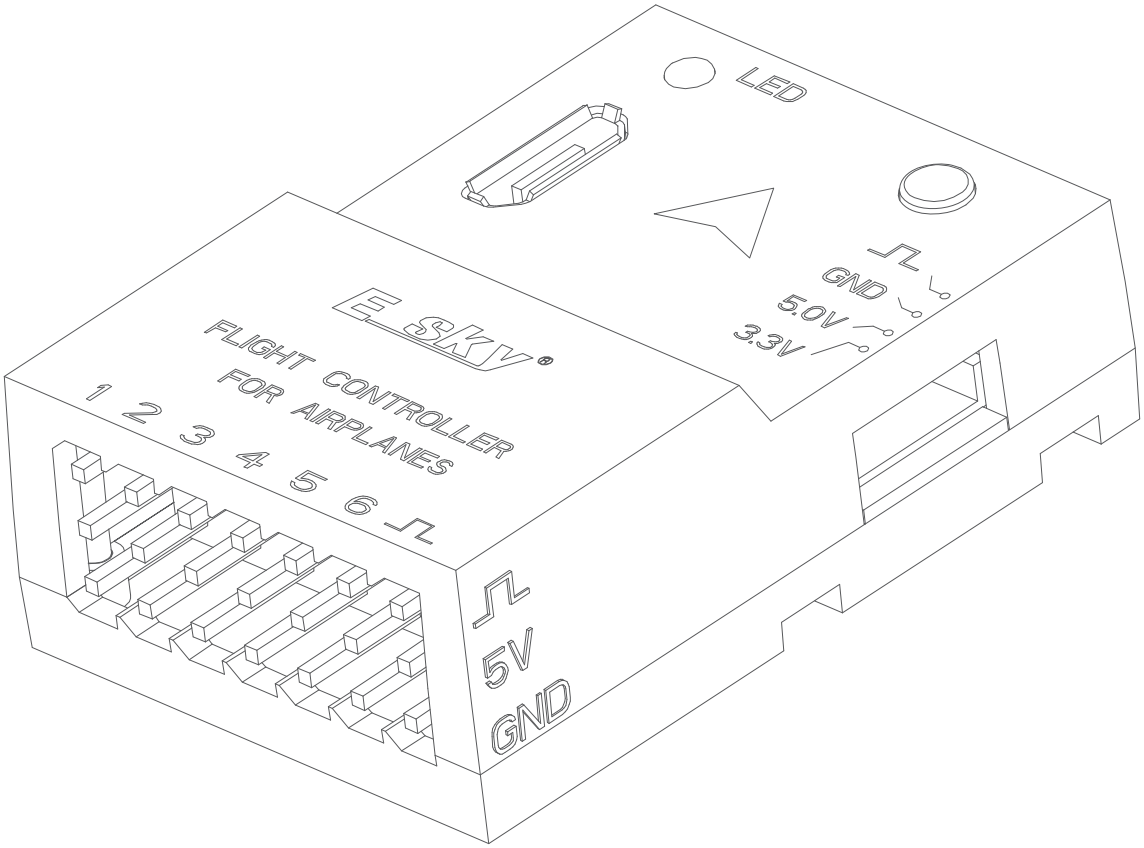
固定翼飞控

Airplanes Flight Controller

使用者手册 / User Manual



ESKY固定翼飞控仅支持ESKY PNP固定翼
ESKY新机型的支持参数文件将通过上位机更新

The ESKY airplanes flight controller **ONLY** supports ESKY PNP airplanes
The support parameter files for ESKY's new model aircraft can be updated through the FXZ configurator

E_sky®

Specifications

Length: 36.2mm
Width: 24.4mm
Height: 12mm

Weight: 7.8g
Input Voltage: 5V±0.5
Output PWM: 6 Channels

Input Signal: PPM, SBUS, DSM, DSMX/SRXL2, IBUS, CRSF

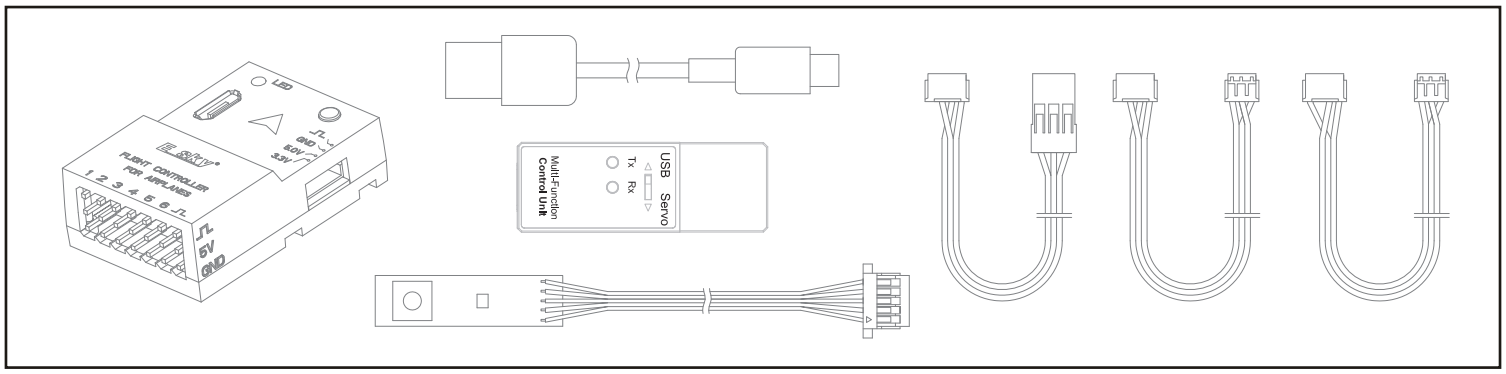
Needed To Complete

Transmitter
Channel: 6 channel or above
Switch: 2 or 3 position switches x 2

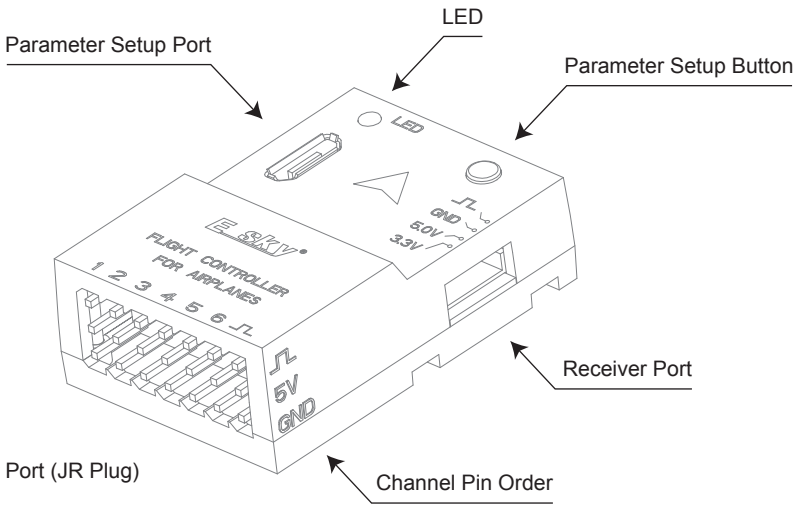
Receiver
Input Voltage: 3.3V or 5V
Output Signal: PPM, SBUS, DSM, DSMX/SRXL2, IBUS, CRSF

Box Contents

1 x Flight Control
1 x 5V JR Receiver Connection Wire
1 x 5V Receiver Connection Wire
1 x 3.3V Receiver Connection Wire
1 x External Parameter Setup Unit
1 x USB Cable
1 x Multi-Function Control Unit



Flight Control



1 - Aileron
2 - Elevator
3 - Throttle
4 - Rudder
5 - Aux 1
6 - Aux 2
⎍ - 5V Receiver Port (JR Plug)

There are two modes available for the flight control:
Beginner Mode (6-axis mode) and experienced mode (3-axis mode)

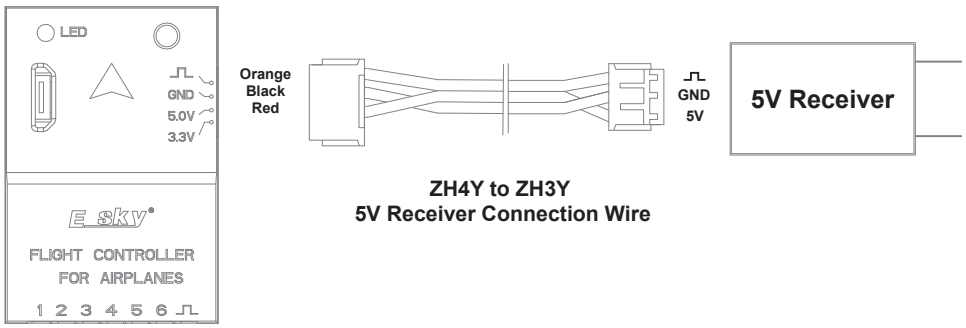
Beginner Mode (6-axis mode): To prevent over-control and mitigate the risk of orientation loss and crashes, pitch and bank angle limits are in place. Additionally, when the control sticks are released, the airplane automatically returns to level flight, ensuring a safe and stable flying experience.

Experienced mode (3-axis mode): There are no restrictions on pitch or bank angles, providing you with full control over the aircraft! 3 Axis Mode operates in the background to enhance stability by minimizing the impact of wind and turbulence. This results in a controlled and immersive flying experience, giving you the sensation of piloting a larger aircraft.

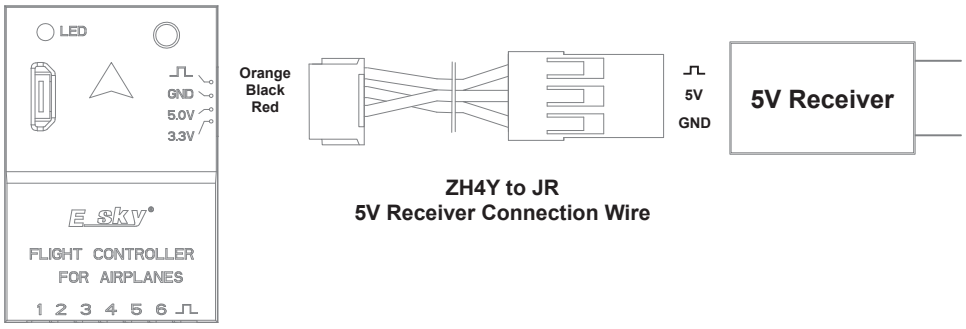
Caution: Flight mode switching is assigned to channel 5 of the transmitter using 2 or 3 position switches. Channel 6 of the transmitter is used for throttle cut using 2 or 3 position switches and these setting **CANNOT** be changed. The "Aux1" and "Aux2" channels on the flight control can be assigned to channels other than 1-6 for controlling flaps or retracting landing gear.

Flight Control Connection

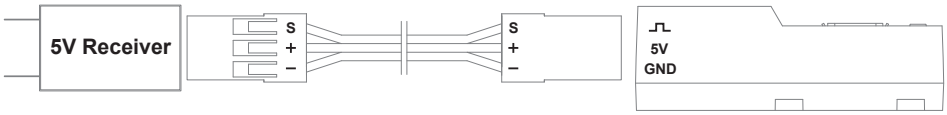
The connections between various 5V receivers and flight control are as follows:



ZH4Y to ZH3Y
5V Receiver Connection Wire

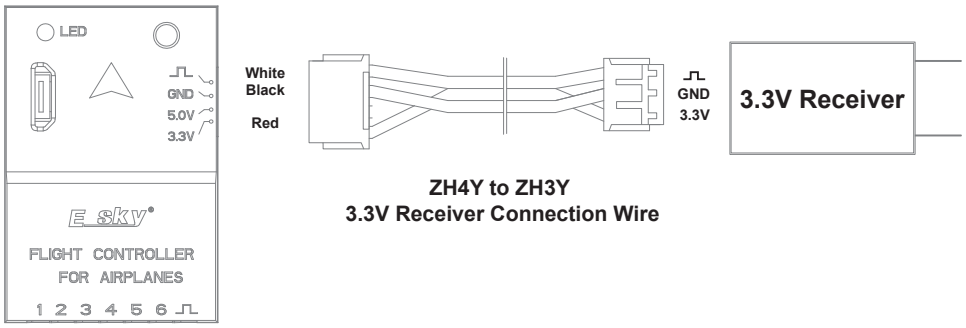


ZH4Y to JR
5V Receiver Connection Wire



JR to JR
5V Connection Wire
(Not Included)

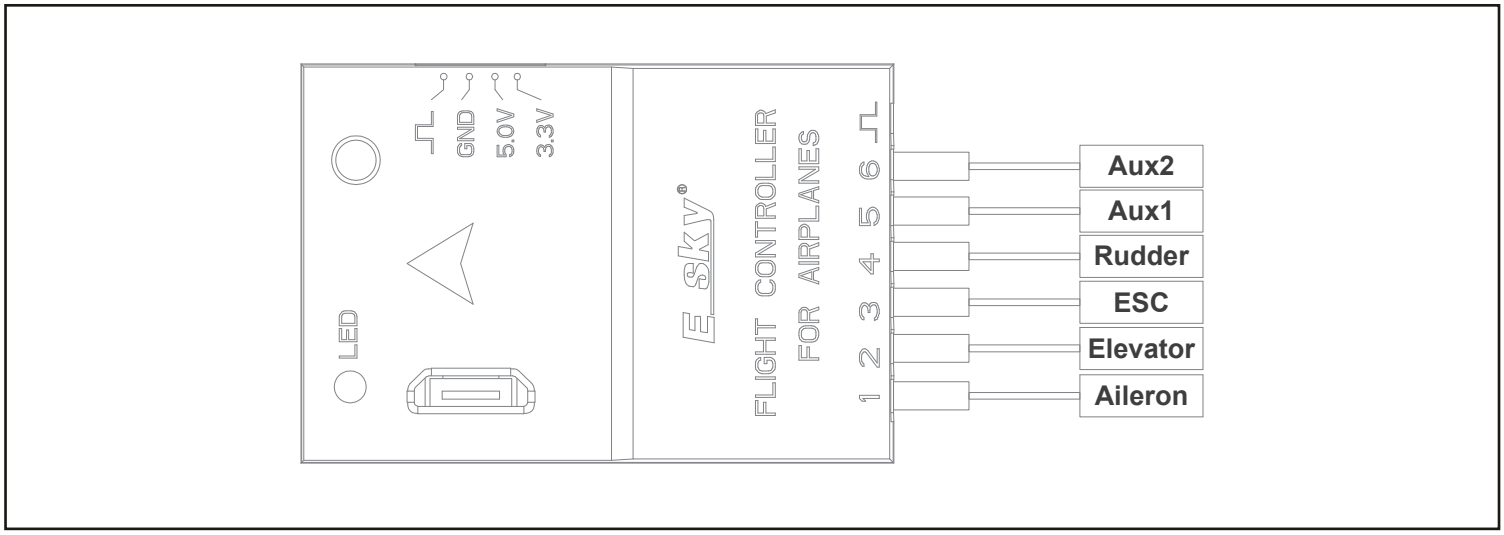
The connections between various 3.3V receivers and flight control are as follows:



ZH4Y to ZH3Y
3.3V Receiver Connection Wire

Servo and Electronic Speed Control (ESC) Connection

Refer to the flight control output port wiring as below. Confirm the electronic speed control voltage and wiring sequence are correct before connecting it to the flight control, to avoid damaging the flight control.



Receiver Binding

Follow the binding process of your transmitter to pair the receiver and transmitter. This flight control does not affect the binding process. After successful binding, the flight controller and receiver will automatically match. Also, set the channel functions according to your transmitter.

Flight Control Configuration

Flight control preparation

Ensure the transmitter has 4 control stick channels and 2 two-position switch channels active. The remote and receiver have already been bound and no other remote functions need to be set. If using a complex remote with a screen setting functon, create a new model. Select fixed-wing aircraft and assign channel 5 to one of the 2-position switch, and channel 6 to another 2-position switch. Don't enable any other functions.

Flight controller configuration operations as follows:

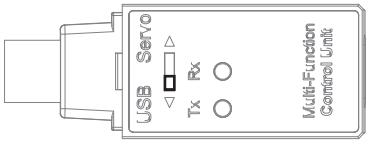
Caution: Before performing the following steps, please ensure that the transmitter is turned on.

☐ Download the FXZ Configurator through the following QR code.

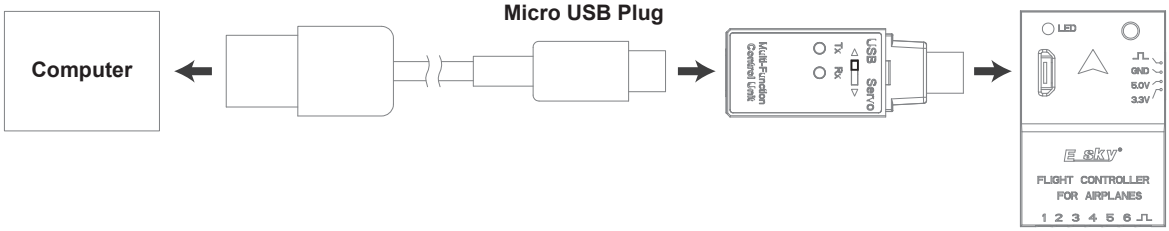
https://esky-rc.com/manual/detail/2

☐ Double-click the FXZ Configurator to open the flight control configuration software.

☐ Adjust the toggle switch on the multi-function control unit to the USB end. Refer to the diagram below.

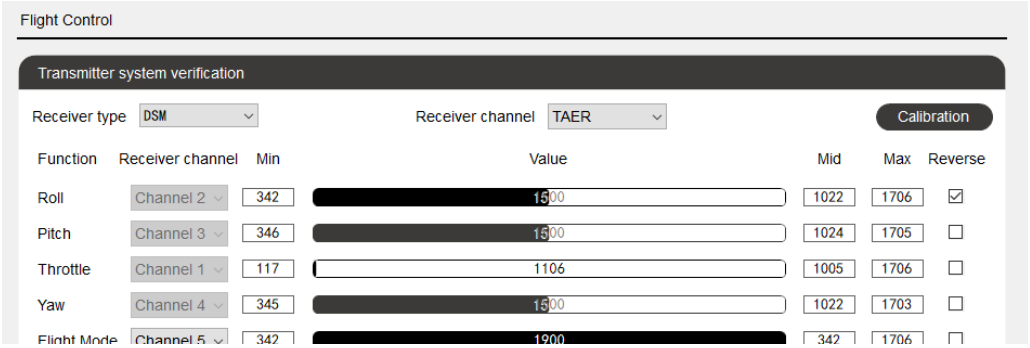


☐ Connect the flight control and multi-function control unit to the computer as shown in the diagram below. The configuration software will automatically detect and connect to the flight control. If it doesn't automatically connect, select the correct serial port and click on the "Connect" button.



Flight Control Configuration

☐ Once the configuration software interface displays "Flight Control" and "Attitude" in the bottom left corner, click on "Flight Control" to enter the "Flight Control System" interface.



☐ Please refer to figure 1 to select the correct receiver protocol based on the type of receiver being used. The system will automatically match the channel order according to the selected receiver protocol, with the first four channels displayed in gray and cannot be modified, as shown in figure 2. To change the default channel order, select "Custom" on the right side of the "Receiver Channels" column, as shown in figure 3. All channels can be matched according to your needs, as shown in figure 3. Click the "Save" button to save the settings, it will displays "Save successful" and reverts back to "Save" to finish the setting.

Figure 1

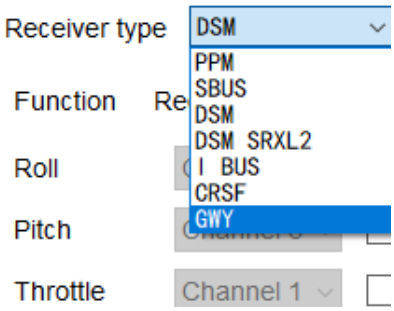


Figure 2

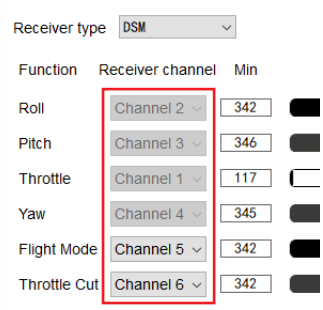
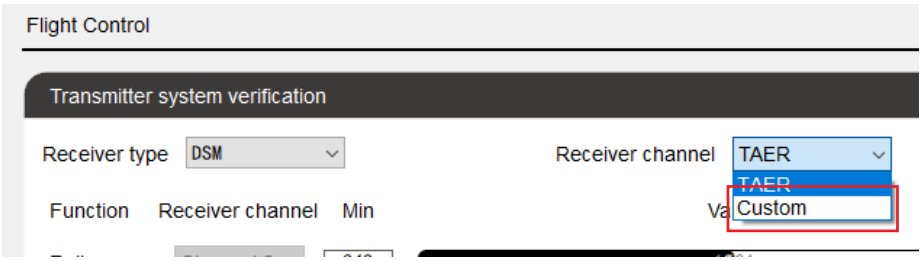


Figure 3



Transmitter Calibration

The calibration procedure for the transmitter is as follows:
Before starting the calibration of the transmitter, please adjust the trims of each channel to the neutral position. The following instructions are provided with the left hand throttle (Mode 2) as an example.

- ☐ Calibration: Click the "Start Calibration" button in the top right corner of the software. Move the sticks in a + shape moving from left to right, (as shown in figure 1) then up and down.(as shown in figure 2) Press gently on the sticks at the stops to achieve an accurate calibration. Return both sticks to the center position. Set the 2-position switches corresponding to channels 5 and 6 to the maximum and minimum positions (as shown in figure 3).Then click the "Complete Calibration" button and wait for the system update to finish the transmitter calibration.

Figure 1

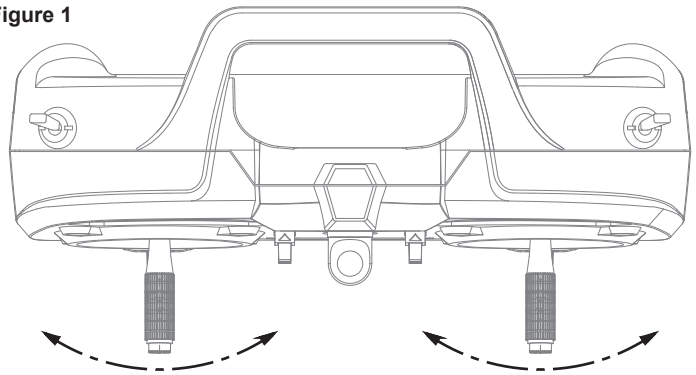


Figure 2

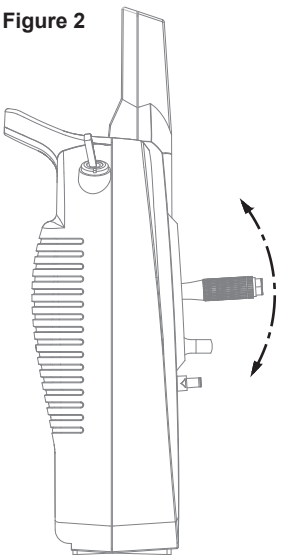
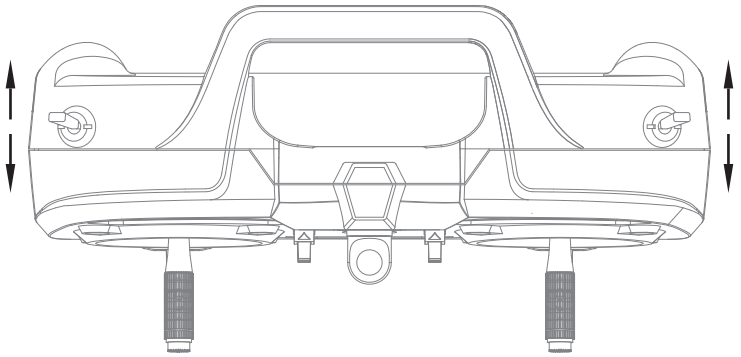
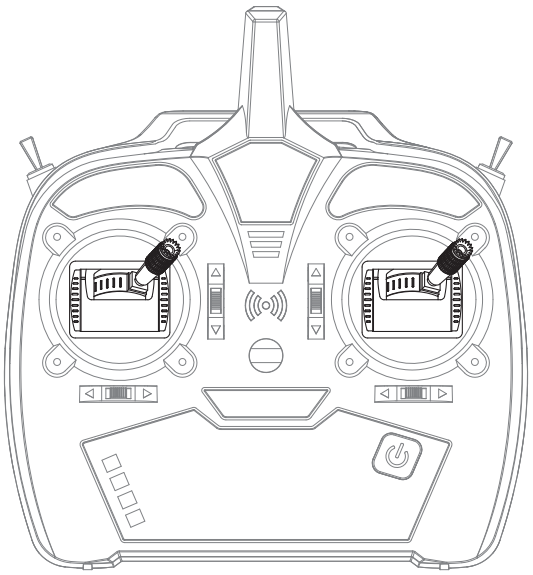


Figure 3

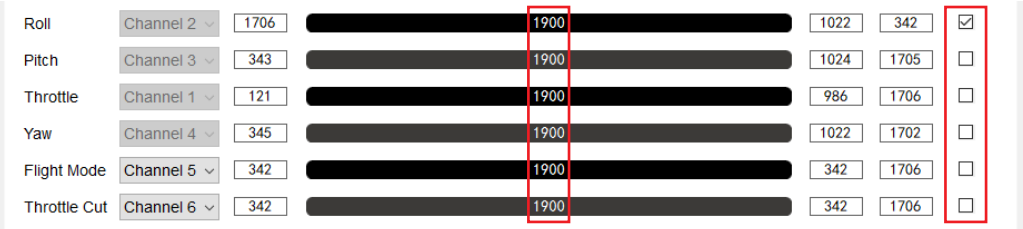


- ☐ Channel Direction: Move both sticks to the top right corner and press gently on the sticks at the stops.

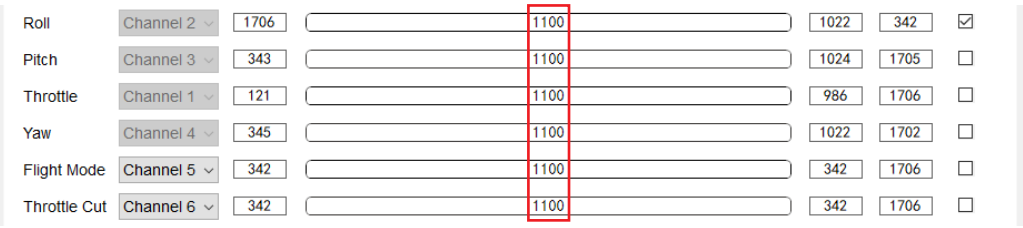


Transmitter Calibration

The values for channels 1, 2, 3, and 4 should be around 1900. If the values are around 1100, click the "Reverse" checkbox on the right to reverse the direction and click "Save" to finish the direction setting.



When moving both sticks to the bottom left corner, the values for channels 1, 2, 3, and 4 should be around 1100.



Move both selected 2-position switches to the forward position (as shown in figure 4). The values for channels 5 and 6 should be 1900 (as shown in figure 5).Click the "Reverse" checkbox on the right to reverse the direction if the values are 1100 and click "Save" to finish the direction setting.

Figure 4

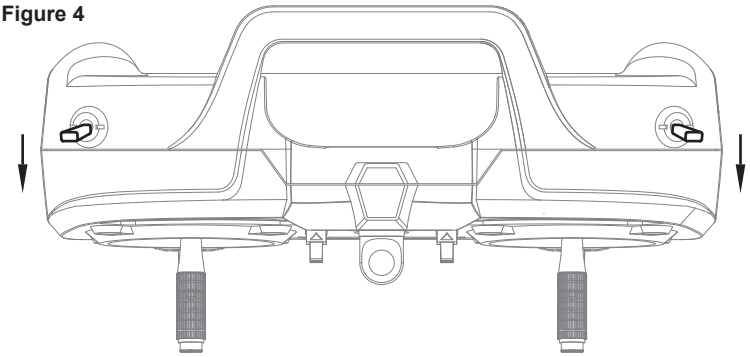
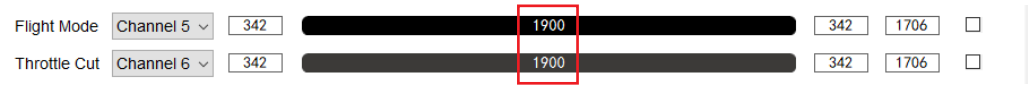


Figure 5

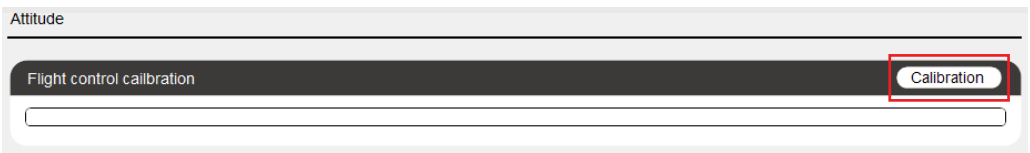


Flight Control Calibration

The flight control has been calibrated before leaving the factory, calibration is not necessary during the initial installation. Ensure that the installation position is level and positioned as close to the center of gravity of the aircraft as possible.

During calibration, remove the flight control from the aircraft and place it on a level and stable surface. Failing to do so may result in significant deviations in flight attitude.

☐ To connect the flight control to the computer using a USB data cable and multi-function control unit, without turning on the transmitter or connecting the receiver. Open the FXZ software and click the "Altitude" button in the bottom left corner of the calibration page to enter the "Flight Control Calibration" page.



☐ Click the "Calibrate" button on the right side and wait for the calibration to complete. The "Calibrate" text will appear in gray, and it will return to black once the calibration is finished.

Difference between Beginner Mode and Experienced Mode

In Experienced mode (3-axis mode), when the aircraft tilts to the left or right, the aileron control surface will not automatically return to its neutral position.
In Beginner Mode (6-axis mode), when the aircraft tilts to the left or right, the aileron control surface will slowly return to its neutral position on its own.

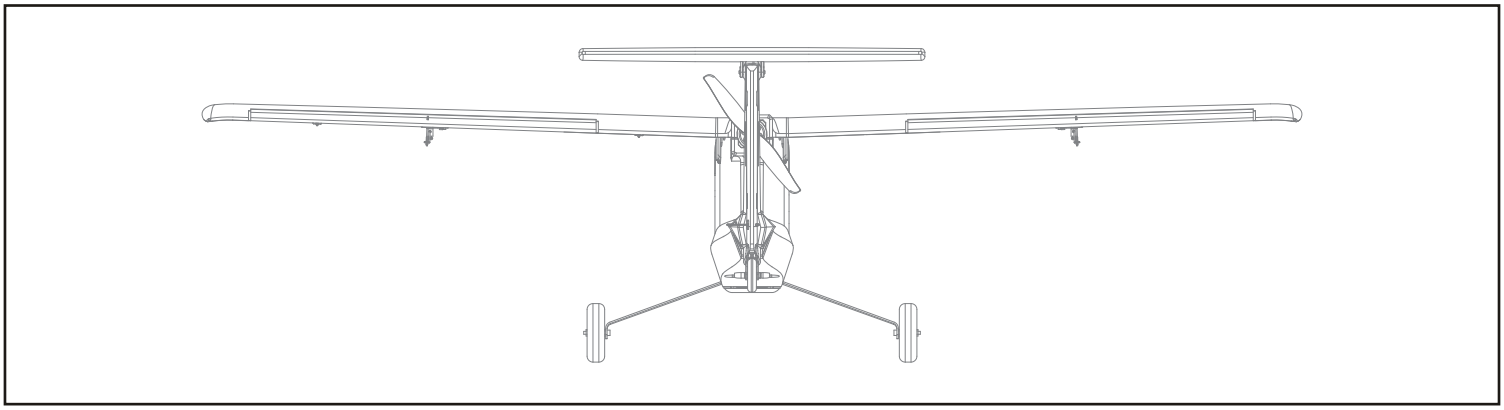
Control Direction Test

Power on the transmitter and turn on throttle cut, place the aircraft on level ground away from obstacles and power on the aircraft to let it fully initialize. Move the sticks on the transmitter as below and observe the control surfaces on the aircraft. Ensure the aircraft control surfaces respond as below and return to neutral when the control input is released.

Aileron: Move the aileron stick to the left, the left aileron should move up. Move the aileron stick to the right, the left aileron should move down.
Elevator: Pull the elevator stick backward, the leading edge of elevator should move up. Push the elevator stick forward, the leading edge of elevator should move down.
Rudder: Move the rudder stick to the left, the rudder should move to the left. Move the rudder stick to the right, the rudder should move to the right.

Flight Control Correction Test

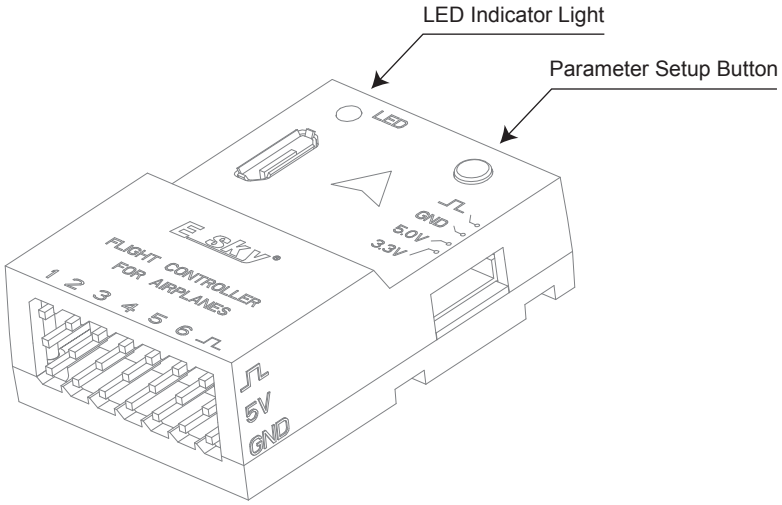
Point the nose of the aircraft away from yourself as shown in the diagram below.



Observe the control surfaces on the aircraft as below.
Aileron: Bank left the aircraft quickly, the left aileron should move down and the right aileron should move up. Bank right the aircraft quickly, the right aileron should move down and the left aileron should move up.
Elevator: Make the nose of the aircraft go down quickly, the trailing edge of elevator should move up. Make the nose of the aircraft go up quickly, the trailing edge of elevator should move down.
Rudder: Yaw the aircraft nose to the right quickly, the rudder should move to the left. Yaw the aircraft nose to the left quickly, the rudder should move to the right.

Parameter Setup Button

The flight control has a parameter setup button can be used to make precise adjustments to the neutral position of each control surface. Before using the button, ensure to push all the trims on the transmitter to their neutral positions.



The parameter setup button is designed for short presses only. To enter the setup mode, power on both the transmitter and the flight control unit. The LED indicator light should glow solid blue to indicate normal operation. Ensure that there is an appropriate interval between two button presses, without it being too short. When entering the setup mode, the LED indicator light will blink red or purple if the servo is not in the neutral position. The LED indicator light will glow solid purple if the servo is in the neutral position.

- ☐ Press the button for the first time (the blue LED indicator light will blink once) to enter the neutral position adjustment mode for the aileron servo. Adjustment can be made using the aileron stick.
- ☐ Press the button for the second time (the blue LED indicator light will blink twice) to enter the neutral position adjustment mode for the elevator servo. Adjustment can be made using the elevator stick.
- ☐ Press the button for the third time (the blue LED indicator light will blink three times) to enter the neutral position adjustment mode for the rudder servo. Adjustment can be made using the rudder stick.
- ☐ Press the button for the fourth time (the blue LED indicator light will blink four times) to enter the neutral position adjustment mode for the flap channel. Adjustment can be made using the rudder stick.
- ☐ Press the button for the fifth time, and the LED indicator light will glow solid blue to indicate that the setup is completed.
  (If no settings or actions are performed within one minute prior to this step, the system will automatically exit. In such a case, the blue LED indicator light will revert to glowing solid blue, and any adjusted parameters will not be saved.)

The setup procedure is a sequential operation. It is necessary to complete all five steps and wait for the modified parameters to be saved. (LED reverted to glowing solid blue). This fixed-wing aircraft does not have flaps or retractable landing gear, so there is no need to adjust the neutral position of the flap.

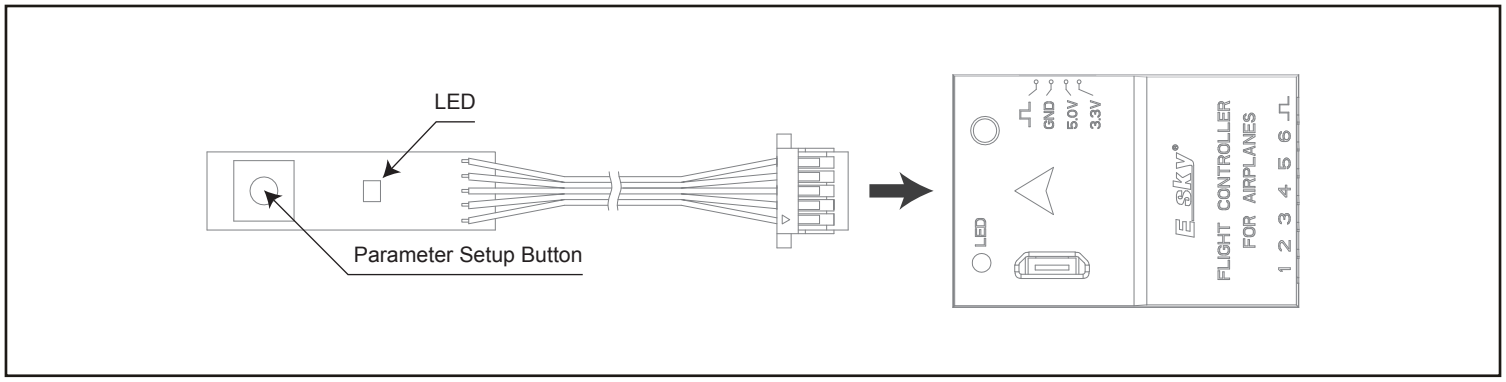
Each step mentioned above is adjusted by moving the corresponding stick on the transmitter up, down, left, or right. If the red or purple LED indicator light blinks at an increasing frequency, it indicates that the control surface is moving further away from the neutral point. if the blinking slows down, it means the control surface is approaching the neutral point. When the LED indicator light turns solid purple, it indicates that the servo is in the neutral position.

Remarks:

- ☐ To reset all servos, press and hold the "Parameter Setup Button" on the flight control for more than 6 seconds until the LED indicator turns from solid blue to blinking purple and returns to solid blue, then release the button. All servos will automatically return to the neutral position.
- ☐ To adjust the mechanical position of the servo arms or push-pull rods, press and hold the "Parameter Setup Button" on the flight control for 3 seconds until the LED indicator light turns from solid blue to blinking purple, then releasing the button and pressing it again, the LED indicator light will turn blinking red to indicate all servos return to the neutral position and all the control surfaces have stopped moving, allowing you to make the necessary adjustments. Press the button once again to finish the adjustments, the LED indicator light will return to solid blue. This operation can be performed in both beginner flight mode (6-axis mode) and experienced flight mode (3-axis mode).

External Parameter Setup Unit

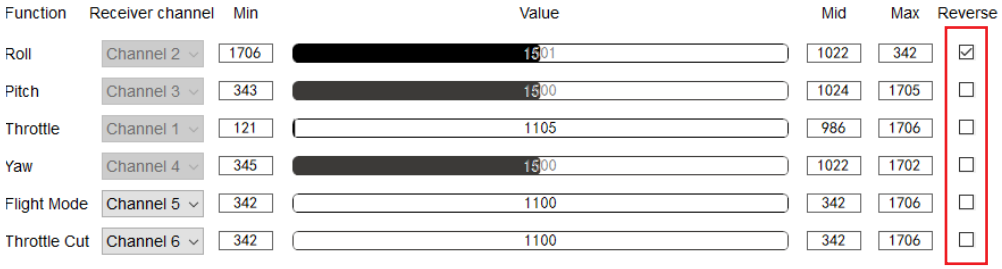
The diagram below shows the connection between the external parameter setup unit and the flight control.



Control Direction / Mode Switch / Throttle Cut Switch Test

The receiver channels will automatically change based on the type of receiver being used. In case the automatic recognition fails, you can manually select the appropriate receiver channel. When selecting "Custom", choose the corresponding receiver channel for each function in the "Receiver Channel".

If the aircraft actions are reversed, you can adjust the corresponding channel's direction settings on your transmitter. If your transmitter does not have this adjustment feature, you can switch on the "Reverse" option located on the far right, as shown in the diagram below. Click the "Save" button to finish the settings.



Troubleshooting Guide

Situation: Unable to connect the parameter multi-function control unit to the computer
Reason/Solution: Please check the following
- Check if the USB cable is damaged or has any other issues
- Download the driver installation folder named "Driver1" for the computer from the official website and proceed with the installation
- Download the driver installation folder named "Driver2" for the flight control from the official website and proceed with the installation
If your computer is running a 32-bit system, select and install the CP210xVCPInstaller_x86.exe file
If your computer is running a 64-bit system, select and install the CP210xVCPInstaller_x64.exe file

Situation: After connecting the receiver to the flight control, there is no output from the flight control
Reason/Solution: Please check the following
- Check if the receiver and the transmitter have been properly bound
- Check the working status and output of the receiver to ensure they are functioning properly
- Check if the connection between the receiver and the flight control is correct
- Check if the receiver type is correctly selected in the configuration software
- Connect the flight control to the configuration software and perform a calibration of the input channels in the configuration page

Situation: Flight control outputs do not match the movements of the transmitter's sticks.
Reason/Solution: Please check the following
- Check if the output channel settings for the sticks and switches on the transmitter are correct
- After connecting the flight control to the FXZ software, check if the receiver channel settings are correct.
- After connecting the flight controller to the FXZ software, select "Custom" in the receiver channel page. Adjust the receiver channel order as needed until the output channels match the transmitter
(Caution: Transmitter Calibration should be performed again after the adjustments)

Situation: Servo movements are reversed to the stick movements
- Find the output channel reverse setting on the transmitter and adjust the corresponding channel's setting
- If you are unable to adjust the output channel reverse on the transmitter , you can connect the flight control to the FXZ software. Go to the flight control configuration page and check the "Reverse" checkbox next to the corresponding channel, Press “Save” to finish the settings

产品参数

长度: 36.2mm
宽度: 24.4mm
高度: 12mm

重量: 7.8g
输入电压: 5V±0.5
输出PWM数量: 6 通道

输入信号协议: PPM, SBUS, DSM, DSMX/SRXL2, IBUS, CRSF

使用前准备

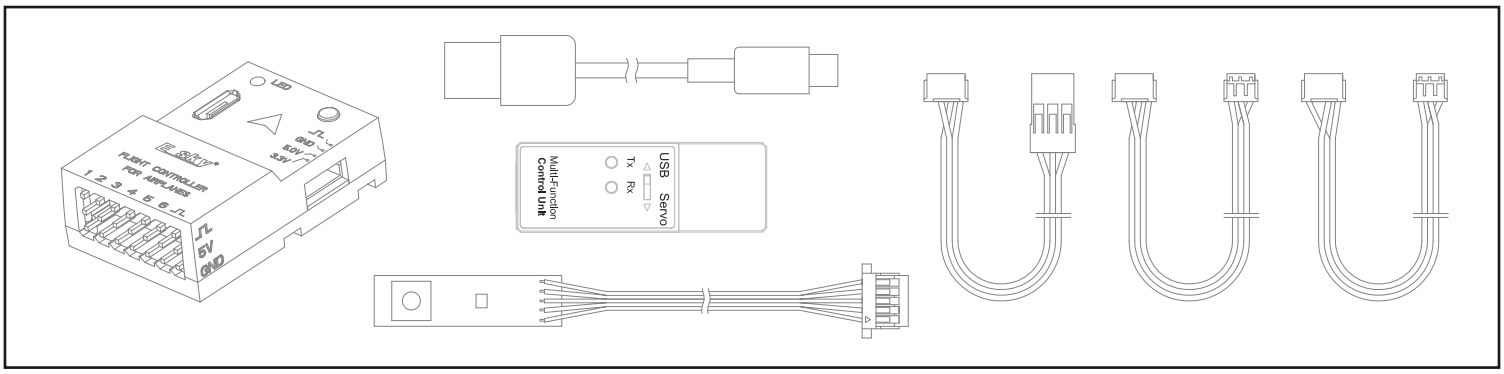
遥控器（需自备）
通道数量: 6CH及以上
开关数量: 2档或3档开关 *2

接收机（需自备）
输入电压: 3.3V或 5V
输出信号协议: PPM、SBUS、DSMX\SRXL2、IBUS、CRSF

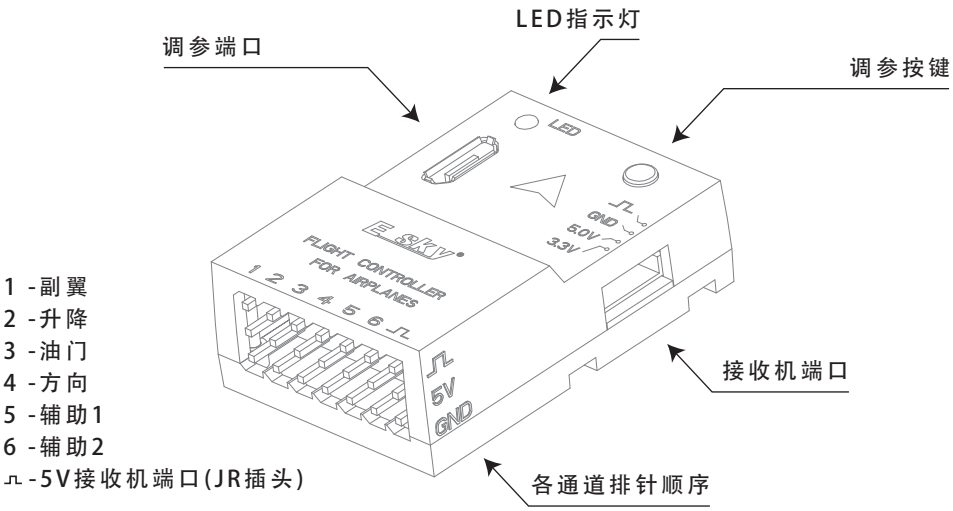
包装内容

1 x飞控
1 x 5V JR型接收机连接线
1 x 5V接收机连接线
1 x 3.3V型接收机连接线

1 x 外接调参板
1 x USB线
1 x 调参模块



飞控介绍



1 -副翼
2 -升降
3 -油门
4 -方向
5 -辅助1
6 -辅助2
⎍ -5V接收机端口(JR插头)

此飞行控制模块有两种飞行模式，自稳模式(6轴模式)和增稳模式(3轴模式)。

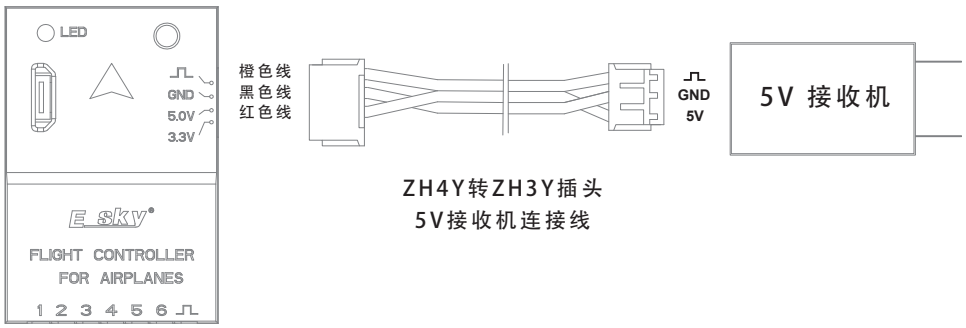
自稳模式: 此模式下系统能确保飞机保持水平直线飞行，飞机能够进行基本的飞行操作。但是飞机不能实现横滚、倒飞、拉筋斗、垂直爬升或俯冲等特技动作。除了在操控瞬间飞机能够有限改变姿态外，其它时候飞机将一直保持当前的水平直线飞行状态。此模式适合新手练习。

增稳模式: 在这种模式下，系统可以辅助对抗和修正由外部力量如风、湍流、机翼失速、重心位置偏差或飞机设计引起的飞行不稳定性问题，纠正和稳定飞机瞬时飞行姿态，使飞行更加平稳，同时不会干扰飞行员的操纵意图;飞机可以实现横滚、倒飞、拉筋斗、垂直爬升或俯冲等特技动作。此模式适合高手及进阶练习。

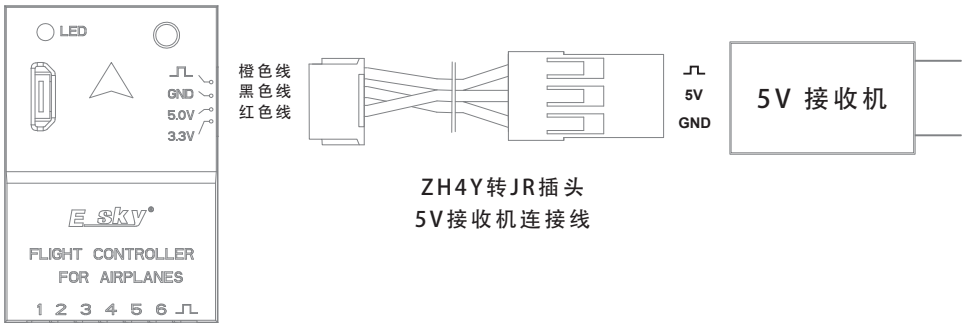
特别说明: 飞控系统默认状态下，模式切换控制为遥控器的 5 通道，2 档或 3 档开关均可;遥控器的 6 通道为熄火开关控制通道，2档或3档开关均可，此默认设置不可更改。其中，飞控通道插槽上的“辅助 1”和“辅助 2”通道，在遥控器通道数和功能允许的情况下，可根据需要进行分配使用，比如用于收放襟翼或是收放起落架等(仅可设置 1~6 通道以外的通道数)。

飞控连接说明

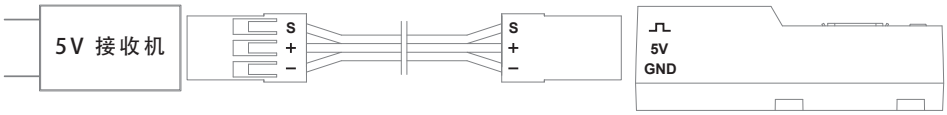
5V接收机连接示意图：



ZH4Y转ZH3Y插头
5V接收机连接线

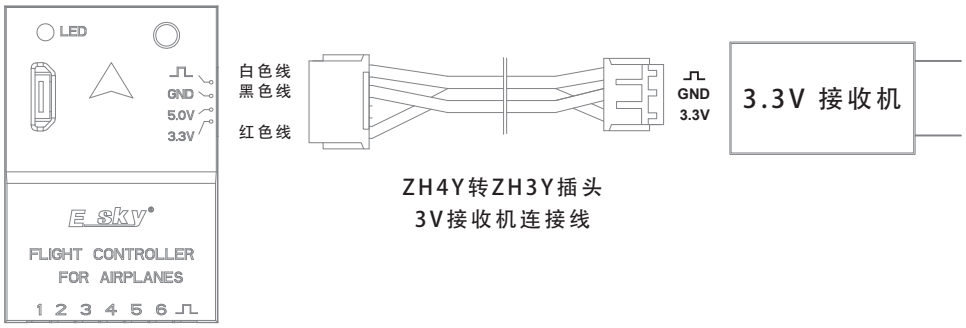


ZH4Y转JR插头
5V接收机连接线



5V双JR插头连接线
(不包含)

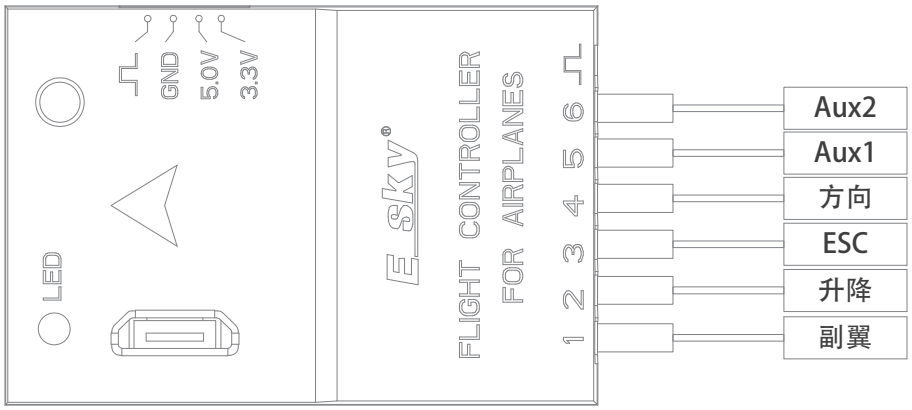
3.3V接收机连接示意图：



ZH4Y转ZH3Y插头
3V接收机连接线

舵机及调速器的连接

注意：请先参考飞控输出端口线序，确认调速器供电接口电压及线序是否正确后再将调速器与飞控连接，避免因供电电压或线序错误导致飞控损坏。



接收机对频

接收机与遥控器的对频请遵循所选用遥控设备的对频流程。此飞控系统对所选用接收机和遥控器的对频过程没有任何影响，对频成功后飞控与接收机自动匹配；同时相关通道功能设置也请遵循所选用遥控器的对应功能。

飞控配置

飞控配置准备工作：

请确认遥控器只开启4个摇杆通道和2个2段开关对应通道输出，遥控器本身无需也不要设置任何功能(例如熄火/油门截止功能、飞行模式功能、混控功能..等等都不要设置)，且遥控器与接收机已经对频完成。如果是复杂遥控器(有屏幕及设置功能的遥控器)，强烈建议新建立一个模式，模型选择飞机(固定翼模型，正常尾翼)，5通道设置对应一个2段开关，6通道设置对应另一个2段开关即可，不要启用其他功能。

飞控配置操作如下：

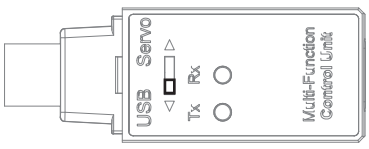
备注：在进行如下操作之前请先打开发射机。

☐通过以下二维码下载 FXZ 上位机。

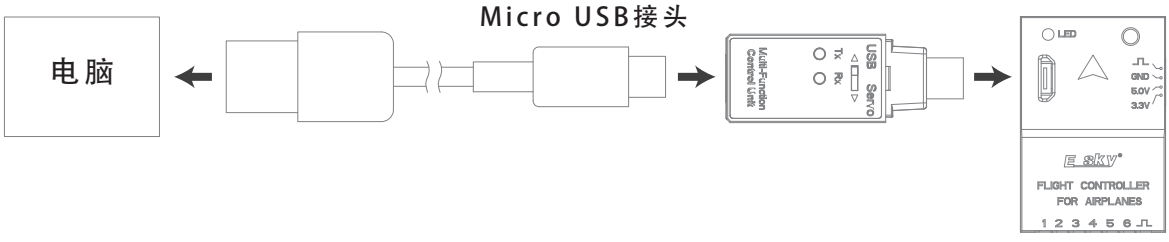
https://www.esky-rc.com.cn/manual/detail/9

☐双击FXZ程序打开飞控配置软件。

☐将连接飞控端的调参工具模块上的拨动开关调至USB端。如下图

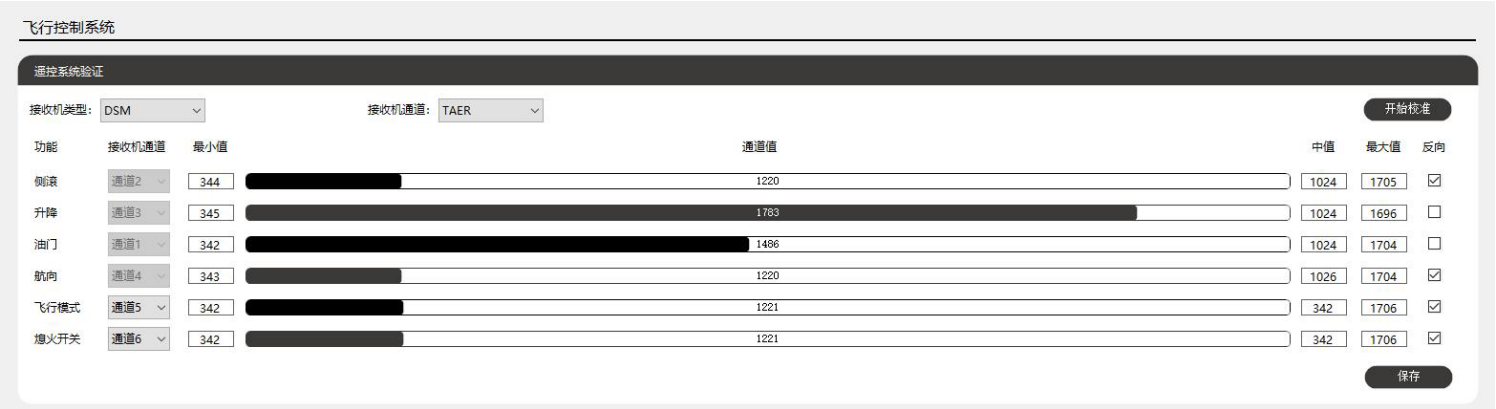


☐将飞控、调参工具与电脑连接（如下图），配置软件将自动识别并连接飞控，如未自动连接请选择正确串口后点击连接。



飞控配置

☐待配置软件界面左下角显示【飞行控制】和【姿态】后点击【飞行控制】进入【飞行控制系统】界面



☐如下图1所示根据所使用的接收机类型选择正确的接收机协议。选择完接收机协议后，系统会根据所选接收机协议自动匹配通道顺序且前四个通道是灰色字体不能修改，如下图2;如果想改动默认通道顺序，可选择【接收机通道】栏右边的【自定义】，如图3;此时所有的通道可根据需要自行匹配;然后点击【保存】。设置完成此步后，需点击【保存】按钮进行保存，待短暂显示【保存成功】并恢复到【保存】字样后，再进行下一步设置。

Figure 1

Figure 2

Figure 3

遥控器校准

遥控器校准操作如下:

在进行遥控器校准之前，请将各通道微调调整至中立位置。下面的操作是以左手油门为例:

☐ 行程校准:点击右上角【开始校准】按钮:左、右手分别按住或捏住左、右摇杆，两摇杆左边和右边均运行到左右两端极限位置(如图1所示);两摇杆上边和下边均运行到上下两端极限位置，然后松开手并让油门摇杆立于中间位置(如图2所示)。5、6通道对应的2段开关拨向前后两端最大最小位置(如图3所示)，然后点击【完成校准】。
等待系统更新结束，遥控器校准完成。

图1

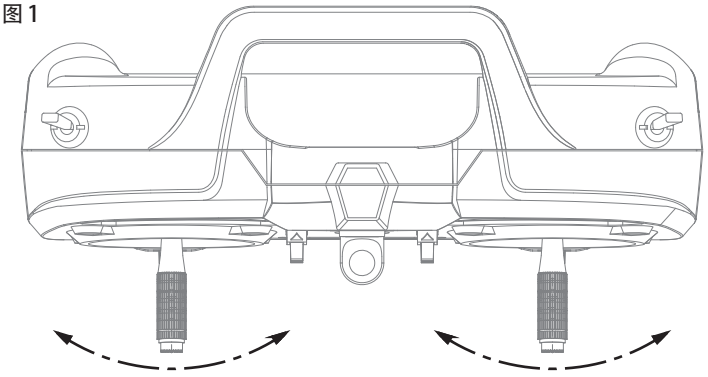


图2

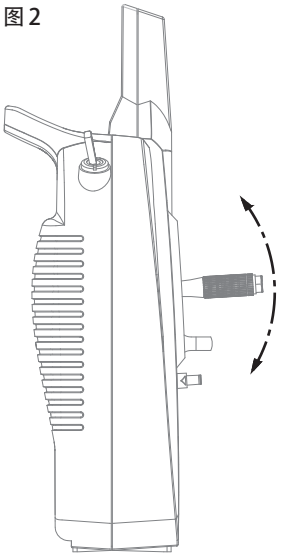
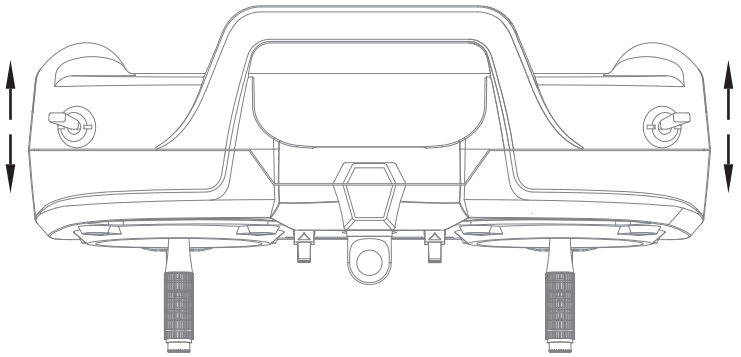
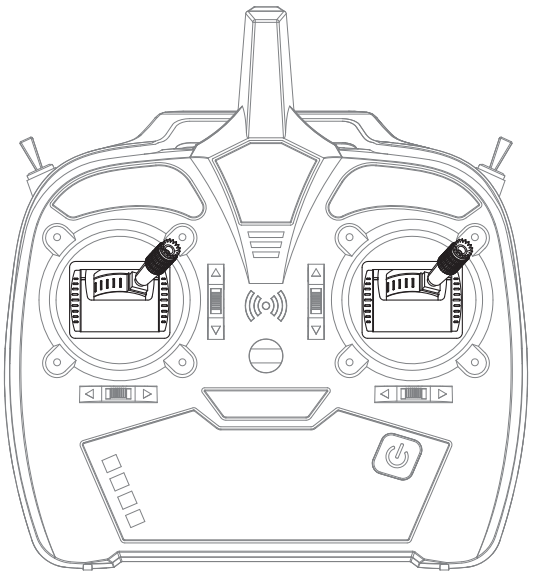


图3

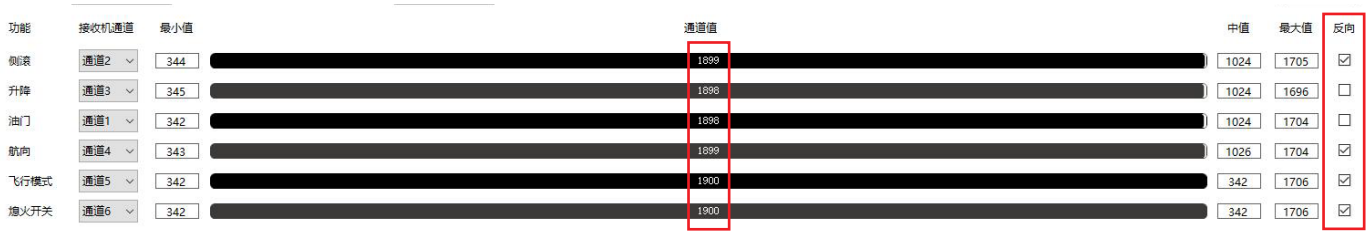


☐检查通道正反向:左、右摇杆一起拨至摇杆总成座右上角极限位置，如图4所示。

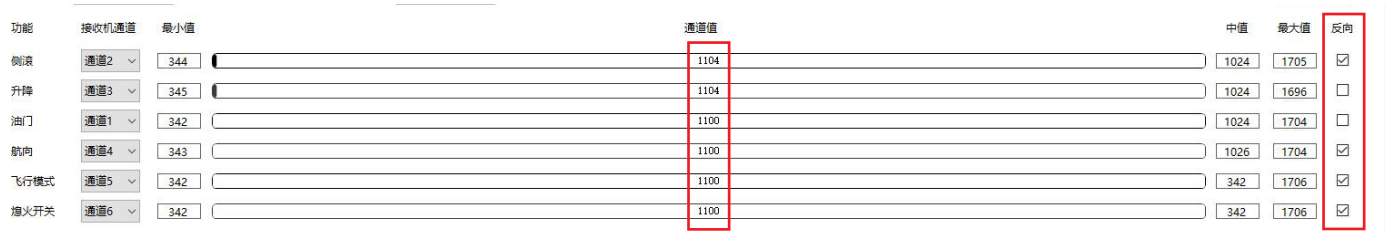


遥控器校准

此时 1、2、3、4 通道需要显示1900或是接近1900的数值。如果有显示 1100 或是接近 1100 的数值，请点击勾选此栏对应最右侧的反向方框中进行方向调整切换，并点击【保存】。如下图



如果左、右摇杆一起靠在左下角，则 1、2、3、4 通道需要显示1100或是接近 1100 的数值。如下图:



如图5所示，关于 5、6 通道，请把2个选定的2段开关全部拨向前端，此时5、6通道数据需要显示1900，如果有显示1100的，请点击勾选此栏对应最右侧的【反向】方框中进行方向调整切换，并点击【保存】。

图5

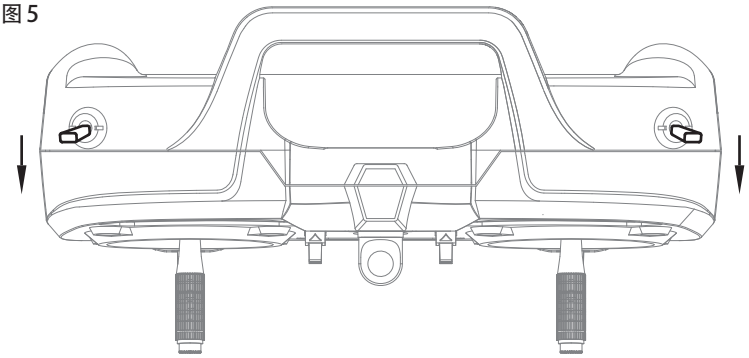
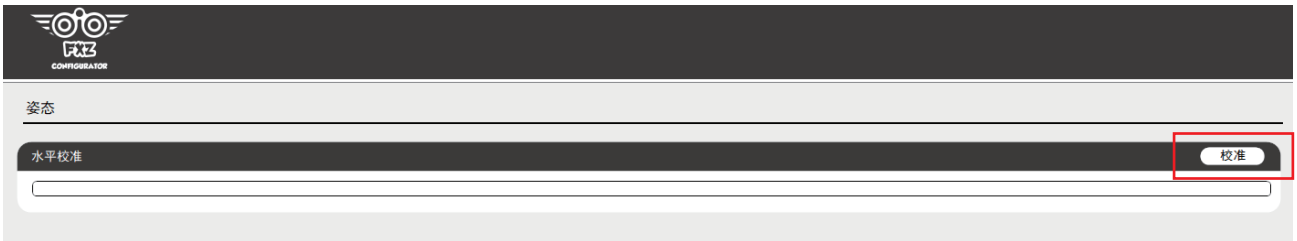


图5

飞控水平校准方法

此飞控出厂前已经做了水平校准。购买ESKY飞机带此飞控，则无需校准;如果飞机出现炸机或是多次大强度的撞击后出现了飞行姿态的明显偏差而且与飞机结构和气动损伤没有关系的，可以考虑重新校准飞控。校准时需将飞控取下放置在水平的平面操作台上并固定牢靠，再进行校准。**校准过程中飞控不能被移动。如果飞机上安装飞控的位置不平整或是有损伤，也有可能导致飞行姿态的较大偏差。**

☐使用USB数据线和调参模块连接飞控和电脑，无需打开发射机，也可不连接接收机。打开 FXZ 调参界面，点击界面左下角【姿态】模块，进入飞控水平校准界面。如下图所示:



☐点击右侧的【校准】等待校准完成
(此过程中【校准】字体为灰色，校准完成后重新变回黑色)。

自稳模式和增稳模式简单判断方法

自稳模式下（Lo），当飞机左右倾斜时，副翼舵面翘起来后不会自己回正。
增稳模式下（Hi），当飞机左右倾斜时，副翼舵面翘起来后会自己缓慢回正。

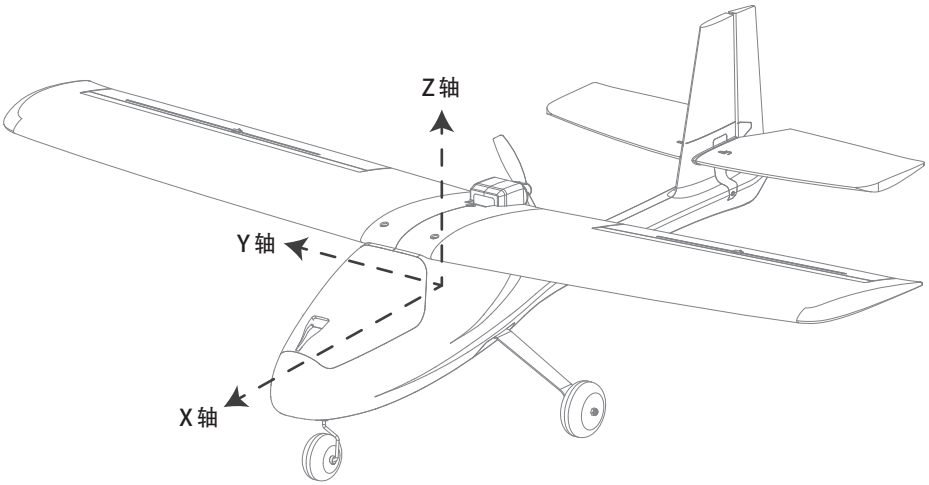
判断舵面偏转是否正确

飞机平放，将机头朝前，人站在飞机的后面，确保打开熄火开关，无动力输出

副翼: 往左偏转副翼摇杆，左边副翼往上偏转，右边副翼往下偏转;
升降: 往下拉杆，升降舵往上偏转(如果是全动平尾，则整个平尾往上偏转)
方向: 往左偏转方向舵摇杆，方向舵往左边偏转。

判断飞控系统对舵面修正方向是否正确(两种飞行模式通用)

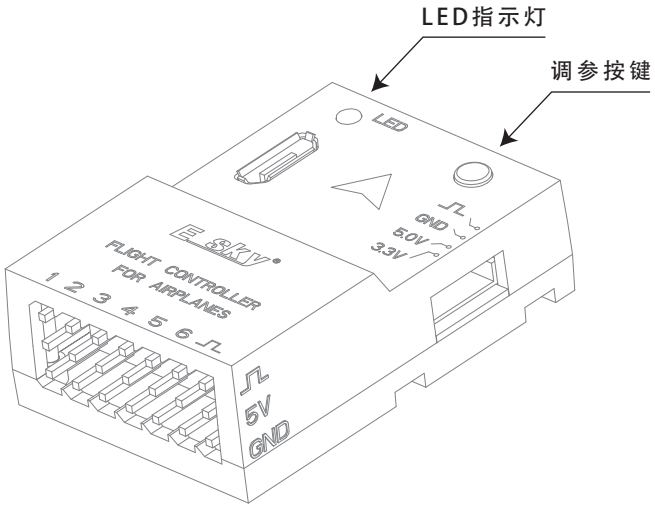
将机头朝前，人站在飞机的后面，飞机平放在手上。



副翼: 绕着机身轴线(上图中的X轴)快速的往左偏转飞机。
左边副翼需往下偏转，右边副翼需往上偏转。
升降: 绕着上图中的 Y 轴快速的将机头朝下，升降舵往上偏转。
(如果是全动平尾，则整个平尾往上偏转)，如果是机尾朝下，则修正方向相反。
方向: 绕着上图中的 Z 轴快速往左摆动机身尾部，则方向舵往左边偏转，反之亦然。

飞控按键功能简介和使用

此飞控有一个调参按键，用于对各舵面中立位较为精确的调整，
有需要的可以使用此功能。使用按键调参之前，请将遥控器各通道微 调调整至中立位置。



调参按键只有短按方式，打开发射机，给飞控通电，正常状况下LED指示灯蓝色常亮。两次按键的间隔时间不能过短，需等每一步的流程走完后在进行下一步按键操作，并且每进入一个调参状态时，LED指示灯的颜色可能是红色闪烁(表示舵机不在中立位)，紫色闪烁(表示舵机不在中立位)或是紫色长亮(舵机处于中立位置):

- ☐ 短按第一次按键并松开: 蓝灯闪烁一次，然后进入副翼舵机中立位调整状态
  (配合副翼摇杆增减操作);
- ☐ 短按第二次按键并松开: 蓝灯闪烁二次，然后进入升降舵机中立位调整状态
  (配合升降舵摇杆增减操作);
- ☐ 短按第三次按键并松开: 蓝灯闪烁三次，然后进入方向舵机中立位调整状态
  (配合方向舵摇杆增减操作);
- ☐ 短按第四次按键并松开: 蓝灯闪烁四次，然后进入襟翼通道中立位调整状态
  (配合方向舵摇杆增减操作);
- ☐ 短按第五次按键并松开: LED指示灯变为蓝色常亮，保存参数调整结束。
  (此步骤之前任一步操作，如果一分钟内不进行任何设置和动作，系统将自动退出，蓝灯常亮并且已调整的参数不会保存)

调参过程是滚动式操作，一步都不能少，需等待以上五个步骤进行完后所修改的参数才会得以保存。由于此固定翼飞机(不带襟翼和收放起落架)，襟翼通道中立位无需进行调整。

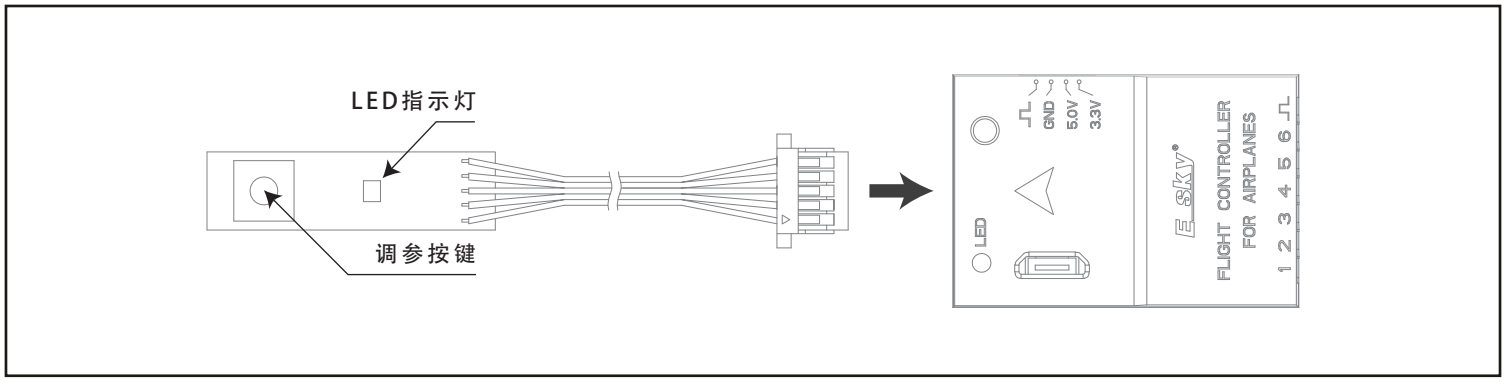
以上每步操作均通过遥控器上对应通道摇杆上下或左右摇动进行调整;如果红灯或是紫色灯闪烁的频率越来越快，说明舵面离中立点越来越远，反之则越来越近，直至灯的颜色变为紫色常亮，表示此时舵机处于中立位置。

备注：

- ☐ 以上步骤如果操作过程中出现差错混淆或是其它因素需要所有舵机重新复位的。
  可以长按“调参按键”6秒以上松开，灯的颜色变化：蓝灯常亮-紫色闪烁-蓝灯常亮。
- ☐ 如果需要对舵机摇臂或是推拉杆机械位置进行调整，可以长按“调参按键”3秒，待指示灯变为紫色闪烁后松开再按一次，指示灯的颜色变为红色闪烁，此时所有舵机回到中立位，舵面停止动作。待调整完成后再短按一下按键，指示灯恢复蓝灯常亮，所有舵面恢复正常工作状态。此操作在增稳模式和自稳模式下均可进行。

外接调参板简介和使用

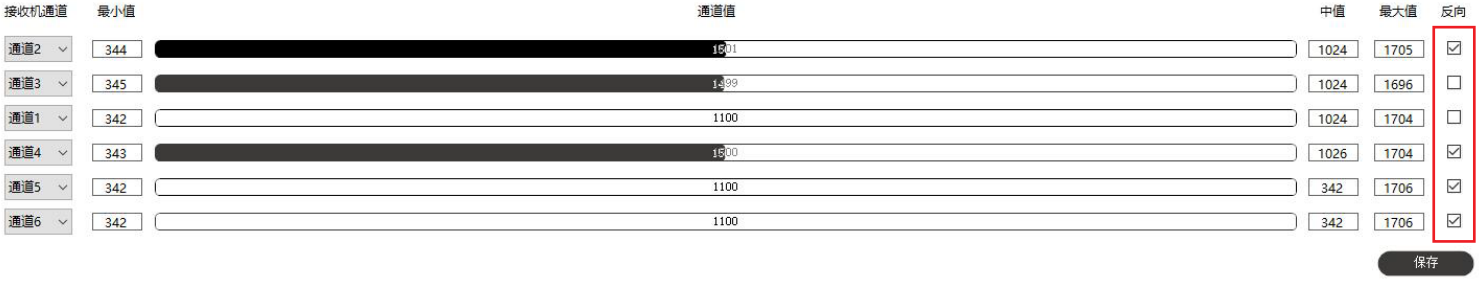
外接调参板安装于飞机机舱内部，方便直接操作调参，使用方法和步骤与飞控上的调参按键相同。如下图所示:



检查飞机动作、模式开关及熄火开关功能是否正确

注意:接收机通道会根据接收类型自动更改，如自动识别失败可手动选择正确的接收机通道，当选择自定义时请在【接收机通道】栏内手动选择各功能对应的接收机通道，修改完成后点击保存。

注意:飞控输出动作反向时可在遥控器内调整对应通道的正反向设置，如遥控器不具有调整功能，可在下图所示最右侧的 【反向】栏进行切换，完成后点击【保存】按钮。



异常及排除(如果以下方法未能解决问题，请与售后支持联系)

情况:USB 线与电脑不能正常连接
解决方法:
-检查 USB 线是否有破损或是其它问题。
-在官网上下载driver1电脑驱动安装文件夹进行安装。
-在官网上下载driver2飞控驱动安装文件夹进行安装。
如果电脑是32位系统，选择安装CP210xVCPInstaller_x86.exe 。
如果是64位系统，选择安装CP210xVCPInstaller_x64.exe 。

情况:接收机与飞控连接后飞控无输出
解决方法:
-检查接收机与遥控器是否已经对频完成。
-检查接收机工作状态和输出是否正常。
-检查接收机与飞控连线是否正确无误。
-将飞控与配置软件连接检查配置界面接收机机类型是否选择正确。
-将飞控与配置软件连接，在配置界面重新进行输入通道校准操作。

情况:飞控与配置软件无法连接
解决方法:
-检查调参工具与飞控及电脑之间是否已正常连接。
-配置软件端口选择位置是否选择了正确的串口。
-调参工具上的切换开关是否选择在 USB 位置。
-关闭并重新打开配置软件选择正确串口后再将调参工具与飞控连接。

情况:飞控输出通道与遥控器摇杆不匹配
解决方法:
-检查遥控器内摇杆及开关与输出通道之间的设置是否正确
-将飞控与配置软件连接后检查接收机通道的设置是否正确
-将飞控与配置软件连接后在接收机通道设置内选择自定义后可根据需要调整接收机通道顺序直至输出通道与遥控器匹配。(调整后需再次进行校准操作)

情况:拨动遥控器摇杆舵机输出动作与摇杆动作相反
解决方法:
-在遥控器内找到输出通道正反向设置，调整对应通道的正反向设置。
-如遥控器无法调整输出通道正反向可将飞控与配置软件连接，在飞控配置软件内勾选对应通道后面的反向勾选框并保存。

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