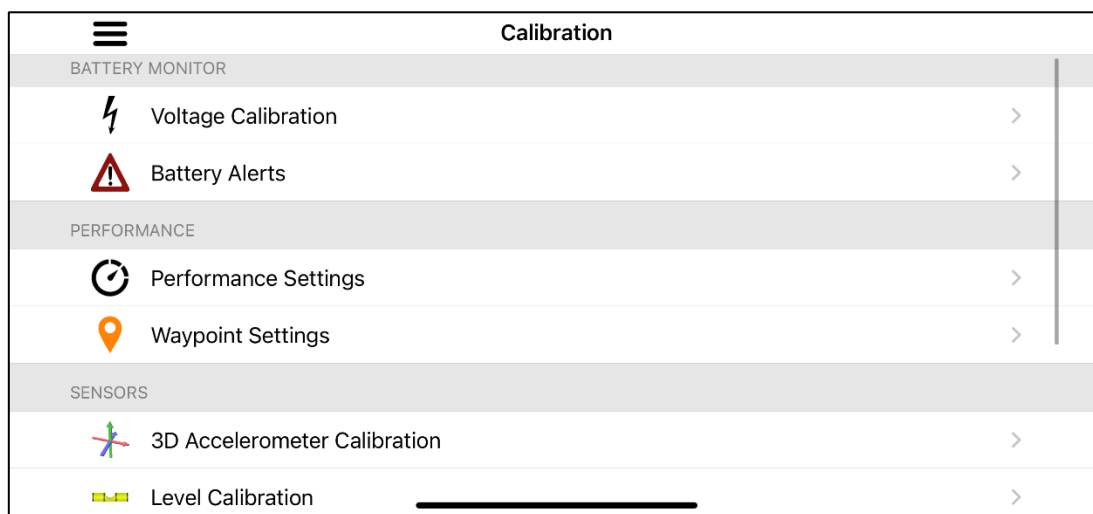
Once you are done with writing your log, tap the save button and it will be added to the list of logs. To edit or view an old log, just tap on it!

If you wish to send logs to yourself or a friend, tap the export button on the bottom right, this will open an email view and you can email it off! If you received an email containing logs, you can either view it on excel on the computer, or if on another iOS device, you can import it to the SidePilot app. Perfect for if you have multiple devices!

Data Flash Logs

Data flash logs contain important flight information recorded by the autopilot. Normally to download these requires a computer. Now by tapping on Vehicle logs, you can download any Data Flash log that is stored on your autopilot's memory. This can then be emailed to yourself or friends.

Calibration



Voltage Calibration

Allows you to enter the current voltage of your battery (measured with a Multimeter or another device) and will automatically calculate the voltage multiplier.

Battery Alerts

Battery alerts are banners that will appear on the main screen as well as a voice alert once your battery drops below custom thresholds. There are two levels of alert, Low and Critical. When your battery hits the low threshold, it will twice display a banner for 2 seconds. Once it hits critical threshold, it will be announced until the drone is landed.

Performance

See the performance section on page 24

Waypoint Settings

Adjusting this changes the maximum speed that the drone will fly at while doing waypoint missions. Affects the entire mission.

3D Accelerometer Calibration

When calibrating the accelerometer, instructions will be provided on screen. For 3DR Solo, this is the same as the level calibration.

You will need to place your drone in the orientations the picture depicts as instructed.

Level Calibration

To calibrate level, ensure your drone is on a level surface and tap 'Level Calibration'. This will define the new level angle for your drone. Tap 'Continue' on the popped-up view. If this does not disappear after a second, try the 3D Accelerometer Calibration.

Compass Calibration

Tap the 'Compass Calibration' button to begin the calibration. If your drone has a buzzer attached, you should hear it 'chirping' during the calibration. Pick up the drone and begin rotating it on all axis. Videos of this procedure can be found online.

Continue rotating until the red bar fills up completely then the drone will automatically reboot. This means that the calibration has been successful. You will also get an alert on your device.

RC Calibration

This view enables you to calibrate your RC transmitter endpoints. It will only save the values that are changed, so if you notice your yaw stick is not doing anything after a certain point, you can calibrate just the yaw stick and not have to worry about the others.

Flight Modes (Not available for 3DR Solo)

This screen allows you to change what flight modes can be selected using your radio transmitter.

Airspeed Calibration (Only available to ArduPlane)

This calibrates the airspeed sensor of the drone if installed. Follow the instructions at this [link](#), where this option replaces the 'Preflight Calibration' option of mission planner

Performance Settings

The screenshot shows the 'Performance Settings' screen in the SidePilot App. At the top, there is a back arrow and the text 'Calibration'. The title 'Performance Settings' is centered at the top. Below the title, there are four settings, each with a slider or input field:

- Flight Speed:** The slider is set to 'Medium'. The range is from 'Slow' to 'Extreme'.
- Yaw Speed:** The slider is set to 'Slow'. The range is from 'Very Slow' to 'Extreme'.
- Maximum Height:** The input field shows '200' and the unit is 'm'. The range is from '10' to '1000'.
- Maximum Distance:** The input field shows 'Unlimited' and the unit is 'm'.

These settings change certain parameters to tune your drone's performance as desired.

Flight Speed:

This setting will change how your drone handles during regular pitch, roll and vertical flight. Setting this to 'Slow' is recommended for first time users and if you desire smoother flight.

'Extreme' is not recommended unless you are a very confident operator! Your drone could easily get out of control!

Yaw Speed:

This setting changes the yaw characteristics of the drone. Set this to 'Slow' for more cinematic shots. 'Extreme' is not recommended unless confident!

Maximum Height

This sets the fence height limit of the drone. Slide all the way to the right for no limit.

Maximum Distance:

This sets the maximum distance the drone will fly from you before either stopping or RTL, depending on your FENCE_TYPE parameter. Slide all the way to the right for no limit.

3DR Solo Setup

Here you can set your 3DR Solo's settings.

Settings		3DR Solo Setup
WIFI SETTINGS		
WiFi SSID:		>
WiFi Password:		>
WiFi Country:		>
CONFIG		
	<input checked="" type="checkbox"/> Metric <input type="checkbox"/> Imperial	
Button Assignments		>
LED Configuration		>

Wifi SSID:

Set this to be whatever you want your Solo's WiFi name to show up as. One thing is that it will be prefixed with 'SoloLink_', however this will be done automatically so don't enter it here! This will reboot the IMX in your controller and Solo so they will disconnect for 30 seconds.

WiFi Password

Sure you can figure that out.

WiFi Country

Select between United States, European Union, Australia & Japan. This limits your TX power to the maximum in that country. Hint: US has the highest.

Units

Sets the units that the controller will display. Make sure to change this both here and in the App settings.

Button Assignments

Set what each button press does. For the A and B buttons you have 3 different button press 'events' These are Press, Short hold and long hold.

For all other buttons, you can only change their short and long hold events.

LED Configuration

Here you can set the color and properties of the LED's of your 3DR Solo.

There are a few premade color themes which you can try out, or create your own by tapping the color next to the arm you wish to change in the Solo diagram. You have many options here such as:

Color:

- You can set the color from the color wheel and slider on the left side.

Pattern:

- Solid
- Strobe
- Double Flash

Strobe Speed:

- Slow
- Fast
- Very Fast

Phase Offset (Alternate):

- This mode gives a 180° Phase offset of the flashing of this LED compared to normal. This allows you to alternate strobes between arms. (If you don't understand just try it!)

As soon as you tap 'Apply' the correct LED will be set as desired (If connected).

Once you have your desired LED configuration, you can save it using the save button in the top right. You will be asked to give it a name. If you choose a name that is already taken (Unless it's a stock layout), the new one will overwrite the old one.

If you want this LED layout to appear everytime you use the Solo, enable the 'Always Enabled' switch. Now each time you connect to the Solo using SidePilot, it will change the LED's over to the desired layout.

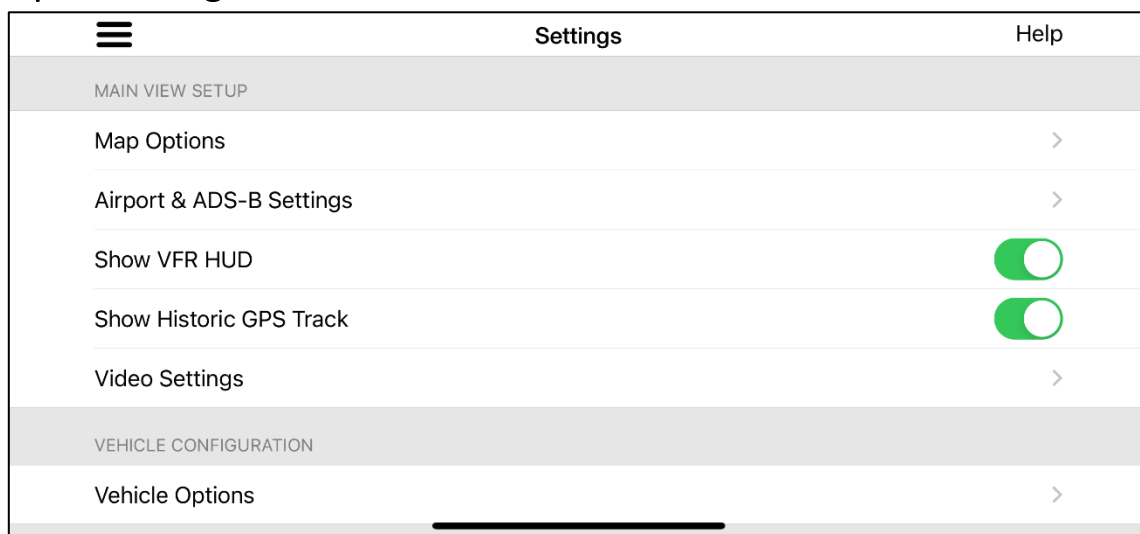
NOTE: If using Auto or Guided modes, your LED's will not change to flashing, this is normal and expected.

NOTE: To get back the stock layout, you just need to restart Solo.

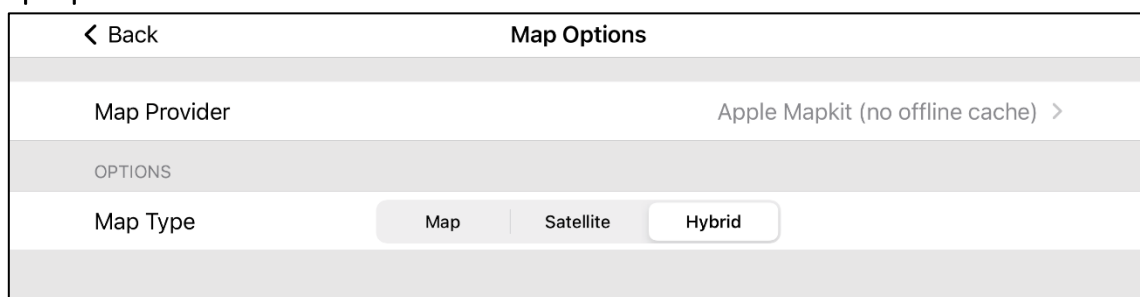
Solo WiFi Auto-connect

When enabled, a prompt will appear when opening SidePilot to connect to Solo WiFi. It will only appear after SidePilot has been connected to Solo at least once.

Help & Settings



Map Options



This menu gives you options on how the map is displayed on the main screen.

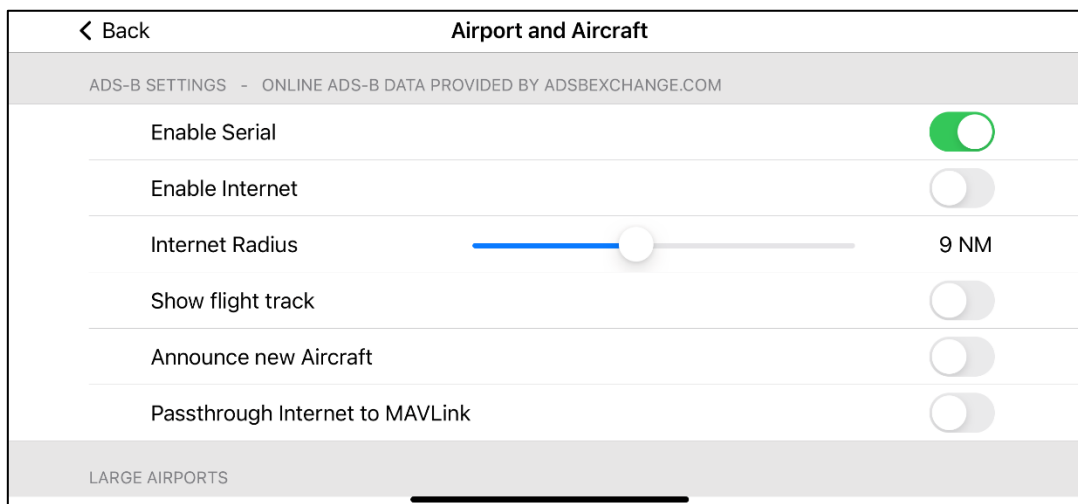
Map Provider

Allows you to select the map tile provider.

Some map providers allow for offline map caching, by selecting the 'Download Offline Area' button, moving to the area you wish to download and selecting 'Done' to save. This removes the need for an internet connection when operating your drone.

Custom map tile servers can be used, with instructions on how to set this up [here](#).

Airport & ADS-B



This menu allows you to setup how ADSB and airport data is displayed in SidePilot.

ADS-B Settings

ADS-B data is provided either by using a serial MAVLink ADS-B receiver such as the uAvionix PingRX or from the internet using the fantastic ADSBexchange.com.

Enable Serial

This enables the use of a serial ADS-B device like the PingRX

More information on uAvionix PingRX can be found here:

<https://www.uavionix.com/products/pingrx/>

and Arducopter installation instructions here:

<http://ardupilot.org/copter/docs/common-ads-b-receiver.html>

Enable Internet

This enables the use of the ADSBexchange online ADS-B service.

NOTE: ADSBexchange.com runs off an enthusiast community to provide the world with ADSB data from aircraft. This is only possible by people who setup receiver stations which can receive ADSB data from aircraft and 'feed' it back to the community. Anyone can setup a feeder station, more details can be found at <https://www.adsbexchange.com/how-to-feed/>

Internet Radius

This sets the radius that the internet API will search for aircraft, to a maximum of 20 nautical miles.

Show flight track

This shows a line of where each aircraft has flown since you began tracking it. It is colour coded for different altitudes.

Announce new Aircraft

This enables the device to 'speak' when it detects a new aircraft.

Passthrough Internet to MAVLink

This option enables SidePilot to send Internet based ADSB data to the drone, allowing the drone to perform avoidance.

Airports

Airport information is provided by OurAirports.com and are separated into five categories dependant on their classification; Large, Medium, Small, Heliport and Other.

You can control specific settings for each of the types of airport.

Enable – This enables or disables the showing of this type of airport on the map

Circle Scheduled – This enables or disables showing a 5km (3nm) circle around the airport. Scheduled means that this airport has regular flights scheduled.

Circle Unscheduled – This enables or disables showing a 5km (3nm) circle around the airport. Unscheduled means that this airport has NO regular flights scheduled.





Show VFR

Show VFR enables you to toggle the VFR view on the main screen on or off. This frees up the screen when not needed or on iPhone.

Show historic track

The SidePilot map will display a historic track of where the drone has been for the past 1 minute.

Video Settings

< Back	Video Settings	Help
Show on Main Screen		
Media Type	3DR Solo	
Flip Video		
Save to Camera Roll		
Automatically record video during shots		
Live Streaming Settings		>

This menu allows you to set video settings for the main screen. Currently the only media type available is 3DR Solo.

Show on Main Screen:

This will enable the video to be viewed on the main screen when the device is in landscape mode.

Media Type:

Currently the video feed is only for 3DR Solo. If you require another method of video input, please contact me at tom@sidepilot.net.

Flip Video:

This will flip the video feed to allow for cameras that do not flip their HDMI video output when mounted upside down (eg. GoPro Hero 7).

Save to Camera Roll:

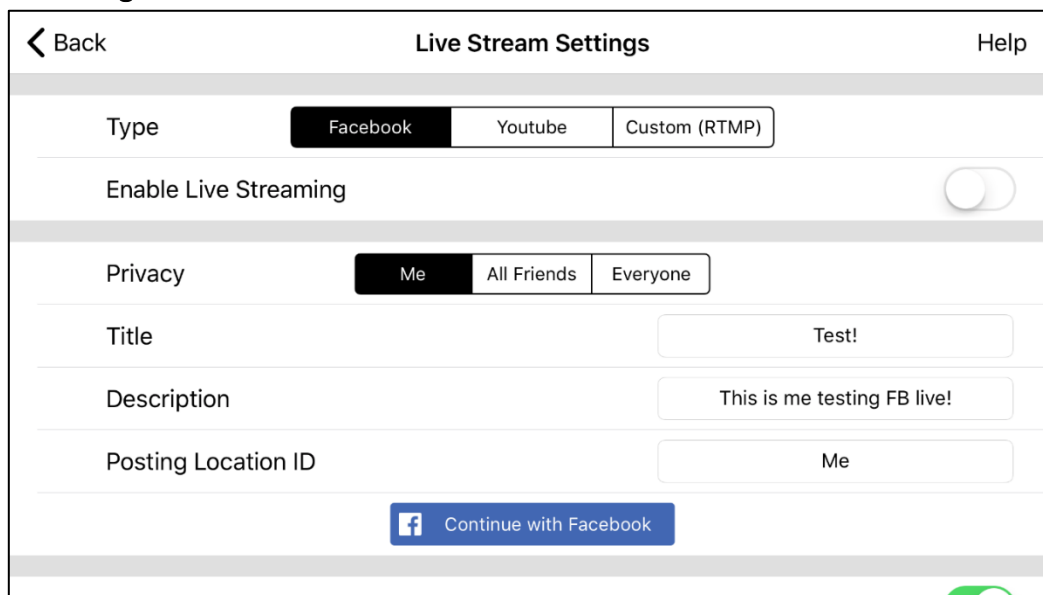
Enables saving video to the camera roll. If in the Solo gimble, this will also trigger your GoPro to start recording, otherwise it is only screen recording the live video feed and saving to your iOS device. Note: These will be lower quality than what will be on the GoPro itself.

Automatically record video during shots:

This option enables the device to automatically begin recording using GoPro (If using supported firmware, see 3DR website) whenever a shot is started.

NOTE: Live video may be very intensive on your device. If you notice lag or slow performance it is recommended to close all current applications. Some older devices will run slower than newer devices.

Live Streaming:



The screenshot shows the 'Live Stream Settings' screen. At the top, there is a 'Back' arrow on the left and a 'Help' button on the right. Below the title bar, there are three tabs: 'Facebook' (selected), 'Youtube', and 'Custom (RTMP)'. A toggle switch for 'Enable Live Streaming' is on the right. Below this, there are three privacy options: 'Me' (selected), 'All Friends', and 'Everyone'. The 'Title' field contains 'Test!'. The 'Description' field contains 'This is me testing FB live!'. The 'Posting Location ID' field contains 'Me'. At the bottom, there is a blue button with the Facebook logo and the text 'Continue with Facebook'.

To begin live streaming, open the 'Live Stream Settings' menu.

Live Stream Settings:

To set the settings for your live stream, tap the 'Live Stream Settings' button which will open a new Live Stream page.

Always available settings:

- Begin Streaming while recording
 - This option enables live streaming. This will occur when you begin recording video.
- Mute audio (enabled by default):
 - Mute all audio of the stream. If disabled, audio comes from your iOS devices microphone, not your drone so be careful!
 - This feature can be turned on/off during the stream.
- Auto Filter:
 - Applies automatic filtering to the video stream. You will not see the effect directly on your device. This enhances the viewers experience as they won't just get the raw video feed. In some cases, it may be unsuitable so make sure to check the stream if possible.
 - Enhancements are made automatically to:
 - Saturation
 - Contrast
 - Highlights & Shadows
 - This feature can be turned on/off during the stream.

There are three live streaming methods currently supported, these are:

Facebook

To use Facebook livestreaming, you must first tap the blue 'Continue with Facebook' button and login to your Facebook account.

Options include:

- Share with:
 - These are the streams privacy settings.
- Title:
 - Set the desired video title/
- Description:
 - Set the desired video description
- Location ID:
 - Here you can specify where the video will be streamed to.
 - To stream to your personal page, either enter 'me' or leave this field blank.
 - To stream to a group or event page, enter the page ID. This can be found by going to <https://lookup-id.com> and enter the page URL.
 - When a valid ID is entered, this field will change automatically to reflect the correct group/page/user name. Do not enter the name manually!

YouTube

To use YouTube live streaming, you must first go to your YouTube dashboard in safari (https://www.youtube.com/live_dashboard). On this page, you can set the title, description and other settings before going live. You will also get the Stream URL and Stream Key from this page.

Options include:

- Stream URL:
 - Set the streams URL
- Stream Key:
 - Set the streams key (from YT dashboard)

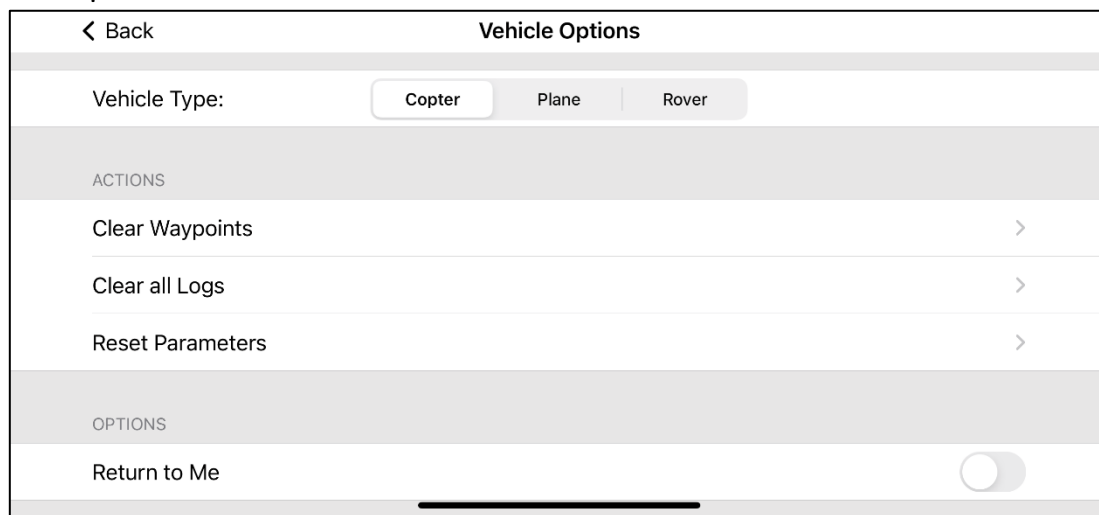
RTMP

RTMP is used for streaming to custom services that support RTMP streams.

Options Include:

- Stream URL:
 - Sets the streams URL, depending on the streaming server, this may include the stream key in the URL.

Vehicle Options



This menu allows you to set specific vehicle options.

Vehicle Type

Here you can set what ArduPilot vehicle you have, Copter, Plane or Rover. This sets what options are available in SidePilot, as well as changes the app icon to reflect the vehicle type.

Clear Waypoints, Clear all Logs

These buttons do as they say, the 'Clear Waypoints' button will remove all waypoints from the device and drone. 'Clear all logs' will remove the user flight logs. This does not remove the data flash logs from the drone.

Return to Me

RTM will cause the drone to return to your last known GPS location, this is useful if you are launching from a boat or car.

This works by constantly sending your devices location to the drone, so you must have a good GPS lock on yourself. This is not recommended if you are using an iPad that does not have cellular capability.

Reset Parameters

This will reset all parameters on the drone to the default ones by setting the "FORMAT_VERSION" parameter to 0, which will reset all parameters upon the next reboot. Useful for if you incorrectly calibrated your PID and want to start from scratch.

To use this, you must first be connected to your drone, go to the Params tab and ensure all of the current parameters are loaded. (Tap 'Load from Vehicle' if they are not.)

Network Settings

< Back		Network Settings		
Type:	Bluetooth	UDP	TCP	3DR Solo
WiFi Setup		Port: 14550 >		

This menu defines the network connection used to communicate with your drone.

Bluetooth

This setting enabled you to use the either a generic (HM-10 etc) BLE module, or a custom BLE repeater to send serial data via Bluetooth low energy.

This way you can use your own existing Sik Radio telemetry set to connect to your drone over long range. This is useful for custom drones.

Wi-Fi

This enables you to connect to your drone if you have a Wi-Fi connection to it over either UDP or TCP.

3DR Solo

Sets all settings to be compatible with the 3DR Solo.

BLE Setup

This button opens a view for changing the settings on your BLE module. Here is where you can enable or disable your BLE module from connecting (Its based off the devices name).

If you have a SidePilot BLE repeater, you can also change Parameters such as the Name and Baud Rate (Important if you have changed your baud rate from the usual 57600).

If changing the name of your BLE Repeater, note that it can take a long time for changes to be reflected in the app.

If using a DIY Generic BLE module such as the HM-10, here's some tips:

- Ensure you have set the correct baud rate of the module. It needs to match both the flight controller's serial rate, and the telemetry modules rate (if using one).
- The Service UUID should be set to "FFE0"
- The TX/RX characteristic UUID should be "FFE1"
- If you have a device that doesn't use these but wish to add support, contact me at tom@sidepilot.net and I'll see what I can do.

WiFi Setup

Here you can set the IP (for TCP connections) and Port number for SidePilot to connect to your drone through.

MAVLink Settings – ADVANCED USERS

MAVLink Settings	
ADVANCED USE ONLY - IT IS NOT RECOMMENDED TO CHANGE THE BELOW SETTINGS	
Protocol	Auto 1 2
My System ID (Default 254)	254 - +
My Component ID (Default 190)	190 - +
Target System ID (Default 1)	1 - +
MAVLINK INSPECTOR	
Raw MAVLink data	>

This contains SidePilot's MAVLink options.

Protocol

Defines which MAVLink protocol to use when talking to your drone. This is recommended to be left at auto, where it will detect which protocol the drone is sending through and adjust accordingly.

My System ID & Component ID

This defines the system ID and component ID that SidePilot is using. By default a system ID of 254 and Component ID of 190 is recommended for GCS.

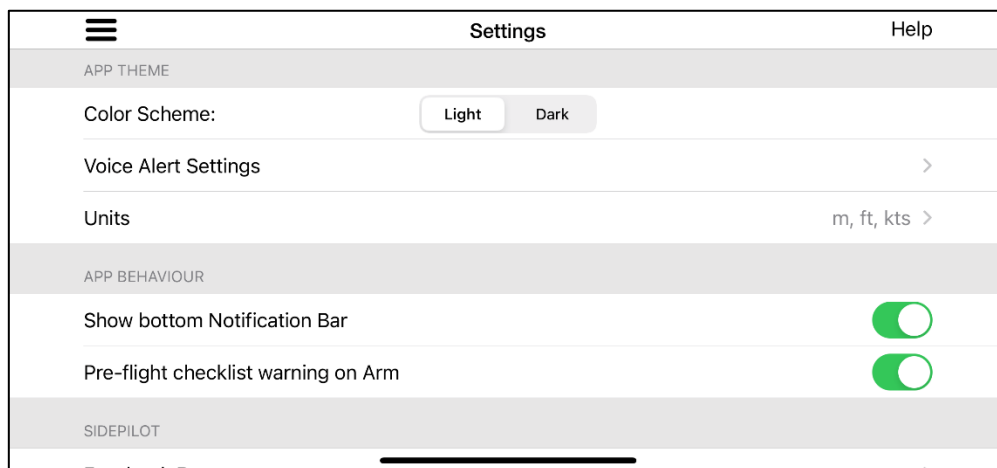
Target System ID

This is the target system that SidePilot is controlling. This is used for situations where you may have multiple MAVLink devices talking to each other so that SidePilot controls the correct one. 1 is the standard vehicle ID.

Raw MAVLink data

Here you can see the raw MAVLink messages being received by SidePilot.

App Theme



Color Scheme

SidePilot supports two different themes, light and dark. They are exact opposites of one another and it is a personal preference of the user which they prefer.

Voice Alert Settings

These settings let you change the announcement voice. You can enable/disable the voice announcements, change the volume of the voice, as well as change the gender of the voice.

Units

These settings allow you to set the units displayed in the user interface. You can pick from predefined Imperial or Metric, or fine tune specific unit types as desired.

App Behaviour

Show Notification Bar

This controls whether or not the orange notification bar appears on the main screen when SidePilot receives a 'EMERGENCY', 'CRITICAL' or 'ALERT' status message from the drone.

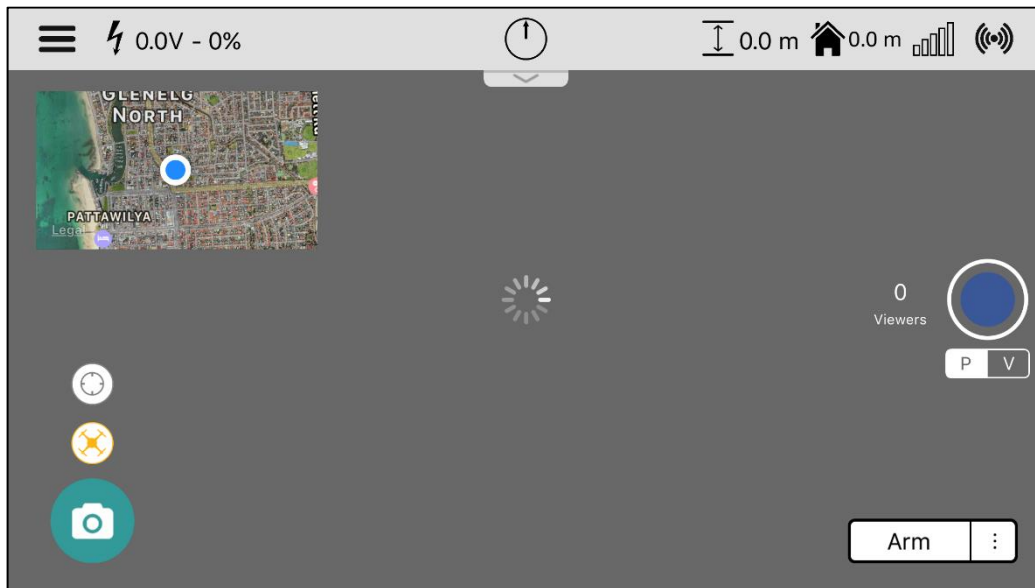
Pre-flight checklist warning on Arm

This setting toggles whether SidePilot will display a warning when attempting to arm your drone when the Pre-Flight Checklist is not complete.

Live Streaming Video

Facebook

To begin live streaming video to Facebook, enter the desired settings in the 'Video Settings' page.



Instruction video: https://www.youtube.com/watch?v=BsuQgB2_oD8

Then navigate back to the main screen, while live streaming is enabled, the recording button will be blue.

To begin the live stream, tap the record button. This will start the stream and the GoPro recording.

If you need to switch batteries or your signal cuts out for whatever reason, you have 2-3 minutes to reconnect before the stream will end on Facebook. If swapping batteries, be sure to not tap the disconnect button. Once your Solo turns back on and reconnects to the controller, the live stream will continue and SidePilot will reconnect automatically.

NOTE: It is recommended to test this on your personal page and with the privacy settings set to 'me'. This will post a video to your own page which only you can see.

FEATURES:

- Add a Title & Description to your video
- Privacy settings (Me, Friends & Everyone)
- Location (My timeline, group or event pages)
- Ability to swap batteries while staying streaming (Stream will cut out for 30 seconds, but once reconnected will automatically start again)
- Audio is recorded from the iOS device directly, so you can narrate the flight instead of having viewers just listen to wind/blade noise. You can also mute the audio in settings.
- Automatic image enhancements (filtering) can be enabled/disabled in the stream settings.

YouTube

To begin live streaming video to YouTube, enter the Stream URL and Stream Key into the Live Stream settings in the Video Settings menu. These can be found on your YouTube dashboard.

Then navigate back to the main screen, while live streaming is enabled, the recording button will be blue.

To begin the live stream, tap the record button. This will start the stream and the GoPro recording.

If you need to switch batteries or your signal cuts out for whatever reason, the stream will continue once the Solo is back on and connected to the controller. If swapping batteries, be sure to not tap the disconnect button. Once your Solo turns back on and reconnects to the controller, the live stream will continue and SidePilot will reconnect automatically.

NOTE: It is recommended to test this before use!

RTMP

RTMP livestreaming is similar to the YouTube setup, but just with a URL instead (If you have a stream key as well, you can either use the YouTube setting or append the key to the end of the URL with a forwardslash). Enter the Stream URL in the Live Stream settings in the Video Settings menu.

Then navigate back to the main screen, while live streaming is enabled, the recording button will be blue.

To begin the live stream, tap the record button. This will start the stream and the GoPro recording.

If you need to switch batteries or your signal cuts out for whatever reason, the stream will continue once the Solo is back on and connected to the controller. If swapping batteries, be sure to not tap the disconnect button. Once your Solo turns back on and reconnects to the controller, the live stream will continue and SidePilot will reconnect automatically.

NOTE: It is recommended to test this before use!

3DR Solo Firmware Upgrade

To open the firmware upgrade menu, go to 'Help & Settings' then scroll to the bottom where there is the '3DR Solo Firmware Upgrade' button. Tap this.

< 3DR Solo Setup	Solo Firmware Upgrade	Help
HERE Revert To Leg Compass 1477 bytes		<input type="radio"/>
Landing Gear Parameters 2019-11-19 1326 bytes		<input type="radio"/>
Open Solo 4.0.0 Clean Install (Controller) 75117191 bytes		<input type="radio"/>
Open Solo 4.0.0 Clean Install (Copter) 76854962 bytes		<input type="radio"/>
Open Solo Update Factory Reset Partition (Controller) 1280 bytes		<input type="radio"/>
Open Solo Update Factory Reset Partition (Copter) 1269 bytes		<input type="radio"/>
Add Custom URL		
Controller: Unknown, Controller f/w: Unknown, Solo: Unknown, Autopilot: Unknown, Gimble: Unknown		

How to use:

Tap the desired file to download it to your device. When downloaded a green tick mark will appear to the right of the file.

To upload the package to your Solo, tap it again. A description will pop up and confirm the upload. Please read this to ensure you are uploading the correct package and following the instructions.

To delete a file, swipe in from the right.

Custom Packages:

NOTE: ADVANCED USERS ONLY!

If you have a custom package you wish to upload (OpenSolo DIY versions), tap the 'Add Custom URL' button. This must be a link to the file with a .zip extension. If using a Github link, ensure you are using the 'raw' URL. This can be done by changing 'blob' to 'raw' in the URL.

Instructions for how to format the files for a custom package can be found [here](#).

Some useful custom packages such as the BMSOne Li-ion parameters can be found [here](#). Copy the file link and paste into the 'Add Custom URL' section of SidePilot.

It is also possible to upload the unzipped package folder containing the correct format to the SidePilot -> solo-upgrade folder in the Files app.

Open Solo 4 Installation Instructions

Note: If you are doing a brand new green cube install, please be sure to start off with the [\[New Green Cube Instructions\]](#). This warning does not apply to stock solos and existing green cube solos.

Please read all the instructions carefully prior to beginning. Skipping steps or doing things out of order will generally result in failure that is difficult to diagnose and repair.

These instructions are for SidePilot only. Please ensure your mobile device has the latest version of SidePilot installed via the Apple App Store.

1. **Download packages:** If you haven't recently downloaded the latest files, you will need to do this first.
 - First open SidePilot and navigate to the *Help & Settings -> 3DR Solo Setup -> 3dr Solo Firmware Update* page. *Note: Your connection type will need to be set to '3DR Solo' for this menu to appear*
 - Download the *Open Solo 4.0.0 Clean Install* packages (solo and controller) by tapping the packages. The installation packages are ~75MB each, so it will take a little longer to download than you may be used to. A green tick will appear next to the package when downloaded.
 - If you have the HERE GPS or retractable landing gear mods, also download those parameter packages.
 - You do not need any ArduCopter parameter package or the ArduCopter firmware package for this process.
2. **Connect:** Once you've downloaded both, connect your mobile device to the Solo WiFi and make sure SidePilot says connected to vehicle. Again, your solo and controller must be fully charged, powered on, paired, connected, and not malfunctioning. You may need to press the connect button in SidePilot to force it to connect.
3. **Install Controller Package:** Navigate back to the firmware upgrade menu in SidePilot, tap the *Open Solo 4.0.0 Clean Install (Controller)* package that you previously downloaded.
 - Press install. Press install again when prompted again to confirm. *This is your last chance to change your mind.*
 - Be patient while numerous large files are extracted and scripts execute. Do not push buttons, exit the app, mess with the Solo, etc. Let it do its thing. Until it says it has completed.
 - SidePilot will tell you when the whole process is complete.
 - **DO NOT REBOOT THE CONTROLLER YET!** You must do the install for both the controller and the copter before rebooting anything. Once SidePilot tells you the install is complete, leave the controller and move on to the copter install.

Continued next page...

4. **Install Copter Package:** From the firmware upgrade menu in SidePilot, tap the *Open Solo 4.0.0 Clean Install (Copter)* package that you previously downloaded.
 - Press install. Press install again when prompted again to confirm. *This is your last chance to change your mind.*
 - Again, be patient while numerous large files are extracted and scripts execute. Do not push buttons, exit the app, mess with the Solo, etc. Let it do its thing. Until it says it has completed.
 - The solo will click and lights will go disco. At this time, ArduCopter firmware is being pre-installed on the Cube. This step takes about 1 minute and SidePilot will tell you when the whole process is complete.
 - *Stock cube users upgrading from the old firmware:* you will not get any happy tones to indicate firmware loading completed, and the lights will stay disco. This is not a problem, and this is why we're pre-loading the firmware now.
 - Once SidePilot tells you the install is complete, **you must continue to wait a few minutes** to allow the autopilot to install. After approximately 10 minutes, continue to the next step.
5. **Reboot:** Power cycle the Solo and controller once the SidePilot installation packages have both completed successfully. When they power back on, they will automatically begin installation.
 - *Unlike in Open Solo 3, the recovery partition will not be updated to Open Solo 4 during the install process. Updating the recovery partition will be done later very easily. You will likely hear the cube reboot and flash its lights twice (firmware install and parameter reset). You will see the controller reboot and say update success once.
 - It is difficult to know exactly what stage it is at since it can't speak and isn't telepathic. The process takes about 6 minutes on both the solo and the controller. So just wait about 6 minutes.
6. **Pair:** Hit the pair button under the Solo with a small pointy poking apparatus like a paper clip for 2 seconds to get the controller and solo re-paired. When the controller tells you it has detected the solo, hold the A and B button for 3 seconds... which is the second set of vibrations... until the the screen says pairing in progress. If they are not pairing, they may have timed out. Reboot both and try again.
7. **Reconnect mobile device:** You will need to reconnect your mobile device to Solo's WiFi now. This installation process reset the WiFi to defaults. The default password is `sololink`.
8. **Load applicable parameter packages:** If you have a HERE GPS/Compass or a retractable landing gear mod, you will need to install some applicable parameter packages now. If you have none of these modifications, you can skip this step.
 - Tap each package in the SidePilot Firmware Updates menu to install the parameters. You do not need to reboot in between
 - If you have the HERE gps/compass, load the *HERE Compass Parameters* package.
 - If you have the landing gear mod, load the *Landing Gear Parameters* package.
 - You do not need to load the ArduCopter parameters or ArduCopter firmware packages!!!
 - Reboot the solo after loading all the applicable parameter packages.

9. **Verify:** In the SidePilot firmware upgrade menu, you can verify everything installed by looking at the listed version information on the bottom panel.
10. **Update Factory Reset Partition:** In the Solo Firmware Upgrade menu, there is a copter and controller package called *Open Solo Update Factory Reset Partition*. Run each one to update your factory reset (recovery) partitions. This will allow the Solo automatically reset back to a clean Open Solo 4 if you ever do a factory reset. *Note, this does not actually install anything. It just runs a script that updates the recovery partition's file system. There no clicks, beeps, blinks, or bangs. SidePilot will tell you when it is done, and that's it.*

Installation Complete!

Proceed to the [Post Install Instructions](#).

Debug Mode

To enable more comprehensive messaging, you can enable Debug mode by tapping 3 times on the word 'Settings' in the title of the settings menu.

This enables:

- More granular messages to appear in the Messages page
- FPS counter is displayed in the bottom right corner of the video feed (3DR Solo only)
- Debug messages are included in the analytics sent to us, enabling us to view if there are any issues occurring. This can be useful if you have a problem you wish to show us and we cannot replicate the issue.

Debug mode will persist throughout restarts of the app with a warning dialog appearing each time.

Any other questions, please ask on the SidePilot
Facebook page, or send via email to

tom@sidepilot.net