

Version No.:EG01-V01

# FreewingGuard

## 6 Axis Gyro | Instruction Manual

飞翼卫士 | 型六轴陀螺仪

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**Freewing** M DEL  
www.sz-freewing.com

MADE IN CHINA



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## ( I ) . Freewing Guard 6 Axis Gyro I function introduction

- 1.The Freewing Guard EG01 gyro can automatically adjust the three channels of aileron, elevator, and rudder in real time to make the aircraft fly more smoothly, enhance stability during windy flight conditions, and overall enhance a pilot's flying experience. Level flight, inverted flight, side flight, 3D flight, and more maneuvers become easier to accomplish while maintaining core user control.out of position during flight.
- 2.Various types of flight configurations are supported by the EG01, including ordinary fixed-wing, delta-wing aircraft (flying wing). The factory default model is set for a standard single wing, fixed-wing aircraft.
- 3.The EG01 gyro also supports multi-channel output function, include the channels of aileron, elevator, rudder, gyro on/off.
- 4.The visual settings interface of the mobile APP allows for downloading and storing preset flight parameters or setting relevant parameters separately.
- 5.Functions of the gyro can be changed in real time using the pilot's radio transmitter. When flying in the air, you can use this switch to control the various functions, allowing you to experience and evaluate different control configurations.
- 6.Flight mode indicator LED light, timely grasp the current working mode. (Green - Basic gain mode, blue - Auto Level gain mode, white - gyro off)
- 7.Designed with low weight and small physical size, the gyro can be used in many fixed-wing aircraft without major modification.

## ( II ) .Precautions for Initial Startup

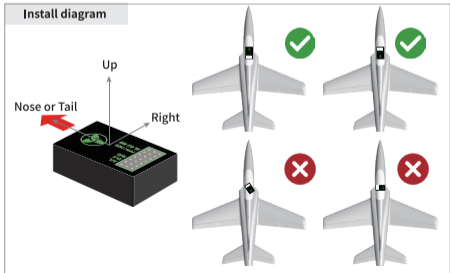
- 1.Please read the instructions carefully before powering on the FreewingGuard gyro for the first time.
- 2.Verify that the direction and position of the connection line of each channel are correct.
- 3.Position the aircraft in a stable place to prevent it from shaking, and then turn on the power to ensure that the gyro is fully initialized.
- 4.Visually inspect the gyro's LED indicators to confirm the gyro is in the intended Mode that you want to use.
- 5.To check the control signal output of the remote control, first use the remote control to check whether the control directions of the ailerons, elevator, and rudder are correct. If they are not correct, set the channels in the remote control to be positive or negative until the control directions of each channel are correct. Your finger's inputs from your radio control/transmitter must correspond correctly to the movements of the aircraft's control surfaces for the gyro's inputs to compliment your inputs.

6. To check the output of the gyro correction signal, please carefully follow the introduction in the direction of the gyro correction, carefully check whether the direction of the output correction signal of each channel is completely correct. If not, please change the corresponding correction direction and set it to the correct direction. Failure to configure the gyro's control surface direction properly will result in a crash. The Delta Wing (flying wing) Mode uses ailerons and elevators for mixing. The remote control does not need to be set to mixing. The mixing output is done by the gyro. Set the Model Type in your radio transmitter to Normal Wing configuration, so that it does not compete with the FreewingGuard gyro's onboard mixing software.

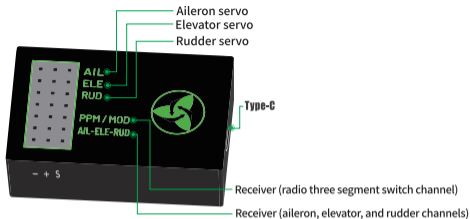
7. "Gain" describes the amount of sensitivity with which the gyro reacts in physical movement of your aircraft in flight. If gain is set too low, the gyro will not influence your aircraft's flight. If gain is set too high, the gyro will overreact to each motion of the aircraft. It is important for the user to adjust the amount gain to achieve their preferred balance between under-sensitivity and over-reaction. It is generally recommended to adjust it at 40-50 first, and then fine-tune it according to the flight situation. If the aircraft control surface shakes more severely during flight, then reduce the sensitivity of the corresponding control surface and test it again. The higher the gain, the more likely the aircraft will shake, and the smaller the gain, the smaller the stabilization effect. Different aircraft require different stabilization effects. This requires you to adjust the gain during flight.

## ( III ) .Installation method

Use 3M double-sided tape to install the EG01 inside the fuselage, while being sure to keep the three sides of the gyro shell parallel to the three rotation axes of the aircraft. It is critical to keep the gyro parallel to the installation plane and minimize the installation angle deviation. Misaligned gyro installation will result in an uncontrollable aircraft. LED logo lights need to be oriented towards the nose cone or the tail of this aircraft.



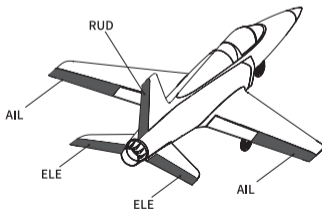
## ( IV ) .Gyro introduction



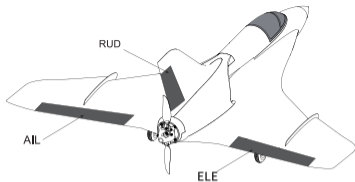
## ( V ) .Supported control surface layout

Freewing Guard I supported to set the mix control of ordinary fixed-wing and delta-wing aircraft (flying wing). Please connect according to the below diagram.

### Conventional Fixed Wing



## Delta Wing (Flying Wing)



### ⚠ Attention:

Please make sure to turn off the radio mix switch when using delta-wing mix function of Freewing Guard I gyro.

## ( VI ) .Flight Mode

Freewing Guard I gyro EG01 provides a variety of flight modes for selection, which can be switched and selected through the dual/three-stage switch of receiver to connect the **【PPM/MOD】** channel; In the Freewing Assistant APP, you can rearrange the "switch mode" switching sequence

### ■ Basic gain mode:

During the Basic Gain Mode, the LOGO is displayed in green. This mode is suitable for all fixed-wing aircraft and is the most commonly used mode. It can effectively improve the stability of the aircraft, improve the control accuracy, and reduce the stall point of the aircraft, which is especially filter out the wind, turbulent airflow, or other unstable flight conditions caused by non-human control, so that the aircraft can maintain the stable flight.

### ■ Auto Level gain mode:

During the Auto Level Gain Mode, the LOGO is displayed in blue. This mode not only includes the function of increasing stability mode, but also actively intervenes in the control of flight attitude. In any case, once the remote control lever is released, the aircraft will automatically return to the horizontal position and maintain horizontal flight until manual intervention is made. When manually controlled, the aircraft will change its attitude according to the actual operation situation.

## ■ Gyro off mode:

During the Gyro off Mode, the LOGO is displayed in white. In this mode, the gyro function is completely turned off, and gyro will not make any corrective actions to the aircraft. The pilot has full control of all parts of the aircraft.

## ( VII ) .Indicator lights and corresponding functions

Indicator light status	Green light is always on	Blue light is always on	White light
Corresponding function	basic gain mode	Auto Level gain mode	Gyro off mode

## ( VII ) .Gyro correction direction

Aileron turn left during flight—Aileron correction diagram



When the roll axis rotates to the left, please pay attention to the left and right ailerons to correct them as shown in the arrow direction. If the action is not correct, it should be reset.

Aileron turn right during flight—Aileron correction diagram



When the roll axis rotates to the right, please pay attention to the left and right ailerons to correct them as shown in the arrow direction. If the action is not correct, it should be reset.

Nose down during flight—Elevator correction diagram



When the pitch axis rotates upwards, please make sure that the elevator is corrected as shown by the arrow direction. If the action is not correct, it should be reset.

Nose up during flight—Elevator correction diagram



When the pitch axis rotates downwards, please make sure that the elevator is corrected as shown by the arrow direction. If the action is not correct, it should be reset.

Turn left during flight—Rudder correction diagram



When the auto shaft rotates to the left, please make sure that the rudder corrected as shown by the arrow direction. If the action is not correct, it should be reset.

Turn right during flight—Rudder correction diagram



When the auto shaft rotates to the right, please make sure that the rudder corrected as shown by the arrow direction. If the action is not correct, it should be reset.

## ( IX ) .Gain Settings

### Basic gain

Changing the gain value can change the sensitivity of the gyro's correction action; The Freewing Guard I gyro can set different gain levels for ailerons, elevator, and rudder.

- In general, our recommended initial gain value is around 45. Then, based on the actual performance observed during the flight, set the most appropriate gain value.
- The gain value is too high, and the correction action is exceptionally sensitive. During flight, the corresponding control surface will experience high-frequency oscillation. At this point, it is necessary to reduce the gain value.
- The gain value is small, and the correction action is slow. During the flight, the aircraft continues to be affected by crosswinds and turbulent airflow, occasionally experiencing unstable flight conditions. At this point, it is necessary to increase the gain value.

 Attention: Please maintain a fast horizontal flight at 100% full throttle to test the suitability of the gyro gain value.

### Level gain

In Auto Level gain mode, the gain directly determines the magnitude and speed of the aircraft's automatic recovery to the horizontal attitude. In general, our recommended initial balance gain value is around 45.

- The higher the gain value is, more flexible the amplitude of the aircraft's horizontal attitude recovery action is, shorter move time takes. Excessive gain can cause a sudden and violent shaking of the aircraft during the process of automatically restoring its horizontal attitude. It may cause the aircraft to stall
- The smaller the gain value is, more gentle the amplitude of the aircraft's horizontal attitude recovery action is, longer move time takes. And, smaller gain will move more smoothly during the process of automatically restoring its horizontal attitude, and the return to level speed will be slower.



## ( X ) .APP function

If you need to modify the gyro parameters, please download the Flight Assistant APP on the official website: [www.freewingmodel.com](http://www.freewingmodel.com)

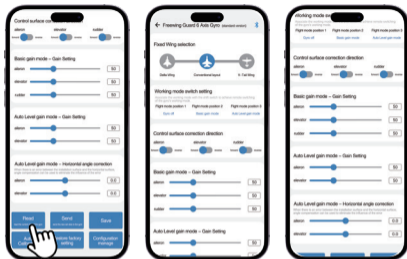
### 1.Connection method

While the gyro is powered on, use a data cable to connect the gyro and Freewing Blue Bridge. Open the Flight Assistant APP for operation: [ Find Device ] – [ Connection ] to complete the device connection.

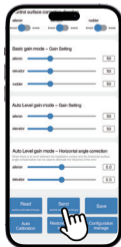


## 2. Read parameters and settings

- ( 1 ) Click [ Read ] – Read the current data of the gyro;
- ( 2 ) Modify the currently read gyro parameters,



- ( 3 ) Click [ Send ] – send the new set data to the gyro, and the interface will display [ Successfully executed ] to complete the settings.



### 3. Save and automatic calibration

- ( 1 ) If you need to save the set parameters, you can click [ Save ] and name the saved data.
- ( 2 ) The gyro has been horizontally calibrated at the factory. If you need to calibrate it again, please place the gyro horizontally and click on [ Auto Calibration ] .



### ( XI ) .Material List

Gyro	No.	Name
	1	Gyro *1
	2	Connection cable *2
	3	Manual *1
	4	EVA Sponge sticker *2

### ( XII ) .Specification

Dimension: 39x25x15mm

Weight: 10g

Operating Voltage: 4.8-8.4V

Operating temperature: -20°C-50°C

Current: Max 50mAh

Gyro: 2000 degrees/S

Input signal: 50HZ PWM

Output signal: 100HZ PWM

## (一). 飞翼卫士 I 型六轴陀螺仪功能介绍

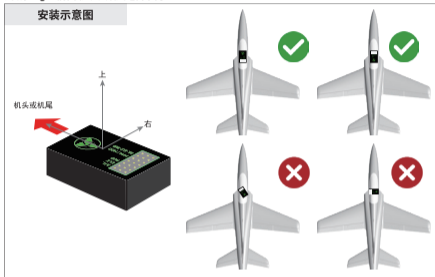
1. 飞行增稳，陀螺仪能自动对副翼、升降、方向三个通道做补偿调整，使飞机比较平稳飞行，增强抗风能力，减少失速问题，平飞、倒飞、侧飞、3D飞行变得轻松，却不会对飞机的操控性带来影响，让飞行得心应手。
2. 支持常规、三角翼、等两类机翼布局的固定翼飞机，出厂默认是普通固定翼飞机模式。
3. 多通道输出，包含副翼、升降、方向及开关。
4. 手机APP可视化设置界面，可以下载、储存预设飞行参数或单独设定相关参数。
5. 多种功能切换，利用遥控器上的开关通道来控制陀螺仪的功能切换，在空中飞行时，可以通过这个开关来控制陀螺仪的各种功能，让你随时体验各种功能下的飞行乐趣。
6. 飞行模式指示LED灯，及时掌握当前工作模式。（绿色-增稳模式，蓝色-平衡模式，白色-陀螺仪关闭）
7. 重量轻，尺寸小巧，通用性广。

## (二). 首次使用陀螺仪注意事项：

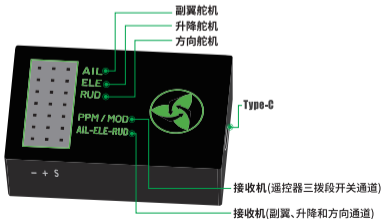
1. 通电前请先仔细阅读说明书。
2. 检查每个通道的连接线方向、位置是否正确。
3. 请将飞机放置在稳定的地方，防止抖动，再上电，保证陀螺仪锁定成功。
4. 陀螺仪使用状态检查，请查看陀螺仪 LED 灯的状态，核对是否是在您所需要的飞行模式上面，如果不是请修改到自己所需要的模式。
5. 遥控器控制信号输出检查，首先用遥控器检查副翼、升降、方向的控制方向是否正确，如果不正确，请设置遥控器里面的通道正反，直到各个通道控制方向正确。
6. 陀螺仪修正信号输出检查，请仔细按照陀螺仪修正方向中的介绍，认真检查各通道输出修正信号方向是否完全正确，如果不正确，请把相对应的修正方向改过来，设置到方向完全正确，这点非常重要，错误的修正方向会让飞机炸机。三角翼（飞翼）使用副翼和升降来混控，遥控器不需要设置为混控，混控输出由陀螺仪完成，注意遥控器不需要再设置混控。
7. 感度调节，感度是陀螺仪对相关舵面修正强度的调节，一般建议先调节在40-50，根据飞行情况再来微调一下，如果飞行中飞机哪个舵面抖晃比较厉害，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。

### (三). 安装方法

使用 3M 双面胶将飞翼卫士 I 安装在机身内部，使陀螺仪外壳的三条边与飞机的三个旋转轴保持平行，保持陀螺仪与安装平面平行，尽量减少安装角度偏差。需将有 LED 灯的 logo 朝向机头或机尾方向。



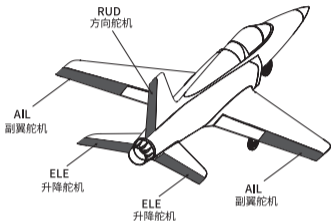
### (四). 陀螺仪介绍



## (五). 支持的控制舵面布局

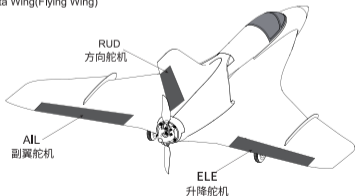
飞翼卫士 | 支持常规固定翼和三角翼（飞翼）混控，具体请按照下面示意图进行连接；

### 常规布局固定翼



### 三角翼（飞翼）

Delta Wing(Flying Wing)



### ⚠ 注意事项

使用飞翼卫士I的三角翼混控时请务必关闭遥控器的混控设置。

## (六). 飞行模式

飞翼卫士六轴陀螺仪提供多种飞行模式以供选择,通过【PPM/MOD】通道接入接收机的双/三段开关进行控制;在飞翼助手APP中,您可以对【开关-模式】切换顺序进行重新排列的设置。

### ■ 增稳模式：

LOGO 显示为绿色时代表增稳模式开启。此模式较常见,适用于所有的固定翼飞机。它能有效地过滤风、紊乱气流、或其它非人为操控而导致的不稳定飞行状态使飞机一直保持稳定的飞行,从而有效地提高控制精度,降低失速点。此模式下,陀螺仪不会干预人为操作,飞行全程需要自主操控飞机。

### ■ 平衡模式：

LOGO 显示为蓝色时,代表平衡模式开启。此模式除包含增稳模式的功能之外,还将主动介入飞行姿态的控制。任何情况下,一旦松开遥控器操作杆,飞机将会自动恢复到水平位置,并始终保持水平飞行,直到人工介入操控。当人工操控时,飞机将根据实际操作情况而改变姿态。

### ■ 关闭模式：

LOGO 显示为白色时,代表陀螺仪已关闭所有功能;陀螺仪将不会对飞机做任何修正动作。

## (七). 指示灯和对应功能

指示灯状态	绿色灯常亮	蓝色灯常亮	无灯亮
对应功能	增稳模式	平衡模式	关闭模式

## (八). 陀螺仪修正方向

飞行中副翼左转 —— 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。

飞行中副翼右转 —— 舵面修正图示



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。

飞行中飞机右转弯时 —— 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。

## (九). 感度调节

### 增稳模式 - 感度调节

更改感度数值，可以改变陀螺仪纠偏动作的灵敏度；飞翼卫士陀螺仪，可以对副翼、升降、方向分别设定不同大小的感度。

- 一般情况下，我们建议的初始感度值为 45 左右。然后，根据飞行过程中所观察到的实际表现，设定最合适感度值。
- 感度值过大，纠偏动作异常灵敏，飞行过程中，对应舵面会出现高频率的摆动，此时，需要减小感度值。
- 感度值较小，纠偏动作迟钝。飞行过程中，飞机继续受到侧风、紊乱气流影响，偶尔出现不稳定飞行状况。此时，需要加大感度值。

**⚠注意：**请保持100%满油门快速水平飞行，来测试陀螺仪感度值是否合适。



## 平衡模式 - 感度调节

在自动平衡模式下，感度大小直接决定飞机自动恢复水平姿态时，动作幅度的大小和速度的快慢。一般情况下，我们建议的初始平衡感度值为 45 左右。

- 感度越大，飞机恢复水平姿态动作幅度越大，动作用时越短。过量的感度，飞机在自动恢复水平姿态的过程中，可能会带来飞机失速。
- 感度越小，飞机恢复水平姿态动作幅度较柔和，动作过程用时越长。但是，较小的感度，飞机在自动恢复水平姿态的过程中，动作会比较平稳，回平速度较慢。

## (十) .APP 功能

如果您需要对陀螺仪参数进行修改，请在飞翼官方网站 ([www.freewingmodel.com](http://www.freewingmodel.com)) 下载飞行助手 APP。

### 1.连接方法

在陀螺仪通电的情况下，用数据线连接陀螺仪与飞翼蓝桥 (Freewing BlueBridge)；打开飞行助手APP进行操作：【查找设备】-【连接】，完成设备连接。



## 2. 读取参数与设定

(1) 点击【读取】-读取陀螺仪当前数据；(2) 对当前读取的陀螺仪参数进行修改。



(3) 点击【发送】-发送新设定数据给陀螺仪，界面显示【执行成功】完成设置。



### 3.保存与自动校准

- (1) 如需要对所设定的参数进行保存，可点【保存】，命名所保存的数据。
- (2) 陀螺仪在出厂时已经进行过水平校准，如需再次校准，请将陀螺仪水平放置好后，点【自动校准】即可。



### (十一). 物料清单

陀螺仪	序号	名称	序号	名称
	1	陀螺仪一个	3	说明书一份
	2	连接线2条	4	EVA海绵贴纸两块

### (十二). 规格参数

外形尺寸: 39x25x15mm

重量: 10g

工作电压: 4.8-8.4V

工作温度: -20 C-50 C

电流: 最大50mAh

陀螺仪: 2000度/s

输入信号: 50HZ PWM

输出信号: 100HZ PWM



**Dongguan Freewing Electronic Technology Ltd**  
**HK Freewing Model International Limited**

Address: FeiYi Building, face to Labor Bureau, Fumin Middle Road, Dalang Town,  
Dongguan City, Guangdong Province, China

Web: <http://www.sz-freewing.com> [www.freewingmodel.com](http://www.freewingmodel.com)

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