E51 V2 3-AXIS AIRPLANE GYRO

3-AXIS GYRO FUNCTION INSTRUCTION AND USER MANUAL

| EN | 1~7 |
| 中 | 8~14 |

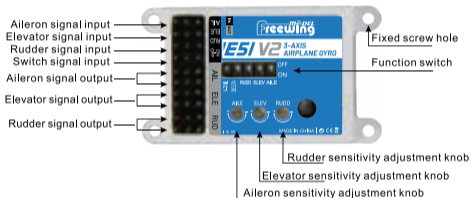freewing MODEL
www.sz-freewing.com

MADE IN CHINA

Thank you for using our Freewing 3-axis gyro, which is designed and developed only for the fixed-wing airplanes. It can automatically calculate the movement of aileron/elevator/rudder, rear output compensation to the corresponding channel to maintain its stable flight. Add the gyro, it control more precise and stable,it allows you to fly easier and calmly. Beautiful and sturdy plastic box with 4 pcs screws, it fixed the gyro more reliable in order to prevent any damage since gyro fall off. In function, it supports the aeroplane, delta wing(trianguler wings), V-tail plane. Please read the user manual carefully before starting.

Gyro Diagram

Aileron signal input
Elevator signal input
Rudder signal input
Switch signal input
Aileron signal output
Elevator signal output
Rudder signal output

Fixed screw hole
Function switch

Rudder sensitivity adjustment knob
Elevator sensitivity adjustment knob
Aileron sensitivity adjustment knob

Functions

1. Stability augmentation of aircraft : It can automatically calculate the movement of aileron/elevator/rudder, rear output compensation to the corresponding channel to maintain its stable flight, enhance its wind resistance and reduce the stall problem, it fly easier in level flight, inverted flight, side flight, 3D flight… and don't affect planes' handling, let it fly more smoothly.

2. It supports kinds of normal aeroplane, delta wing plane, V-tail plane…etc.The factory default is normal aeroplane mode.

3. Multi-channel output, aileron/elevator/rudder have two independent output channels, it can set up positive and negative correction independently, it also can connect two aileron/elevator/rudder servo simultaneously to achieve more control way.

4. Independent sensitivity adjustment Aileron、elevator、rudder have its independent sensitivity adjustment knob, it can adjust the best sensitivity which match with airplane.

5. 5-digit DIP switcher, the setup of gyro function become simple and convenient.

6. Controlling function of flight manual is used through the channel of on/off on the remote control to control the start function. In flight, flight manual control is able to be achieved by this switch so that you can feel the flight functions of plane whether it is controlled or not, you can enjoy the flight with gyro or without gyro.

7. Red LED light and blue Led light, very easy to distinguish the working mode and status.

8. Light weight, small size, can be used for many airplanes, screw lock fixation is more reliable, very good to prevent the crash of flight cause gyro fall off.

Technical Parameters

1. Dimension：As the following photo shown

2. Weight：12g

3. Voltage：4.8-8.4V

4. Current：50mA(max)

5. Gyro：2000 d/s

6. Input signal：50HZ pwm

7. Output signal：50HZ pwm

8. Working temperature：-40 ~ +80℃
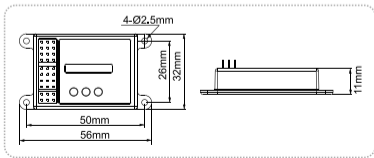
LED Light Instruction

1. Power on indication Proces:

   Red Led light flash 5 times quickly.(gyro is locking now, please make sure the airplane is in static), then red LED light become to continuous light. Now the gyro finish its lock, and work normally.

2. Radio channel indication:

   Red LED continuous light means radio channel turn on. Now the gyro work normally. (you can shake airplane to check gyro function), Red Led light off means turn off the gyro channel in radio, now the gyro don't work.

3. Blue LED light indication:

   Blue LED light off means normal aeroplane working mode. Blue LED light flash means turn on the delta plane mode. Blue LED continuous light means turn on the V-tail wing control mode. Delta plane and V-tail plane can't open at the same time.

DIP Switch Function Setup

Before power on, please refer to the following photo to set up the corresponding function.After power on, it also can change freely, gyro will real time read the DIP switch and through red/blue LED light show its condition, Set the corresponding models and features, and test each channel can output correctly.
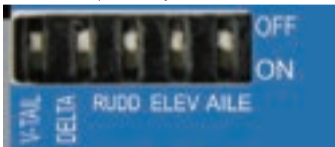
1. V-tail denote the V-tail plane function, Delta plane (triangular wings) denote the Delta plane function.We can use DIP switch to control the two functions on/off. (Note: the two functionn can't switch on in the same time.) When the two function are off, means its in airplane function.

2.RUDD, ELEV, AILE, the three pcs DIP switch denote the positive/reverse switch of output signal of rudder/elevator/aileron.

Gyro Sensitivity Adjustment

Gyro output sensitivity set-up is as the following photo shown:
Clockwise rotation, sensitivity increases. counterclockwise rotation, sensitivity decreases.

Gyro Adjustment

Aileron turn left during flight Aileron correction diagram	Aileron turn right during flight Aileron correction diagram
Turn left the roll axis in flight, please pay attention of left/right aileron adjustment directions as the photo shown, the arrow direction is correct direction.If action is not correct, it should be re-set.	Turn right the roll axis in flight, please pay attention of left/right aileron adjustment directions as the photo shown, the arrow direction is correct direction.If action is not correct, it should be re-set.

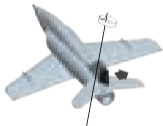Nose-down in flight
Elevator correction diagram

Rotate the pitch axis upwards and pay attention to the adjustment direction of the elevator as the photo shown. the arrow direction is correct direction. If action is not correct, it should be re-set.

Nose-up in flight
Elevator correction diagram

Turn downwards the pitch axis and pay attention to the adjustment direction of the elevator as the photo shown. the arrow direction is correct direction.If action is not correct, it should be re-set.
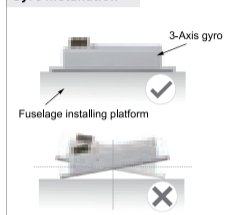
Turn left in flight
Rudder correction diagram

Turn left the rotation axis, and pay attention to the adjustment direction of the rudder as the photo shown. the arrow direction is correct direction. If action is not correct, it should be re-set.

Turn rightin flight
Rudder correction diagram

Turn right the rotation axis, and pay attention to the adjustment direction of the rudder as the photo shown. the arrow direction is correct direction. If action is not correct, it should be re-set.
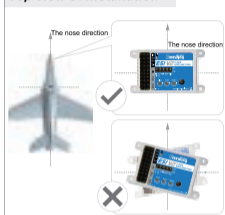
Gyro Installation

Gyro can install on the front or the back of the plane. Before install, please note the sticker on the back of gyro, it printed a plane pattern. When install on the gyro, you should check the plane nose cone of gyro sticker, it should

be toward the direction of airplane nose cone. And install it in the center of airplane (it also can install on the battery compartment), put it flat and screw it on the plane. If there is any loosen in flight, it may cause the airplane out of control.
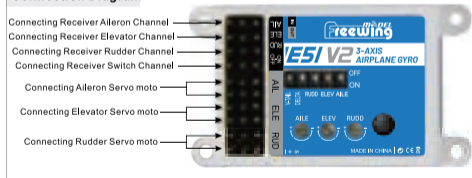
Gyro Installation

3-Axis gyro

Fuselage installing platform

Top View Of Installation

The nose direction

The nose direction

Connection Diagram

Connecting Receiver Aileron Channel
Connecting Receiver Elevator Channel
Connecting Receiver Rudder Channel
Connecting Receiver Switch Channel

Connecting Aileron Servo moto

Connecting Elevator Servo moto

Connecting Rudder Servo moto

Freewing

E51 V2 3-AXIS AIRPLANE GYRO

OFF
ON

AILE   ELEV   RUDD

MADE IN CHINA

First Use Precautions

1. Before power on, please read the user manual carefully.

2. Check the connection line direction、 position of channels are correct, check the position of DIP switch is correct.

3. Put the airplane in steady, and prevent shaking. Then power on, make sure the gyro lock successfully. When gyro is locking, the airplane must remain still. If the wind is strong, the best way is to place it onto stable and secure place.

4. Check the radio switch is normal, when gyro power on, red LED light should be continuous light. Shaking the plane, gyro will output the revising rate for aileron、elevator、rudder、flap. Gyro power off, red LED light should be off. Shaking plane, gyro don't output.

5. Gryo use state examination.Please refer to DIP switch set-up instruction, check the switch position, the flight mode is your want .If not, please revise to the desired mode.

6. Radio signal output examination.Firstly, use radio to check the control direction of aileron/elevator/rudder is correct. If not correct, please set up the positive、negative of radio channels, till the control direction is correct.

7. Gyro correction signal output examination. Refer to the gyro adjustment introduction, check carefully that the direction of output signal of each channels is correct. If not correct, toggle the DIP switch of corresponding revision direction, set up the direction is correct. This is very important. Wrong revision direction will let plane out of control. If happen like that, you need to power off the gyro and landing.

8. Delta plane use aileron and elevator to mix. V-tail plane use elevator and rudder to mix. Radio don't need to set up its mix. Mix output need gyro to finish.

9. Gyro sensitivity adjustment. Sensitivity is that gyro adjust the control strength on the airplane. Clockwise rotation, sensitivity increases. counterclockwise rotation, sensitivity decreases. Usually we advise to adjust the gyro in 1/2 or 1/3,and then adjust it slightly as required. If you feel the airplane jitters greatly, adjust the sensitivity smaller to counterclockwise slightly and fly again. If no jitters in flight, adjust the sensitivity clockwisely to obtain optimal performance.The higher degree the gyro turns clock wisely, the greater the sensitivity. Different plane need different augmentation ,it need you practice in flight.
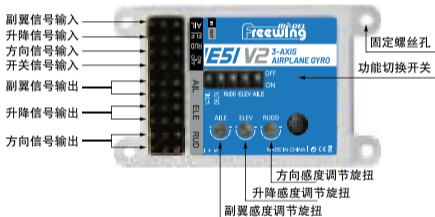
Packing List

1.Gyro	(1pcs)	4.Screwdriver	(1pcs)
2.Connection line	(4pcs)	5.Manual	(1pcs)
3.Screw	(4pcs)	6.Double-sided tape	(1pcs)

　　感谢您使用飞翼模型的这款 3 轴陀螺仪，这是一款专门为固定翼飞机而设计开发的飞控设备，它能自动对固定翼飞机的副翼、升降、方向三个轴的运动做计算，实时输出补偿舵量到相对应通道，以保持飞行姿态的相对平稳，使操控更加精准、平稳，以达到辅助飞行的目的，它能让您的飞机飞起来更加轻松、从容。

　　专用的塑料外壳精美而坚固，外加 4 个可以固定的螺丝孔，能让陀螺仪固定的更可靠，很好的防止飞行中因为陀螺仪脱落而造成的炸机问题。功能方面支持普通固定翼飞机、3 角翼飞机（飞翼）和 V 尾控制的飞机，首次使用请仔细阅读说明书内容。

E51面板介绍

副翼信号输入
升降信号输入
方向信号输入
开关信号输入

副翼信号输出

升降信号输出

方向信号输出

固定螺丝孔
功能切换开关

方向感度调节旋扭
升降感度调节旋扭
副翼感度调节旋扭

E51型3轴陀螺仪功能介绍

1. 飞行增稳——陀螺仪自动对副翼、升降、方向三个通道做补偿调整，使飞机比较平稳飞行，增强抗风能力，减少失速问题，平飞、倒飞、侧飞、3D飞行等变得轻松，却不会对飞机的操控性带来影响，让飞行得心应手。

2. 支持各种类型的普通固定翼飞机，3角翼飞机（飞翼），V尾控制等飞机，出厂默认是普通固定翼飞机模式。

3.多通道输出功能，副翼、升降、方向分别各有两个独立的输出通道，可独立进行正反修正设置，可以同时接两个副翼、升降、方向舵机，可实现更多的控制方式。

4.独立的感度调节，副翼、升降、方向三个通道分别有独立的感度调节旋钮，可调节到和飞机最好的匹配感度。

5.5位拨码开关，让陀螺仪的功能设置变得简单方便。

6.飞行控制开关，利用遥控器上的开关通道来控制陀螺仪的功能是否开启，在空中飞行时，可以通过这个开关来控制陀螺仪开启或者是关闭，让你随时体验有无陀螺仪时的飞行感觉。

7.红蓝两个工作LED灯，方便区分陀螺仪的工作模式和状态。

8.重量轻，尺寸小巧，可通用很多的固定翼飞机，螺丝锁式固定更可靠，很好的防止飞行中陀螺仪脱落而造成的炸机问题。

技术参数

1. 外形尺寸：见下图
2. 重量：12g
3. 电压：4.8~8.4V
4. 电流：最大50MA

5. 陀螺仪：2000度/s
6. 输入信号：50HZ PWM
7. 输出信号：50HZ PWM
8. 工作温度：−40 ~ 80℃
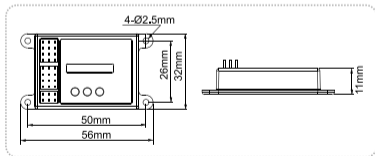
LED灯指示说明

1.上电开机指示流程：红灯快速闪烁5次（陀螺仪锁定中，请保证飞机处于静止状态），然后红灯常亮，此时陀螺仪锁定完成，可正常工作。

2.遥控器开关指示：红灯常亮表示遥控器开关打开，此时陀螺仪正常工作（这时候可以摇动飞机看看，各舵面应该有陀螺仪的修正舵量输出），红灯熄灭表示遥控器开关关闭，此时陀螺仪不工作。

3.蓝灯功能指示：蓝灯不亮表示当前是普通固定翼飞机工作模式，蓝灯闪烁表示开启3角翼飞机模式，蓝灯常亮表示开启V尾控制飞机模式，3角翼模式和V尾模式不能同时开启，否侧没有功能.

拨码开关设置

　　通电前请按下图（产品贴纸上面也有明显标示）设置好对应开关功能，通电后也可随意改动，陀螺仪会实时读取读取拨码开关状态，并通过红、蓝两个LED灯来表示，设置好对应的机型和功能，并测试各通道输出正确即可飞行。

1.“V–TAIL”及“DELTA”分别表示“V尾”及“三角翼”功能，我们可以通过拨码开关来控制这二个功能的开启和关闭（注意：这二个功能不能同时开启）；当这二个功能处于关闭“OFF”状态时，表示飞机为常规飞行布局；

2.“RUDD”、“ELEV”、“AILE”这3个拨码开关，分别表示“方向”、“升降”、“副翼”输出信号的正反向切换；

陀螺仪感度调试

陀螺仪输出感度设置如下图：顺时针旋转感度加大，逆时针旋转感度减小。
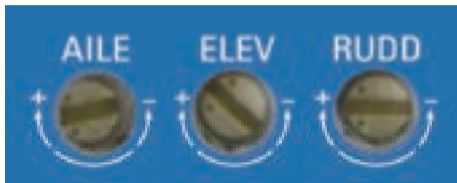
陀螺仪修正说明

飞行中副翼左转 ---- 舵面修正图示	飞行中副翼右转 ---- 舵面修正图示
当横滚轴向左旋转时，请注意左、右二侧副翼如上图箭头方向所示进行纠正，如动作不正确，应当重新设定。	当横滚轴向右旋转时，请注意左、右二侧副翼如上图箭头方向所示进行纠正，如动作不正确，应当重新设定。

飞行飞机低头时 ——— 舵面修正图示

当俯仰轴向上旋转时，请确认升降舵面如上图箭头方向所示进行纠正，如动作不正确，应当重新设定。

飞行中飞机抬头时 ——— 舵面修正图示

当俯仰轴向下旋转时，请确认升降舵面如上图箭头方向所示进行纠正，如动作不正确，应当重新设定。
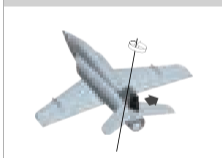
飞行中飞机左转弯时 —— 舵面修正图示

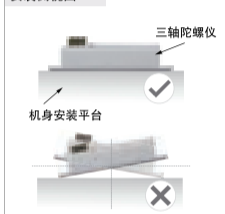当自转轴向左旋转时，请确认升降舵面如上图箭头方向所示进行纠正，如动作不正确，应当重新设定。

飞行中飞机左转弯时 —— 舵面修正图示
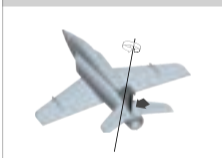
当自转轴向右旋转时，请确认升降舵面如上图箭头方向所示进行纠正，如动作不正确，应当重新设定。

陀螺仪安装

陀螺仪可以安装在飞机的正面或者是反面，安装陀螺仪时，陀螺仪贴纸的飞机图示的机头方向请朝向模型飞机的机头方向，尽量安装在飞机的中心（也可安装在电池仓中），将陀螺仪放平、摆正锁紧在飞机上，如果飞行中松动有可能会造成飞机失控。
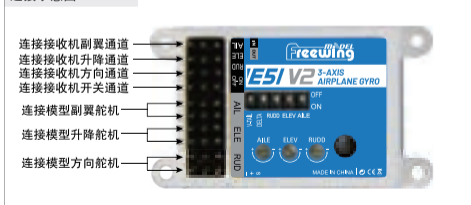
安装侧视图

三轴陀螺仪

机身安装平台

安装俯视图

机头方向

机头方向

连接示意图

连接接收机副翼通道

连接接收机升降通道

连接接收机方向通道

连接接收机开关通道

连接模型副翼舵机

连接模型升降舵机

连接模型方向舵机

首次使用注意事项

1.通电前请先仔细阅读说明书。

2.检查每个通道的连接线方向、位置是否正确，拨码开关的位置是否正确。

3.请将飞机放置在稳定的地方，防止抖动，再上电，保证陀螺仪锁定成功，陀螺仪在锁定的时候飞机必须静止，如果风较大，最好将飞机放置在风小的地方通电。

4.检查遥控器开关是否正常，陀螺仪开启时，红色LED灯常亮，摇动飞机，各舵面应该有陀螺仪的修正舵量输出。陀螺仪关闭，红色LED灯熄灭，摇动飞机，各舵面无陀螺仪的修正舵量输出。

5.陀螺仪使用时物态检查，请参阅拨码开关功能设置说明，核对开关位置是否是在您所需要的飞行模式上面，如果不是请修改到自己所需要的模式。

6.遥控器控制信号输出检查，在每一组遥控器检查副翼、升降、方向的控制方向是否正确，如果不正确，请设置遥控器里面的通道方向，直到各个通道控制方向正确。

7.陀螺仪修正信号输出检查，请仔细按照陀螺仪修正调试中的介绍，认真检查各通道输出修正信号方向是否完全正确，如果不正确，请拨动相对应的修正方向拨动开关，设置到方向完全正确，这点非常重要，错误的修正方向会让飞机无法操控，出现这种情况需快速关闭陀螺仪并降落飞机重新设置。

8.3角翼（飞翼）使用副翼和升降来混控，V尾使用升降和方向来混控，遥控器不需要设置混控，混控输出由陀螺仪完成。

9.感度调节，感度是陀螺仪对相关舵面修正强度的调节，顺时针旋转感度加大，逆时针旋转感度减小，一般建议先调节先调节在1\2或者1\3处，根据飞行情况再来微调一下，如果飞行中飞机哪个舵面出现比较震的，那就要将相应舵面的感度调小一些，再飞行看看，如果没有抖晃的舵面可以将感度调大一些，直到自己感觉最好的效果。感度越大飞机越容易出现抖晃，感度越小增稳效果就越小，不同的飞机需要的增稳效果大小不同，这个需要您飞行中调节感度来体会。

包装清单

1.陀螺仪一个   4.螺丝刀一把(感度调节用)

2.连接线四根   5.说明书一份

3.螺丝(PA2.6*6mm)4颗   6.EVA海绵贴纸一块