FOXTECH RHEA 160

User Manual (Pixhawk Version)

V1.0   2023.03

FOXTECH

Description

Disclaimer

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You can also get product usage information or technical support through official customer service. Due to different production batches, the appearance or function parameters are slightly different and will not affect the normal use of the product.

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Product Profile

Introduction

RHEA 160 is a very unique hexacopter featuring high pressure molding full carbon fiber body, light weight and super high strength. To keep its super cool natural carbon fiber appearance, we left it unpainted. The 90minutes no-payload super long flight time makes it a perfect platform for mapping, surveillance, logistics and a lot more applications.

RHEA 160 also features wonderful quick-detach arms and landing gear, making it convenient for storage and easy to transport. Also the new landing gear and gimbal mounting point, new wiring method, create a really vast internal space. And the new ESC mounting type, features good heat dissipation, so don't need to worry about heat dissipation problem even working with Tethered Power System.

RHEA 160 is equipped with high efficiency power system, the max take-off weight is 32kg at sea level. The flight time can reach 110 minutes(no payload) with 4x6S 30000mAh li-ion batteries. The light and strong fuselage, big wheelbase and powerful system make RHEA 160 a high efficiency drone with long duration and good loading capacity. It can be widely used in surveillance, inspection, survey and mapping loading with different devices.

By loading FOXTECH zooming camera, and also VDC long range video transmission system, RHEA 160 can be used for long range inspection, the video transmission distance can reach 15km.

GPS on RHEA 160 is installed on a space-saving, easy to transport foldable GPS antenna mount holder, whose unique tube design allows GPS wires to be placed inside the tube to avoid abrasion and fatigue.

When equipped with EH314 4K zoom camera and gimbal, RHEA 160 can be used for AI Recognition; When equipped with EH2000 camera RHEA 160 can be used for inspection which can get high-resolution pictures.

RHEA 160 is also able to load Map-01, Map-02, Map-A7R and 3DM V3 and PPK system for high definition and precision mapping jobs.

Detail

①	GPS	②	Quick-Detach Ring
③	Propulsion System	④	Landing Gear

Specifications

Item Name	RHEA 160
Wheelbase	1600 mm
Frame Weight	3.8 kg(with landing gear)
Take-off Weight	32 kg
Flight Time	110 min(4x 6S 30000 mah)
Battery	4x 6S 30000 mah Li-ion
Working Temperature	-10℃~30℃
Propeller	2995
Motor	T-MOTOR U8 Lite KV85
Max Take-Off Altitude	3000 m
Max Climb Altitude	500 m
Max Speed	14 m/s
Working Voltage	48 V

Mission Planner Basic Operation

Connect To The Mission Planner

Data transmission connection method: usually use USB to connect the data link of the ground station you need to select the corresponding COM port, and set the baud rate on the right side to 115200; while if using WIFI or Bluetooth to connect the data link of the ground station, it is in the device list Select the corresponding type and fill in the IP address to connect. For specific parameters, please refer to your data link instructions first.
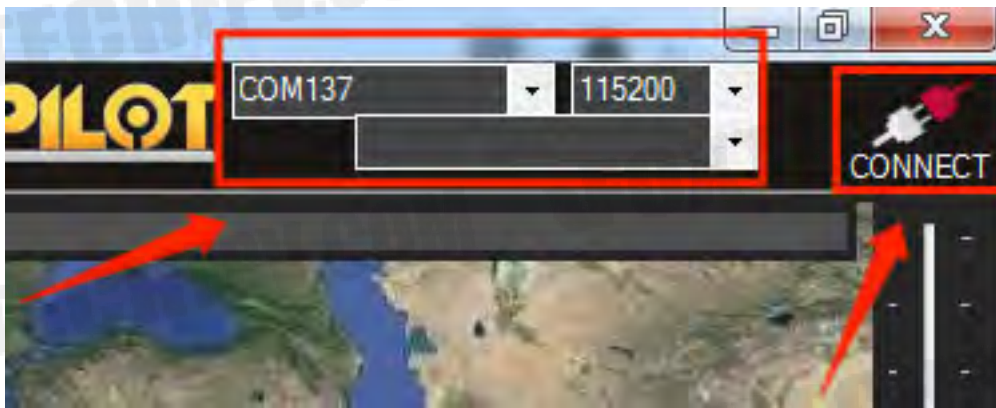
Basic Hardware Calibration

Check the items shown in the upper left section, including RC signal quality, flight mode, battery voltage, GPS status, etc.
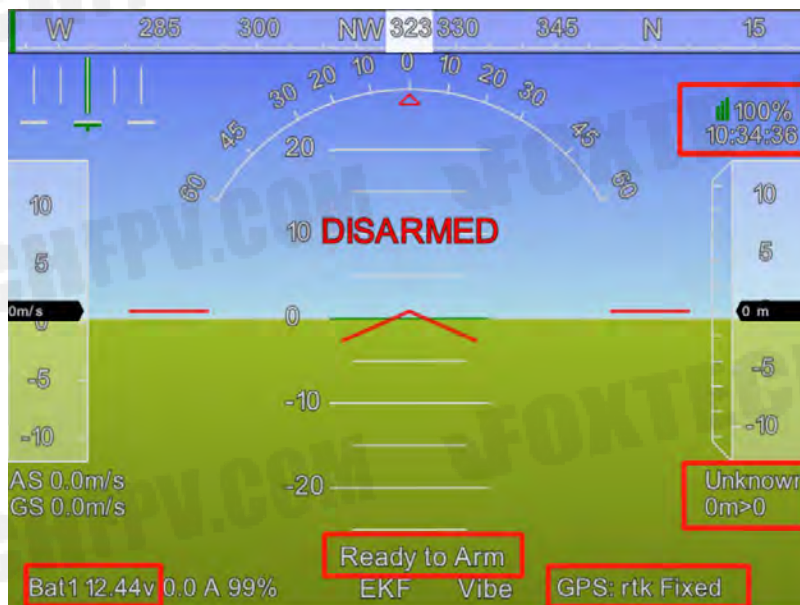
The RC signal quality should be 100%;

The flight mode should agree to the current status of the RC three-position switch;
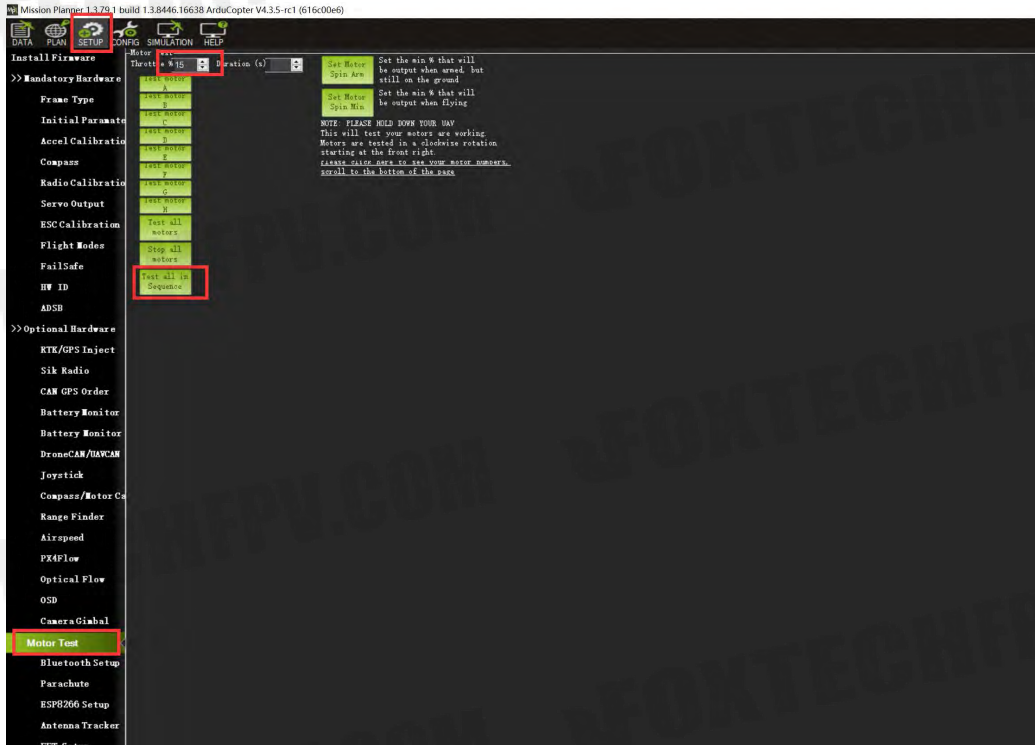
The battery voltage should be above 48 V;

The GPS status should display rtk Fixed or 3D Fix if there is no RTK module onboard;

The Ready to Arm alert should be white if all the items are fine.

Motor Test

Run the motor test under *SETUP>MOTOR TEST*>fill in a number between 15~20 in the throttle box>*Test all in sequence*

Compass Calibration

Run the compass calibration under *SETUP>Mandatory Hardware>Compass*>choose *Relaxed* in Fitness box>Click *Start*
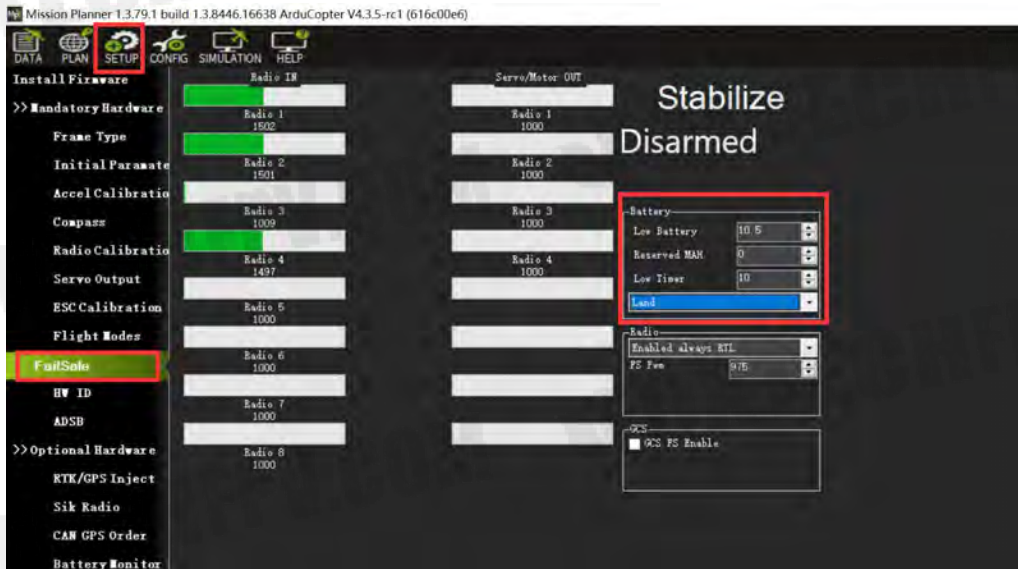
Radio Calibration

Run the radio calibration under *SETUP>Mandatory Hardware>Radio Calibration>Calibration Radio*

FailSafe Setting

Set the fail insurance of the battery under *SETUP>Mandatory Hardware>FailSafe>*Battery.

Route Planning

Click on PLAN in the upper left corner to open the route planning page.
Steps:
① Click on the map on the left area to create a new waypoint with the left mouse button,
and a corresponding waypoint will appear on the right section;
② After adding all the waypoints on the map, and all corresponding waypoints appearing on the
right, set the first waypoint to TAKEOFF, and the last waypoint to RETURN_TO_LAUNCH;
③ Click Write to save the route planning;
④ Click Read to override the old route.
⑤ Choose OK on the pop-up window that says "This will clear your existing points, Continue?"
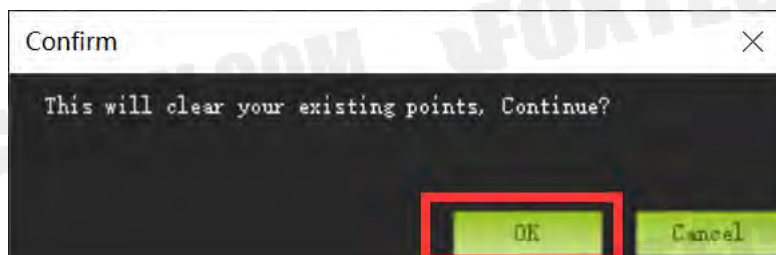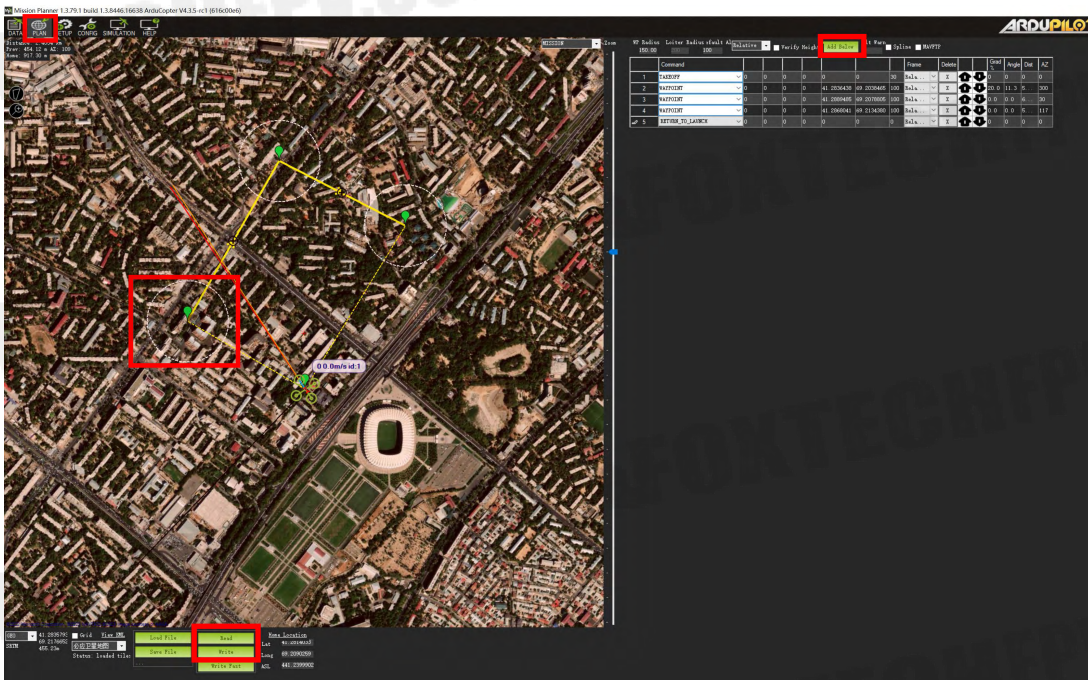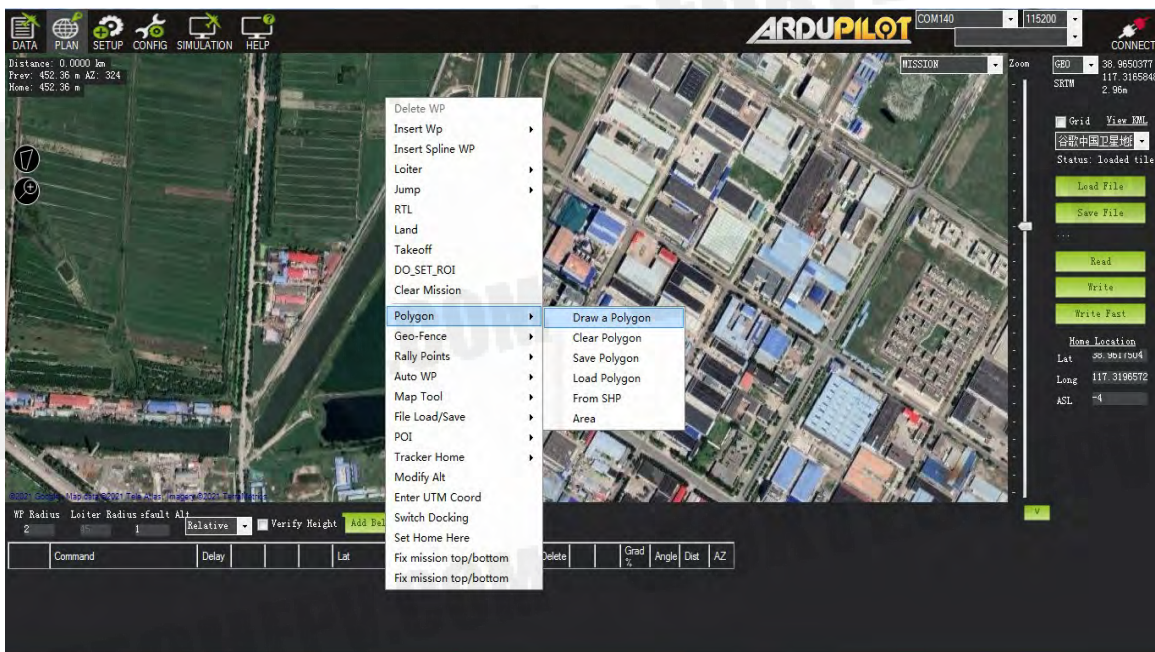
Automatic Mission Planning

Flight planning is one of the most important functions in MP: the average player can use it to plan the simplest flight missions, including height control of each waypoint, stay time, camera trigger, various condition triggers, channel triggers, and even Automatic take-off and landing planning, etc. Industry users can also do surveying and mapping planning and so on.
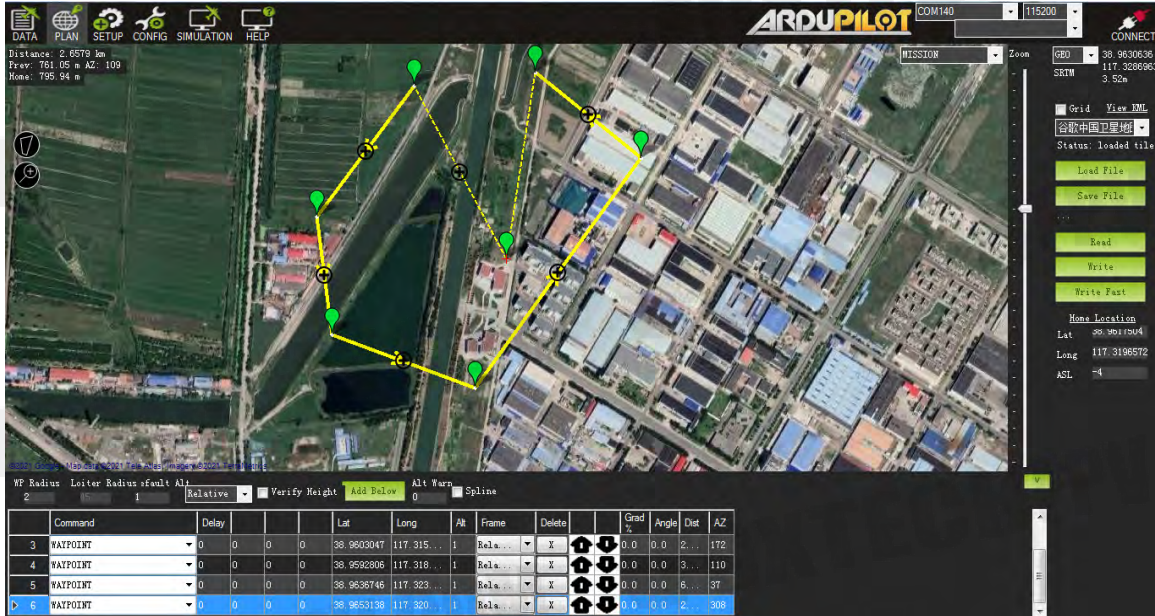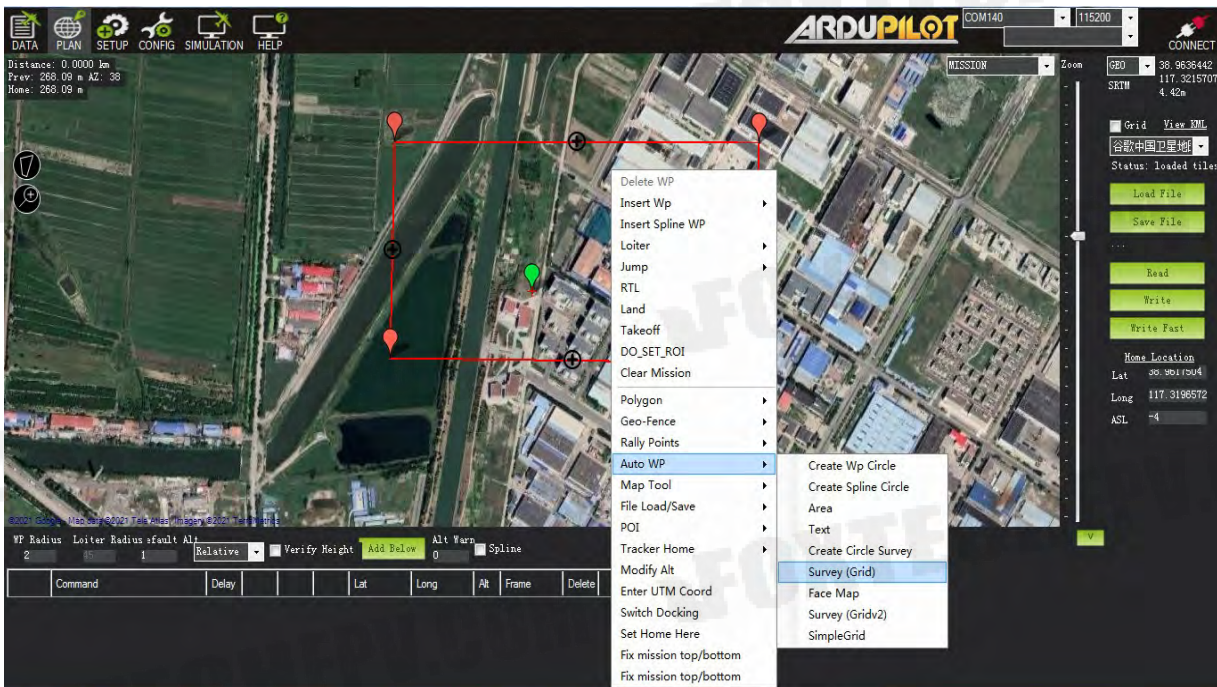

The main explanation here is the mission planning function of the MP ground station, but the waypoint planning concepts of other ground stations are actually very similar.

- In the MP mission planning interface, create a multi-waypoint area

- In the area, click the right mouse button to open the menu and select Automatic Waypoint Survey(Grid)

- The mission planner will display the configuration interface. This interface defines the camera parameters and automatically calculates the shooting distance. DO_SET_CAM_TRIGG_DIST command parameters, you can also set the parameters according to the actual situation.

If you accept these parameters, please click accept, the mission plannaer will generate a series of waypoints covering the designated area, including the take-off point and the landing point. Call DO_SET_CAM_TRIGG_DIST command to set the distance of the camera shutter command, and finally call DO_SET_CAM_TRIGG_DIST again to set the parameter back to 0 and stop taking pictures; note that the parameters of two call are different.

Flight

Flight Environment

1. Do not use the aircraft in adverse weather conditions including rain, snow, fog, and strong wind.

2. Only fly in open areas. Tall buildings and steel structures may affect the accuracy of the GPS signal.

3. Avoid flying near obstacles, crowds, high voltage power lines, trees and water.

4. Avoid flying in areas with high levels of electromagnetism, including mobile phone base stations and radio transmission towers.

5. Aircraft and battery performance is subject to environmental factors such as air density and temperature.

ARM the drone

Before the drone takes off, it must be unlocked. This will power all motors and actuators. Before unlocking, please make sure to test in an empty environment to avoid accidents. Check in detail whether the hardware installation is correct (especially whether the arm is locked in place, the battery compartment cover is tightly locked, whether the landing gear is locked, whether the external load is installed firmly, the direction of the propeller, etc.). After confirming that there is no problem, perform the following steps :

- Turn on your rc transmitte
- Insert the battery into the aircraft. The flight control status light should flash red and blue alternately (self-check process). Do not move the aircraft during the self-check.
- Pre-Arm will run automatically. After a normal self-check, the blue light or green light will flash, indicating that the Pre-arm has no error and can be unlocked. If the yellow light is flashing, please refer to the FAQ summary to eliminate the error.
- Set the correct mode: Set the mode to Stabilize, ATLhold or Loiter (outdoor GPS lock is required). Novices are recommended to use Stabilization or Altitude hold mode.

⚠️ **For this product, press the A button on the bottom of the remote control to enter Althold. mode**

- Unlock the safety switch: Press and hold the unlock safety s itch until the safety LED is always on (flashing means lock and does not output pwm signal, and always on means unlocking and output pwm signal) (the safety switch of this product is disabled, so the user can omit this step)
- Arm the aircraft: There are two ways to unlock the autopilot, which can be unlocked through the ground station or the remote control.

Unlock through the remote control, lower the RC throttle to the lowest position, and the YAW channel to the far right for 2 seconds to unlock it, and then return the YAW channel to the center.

Unlock through the ground station. Under the premise that the autopilot has a link to the ground, there is an action tab at the bottom of the HUD window of the ground station. Click the unlock button inside to unlock.

- ARM Successfully : The propeller will spin up at idle speed to remind that it has been successfully unlocked.
- Take off: raise the throttle to take off, and control the direction according to the attitude (if the novice is not familiar with the control, you can practice the flight simulator first, so as to avoid the explosion of the aircraft and the loss of personnel and property)

⚠️ **If there is no operation within 15 seconds after unlocking, it will be automatically locked. After unlocking, the ideal attitude is too different from the actual attitude it will be automatically locked.(Such as hitting the roll bar sharply or shaking the aircraft with your hands)**

Disarm the drone

Perform the following operations to disarm the drone:

- Check your flight mode switch, set to Stabilize, Alt Hold or Loiter.

- Keep the throttle at the lowest and the direction YAW to the left.

- Unplug the aircraft battery

- Turn off the remote control transmitter

Take-off Precautions

It is best to use the Stabilize mode to take off for the first time. Make sure that the aircraft is flying normally before switching to another mode. The throttle control mode of the stable mode is linear, so the range of throttle control needs to be relatively small.
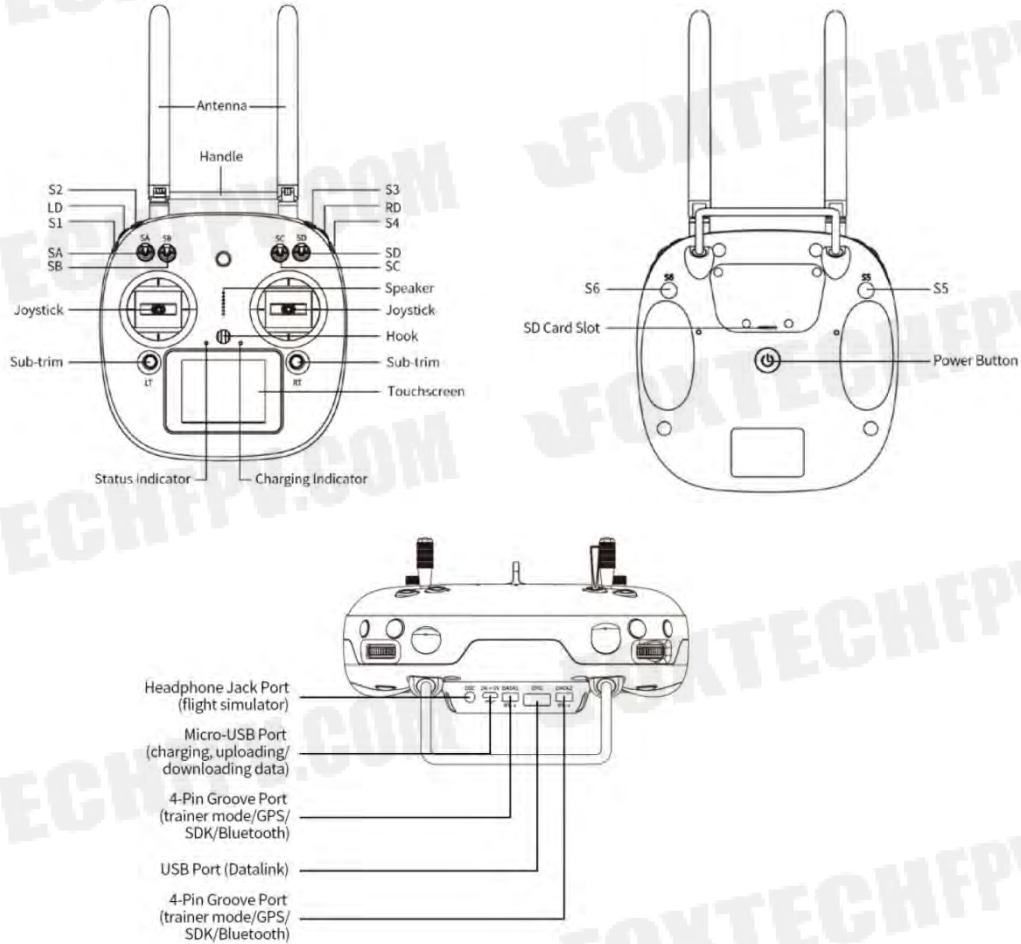
After flying in the stable mode for a period of time, if the altitude stays above 1 m, you can switch to other functional modes such as altitude hold, fixed point, etc. The throttle control logic of altitude hold and fixed point modes is different. There is a dead zone in the neutral position of the throttle to maintain altitude , Push up, the plane goes up, push down, the plane goes down.

⚠️ **Note: Before switching to another function mode, you must first understand the characteristics of the flight mode.**

Appendix

DA16S+ Remote Controller