

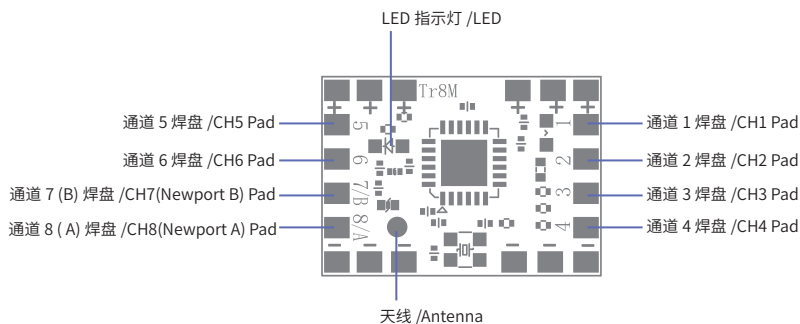
产品介绍 Introduction

Tr8M 是一款极致轻量化与紧凑化的 8 通道接收机。它采用 AFHDS 3 协议，配备单天线，具备发射与接收功能，支持双向传输和回传功能。本接收机支持 2 个 Newport 接口，可自定义这些接口的输入或输出的信号类型，包括 i-BUS2/S.BUS/i-BUS/PPM/PWM 等。专门适配教育、竞技、娱乐模型使用。

The Tr8M is an ultra-lightweight, ultra-compact 8-channel receiver. Operating on the AFHDS 3 protocol, it features one antenna and supports both transmission and reception, as well as one-way/two-way transmission plus telemetry functionality. It features 2 Newport connectors, which can be customized for various input or output signal types, including i-BUS2, S.BUS, i-BUS, PPM, PWM, etc. It is designed for educational, competitive, and recreational models.

接收机概览 Receiver Overview

接收机正面 /Front View



① 注意：焊接时请规范操作，确保安全。焊后必须进行焊点质量检查。

① Follow safe soldering practices. All solder joints must be inspected post-welding.

产品规格 Product Specifications

- 产品型号: Tr8M
- 适配发射机: 支持 AFHDS 3 协议的发射机 (如 PL18 Ultra)
- 适配模型: 教育、竞技、娱乐模型
- PWM 通道数: 8
- 波段个数: 171
- 无线频率: 2.4GHz ISM
- 无线协议: AFHDS 3
- 发射功率: <20dBm
- 天线类型: 单天线
- 工作电压: 3.0~9V/DC
- 通道分辨率: 4096
- 数据输出: PWM/PPM/i-BUS2/S.BUS/i-BUS
- 温度范围: -10°C ~ +60°C
- 湿度范围: 20% ~ 95%
- 固件更新: 支持
- 外形尺寸: 16.5*11.8*2.5mm
- 机身重量: 0.5g
- 认证: CE, SRRC, FCC ID: 2A2UNTR8M00

- Product Model: Tr8M
- Compatible Transmitter: Transmitter based on AFHDS 3 protocol, such as PL18 Ultra
- Compatible Models: Educational, Competition, and Recreational Models
- Number of PWM Channels: 8
- Number of Bands: 171
- RF: 2.4GHz ISM
- RF Protocol: AFHDS 3
- Maximum Power: <20dBm (e.i.r.p.) (EU)
- Antenna: Single Antenna
- Operating Voltage: 3.0~9V/DC
- Resolution: 4096
- Data Output: PWM/PPM/i-BUS2/S.BUS/i-BUS
- Temperature Range: -10°C ~ +60°C
- Humidity Range: 20%~95%
- Firmware Update: Supported
- Dimensions: 16.5*11.8*2.5mm
- Weight: 0.5g
- Certifications: CE, SRRC, FCC ID: 2A2UNTR8M00

对码 Binding

本款接收机支持单 / 双向对码，通电自动进入对码状态：

- 接收机上电即进入等待连接状态，等待与已对码的发射机建立通信；
- 若 2 秒 未与已对码的发射机建立通信，则自动进入对码状态，此状态持续 3 秒；
- 若与发射机对码成功，即进入正常通信状态，否则退出对码状态，回到等待连接状态。

注：对码时，接收机 LED 快闪；等待连接时，接收机 LED 慢闪；正常通信时，接收机 LED 常亮。

双向对码步骤：

1. 发射机选择双向通信，然后进入对码状态；
2. 接收机上电后先等待 2S：若期间未检测到发射机信号，则自动进入对码状态，此时 LED 快闪；也可在通电前短接 CH3 与 CH4 信号端，再上电，即进入对码状态；
3. 对码成功后，接收机 LED 灯常亮；
4. 检查发射机和接收机是否正常工作。如需重新对码，请重复以上步骤。

单向对码步骤：

1. 发射机选择单向通信，然后进入对码状态；
2. 接收机进入对码状态；
3. 接收机 LED 灯变为慢闪后将发射机退出对码状态。此时，如果接收机的 LED 灯常亮，表示对码成功；
4. 检查发射机和接收机是否正常工作。如果需要重新对码，请重复上述步骤。

注：对码时请先将发射机进入对码状态，再将接收机进入对码状态，若 3 秒内对码没有完成，接收机 LED 灯进入慢闪状态。

This receiver is compatible with one-way/two-way binding, and is to automatically enter the binding mode upon power-on.

- The receiver will enter the waiting-for-connection status upon power-on, waiting for the connection to the bound transmitter.
- If the receiver does not connect the bound transmitter within 2 seconds, it will automatically enter the binding state. This state lasts for 3 seconds.
- If the binding with the transmitter is successful, it will enter the normal communication status, otherwise, it will exit the binding state and return to the waiting-for-connection status.

Note: In case of binding, the receiver LED flashes quickly. In case of waiting-for-connection, the receiver LED flashes slowly. In case of normal communication, the receiver LED is solid on.

Follow the steps below to bind in two-way binding:

1. Select [2 WAY] for RF standard of the transmitter, then put the transmitter into the binding mode.
2. After powering on, the receiver will wait for 2 seconds. If no transmitter signal is detected during this period, it will automatically enter binding mode, indicated by a rapidly flashing LED. Alternatively, you can enter binding mode by shorting the signal pins of CH3 and CH4 before powering on.
3. When the receiver's LED is solid on, it indicates that the binding is successful.
4. Check if the transmitter and receiver are working properly. If you need to re-bind, please repeat the above steps.

Follow the steps below to bind in one-way binding:

1. Select [1 WAY] for RF standard of the transmitter, then put the transmitter into the binding mode.
2. This receiver enters the binding state.
3. After the receiver LED becomes slow flashing, then put the transmitter to exit the binding state. If the receiver's LED is solid on, it indicates that the binding is successful.
4. Check to make sure the transmitter and receiver functions are working correctly, repeat steps above(binding process) if any problems arise.

Note: Set the transmitter to its binding state first, and then set the receiver to its binding status. If the binding is not finished within 3 seconds, the receiver LED will enter a slow flashing status.

固件更新 Firmware Update

本接收机的固件更新需要通过富斯遥控管家 (FlySkyAssistant) 来完成。请注意，只有 3.0 及以上版本的富斯遥控管家支持此操作，相关固件可以从官网 www.flyskytch.com 下载。更新过程可以通过以下两种方式进行：

方式一：首先完成发射机与接收机的对码（接收机 LED 灯常亮），然后将发射机连接到电脑。在电脑端打开富斯遥控管家软件，通过该软件进行固件更新。

方式二：首先将发射机连接到电脑，然后按照以下步骤使接收机进入强制更新状态（接收机 LED 灯状态为三闪一灭）：

- 先短接接收机 CH1 与 CH2 信号端；
- 再给接收机上电，接收机 LED 状态为 3 闪 1 灭，即进入强制更新状态。

完成上述步骤后，在电脑端打开富斯遥控管家软件，通过该软件完成固件的强制更新。强制更新完成后，接收机的指示灯将由 3 闪 1 灭状态变为慢闪状态。

The firmware update for this receiver must be completed through FlySkyAssistant. Please note that only versions 3.0 and later of FlySkyAssistant support this operation, and the relevant firmware can be downloaded from the official website www.flysky-cn.com. The update process can be carried out in two ways:

Method I : First, complete the binding between the transmitter and the receiver (the LED of the receiver is solid on), then connect the transmitter to the computer. Open FlySkyAssistant on the computer and perform the firmware update through the software.

Method II : First, connect the transmitter to the computer, then follow these steps to put the receiver into forced update mode (the LED of the receiver will operate in a three-flash-one-off mode repeatedly):

- Short the signal pins between the CH1 and CH2.
- Power on the receiver. The LED of the receiver operates in a three-flash-one-off mode repeatedly, indicating that the receiver is in forced update mode.

After completing the above steps, open FlySkyAssistant on your computer and complete the forced firmware update through the software. Once the forced update is completed, the LED of the receiver will change from the three-flash-one-off state to a slow flashing state.

失控保护 Failsafe

失控保护功能用于在接收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] 输出设置的通道值。

注：

1. 对于 PPM/i-BUS/S.BUS/i-BUS2 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/i-BUS2 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 when the receiver loses signal and is out-of-control, in 2.4GHz. The receiver performs channel output according to the set failsafe value to protect the safety of the model and personnel.

This receiver supports three fail-safe modes: **No output**, **Hold**, and **Fixed value**.

No output: No output for PWM channel.

Hold: Maintain the last output value.

Fixed value : Output the failsafe values that have been set for each channel.

Notes:

1. For bus signal types such as PPM/i-BUS/S.BUS/i-BUS2, 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/i-BUS2 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。如果关闭发射机电源时接收机仍然在工作，将会导致遥控设备失控。失控保护装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。

! 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 lead to lose control. Unreasonable setting of the Failsafe may cause accidents.
- 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.

认证相关 Certification

EU DoC Declaration

Hereby, [Shenzhen FLYSKY Technology Co., Ltd.] declares that the Radio Equipment [Tr8M] 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

FCC regulatory compliance statement

§ 15.19 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.

§ 15.21 Information to user

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

RF Exposure Compliance

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter. This equipment should be installed and operated with minimum distance 20cm between the radiator and your body.

• List of applicable FCC rules:

47 CFR Part 15.247 For Frequency hopping systems in the 2400-2483.5 MHz band

• Summarize the specific operational use conditions

This module can be used in IOT devices. The module has been certified for Mobile applications. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

• Limited module procedures

This module has no own RF shielding and has been granted a limited modular approval (LMA). As grantee of the LMA, FLYSKY is responsible for approving the host environment that the module is used with. Thus, the host manufacturer must observe the following procedure to ensure host compliance when the module is installed in the host device:

1. FLYSKY must review and release the host environment prior to giving the host manufacturer approval.

2. This module is to be installed by trained and qualified personnel only, and according to the instructions provided by FLYSKY.

3. The host integrator installing this module into their product must ensure that the final composite product complies with the FCC requirements by a technical assessment or evaluation to the FCC rules.

4. A Class II Permissive Change(C2PC) is required for each specific host installation (see Chapter of Test Plan for host Product).

• Trace antenna designs

The antenna is not a trace antenna.

• RF exposure considerations

This Module complies with FCC radiation exposure limits set forth for an uncontrolled environment and used for Mobile applications. This module should be installed and operated with a minimum distance of 20cm between the radiator and your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Modules can only be used in a host for the conditions that it was granted for. To be used in any other way than granted, such as mobile to portable or with other transmitters simultaneously, requires additional evaluation, testing, or testing and Class II permissive change.

• Antennas

Only antennas of the same type with equal or lower gain may also be used with this module.

If you desire to increase antenna gain and either change antenna type or use same antenna type certified, a Class II permissive change application is required to be filed by us, or you (host manufacturer) can take responsibility through the change in FCC ID (new application) procedure followed by a Class II permissive change application.

This module is tested with the following antenna:

Antenna Type	Brand/manufacturer	Model No.	Max. Antenna Gain
Copper Antennae	Shenzhen Yinglichuang Electronic Technology Co., Ltd.	YC-80032-B03	0.89 dBi

• Label and compliance information

Please notice that if the FCC identification number is not visible when the module is installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module. This exterior label can use wording such as the following: "Contains FCC ID: 2A2UNTR8M00" any similar wording that expresses the same meaning may be used.

§ 15.19 Labelling requirements shall be complied on end user device.

Labelling rules for special device, please refer to § 2.925, § 15.19 (a)(5) and relevant KDB publications. For E-label, please refer to § 2.935.

• Information on test modes and additional testing requirements

The OEM integrator is responsible for ensuring that the end-user has no manual instruction to remove or install module.

The module is limited to installation in mobile application, a C2PC or separate approval is required for all other operating configurations, including portable configurations with respect to § 2.1093 and difference antenna configurations. (see Chapter of Test Plan for host Product)

• Additional testing, Part 15 Subpart B disclaimer

This modular transmitter is only FCC authorized for the specific rule parts listed on our grant, host product manufacturer is responsible for compliance to any other FCC rules that apply to the host not covered by the modular transmitter grant of certification.

Host manufacturer in any case shall ensure host product which is installed and operating with the module is in compliant with Part 15B requirements.

Please note that For a Class B or Class A digital device or peripheral, the instructions furnished the user manual of the end-user product shall include statement set out in § 15.105 Information to the user or such similar statement and place it in a prominent location in the text of host product manual. Original texts as following:

For Class B

Note: 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

For Class A

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

• EMI Considerations

The Tr8M module has been fully tested and verified to comply with applicable FCC Part15 emission requirements in its standalone configuration. However, when the module is integrated into a host product, non-linear interactions between the module host PCB layout, surrounding high-speed circuits, power supply networks and other co-located transmitters may generate additional spurious or harmonic emissions that exceed regulatory limits.

Host manufacturers shall follow the RF design, integration and verification best practices defined in FCC KDB 996369 D04 Module Integration Guide:

For standalone mode (only the Tr8M module operates as an active transmitter in the host), refer to the integration guidance in KDB 996369 D04 to conduct system-level emission testing and compliance evaluation.

For simultaneous multi-transmitter mode (the Tr8M module is co-located and operated concurrently with other active transmitters with in the same host), refer to KDB 996369 D02 Module Q&A Question 12. The host manufacturer is responsible for performing co-location emission tests to confirm the combined system meets all applicable FCC Part15 limits.

As this is a limited modular transmitter without an integrated RF shield, the host manufacturer shall pay special attention to module placement, grounding design, separation from high-speed digital circuits, and host-level shielding measures to minimize EMI coupling effects.

The host manufacturer assumes full responsibility for all system-level EMC/EMI compliance of the final end product, including conducted emissions, radiated emissions, and spurious harmonic emissions across all required frequency bands.

认证相关 Certification

• How to make changes

Since only the FCC Grantee is permitted to file and execute permissive changes, host manufacturers shall NOT make any modifications to the module on their own. All changes to the module — including but not limited to antenna replacement beyond the certified specification, RF circuit adjustment, matching network modification, and firmware alteration — must be evaluated and processed formally by the module Grantee.

If the host manufacturer intends to use the module in a configuration different from the granted approval, they shall contact the Grantee for guidance and complete the required Class II Permissive Change or new certification application through the Grantee.

Any unauthorized modification made by the host manufacturer will void the FCC authorization of this module, and the host manufacturer shall bear full responsibility for all resulting compliance issues and legal liabilities.

Grantee Contact Information:

Shenzhen Flysky Technology Co., Ltd.

Website: www.flysky-cn.com

Email: fs-cust@flysky-cn.net

After-Sale Service Hotline: +86-0755-83176291

• Test Plan for host Product:

This module does not contain a shield and therefore is limited. When the module is integrated into the host, it can be used only after being approved by the module grantee through the C2PC process. The host integrator will be required to file a Class II Permissive Change for each host specific installation. The following testing should be performed to demonstrate continued compliance.

Class II Permissive Change (C2PC) Test Plan for Host Devices:

1) AC Conducted Emission (FCC Part 15.207)

2) Maximum conducted power (FCC Part 15.247(b))

3) Radiated Emission (FCC Part 15.205&209, FCC Part 15.247(d))

4) Host cannot change the RF Exposure use conditions. If use conditions is changed then C2PC shall be required.

Note :

1. These tests be based on C63.10 and FCC Part 15.247 as guidance, according to the operating frequency High, Mid and Low channel test.

2. For these tests, all modes need to be tested.

3. Maximum conducted power of the original grant is 10.55dBm, followed by an in-host measurement to be made showing that the conducted power must <10.55dBm.

4. RF Exposure evaluation: The host product operating conditions must be such that there is a minimum separation distance of 20 cm (or possibly greater than 20 cm) between the antenna radiating structures and nearby persons. The host manufacturer is obligated to confirm the use conditions of the host product to ensure that the distance specified in the instructions is met. In this case the host product is classified as a mobile device for RF exposure purposes. If the modular transmitter is authorized to be used in a specific type of host platform and installed such that it can be operated at closer than 20 cm to users or nearby persons, please follow below guidance:

If the portable host product has only stand-alone mode, it requires additional evaluation or testing for Class II permissive change. If the portable host product has multiple transmitters, it requires routine evaluation or SAR testing for the simultaneous transmission of the co-located transmitters according to KDB 447498. The portable host product shall be evaluated for ensuring continued compliance with FCC rule Part 2.1093 & Part 1.1310 via C2PC. Additional guidance for portable host products is provided in KDB Publication 996369 D02 and D04. If the host product is not installed in accordance with this guide, the module certification will be invalid, and a new grant certification will be required for the host product.

Debug and Test Configuration

Debug Interface

The Tr8M receiver provides a Serial Wire Debug (SWD) interface for factory programming, firmware verification, and RF calibration. This interface is intended for manufacturing and integrator use only, and is not accessible to end users in the final product configuration.

SWD Interface Pin Assignment:

Pin	Signal	Description
1	VDD	2.8V regulated power (debug probe supply)
2	GND	System ground
3	RST	MCU reset (active low)
4	SWCLK	Serial wire debug clock
5	SWDIO	Serial wire debug data input/output

Debug Interface Location:

The SWD interface is located on the edge of the PCB as 5 test pads. Refer to the receiver pin definition diagram for exact location.

Test Mode Entry

The receiver supports RF compliance testing through the following methods:

Method 1: Software-controlled test mode (recommended)

Bind the receiver with a compatible AFHDS 3 transmitter (e.g. PL18 Ultra)

Connect the transmitter to a PC via USB cable

Launch FlySkyAssistant software (V3.0 or later)

Navigate to the RF Test tool section

Select the desired test mode and parameters (frequency, power, modulation)

The receiver will enter the specified test mode automatically via the AFHDS 3 over-the-air command

Method 2: Forced update/test mode (hardware trigger)

Short the signal pins of CH1 and CH2 before applying power

Power on the receiver — LED will indicate a three-Flash-one-off pattern

The receiver enters forced update mode

Use FlySkyAssistant to configure RF test parameters or update firmware

Supported RF Test Modes:

Continuous transmission at fixed frequency (2402.15 MHz / 2439.95 MHz / 2479.85 MHz)

Frequency hopping spread spectrum (FHSS) test mode

GFSK modulation test

Receiver sensitivity test

Continuous wave (CW) transmission test

Test Software and Firmware Versions:

Configuration software: FlySkyAssistant V3.0 or later

Receiver application firmware: V1.0.5

RF transceiver firmware: V1.1

RF IC: SX1281.

认证相关 Certification

Power Management and Fault Protection

Regulated Power Supply:

The Tr8M module integrates an on-board LDO voltage regulator (BCT2014ELS28-TR) that provides a regulated 2.8V supply to the MCU and RF transceiver. The input voltage range is 3.0V to 9V DC. The regulated supply ensures stable RF performance across the entire input voltage range.

Watchdog Protection:

The MCU (STM32G071) incorporates an independent watchdog timer (IWDG) that automatically resets the device in the event of a firmware hang or fault condition. This ensures the module returns to a known, compliant state under host fault conditions.

Battery Protection:

The module includes battery over-discharge protection (BTRD04A035) and battery voltage monitoring (BAT_MON) to prevent operation outside safe voltage limits.



微信公众号



Bilibili



Website



Facebook



FCC ID: 2A2UNTR8M00

Manufacturer: ShenZhen FLYSKY Technology Co., Ltd.

Address: 16F, Huafeng Building, No. 6006 Shennan Road, Futian District, Shenzhen, Guangdong, China

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Figures and illustrations in this manual are provided for reference only and may differ from actual product appearance. Product design and specifications may be changed without notice.

<http://www.flysky-cn.com>

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