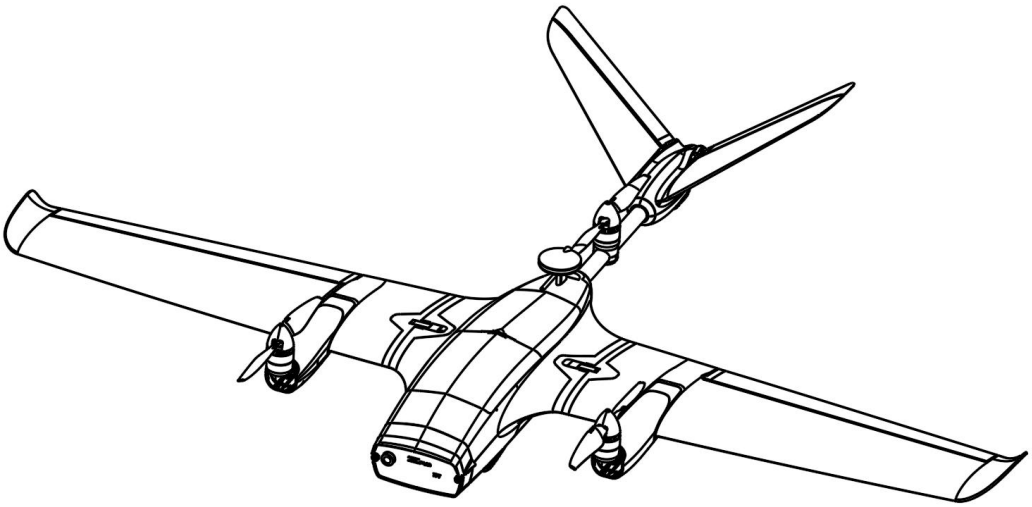
OMPHOBBY

ZMO PRO

Quick Start Guide



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Fly in the empty area and unobstructed environment within 200 meters around with lower than 6 m/s wind speed(less than the fourth-level wind), staying away from the residential areas and high buildings.Calibration must be completed before unlocking the new remote controller. The factory-configured remote control does not need to be calibrated.

The ZMO PRO aircraft is equipped with a standard charger, which can be easily charged by connecting the socket. Selecting the LiHv mode 6A current, the battery can be fully charged in about 60 minutes. (65WPD charging plug needed but not included inside package, suggest to purchase by yourself)

The plane should remain stationary on slick ground when connecting with the battery. Do not move aircraft until its system self-check is completed. (After the self-test is completed, you will hear two long "didi" noise)

1. Powering on the unit

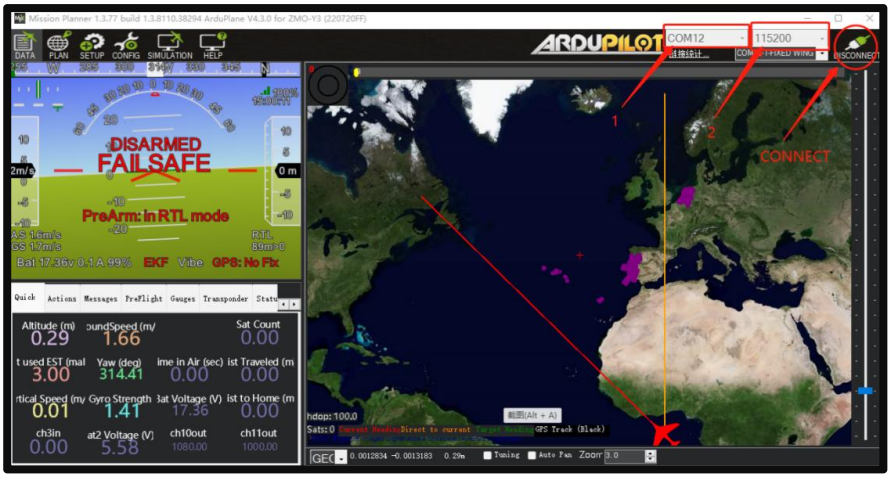
Put the ZMO PRO on the ground horizontally when all batteries are fully charged. Turn on the power of the remote control, then start up the ZMO PRO (standstill after booting) and wait for self-check to complete. Generally, The self-test can be completed in 1 minutes until hearing two "Didi" noise.

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.

Click " set up", select" Mandatory Hardware", click "radio calibration" , click “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 so far. When the operation is completed, The notice "Make sure all sticks are located on the center, throttle down, and click OK to continue." appear. Set 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)

Set SA and SD sticks to the bottom, SB and SC sticks to the top, and set the left rocker to the bottom (shown in the figure below).

Please note that the aircraft is in multi-rotor self-stabilizing flight mode at this time.

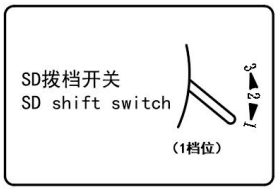
The beginner have to switch to multi-axis fixed-point mode (SA is set to the second gear) if GPS signal is good.

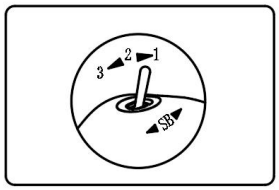
Taking the Mode 2 as an example, the accelerator of the remote control is at the lowest position.

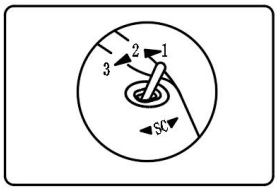
Pull the left rocker down and inward (lower inner eight) until the motor unlocking to start.

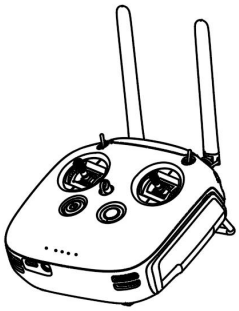
Push the remote control accelerator lever upward after turning on the propeller until ZMO PRO takes off.

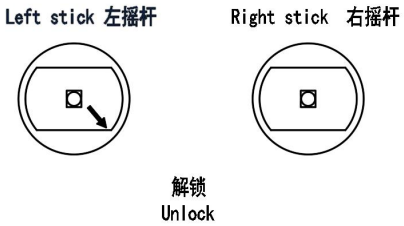
Operate the remote stick back and forth, left and right when flying to an altitude of 20-30 meters, make sure that the ZMO PRO is in the same direction as the remote control stick, and move normally in parallel back and forth, left and right.

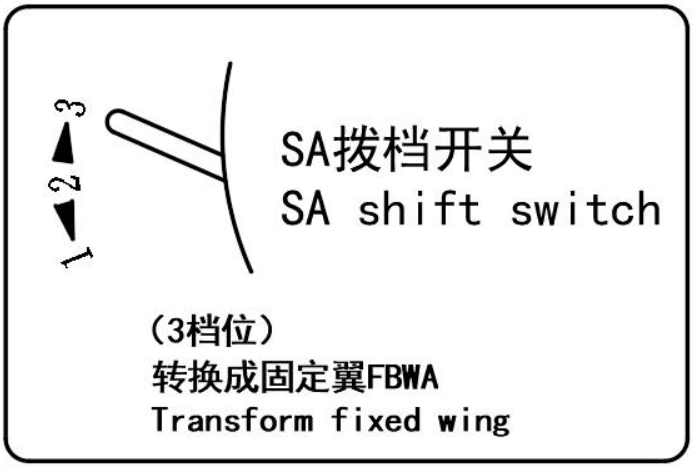












4. Fixed wing departure and return

Put the accelerator remote lever in the middle(do not move any stick) when climbing to the height of 20-30m with the nose facing to the open upwind direction in the VTOL vertical mode.

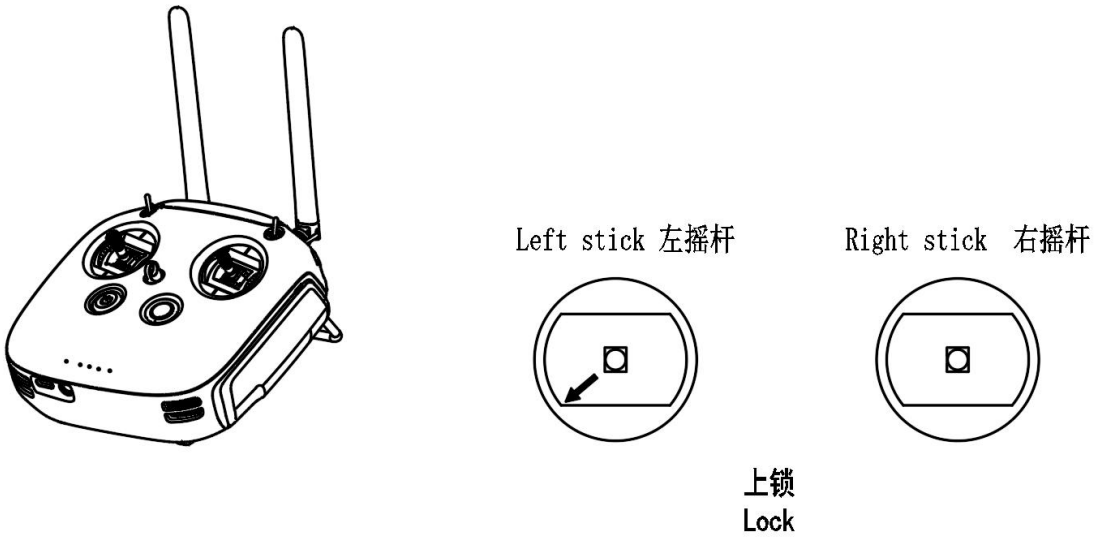
Switch the DJI remote controller from SA 1 to SA3, ZMO PRO will automatically complete VTOL to the fixed wing FBWA mode.

The flight speed is adjusted according to the throttle ratio. When the throttle is 0, the speed will also be 0. The maximum accelerator proportional acceleration can reach to 30m/s.

In the fixed wing mode, keep the accelerator remote levers 50% in advance. 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 remote controller stick to the SA2(Quad Loiter)The ZMO PRO will automatically complete the conversion from fixed wing to VTOL vertical mode and hover, then operate manually the throttle to land. Keep throttle at the lowest position, and YAW direction to the left (Maintain for about eight seconds). Locking is completed until the aircraft motor stop working.

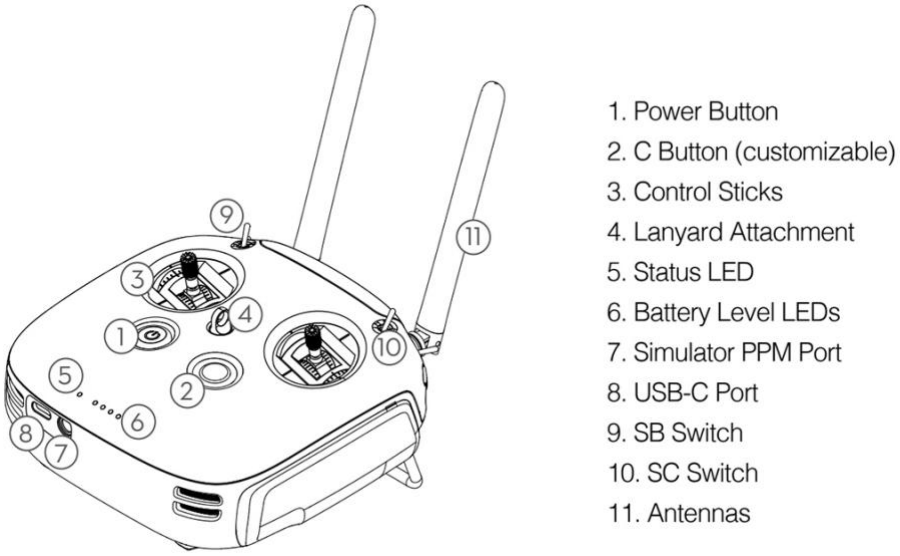
Important Notice: The plane can fall easily if switching to multi-axis self-stabilization mode during landing, because the throttle of the remote control is 0, and the output throttle of the aircraft is adjusted

automatically to 0.



Fast locking the aircraft: Keep the throttle at the lowest position and the YAW direction to the left (opposite to the unlocking direction). The aircraft should remain in the mode of Quad stabilize or Quad Loiter when locked.

5. DJI remote control switch definition



6. Automatically return and land

Keep the accelerator remote levers at about 50%, turn SC switch to the third gear, ZMO PRO will automatically return to its original take off position and land.

If the flight height is lower than 30meter before returning, ZMO PRO will automatically climb to 30 meters and return. And if the flight height is higher than 30meter before returning, ZMO PRO will remain at the current height to return and land.

Turn SC switch into Down position(first gear) during the returning to cancel the return at any time.

At this time, the flight model can be changed to Fixed wing Stabilization mode(FBWA). Without switching modes, the landing position can be corrected by adjusting ailerons or pitching controller stick during the return and land.

Return logic: After entering the return mode, the aircraft will fly in the fixed wing mode to circle and descend at the place of 50 meters ahead

of the nose at takeoff. After descending to 30 meters, it will automatically switch to the multi axis mode and land vertically to the takeoff location.

Mode 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. The 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 pressing the 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 and automatically return to land after the flight is completed.

The definition of remote control gear switch:

SA (1-2-3 gears) FIVE Channel , Quad stabilize, Quad Loiter,

Fixed-wing Self-stabilization(FBWA)

SB (3 gears)SIX Channel, Cruise Mode

SC (3 gears) SEVEN Channel, Return To Launch Mode

SD (3 gears)EIGHT Channel, Automatic Mode

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. More specific operations refer to manual.

2. Speed protection: During Fixed wing mode(FBWA), the multi-axis will come out for protection when the flight speed lower 12m/s. At this time, keep pushing up the throttle stick to reach the speed and the aircraft will automatically switch to the fixed-wing 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. Out of control protection: After the aircraft loses the connection with the remote controller for more than 10s, it will automatically enter the return home mode and hover to the take-off point to land;

5. During active return, you can manually control the aircraft to lower its altitude before returning (the descent rate is slow in the rotor mode).

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 ensure that the aircraft is within 5 km when the battery is 14.8V (3.7V for a single cell), so that there 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 between

14.6 and 14.8V, the voltage of the battery will decrease when the accelerator is momentarily increased, so the first level protection may occur). When the aircraft is protected by secondary voltage (13.6V), 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. Don't worry! 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.

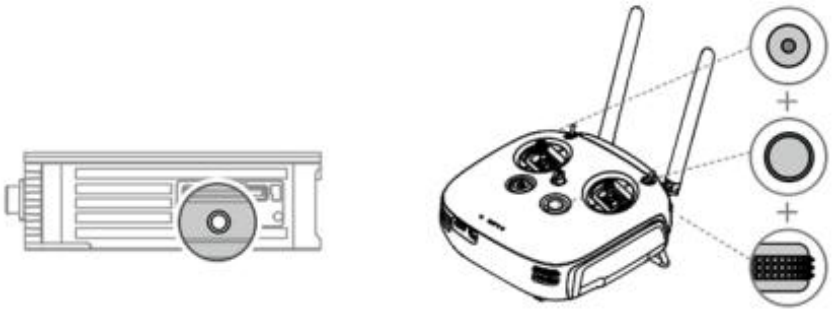
Therefore, ZMO PRO can not only fly smoothly with fixed-wing in different wind directions, but also to complete the transition in the downwind or headwind direction, without manual judgment and intervention in the whole process. Among them, the downwind conversion is easier, unlike the headwind situation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

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.

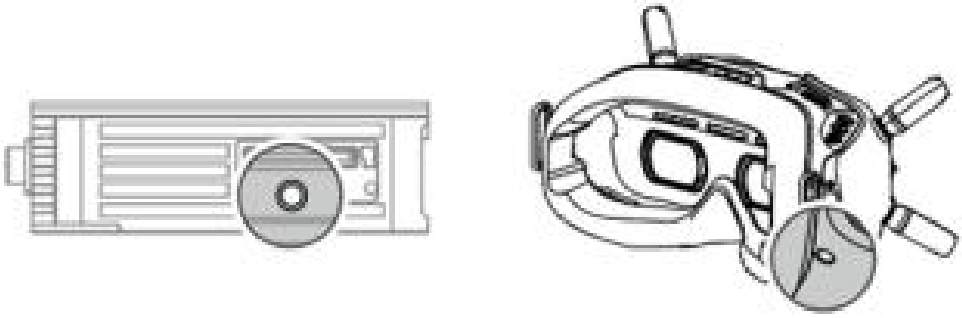
If you need to use the DJI FPV Goggles and remote controller together, the air unit must be linked to the goggles before the remote controller.

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.



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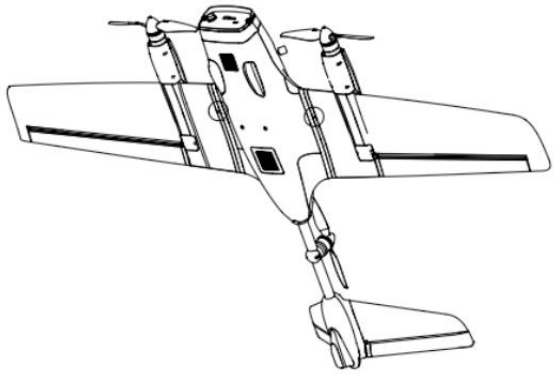
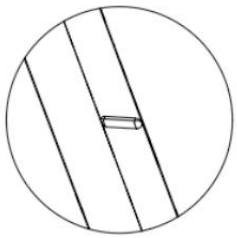
8. Center of Gravity

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 structure on the bottle of the left and right wings, which is the position of the center of gravity of the aircraft. Users can hold up the protruding structure of 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 motor 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 balanced state.

When the ZMO PRO did not load with Go pro, the battery should be installed as close to the air unit as possible; When the ZMO PRO connect with Go pro, the battery should be installed as far away from the air unit as possible. So that ZMO PRO can be brought close to the equilibrium state.

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.

Q5. 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.

Q6. Does the ZMO PRO support manual mode ?

Answer: Yes.

Q7. Does the ZMO PRO support route planning?

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