

Agriculture Drone User manual

DF-T4

SINOCHIP

1. Disclaimer

Users are advised to read this manual carefully before using this product. By using this product, user are considered to acknowledge and accept all contents of this statement. This product is not suitable for users under age 18.

Thank you for purchasing from SINOCHIP. This product is a high efficiency agricultural spraying drone. Please strictly follow operation methods of this manual. It is highly recommended NOT to turn on the main power while installing propellers to avoid accidents. Please use it only when you are away from people, dangerous and fragile goods. SINOCHIP will not bear the liability if any personal injury and property damage caused directly or indirectly by the following reasons:

- (1).Start to use the product without carefully reading this manual in advance.
- (2).Operate the product in drinking, drug abusing, fatigue, bad physical or mental situation.
- (3).Hurt people on purpose with the product.
- (4).Unauthorized user modification on the product and cause damage.
- (5).Damages caused by operation errors or subjective judgement mistakes.
- (6).Damage caused by abnormal flight because of natural device abrasion, circuit aging, etc.
- (7).Operate the product in situations that knowing device is in no-fit and abnormal status.
- (8).Operate the product in extreme bad weather like typhoons, hail, snow, etc.
- (9).Operate the product in area with interference of magnetic, radio, or no-fly zone.
- (10).Operate the product in low visibility or when sight is blocked.
- (11).Other losses that are not within the scope of SINOCHIP liabilities.

Intellectual property

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2.Product Introduction

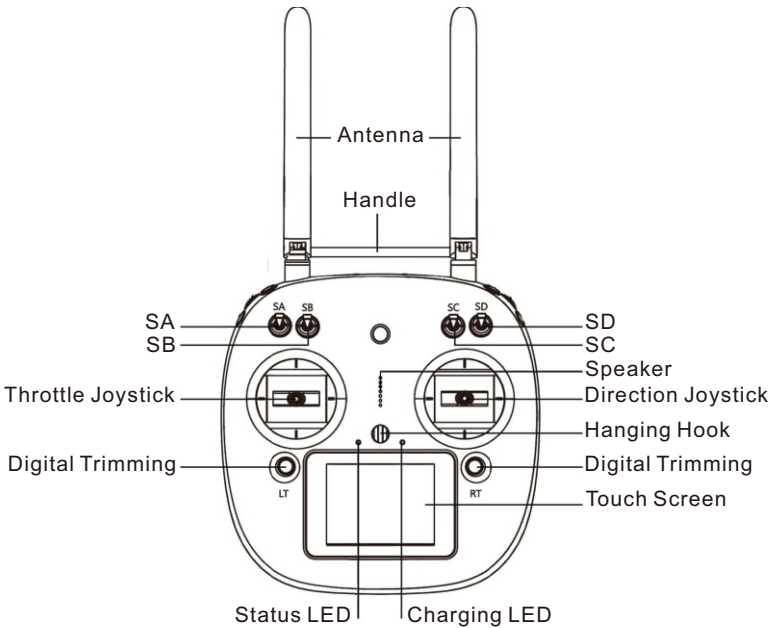
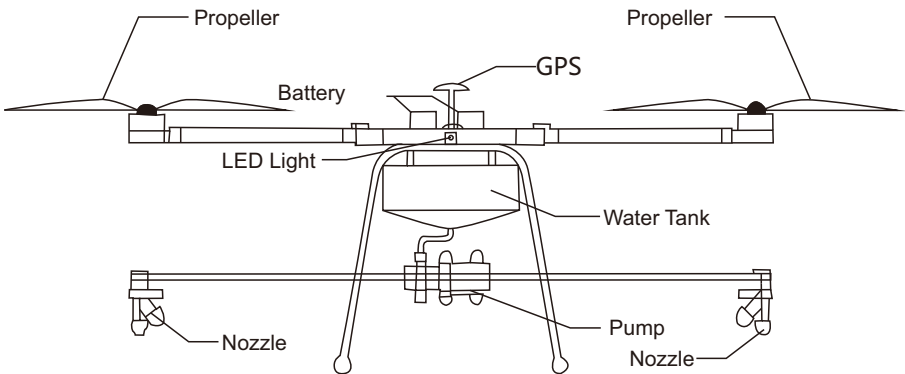
SINOCHIP T series drones are considered high quality and perfect Performance aircraft in the market. Product functions are listed as below :

- Semi-automatic Operation Mode
- A→B Point Operation Mode
- Support Radar Wave Altitude Sensor
- Dose Detection Function
- GPS Record Spraying Breakpoint
- Low Voltage Protection
- Auto-return in Out-Of-Control Situation

3.LED Symbol Description

Symbol	description
 (N)	means LED light flash in color  for "N"times.
{   }(N)	means LED light flash in color   for "N"times.
 (∞)	means LED light flash in color  continuously.
 (N)	means LED light keep on in color  for"N"seconds.

4. Introduction of Drone and Remote Control



! The remote control is default American handle mode. Above marked switches are needed in the flight, others without remark are not necessary during flight.

5. Remote Control Switch Functions

	SD	SC	SB	SA
	Gesture Mode	Standby	Standby	Record Point A
	Spray Mode	Spray on	Standby	Standby
	GPS Mode	Return	A→B Mode	Record Point B

6. Introduction Of Joysticks

Remote control	Drone	Description
		1. Push throttle joystick up, drone ascends. 2. Pull throttle joystick down, drone descends. 3. When drone comes to required altitude, do not move the joystick, the drone will hover at the current height. Push throttle Joystick slowly to avoid aircraft ascend or descend too quick
		1. Pull throttle joystick left, drone rolls left. 2. Pull throttle joystick right, drone rolls right.
		1. Push direction joystick up, drone fly forward. 2. Pull direction joystick down, drone fly backward.
		1. Pull direction joystick left, drone fly left side. 2. Pull direction joystick right, drone fly right side.

7. Drone Calibration Instruction

(1). Electric Speed Control(ESC) Calibration

The drone has been calibrated when it leaves factory, but if the motor speed is obviously inconsistent during the later flight, please calibrate the drone again as follows:

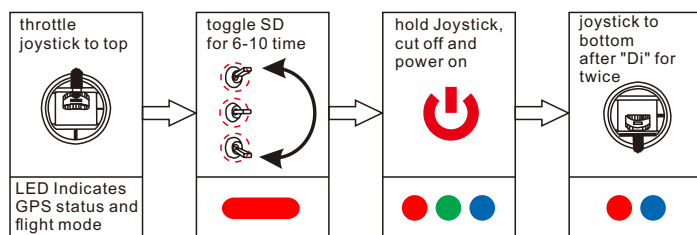
Step1:Power on the drone and push throttle joystick to top, then LED indicates the current GPS status and flight mode

Step2:Toggle SD quickly for 6-10 times from top to bottom until LED light up in RED.

Step3:Hold the throttle joystick, plug drone power off and then power on, the LED will flash once in turn of RED, GREEN and BLUE.

Step4:After power on for about 0.5 seconds, the drone will "DiDi" sound twice. please pull the throttle joystick to bottom in 2 seconds, and drone will "DiDi" sound twice again. LED will flash in RED and Blue normal status.

Operation diagram :



(2).Horizon Level Calibration

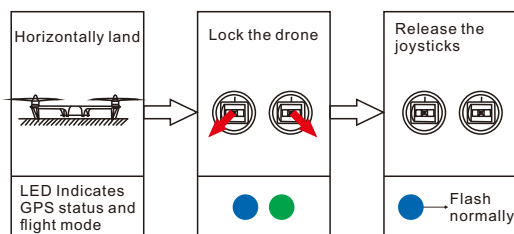
The drone has been calibrated when it leaves factory, if it tilts seriously towards certain direction during later flight, please calibrate the drone again as follows:

Step1 : Put the drone on horizontal ground, make sure it doesn't shake.

Step2 : Lock the drone by holding the joysticks like second diagram for 10 seconds until LED flash alternately in BLUE and GREEN.

Step3 : Release the joysticks, LED will flash in BLUE about 10 seconds later, and then LED will flash normally after 15 seconds.

Operation diagram :



(3).Compass Calibration

Compass calibration is required when the aircraft takes off first time or changes location (50KM from the last flight position). The calibration method is as follows:

Step1 : pull throttle joystick to bottom.

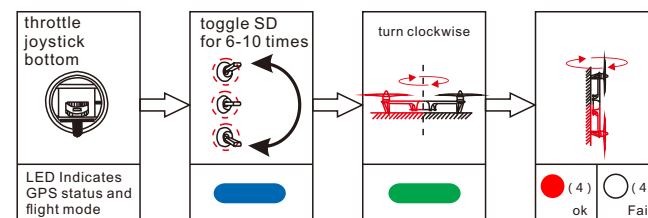
Step2 : Toggle SD quickly for 6-10 times from top to bottom until LED light up in BLUE.

Step3 : Place the drone head facing forward horizontally, slowly turn the drone clockwise at least one round until the LED green light is on

Step4 : Place the drone head down, fuselage vertical, and then slowly turn clockwise at least one round until the LED light up in WHITE for 4 seconds.

If the LED light up in RED for 4 seconds, indicating calibration failure, repeat steps 2-4 until succeed.

Operation diagram :



8. Flight Mode Introduction

(1).Gesture mode

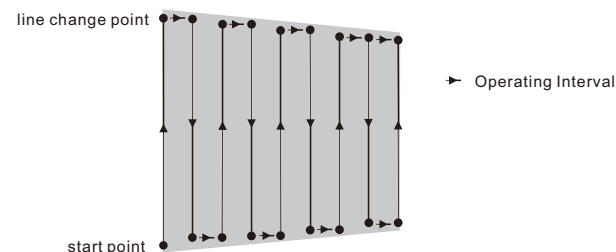
In gesture mode, without too much data to calculate, the drone respond fast but cannot Hover at fixed-point, this mode is suitable for skilled pilot.

(2).GPS mode

With good GPS signal, the drone can hover at fixed-point in GPS mode.

(3).Spray mode

Spray mode is based on GPS mode, only with good gps signal, user can enter this mode. operate method as follows:



Step1 : Fly the drone to the start point, switch SD to Spray Mode and SC to Spray On then push or pull the direction joystick over 15% from the middle position, the drone will spray in uniform speed and fixed height.

Step2 : When the drone fly to a line change point, release direction joystick back to middle position, now the drone will hover. pull direction joystick left or right and then middle, it will fly to the start point of next line.

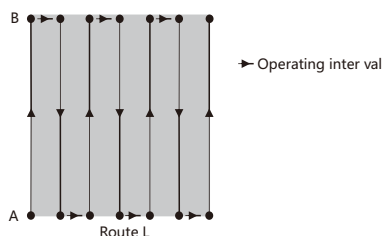
Step3 : Repeat step 1-2 to finish the spray work .

During spraying, the height can be adjusted accordingly, the drone will fly at fixed height when throttle joystick stay at the middle position.

Spray flow rate associated with the flight speed of the drone, the greater the speed the greater the flow; it will stop spraying when speed is less than 0.5 m/s.

(4). A-B Point Mode

A-B point mode is a fast automatic route planning mode, users need to confirm the GPS signal is good. methods are as follows:



Step1: Fly the drone to start point A, SA switches from STANDBY to "RECORD POINT A" position, then the drone will record point A gps coordinate, LED will flash 10 times in RED ● (10)

Step2 : Fly the drone to Point B position, SA switches to "RECORD POINT B" position, then the drone will record point B gps coordinate, LED will flash 10 times in GREEN ● (10)

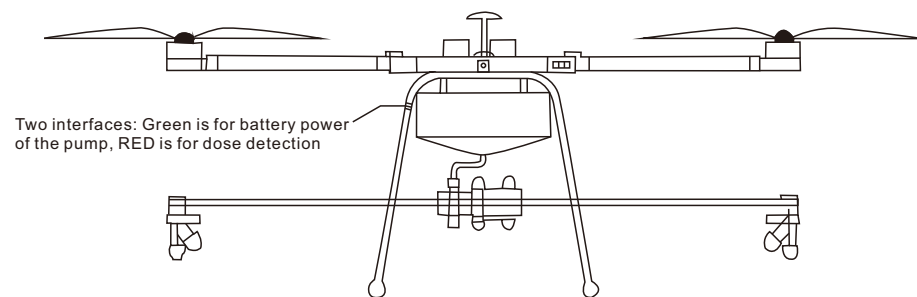
Step3 : Switch SB to A-B MODE, LED flash 8 times in BLUE (8), ● pull direction joystick left or right and then middle, it will fly to the start point of next line and then fly in route L and spray in uniform speed and fixed height.

Step4 : Quit A-B MODE when finish spraying, the drone will hover.

- Only in spray mode or GPS mode can record A and B point.
- A-B mode is not available when the drone is on ground.
- During operation, the LED flashes 3 times in RED ● (3) when flying to point A, and then flashes 3 times in GREEN ● (3) when flying to point B.
- Erase A and B point: 1) Exit A-B mode, re-record the A and B point; 2) Toggle SA up and down 8 times and LED will flash 10 times in YELLOW (10); 3) A and B point will be erased when erase the pesticide break point (refer to next page); 4) If pesticide breaking point has not been recorded, A and B point will be erased automatically when the drone land and auto locked.

9. Restart At Pesticide Breaking Point

The drone has dose detection function, when the dose is insufficient, the drone will record breaking point, and will automatically fly to the breaking point to restart spraying after reloading pesticide. Dose sensor switch interface is as the following figure, you can disconnect it and cancel the dose detection function.



Step1 : When low dose is detected, the aircraft will decelerate, automatically rise 1.5 meters and hover (Gesture / GPS mode will not rise), record the current position, LED flash 4 times in light blue ● (4), in the process of rising, you can switch SD to stop rising, the drone still records pesticide breaking point.

Step2 : When finish rising, the drone will hover, you can manually operate the drone to return or press the auto return switch (if HOME position recorded).

Step3 : After reloading, the drone will automatically rise to the 2.5 meter height and fly back to break point, and then drop to the operating height and restart spraying (you can pull throttle joystick to stop dropping).

- If the drone record the breaking point, pull the throttle up to 70% and then back to middle when it is rising, and then it will automatically fly back to the breaking point and restart spraying.
- Spray mode, A-B mode, gesture mode and GPS mode all allow record breaking POINT, but automatic flight back to the point is NOT available in gesture mode.
- Toggle SD 4 times can erase the current breaking point. Also it will clear automatically After drone landing and locking for 15 minutes.

10. Return Command

Only when the GPS signal is good and return landing position has been record before flight starts (LED will flash 10 times in BLUE if recorded ● (10)), can the drone receive return command, method as follows:

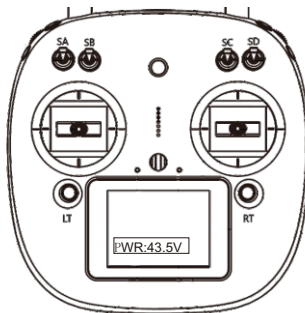
- Step1** : Switch SC to RETURN position, the drone will automatically rise 1.5 meters and hover, (will not rise in gesture mode or GPS mode), and record the breaking point.
- Step2** : Toggle SC once and back to RETURN position, the drone will rise up 2 meters and then return.
- Step3** : Restart the drone (refer to method of restart at pesticide breaking point). the drone will automatically rise to the 2.5meter height and fly back to break point, and then drop to the operating height. (user can pull throttle joystick to stop dropping)

11 Out of Control Protection

If remote control signal lost, LED will keep flash in YELLOW and BLUE ● ● (∞), after hovering for 5 seconds, the drone will return to the take-off position, land and lock . if the signal recovered during return flight, it will stop returning and switch back to RC current SD mode.

12. Low Voltage Alarm

During flight, battery voltage PWR will be displayed real-time on remote control screen (display position as below configure). When drone battery voltage is lower than 43.5V, remote control will give voice and vibration alarm. The drone can last about 2 minutes at this time, please land the drone in time and replace batteries.

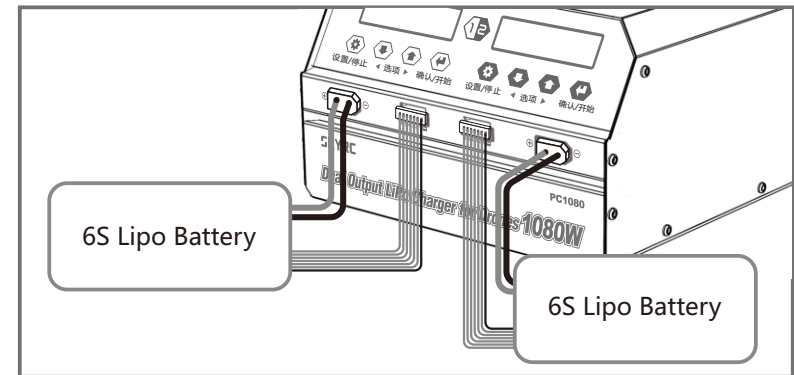


13.Battery Charge

Battery Charging: User shall charge battery when voltage is low. (input power AC100-240V)

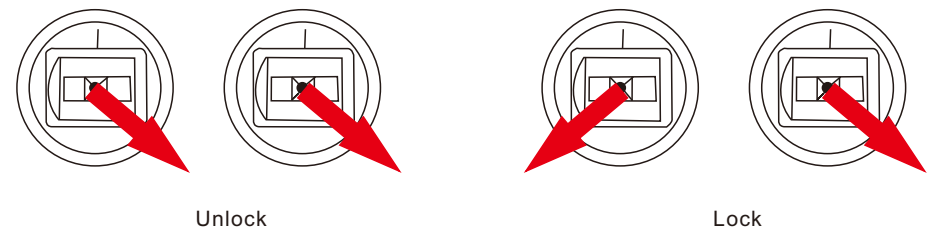
Connect battery like below configure, connect power cable, press "start" 2 seconds to charge. Once charging finished, it will show "charging finished" on screen, full voltage should be around 25.2V.

If the batteries are not used for more than 10 days, user shall use "charge for storage" mode to keep battery in a storage voltage.



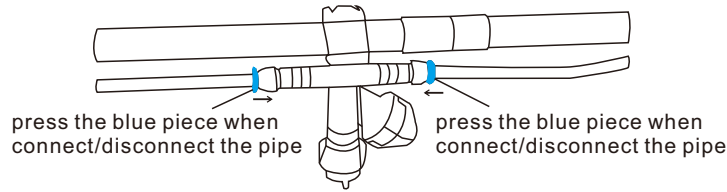
14. Lock and Unlock the Drone

Only one way available for locking and unlocking the drone. show as follows: pull the throttle joystick for at least 3 seconds after the drone land, it will lock automatically. and rotors will start one by one after unlocking.



15. Others

- (1). **Propellers:** install the propeller correctly according to the marks CCW/CW, put on the gasket and then tighten with a screw.
- (2). **Water pipe connection:** tighten the spray rod, clamping to the drone, connect the pipes and then connect the pipes to the pump. as follows:



16. First Flight

- Step1:** turn on the remote control and then power on the drone.
- Step2:** after LED flash (●●)(10), make a compass calibration (please refer to page 6).
- Step3:** after the calibration is complete, install the propellers correctly.
- Step4:** wait for GPS signal search, LED will flash singly turn from RED to GREEN if succeed.
- Step5:** check if the LED flash correctly according to the correct flight mode.
- Step6:** step away from the drone for at least 5 meters, unlock the drone and start flying.
- Please disconnect the dose detection cable or clear the pesticide breaking point before the compass calibration, in case it may record a wrong breaking point because of unloading.
 - Please operate the joysticks slowly.
 - Please keep SA, SB, SC in STANDBY mode before unlocking the drone.

17. LED Indicator Introduction

Normal flight indications: first flash GPS status lights, and then flash flight mode lights			
Content	Flash	Meaning	Remark
GPS status	● (2) (1)	GPS function unavailable	●● (2)GPS signal below level-7 ● (1)GPS signal above level-7 but not good
	●	GPS function available	
flight mode	●	Gesture mode, no pan & tilt command	
	● (2)	Gesture mode with pan & tilt command	
	●	GPS mode, no pan & tilt command	
	● (2)	GPS mode with pan & tilt command	
	●	Auto flight mode	it flashes in any auto flight mode such as auto return and auto spraying.
Special status indications: these flashes take precedence over the normal flight indications.			
Content	Flash	Meaning	Remark
Initialization status	{ ● ● } (10)	Hardware initialization, gyro bias has been corrected	
Sensor status	○ (∞)	IMU or barometer data is abnormal	Reconnect the power to see if it keep in stillness
	{ ● ● } (∞)	compass data is abnormal	Check if magnetic interference and recalibrate the compass
RC status	{ ● ● } (∞)	remote control lose the signal	
Voltage status	● (∞)	low voltage alarm level 1	
	● (∞)	low voltage alarm level 2	
Return position record	● (10)	record the return position	It records once during the first GPS positioning as well as every time the motor is started
location status	● (5)	arrive the specified location	
breaking point tip	● (4)	breaking point exist	
A point record	● (10)	A point recorded	
B point record	● (10)	B point recorded	
A-B route mode	● (8)	A-B route available	
clear AB point	● (10)	AB point cleared	

Caution:

This device complies with Part 15 of the FCC rules and Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

The manufacturer is not responsible for any radio or TV interference caused by unauthorized modifications or change to this equipment. Such modifications or change could void the user's authority to operate the equipment.

This radio transmitter (identify the device by certification number or model number if Category II) has been approved by Industry Canada to operate with the antenna types listed below with the maximum permissible gain indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

The device has been evaluated to meet general RF exposure requirement.

To maintain compliance with FCC's RF exposure guidelines, this equipment should be installed and operated with a minimum distance of 20cm between the radiator and your body.