



OPERATOR'S MANUAL



WISPr Pogo

User Manual v1.0.2

September 27, 2019



Notice

All instructions and documents are subject to change at the sole discretion of Autonomous Industrial Solutions. For up to date product information, visit www.wisprsystems.com and go to the support page

**WARNING**

Read the entire user manual to become familiar with the operation

and features of this product before use. Failure to operate the product as directed can result in damage to the product, cause damage to personal property and cause serious injury. This is a sophisticated and technical product. It must be operated with caution and good judgement and requires some basic mechanical aptitude. Failure to operate this product in a safe and responsible manner could result in injury or damage to the product or other property. This product is not intended for use by children or persons under the age of 18. Be sure to only use genuine WISPr Systems components. Do not alter this product in any way outside of the documents provided by WISPr Systems. These safety guidelines contain instructions for safety, operation and maintenance. It is essential to read and follow all the instructions and warnings in the user manual, prior to assembly, setup or use, in order to operate the product correctly and avoid damage or serious injury.

Pre-Flight Checklist:

Ensure that you have your FAA Part 107 License

Be familiar with FAA Part 107 rules and regulations

Ensure your aircraft is registered with the FAA

Ensure weather conditions are suitable for flight

Ensure that you are NOT under the influence of alcohol, drugs, or any medications that could impair your abilities to operate the UAV safely

Ensure that you are using only genuine WISPr Systems parts and that all the parts are free from damage or broken components.

Ensure the Remote, Battery, and mobile devices are fully charged

Ensure propellers are mounted correctly and confirm the propeller attachment is secured to the motor attachment.

Ensure you are flying OUTSIDE of restricted areas and No Fly Zones

Ensure that you are operating within local and federal laws and regulations

Ensure that you have obtained any appropriate authorizations

Be aware of your surroundings and understand the risks associated with operating UAV

Be familiar with the WISPr Systems User Manual

Safety Regulations

General

DO NOT store the WISPr Pogo near any electromagnetic or magnetic fields, heavy machinery, large electric motors, high voltage sources, server rooms, sound equipment, laptops, batteries, or any other sources of interference.

You should not be under the influence of drugs, alcohol, or any medications that could impair your ability to operate the UAV safely.

Never use the Pogo for illegal operations.

Always have a flight plan.

DO NOT fly near or within a no-fly zone.

DO NOT fly above authorized altitude.

DO NOT fly aircraft out of your line of site.

Maintain contact with controller for entire flight.

Become familiar with operating drone and its controls before using the Pogo.

Never fly near or interfere with manned aircraft operations.

Always follow local and federal regulations.

Please Read entire user manual to become familiar with the features of this product before operating.

Failure to operate the product correctly and responsibly can result in damage to the product or personal property and cause serious injury.

The Pogo must be operated with caution and common sense and requires some basic mechanical ability.

This product is not intended for use by children and should never be used near children or pets/animals.

DO NOT alter product in any way.

Use only provided genuine WISPr Systems products.

Read manual prior to assembly and/or use.

The WISPr Pogo is not a toy and should only be used for its specified purposes.

Individual Parts

Remote Controller

Physically inspect remote for any visible damage.

Must not fly with a damaged controller.

Ensure successful connection.

Only use controllers purchased from WISPr Systems.

Camera

Ensure camera functions properly before use.

Ensure camera lens is clean before use.

Do not tamper with camera in any way.

Propellers

Inspect propellers for damage before use.

Do not use damaged or broken propellers.

Never approach spinning propellers.

Be aware of sharp edges on propellers when handling, installing, or removing propellers and use gloves during these procedures to avoid injury.

Use necessary tools to install and remove propellers.

Do not arm motors with installed propellers where there are people, animals, or other objects present.

Motors

Ensure motors are securely mounted and rotating smoothly.

Do not modify the motors in any way.

Inspect motors for physical damage.

Do not handle motors immediately after flight as they will be hot.

Range Sensor

Never look directly into the range sensor. The laser could damage eyes.

Ensure the range sensor lenses are clean before every use.

Propeller Bumpers

DO NOT operate the Pogo without the use of propeller bumpers.

Ensure the propeller bumpers are tightened to avoid vibration to the flight controller.

Inspect the propeller bumpers for physical damage before and after every flight.

The propeller bumpers ARE NOT intended to protect bystanders or property during a malfunction, rather is intended for very light collisions against solid, flat surfaces, and/or tip-overs on landing.

Legs

DO NOT operate the Pogo without the use of the legs.

Ensure the legs are tightened to avoid vibration to the flight controller.

Inspect the legs for any physical damage before and after every flight.

Battery

DO NOT use other batteries that are not purchased from WISPr Systems.

Inspect the battery before use, for any physical damage or swelling.

Never store a battery above 30%.

DO NOT bring batteries on any commercial or private aircraft.

Ensure snug connection when connecting the battery to the drone before use.

CPE Data Cables

ONLY use ethernet cables purchased from WISPr Systems, as they are designed for this specific use.

Ensure there is no physical damage to the cable before and after use.

GPS Module

DO NOT TOUCH other than lightly pressing the safety switch.

DO NOT tamper or move the GPS after calibration. Slight inconsistencies in the GPS could cause flight failures.

Manual Use:

Legend



Tips



Warning



Important



Reference

Read Before Use:

Unpacking the WISPr Pogo

WISPr Pogo Operational Manual

FAA Regulations - https://www.faa.gov/uas/commercial_operators/become_a_drone_pilot/

Watch Before Use:

All the following videos can be found at: <https://wisprsystems.com/support/>

Configuring CPE to connect to the WISPr OS

POGO Pre/Post Flight Procedures

WISPr OS Failsafes

WISPr OS control options and tutorial

Calibration Tutorial

Contents

Notice	3
Pre-Flight Checklist:	3
Safety Regulations	4
General	4
Individual Parts	4
Remote Controller	4
Camera	4
Propellers.....	4
Motors	5
Range Sensor	5
Propeller Bumpers.....	5
Legs	5
Battery	5
CPE Data Cables	5
GPS Module	5
Manual Use:	6
Legend	6
Read Before Use:	6
Watch Before Use:	6
Introduction	10
Pogo Specific Features	10
Included with Purchase	11
Pogo Diagrams	12
Hand Controller Diagram	13
Keyboard Diagram	13
GPS LED Descriptions	15
Calibrate First Before Flying	17
Download Calibration Software	17
Calibration Warnings and Important Details	17
Configuring your CPE antenna	18
Safety when running autonomous surveys	19
Safety Failsafes.....	22

Reference to front of aircraft.....	25
Plug in battery and calibration cable	25
Open Calibration Software.....	25
Compass Calibration	26
Gyroscope Calibration.....	29
Accelerometer Calibration	31
Level Horizon Calibration.....	33
Post Calibration.....	34
Pre-Flight Checklist	35
Connect to Pogo Wi-Fi Access point	36
Initializing Hand Controller	37
Using WISPr OS.....	37
<i>Connect to WISPr OS</i>	<i>37</i>
Controlling the WISPr Pogo.....	38
<i>Hand Controller Controls.....</i>	<i>38</i>
<i>Keyboard Controls</i>	<i>40</i>
<i>Bluetooth/Nimbus Controller</i>	<i>42</i>
<i>Touchscreen Controller.....</i>	<i>43</i>
Preparing the WISPr Pogo.....	44
<i>Attach CPE Antenna to Pogo.....</i>	<i>44</i>
<i>Connect Landing Gear/ CPE mount to POGO</i>	<i>45</i>
<i>Connect Landing Gear/ CPE mount to POGO</i>	<i>46</i>
<i>Install Quick attach Propeller</i>	<i>48</i>
<i>Insert Battery.....</i>	<i>51</i>
<i>Plug in battery</i>	<i>51</i>
<i>Flight Restrictions</i>	<i>53</i>
Geofence Breach	53
Low Battery.....	53
<i>Initialize Controls.....</i>	<i>54</i>
<i>Arming the Pogo.....</i>	<i>54</i>
<i>Take-Off.....</i>	<i>56</i>
<i>Landing</i>	<i>57</i>
Post flight Procedures	58

<i>Powering Down the Pogo</i>	58
<i>Remove Propellers</i>	59
<i>Remove Battery</i>	60
<i>Remove Landing Gear/ CPE Mount</i>	61
<i>Unscrew and lock down GPS mount for storage</i>	62
Emergency Procedures.....	63
Appendix.....	64
Product Agreements	65
References	74

Introduction

Pogo can complete any size survey at any location in under a maximum of 10 minutes, while keeping the technician safe on the ground.

The WISPr Pogo is an Industrial Drone and will operate and function differently than a normal consumer drone. Please read this manual carefully and follow all instructions listed within this manual.

Pogo Specific Features

The WISPr Pogo uses triple sensor redundancy within its flight controller and lidar, allowing the Pogo to report heights with centimeters accuracy*, as well as, azimuth accuracy within 5°. boasts a 4-pound payload in 10mph winds up to 15mph wind gust with a maximum flight time of 18 minutes*.

When using the multi-band Wi-Fi dongle included in with the purchase of the Pogo, the connection range is 300ft (91.44m). The Wi-Fi dongle, swaps between 2.4GHz and 5.8GHz depending on the operating frequency of the CPE under test.

An 8MP Camera is used for First Person View and takes snapshots of survey locations.

A Geofence with a 200ft (60.96m) radius is set so ensure connection, maximum altitude of 200ft (61.96m), and a minimum altitude of 6.5ft (2m). The Pogo will be prompted to turn toward home and travel 32.8ft (10m) away from the geofence. If the turnaround fails due to a timeout or high winds, the Pogo will initiate the Return to Launch (RTL) function, where the Pogo will return and land at its original launch position.

The Pogo is equipped with a Lidar range finder that reports within $\pm 3\text{cm}$ when the Pogo is below 55.5ft (17m).

The Pogo offers flexible controls by allowing to use a hand controller with your laptop, a controller for your Apple or Android phone, or basic keyboard controls via laptop, for the user's ease. Also, touch screen controls have been added as a option.

The Pogo is designed to report accurate data to aid telecommunications experts in surveying wireless networks.

*Maximum flight time was tested in low to mid winds, at various speeds and maneuvers.

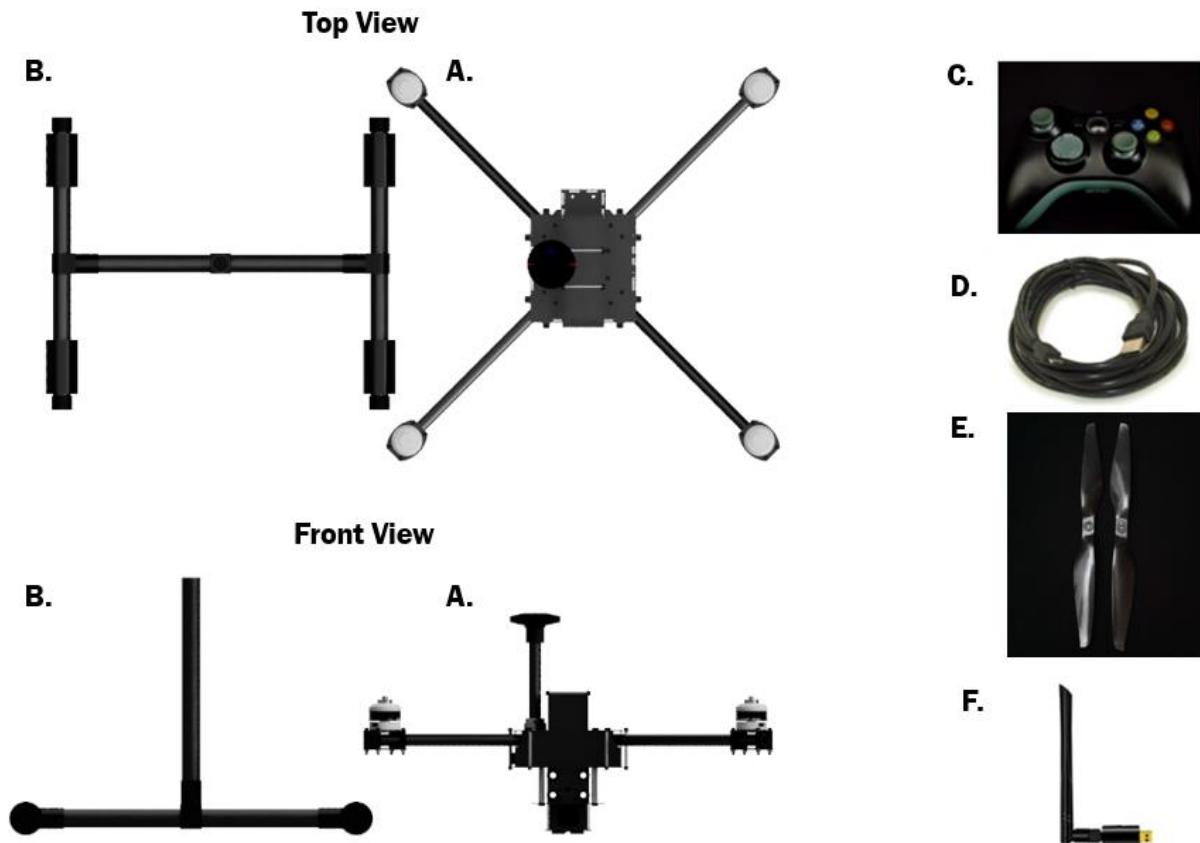
*Azimuth accuracy was tested in low winds with a clear sunny sky.

*Height accuracy was tested in low winds at various heights.

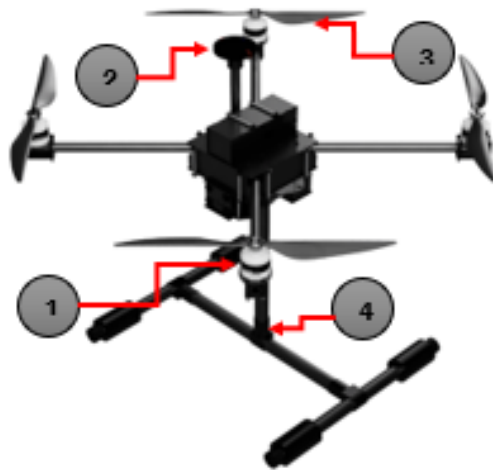
Included with Purchase

- A. WISPr Pogo Drone
- B. Landing Gear
- C. Remote Controller
- D. microUSB cable
- E. Propellers (2 pairs)
- F. Dongle (Wi-Fi adapter)

****Battery and Battery Charger not included**

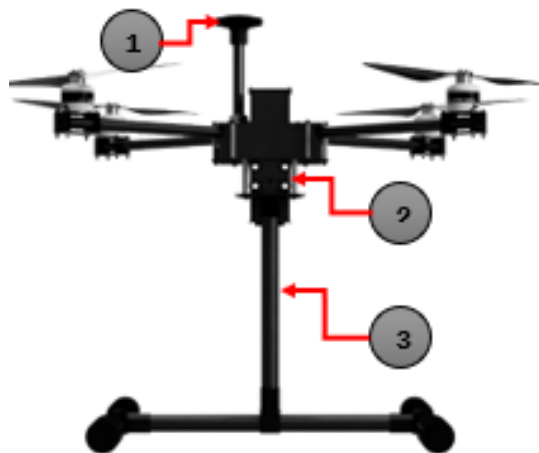


Pogo Diagrams



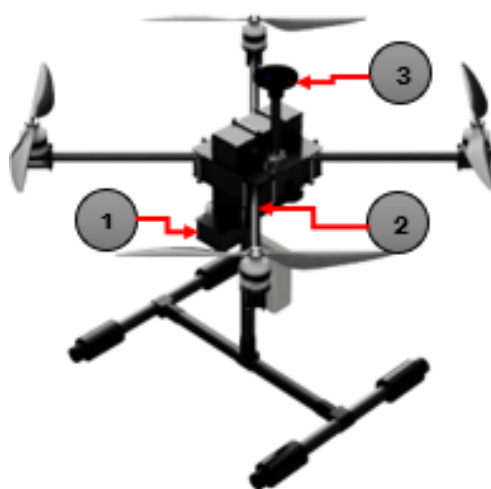
Front Perspective View

1. Motor
2. GPS/ Safety Switch
3. Propeller
4. Landing Gear/ CPE Mount



Front View

1. GPS/ Safety Switch
2. First Person View Camera
3. Landing Gear/ CPE Mount



Back Perspective View

1. Lidar
2. Battery Tray
3. GPS

Hand Controller Diagram



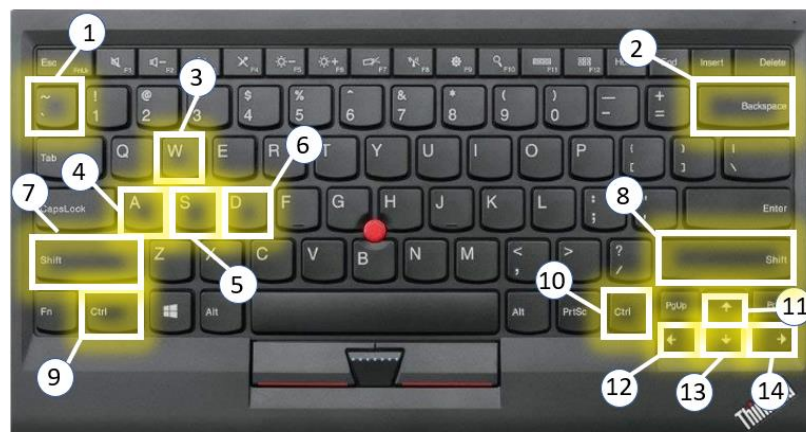
Usable Controls

1. Left Joystick
2. Back Button
3. Start Button
4. Right Joystick
5. Right Bumper
6. Right Trigger
7. Left Trigger
8. Left Bumper



Only use controllers provided by WISPr Systems, using third party controllers could cause unexpected flight failure.

Keyboard Diagram



Usable Keyboard Controls

1. ~
2. Backspace
3. W
4. A
5. S
6. D
7. Left SHIFT
8. Right SHIFT
9. Left CTRL
10. Right CTRL
11. Up Arrow
12. Left Arrow
13. Down Arrow
14. Right Arrow



Useable Controls

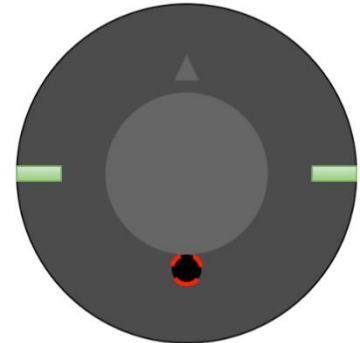
1. Left Joystick
2. Right Joystick
3. Right Bumper
4. Right Trigger
5. Left Bumper
6. Left Trigger

GPS LED Descriptions

Solid Green indicates that the Pogo is ARMED and LOCKED to the GPS. The Pogo is ready for guided missions as the motors become unlocked and you are in control.

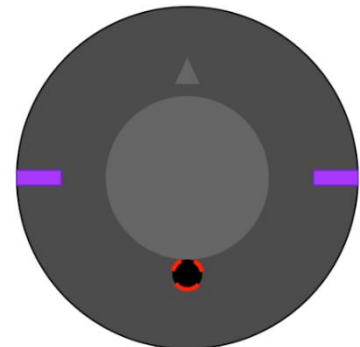
Flashing Green indicates that the Pogo is DISARMED and LOCKED to the GPS. You will not be able to control the motors of Pogo, but other subsystems are working.

Top View - GPS



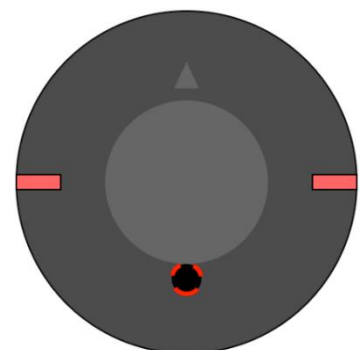
Top View - GPS

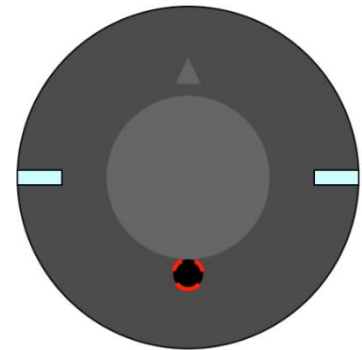
Solid Purple indicates the Pogo has hit the FAILSAFE MODE. This becomes active when the Pogo has an issue during flight which can be losing manual control, critically low battery, or even internal error. The Pogo will attempt to return to its initial takeoff location or even decrease altitude where it is currently located.



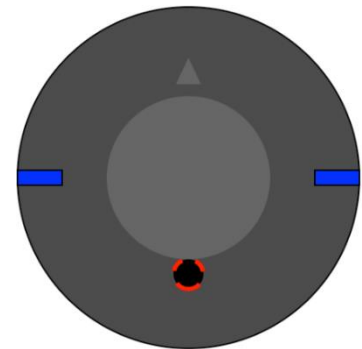
Top View - GPS

Flashing Red indicates ERROR. Autopilot needs to be calibrated or configured before takeoff. You must attach the MicroUSB cable to your Ground Control Station to figure out what the problem is. If it continues to flash after you've checked then there might be another error.



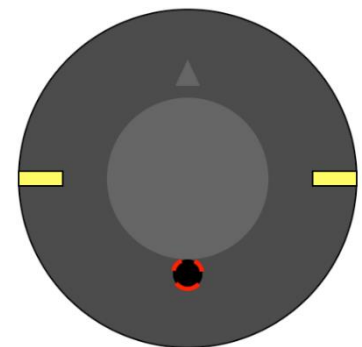
Top View - GPS

Flashing White indicates INTERCHANGING MODES. Once pressing and holding the Safety Switch on the GPS, this will indicate the Pogo is safe to unplug the battery and be handled with caution.

Top View - GPS

Solid Blue indicates that the Pogo is ARMED and NOT LOCKED to the GPS. The Pogo will be able to fly in this mode but cannot perform controlled surveys.

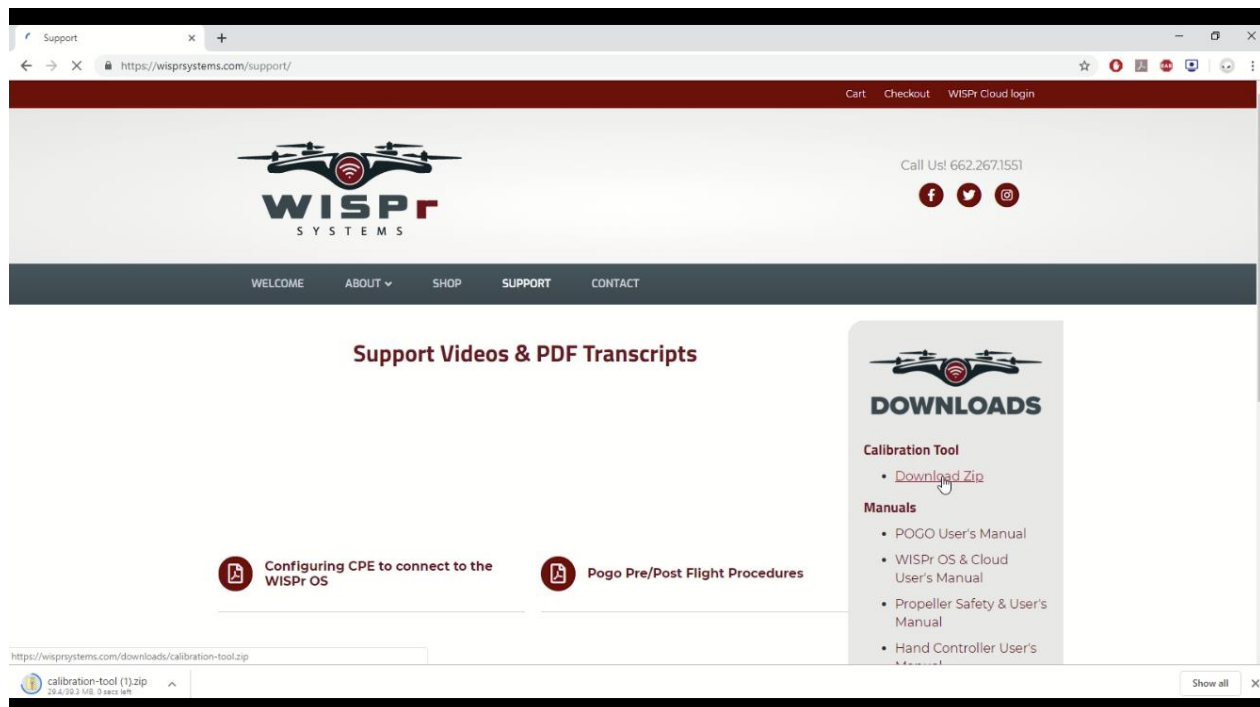
Flashing Blue indicates that the Pogo is DISARMED and NOT LOCKED to the GPS. You cannot control the Pogo's motors, but all subsystems will still work.

Top View - GPS

Solid Yellow indicates LOW BATTERY. The Pogo is at a dangerous point at battery level. The Pogo will go into Failsafe Mode at a certain percentage of battery level.

Calibrate First Before Flying

Download Calibration Software



- Download WISPr Systems Calibration software from our website at, wisprsystems.com/support/

Calibration Warnings and Important Details

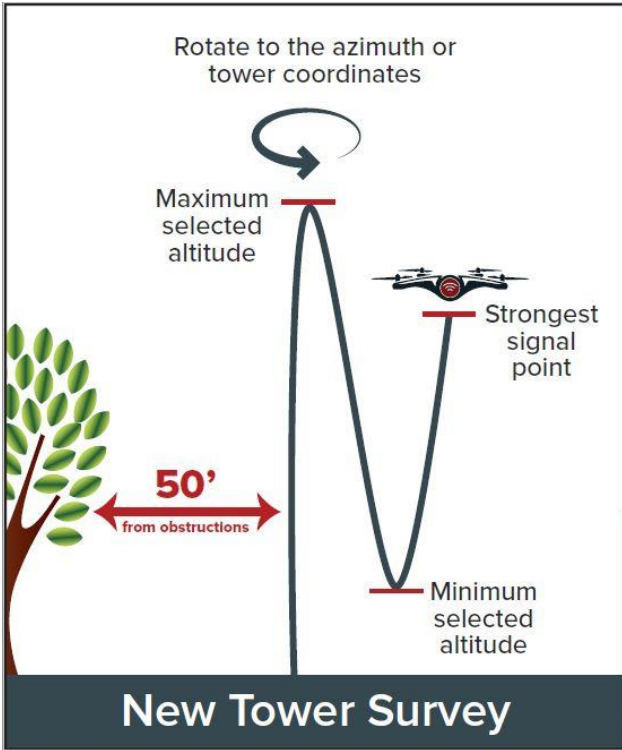
- **THE CPE MUST BE UNPLUGGED BEFORE CALIBRATIONS BEGIN**
- After unboxing your drone for the first time the sensors must be calibrated before attempting to fly or if the GPS LEDs blink red recalibrate.
- Make sure to keep any electronics (Smartphones, vape pins, etc.), magnets or any metal at least 5 feet from the aircraft while calibrating sensors.
- Battery must be fully charged before calibration begins
- It is important while calibrating your aircraft to keep your aircraft level in each of its respected positions.
- Make sure the propellers are removed from the aircraft before powering and attempting to calibrate.
- For optimal flight, calibrate before every flight.

Configuring your CPE antenna

- CPE ANTENNA'S LAN PORT MUST BE CONFIGURED TO 192.168.1.20 TO WORK WITH THE WISPR POGO.
- FOR SIMPLICITY IT IS BEST TO SET YOUR CPE ANTENNA'S CHANNEL WIDTH TO AUTO SELECT.

Safety when running autonomous surveys

1. New Tower Survey



The diagram illustrates the 'New Tower Survey' process. A drone is shown at the 'Maximum selected altitude' on the left, with a curved arrow indicating it will rotate. It then descends to a 'Minimum selected altitude' on the right, where it is labeled 'Strongest signal point'. A red double-headed arrow indicates a '50' from obstructions' (represented by a tree) to the flight path. The text 'Rotate to the azimuth or tower coordinates' is at the top. The title 'New Tower Survey' is at the bottom.

When the survey is pre-configured in the WISPr CLOUD, a maximum and minimum altitude is selected by the user.

Next, select either an azimuth or tower coordinate of the access point in which you want to connect.

The drone flies up to the maximum altitude selected, then rotates and locates either the tower coordinate or azimuth selected.

The CPE then connects to the access point on the tower and the WISPr OS records signal from the maximum altitude down to the minimum altitude.

After reaching the minimum altitude the drone flies back up to point in which the signal was strongest.

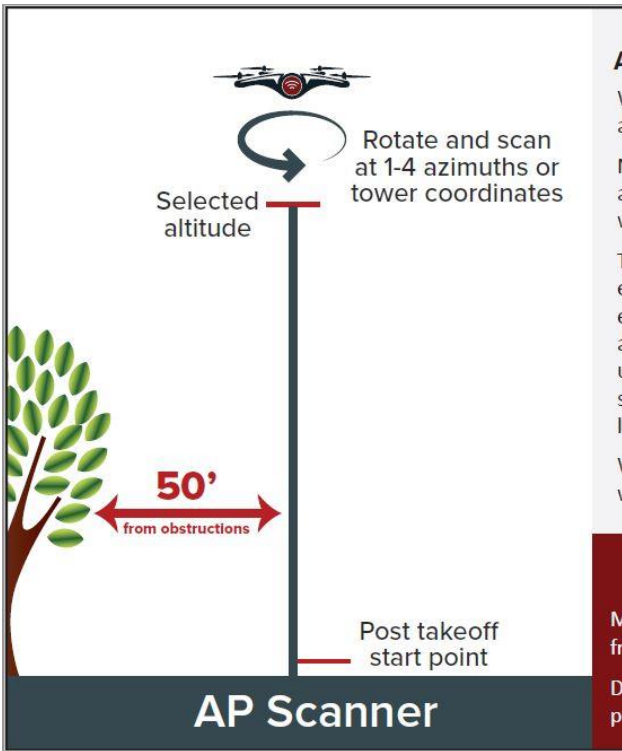
At this point the survey is complete.

WARNINGS

Make sure you are running this survey in an open area at least 50 feet from any obstructions (trees, people, houses, buildings, vehicles, etc.)

Do not fly directly over roof unless you are a minimum of 20 feet; propeller wash can cause the POGO to crash.

2. AP Scanner



The diagram illustrates the 'AP Scanner' process. A drone is shown at a 'Selected altitude' on the left, with a curved arrow indicating it will rotate. It then scans at '1-4 azimuths or tower coordinates' on the right. A red double-headed arrow indicates a '50' from obstructions' (represented by a tree) to the flight path. The text 'Post takeoff start point' is at the bottom right. The title 'AP Scanner' is at the bottom.

AP SCANNER

When the survey is pre-configured in the WISPr CLOUD, an altitude is selected by the user.

Next, select either 1-4 azimuth(s) or tower coordinate(s) of the access point(s) in which you want to scan for, and the time in which you want to scan either 30 seconds to 1 minute.

The drone flies up to the altitude selected then rotates, locates each tower coordinate(s) or azimuth(s) selected, and scans at each point(s) for the time frame selected. The CPE will receive all access points available in the frequency range of the CPE used. All access points will be saved to the logs with signal strength, azimuth, and altitude in which the access point is located.

When the survey is done the drone stays at the location in which the survey ended.

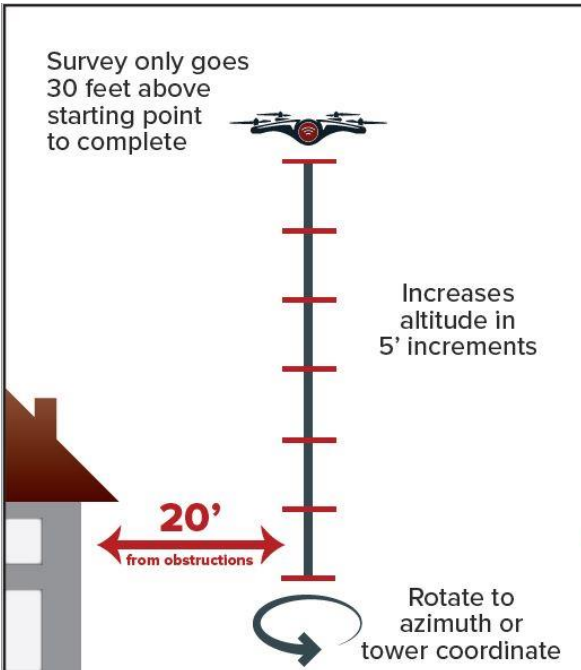
WARNINGS

Make sure you are running this survey in an open area at least 50 feet from any obstructions (trees, people, houses, buildings, vehicles, etc.)

Do not fly directly over roof unless you are a minimum of 20 feet; propeller wash can cause the POGO to crash.

3. Near Roof – Single Point (New Tower Survey)

Survey only goes 30 feet above starting point to complete



Increases altitude in 5' increments

20' from obstructions

Rotate to azimuth or tower coordinate

Near Roof Survey

**NEAR ROOF
Single Access Point**

When the survey is pre-configured in the WISPr CLOUD, an altitude is selected by the user.

Next, select an azimuth or tower coordinate of the access point in which you want to connect.

The drone first locates the tower coordinate or azimuth selected and continuously tries to connect to the access point in question.

Once the drone has reached 30' above the starting location, the WISPr OS no longer scans, and the survey is complete.

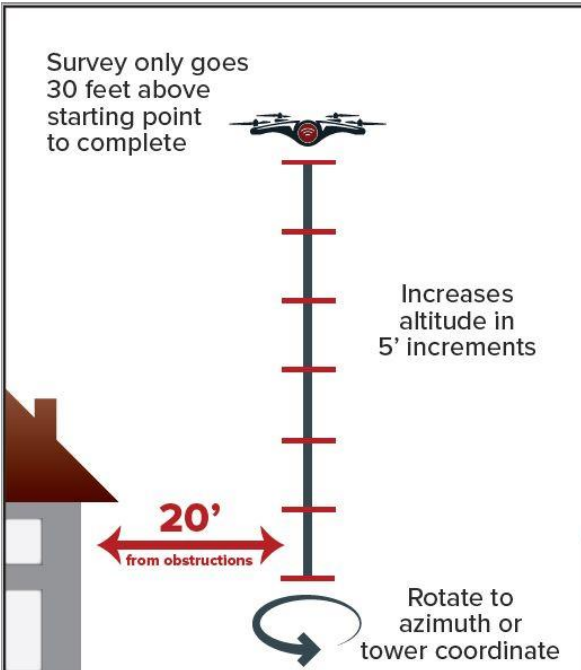
WARNINGS

Make sure you are running this survey in an open area at least 20 feet from any obstructions (trees, people, houses, buildings, vehicles, etc.)

Do not fly directly over roof unless you are a minimum of 20 feet; propeller wash can cause the POGO to crash.

4. Near Roof – Multi Point (AP Scanner)

Survey only goes 30 feet above starting point to complete



Increases altitude in 5' increments

20' from obstructions

Rotate to azimuth or tower coordinate

Near Roof Survey

**NEAR ROOF
Multi Access Points**

When the survey is pre-configured in the WISPr CLOUD, an altitude is selected by the user.

Next, select an azimuth or tower coordinate of the access point in which you want to connect.

The drone first locates the tower coordinate or azimuth selected and continuously scans for access point in that direction.

Once the drone has reached 30' above the starting location, the WISPr OS no longer scans, and the survey is complete.

WARNINGS

Make sure you are running this survey in an open area at least 20 feet from any obstructions (trees, people, houses, buildings, vehicles, etc.)

Do not fly directly over roof unless you are a minimum of 20 feet; propeller wash can cause the POGO to crash.

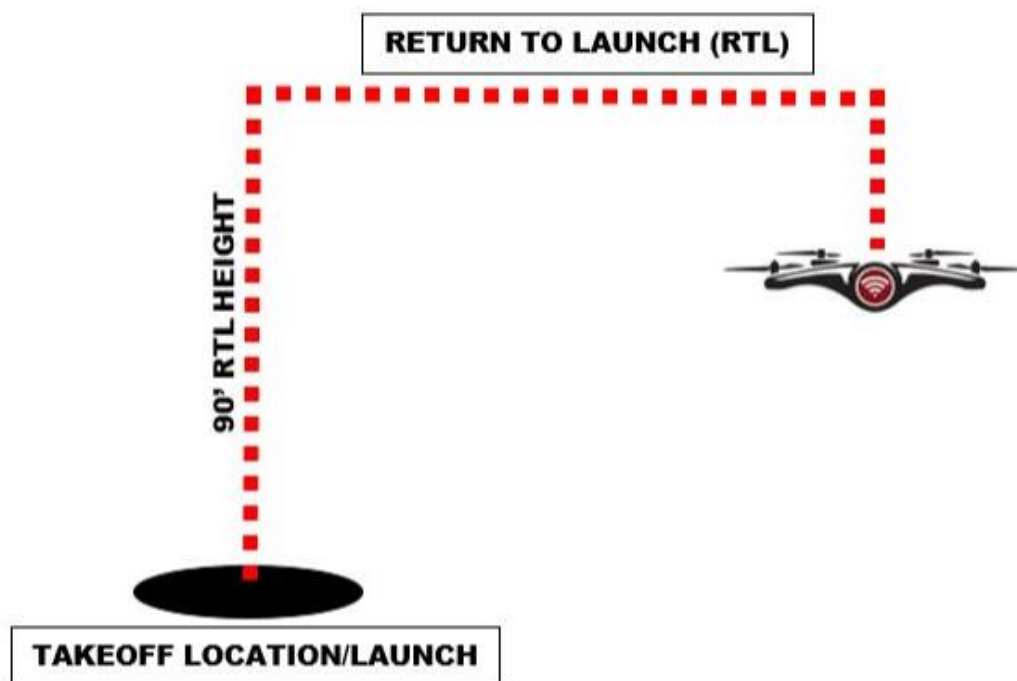
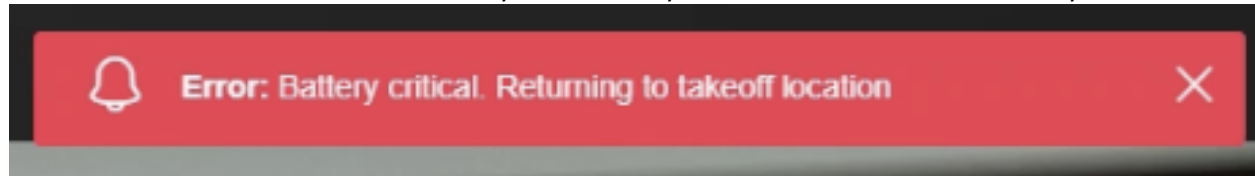
5. Go-To Controls

*****Do not fly within 50 foot vertically or horizontally of any object/obstruction when running any Go-To control.*****

Safety Failsafes

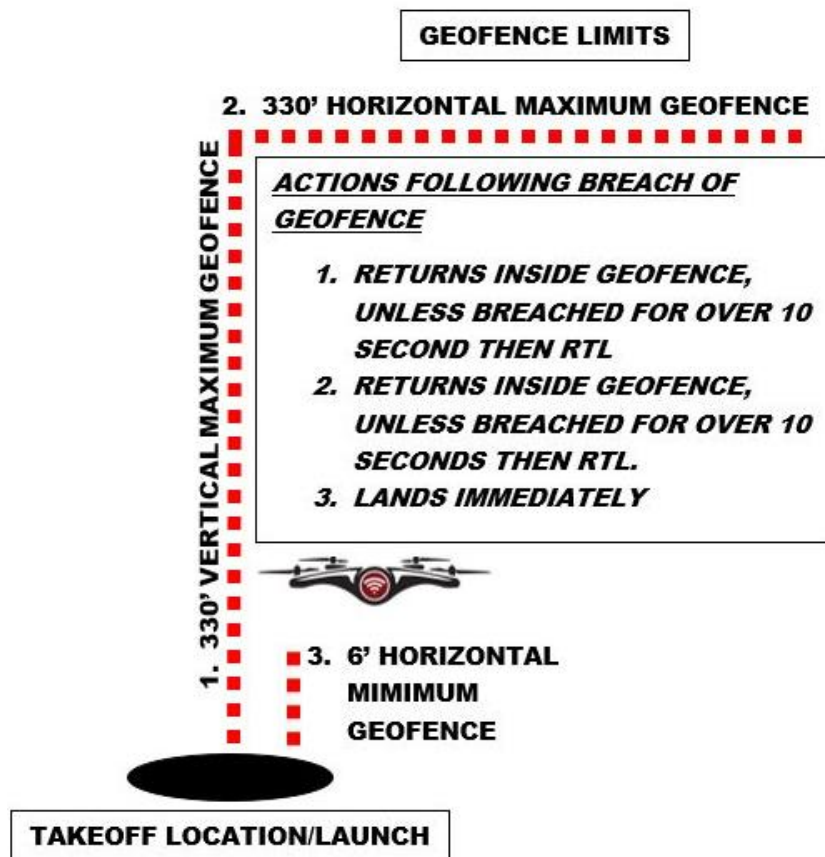
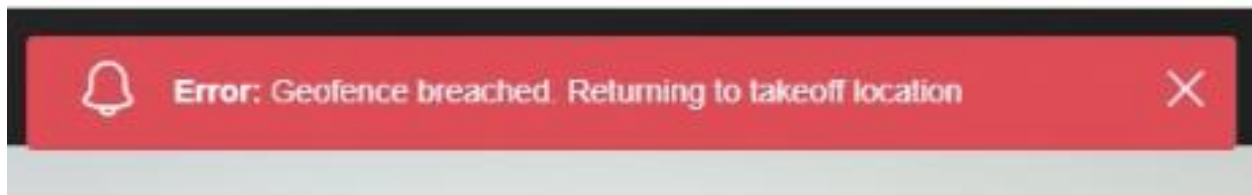
Battery failsafe

- Less than 120 feet horizontally and vertically the drone will Return to Launch (RTL) at 20% battery level
- Greater than 120 feet horizontally and vertically the drone will RTL at 20% battery level



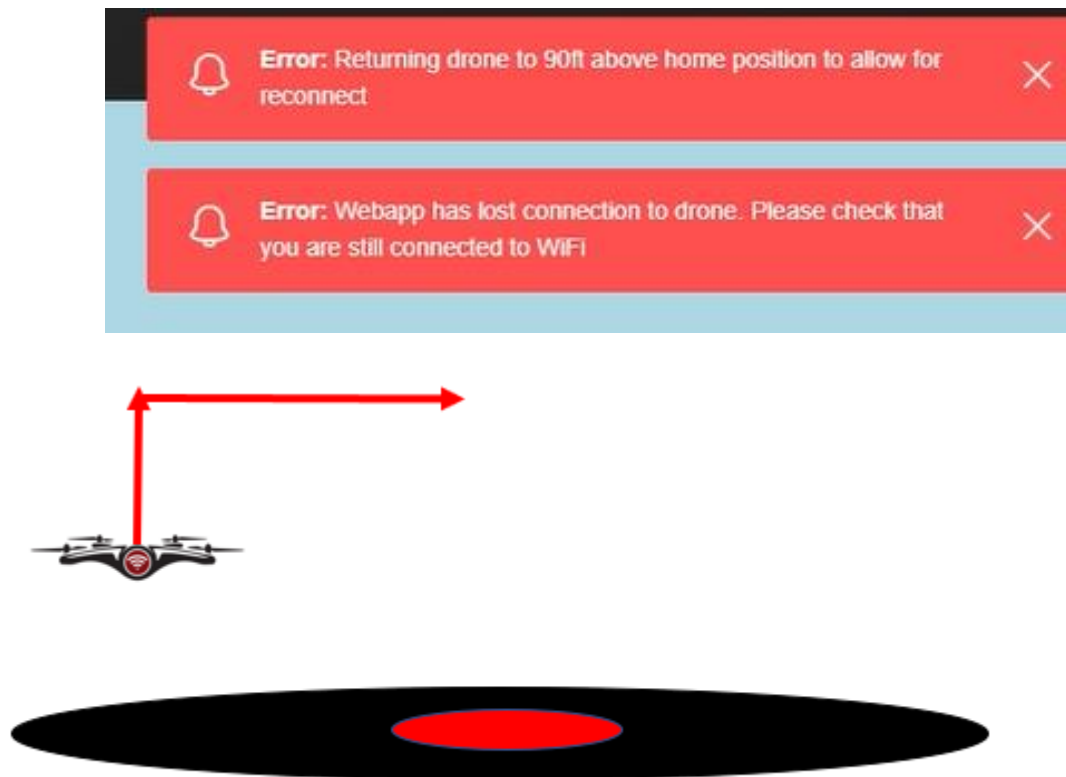
Geofence failsafe

- Returns inside of geofence if the drone has exceeded a vertical and horizontal geofence of 330 feet
- RTL is engaged if the horizontal geofence is exceeded for over 10 seconds
- If the drone is flown under 6' it will land automatically

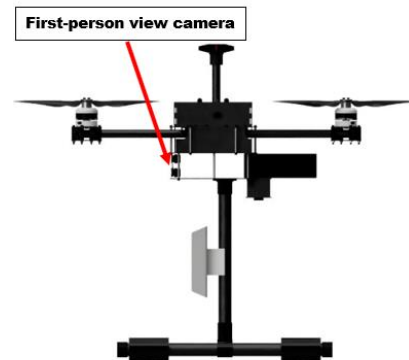
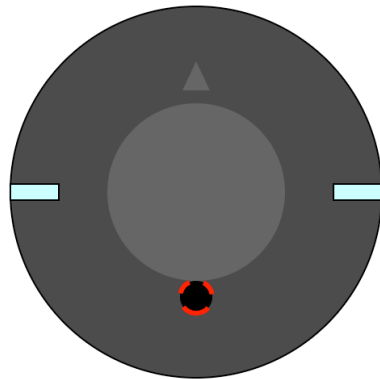


Disconnect from drone's access point or web app failsafe

- If you accidentally close the WISPr OS web app or lose connection to drones access point during flight the drone will return within a 20ft radius from the home position at an altitude of 90ft.
- Likely the drone will hover directly over home, but if not, it will be within 20 feet.
- This allows the user to reconnect and bring the drone closer to home in case this happens for precautions.



Reference to front of aircraft



- Locate the front of the aircraft for reference when calibrating.
- The arrow on the top of the GPS informs of the direction of the front of the aircraft.
- The first-person view camera also informs the user the front of the aircraft.

Plug in battery and calibration cable

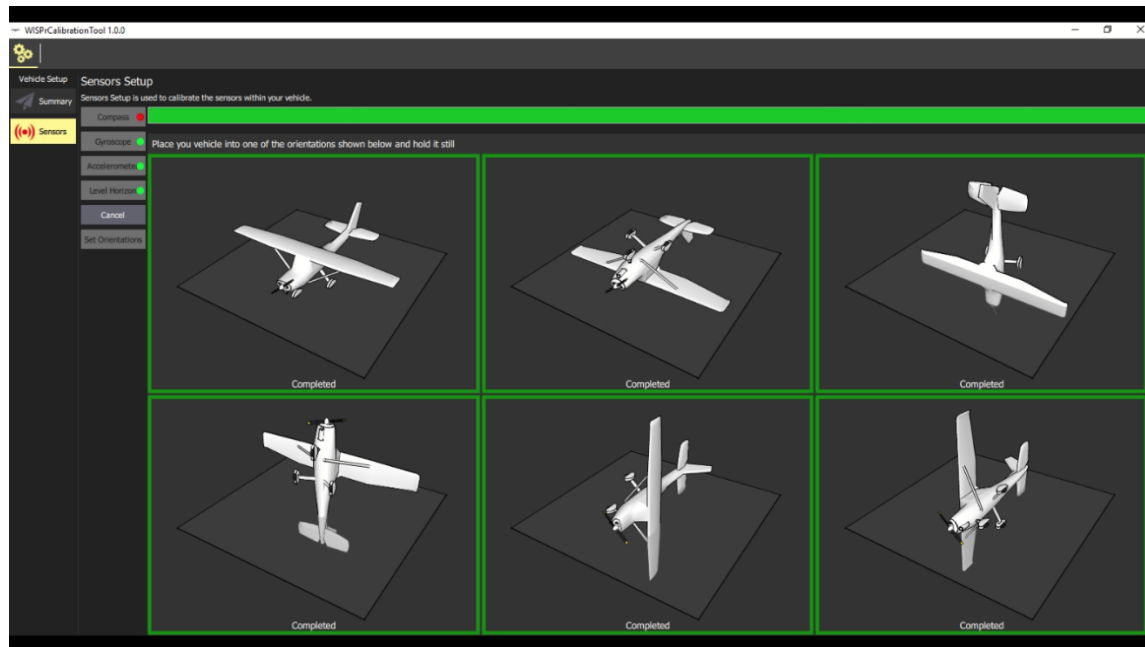
- Insert the battery and tighten the Velcro strap and plug in the drone to power it.
- Plug the 15' calibration cable USB A male end into your laptop or tablet.
- Insert the microUSB end of the 15' cable into the drones calibration port on the port side of the aircraft. Confirm the microUSB end is securely plugged into the calibration port before moving to the next step.

Open Calibration Software

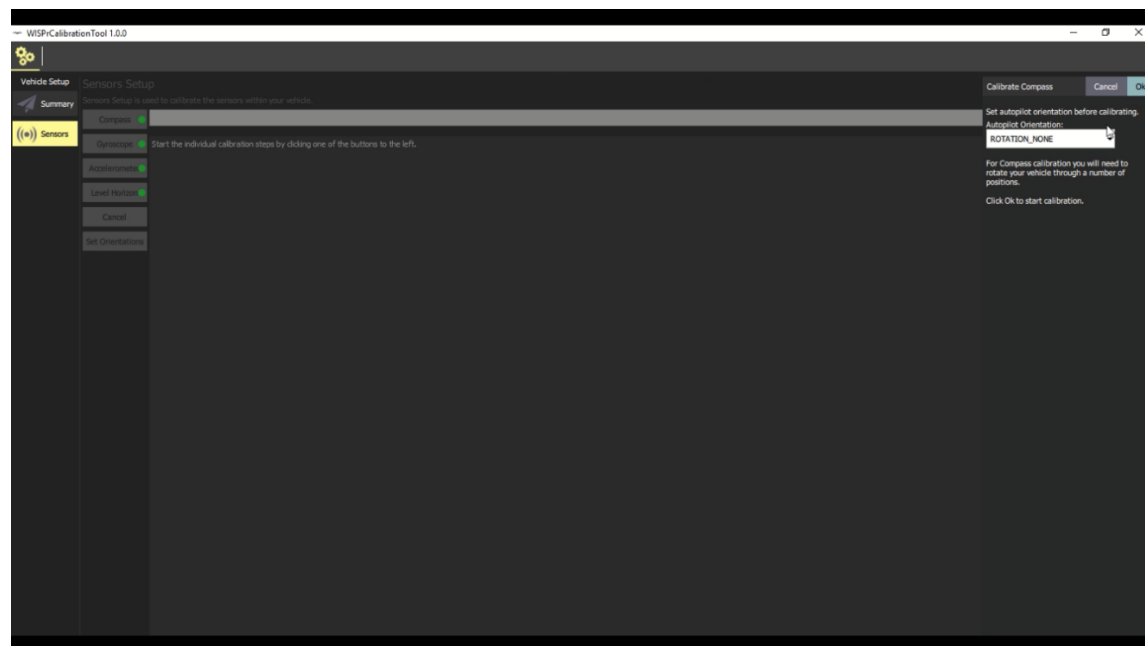


- Next, open up your WISPr Systems Calibration software, which is to be downloaded from the support

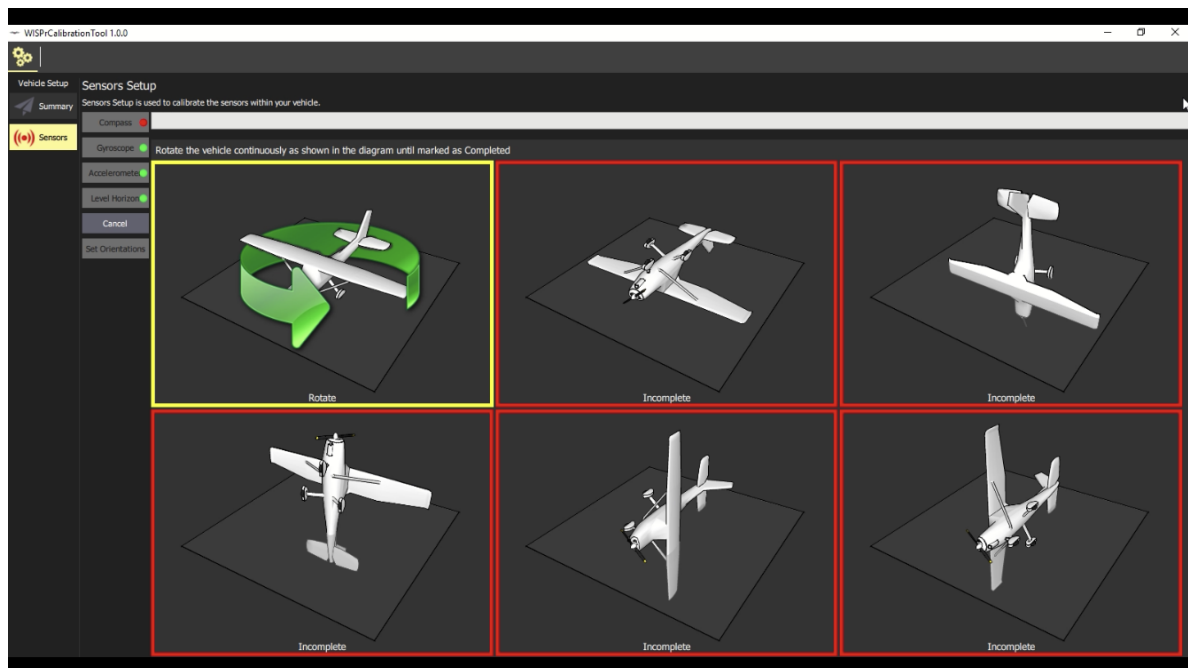
Compass Calibration



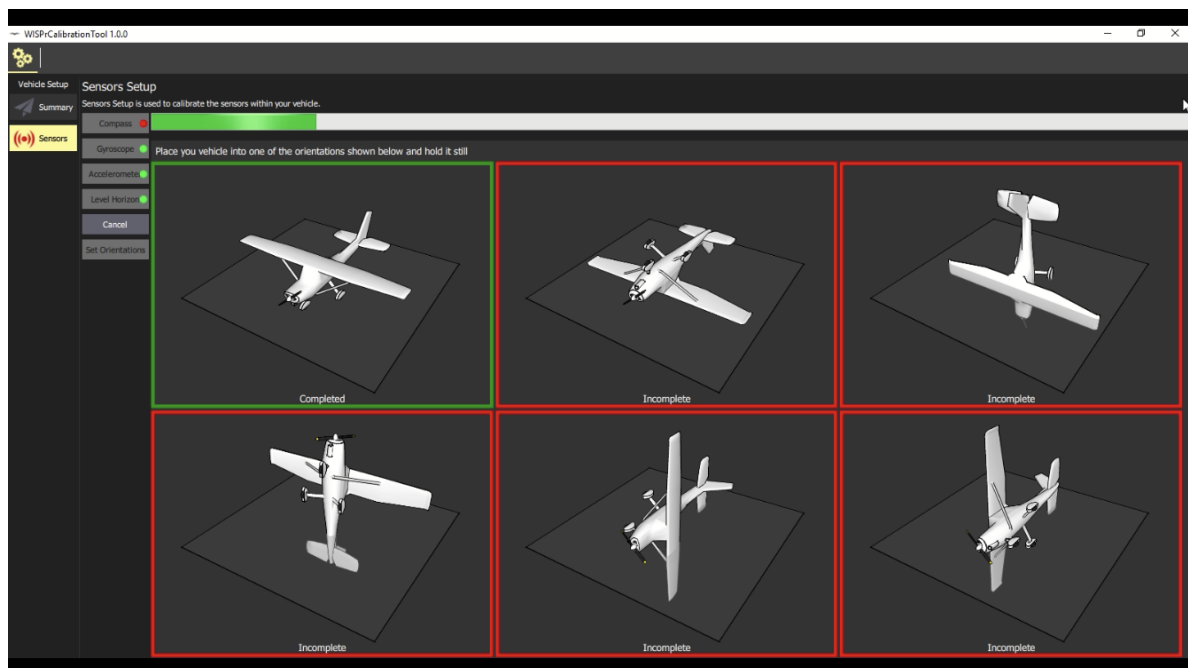
- To begin compass calibration, click the Compass tab on the left side of the screen.



- A pop-up on the right side of the screen will appear that gives the option to select the Autopilot orientation and click Ok to begin.
- Select that the Autopilot Orientation is set to ROTATION_NONE then click Ok and the calibration will begin.



- When compass calibration begins place the aircraft in one of the orientations referenced by the software. Hold still and wait for the software to inform you to rotate.

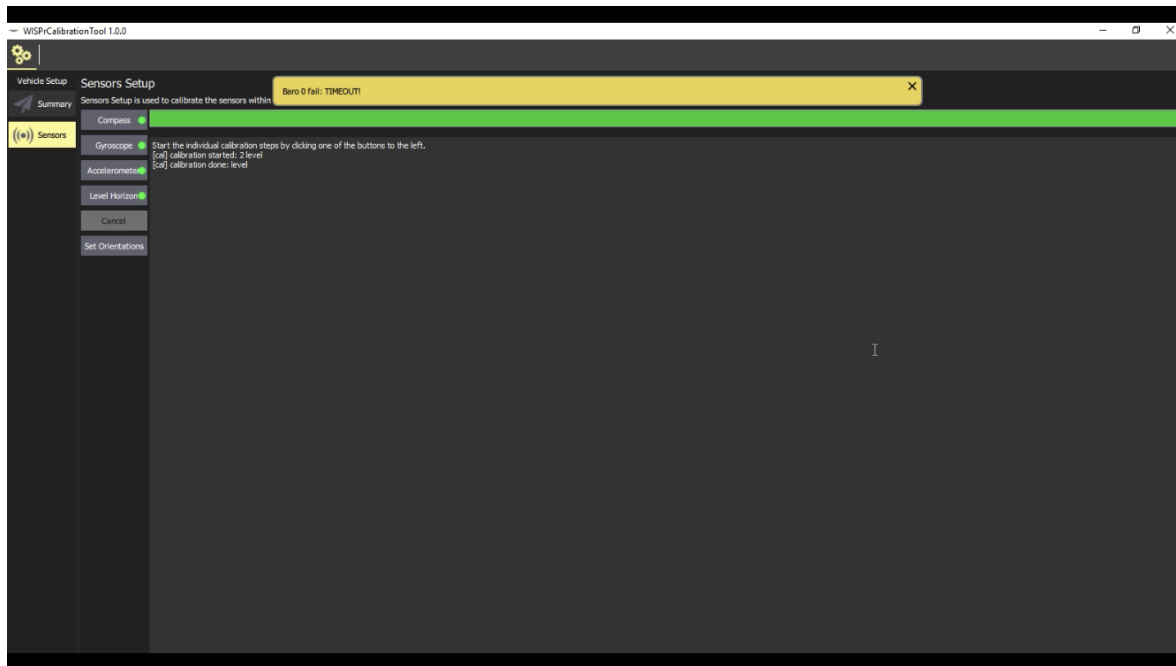


- Rotate counterclockwise until the software informs you that orientation is calibrated. This is done for each orientation.
- After the calibration for one orientation is complete the GPS LED lights will flash purple/white to inform the user the calibration is complete.
- As well as the border around the orientation reference picture will turn from yellow to green and say complete at the bottom of the picture.

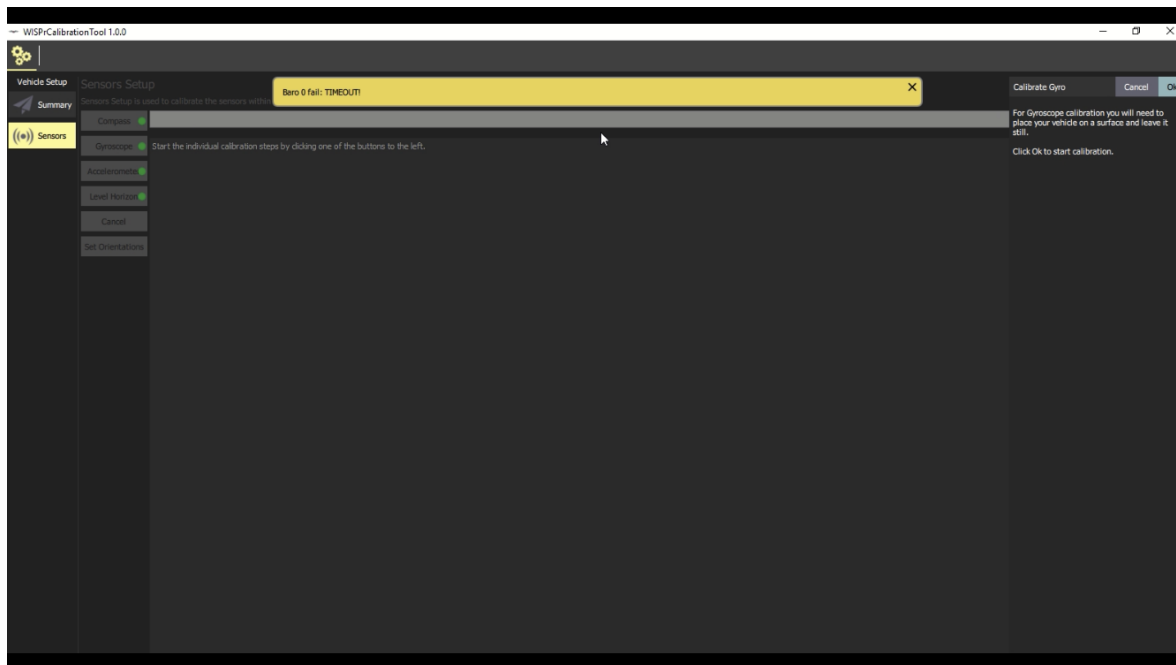


- Once all calibrations are complete either click Ok to complete the calibration or click Ok to reboot, depending on the message sent.

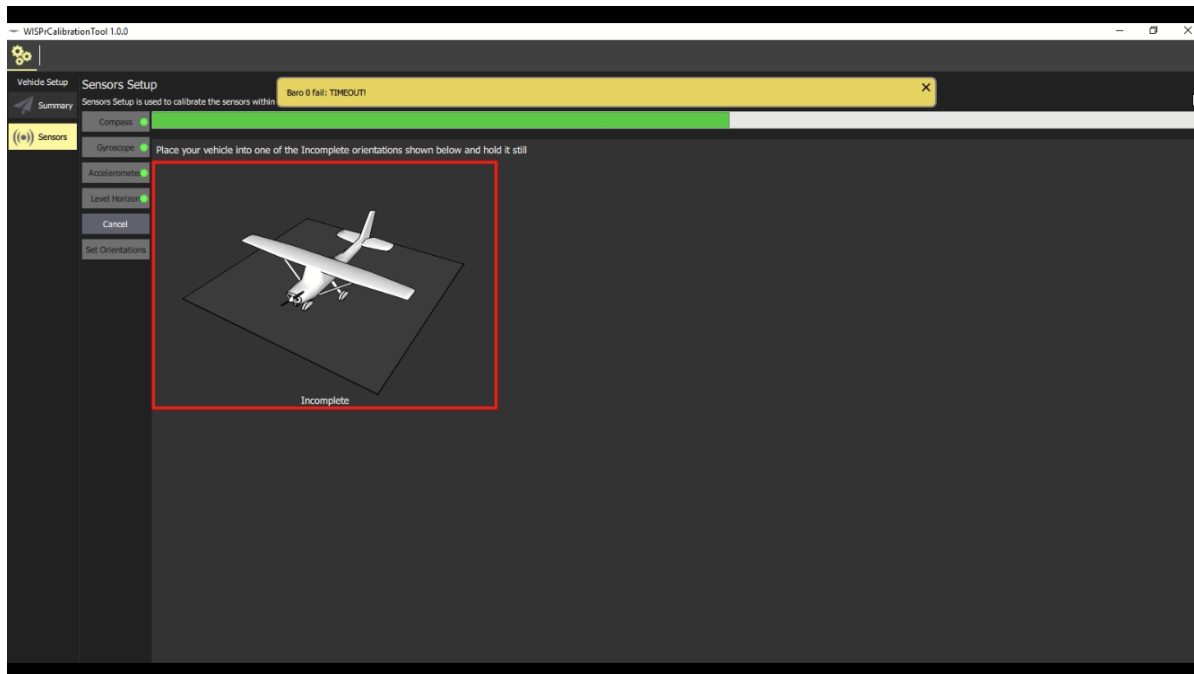
Gyroscope Calibration



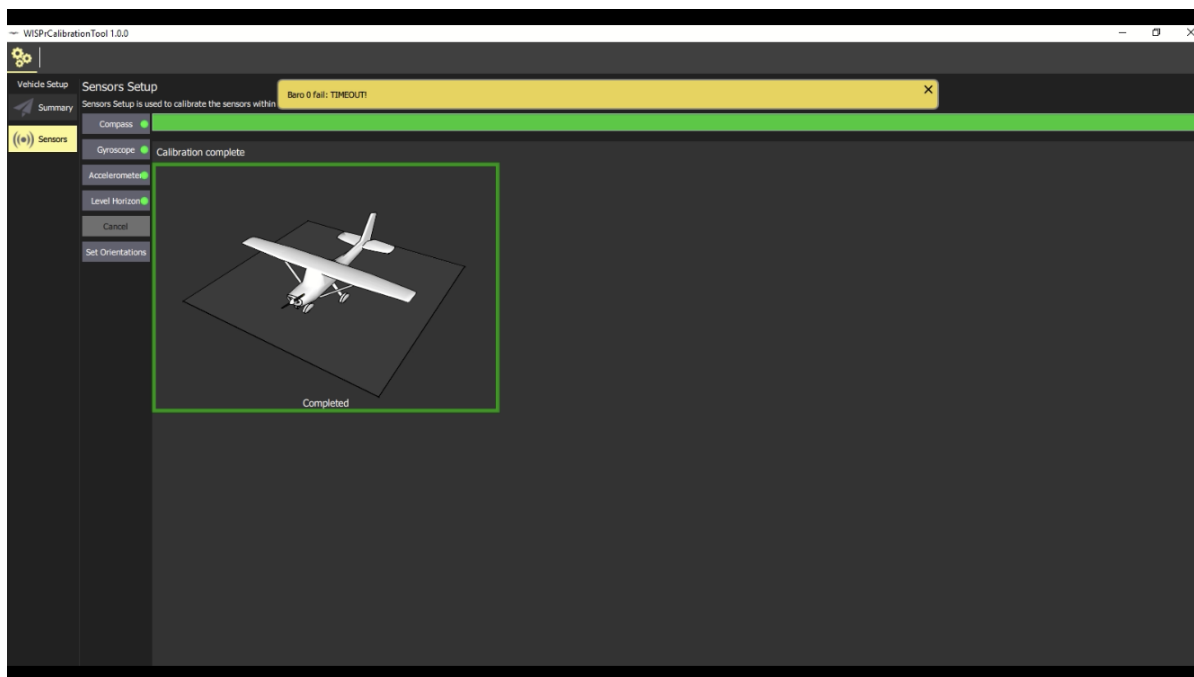
- To begin Gyroscope calibration, select “gyroscope” tab on the left side of the screen.



- Then a pop-up on the right side of the screen will ask you to click Ok to start. Click Ok and calibration will begin.

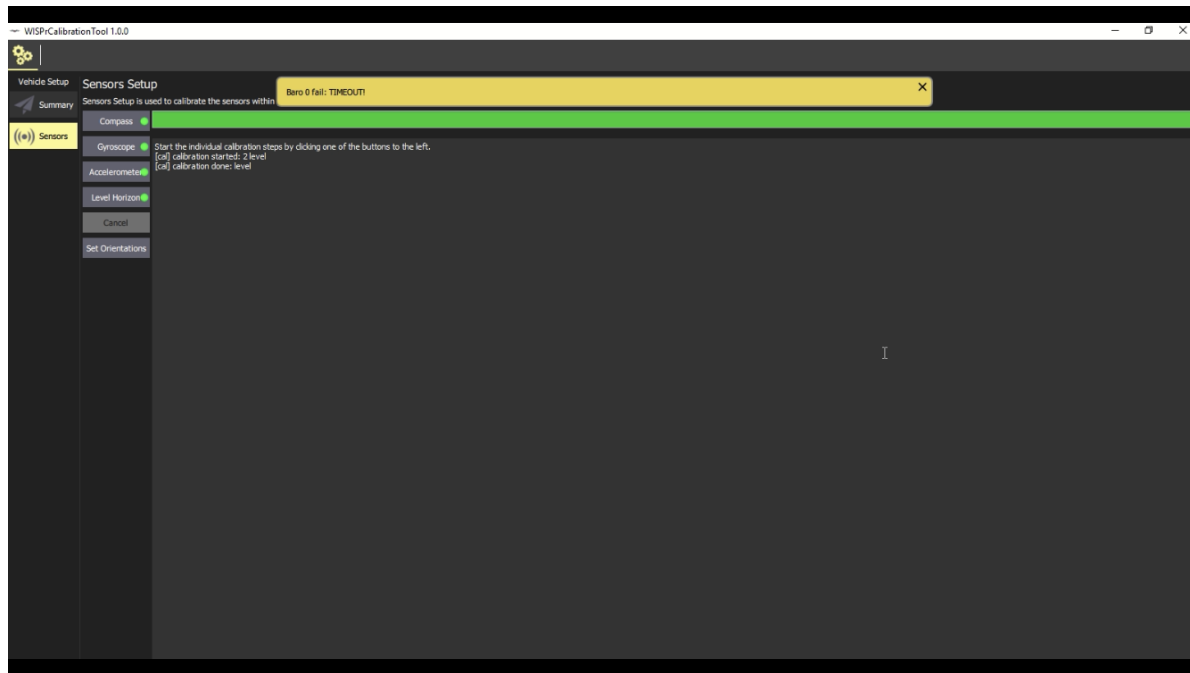


- Let the drone sit still in a level position until calibration is complete.

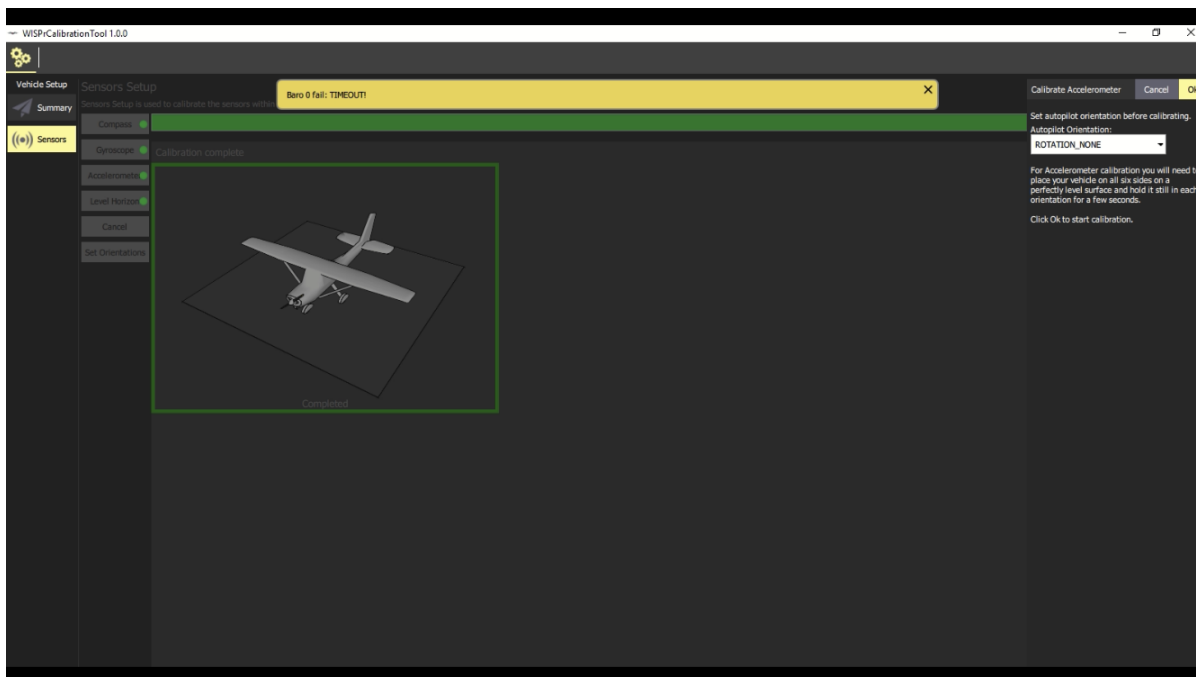


- Once calibration is complete the GPS LEDs will flash from red to green informing the user the gyroscope is calibrated.
- Once calibration is complete the border around the calibration software reference picture will turn green and it will say complete at the bottom of the picture.

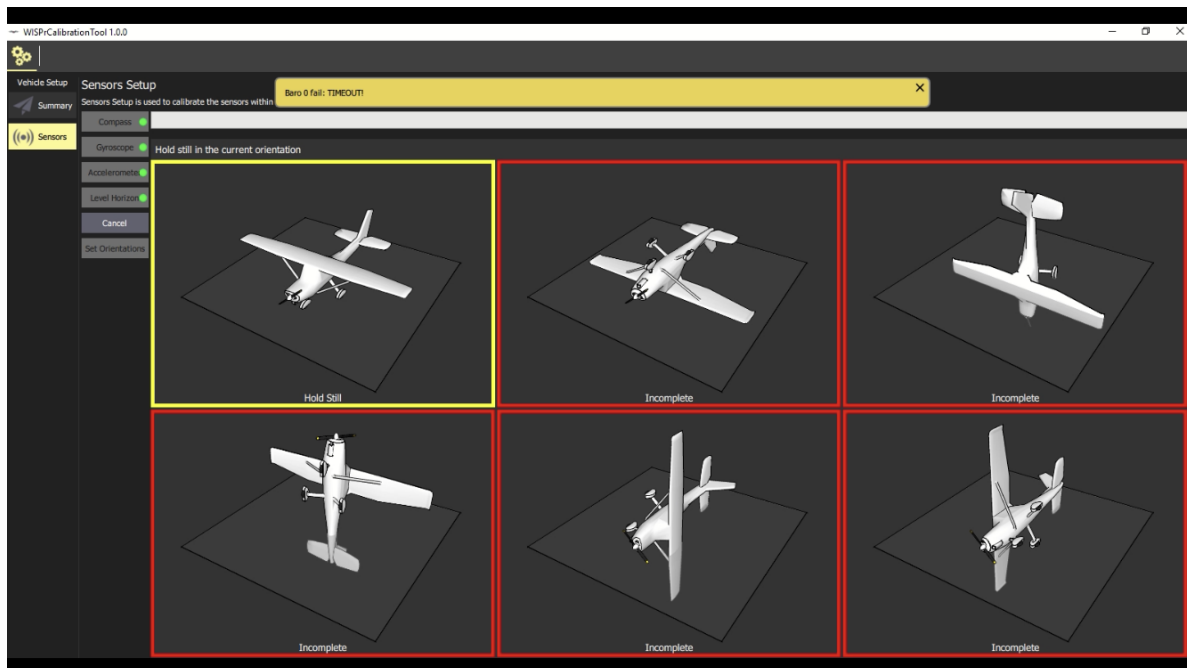
Accelerometer Calibration



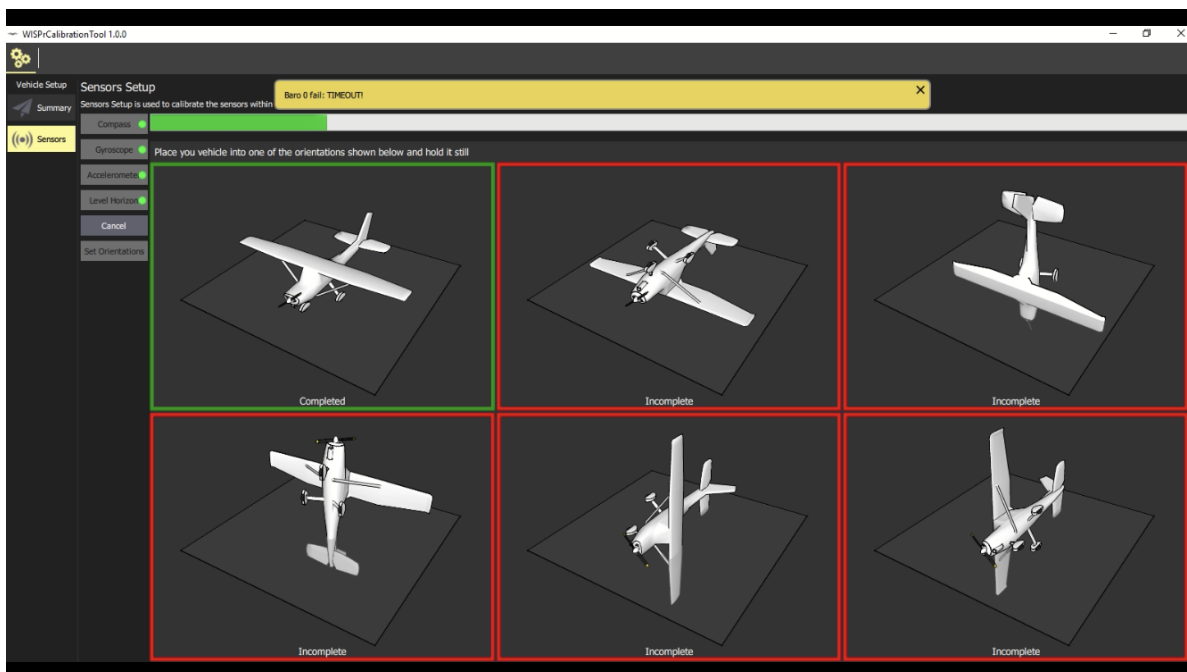
- To begin accelerometer calibration, click “accelerometer” on the left-hand side of the screen.



- A pop-up on the right side of the screen will appear that gives the option to select the Autopilot orientation and click Ok to begin.
- Select that the Autopilot Orientation is set to ROTATION_NONE then click Ok and the calibration will begin.

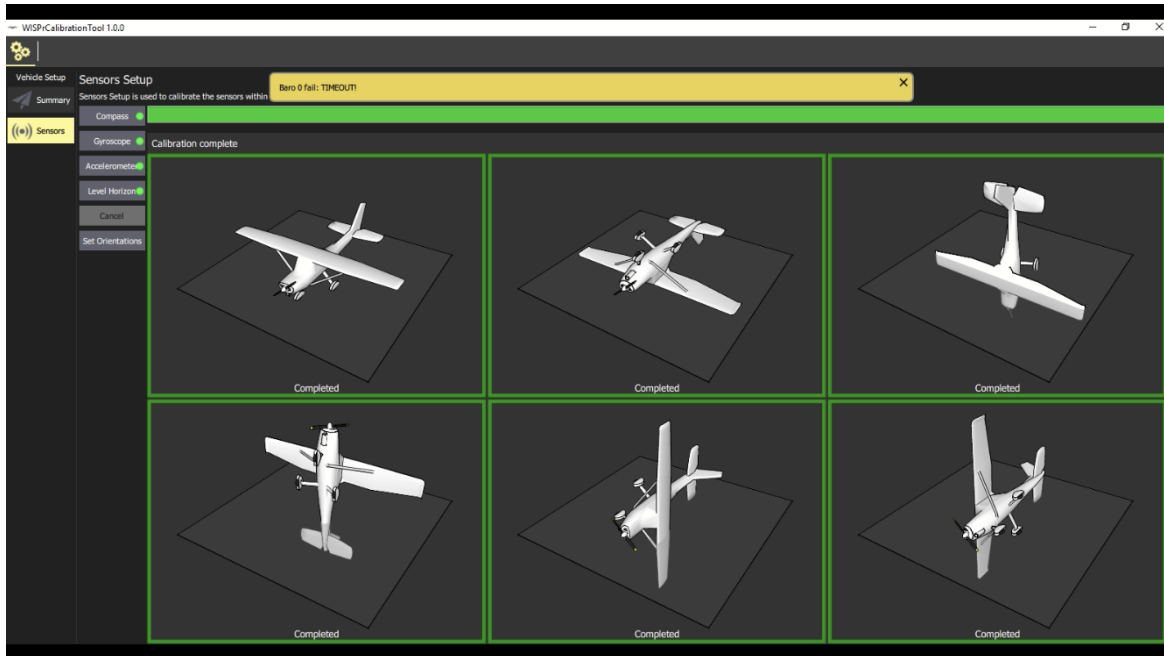


- Place the aircraft in one of the orientations referenced by the calibration software and hold the aircraft level and still for calibration to begin.
- A yellow border around the orientation will appear once the calibration has begun.



- Once the two LED on the GPS blink white/purple then that orientations calibration is complete, and you can move to the next orientation.
- Also, the border around the orientation referenced in the picture will turn green and it will say complete at the bottom of the picture.

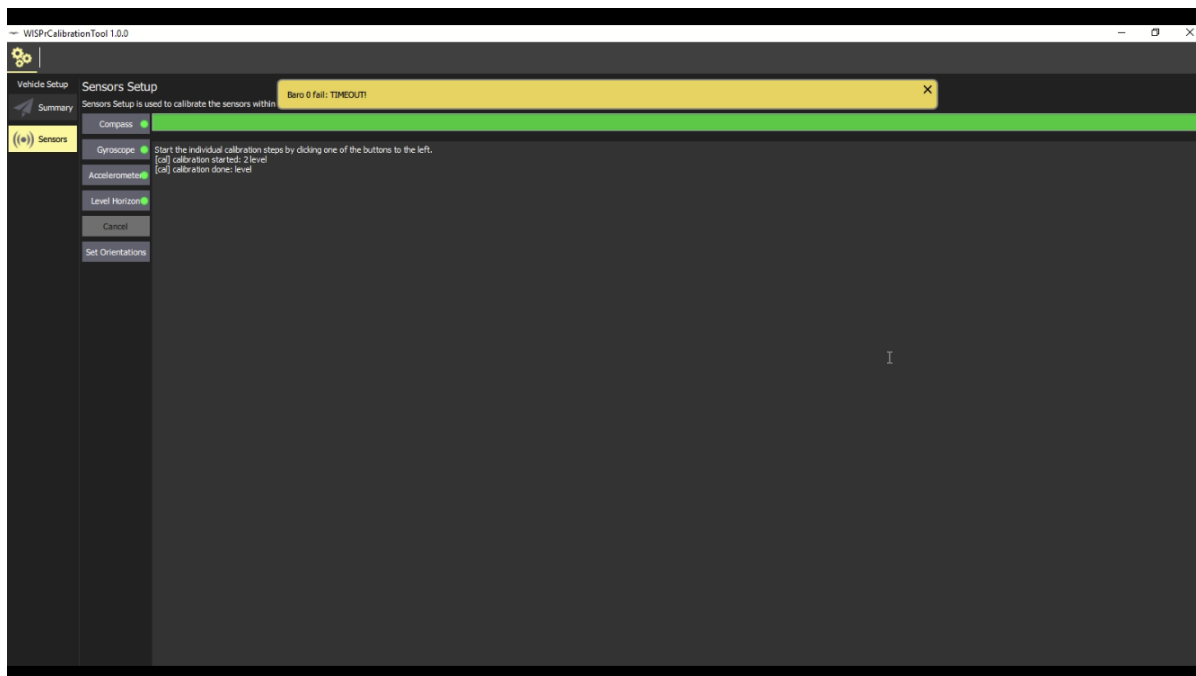
Level Horizon Calibration



- To begin level horizon calibration, select level horizon on the left side of the screen.



- Once calibrate level horizon is selected the autopilot orientation must be set to `ROTATION_NONE`. After the orientation is selected click ok to begin calibration.



- Once calibration is complete the GPS LED flashes from red to green informing the user the drone has completed level horizon calibration.
- Also, a green bar above the display terminal on the screen will fill out showing the calibration is complete.

Post Calibration

- After calibration is complete, unplug the battery and plug it back up and allow the drone to sit for 2 minutes, giving the calibration the time needed to lock in calibration.

Pre-Flight Checklist

According to the FAA, any UAV over 0.55 pound must be registered with the FAA and have the registration number visible on the craft. This is the responsibility of the user to operate with compliance of the FAA.

The FAA also requires anyone who flies commercially or who flies in zones set by the FAA to acquire and use a 107 Pilots License.

Have read the WISPr Pogo Manual in its entirety.

Have watched all the support videos.

Have prepared for emergency situations, such as, loss of control, loss of connection, erratic flight behavior, etc.

Inspect propellers for nicks cracks or any other blemishes.

Ensure Lidar distance sensor lenses are clean.

Ensure camera lens is clean.

Ensure all screws are tightened.

Connect to Pogo Wi-Fi Access point

If using a laptop connect a usb dongle for extended range while flying. Insert USB of the wireless dongle into the laptop before attempting to connect to Wi-Fi network. Failure to do this could result in a mid-flight connection loss.

The dongle is dual band 2.4GHz and 5GHz to allow the user to be able to connect to 2.4GHz or 5GHz Pogo access point. The dongle also increases the distance in which the Pogo can fly away from the signal source. A geofence of 200 feet altitude ceiling and a 300 feet radius from the takeoff location.



Otherwise just connect user device (Laptop, Tablet or Smartphone) to Pogo Access Point. Name of Wi-Fi network will vary between each WISPr Pogo and the Wi-Fi network name and password will be given to the user with the purchase of the WISPr Pogo. Make sure to use the Wi-Fi dongle by selecting the “Wi-Fi 2”, when selecting the Wi-Fi card to use to connect to the WISPr Pogo Wi-Fi network. For demonstration purposes we use “Test_net” as our Wi-Fi network to connect to.



Using a dongle from WISPr Systems will allow the user to receive broadcast from the POGO 2.4GHz or 5GHz access point.



If the Pogo's SSID is not visible, restart the Pogo and try again.

! If the Wi-Fi is not visible, a recent change to the broadcast frequency may have been made. After the change, only a computer with a Wi-Fi IC that works with 5.8GHz will be able to view it

Initializing Hand Controller

There are two ways to control the WISPr Pogo, by a hand controller or laptop keyboard. If you plan to use the wired hand controller, plug it into your computer's USB port before opening the WISPr OS.

Plug in the hand controller via USB and ensure solid connection. Press a few random buttons on the controller to initiate the controller on your computer.



! Only use controllers provided by WISPr Systems. Using a third-party controller may cause the Pogo to behave unexpectedly.

Always inspect the controller for physical damage before use.

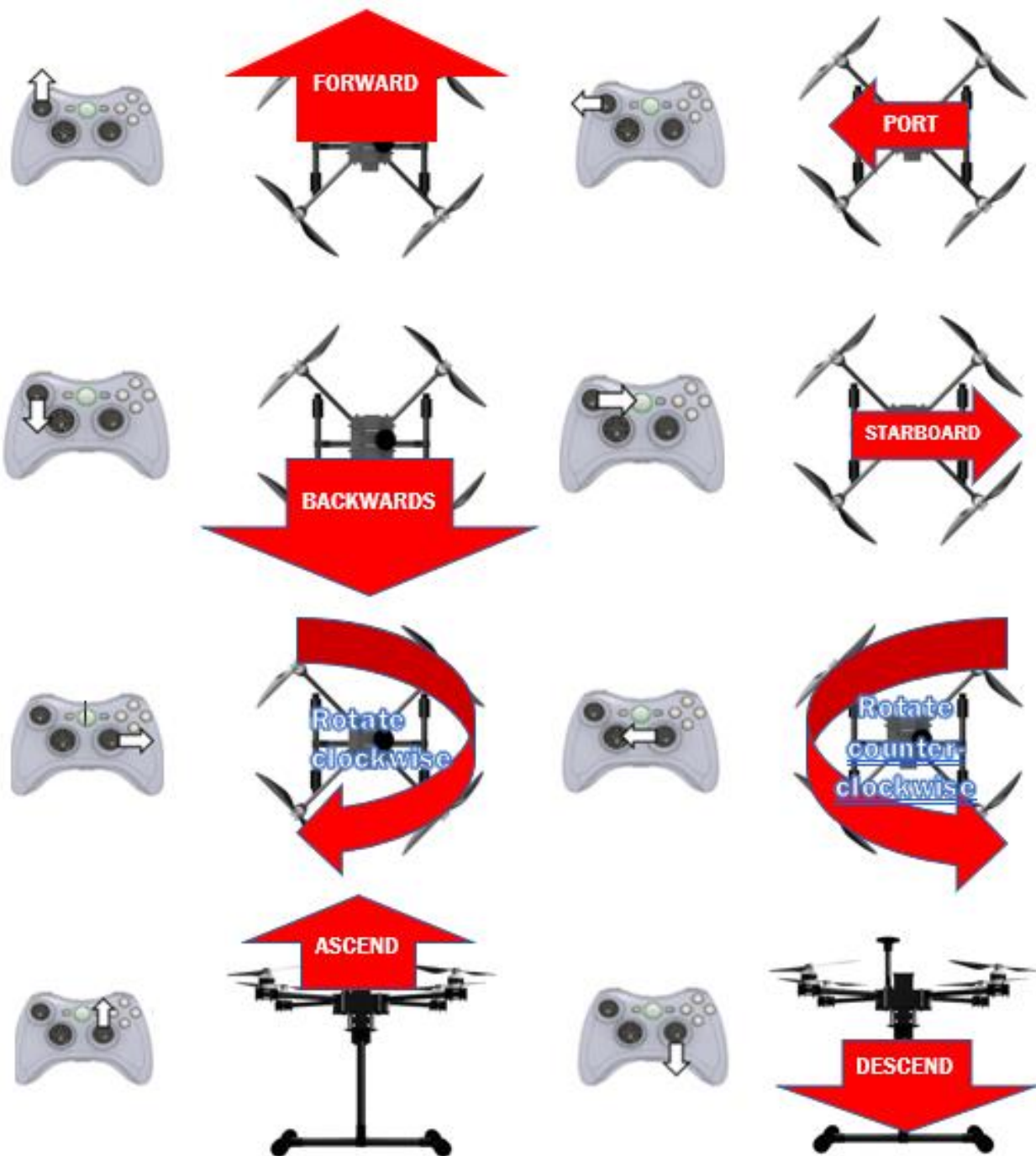
Using WISPr OS

Connect to WISPr OS


Once the user is connected to the WISPr Pogo access point, open up a web browser (Chrome, Firefox, etc.) and go to the address, 172.16.1.1:4201 and a login page will appear. Use the login credentials used to create an account when purchasing the WISPr Pogo to log into the WISPr OS. To learn how to use refer to the WISPr OS & Cloud Software Operations Manual.

Controlling the WISPr Pogo

Hand Controller Controls

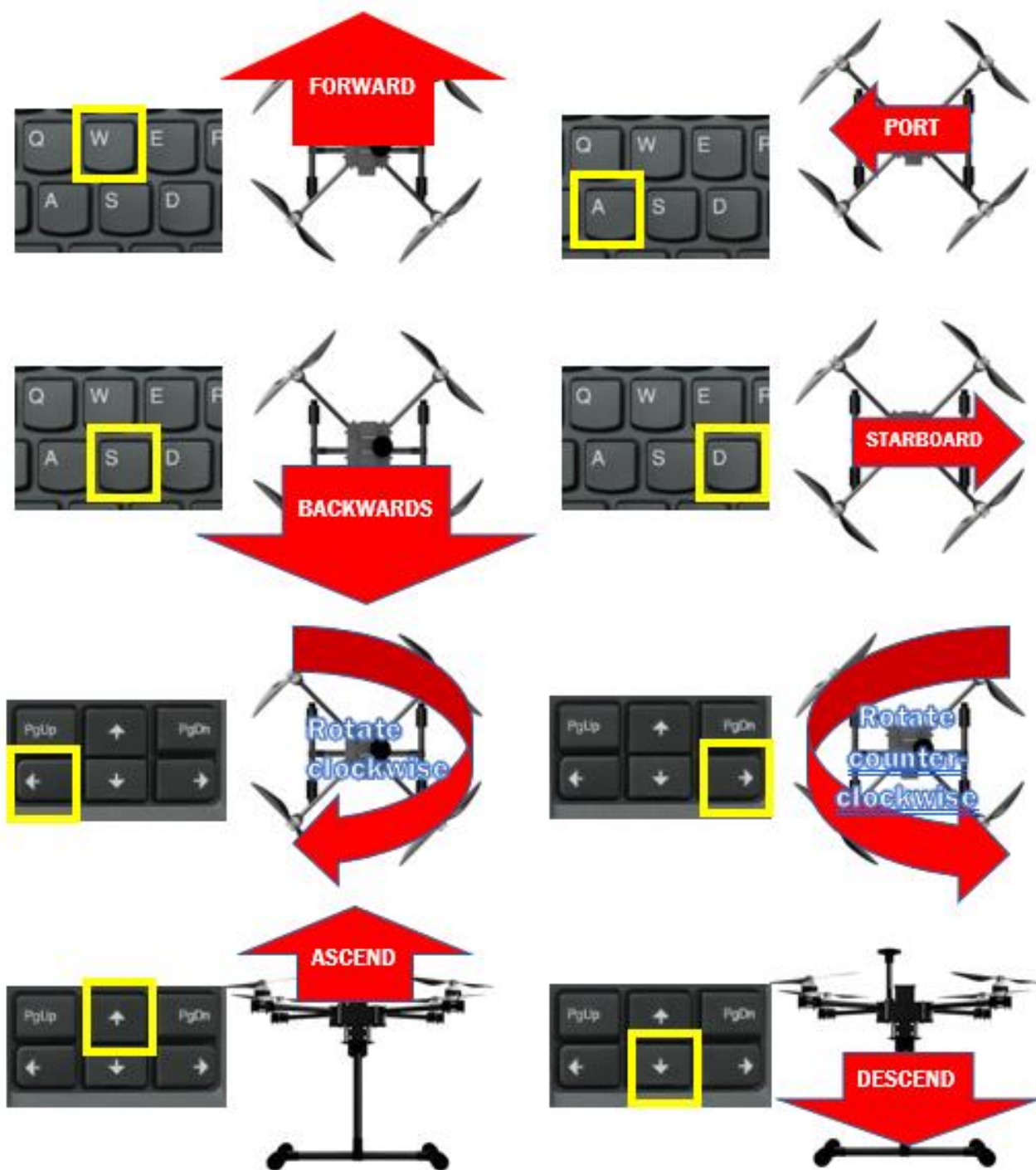




 DO NOT fly the Pogo near humans, animals, tree branches, fences, power lines, guy wires, or any other objects that may be difficult to see from a distance.

DO NOT fly the Pogo over bodies of water or other reflective surfaces

Keyboard Controls





DO NOT fly the Pogo near humans, animals, tree branches, fences, power lines, guy wires, or any other objects that may be difficult to see from a distance.

DO NOT fly the Pogo over bodies of water or other reflective surface

Bluetooth/Nimbus Controller



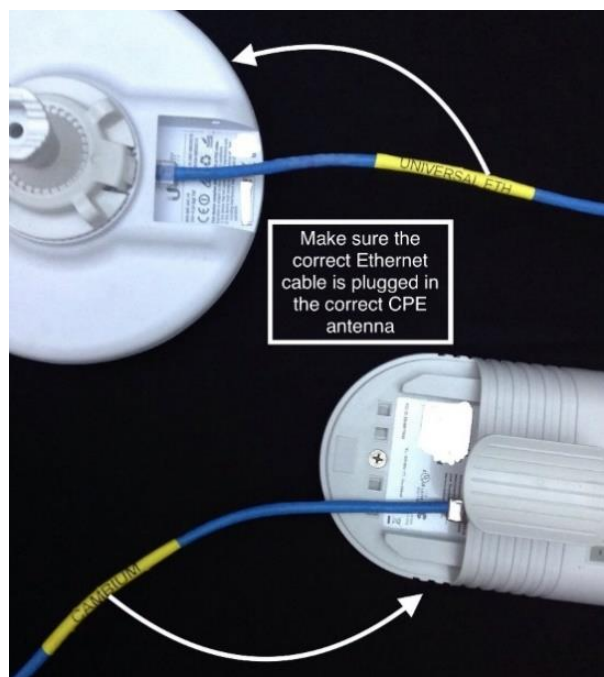


Touchscreen Controller

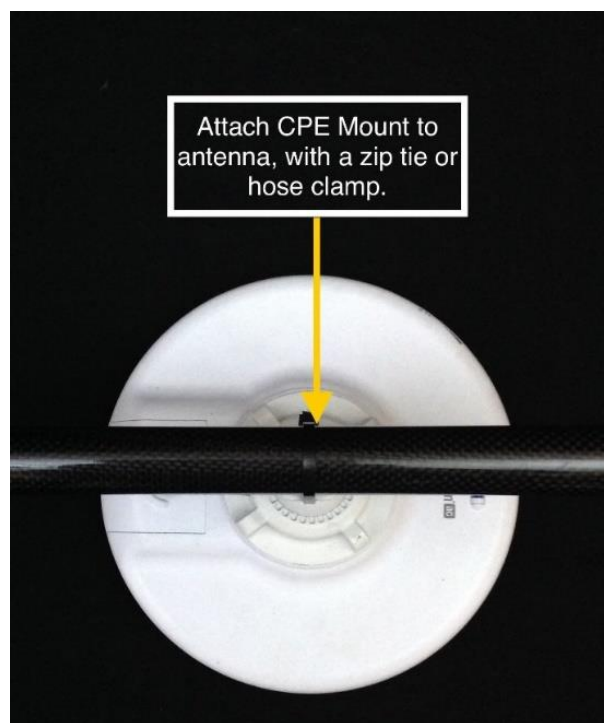
Preparing the WISPr Pogo

Attach CPE Antenna to Pogo

Connect appropriate ethernet cable to CPE antenna.



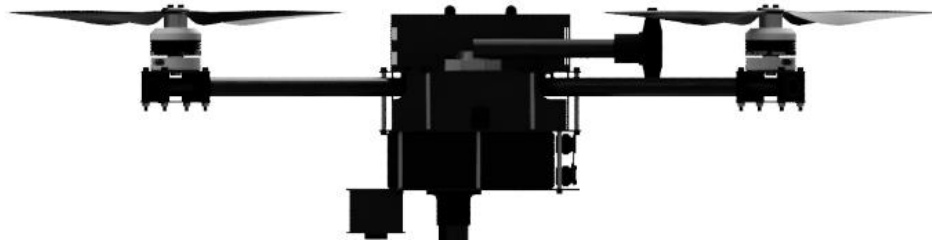
Attach CPE to CPE Mount



Connect Landing Gear/ CPE mount to POGO

Disconnect GPS mount from its storage position and insert into the GPS mount. Make sure the arrow on top of the GPS is pointing in the same direction as the first-person view camera. Screw in the lock screw on the mount to keep the GPS mount from moving in flight.

GPS in storage position



GPS inserted into GPS mount.



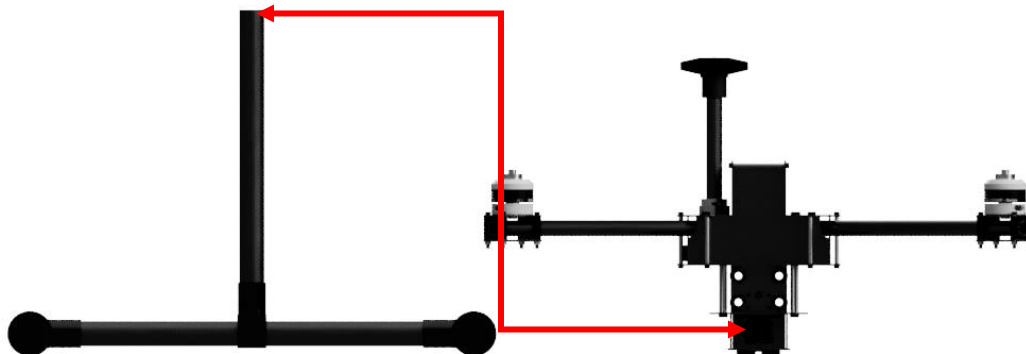
Be sure to not damage the GPS wire while inserting the GPS into the GPS mount.

Confirm the GPS mount is secured before flying.

A re-calibration of the compass and accelerometer must be completed before flying.

Connect Landing Gear/ CPE mount to POGO

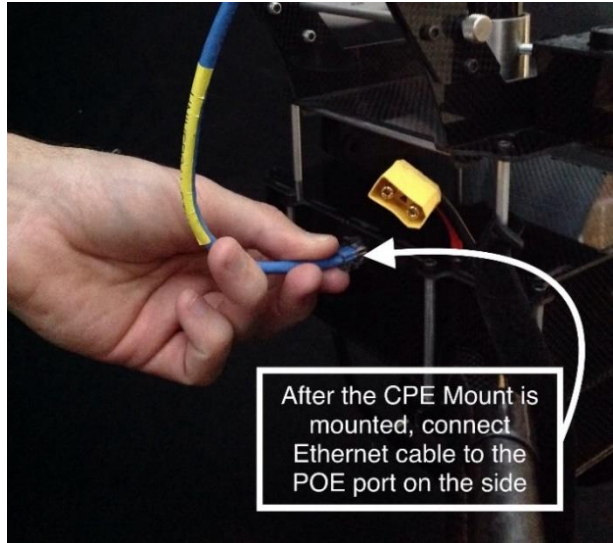
Insert landing gear/CPE mount into the mount on the bottom of the Pogo. Tighten the screw to hold the mount in place.



The CPE antenna should point in the same direction as the First-Person View Camera.



Plug the ethernet cable into the Pogo's 24V POE.



Use ONLY Ethernet cables provided by WISPr systems.

Cables MUST NOT exceed 22 inches in length.



ONLY use Cambium cables with Cambium antennas.

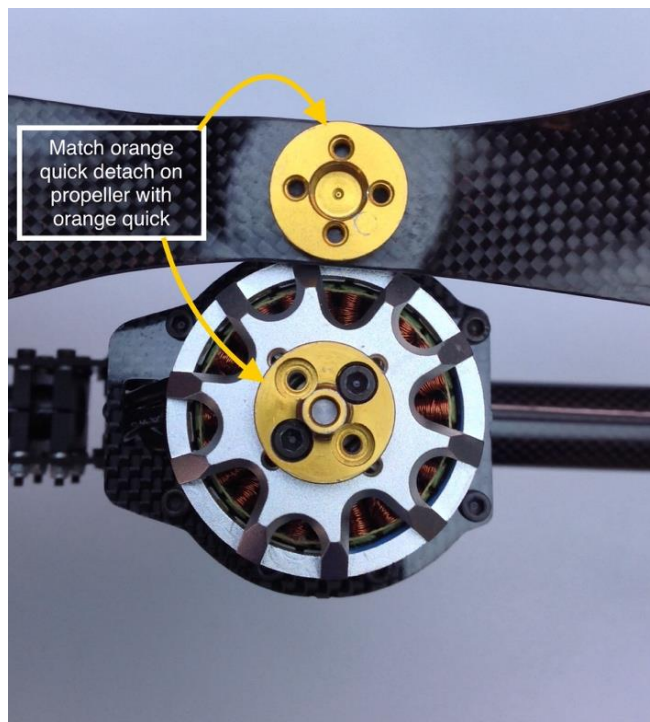
The Pogo's POE will power only 24V CPEs.

Inspect cable for nicks and damages RJ45 connectors.

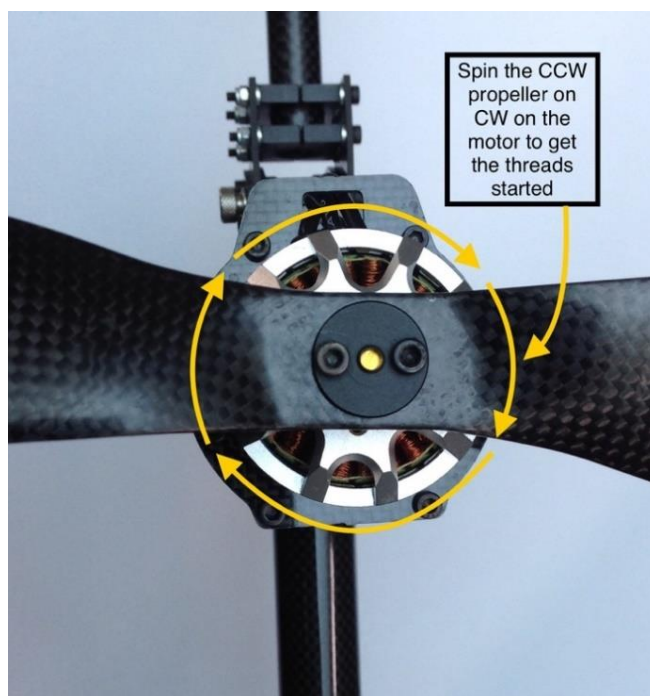
DO NOT attempt to repair cables without contacting WISPr Systems.

Install Quick attach Propeller

Connect the counter clockwise (CCW) propeller with the orange quick detach to the motor with the orange quick detach attachment.

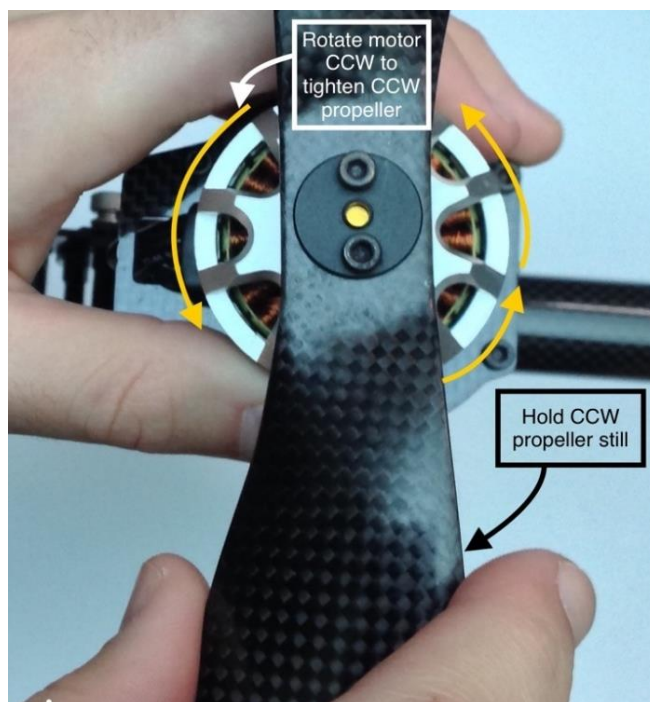


Hold the motor still and spin the CCW propeller on the motor clockwise (CW) to get it started.

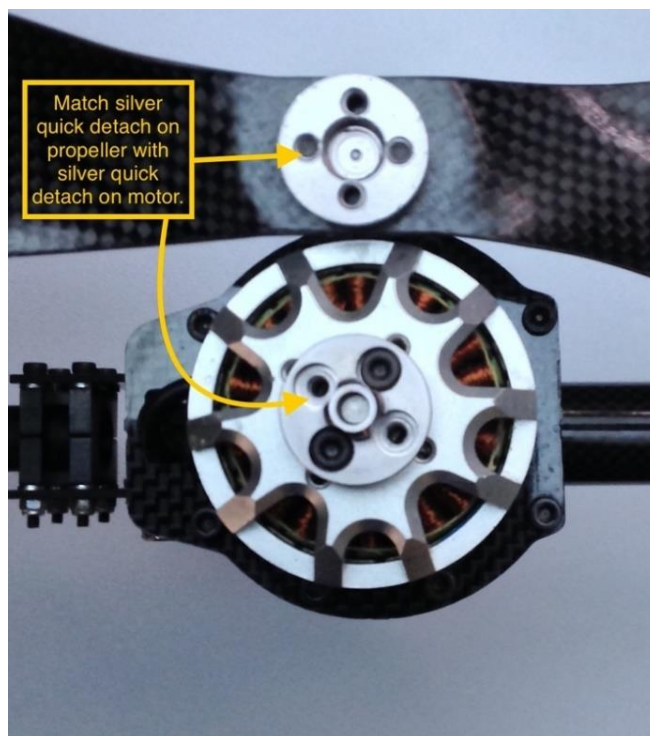


After the threads have started, hold the propeller still and spin the motor CCW to tighten the quick detach.

After installing the propeller, give the propeller a “wiggle” test, to ensure the Quick detach piece on the motor is secured tightly. If the part is loose, tighten the screws.

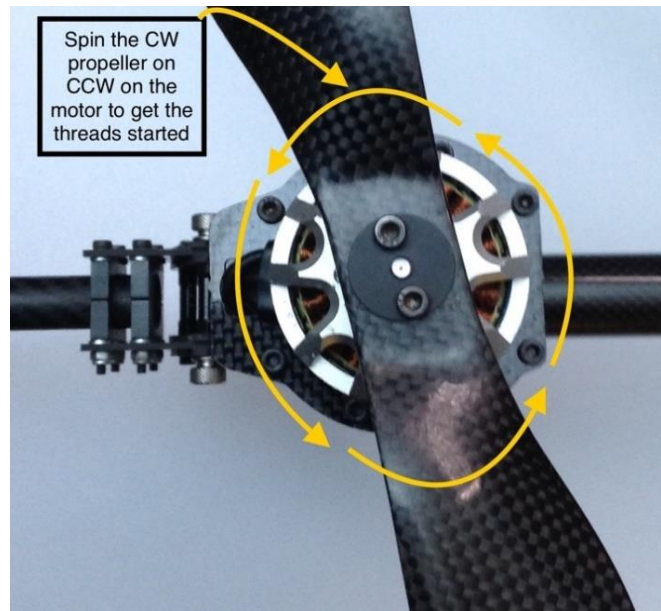


Connect the CW propeller with the silver quick detach to the motor with the silver quick detach attachment.

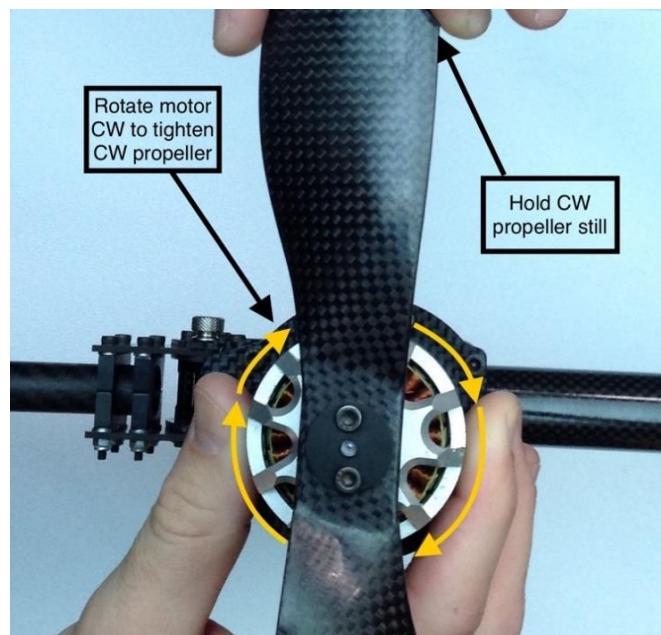


Hold the motor still and spin the CW propeller on the motor CCW to get it started.

After the threads have started, hold the propeller still and spin the motor CW to tighten the quick detach.



After installing the propeller, give the propeller a “wiggle” test, to ensure the Quick detach piece on the motor is secured tightly. If the part is loose, tighten the screws.



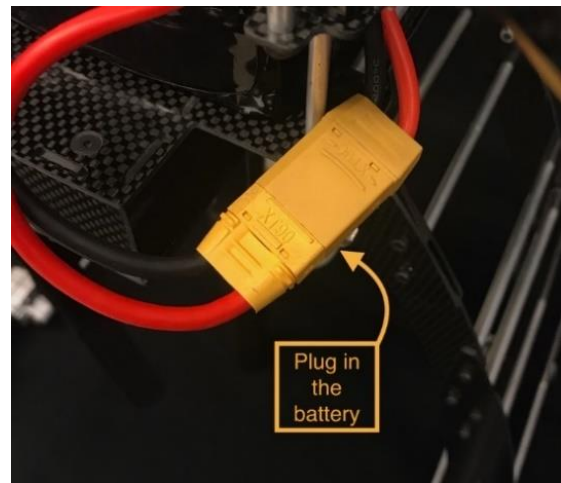
Insert Battery

Insert battery into the battery tray on the POGO.



Plug in battery

After the propellers are attached to the motors, plug in the battery.



Ensure the battery XT90 male connector is not connected to the battery's female XT90 connector when installing/uninstalling quick detach propellers.

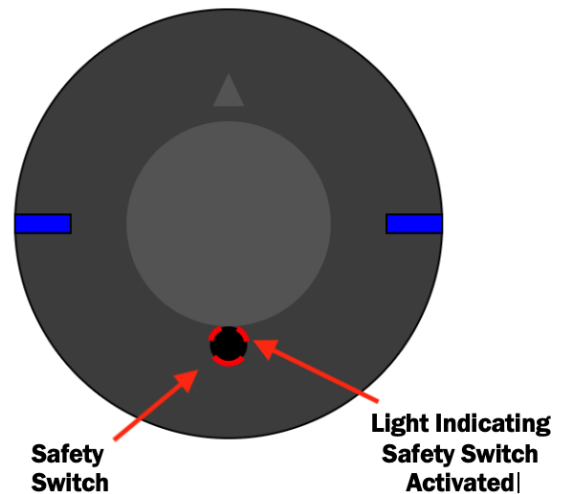
Ensure no large nicks are present on the propeller.

Inspect that the quick detach piece is tightened

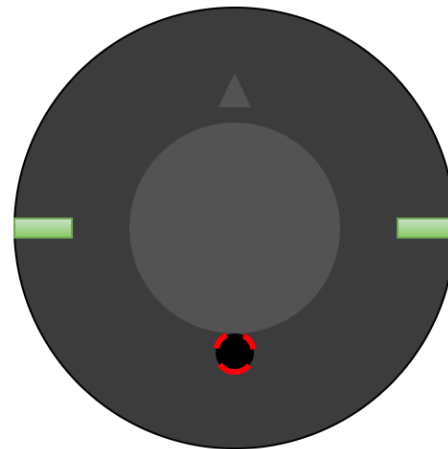


DO NOT force the propeller to thread onto the motor as this could cause damage to the quick attach hardware.

Once the light on top of the GPS begins to blink blue or green, then press and hold the safety switch button until the red light around the button on the GPS begins to blink at a faster rate. At this point the Pogo should not be moved from this position. If the Pogo is moved while the safety switch is pressed, the Pogo may sense a takeoff and the propellers could begin to spin causing serious injuries to the user.



You can only arm the Pogo when the GPS is green. The Pogo will not arm if the GPS lights are any other color.



Inspect the battery once more

Ensure battery is sufficiently charged

Safety glasses should be worn when connecting battery to drone

You should never plug in battery with your body over the propellers

Flight Restrictions

Geofence Breach

Parameter breach

If the Pogo breaches the 300ft geofence the Pogo will turn its heading toward home and fly 10m toward home. If there are high winds present this may take the Pogo more than 10s to turn around, and at this time will be issued an RTL. This ensures the user is not flying too far away to notice the Pogo's drift and prevents the geofence breach turn around function from malfunctioning in an infinite loop.

Height breach

When approaching the maximum height (200m) the Pogo will no longer accept accent inputs, but if for some reason the Pogo breaks the outer bound of the geofence, the function will prompt the Pogo to descend 10m to ensure the Pogo is within the geofence (this protects the Pogo from rising during high winds causing a geofence breach)

Low Battery

Low Battery Return to Launch

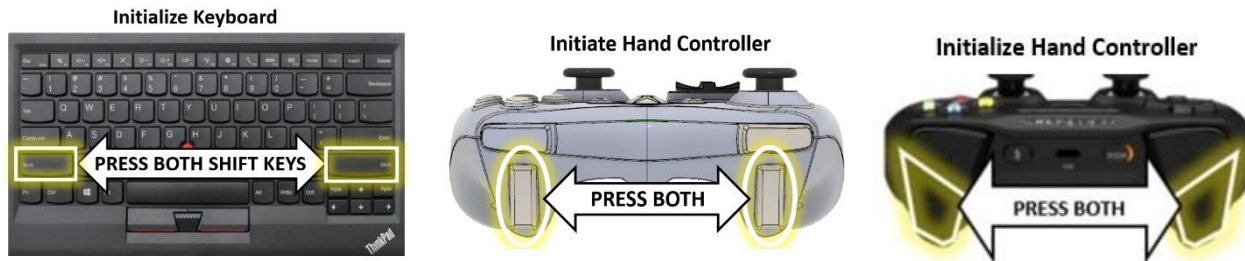
If battery reaches a level of 15% a Return to Launch (RTL) will be initiated. Once the RLT begins, it cannot be aborted, and cannot be rearmed for another flight.

Low Battery Arming Restriction

If the Pogo has a battery percentage below 30% the Pogo will not arm. This protects the Pogo from undervoltage upon takeoff, which could cause unstable flight.

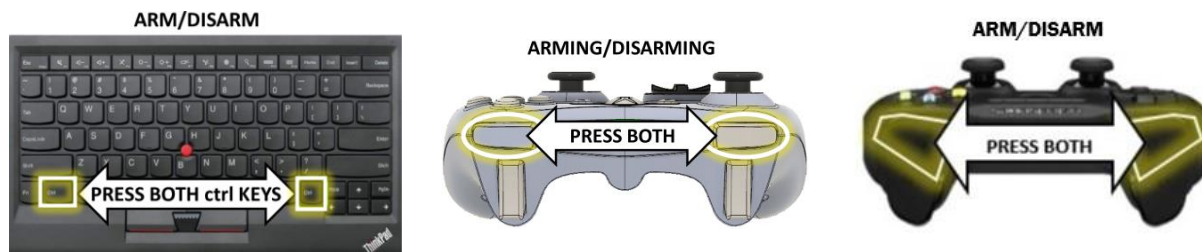
Initialize Controls

To take off the Pogo do as shown in the diagrams below to initialize the hand controller.



Arming the Pogo

There are 3 controls you can use to operate the WISPr Pogo: wired Hand Controller, Wireless Hand controller or Keyboard. To arm the Pogo, do as shown in the picture below.



Ensure the user and bystanders are at least 25 feet away from the Pogo before arming.

Pogo will not arm or takeoff if:

- Low Battery RTL has been initiated previously (in the same life cycle)

- Battery percentage of 30% is reported. Large voltage drops on takeoff can compromise the flight.

- The GPS safety switch is not pressed

- No GPS Lock (GPS Light is blue)

MAKE SURE ALL MOTORS ARE SPINNING BEFORE TAKING OFF

Troubleshooting Controller Connections

If the Hand Controller option is not visible on the controller selection prompt:

- A. While on the controller selection screen, press any random button on the controller to initialize
- B. While on the controller selection screen, unplug and plug the controller in.
- C. Close WISPr OS. Navigate to your computer's desktop. Unplug and plug in the hand controller. Press random buttons on the controller to initialize. Open WISPr OS again. Follow the previous instructions to navigate to the controller selection page. If the controller still doesn't show, press any button on the controller to reinitialize.
- D. If the hand controller option is still not visible, your computer may have to be rebooted.
- E. If you still cannot get the controller to connect, please contact Tech Support.

If the controller becomes accidentally unplugged, plug the controller back in, click the dashboard button at the top left of the screen, click new flight, and choose the hand controller option. If the controller will not connect, choose the keyboard control option, and land the Pogo using the keyboard controls.



Only use hand controllers purchased from WISPr OS.
Inspect the controller for broken buttons/joysticks, and nicks in the wire before use.

MAKE SURE ALL MOTORS ARE SPINNING BEFORE TAKING OFF

If the wrong controller was selected and initiated, press the dashboard button, and begin a new flight.

If the controller is not a choice in the controller selection prompt:

1. Press any button on the hand controller.
2. Unplug and plug in the hand controller while on the controller selection screen and press any button to have it show up as an option.
3. Close WISPr OS and go to the computer's Desktop. Unplug the controller and plug it in. Press any button on the controller. Open WISPr OS and try again.
4. There may be an issue with the computer's OS. Restart the computer and try steps 1-3 again. If it does not work, contact Tech Support.

Take-Off

Once the motors are armed the user can take off the Pogo. At this time, ensure there are no obstacles above the Pogo. Take-off is an automated process, which is determined by the controller being used. Take-off controls are seen above in the controls section.



Depending on the controller selected, press and hold the takeoff buttons for 5 seconds, when the bar fills on the screen, the Pogo will initiate takeoff. Takeoff is an automated process in which the user will not be able to control the Pogo during this process.



**DO NOT FLY UNDER 5 FEET ABOVE THE ROOF OF A HOUSE WHEN SURVEYING
MAINTAIN LINE OF SIGHT WHILE FLYING.**

Landing

When the user has completed all test, they have the option to manually fly around and survey more or land.

Landing is an automated process in which the user can hover below 3 feet and automatically land or click the land command manually.

Giving the land command will make the Pogo land at its current position.

The user must fly to above area in which they want to land and fly the Pogo down in altitude to less than or equal to 10 feet above the landing area before executing the land command.

Landing controls are seen above in the controls section.

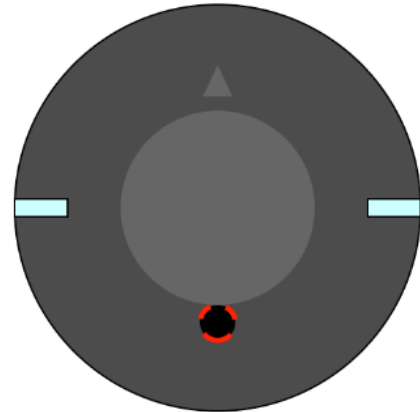


Post flight Procedures

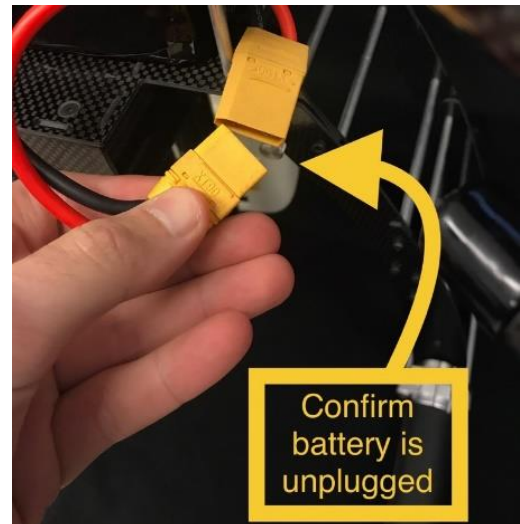
Powering Down the Pogo

Ensure the Pogo's propellers are not spinning. You should NEVER approach the Pogo when the propellers are spinning.

Press and hold the safety switch until the light flashes white/teal color. You should never touch/move the Pogo while it is armed! The Pogo is DISARMED IF THE SAFETY SWITCH BLINKS ONCE BETWEEN PAUSES AND IS ARMED IF IT BLINKS TWICE BETWEEN PAUSES.



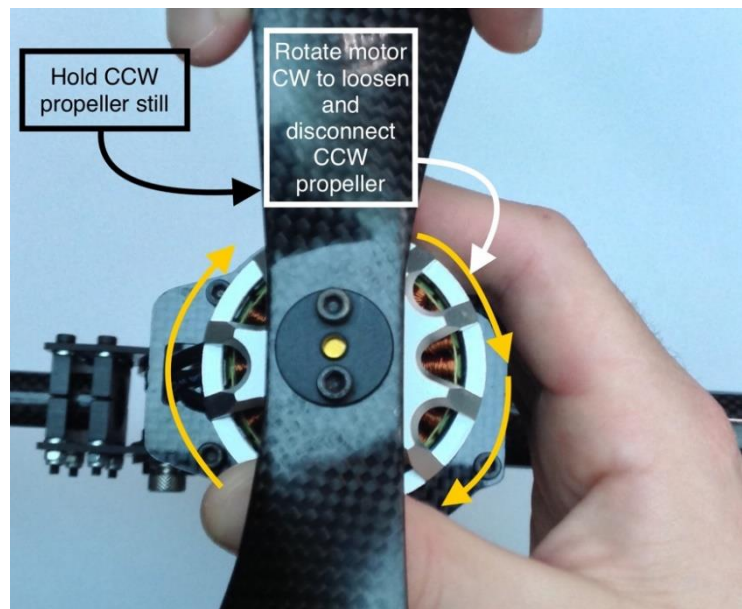
Unplug the battery Female XT90 from the WISPr Pogo Male XT90.



Remove Propellers

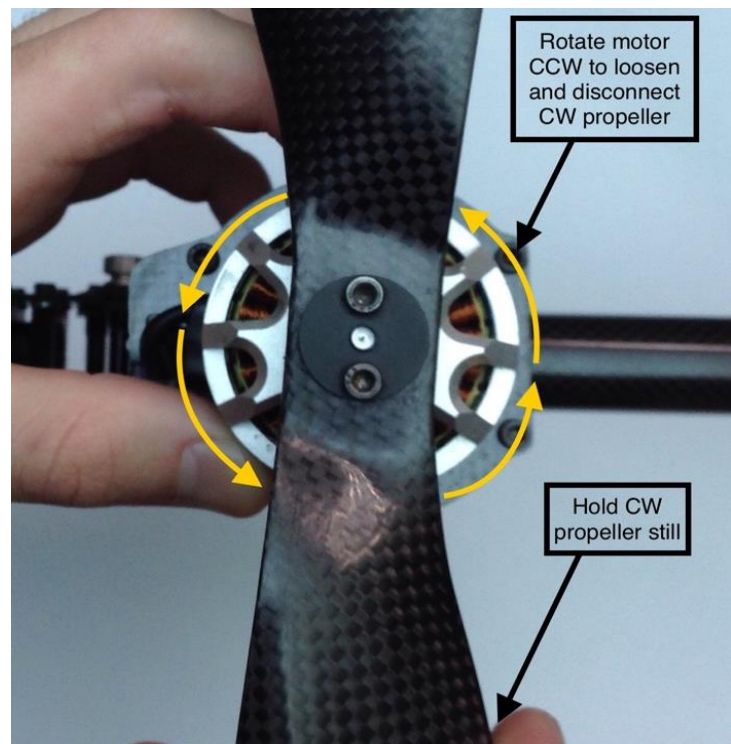
Disconnect the CCW propeller with the orange quick detach.

Hold the propeller and spin the motor by hand CW to unscrew and disconnect the CCW propellers.



Disconnect the CW propeller with the silver quick detach.

Hold the propeller and spin the motor by hand CCW to unscrew and disconnect the CW propellers.





The Pogo MUST BE UNPLUGGED when removing propellers.
ALWAYS inspect propellers after use.

Remove Battery

Slide the battery out of the Pogo after use. Do Not pull the battery out by the wires as this could damage the battery, or worse, could cause a fire due to a shorted connection from pulling on the wires.



Ensure:

No swelling on the battery

No exposed wires

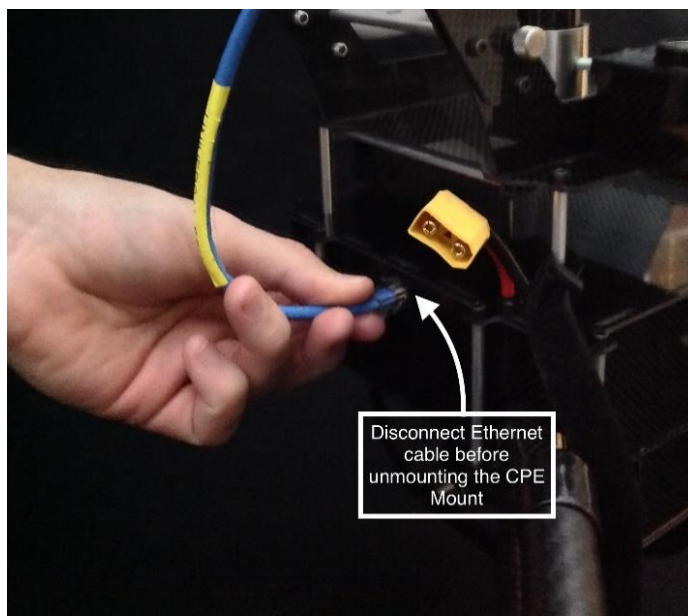
No nicks on wires or battery

Battery is fully charged before use

If any of these issues are present, send battery back to WISPr Systems so we can properly dispose of the damaged battery.

Remove Landing Gear/ CPE Mount

First, disconnect ethernet from 24V POE port

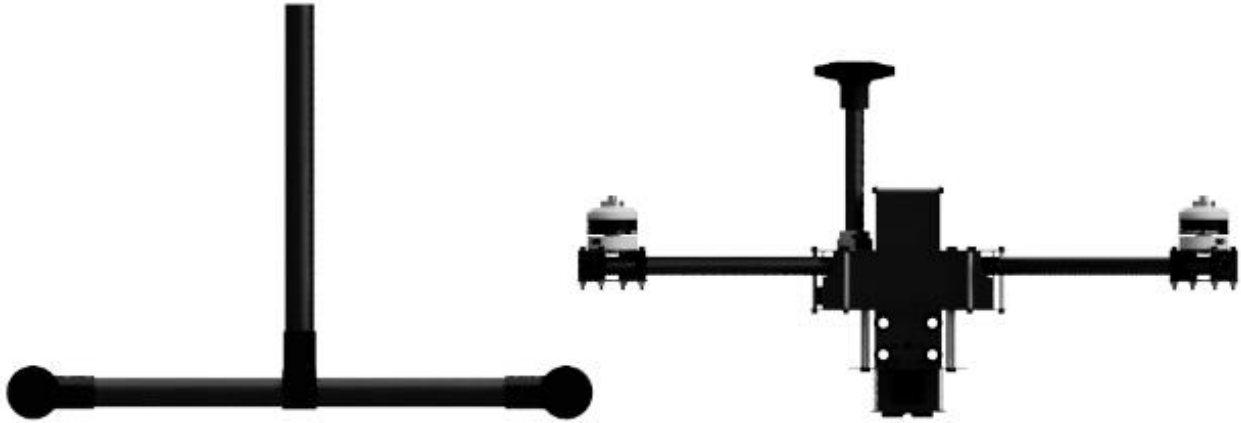


Unscrew the mount connecting the POGO to the landing gear/ CPE mount and remove landing gear/ CPE mount for storage.

POGO and Landing Gear/ CPE mount connected



POGO and Landing Gear/ CPE Mound disconnected



Unscrew and lock down GPS mount for storage

If desired the GPS pole can be unscrewed and locked down horizontally for better storage of the pogo. As seen in the picture below.



Emergency Procedures

The user must determine if they are in an emergency situation while flying the WISPr Pogo or not, if the user is in a situation where they want to kill all power to the motors, below are the kill switch options.

EMERGENCY KILLSWITCH



EMERGENCY KILLSWITCH



If the emergency kill switch is initiated during flight, call WISPr Systems Technical Support Immediately, and do not attempt to fly until speaking with WISPr Systems.

Appendix

Aircraft	
Weight	
All Up Weight	4.5lbs (2041g)
Dimensions Disassembled (L x W x H)	21.5 x 21.5 x 8in (54.61 x 54.61 x 22.86cm)
Dimensions Assembled (L x W x H)	21.5 x 21.5 x 24in (54.61 x 54.61 x 60.96cm)
Dimensions Diagonal	29in(73.66cm)
Max Speed	4.92ft/s (1.5m/s)
Max Ascend/Descend Speed	4.92ft/s (1.5m/s)
Geofence Breach Distance	300ft (91.44m)
Geofence Breach Min Height	6.5ft (2m)
Geofence Max Height	200ft (60.96m)
Low Battery RTL %	15%
Min Battery % Takeoff	30%
RTL Height	90ft (27.43m)
Max Flight Time	22min
Average Flight Time	18min
Max Payload	4lbs (1814g)
Max Wind Speed	15mph (40.23kph)
Operating Temperature	32°F (0°C)
Storage Temperature	32°F (0°C)
Operating Frequencies	2.4GHz/5.8GHz
Satellite Positioning	GPS/GNSS
Azimuth Accuracy	±5°
Camera	
Picture Resolution	8MP
Video Resolution	720P or 1080p
Distance Sensor (Lidar)	
Max/Min Distance	55ft (17m) / 0.4in(1cm)
Battery	
Capacity	5450mAh
Voltage	22.2-25.2V
Battery Type	6s LiPo
Weight	1.53lb (693g)
Storage Temp Max	32°F (0°C)
Storage Temp Min	32°F (0°C)
Operating Temp	32°F-140°F (0°C-60°C)
Max Charging Current	54.5A
Max Dissipation Current	1300A
Discharge Current for Storage/Disposal	5.4A

Product Agreements

WISPr PRODUCT PURCHASE AND SOFTWARE LICENSE AGREEMENT

THIS AGREEMENT is a part of the registration and activation of your WISPr unmanned aerial vehicle (UAV) and related Software. You must signify your acceptance of the terms of this agreement by clicking the “I Agree” button below. By doing so you represent that you, or if the registrant is a business entity, your entity, agree to the terms of this Agreement and that you have the authority to execute the Agreement. If you decline to enter this Agreement, please immediately return any WISPr products in your possession for a refund.

FOR AND IN CONSIDERATION of the purchase price and licensing fees reflected hereto, the parties agree as follows:

1. Definitions

1.1 Agreement

“Agreement” includes this agreement and its attached Exhibits.

1.2 Designated Environment

“Designated Environment” is the UAV or UAVs registered by you in the Registration Materials and does not include any other unmanned aerial vehicle.

1.3 Documentation

“Documentation” means the user, system and installation documentation and/or manuals for the Software and UAV, as current at the time of purchase.

1.4 Error

“Error” means a material failure of the Software to function in conformity with the Documentation.

1.5 License

“License” means the license granted by Licensor to Licensee to use the Software and Documentation in accordance with the terms and conditions of this Agreement.

1.6 Licensee

“Licensee” means you, the entity licensing the Software and purchasing the UAV.

1.7 Licensor

“Licensor” means Autonomous Industrial Solutions, LLC, d/b/a WISPr Systems.

1.8 Registration Materials

“Registration Materials” means any and all information entered on this website by Licensee or its agent, including but not limited to identifying information of Licensee, Licensee purchases of UAV(s), Licensee licensing of Software and add-on functionality, purchases of extended warranties and acceptance of this Agreement.

1.9 Software

“Software” means the WISPr computer program(s) and add-on functionality acquired by Licensee and reflected in the Registration Materials, in machine-readable, object code form, and any computer programs delivered to Licensee in machine-readable, object code form, including any updates or upgrades thereto.

1.10 UAV

“UAV” means the unmanned aerial vehicle(s) purchased by Licensee and identified in the Registration Materials, together with such controllers, battery packs, battery chargers and other hardware sold as a package. UAV shall not include the Software accompanying the UAV.

1.11 UAV Warranty Period

“UAV Warranty Period” means sixty (60) days from the date of Purchase (or such longer period as agreed by the purchase of an extended warranty or warranties as reflected in the Registration Materials.)

2. Software License

2.1 License

Licensor grants Licensee a non-exclusive, non-transferable license to use the Software and Documentation solely for its internal operations on the Designated Environment. Licensee recognizes that the Software functions in an environment in which other third-party software is or may be necessary. Licensee acknowledges that any open-source, third-party software is provided without warranty, but is incorporated into the Software as may be necessary to create the operating environment for the Software. Such software which may be utilized in operation of the Software and UAV is set forth in Exhibit A hereunder.

2.2 Support and Updates

In exchange for Licensee’s monthly Software fee(s), during the term of this License, Licensor shall provide routine telephonic support for Licensee during regular business hours, at the number identified on Licensor’s website. During such term, Licensor shall also make available to Licensee updates and upgrades of the Software licensed by Licensee. Licensee covenants to promptly install any such update or upgrade. To the extent that Licensee requires more extensive telephonic support, in-person support, or personal user training, such shall be provided at Licensor’s then-current rates.

2.3 Distribution

Except as explicitly provided herein, Licensee shall not: (1) make available or distribute all or part of the Software or Documentation to any third party by assignment, transfer, sublicense or by any other means; (2) copy, adapt, reverse engineer, decompile, disassemble, or modify, in whole or in part, any of the Software or Documentation; or (3) use the Software to operate in any operating environment other than the Designated Environment.

3. Price and Payment

3.1 Price

Licensee shall pay the price reflected in the Registration Materials and agrees to pay the monthly fees for the Software package or packages selected by Licensee as reflected in the Registration Materials as adjusted by Licensor from time to time and reflected on this website. Licensee shall enter a valid credit card and will be billed automatically to such card on a monthly basis until Licensee notifies Licensor in writing that it desires to cancel the License or Licenses for such Software. Licensee shall promptly update all credit card information as revised.

3.2 Tax

Except to the extent Licensee is exempt from such taxes, Licensee shall be responsible for any applicable sales or use taxes or any value added or similar taxes payable with respect to sale of the UAV or the licensing of the Software, or arising out of or in connection with this Agreement, other than taxes levied or imposed based upon Licensor's income. In the event that Licensor pays any such taxes on behalf of Licensee, Licensor shall invoice Licensee for such taxes and Licensee agrees to pay such taxes in accordance with this Agreement.

3.3 Interest

Failure by Licensee to pay any amounts invoiced under this Agreement in full in accordance with this Agreement, shall make Licensee liable to pay Licensor interest at the rate of one and one-half percent (1.5%) per month on the remaining amount due, or at the highest amount permitted by applicable law, whichever is less, such interest to accrue on a daily basis after as well as before any judgment relating to collection of the amount due.

4. Proprietary Rights

Licensee acknowledges and agrees that the copyright, patent, trade secret, and all other intellectual property rights of whatever nature in the Software, Documentation and UAV are and shall remain the property of Licensor, and nothing in this Agreement should be construed as transferring any aspects of such rights to Licensee or any third party. Licensee acknowledges that it understands that Licensor has no proprietary right, nor does it purport to convey any right, in third party software which may be necessary to create the operating environment for the Software the subject of this Agreement. Licensee hereby assigns to Licensor any intellectual property rights in, or arising out of, any suggestion, comment, or statement made by Licensee which may be incorporated into unmanned aerial vehicles or the Software.

5. Software Warranty

Licensor warrants the Software in accordance with the provisions in Section 5 hereunder. Neither Licensee, nor the respective developers makes any warranty with respect to the third-party, open-source software (identified in Exhibit A) or its operation therewith.

5.1 Operation

Licensor represents to Licensee that: (1) during any period in which Licensee pays the monthly Software fee(s), the Software shall operate without any Errors; and (2) upon notification to Licensor of any Errors, Licensor will, during its normal business hours and at no cost to Licensee, use reasonable efforts to correct such Errors which are reproducible and verifiable by Licensor, excluding any Errors caused by uses of the Software which were not in accordance with the Documentation or caused by other Licensee error or negligence. Licensor makes no warranty whatsoever as to any third-party software.

5.2 Correction

In the event that Licensee notifies Licensor of an Error, Licensor's sole liability, and Licensee's sole remedy, will be Licensor's use of reasonable efforts to correct such Errors or, in Licensor's sole discretion, to refund the portion of the paid price applicable to the portion of the Software which fails to comply with the Warranty.

5.3 Software Warranty Disclaimer

THE WARRANTY SET FORTH IN THIS SECTION 5 IS A LIMITED WARRANTY AND IT IS THE ONLY WARRANTY MADE BY LICENSOR WITH RESPECT TO THE SOFTWARE. LICENSOR EXPRESSLY DISCLAIMS, AND LICENSEE HEREBY EXPRESSLY WAIVES, ALL OTHER WARRANTIES EXPRESS OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. LICENSOR DOES NOT WARRANT THAT THE SOFTWARE WILL MEET LICENSEE'S REQUIREMENTS OR THAT THE OPERATION OF THE SOFTWARE WILL BE UNINTERRUPTED OR ERROR-FREE, OR THAT ERRORS IN THE SOFTWARE WILL BE CORRECTED. LICENSOR'S LIMITED WARRANTY IS IN LIEU OF ALL LIABILITIES OR OBLIGATIONS OF LICENSOR FOR DAMAGES ARISING OUT OF OR IN CONNECTION WITH THE INSTALLATION, USE OR PERFORMANCE OF THE SOFTWARE. THE PARTIES AGREE THAT THE SOFTWARE'S FAILURE TO PERFORM IN ACCORDANCE WITH THE DOCUMENTATION SHALL NOT BE CONSIDERED A FAILURE OF THE ESSENTIAL PURPOSE OF THE REMEDIES CONTAINED HEREIN. EXCEPT FOR THE ABOVE LIMITED WARRANTY, THE ENTIRE RISK OF THE SOFTWARE'S QUALITY AND PERFORMANCE IS WITH LICENSEE.

6. UAV Warranty

Licensor warrants that the UAV shall, for the UAV Warranty Period operate in accordance with the Documentation.

Upon tender of the UAV and in compliance with the warranty provisions herewith, during the Warranty Period, Licensor shall repair or replace the UAV, which in its discretion, may include a reconditioned UAV of the same model. The above shall be the sole and exclusive remedy under the UAV Warranty.

6.1 Warranty Exclusions

The following actions and activities will void any UAV warranty hereunder:

1. Damage caused by operating the unit with a weight greater than a 10-pound payload.
2. Damage caused by forced flight when frame, props, etc., have been aged or damaged.
3. Damage caused by reliability or compatibility issues when using third-party parts.
4. Damage caused by operating the UAV with a low charged battery or defective battery charging hub.
5. Damage caused by an unauthorized modification, disassembling or shell opening of the UAV.
6. Damage caused by improper installation or incorrect use of operation, in conflict with the Documentation and/or training material supplied herewith.
7. Damage caused by unauthorized modification of circuit, or mismatch or misuse of battery and charger.
8. Damage caused by flights which ignore the instructions of the Documentation and/or training material supplied herewith.
9. Damage caused by operating the UAV in bad weather (rainstorm, snow storm, sand storm, high winds, etc.)
10. Damage caused by operating the UAV in an electromagnetic interference environment.
11. Damage caused by operating the UAV in a known environment with interference from other wireless devices (i.e. transmitter, video-link, wi-fi signals, etc.)
12. Damage caused by operator error.
13. Damage caused by operation of the UAV by anyone under twenty-one years of age.
14. Damage caused by any intentional act of the operator.

15. Damage resulting from operation of the UAV in violation of any applicable law or regulation.

6.2 Making a Claim

In order to make a valid claim, Licensee must, during the UAV Warranty Period:

1. Notify Licensor of the claim by contacting Licensor at the address below, describing in detail the basis of the claim.
2. Follow the directions of Licensor in either returning the UAV to Licensor at the address below, at the expense of the Licensee, or providing documentation of the damage as directed by Licensor.
3. Provide valid proof of purchase, receipt, invoice and order number from Licensor or Licensor's dealer.
4. Demonstrate that no unauthorized disassembling, modification, or installation has been performed and that the shell of the UAV has not been opened.

6.3 UAV Warranty Disclaimer

THE UAV IS A SOPHISTICATED PIECE OF AERIAL EQUIPMENT AND SHOULD BE OPERATED ONLY BY ADULT, KNOWLEDGEABLE OPERATORS AFTER FULL TRAINING.

THE WARRANTY SET FORTH IN THIS SECTION 6 IS A LIMITED WARRANTY AND IT IS THE ONLY WARRANTY MADE BY LICENSOR WITH RESPECT TO THE UAV. LICENSOR EXPRESSLY DISCLAIMS, AND LICENSEE HEREBY EXPRESSLY WAIVES, ALL OTHER WARRANTIES EXPRESS OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. LICENSOR DOES NOT WARRANT THAT THE UAV WILL MEET LICENSEE'S REQUIREMENTS OR THAT THE OPERATION OF THE UAV WILL BE UNINTERRUPTED OR ERROR-FREE. LICENSOR'S LIMITED WARRANTY IS IN LIEU OF ALL LIABILITIES OR OBLIGATIONS OF LICENSOR FOR DAMAGES ARISING OUT OF OR IN CONNECTION WITH THE INSTALLATION, USE OR PERFORMANCE OF THE UAV. THE PARTIES AGREE THAT THE UAV'S FAILURE TO PERFORM IN ACCORDANCE WITH THE DOCUMENTATION SHALL NOT BE CONSIDERED A FAILURE OF THE ESSENTIAL PURPOSE OF THE REMEDIES CONTAINED HEREIN. EXCEPT FOR THE ABOVE LIMITED WARRANTY, THE ENTIRE RISK OF THE UAV'S QUALITY AND PERFORMANCE IS WITH LICENSEE.

7. Indemnity

7.1 Licensee Indemnification

Licensee hereby indemnifies, defends and holds harmless Licensor, its owners, officers, directors, employees and agents, against any claim for (1) alleged infringement of any U.S. registered copyright or patent, arising out of the use of the Software or UAV in any manner prohibited by this Agreement or in contravention to the Documentation (2) Operation of the UAV in contravention to Federal Aviation Authority or other governmental regulations, or in contravention to the Documentation and training materials; (3) Damage caused by excluded conduct set forth in Section 6.1 of this

Agreement. Licensee shall at all times maintain adequate insurance to cover claims against the above perils and shall furnish Licensors with evidence of such insurance upon request.

8. Limitation of Liability

8.1 Limitation

LICENSOR SHALL HAVE NO LIABILITY WITH RESPECT TO ITS OBLIGATIONS UNDER THIS AGREEMENT, THE WARRANTIES HEREIN, OR OTHERWISE FOR CONSEQUENTIAL, EXEMPLARY, SPECIAL, INCIDENTAL OR PUNITIVE DAMAGES EVEN IF IT HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. IN ANY EVENT, THE LIABILITY OF LICENSOR TO LICENSEE FOR ANY REASON AND UPON ANY CAUSE OF ACTION SHALL BE LIMITED TO THE AMOUNT PAID TO LICENSOR BY LICENSEE UNDER THIS AGREEMENT FOR THE SOFTWARE AND UAV. THIS LIMITATION APPLIES TO ALL CAUSES OF ACTION IN THE AGGREGATE, INCLUDING WITHOUT LIMITATION TO BREACH OF CONTRACT, BREACH OF WARRANTY, NEGLIGENCE, STRICT LIABILITY, MISREPRESENTATIONS, AND OTHER TORTS. BOTH PARTIES UNDERSTAND AND AGREE THAT THE REMEDIES AND LIMITATIONS HEREIN ALLOCATE THE RISKS OF PRODUCT AND SERVICE NON-CONFORMITY BETWEEN THE PARTIES AS AUTHORIZED BY THE UNIFORM COMMERCIAL CODE AND OF OTHER APPLICABLE LAWS. THE FEES HEREIN REFLECT, AND ARE SET IN RELIANCE UPON, THIS ALLOCATION OF RISK AND THE EXCLUSION OF CONSEQUENTIAL DAMAGES SET FORTH IN THIS AGREEMENT.

8.2 Force Majeure

Neither party shall be under any liability for any loss or for any failure to perform any obligation hereunder due to causes beyond its control including without limitation industrial disputes of whatever nature, power loss, telecommunications failure, acts of God, or any other cause beyond its reasonable control; provided, however, that operation of the UAV in the weather events described in Section 6.1 herein, shall not excuse Licensee for any resulting liability or damage to the UAV.

9. Termination

9.1 Breach

Licensors may terminate this Agreement and the License, without prejudice to any other remedy Licensors may have, immediately without further obligation to Licensee, in the event of (1) any breach by Licensee of this Agreement which cannot be remedied within thirty (30) business days of Licensors' notice to Licensee of the breach and Licensors' intent to terminate the License; (2) Licensee's making an assignment for the benefit of its creditors, the filing under any voluntary bankruptcy or insolvency law, under the reorganization or arrangement provisions of any law of like import in connection with Licensee, or the appointment of a trustee or receiver for Licensee or its property; (3) Licensee's failure to pay monthly fees for the Software as reflected in the Registration Materials.

9.2 Remedy

Licensee may terminate the License, without prejudice to any other remedy Licensee may have, in the event of any material breach of this Agreement which is not remedied within thirty (30) days of Licensee's notice to Licensors of the breach and Licensee's intent to terminate the License. Termination

shall not relieve Licensee's obligation to pay all amounts which due and payable or which Licensee are has agreed to pay.

9.3 Cessation of Use

Upon termination of this Agreement or any purchased Software, Licensor shall have the option and ability to disable the Software remotely, which shall prevent any further use of Software, UAV, or features thereof.

10. General

10.1 Headings

The headings used in this Agreement are for convenience only and are not intended to be used as an aid to interpretation.

10.2 Validity

If any part of this Agreement is held to be illegal or unenforceable, the validity or enforceability of the remainder of this Agreement shall not be affected.

10.3 Binding

This agreement will be binding upon and inure to the benefit of the parties hereto, their respective successors and assigns. Licensee may not assign its rights or obligations under this Agreement without the prior written consent of Licensor.

10.4 No Waiver

Failure by either party to exercise any right or remedy under this Agreement does not signify acceptance of the event giving rise to such right or remedy.

10.5 Choice of Law/Choice of Forum

This Agreement shall be deemed to have been executed in the State of Mississippi and will be governed by and construed in accordance with the laws of the State of Mississippi. The parties hereby consent to the exclusive jurisdiction of the courts of the State of Mississippi or the United States District Court for the Northern District of Mississippi for the purpose of any action or proceeding brought by either of them in connection with the Agreement.

10.6 Attorney's Fees

Licensee shall be responsible for Licensor's reasonable attorneys' fees associated with the enforcement of the terms of this Agreement or the collection of any amounts due under this Agreement.

10.7 Entire Agreement

This Agreement and its Exhibits comprise the entire agreement between the parties regarding the subject matter hereof and supersedes and merges all prior proposals, understandings and all other agreements, oral and written between the parties relating to the Agreement.

References

“ThinkPad Compact Bluetooth Keyboard with TrackPoint - US English.” Amazon, Amazon/Lenovo, www.amazon.com/ThinkPad-Compact-Bluetooth-Keyboard-TrackPoint/dp/B00C32FWJC. ThinkPad Compact Bluetooth Keyboard with TrackPoint - US English

GrabCAD: Design Community, CAD Library, 3D Printing Software, PlasmaDan, 17 July 2015, grabcad.com/library/xbox-360-controller-black-1.