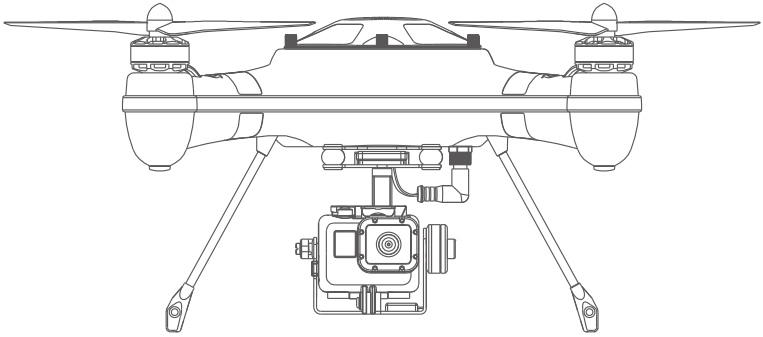
SwellPro

SPLASH DRONE
User Manual V5.5



www.swellpro.com

SWELLPRO TECHNOLOGY Co., LTD

PREFACE

Thanks for purchasing swellpro product. Please thoroughly read the entire contents of this manual to understand the product before using.

This product is NOT SUITABLE FOR PEOPLE UNDER THE AGE OF 18.

For the sake of safety, please DO comply with regulations of ICAO, Local space territory Legacy and UAV Management Discipline to enjoy flights with Splash Drone in the open air & keep away from residences. Uninstalling propellers is strongly advised during calibrations & parameters setting.

Due to any unforeseen changes or product upgrades, the information contained within this manual is subject to change without notice. It is advised to check the splash drone's product page at www.swellpro.com, which is updated on a regular basis. This will provide services such as product information, technical updates and manual corrections.

WARNING & DISCLAIMER OF LIABILITY

Swellpro is exempt liabilities from damage(s) & injuries incurred directly / indirectly from the use of this product in the following conditions:

1. Damage(s) or injuries incurred when users are under the influence of alcohol, drugs or impaired in any way through sickness, both physically and mentally.
2. Damage(s) or injuries caused by subjective intentional operations as well as any mental damage compensation caused by accident.
3. Any malfunction caused by human failure to follow the guidance of the manual to assemble or operate.
4. Damage(s) or injuries occurred in mechanical and electronic parts by a green hand operator without training.
5. Damage(s) or injuries caused by forgetting/failing to calibrate drone before flight.
6. Damage(s) or injuries incurred from using the unauthorized third party accessories or counterfeit parts against Swellpro relative policy.
7. Damage(s) or injuries caused by operational mistakes, personal modifications and disassemble the drone fuselage, and further potential issues such as lose control, crash, and water leakage;
8. Damage(s) or injuries incurred by intentionally drop/crash splash drone into water from high altitude, especially water leakage from drone fuselage and gimbal dive box;
9. Damage(s) or injuries incurred by intentionally drop/crash splash drone against ground from high altitude, especially water leakage from drone fuselage and gimbal dive box after the dramatic collision;

10. Damage(s) or injuries occurred by salty corrosion without thoroughly washing & drying the parts that engaged in seawater.
11. Damage(s) or injuries caused by losing control on drone due to change the location of flight controller.
12. Damage(s) or injuries caused by using other third party appliances, such as transmitter/receiver or remote control device.
13. Damage(s) or injuries occurred in circumstances with possible interference, including the magnetic filed, radio signal and other subjective operation troubles caused by bad judgments, obscure vision & poor-eyesight.
14. Damage(s) or injuries occurred when the drone is in the following situations: collision, fire, explosion, floods, tsunamis, ice, snow, avalanche, flooding, landslide, earthquake, etc.
15. Damage(s) or injuries caused by abusing & modifying the protective circuit inside of battery.
16. Any legal liability incurred by illegal activities. Please use products within limits permitted by local laws and regulations.

Swellpro reserves all the rights for final interpretation.

Symbols Highlighting ⃠ Forbidden (Important) ⚠ Caution (Important)

Fundamental Awareness

⚠ Please QUIT using the drone if any exceptional abnormality occurs.

⚠ Please DO make sure the Throttle joystick is staying at neutral position before switching on radio controller. Damage(s) or injuries may occur in tuning Splash Drone, so please DO ensure all engines are turned off before any calibrations.

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1.PRODUCT INTRODUCTION

Splash Drone is the world's best amphibious & waterproof drone. Packed with useful and practical features, it is capable of landing and floating on water.

The Splash Drone is perfect for the outdoor fans that use a GoPro style action camera to capture their adventures however wet or rough. It's also an ideal tool for ocean farers, lake and ocean scientists, boat owners, professional fishermen, water-sports, and all enthusiasts around the world.

Splash Drone comes with two versions: AUTO version & Fisherman version.

AUTO version – comes with payload release, waterproof gimbal, FPV screen, ground station module etc. You are available to use it for waterproof aerial filming, monitoring, fishing, delivering and smart flying like mission planning, point-fly and follow me etc. Besides, you can buy an optional payload release that includes a FPV camera (SaR device) ideal for long-distance fishing, rescue and delivery.

Fisherman version – comes with a payload release including a waterproof FPV camera (SaR device), the 5.8G video transmitter and FPV screen allow you to locate the precise position for long-distance fishing, rescue and delivery.

2.FEATURES

1. Fully waterproof design that allows flying in wet weather or conditions, like in rain, fly over/land on ocean, lake and river etc.
2. Waterproof payload release allows up to 1kg load to be flown and released at a specified location. Suitable for water rescue with life vest; to deliver fish food for fisherman; fishing etc.
3. Waterproof gimbal: The world's first waterproof gimbal for drones! It fits GoPro Hero3/3+/4 and particularly the Swellpro ZERO camera.
4. Added feature with the ZERO camera: control recording/standby for taking picture or shooting video via radio controller.
5. Built-in 5.8G video transmission system, bundled with a high-resolution 7" FPV screen, ensuring great FPV flying experience within 1km range.
5. Auto Return to Home (RTH) function: Prevent loss of the drone in difficulties or emergency situations. This provides good re-assurance for drone operators.
6. Real time OSD data on the controller: Most of the important flight data is displayed on the radio controller LCD screen, to help you check the drone's status in flight.
7. Follow me mode: The Splash Drone follows the ground station module and the smart phone GPS location, while filming the action. (for AUTO version)
8. App control: Control your Splash Drone with the Android and iOS smartphone and tablet Apps. (for AUTO version)

9. Way-point & Mission Planning flight: Allow pilot to drop waypoints and execute specific flight path at expected attitude. (for AUTO version)

10. Circle Flight: Fly the drone around a specified target to catch a perfect 360° object centered film.

11. Self-tighten Carbon Fiber Propellers: Strong and durable, no need of tools to screw the propellers on.

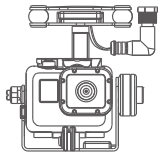
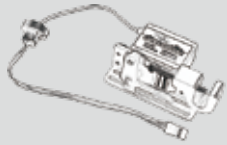
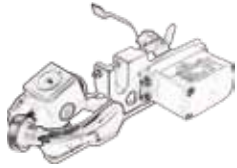
12. Smart Charger: All-In-One design, with no complicated settings, that supports 2S to 4S Li-Polymer battery.

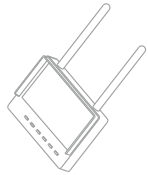
13. Aluminum suitcase: The compact and strong design makes for an easy to carry case while offering great protection to the drone while having plenty of space for the drone and its accessories.

3.WHAT'S IN THE BOX?

Attention: please check & confirm the parts inside the package comply with the part list as below:

Accessories	PHOTO	Fisherman	AUTO
Splash Drone x 1 set		✔	✔
Propeller x 2 pairs		✔	✔
Lipo Battery x 1 pc		✔	✔
Quick-release Landing gear x1 set		✔	✔

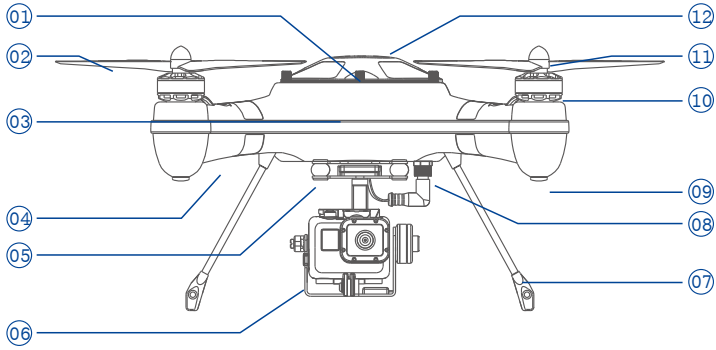
Accessories	PHOTO	Fisherman	AUTO
2.4G Radio controller x 1 set		✓	✓
Receiver Ground station x 1 set		✗	✓
Transmitter Ground station x 1 set		✗	✓
Mini 5.8G video transmitter x 1 set		✓	✓
2–Axis Waterproof Gimbal x 1 set		✗	✓
Waterproof Pay–load releaser x 1 set		✗	✓
SAR device(Payload release with waterproof FPV camera)		✓	✗

Quick-release mounting plate for Dive Case x 1 set		✓	✓
Mounting bracket of FPV Monitor x 1 set		✓	✓
7 Inch diversity LCD FPV Monitor x 1 set		✓	✓
Smart balancing Charger x 1 set		✓	✓
Aluminum-alloy Suitcase x 1 set		✓	✓

4. SPLASH DRONE AUTO VERSION

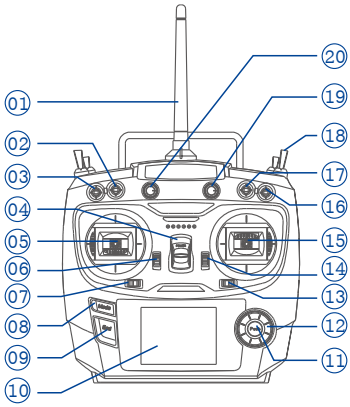
4.1 CONFIGURATION

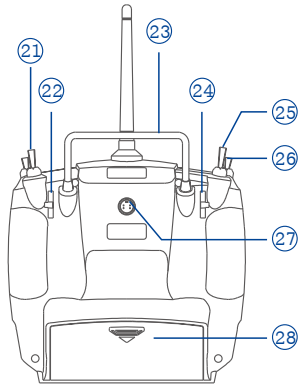
4.1.1 DRONE CONFIGURATION



1. Hatch Screws
2. Propeller
3. Drone Nose
4. Navigation Indicator
5. Shake-proof damper ball
6. 2-Axis Waterproof Gimbal
7. Landing Gear
8. Watertight seal screw
9. Rubber cushion foot
10. Watertight Motor
11. Nut of Propeller
12. NANO Vent cover

4.1.2 RADIO CONTROLLER CONFIGURATION





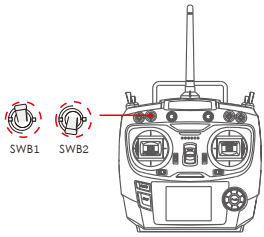
1. Antenna
2. SWB-Return Home
3. SWA-Airdrop
4. Power switch
5. Left Joystick
6. Throttle Sub-trim
7. Yaw Sub-trim
8. Mode/Menu
9. End/Back
10. Display
11. Enter
12. Scooter
13. Left/Right Sub-trim
14. Front/Rear Sub-trim
15. Right Joystick
16. SWD-Camera Control
17. SWC-Flight Mode
18. SWG (NO Function)
19. VRB (NO Function)
20. VRA (NO Function)
21. SWH (NO Function)
22. VRD-Pitch control on Gimbal
23. Handle Shaft
24. VRC-Roll control on Gimbal
25. SWF (NO Function)
26. SWE (NO Function)
27. Trainer
28. Battery cover

Remark: 18,19,20,21,25,26 are spare buttons for extra usage if any. The default Throttle control is American Mode (Left Joystick), Right throttle (Japanese Mode) is available.

4.2 FLIGHT GUIDE

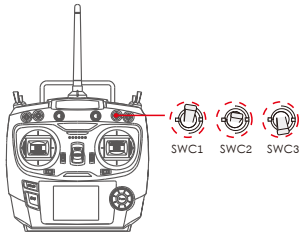
4.2.1 RADIO CONTROLLER OPERATIONS

4.2.1.1 Return-Home

Return-Home Switch		
	SWB1	Normal
	SWB2	Return-Home

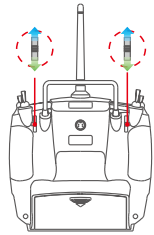
Attention: During returning and descending, drone nose & aileron joystick are controllable for a better landing location, Throttle is unavailable under Auto Return-Home mode.

4.2.1.2 Flight Mode Abstract

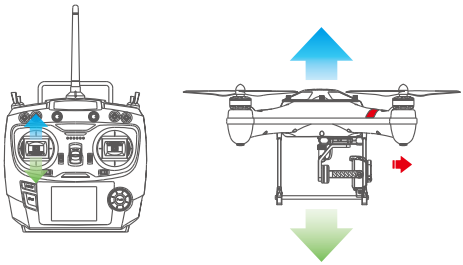
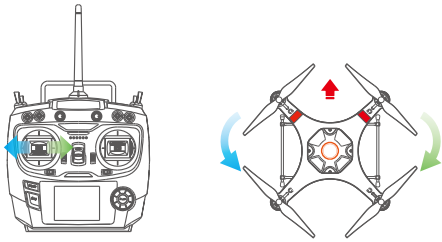
Flight Mode switch (SWC1, SWC2, SWC3)		
	SWC1	GPS Mode
	SWC2	Circle Flight
	SWC3	ATTI Mode

4.2.1.3 Gimbal controller

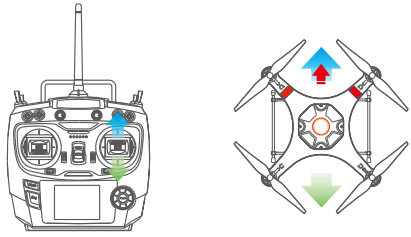
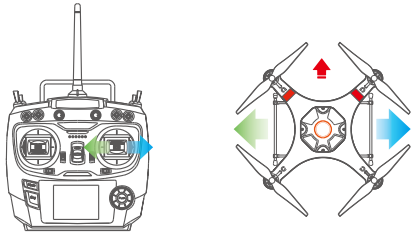
VRC, VRD is a gear switch to adjust the Roll/Pitch of Gimbal to get a better photography angle, please refer to 4.6.2 for more details.



4.2.1.4 Left joystick is for throttle and nose direction (YAW)

Throttle joystick (from Down to Up controls the flying height)	
	Slightly push up the throttle joystick to raise the drone. Pull down Throttle joystick to low down the drone. Drone keep current height when throttle joystick stays at neutral position.
YAW direction control	
	Slightly pull left joystick to RIGHT to execute clockwise rotation. Slightly pull left joystick to LEFT to execute counter-clockwise rotation. The drone will keep current YAW direction when the left joystick stays at neutral position.

4.2.1.5 Right Joystick is for AILERON control (Fly Forward | Fly Backward | Fly Left | Fly Right).

AILERON control	
	Up – Fly Forward Down – Fly Backward eft – Fly Left Right – Fly Right The drone will keep current position when the right joystick stays at neutral position in GPS mode.
	

4.2.2 FLIGHT MODE

4.2.2.1 Introduction spreadsheet

	ATTI Mode	GPS Mode
Radio Input	Linear Control	
Operational function	The drone keep horizontal when both joysticks stay at neutral position. Max tilting flight angle is 25degree.	The drone keep horizontal and LOCK POSITION when both joysticks stay at neutral position. Max tilting flight angle is 25degree.
Position Lock	Not Supported	Supported
Max Ascend Speed	4m/s	4m/s
Return – Home	Supported	Supported
Max Flight Speed	20m/s	6 m/s

Flight Mode

Flight Mode	
GPS Mode	GPS mode: The most commonly used mode. In this mode, the compass and GPS will be activated to make the drone recognize the current location precisely, it ensures you to fly the drone in good gesture and easily hover anytime. Different from the ATTI mode that is suitable for senior pilot, GPS mode is suitable for new pilot and aerial filming. However, weekness consists that the GPS & compass module is quite sensitive against magnetic interference.Make sure to fly in a place without strong magnetic interference and good GPS signal.
ATTI Mode	ATTI mode: Under ATTI mode, the flight operation doesn't rely on GPS module. The drone can maintain the height, but not able to lock the position automatically. This mode is good for senior pilot and necessory for every drone. Due to GPS senstivity and poor GPS signal, it's not advised to fly the Splash Drone indoor, or around the crowd and strong magnetic environment. (Important notice: when your drone is out of control suddenly in GPS mode, the best way to get it back is switching to ATTI mode to bring it back manually).

Circle Flight	Circle flight: Fly the drone over the target object, switch SWC to SWC2 (Circle Flight) to activate Circle Flight mode. The drone will take this point as the center of circling. The target object will be recognized as the default nose/camera direction. Pull the AILERON joystick down to enlarge the circle diameter, push up to reduce the circle. Slightly turn AILERON joystick to left, the drone will make a counter-clockwise circle flight. Keep turning the joystick to right, the drone will slow down the counter-clockwise circle fight until implementing clockwise circle flight. Keep turning more, the circlie flight speed will be faster. The circling speed is proportional to the AILERON joystick movement. Use the THROTTLE joystick to increase or decrease the flight altitude, use the YAW joystick to turn the nose/camera direction.
Return-Home mode	Return-Home mode will be active once flipping the SWB to SWB2 (Return-Home) position. YAW (nose) direction is controllable in Return-Home mode. When the drone returns to the TOP point of take-off location, both YAW and AILERON joystick are controllable for a better landing-off location, Throttle is unavailable in Return-Home mode.
Fail Safe Return	Fail Safe Return mode will be active when drone is out of radio range & radio controller is turned off by accident. After regaining the radio signal, drone will be controllable by switching SWB to "Normal" to take over the flight, no matter in ATTI or GPS mode.

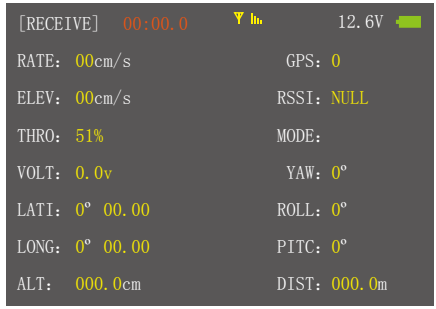
4.2.2.2 Graphic Illustration

Circle Flight

Note: To prevent unexpected accidents, please DON'T take-off under Circle Flight mode. Find out the drone NOSE direction before quitting Circle Flight mode.

4.2.3 READING OSD DATA ON CONTROLLER SCREEN

4.2.3.1 Find out and recognize the OSD data

OSD data on controller screen	
Press "End" button to enter into OSD data interface, all the flight data will be shown on the controller screen, including at-sight battery voltage, flying speed, GPS signal, etc.	

Attention:

1. Under normal flight, to prevent mis-operation, the controller screen will be locked automatically when the pilot don't press the buttons up to 20seconds. Long press the right PUSH button to unlock the screen again.

2. When the controller screen is in OSD display, the system will not auto lock the screen.

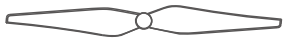
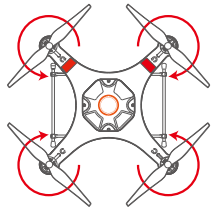
4.2.3.2 KEY word Introduction

Menu	Introduction
Rate	Flight Speed (m/s)
ELEV	Ascending(+) /Descending(-) speed (m/s)
THRO	Throttle
VOLT	At-sight voltage of the DRONE battery (V)
LATI	Latitude
LONG	Longitude
ALT	The relative height between current point and the take-off point
DIST	The ground distance from current point to take-off point
GPS	GPS Signal level
RSSI	NULL, indicate the Sensitivity of Receiver
MODE	Flight Mode
YAW	Flying angle of drone Nose
Pitch	Flying angle of moving forward(+)/ Backward(-)
Roll	Flying angle of moving to Right(+)/ Left(-)

4.2.4 PROPELLER

4.2.4.1 Installation

Take out the 4pcs original 12inch self-tighten carbon fiber propellers. Install the 2pcs propellers with silver spinner onto CCW motors; Install the 2pcs propeller with black spinner onto CW motors. Tighten them.

Propeller	Propeller with silver spinner	Propeller with black spinner
Graphic		
Assembly Location	Motor with silkprinting 'CCW'	Motor with silkprinting 'CW'
Installation Graphic		

4.2.4.2 Uninstall Propeller

NEVER try to uninstall the propellers before the drone is not locked properly and motor stop spinning.

Notice :
⃠ Props are self-tighten design without extra spinner & screw to fix.
⚠ The special propeller design make it not able to install the wrong propeller.
⚠ Please check to ensure every Props are in good shape before every flight. Aging & destroyed Props are FORBIDDEN to use on Splash Drone.
⃠ DON'T touch the rotating propellers.
⚠ Please ALWAYS use the original 12inch propellers to guarantee good fly experience.

4.2.5 BATTERY

4.2.5.1 Usage & Cautions

The battery is specially designed for Splash Drone, with 4S 5200mAh capacity, 14.8V and charge-discharge management functionality.

⃠ DO NOT put the battery into water, fire or heat place; please keep the battery away from source of water and fire.

⚠ Battery should be stored in a cool and dry environment.

⃠ The Battery temperature will be high temporarily after each use. Don't start charging until the battery cools down to room temperature.

- Do not leave the battery charging unattended. If an abnormal charging situation occurs, please stop charging the battery at once; if you cannot attend to the battery, remove the battery from the charger to avoid any unpredictable danger.
- Forbid imposing external force on the battery; do not drop the battery from high places and disassemble or modify the battery.
- Please replace the battery with new one if it bulges.
- If a child accidentally swallows the battery you should immediately seek medical assistance.
- Battery should be charged with proper standard charger.
- DO NOT connect the battery reversed in positive and negative terminals in the charger or equipment.
- DO NOT let the battery terminals (+and–) touch together to cause short–circuit.
- DO NOT transport or store the battery together with metal objects.
- DO NOT drive a nail in, hit with a hammer, or stomp on the battery.
- Do not disassemble or alter the battery.
- Do not use the battery in strong electrostatic areas; otherwise the electronic protection may be damaged which may cause a hazard.
- If you get the battery electrolyte leakage into your eyes, don't rub, first wash your eyes with clean water then seek medical assistance immediately. If not handled in a timely manner, eyes could be damaged.
- Do not use the battery when it emits an odor, high temperature, deformation, change in color or other abnormal phenomena; if the battery is in use or charging, you should stop charging or using immediately.
- If the battery terminal gets dirty, please clean it with a dry cloth before using. Otherwise it will cause a poor contact, thus lead to energy loss or the inability to charge.
- Discarded battery could lead to a fire; you should completely discharge the battery and wrap the output terminal with insulating tape before discarding.
- DO NOT drain the battery of Splash Drone or leave the battery plugged into the Splash Drone when not in use. When there is low voltage alert, please land the splash drone in a timely to avoid damages to the battery & drone.
- Unplug the battery if not occupying with drone.

  For a long time without using the drone, please keep the battery between 14.8V–15.8V. When it keeps lower than 14.8V for long time, the battry might be over discharged and get damaged. When it keeps higher than 15.8V, the battery is easy to get swelled up.

4.2.5.2 Charging Battery

Charging Process
1. Insert the AC power cord into charger (Image I)
2. Insert the AC power cord into 100–240V AC socket, all LED will light for 1 second, then your charger is ready for using (Caution: Always power ON the charger before connecting a battery, otherwise, damage will be occurred to the charger & battery)
3. Connecting the battery pack to the charger with the XH balance plug (Image I)
4. When it start charging, the 4 indication LEDs will show you the charging status: one LED blink means 25%, two LED blink means 50%, three LED blink means 75%, and four LED blink means the battery is fully charged.
5. During the charging process, if all 4LEDs keep blinking, that's mean ERROR occur. Check your connection or battery status.

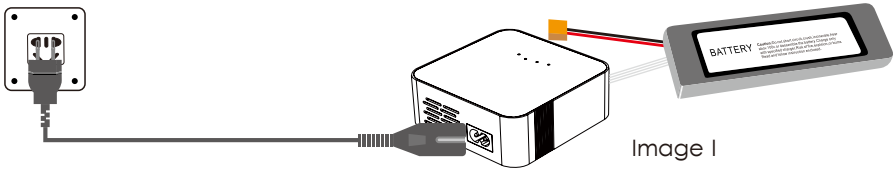
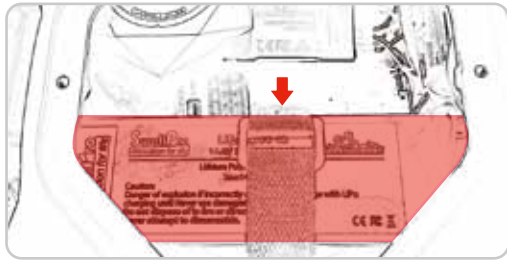


Image I

4.2.5.3 Install Battery

Fit the battery into the specified location as picture below. Put the battery power cord as far away as possible from the GPS module. Make sure no cable is placed under the battery!!!



4.3 CALIBRATION

⚠ Attention: All calibrations SHALL be done under LOCKING status WITHOUT propellers.

4.3.1 ACCELEROMETER CALIBRATION

There are two ways to do Accelerometer Calibration: via controller or via computer.

Calibration is necessary in below cases:

a. Use the drone for the first time.

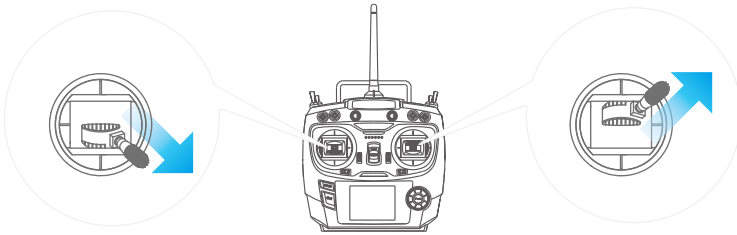
b. After violent flight in ATTI Mode.

c. Push up THROTTLE joystick, and no moving the right AILERON joystick, the drone drift with certain angle in ATTI Mode.

d. Got heavy shake during transportation.

e. After a completed compass calibration as well as unlock the motors successfully, however the LED still keep solid red when trying to start up motors.

4.3.1.1 Accelerometer calibration via controller

Accelerometer calibration via controller
1. Turn on Radio controller, then power on drone, wait till the self-checking is completed, then flip SWB to SWB2 (Return-Home) position.
2. Pull left joystick to right-lowest 45°, push right joystick to right-highest 45°as below picture:

3. Keep above gesture for 2s till light turns into flashing RED, the drone enters into calibration process. Wait till the light quit flashing to blink RED slowly, release the joysticks. Then the accelerometer calibration is finished.

4.3.1.2 Accelerometer Calibration by assistnt software

Accelerometer Calibration by assistnt software
1. Switch on radio controller, power on the drone, and place it on the flat surface, then connect it to computer by USB cable. Wait till the self-checking is completed. 2. Run the software assistant, make sure the connection is successful. Choose 'ACC' in 'BASIC' menu.
3. Make sure the drone is in horizontal status, click "Start Single Calibration". A reminder dialogue will pop up when calibrate successfully.
4. Click "Write" in right-upper corner to save change, and disconnect by clicking "Disconnect" once again. The accelerometer calibration is completed.

4.3.2 RADIO CONTROLLER CALIBRATION

Note: Every radio controller was calibrated befor ex-factory. Normally, no need to do the calibration again. If side flight occurs after successful accelerometer & compass calibration, please try to calibrate the radio controller.

Calibration Steps:

1. Turn on radio controller, and then power on drone.
2. Connect to computer, and run the Assistant Software.
3. Choose "RC" in "BASIC" menu in the same interface of assistant software, click "calibration" at the right-lower corner, system pops up a reminder dialogue to remind you what to do next.
4. Follow the dialogue to rotate 2 joysticks (left/right) in clockwise circle two times with full motion, then release.
5. Click "confirm", then give all reminder dialogues a firm "OK" to complete calibration.
6. Click "write" in right-upper corner to save changes, and disconnect by clicking "disconnect" once again. Then the radio controller calibration is completed.

4.3.3 COMPASS CALIBRATION

⚠ **Note: Recommend to do compass calibration in the fly area before flying. Flying within any magnetic interference is HIGHLY DISCOURAGED. (Please DO make sure to keep far away from High-voltage transmission power lines, Emitting base stations, metal object, etc.)**

Calibration is necessary in below cases:

a. Flying drone for the first time.

b. 100KM away from last compass calibration location.

c. The drone has been crashed/dropped by accident.

d. The drone keeps swaying / drifting during flight.

e. Heavy shake occurred during transportation.

f . RED Light stays on, and motors can't be unlocked.

Compass Calibration Process	LED indication and chart
1. Turn on the radio controller, then power on the drone. Wait till the self-checking is completed, then flip SWB to Return-Home position.	
2. Pull Left joystick to left-lowest 45°, push Right Joystick to left-upper 45°as below picture shows:	
3. Wait 2s till SOLID RED light is ON, the drone is ready for compass calibration.	
4. Horizontally pick up drone to execute full counter-clockwise rotation in 6 cubic planes respectively, 1 circle is enough for each plane, and make sure all the rotation should be based on the same vertical axis, details please refer to below images. After completing above process, put the drone on the flat surface, keep still and wait 2minutes to finish compass data collection. When the solid red indicator change into blinking slowly, the compass calibration is finished. (Note: 1. Try to unlock the motor, if it is ok, means the calibration is successful; 2. If unlock is failed, means calibration is failed, try the above process again.)	

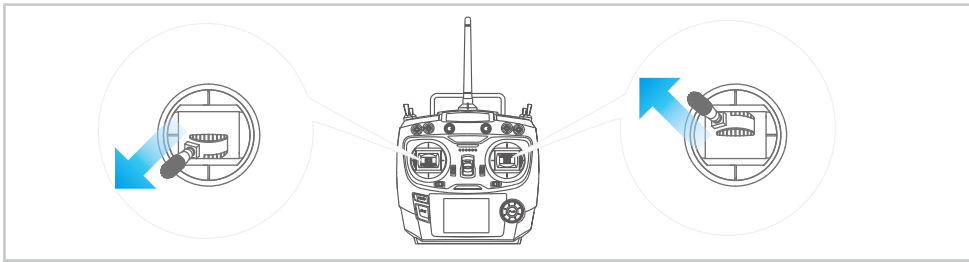


Image1	Image2	Image3

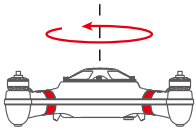
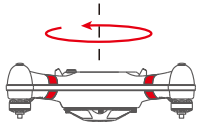
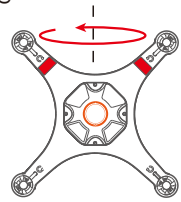
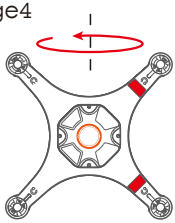
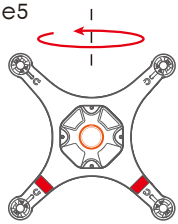
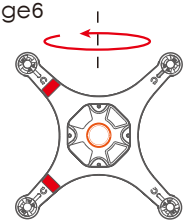

		

Image4	**Image5**	**Image6**
		

4.4 FLIGHT INSTRUCTIONS

The drone is designed for multi-usage with different kind of accessories (gimbal, payload release etc). It is very good to fly without accessories. For beginners, we suggest to fly without gimbal to learn better flying skills.

4.4.1 PRE-FLIGHT ANNOUNCEMENT

⃠ DO NOT operate in following situations:

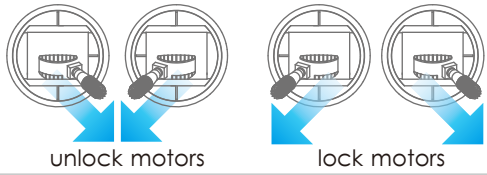
1. Please comply with local policy to eradicate any flights in the No-Fly Zone.
2. Flight nearby strong interference on radio signal is prohibited.
3. Flight among/ near to the crowed/ residences is prohibited.
4. Operations in heavy rain & storm pouring & poor flight vision are prohibited.
5. Operations nearby High-Voltage transmission line & Broadcast signal interference is prohibited.
6. To prevent loosing control, pls DO NOT operate near to the filed with strong magnetic.

7. DO NOT operate when you are tired, not feeling well or under the influence of alcohol or drugs. 8. DO NOT operate drone when the radio controller is malfunction.
⚠ Check and ensure every parts are completely in good shape before every flight.
⚠ Check motors & propellers are well installed before flying. Please DO NOT close to the running motors & propellers to avoid unexpected injuries(damages).
⚠ Please keep the compass module away from magnetic filed, otherwise it will ruin the compass module and leads to malfunction on the drone.
⚠ Please keep flight distance above 3M away from pilot & the crowed & power supplying cables.
⃠ DO NOT overloading any objects that is heavier than 1KG.
⚠ Please check the drone battery and radio battery status, and try to charge them before flying.
⚠ Please place drone away from the strong speaker devices in vehicle, because the strong megnet in the speaker will damage the drone compass module.
⚠ DO NOT WIFI function on camera, because the WIFI signal might interfere to the drone radio signal.

4.4.2 TAKING-OFF

Safety Guide
1. Please always fly the drone in the open air, and DO keep drone 3M away from pilot & the crowed. 2. Put all switches to defaulted position before turning on the radio controller. (SWC stays at GPS position, SWB at Normal position) 3. Please make sure every parts are in good situation before powering on drone. 4. Power on the drone, it will enter into self-checking, don't shake the drone when it is in self-checking, when the self-checking is finished, you will hear "DI" sound. 5. In ATTI mode, unlock and fly without waiting GPS signal; In GPS mode, you should wait till it shows 9 satellite.

Pull the 2 joysticks to their lowest location in opposite direction as showed in right pictures.



4.4.3 LANDING

Land the Splash Drone

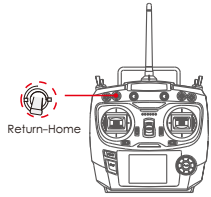
1. Slowly pull down the throttle joystick to reduce the height, when the drone is close to the ground, put the throttle stick to the lowest position, until the drone is landed and motor stop rotating. (Note: the drone will automatically be locked in 5seconds or you can manually lock it.
2. Power off the drone, then power off the radio controller.

Operation diagram

4.4.4 RETURN-HOME FUNCTION

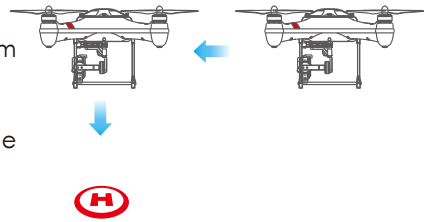
Activate Return-Home

When SWB is staying at SWB2 gear, drone will return to take-off location automatically based on good GPS communication.

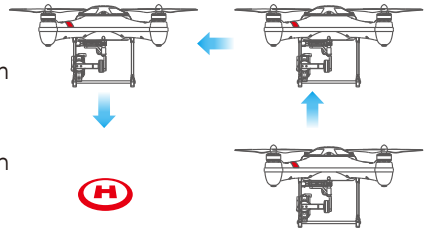


Return-Home Logic

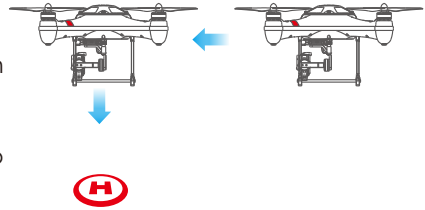
Flying height > 20m;
Straight horizontal distance away from take-off location >15m
(Drone will keep current height to execute the Return-Home function)



Flying vertical height < 20m;
Straight horizontal distance away from take-off location > 15m
(Drone will raise flight height to 20m, and then execute the Return-Home function)



Flying vertical height < 10m;
Straight horizontal distance away from take-off location < 15m
(Drone will keep the original height to execute the Return-Home function)



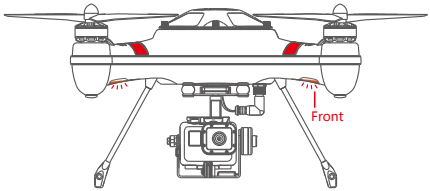
⚠ **Note:**

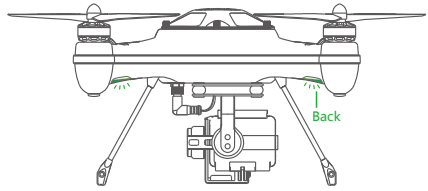
1. If the landing location is the random location, please close the Return-Home function (Switch SWB to "Normal" position), choose the new location manually;

2. During Return-Home process, when the drone start decending, the right AILERON stick is workable to choose the right landing location.

4.4.5 NAVIGATION IIGHTS

There are 4 navigation LEDs on the arms: the Red LED represent the nose direction, Green LED represent the rear direction.

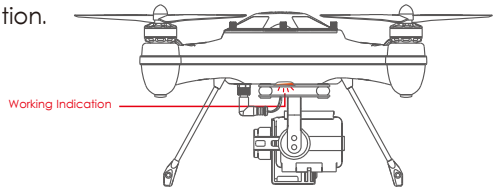




⚠ **Notice: When drone battery voltage is lower than 14.4V, all the 4 navigation lights will start blinking at the same time.**

4.4.6 DRONE STATUS INDICATION

RED LED: System status & Working Indication.



LED Indication	
●●●●●● ●●●●●●	Good GPS signal (None or one blinking)
●● ●●●●●● ●● ●●●●●●	No GPS signal (Two blinking)
●●● ●●●●●● ●●● ●●●●●●	1st level low-battery warning
●●● ●●●●●●●●●●●●●●●●●●●●	2nd level low-battery warning
▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬	Unsuccessful calibration (Solid RED)

4.4.7 LOW BATTERY WARNING & LOW BATTERY AUTO LAND

There are 2 battery warning levels, both of them can be set in the Assistant Software:

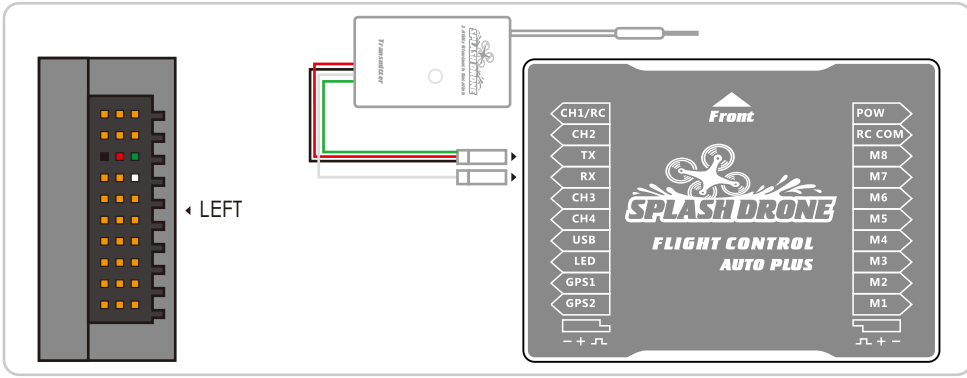
Low-battery warning	LED Indication
When the drone battery drop to 1st level warning, the indication lights will blink 3times intermittently; when it drop to 2nd level warning, the drone will land automatically. If the location is not expected, please switch to ATTI mode to take over flight. (Warning: when the drone enter into 2nd low battery warning status, land as fast as possible, otherwise the drone battery might be over-discharge and get damaged).	●●● ●●●●●●

4.5 SMART GROUND STATION

4.5.1 BLUETOOTH DATALINK MODULE

4.5.1.1 Wire Connection

The bluetooth datalink module include 2 parts: Transmitter terminal and Receiver terminal. The on-board transmitter terminal connects to the "TX" & "RX" channel of flight controller, and communicate with the on-ground receiver terminal via 433MHz/915MHz wireless signal.



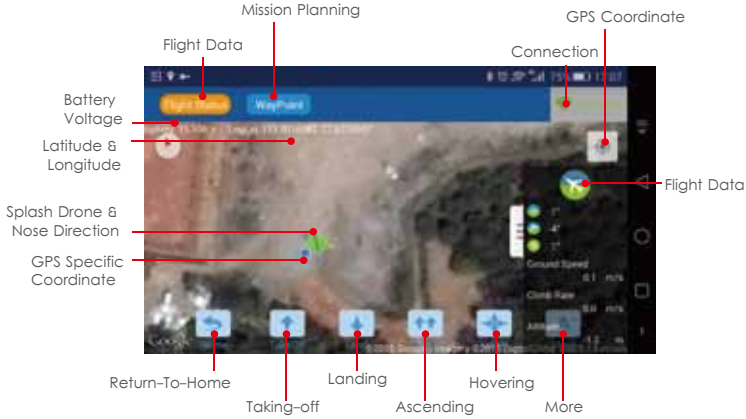
Remark: The 3 color cable (black/red/green) shall plug into "TX" pin, and the single white cable goes to "RX" pin, see above picture.

4.5.1.2 Use the Smart Ground Station

1. Download the Android APK at www.swellpro.com, or download swellpro APP in APPLE store for your iPhone.

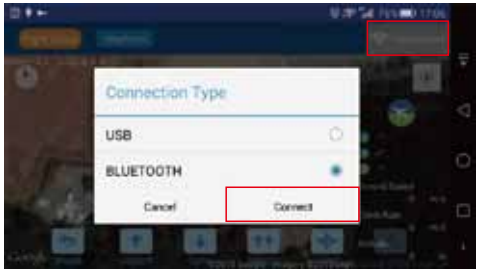
2. Run swellpro APP, click "GPS coordinate" to find the current location and choose a flying area.

Note: If the flying area don't have internet access, you might need to download the goggle map data of the flying area on your smartphone first.



4. After finishing the steps above, turn on mobile's GPS & bluetooth, power on the receiver terminal, click the wifi icon in the right-upper corner, it will pop up "Connection Type" window. Choose "BLUETOOTH" and press "Connect" to scan the available devices.

Note: The Bluetooth signal name always start with "UAV….", see below pictures.



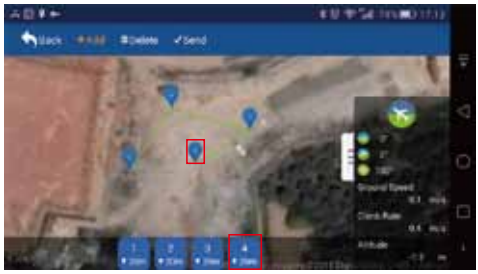
5. The right-upper wifi icon will change into GREEN once connection is successful. Then flight data will be visible on the screen.

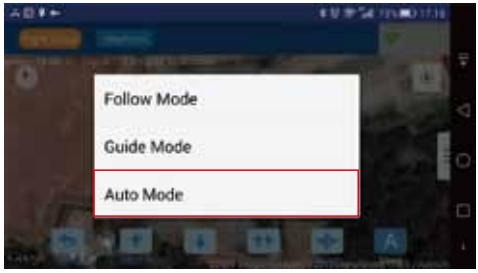
6. Till here, can unlock the drone by controller, then use the app to control the drone to take-off, land, rise up, hovering, return-home, as well as mission planning and follow me function etc.

4.5.2 MISSION PLANNING

1. Setup: Way-point can be easily set by clicking the location on the map, it's also allowed to do customized setup for every way-point, such as height, hovering time, circling, and etc.. (see below pictures)

2. Excute: Click button "A More" to choose "AUTO Mode", then drone starts the mission planning flight.

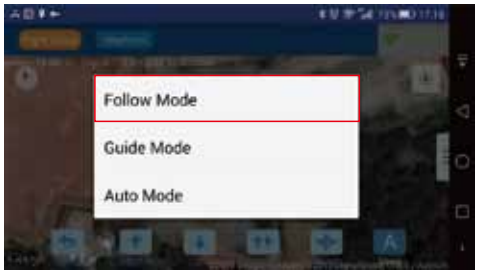


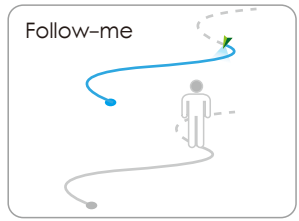


4.5.3 FOLLOW MODE

Click "A More" to choose "Follow Mode", the drone will follow up the people that hold the receiver terminal and smart phone automatically.

Note: Please keep fly far enough from the area with strong magnetic interference, because it will significantly affect the follow me experience.





4.5.4 GUIDE MODE

Tap "A More" to choose "Guide Mode", then click the designated location, then the drone will automatically fly to the specified location and keep hovering when arrive.

Important Note:

1. An ideal wireless communication is of great importance in realizing autopilot functions.

2. If the drone failed to execute orders from app, it's probably influenced by unexpected interference, please try to send new order again.

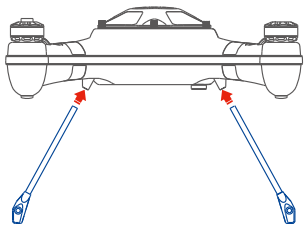
3. Once the drone don't execute any order from the app, please take over the flight by radio controller. (Method: quickly flip SWC from GPS to ATTI once, then stay at GPS position)

4. The receiver and transmiter terminal of the Bluetooth Data Link will link to each other automatically. When it is linked, it won't jump to other device. Make sure you link to the right drone when there is more than one drone flying at the same location.

4.6 USING VARIOUS ACCESSORIES

4.6.1 DETACHABLE LANDING GEAR

Take out the carbon fiber landing gears from the suitcase, insert them into the aluminum joint part under the arms.

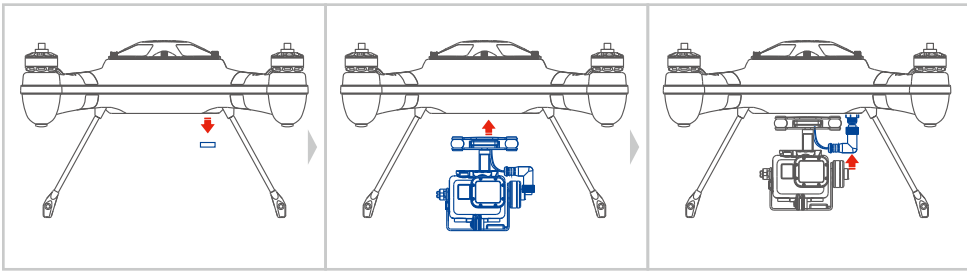


Module Installation Location

Try to install the parts according to the proved locations. But some senior pilots can change the location, like putting the GPS outside etc.

4.6.2 WATERPROOF GIMBAL INSTALLATION

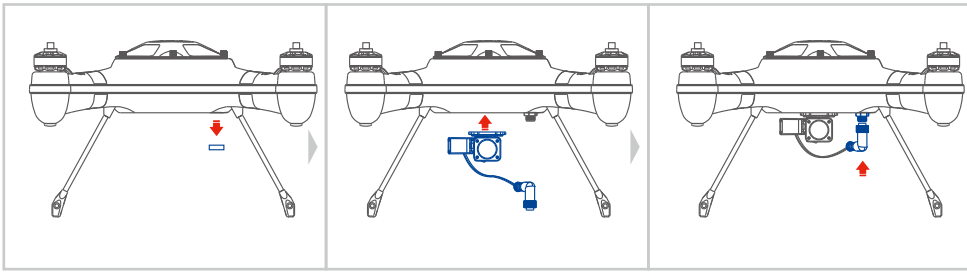
1. Screw out the waterproof screw nut.
2. Mount the gimbal under the drone, choose the right position, then fix it with two screws.
3. Plug the waterproof plug to the corresponding socket and fasten it.
4. Open the divebox on the gimbal, plug the usb plug to the camera usb port, fit the camera into the case. (Note: 1. please sort out the cable inside the divebox; 2. try to choose the right mode before flying)



4.6.3 PAYLOAD RELEASE INSTALLATION

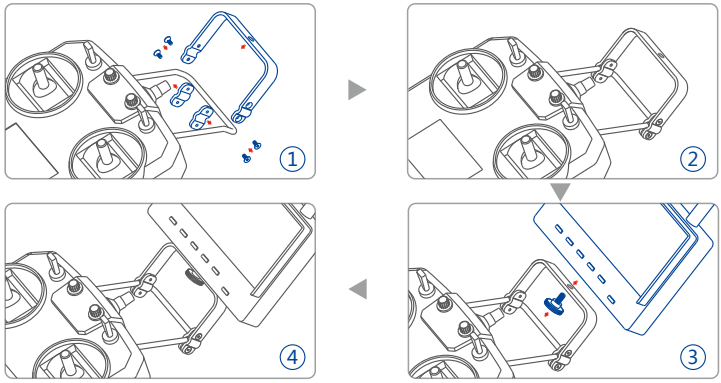
1. Screw out the waterproof screw nut.

2. Mount the payload release to the right position and fix it with screw.



4.6.4 FPV SCREEN MOUNTING

Find out the mounting bracket bag from the suitcase, assemble the mount and fix the FPV screen to the controller handle bar according to below chart.



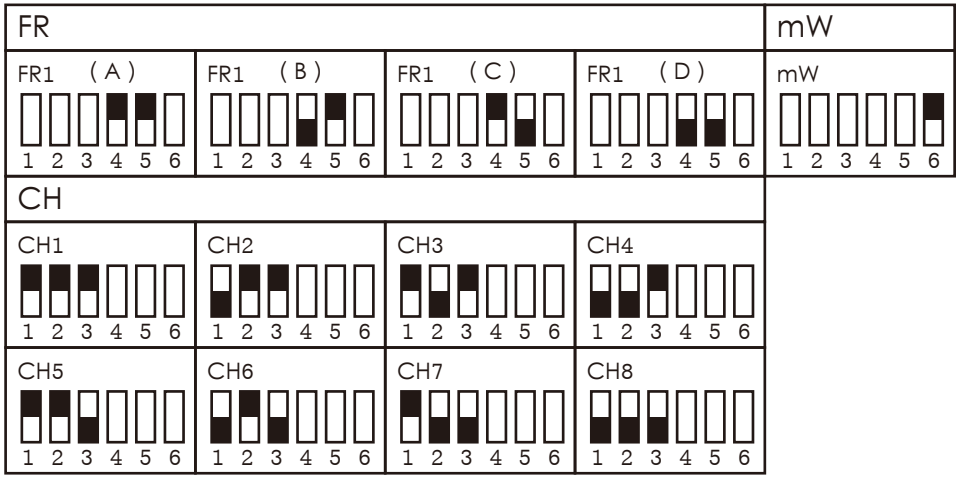
4.6.5 VIDEO TRANSMITTION CHANNEL SELECTION

1. Plug the VTX power cord into a 12V Out socket inside the drone.

2. Power on the drone and switch on the FPV screen.

3. Choose a channel by flipping switches on VTX, there are totally 32channel available for the VTX.

4. See below channel selection sketch map, "4, 5" represent Frequency Range, "1,2,3" represent channel. "6" represent power (Up –> High / Down –> Low), for European customer, need to use low power.



4.6.6 PAIRING A CHANNEL FOR FPV SCREEN

1. Long press power button " ⏻ " 5s to turn on the monitor;

2. Long press " 🔍 " to enter into 'AUTO Searching', the monitor will search for corresponding frequency automatically. Press " 🔍 " once more to look for better resolution if fail to get the clear image the first time.

3. Manual setting is available while the AUTO Searching doesn't work well.

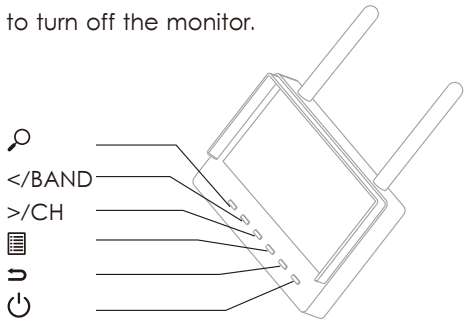
Press ">/CH(Volume up)" to show the frequency details in the left-upper corner of dispaly. Press ">/BAND(Volume down)" to select frequency among "A-B-E-F", Press ">/CH" to select channel among "CH1~CH8".

Note: The frequency diagram has been silk-printed on the video transmitter. Thereinto, the frequency 'E'& 'F' on monitor is proportional to the FR3(C) & FR4(D) on the Video transmitter.

4. Press" " to open the Menu, settings can be realized by button" >/CH " " >/BAND " " " "

5. " " is available in switching between different video input, usually it will show up 'RF' and 'VIDEO', choose 'RF' to enjoy the FPV flight.

6. Long Press " " 3s to turn off the monitor.



Important Note:

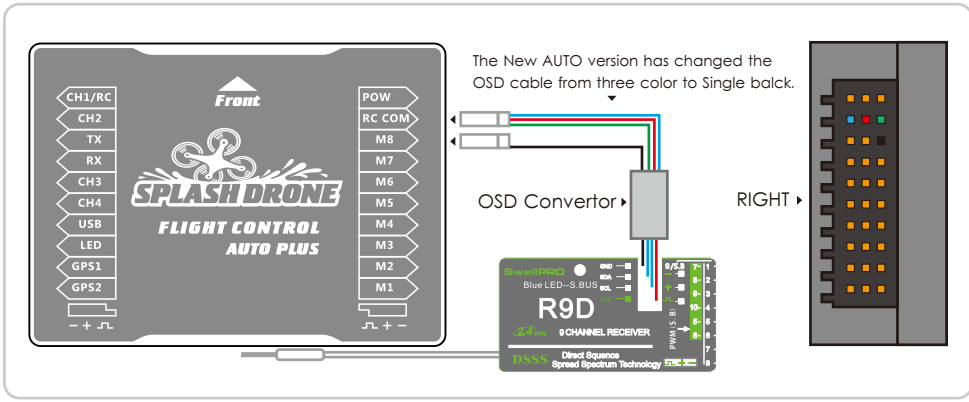
1. For waterproof design reasons, the VTX antenna was placed inside the drone. According to our tests, the default effective range for the VTX is between 600–1000 meters.

2. The FPV screen antennas can be upgraded to reach better quality and/or distance if necessary.

3. Do your own modification by installing the VTX antenna outside the drone (under) to reach longer range.

4.6.7 FLIGHT WITH OSD ON CONTROLLER

Please refer to below wiring configuration of OSD data transmission:



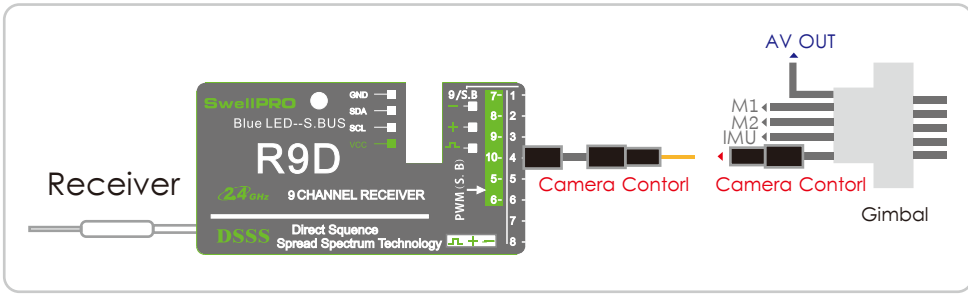
Remark: The cable with 3 colors shall go into 'RC COM' terminal in Flight controller, the 3 pin Cable with Black wire goes into the ground terminal next to 'COM', saying 'M8'. The other end with 4 pins white cable goes into the socket of OSD converter that is pasted on the Receiver.

4.6.8 ZERO CAMERA REMOTE CONTROL

1. When a ZERO camera is fit in the splash drone waterproof gimbal, the ZERO cameracan be controlled by the remote controller to take picture or shoot video. (Note: this function isn't available for GoPro Hero3/4).

2.Installation guide:

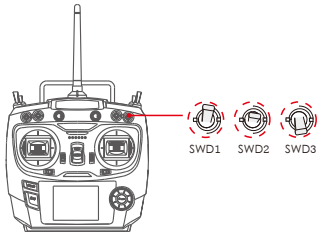
Connect the USB port with the ZERO camera, fit the camera into the gimbal dive box, connect the camera control line to Channel 10 of receiver box. (See below connection diagram)



3. Function Illustration:

Flip SWD to SWD2, camera stays at standby mode;Flip SWD to SWD1, camera take single picture(Note: Series-shooting and Time-lapse photos are applicable by selecting the relative mode in camera setting menu); Flip SWD to SWD3, camera start video recording.

Attention: Please DON'T flip the SWD switch too fast, 1s' staying time (AT LEAST) is appropriate for every gear.

Camera Mode switch (SWD1, SWD2, SWD3)		
	SWD1	Photo
	SWD2	Preview
	SWD3	Video

5. SPECIFICATIONS

Drone & Battery & Radio Controller		
Splash Drone	Fullset Weight	2300g
	Hovering precision	± 0.2 m
	Max Yaw Angular Velocity	25°
	Max pitch Tilting Angle	25°
	Max Ascending/descending Velocity	4m/s
	Max flying speed	Real test 21m/s
	Axis Diameter	450mm
	Flight Time(without payload)	20 mins (5200 mAh)
	Flight Time(Full Set)	15 mins (5200 mAh)
	Max Take-off Weight	3000g
	Temperature	-10C°~ 40C°
Battery	Type and Capacity	4S 14.8V 5200mAh Lipo battery
	Charging Temperature	-10C°~ 40C°
2.4GHz Radio controller	Net Weight	630g
	Operation Frequency	2405 ~ 2475HMZ
	Radio Range	1.0 KM
	Receiver sensitivity (1%PER)	-105dbm
	Working current	120 mA
	battery	7.4V-11.1V
	Channel	10 channels

6. FREQUENTLY ASKED QUESTIONS

Q1: Are there any operational tips during flying the splash drone?

A:1) It's best to execute calibrations (Accelerometer & Compass) outdoor without propellers. Please be sure to stay away from the power supply, magnetic metal objects and emission resource during calibration. DO remember to remove the propellers when calibrate Splash Drone indoor.

2) Once accidents happen out of sudden, such as the drone fall down to the ground or hang on trees, roof and collision to other obstacles, pilot should lock the motors immediately to prevent further damages.

3) If the drone is out of control or radio signal is irresponsible (Delayed signal command or magnetic–field interference) under GPS mode, please switch to the ATTI mode to bring it back manually.

4) Highlights in Video shooting: Always pay attention to the FPV screen and adjust the gimbal angel in real time to avoid capturing the landing gear and arm, 1080P/60 fps will make the video more fluent to avoid the jelly effect.

Q2: What should be done when the splash drone can't be armed?

A:

1.Fail to unlock the motors always consists in the following reasons:

1). The radio controller can't bind properly with the R9D receiver.

2). The setting in the radio controller might be changed deliberately;

3). Aircraft calibration failed;

2. Please follow the checklist once fail to start up motors.

1). Check if the radio controller has been bound with the receiver. Put the aircraft on the horizontal place and power on the drone, the aircraft will finish self–checking automatically after a long beep sound. Then please check whether there is the 'Signal

umbrella' showed on the top center of the screen. If there is signal umbrella and strength display, that indicates the binding procedure between radio and receiver is successful.

2). Check if the setting of radio controller has been changed. Turn on the radio controller and check the main interface, check whether the scale of the sub-trim fine tuning is at normal '0' position. And switch the SWB & SWC back and forth to check whether the flight modes are exactly corresponding to every single flip.

3). Check the indicator inside of the receiver. Usually, The indicator is solid red and solid green during flight operations.

3. If any abnormalities occur, Please follow the guides to implement well-directed operations.

1). Reset Radio controller: Turn on the radio controller, adjust the 4 sub-trim switches around the joysticks to change the value of fine-tuning to the '0' position.

2). Restore the radio controller to ex-factory settings if necessary, here are the steps:

a) Long press "Mode" button for 1 second to enter into the [BASIC MENU], slide the right roller switch to select the "MODEL TYPE", short press "Push" button to access the main interface of [MODEL TYPE];

b) Slide the roller to select "RESET: Execute", long press "Push" button for 1 second, the system pops up an notice "Are you sure?", then short press "Push" button to confirm, it will automatically change into remind "Please wait..."

c) The radio controller finishes the factory setting after the continuous "beep" sound and ends up with a long "beep" sound.

3). Please refer to below video link to check out the binding procedure between Splash Drone radio controller and its receiver.

Youtube: https://youtu.be/uOzK_DMJNkA

4). Disconnect the battery and switch off the radio controller, try to unlock the drone while other switches are in their defaulted position.

Notice: Normally, if the Splash drone is calibrated successfully, it's available to unlock under ATTI mode no matter indoor or outdoor. Good GPS signal is a must when unlocking the drone outdoors under the GPS mode, the value of satellites should reach at least 9.

Q3: Where can I get the manual?

A: The user manual is available for downloading at www.swellpro.com, AUTO and Fisherman version shares the same manual.

Q4: What's the effective range of the radio controller?

A: Practical test indicates the max controllable range is up to 1.0KM; the actual distance might be different depending on flight environment.

Q5: Is there any way to fly back when the drone is out of visible area?

A: Yes, if the drone have good GPS signal, just flip SWB to Return–Home position. Once the drone returns back to visible sight, switch to GPS or ATTI mode to take over flight.

Q6: Is it a truly full waterproof drone with the naked motors?

A: Yes, the whole drone is waterproof design. All the motors are watertight treated. It is no problem to fly in rain, snow, and water environments.

Q7: If sand goes into the motors, what should I do?

A: Stop flying the drone; try to turn the motor slowly to see if it turns smoothly as usual. Put the motor under water and try to shake the sand off from the motors. You can also use brush to clean the sand.

Q8: Why the drone can't fly up to 15minutes?

A: With our brand new 5200mAh battery, the drone can fly up to 20mins with empty loading. 15mins with full set including the camera and gimbal until it start descending automatically. The flight time will decrease when the battery is frequently used or damaged.

Q9: Is it available to change radio controller to be right throttle?

A: Yes, please implement the settings according to below steps:

1. Switch on radio controller, long press "Mode" button for 2~3seconds to enter into [BASIC MENU] interface.

2. Choose the "PARAMETER" item by short press the center location of right switch "Push", then enter into [PARAMETER] interface.

3. Choose the "STK–MODE" item by sliding the roller switch;

4. Short press the "Push" button to revise the mode from 1.2.3.4 by rotating the roller switch.

5. Confirm the mode "1" by Short press the " Push" button again, then press "End" to finish the setting.

Q10: Can I use the WIFI on my camera when the drone is flying?

A: No, you can't. Because WIFI works basing on 2.4GHz signal as well, it might interfere the radio signal in the same frequency that might make the drone out of control.

Q11: Why does the drone start drifting during normal flight?

A: The accelerometer may suffer a sudden/heavy shake; Please execute the Accelerometer Calibration to correct it.

Q12: Why is the drone out of control suddenly during normal flight?

A: Probably, the compass suffers magnetic interference suddenly. Pls switch to ATTI mode to take over the flight and bring it back in your vision. Then please execute the compass calibration, and take off once again.

Q13: How long is the charging time for battery?

A: Around 1 hour.

Q14: What's the root cause of poor satellite under GPS mode?

A: 1. Please make sure there is no shelter from buildings & metal objects, advise to fly in open air;

2. Please check whether there is anything sheltering on the top of GPS antenna.

Q15: Does the alarm "DI DI DI" sounds along with vibration from radio controller indicate functional abnormality?

A: No, this is the low-battery warning from radio controller, just charge or replace a new battery.

Q16: How to adjust the Waterproof Gimbal when it's not in horizontal location?

A: Need to calibrate the Gimbal, detailed procedure please refer to Instruction of Waterproof Gimbal>.

Q17: Why does the drone can't enter into Accelerometer / Compass calibration sometimes?

A: The motion of joysticks is not linear with the program in the radio controller; please try to calibrate the radio controller by referring to 4.3.2 in the manual.

Q18: How to bind the radio controller to its receiver (R9D) module?

A: 1. Switch on the remote controller; check if there is a signal-umbrella that indicates the signal strength in the top middle of the screen;

2. Power on the drone and take out the R9D receiver module. There are a blue light and a red light blinking. Red light is the power indicator; blue light means the receiver is working under S-BUS mode, the splash drone works under SBUS mode.

3. Use a sharp PIN, long-press the button beside the indicator. When the blue light start flashing, the binding process begins. When the flash stops, binding is successful.

4. Once the signal-umbrella shows up again, the binding procedure is finished.

Q19: Why my FPV video signal can't reach even 1000meter?

A: The VTX is build inside the drone for waterproof reason; the real test range in ideal wireless environment can reach up to 1KM. But it might decrease depending on different environment, and different FPV screen (or FPV goggle) might also have different range as well.

Q20: Do I need to use fresh water to wash the drone after flying in salty water?

A: yes, this is always recommended to do. Please DO wash the Motors, Gimbal, and payload release mechanism by pure water.

Q21: Why my drone starts flight like " toilet bowl" effect?

A: The compass might be interfered, please execute the compass calibration again. Or check if the local environment has strong magnetic interference, and change another area to fly the drone.

Q22: What are the main facilities available with the smart ground station?

A: The smart ground station provides an easy & portable platform to control the Splash Drone by mobile phone. Many smart flight modes can be realized in the Swellpro APP, including Follow–me, mission planning (Drop waypoints), Point–To–Fly.

Q23: How does the payload release mechanism help me to complete some special tasks?

A: The payload release mechanism is triggered directly by radio controller, so you can delivery & drop sth. up to 1KG just by a simple flip on switch SWA. It's wildly used in fishing, rescue, ocean research, coast guard & law enforcement, and etc.

Q24: What should I do when the battery is approaching to out of power?

A: Splash Drone is default programmed with 2 levels of low battery alarm. If the 1st level 14.8V is activated, the indicator on the power distribution board will blink triple times continuously. Once the battery is approaching to the 2nd alarm, saying 14.4V, the indicator will flash quickly, and the 4 navigation LEDs under each arm will blink as well. Meanwhile, the radio controller will vibrate rashly and emit "beep–beep–..." sound to remind you of returning the drone. There remains 1~2mins to take over flight to bring it back. If the drone is still in the air, then it will descend slowly basing on the location where the 2nd alarm activated.

Q25: When the drone is out of radio range, what will happen?

A: The Return-Home function will be activated once the drone is out of the effective radio range. When it flies back to visible distance, you can regain control on the drone by flip the SWB once to quit the Return-Home mode.

Q26: Is the Splash Drone available to set the moving boat as its home point to execute Return-Home function?

A: No. The Return-Home function in Splash Drone is basing on the GPS coordinate, it only records the GPS data of the taking-off location as the home point to execute return to home.

Q27: When the drone land on flat ground, why the motor won't stop spinning immediately once the throttle is at 0% position?

A: Actually, It's the consideration of safety issue. After the drone land smoothly and the throttle is at 0% position, it's required to keep it at 0% for 5s until the motors stop spinning, and then the drone was locked automatically.

Q28: Is the Return-Home available when the drone is out of control suddenly?

A: No, it isn't available. Because it's the strong magnetic field interference that causes the lose control. It's advised to switch the flight mode to ATTI to take over flight, and then manually bring the Splash Drone back to visual sight.

Q29: What are the factors leading to shorten the flight time?

A: 1. The battery is not fully charged; 2. Add on loading weight; 3. Battery is aging after long time usage.

Q30: Can I disassemble the Splash Drone for some modifications?

A: Any modification & disassembly on Splash Drone is strictly forbidden. Swellpro is exempt from any liability that caused by private modification & deliberate operations, especially the leakage issue & component burnt after disassembling the drone!

