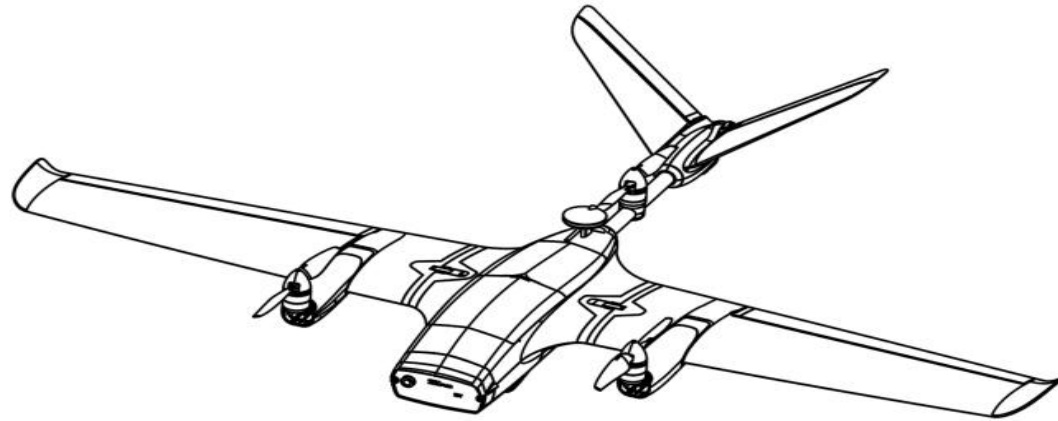


ZMO Pro

Quick Start Guide



WWW.OMPHOBBY.COM

When flying, fly only in "Large Open" areas (Around space better larger than 200m).

Do not fly in "Inclement weather conditions" or "High winds". (Better less than 6m/s)

Do not fly in residential areas and around tall buildings

Compass calibration must be completed when flying in new location and with new remote controller.

When connected to the battery (Battery better with full capacity), pls make sure that the aircraft is on a level ground and remains stationary. After powering on, do not move the aircraft until the self-check of the aircraft system is completed. (After the self-check is completed, you will hear two long beeps of "Didi").

Tips: The battery for ZMO Pro is 5100mAh 4S HV. Pls charge it with chargers supporting "LiHV" battery.

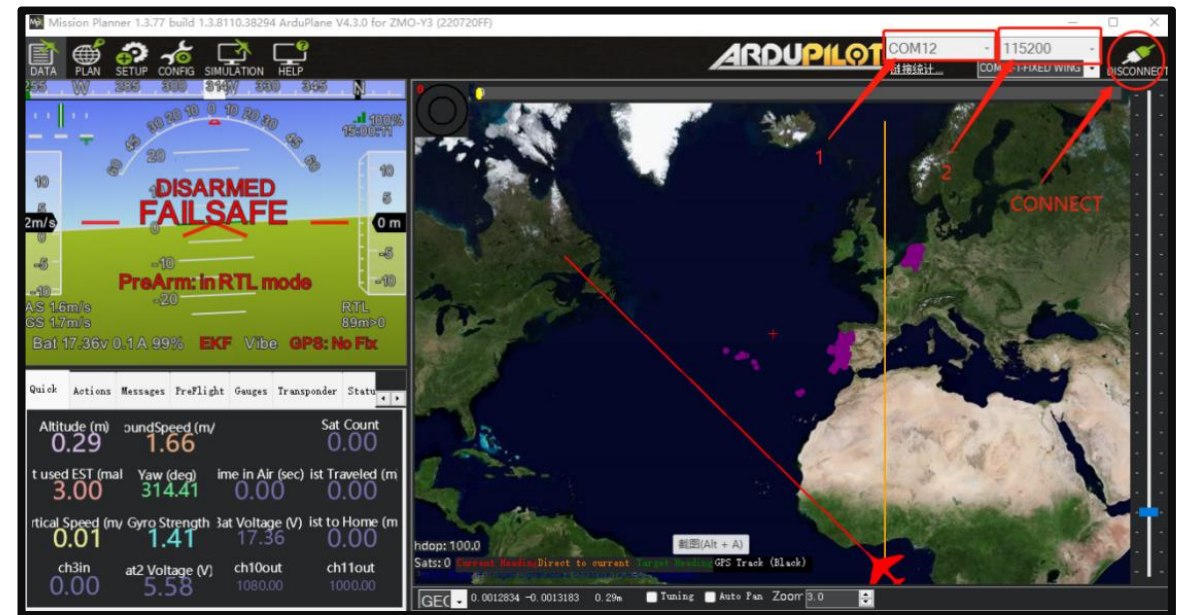
Suggest to charge with 6amp.

1. Power on the Unit

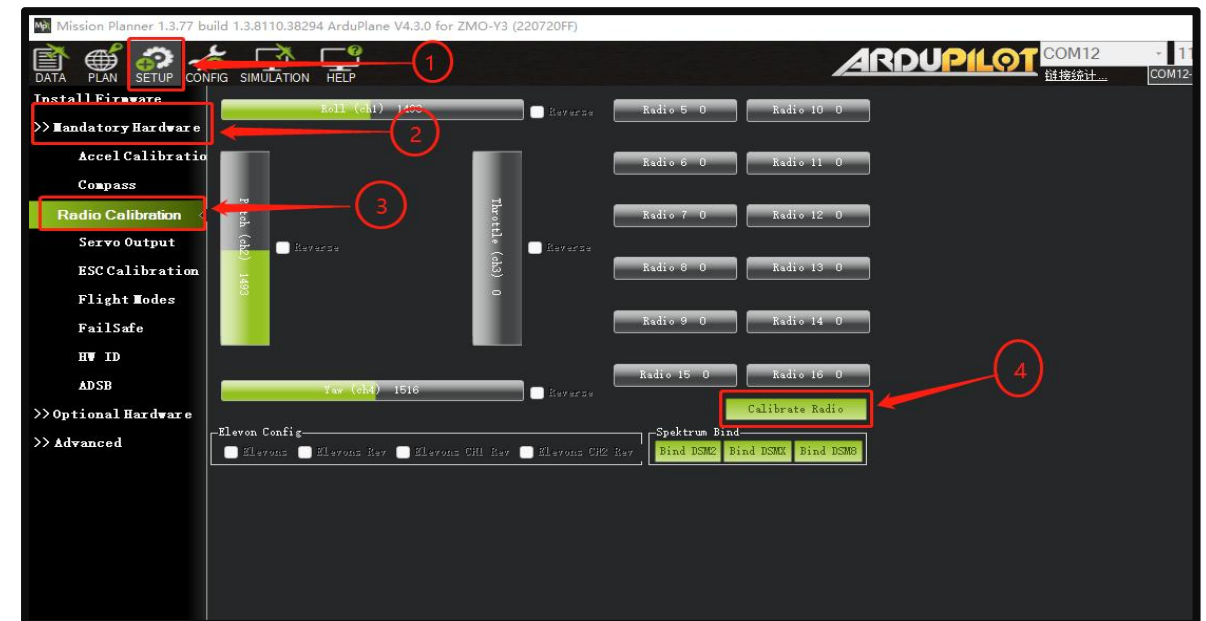
- ① Place ZMO on a level ground
- ② Power on the transmitter
- ③ Connect ZMO battery (Better fully charged)
- ④ Remain stationary after connecting
- ⑤ Wait for the self-check to complete. Generally, the self-check can be completed in 1 minute until hearing two "Beeps".

2. Remote Controller Calibration

- Connect the flight controller USB port through the attached upgrade board.
- Open the “Mission Planner” ground station software, select the corresponding “COM port” and “115200” baud rate, then click to connect.



- ① Enter the "Initial Settings" interface, Click " Set Up",
- ② Select" Mandatory Hardware".
- ③ Click on "Radio Calibration"
- ④ Click on “OK” in the pop-up”Radio Calibration”dialog.



Move all RC sticks and switches to their extreme positions. The red line will appear on the calibration bar, showing the minimum and maximum values.

When the operation is completed, return all sticks back to center positions and throttle stick to the lowest position.

The notice "Make sure all sticks are located on the center, throttle down, and click OK to continue." Make sure the throttle to zero and press "OK" .

The summary of the calibration data will show on Mission planner with the normal value range 1100-1900..

Notice: The quick linking instruction for the remote control and FPV Goggles are attached on the last page of the manual.

3. Unlock take-off (VTOL Mode)

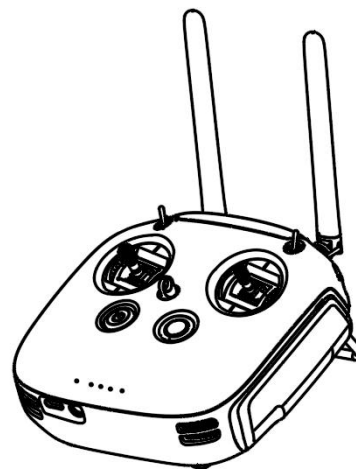
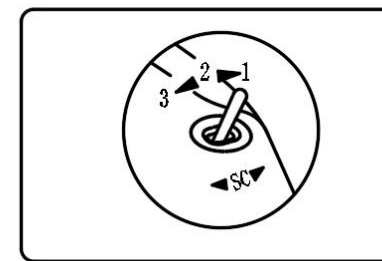
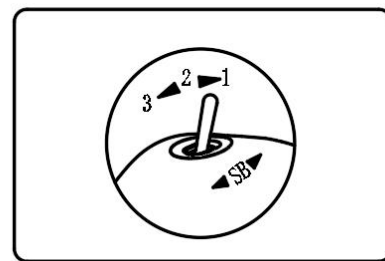
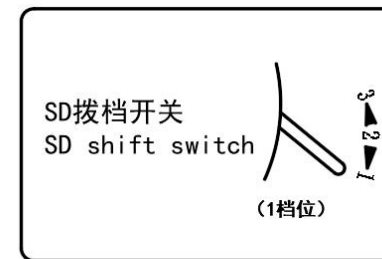
Make sure GPS has a solid connection.

When you switch to the Drone Self-stabilization Mode, the SA, SD Switch needs to be in the “Away Or Down” position, SB, SC Switch needs to be in the “towards or Up” position. The Left stick needs to be in the “Down” Position. When the GPS Signal is in good situation, the beginner must switch to the fixed-point mode (Switch SA to SA2).

Here takes Mode 2 as an example:

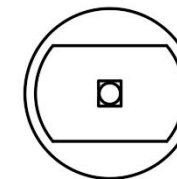
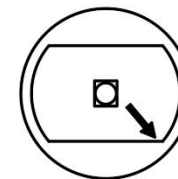
Move the throttle to the lowest position, only need move the left stick “down and in” until the motor is unlocked and started, after the propeller turns, slowly move the throttle stick up until the airplane takes off.

When the altitude reaches 20-30m, try to move the stick left and right, forth and back, to make sure the airplane is in the same direction as the stick. And they can move in parallel normally.



Left stick 左摇杆

Right stick 右摇杆



解锁
Unlock

4. Fixed Wing Departure and Return

In the fixed wing mode, keep the accelerator remote lever $\leq 50\%$ and turn the nose against the open and upwind direction (reduce the flight speed in advance), when it is about 30-50m away from the take-off point, switch the SA to the SA2 Position (drone fixed-point flight mode), the ZMO will automatically complete the conversion from fixed wing to VTOL vertical mode and hover, then can manually control the throttle landing.

Continue to keep the throttle at the lowest position and direction YAW to the left until the motors does not work (around 8 seconds). it indicates the locking is completed.



In the VTOL vertical mode, climbing to 20-30m with the nose facing to the open upwind direction, then move the remote throttle lever in the middle (do not move any stick), toggle the switch N S (DJI remote controller:

SB 1->SB3) with the original remote controller, the position ZMO will automatically complete VTOL to the fixed wing FBWA Mode.

The flight speed increases and decreases with the throttle ratio. When the throttle is 0, the speed will also be 0, and the throttle ratio of 100% will accelerate to a maximum of about 30m/s;

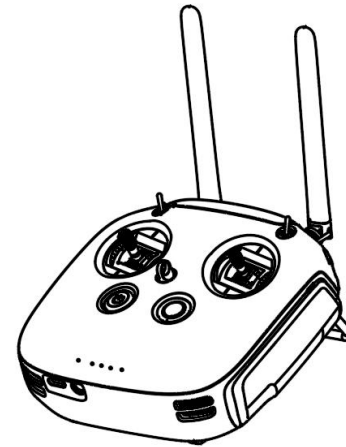
Danger!

If the flight mode is switched to drone self-stabilization mode during landing, the throttle of the aircraft will be controlled by the throttle of the remote control.

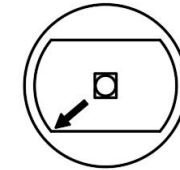
If the throttle of the remote control is 0, and the throttle of the aircraft is also 0. At this time, the aircraft will fall and crash.

Quickly lock the aircraft:

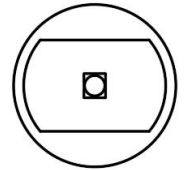
Keep the throttle at the lowest position and the YAW direction to the left (opposite to the unlocking direction). When locking, the aircraft should remain in the drone self-stabilizing (Qstabilize) or drone fixed-point mode (QLoiter).



Left stick 左摇杆



Right stick 右摇杆

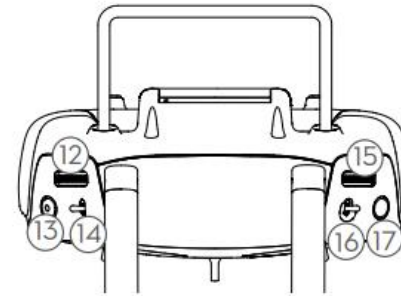


上锁
Lock

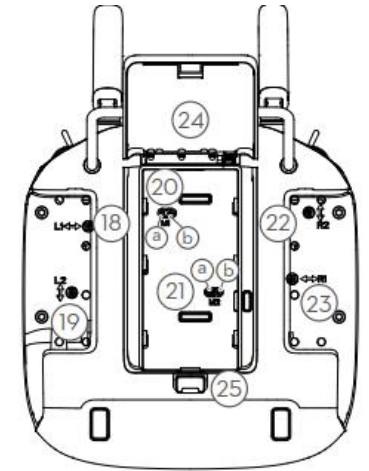
5. DJI remote control switch definition



1. Power Button
2. C Button (customizable)
3. Control Sticks
4. Lanyard Attachment
5. Status LED
6. Battery Level LEDs
7. Simulator PPM Port
8. USB-C Port
9. SB Switch
10. SC Switch
11. Antennas



12. Left Dial
 13. Record Button
 14. SA Switch
 15. Right Dial
 16. SD Switch
 17. Back Button
18. Right Stick Adjustment Screw (Horizontal)
 19. Right Stick Adjustment Screw (Vertical)
 20. Throttle Stick Adjustment Screws* (Mode 1)
 - a. Ratchet Throttle Adjustment Screw
 - b. Smooth Throttle Adjustment Screw



21. Throttle Stick Adjustment Screws* (Mode 2)
 - a. Smooth Throttle Adjustment Screw
 - b. Ratchet Throttle Adjustment Screw
22. Left Stick Adjustment Screw (Vertical)
23. Left Stick Adjustment Screw (Horizontal)
24. Battery Cover
25. Battery Cover Lock

6. Automatically return home mode

When the airplane needs to automatically return and land, keep the throttle stick at about 50% position, Switch the SC switch to SC3, ZMO will automatically return to the take-off point and land. The ZMO will automatically climb to 30 meters when the height is less than 30 meters before returning.

When the altitude is higher than 30 meters before return, ZMO will maintain the current altitude to return and land.

Turn the SC switch to the SC1 position when returning, it can cancel the return at any time. And the aircraft mode will switch to the fixed-wing self-stabilization mode (FBWA MODE);

When returning and landing, you can use the aileron or the pitch stick corrects the landing position without switching the flight mode

Rule of Return To Land (RTL) :

After switching to Return and land mode, the airplane will return to 50m in front of the nose with fixed wing mode, then hover and descend.

After descending to 30 meters, it will automatically switch to vtol drone mode, and land vertically to the take-off position.

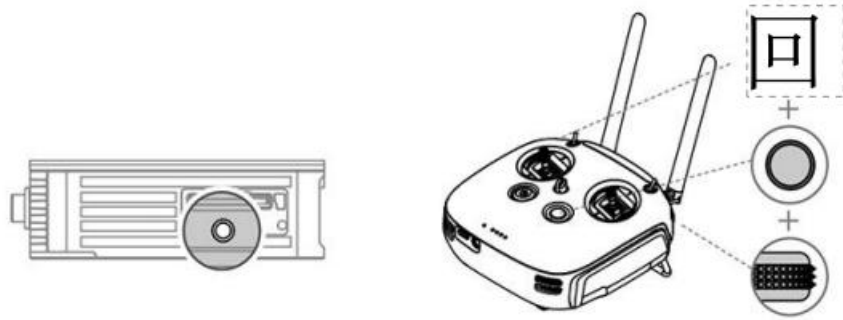


Mode support and Description

- **Quad stabilize:** Under multi axis status, the aircraft only provides stability enhancement function, and the altitude position is controlled by the remote controller. It is generally not recommended for beginner to take off in this mode.
- **Quad Loiter:** Under multi axis status, the aircraft will remain in hover when the accelerator is in neutral position. A good GPS signal is required in this mode. It is recommended that beginner can use this mode to take off. Using this mode to take off requires pushing the throttle of the remote control to 50% before the aircraft leaving the ground.
- **Fixed-wing self-stabilization (FBWA):** In this mode, the stability is increased, the aircraft attitude is more flexible, and the speed changes with the throttle.
- **Fixed wing Cruise (Cruise):** When the throttle is in neutral position, the aircraft will keep the current altitude and heading, and the heading or altitude of the aircraft can be changed by moving the elevator stick. The aircraft altitude will rise or fall slowly in this mode.
- **Return To Land (RTL):** The aircraft automatically lands at the take-off point.
- **AUTO:** In the automatic route mode, the aircraft will automatically fly according to the preset route in “Mission Planner” app and automatically return to land after the flight is completed.
Definition of transmitter switches:
 - SA (1-2-3 positions): Channel 5-- Quad stabilize, Quad Loiter, Fixed-wing Self-stabilization (FBWA)
 - SB (1-2-3 positions): Channel 6: Cruise Mode
 - SC (1-2-3 positions): Channel 7: Return To Home Mode
 - SD (1-2-3 positions): Channel 8: Automatic Mode

7. Linking

1. Power on the air unit and the DJI FPV Remote Controller.
2. Press the link button on the air unit, and then press the record button, C button, and right dial on the remote controller simultaneously.*
3. Both the linking status indicators turn solid green when successfully linked.

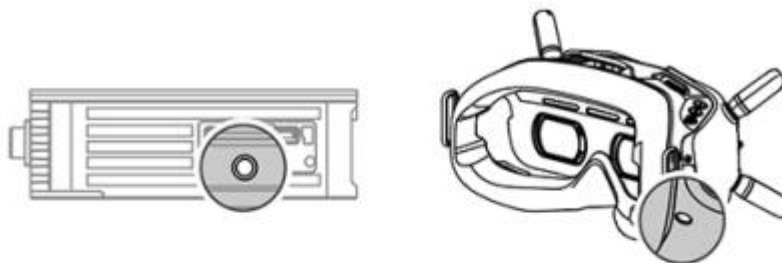


- * When ready to link, the devices will give the following indication:
Air unit: the linking status indicator turns solid red.
Remote controller: the remote controller beeps continually and the status indicator blinks blue.



If you need to use the DJI FPV Goggles and remote controller together, the air unit must be linked to the goggles before the remote controller.

1. Power on the air unit and the DJI FPV Goggles.
2. Press the link button on the air unit and the goggles.*
3. The linking status indicator of the air unit turns solid green. The goggles stop beeping when successfully linked and the video display is normal.



* When ready to link, the devices will give the following indication:

Air unit: the linking status indicator turns solid red.

Goggles: the goggles beep continually.



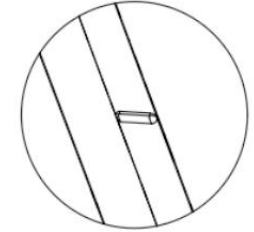
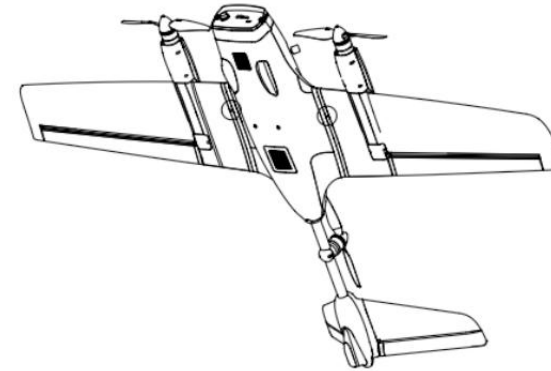
If you need to use the DJI FPV Goggles and remote controller together, the air unit must be linked to the goggles before the remote controller.

8.Center of Gravity

Place the ZMO PRO in the “Forward” flight mode. Center of Gravity is located on the line at the bottom of wings indicated in picture below.

There is a protruding line on the bottom of the left and right wings, this is where the center of gravity of the aircraft is located.

Users lift the ZMO at the raised line on both the left and right wings with their fingers to check whether the center of gravity is appropriate;



Notice:

When testing the center of gravity, the forward motors must be adjusted to the position shown in the figure (fixed-wing mode). The proper state is to hold the two bumps with your fingers, and the plane is in a horizontally.

When the ZMO PRO is used without a Go pro, the battery should be installed as close to the air unit as possible; When the ZMO PRO is used with Go pro, the battery should be installed as far away from the air unit as possible. So center of gravity may be obtained

Frequently Asked Question:

Q1. How to deal with the aircraft hovering from multi-axis fixed-point (QLoiter) to fixed-wing mode (FBWA)?

Answer: Please put the throttle to the 50% position, then switch to fixed-wing mode again after returning to the multi-axis fixed-point (QLoiter).

Q2. What causes the failure to switch fixed wings?

Answer: For safety during switching, switching is not allowed when the pitch and roll angle of the aircraft exceeds 15° . The reason for the excessive pitch angle is that the wind speed is too large (more than 6m/s) or the wind direction is not right, and it is necessary to switch downwind or headwind.

Q3. What should I do if the aircraft hovers back to multi-axis fixed-point mode (QLoiter) during flight?

Answer: The reason for switching back to multi-axis may be that the flight speed is less than 12m/s, resulting in the multi-axis mode protection. At this time, switch the mode back to multi-axis fixed point, return the throttle stick to the 50% position, and switch to fixed-wing mode again, you can switch back to fixed-wing flight.

Q4. How to solve the problem when using FPV glasses if there is a picture but no OSD information?

Answer: Check the OSD information settings, check whether the connection cable with the flight controller is correct TX-RX, and check whether the flight controller OSD parameter settings are correct.

Q5. Does the ZMO PRO support DJI O3 Air Unit ?

Answer: Yes.

Q6. Is the use of ELRS receivers supported?

Answer: Yes, you need to connect the receiver with the SER4 interface, and the flight controller interface parameters need to be modified.

Q7. Does the ZMO PRO support manual mode ?

Answer: Yes.

Q8. Does the ZMO PRO support route planning?

Answer: Yes, the specific operations please refer to ArduPilot - Versatile, Trusted, Open/Flight Missions·quadplane (cuav.net)

Protection Mechanism of ZMO PRO flight control:

Height protection, Speed protection, Attitude angle protection, out of control protection, automatically return home, voltage protection, mechanical tilt protection, smart tilt protection.

1. Height protection: The flying height of the aircraft in the fixed-wing mode cannot be lower than 15 meters. Below this height, the protection will be triggered and it will automatically switch to the multi-axis fixed-point mode. This function can be turned off by modifying the parameters in Mission Planner. More specific operations refer to manual.
2. Speed protection: During Fixed wing mode (FBWA), speeds below 12m/s, speed protection will activate, and fixed wing mode will activate. Raise throttle to increase speed, aircraft will automatically return to forward flight mode.
3. Attitude angle protection: when the fixed wing exceeds the set safety angle during flight, the multi-axis will come out for protection;
4. Loss of signal protection: After the aircraft loses the connection with the transmitter for more than 10s, it will automatically enter the return home mode, return and hover at point of takeoff.
5. During the automatic return and landing, you can control the joystick at any time to make the aircraft fly left, right, front and back. When manually controlling and correcting the position of the aircraft, the aircraft altitude will not drop until the joystick is no longer corrected.

6. Voltage protection: It is recommended to remain active to ensure that the aircraft will maintain enough voltage for RTH mode.

14.8 Volts is enough battery power to support the safe return and land of the aircraft.

The aircraft will automatically return to home location and descend under the first level (14.8V) protection.

When the voltage is 13.6 Volts it will land in place at the current position (QLand).

7. Mechanical tilt protection:

When the servo is stuck and the operator is not aware of this situation, the artificial trigger conversion action will cause the aircraft to lose balance. The flight controller will also make its own judgment and protective intervention to reserve enough height to avoid damage.

8. Smart tilt protection:

This model is equipped with an airspeed sensor. There will be a heading or position shift sometimes due to the influence of wind. The flight controller will try its best to complete the conversion within a controllable range and will also independently and intelligently judge the risk of conversion and terminate the conversion.

Therefore, ZMO PRO can not only fly smoothly in fixed-wing mode, in different wind directions, but also to complete the transition in the downwind or headwind direction, without manual judgment and intervention in the whole process. Among them, the downwind conversion is easier, unlike the headwind situation where there is an additional power requirement.