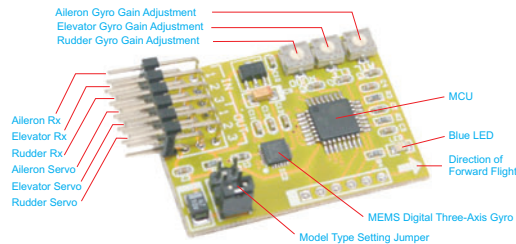Thank you for purchasing this product. S3 is a flight control board designed specifically for fixed-wing airplane, which supports 3 model types, including; Normal Airplane, Flying Wing and V-Tail. With a high-precision MEMS digital threeaxis gyro built in, it provides sound stability, flexibility and reliability by automatically correcting for channels of aileron, elevator and rudder. Small size and light weight make it more adaptable for small airplane (In our test, it can significantly improve the control on small 3D airplane with wingspan under 50 cm).

【Features】
★ Designed for 3 model types: Normal Airplane, Flying Wing and V-Tail, can be easily switched by the on-board jumper;
★ Specifically optimized to work 3D flight without undermining stability;
★ Independent gyro gain adjustment for Aileron, Elevator and Rudder;
★ Basic setting functions including stick centering and gyro reversing;
★ Smaller and lighter, more adaptable for small airplane.

【Specifications】
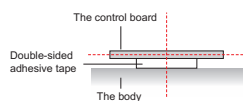Voltage Range: 4-6V DC
PWM Output: 50Hz, 1020-2020us
Full-Scale Range of Gyro: ±1000dps
Sample Rate of Gyro: 1KHz
Operating Temperature: -40℃ to 85℃
Dimensions: 30X40mm
Weight: 8g

S3 Overview

Aileron Gyro Gain Adjustment
Elevator Gyro Gain Adjustment
Rudder Gyro Gain Adjustment

Aileron Rx
Elevator Rx
Rudder Rx
Aileron Servo
Elevator Servo
Rudder Servo

MCU
Blue LED
Direction of Forward Flight
MEMS Digital Three-Axis Gyro
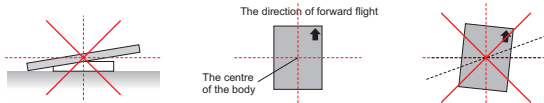Model Type Setting Jumper

【Installation & Wiring】
The board should be securely mounted in the center of the fuselage of your plane applying the provided double sided tape. Please align the white arrow with forward flight direction when mounting. Inappropriate or inaccurate installation could decrease the performance of the board or even result in complete failure.
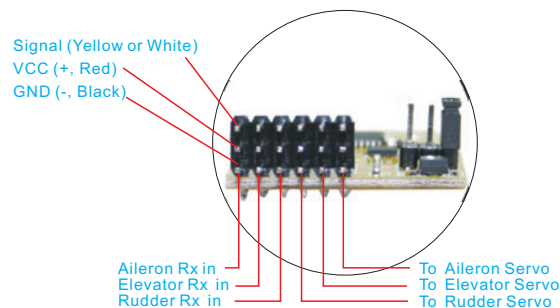
Side View

The control board
Double-sided adhesive tape
The body

Top View

The direction of forward flight
The centre of the body

After installation, connect the channels of Aileron, Elevator and Rudder from your receiver to the pins on the board marked "IN", pin 1 for aileron, pin 2 for elevator and pin 3 for rudder. VERY IMPORTANT The throttle channel need NOT be connected to the board, just connect it to the ESC or throttle servo directly. Connect the servos to the pins marked "OUT", pin1 for aileron servo, pin 2 for elevator servo and pin3 for rudder servo, you should use a Y extension cable when using 2 aileron servos. When connecting, please pay attention to the color of wires to avoid anti-plug, as shown below.

Wiring Diagram

Signal (Yellow or White)
VCC (+, Red)
GND (-, Black)

Aileron Rx in
Elevator Rx in
Rudder Rx in
To Aileron Servo
To Elevator Servo
To Rudder Servo

【Model Type Selection】
S3 has a 3-bit jumper for model type selection. Please match the type with your plane from among Normal Airplane, Flying Wing and V-Tail. VERY IMPORTANT Please restart the board to activate the selected type.
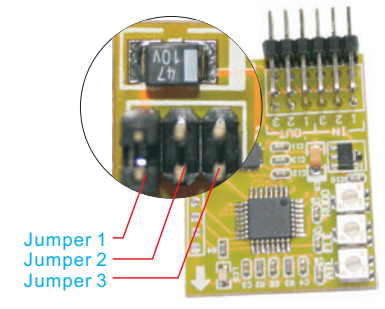
Jumper Setting Table

No.	Model Type	J1	J2	J3
1	Setting Mode	0	0	0
2	Normal Airplane ▲	1	0	0
3	Flying Wing	0	1	0
4	V-Tail	0	0	1

Notes: "0" represents "OPENED". "1" represents "CLOSED", "▲" is the default setting.
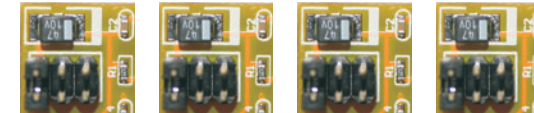
| 1. Setting mode | 2. Normal Type | 3. Flying wing | 4. V-Tail |

Jumper 1
Jumper 2
Jumper 3

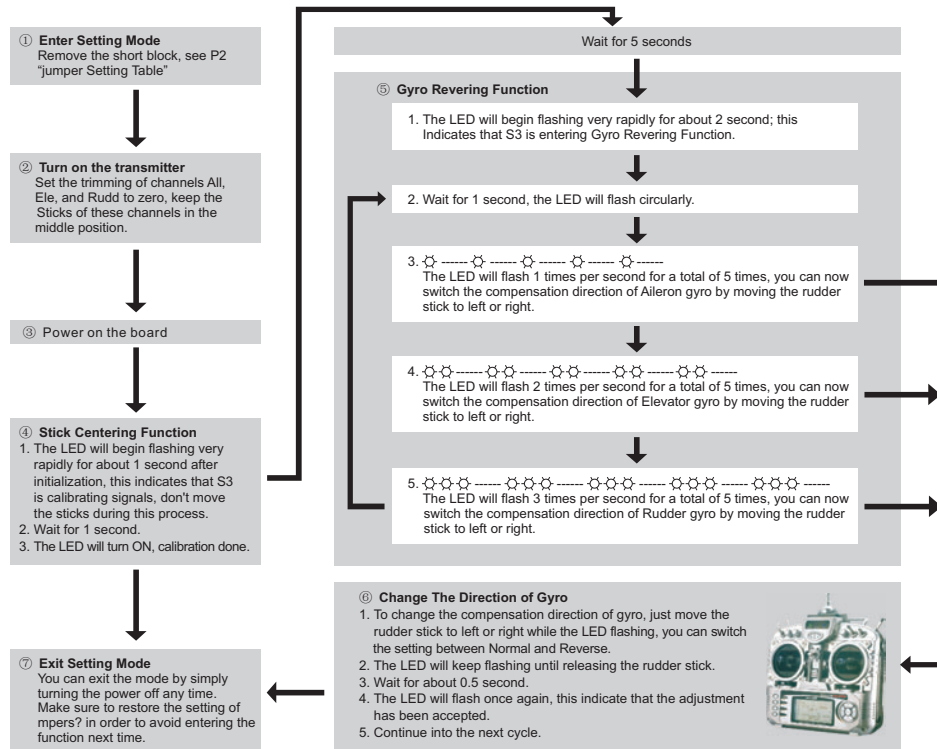## 【Gyro Compensation Direction Verification】
VERY IMPORTANT Please make sure to verify that the gyro compensates in the correct direction after first-time installation, otherwise, it might lead to losing control or even crash during flight! Power on the board, pick the plane up and check it by following the 6 steps shown below.

① Rise the head up around the pitch axis, the elevator should flap down accordingly; ② Put the head down around the pitch axis, the elevator should flap up accordingly; ③ Rotate left around the roll axis, the left aileron should flap down and the other one flap up accordingly; ④ Rotate right around the roll axis, the left aileron should flap up and the other one flap down accordingly; ⑤ Rotate right around the yaw axis, the rudder should turn left accordingly; ⑥ Rotate left around the yaw axis, the rudder should turn right accordingly.

①   ②   ③

④   ⑤   ⑥

If the gyro compensates in the incorrect direction: reverse it by following the instructions of Gyro Reversing Function within the Setting Methods section later in this manual.

【Setting Methods】

① Enter Setting Mode
Remove the short block, see P2 "jumper Setting Table"

↓

② Turn on the transmitter
Set the trimming of channels All, Ele, and Rudd to zero, keep the Sticks of these channels in the middle position.

↓

③ Power on the board

↓

④ Stick Centering Function
1. The LED will begin flashing very rapidly for about 1 second after initialization, this indicates that S3 is calibrating signals, don't move the sticks during this process.
2. Wait for 1 second.
3. The LED will turn ON, calibration done.

↓

⑦ Exit Setting Mode
You can exit the mode by simply turning the power off any time. Make sure to restore the setting of mpers? in order to avoid entering the function next time.

Wait for 5 seconds

⑤ Gyro Revering Function

1. The LED will begin flashing very rapidly for about 2 second; this Indicates that S3 is entering Gyro Revering Function.

↓

2. Wait for 1 second, the LED will flash circularly.

↓

3. ☼ ------ ☼ ------ ☼ ------ ☼ ------ ☼ ------
The LED will flash 1 times per second for a total of 5 times, you can now switch the compensation direction of Aileron gyro by moving the rudder stick to left or right.

↓

4. ☼☼ ------ ☼☼ ------ ☼☼ ------ ☼☼ ------ ☼☼ ------
The LED will flash 2 times per second for a total of 5 times, you can now switch the compensation direction of Elevator gyro by moving the rudder stick to left or right.

↓

5. ☼☼☼ ------ ☼☼☼ ------ ☼☼☼ ------ ☼☼☼ ------ ☼☼☼ ------
The LED will flash 3 times per second for a total of 5 times, you can now switch the compensation direction of Rudder gyro by moving the rudder stick to left or right.

⑥ Change The Direction of Gyro
1. To change the compensation direction of gyro, just move the rudder stick to left or right while the LED flashing, you can switch the setting between Normal and Reverse.
2. The LED will keep flashing until releasing the rudder stick.
3. Wait for about 0.5 second.
4. The LED will flash once again, this indicate that the adjustment has been accepted.
5. Continue into the next cycle.

VERY IMPORTANT To obtain the highest performance, make sure to apply the "Stick centering" function to calibrate channel range after first-time installation or application of new radio system.

【Gyro Gain Adjustment】

S3 offers 3 trimming potentiometers to adjust gyro gain of Aileron, Elevator and Rudder, clockwise for increase, anticlockwise for decrease. The most suitable volume is determined by many factors, such as fuselage size, weight and the power allocation used. We strongly suggest you put the gain at a lower volume for the first flight, and then fine tune to get the best result. The adjustment will take effect immediately without needs to restart. For your safety, please don't adjust them until all the propellers become motionless.

0%   100%
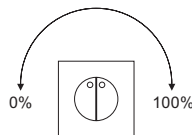
【LED Indicator Description】

Slow Flash: 1 second or longer; Fast Flash: 1/5 second or shorter; Very Rapid Flash:1/50 second or shorter.

| Colors	Way of display	Description
Blue	Flash 1 time when power on	Initialize success, type of Normal Airplane selected.
	Flash 2 time when power on	Initialize success, type of Flying Wing selected.
	Flash 3 time when power on	Initialize success, type of V-Tail selected.
	Fast circular flashing: "☼ – ☼ – ☼ – ☼ – ☼ ------"	Undefined model type, check the setting of jumper.
	Slow circular flashing: "☼ ------☼ ------"	No signal input, check whether the transmitter is on.
	Very vapid flash for 1 second	Entering the stick centering function.
	Very vapid flash for 2 second	Entering the gyro reversing function.
	Solid on	Work ready for flight.

【Supported Model Types】

① out-1 Aileron Servo
② out-1 Aileron Servo
③ out-1 Aileron Servo

Normal Airplane
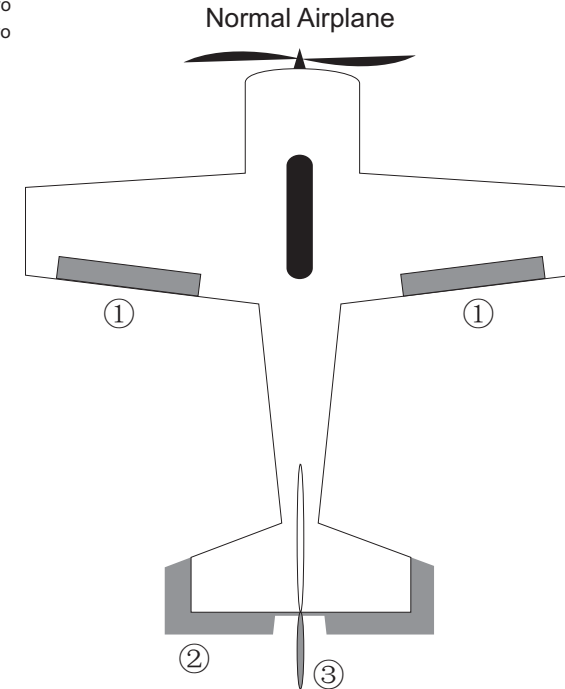
V-Tail

Flying Wing
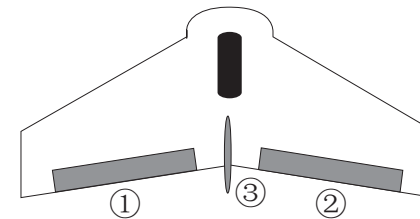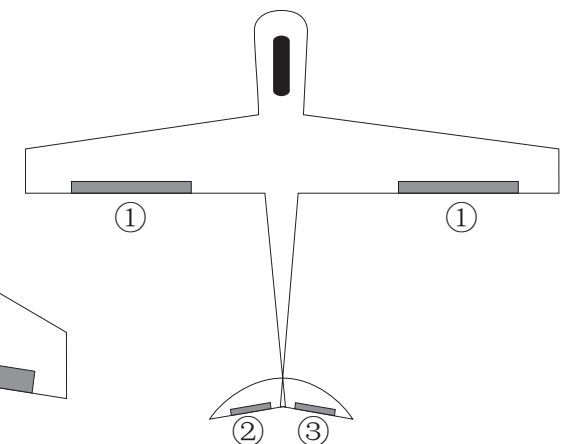
感谢购买本公司飞控系列产品，S3是我们专门为固定翼飞机设计开发的飞行增稳装置，支持普通固定翼、飞翼（三角翼）和V尾3种机型。它采用了高精度的MEMS数字三轴陀螺仪传感器，可同时对副翼、升降、方向3个通道自动进行修正，使飞机更稳定，动作更到位。另外它体积小、重量轻，特别适合小型飞机使用。经过实际测试，A3应用在翼展50cm以内的小型3D机上，可使操控性能得到极大的提高，让您轻松完成室内吊机、低空侧飞通场、快滚灯高难度动作，真正让小飞机飞出大飞机的感觉！

【功能特色】
★ 支持普通固定翼、飞翼（三角翼）和V尾3种飞机类型，通过板上的跳线开关进行选择；
★ 特别优化的特技算法，既能兼顾普通飞行的稳定性，又能充分发挥3D性能；
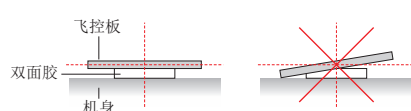★ 副翼、升降、方向三轴陀螺仪感度独立调节；
★ 提供摇杆中位校准、陀螺仪正反向等基本设置功能；
★ 体积小、重量轻，特别适合小型飞机使用。

【技术参数】
输入电压：4-6V DC，可直接使用电调的BEC供电；
输入信号：50Hz脉宽调制信号，兼容大部分遥控设备；
输出信号：50Hz、1520us PWM；
陀 螺 仪：量 程 ±1000dps、响应频率 1KHz；
工作温度：-40℃ 至 85℃；
外形尺寸：30X40mm；
重量：8g。

【安装&连线】
请使用随板附送的双面胶将飞控板尽量安装在靠近飞机的重心位置上，安装时板上的白色箭头应该指向飞行的前进方向（即机头方向），并且保证飞控板与机身平面平行，不正确或粗心的安装有可能影响飞行效果甚至无法飞行。
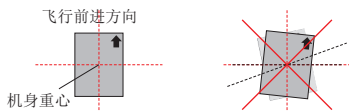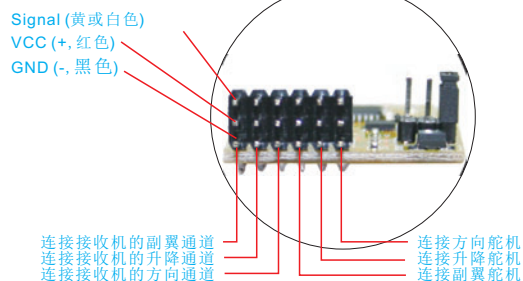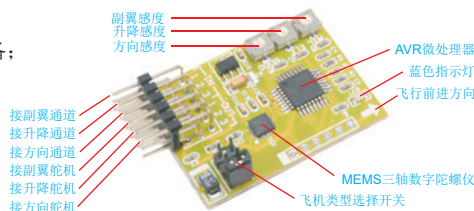
安装完成后，将接收机的副翼、升降、方向三个通道分别连接到板上标注有"IN"的排针插座上，其中"1"接副翼通道，"2"接升降通道，"3"接方向通道。非常重要，请注意！油门通道不需要连接到飞控板，直接连接电调或油门舵机即可；将副翼、升降、方向舵机分别连接至板上标注有"OUT"的排针插座上，其中"1"接副翼舵机，"2"接升降舵机，"3"接方向舵机，如果您的飞机副翼采用双舵机控制，请先用Y线连接后再与飞控板连接。接线时请注意信号线的颜色，避免插反，如下图所以：
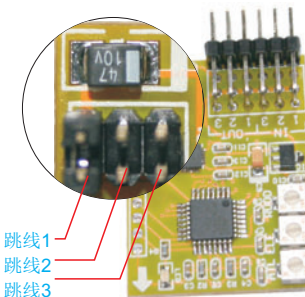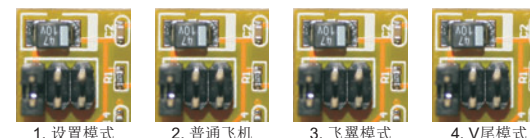

【飞机类型选择】
S3 通过一组3位的跳线开关进行机型选择，支持普通固定翼、飞翼（三角翼）、V尾3种类型，对应的跳线方法如下表所示：非常重要，请注意！ 更改跳线后，新的设置要在下次通电时才能生效！

跳线设置表
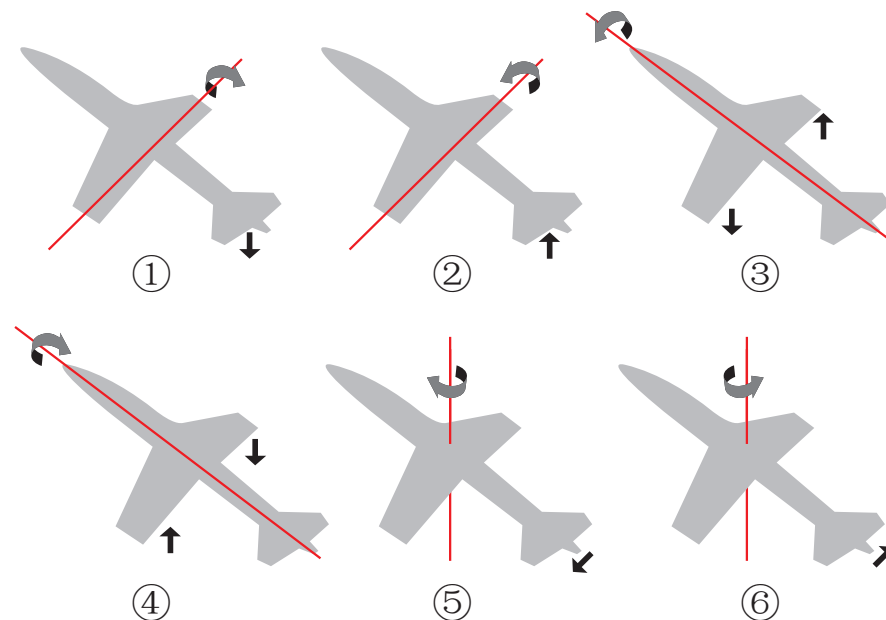| 编号	机型&模式	跳线1	跳线2	跳线3
1	设置模式	0	0	0
2	普通固定翼 ▲	1	0	0
3	飞翼（三角翼）	0	1	0
4	V尾	0	0	1

注: "0" 表示 跳线开始，"1"表示跳线短路，"▲" 为出厂默认设置。
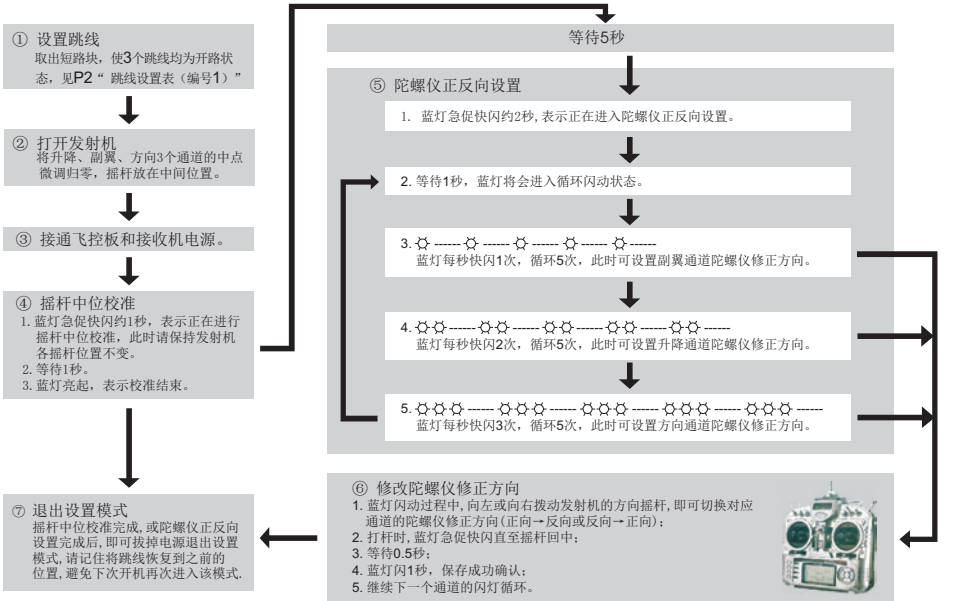
1. 设置模式　2. 普通飞机　3. 飞翼模式　4. V尾模式

【检查陀螺仪修正方向】
非常重要，请注意！安装完成后，请务必进行陀螺仪修正方向的检查，否则可能导致飞机无法控制甚至坠机！检查方法是：打开发射机和飞机电源，用手提起飞机，分别进行以下6个步骤的测试，并观察对应舵面的修正方向是否正确：

① 围绕俯仰轴将机头抬起，升降舵应该自动向下做出修正；② 围绕俯仰轴将机头降低，升降舵应该自动向上做出修正；③ 围绕横滚轴将机身向左旋转，左边副翼应该自动向下做出修正，右边则向上做出修正；④ 围绕横滚轴将机身向右旋转，左边副翼应该自动向上做出修正，右边则向下做出修正；⑤ 围绕自旋轴将机头向右旋转，方向舵应该自动向左做出修正；⑥ 围绕自旋轴将机头向左旋转，方向舵应该自动向右做出修正。

如果在检查过程中发现某个通道的陀螺仪修正方向不正确，请按照下面的"设置流程图"进行修改 。

【设置流程图】

① 设置跳线
取出短路块，使3个跳线均为开路状态，见P2"跳线设置表（编号1）"

等待5秒

② 打开发射机
将升降、副翼、方向3个通道的中点微调归零，摇杆放在中间位置。

⑤ 陀螺仪正反向设置
　1. 蓝灯急促快闪约2秒，表示正在进入陀螺仪正反向设置。

③ 接通飞控板和接收机电源。

　2. 等待1秒，蓝灯将会进入循环闪动状态。

④ 摇杆中位校准
　1. 蓝灯急促快闪约1秒，表示正在进行摇杆中位校准，此时请保持发射机各摇杆位置不变。
　2. 等待1秒。
　3. 蓝灯亮起，表示校准结束。

　3. ☆ ------ ☆ ------ ☆ ------ ☆ ------
　　蓝灯每秒快闪1次，循环5次，此时可设置副翼通道陀螺仪修正方向。

　4. ☆☆ ------ ☆☆ ------ ☆☆ ------ ☆☆ ------
　　蓝灯每秒快闪2次，循环5次，此时可设置升降通道陀螺仪修正方向。

　5. ☆☆☆ ------ ☆☆☆ ------ ☆☆☆ ------ ☆☆☆ ------ ☆☆☆ ------
　　蓝灯每秒快闪3次，循环5次，此时可设置方向通道陀螺仪修正方向。

⑦ 退出设置模式
摇杆中位校准完成，或陀螺仪正反向设置完成后，即可拔掉电源退出设置模式，请记住跳线恢复到之前的位置，避免下次开机再次进入该模式。

⑥ 修改陀螺仪修正方向
　1. 蓝灯闪动过程中，向左或向右拨动发射机的方向摇杆，即可切换对应通道的陀螺仪修正方向（正向→反向或反向→正向）；
　2. 打杆时，蓝灯急促快闪直至摇杆回中；
　3. 等待0.5秒；
　4. 蓝灯闪1秒，保存成功确认；
　5. 继续下一个通道的闪灯循环。

特别提醒 第一次使用S3，或者更换了新的遥控设备后，请进行一次"摇杆中位校准"，避免不同遥控设备之间信号差异的影响。

【感度调节】

S3提供三个微调电位器可分别对副翼（AIL）、升降（ELE）、方向（RUDD）三个通道的陀螺仪感度进行调节，逆时针旋转感度减小，顺时针则感度增大. 由于不同机型对感度的要求不同，我们建议您试飞时先将感度调低，然后在试飞过程中进行微调，如果发现陀螺仪修正效果不明显，应逐渐加大感度，如果发现飞机在飞行中围绕某个旋转轴来回抖动，则应降低相应通道的感度，直至将三个感度都调节到最合适的位置. 感度调节立即生效，不需要断电重启，为了您的安全，请在确认螺旋桨停止转动后再进行调节.
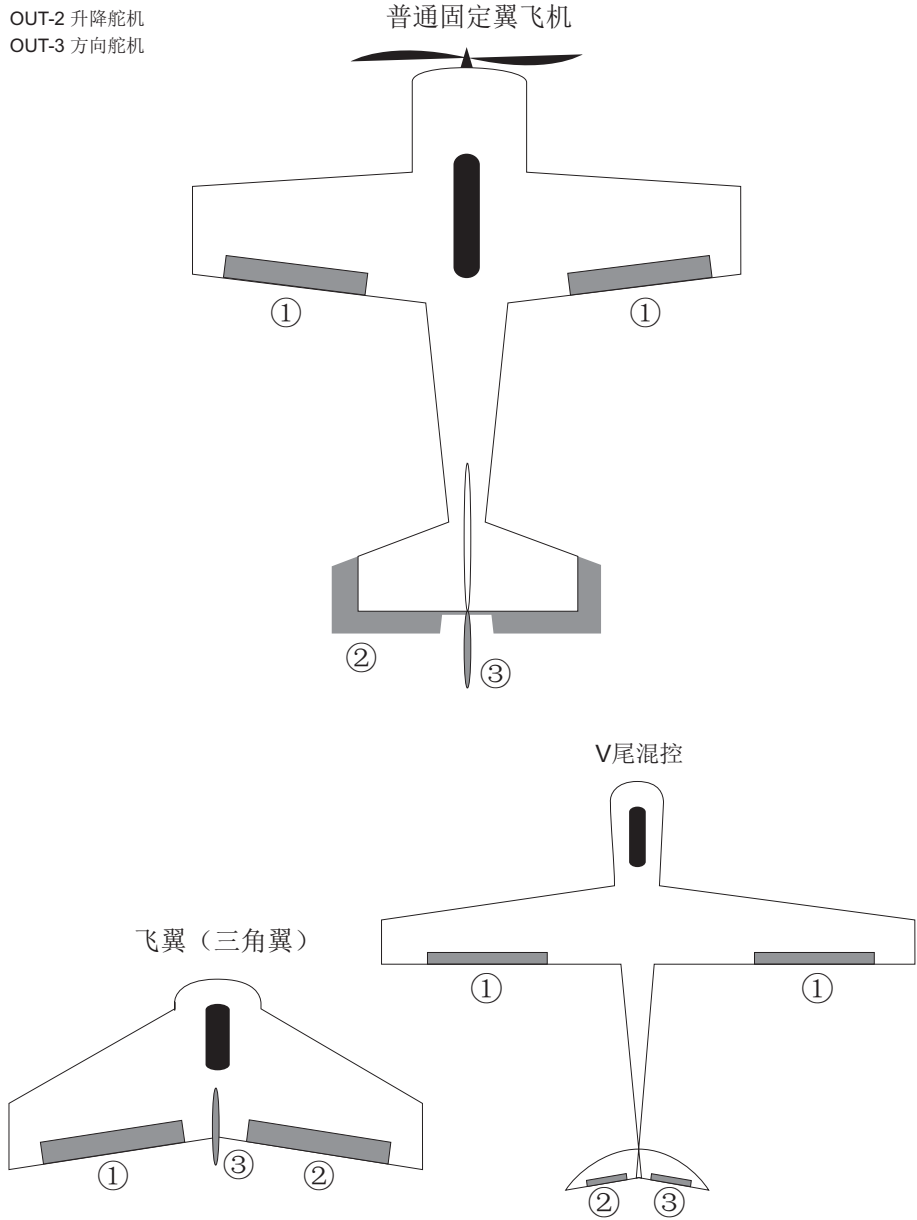
0%　　100%
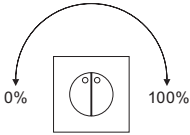
【指示灯】

颜色	闪灯方式	含义
蓝色	开机快闪1次	初始化成功，当前机型为"普通固定翼"
	开机快闪2次	初始化成功，当前机型为"飞翼（三角翼）"
	开机快闪3次	初始化成功，当前机型为"V尾"
	循环快闪 "☆ — ☆ — ☆ — ☆ — ☆ —"	未定义的飞机类型，请检查跳线设置是否正确
	循环慢闪 "☆ ------ ☆ ------ "	未检测到接收机信号，请检查发射机是否打开
	急促快闪持续约1秒	进入摇杆中位校准设置程序
	急促快闪持续约2秒	进入陀螺仪正反向设置程序
	常亮	正常工作，可以起飞

注：急促快闪的间隔约为50毫秒，快闪的间隔约为200毫秒，慢闪的间隔约为1秒。

【S3支持的机型】

① OUT-1 副翼舵机
② OUT-2 升降舵机
③ OUT-3 方向舵机

普通固定翼飞机

V尾混控

飞翼（三角翼）

注：副翼使用双舵机控制时请先使用Y线连接后再接到飞控板的OUT-1上。