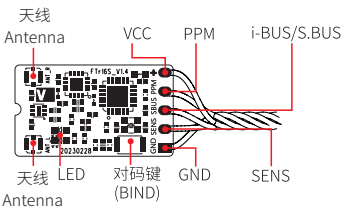
产品介绍 Introduction

FTr16S 是一款专用于穿越机的双天线双向传输接收机，采用了 AFHDS 3 协议。它体积小巧便于安装，可输出标准 PPM 信号和 i-BUS/S.BUS 信号。

FTr16S is a receiver designed for the racing drones. It features two antennas, two-way comunication and adopts AFHDS 3 protocol. The receiver is small and easy to install, and can output standard PPM signals and i-BUS/ S.US signals.

接收机概览 Receiver overview



用于连接接收机与模型的各个部件。

VCC：电源电压为 3.5~8.4V。

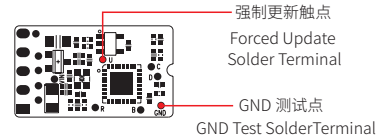
PPM 信号接口：输出标准的 PPM 信号。

i-BUS/S.BUS 信号接口：用于输出 i-BUS/S.BUS 信号。

SENS: 用于连接传感器。

GND：连接地线。

注：接收机将 RSSI 数据转换成 CH14 通道值通过 i-BUS/S.BUS 输出给飞控。信号强度为 0 时对应通道值为 1000，信号强度为 100 时对应通道值为 2000，线性对应相关。



These ports connect the receiver to the componens of the model.

VCC: Power supply voltage from 3.5 ~ 8.4V.

PPM signal port: Outputs standard PPM signal.

i-BUS/S.BUS signal port: Outputs i-BUS/S.BUS signal.

SENS: Connects to sensor

GND: Connects to ground wire.

Note: Signal strength is indicated on the transmitter screen under the Channel 14 output bar with the number 1000 being the quivalent of the lowest signal strength and 2000 being the highest signal strength.

产品规格 Product specifications

- 产品型号：FTr16S
- 适配发射机：PL18(支持 AFHDS 3 的枪控发射机)
- 适用机型：多轴、穿越机等
- PPM 通道：16 个
- 无线频率：2.4GHz ISM
- 发射功率： 小于 20dBm
- 无线协议：AFHDS 3
- 通道分辨率：4096
- 天线类型：双天线（ipex4）
- 输入电源：3.5~ 8.4V
- 数据输出：PPM/i-BUS/S.BUS
- 温度范围：-15°C ~ +60°C
- 湿度范围：20 ～ 95%
- 在线更新：有
- 外形尺寸：21*12.1*3.1mm
- 机身重量：1.5g（含天线）
- 安规认证：CE，FCC ID：N4ZFTR16S00

- Product Model: FTr16S
- Adaptive Transmitters: PL18(All AFHDS 3 Surface Transmitters)
- Model Type: Multicopters, Racing Drones, etc.
- PWM Channels: 16
- RF: 2.4GHz ISM
- Maximum Power: < 20dBm (e.i.r.p.) （EU）
- 2.4G Protocol: AFHDS 3
- Resolution: 4096
- Antenna: Dual Antenna(ipex4)
- Input Power: 3.5~8.4V
- Data Output: PPM/i-BUS/S.BUS
- Temperature Range: -15°C ~ +60°C
- Humidity Limit: 20%-95%
- Online Update: Yes
- Dimensions: 21*12.1*3.1mm
- Weight: 1.5g((Including Two Antennas)
- Certification: CE，FCC ID: N4ZFTR16S00

对码 Binding

1. 将发射机进入对码状态；（发射机进入对码状态的方式可能不同，请根据发射机的使用说明书进行操作）
2. 按住接收机对码键同时接通电源，LED指示灯绿色快闪即进入对码状态；
   - 接收机对码成功后，LED指示灯绿色常亮，即可与发射机正常通信；
   - 对码的发射机是单向模式进入对码状态时，接收机 LED 灯变为慢闪后将发射机退出对码状态，此时接收机 LED 灯常亮，表示对码成功；
   - 接收机未对码或者掉码后，LED指示灯红色慢闪；
   - 接收机发生硬件错误时，LED指示灯红色常亮。
3. 检查发射机、接收机、模型是否正常工作。如需重新对码，请重复以上步骤。

对码 Binding

1. First put the transmitter into bind mode (see the transmitter's user manual for instructions on how to activate bind mode.)
2. Press receiver's BIND key and connect the receiver to power at the same time. The receiver LED will start to flash quickly in green indicating that it has entered bind mode.
   - When the receiver's green LED stops flashing, the transmitter and the receiver have successfully bound.
   - If a transmitter that has its radio frequency (RF Standard) set to "AFHDS3 1 way" (please refer to your transmitter 's user manual) enters bind mode, after the receiver LED becomes slow flashing, then put the transmitter to exit the binding state. At this time, the receiver LED is solid on indicating the binding is successful.
   - When the receiver LED flash slowly in red, it indicates the receiver is losing signal.
   - If there is a critical hardware error, the receiver LED will remain red.
3. Check to make sure that the transmitter and the receiver are working as expected, if there are any issues or unexpected operation, follow the steps above to bind again.

强制更新 Forced update

发射机在更新完后，如无法与接收机对码，需强制更新接收机。

1. 用镊子或其他金属导体短接概览图中的“强制更新触点”和“GND测试点”同时给接收机上电，指示灯红绿慢闪进入强制更新状态；
2. 更新过程中指示灯红绿快闪；
3. 更新完成指示灯红灯慢闪。

If the transmitter is unable to bind with the receiver after a firmware update was performed on the transmitter, a forced firmware update will need to be performed on the receiver following the steps below.

1. Use a pair of metal tweezers or other sharp metal objects to perform a short between the "Forced Update" solder pad/terminaland the "GND Test" solder pad/terminal (refer to picture below) while powering on the receiver. The receiver is in Forced Update status if the LED light flashes slowly between red and green alternately.
2. Forced Update is in progress if the LED flashes rapidly in red and green.
3. Forced Update has been finished if the LED flashes slowly in red.

失控保护 Failsafe

失控保护功能用于在接收机与发射机失去信号不受控制后，接收机按设置好的失控保护值进行通道输出以保护模型及人员安全。

本款接收机共支持三种失控保护模式 : [无输出]、[保持] 和 [固定值]

[无输出] PWM 通道接口为无输出状态 ;

[保持] 输出失控前最后的通道值;

[固定值] 输出设置的固定值。

注:

1. 对于 PPM/i-BUS/S.BUS 等总线信号类型不允许单个或其中几个通道为 [无输出] 模式，通道设置为 [无输出] 模式时，实际信号是保持最后输出值;
2. 因 S.BUS 信号信息包含失控标志位，各通道失控保护设置被失控标志位传达给后续设备，若连接的设备支持失控标志位解析，则失控后，输出各通道设置的失控保护值;
3. 对于无失控标志位的信号 PPM/i-BUS，支持设置失控时信号 [无输出] 模式。设置为 [无输出] 模式后，不管各通道失控保护如何设置，失控后各通道均为 [无输出] 模式。

The failsafe function is used to output the channel value according to the out-of-control protection value set by the user after the receiver loses its signal and is out-of-control to protect the model and personnel.

It can also be set failsafe for each channel respectively. This receiver supports three failsafe modes: **No output**, **Hold**, and **Fixed value**.

No output: No output for PWM interface.

Hold: Keeps the last output value.

Fixed Value: Outputs the failsafe values set for each channel.

Notes:

1. For bus signal types such as PPM/i-BUS/S.BUS, a single or several of these channels are not allowed to be in No output mode. The actual signal is held at the last output value when the channel is set to No output mode.
2. Because the S.BUS signal information contains failsafe flag bits, the failsafe settings of each channel are communicated to subsequent devices by the failsafe flag bits. If the connected devices support the failsafe flag bit analysis, the failsafe values set for each channel are output after out of control.
3. For the signal PPM/i-BUS without failsafe flag bits, it supports the setting of the signal to No output mode in case of out of control. After setting to No output mode, regardless of the setting of the failsafe of each channel, each channel will be in No output mode after out of control.

注意事项：

- 使用前必须确保本产品与模型安装正确，否则可能导致模型发生严重损坏。
- 关闭时，请务必先关闭接收机电源，然后关闭发射机。将会导致遥控设备失控。失控保护设置不合理可能引起事故。
- 确保接收机安装在远离电机，电子调速器或电子噪声过多的区域。
- 接收机天线需远离导电材料，例如金属棒和碳物质。为了避免影响正常工作，请确保接收机天线和导电材料之间至少有1厘米以上的距离。
- 准备过程中，请勿连接接收机电源，避免造成不必要的损失。
- 此接收机的接收信号的距离比回传距离远，当超出回传距离后，部分发射机会有报警提示，此为正常现象。此报警提示音部分发射机可以通过设置发射机关闭，如Paladin (PL18)。

Attention:

- Make sure the product is installed and calibrated correctly, failure to do so may result in serious injury.
- Make sure the receiver's battery is disconnected before turning off the transmitter, failure to do so may lead to unintended operation or loss of control.
- Make sure the receiver is mounted away from motors, electronic speed controllers or any device that emits excessive electrical noise.
- Keep the receiver's antenna at least 1cm away from conductive materials such as carbon or metal.
- Do not power on the receiver during the setup process to prevent loss of control.
- The receiver can receive at distances further than it can transmit from. When the receiver goes out of its transmission range, some transmitter's will sound the lost signal alarm. This is normal, the lost signal alarm can be turned off in the settings for transmitters such as the Paladin (PL18).

认证相关 Certifications

FCC Compliance Statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Warning: changes or modifications not expressly approved by the party responsible for compliance could void the user’s authority to operate the equipment.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:
-- Reorient or relocate the receiving antenna.
-- Increase the separation between the equipment and receiver.
-- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
-- Consult the dealer or an experienced radio/TV technician for help.

DoC Declaration

Hereby, [Flysky Technology co., ltd] declares that the Radio Equipment [FTr16S] is in compliance with RED 2014/53/EU.
The full text of the EU DoC is available at the following internet address: www.flyskytech.com/info_detail/10.html

CE Warning

ThisequipmentcomplieswithFCCradiationexposurelimitssetforthforanuncontrolledenvironment.Thisequipmentshouldbeinstalledand operated withminimumdistance20centimetersbetweentheradiatorandyourbody.

Environmentally friendly disposal

Old electrical appliances must not be disposed of together with the residual waste, but have to be disposed of separately. The disposal at the communal collecting point via private persons is for free. The owner of old appliances is responsible to bring the appliances to these collecting points or to similar collection points. With this little personal effort, you contribute to recycle valuable raw materials and the treatment of toxic substances.

FCC ID: N4ZFTR16S00

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