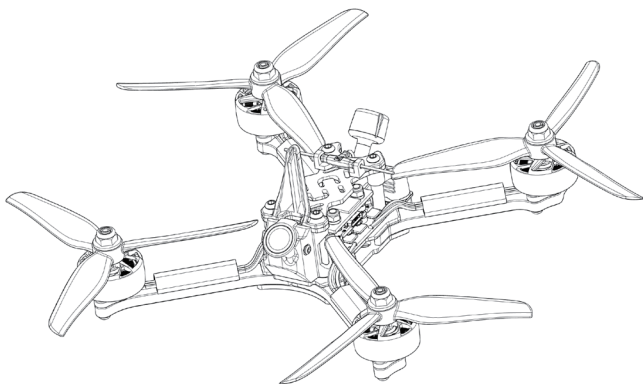




MACH R5 Ultra Trainer

Quick Start Guide

快速入门指南



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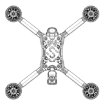
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Declaration of Conformity

一、概述

Mach R5 Ultra Trainer 专为竞速飞手打造轻量化高速穿越机，兼顾 DIY 改装空间与成品稳定性能。采用 190mm 紧凑 X 型 T700 碳板机架，搭配 7075 轻量化中板，整机仅 260g，风阻更小、过弯惯性低，抗炸耐摔，内部走线规整易维护，减少硬件磕碰损坏。全套 Borg H7 飞控 + Borg 60RS 电调 + 2207 竞速电机，极速 245km/h，动力响应迅猛；板载接收机、防打火、高分子聚合物电容等，是赛场竞速、高速训练的不二首选。

产品清单



Mach R5 Ultra Trainer x 1



正转螺旋桨 x 2



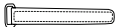
反转螺旋桨 x 2



鲨鱼鳍 x 1



接收机天线 x 1



电池扎带 x 1



防滑垫 x 1



配件包 x 1



贴纸 x 1

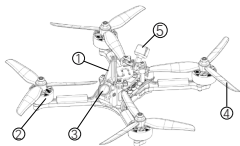


安全提示卡 x 1



免责声明 x 1

外观部件



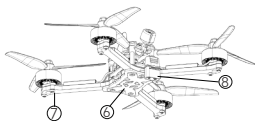
① 鲨鱼鳍

② 电机

③ 摄像头

④ 螺旋桨

⑤ 天线



⑥ 防滑垫

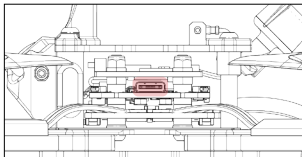
⑦ 机臂

⑧ XT60

二、对频指南

ELRS 接收机对频方法 + 步骤

方式一：使用传统方式对频（以 iFLIGHT Commando8 连接 ELRS2.4 为例，其他遥控器的具体操作请参考对应遥控器的说明书）



接收机进入对频方式一：连续插拔 USB 接口三次

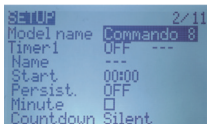
连续开机关机三次或者在未开机的状态下，通过 USB 口给接收机通电，连续插拔 USB 口三次，接收机信号灯呈持续双闪，此时接收机进入对频状态，下一步再到遥控器对频。

接收机进入对频方式二：点击 Betaflight 的接收机对频

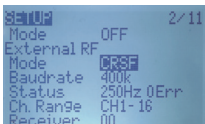
在 Betaflight 的接收机界面点击接收机对频，接收机信号灯呈快速双闪状态，则表示接收机已经进入对频状态，下一步再到遥控器对频



1. 上电后，通过长按 Model setup 按键来到 MODELSEL 界面。



2. 短按 Next Page 来到 SETUP 界面。



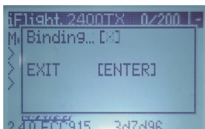
3. 选择并打开 ExternalRF 的 CRSF 协议。



4. 长按 System Settings 来到 TOOLS 界面，移动光标至 ExpressLRS 选项，长按 Enter 进入下一界面 \ 选项。



5. 把光标移动到 [Bind] 选项，按下 Enter 进入对频模式。



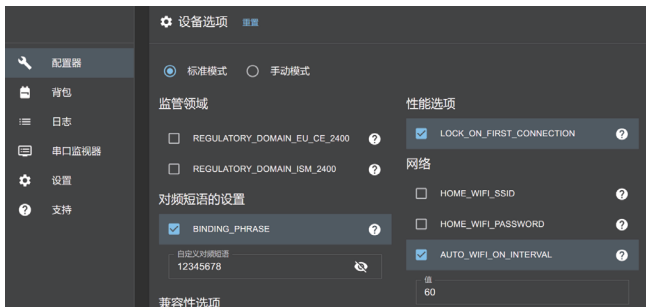
6. 对频完成后，接收机的信号灯双闪会变成常亮状态，此时已对频成功。

【注意】

1. 由于 ELRS 对频速度较快，需先使接收机进入对频模式，再让遥控器进入对频模式。
2. 对频完成后，建议给接收机重新上电。
3. 对频时，接收机与遥控器距离需在 1m 以上。
4. 接收机固件版本与高频头固件版本需保持一致，如遇到无法对频的情况，可尝试把接收机和高频头固件升级到最新的固件，再尝试对频。
5. 如遇到无法对频情况，可尝试重启遥控器与接收机。

方式二：绑定短语对频与传统方式对频

如果你正在刷写接收机与高频头固件，只需要设置好绑定短语即可直接将接收机与高频头绑定，无需使用传统方式对频。在 Custom binding phrase 中设置你的绑定短语。注意！绑定短语内容必须具有唯一性，不要设置简单的绑定短语，否则在 ELRS 信号范围内同样绑定短语的设备将会被绑定。



具体操作流程请参考 EXPRESSLRS 官网中的快速上手教程，或 IFLIGHT 官方哔哩哔哩账号视频教程。

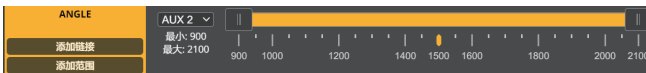
c. 飞行模式设置

套机默认出货为自稳模式，用户可自行设置其他模式。

ARM: 解锁 / 上锁通道开关，用于飞行器的解锁与上锁，默认出厂设置为 AUX1, 低位为上锁，高位为解锁。图标亮起表示解锁，图标呈现灰色表示上锁。



ANGLE: 自稳通道开关，用于飞行器开启自稳飞行模式，默认出厂设置为 AUX2 该模式全程保持开启状态。图标亮起表示开启自稳模式，图标呈现灰色表示非自稳模式。



飞控 12V 供电用于控制图传开关，默认全段开启，通道为 AUX9。用户可根据实际需求设置 AUX 通道。

开启图传开关



关闭图传开关



如需控制开启或关闭，则把通道调至 1600-2000 位置，图标显示黄色则为开启，显示灰色则为关闭

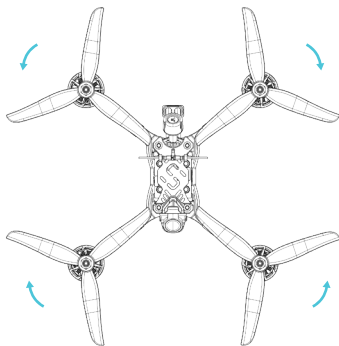


注：如重新刷写固件或恢复默认参数，需要手动在 Betaflight 的 CLI 界面输入以下指令，重新启动图传开关控制功能：

```
resource PINIO 1 D10
set pinio_config = 1,1,1,1
set pinio_box = 40,41,255,255
set box_user_1_name = VTX_ON_OFF
aux 0 40 8 900 2100 0 0
save
```

四、桨叶安装 - 示意图

正转 CW & 反转 CCW，用户需根据桨叶迎风面识别桨叶方向，安装至套机。



五、上电前检查及注意事项

1. 检查使用的电池电量是否充足且健康，确保电池无明显破损、变形或泄露现象。
2. 确认电池型号与穿越机兼容，电压规格正确（比如对于 6S 电池，应为 22.2V 左右）。
3. 检查电池插头与穿越机电池插座接触良好，无松动、污物或损坏情况。
4. 遥控器开启并已与穿越机正确对频，确认接收机指示灯正常闪烁或显示已连接。
5. 确保电机旋转方向正确，拆卸桨叶后，在地面站的电机页面推动油门确认
6. 确认螺旋桨安装方向，确定螺丝螺母不会松动。
7. 确保起飞地点空旷无障碍物，远离人群和贵重物品，以防止意外失控造成的损失。
8. 如果是首次飞行或重大升级后，建议先进行地面测试，确认所有功能正常后再进行空中飞行。

通过进行以上预防性检查，可以有效减少因疏忽导致的飞行事故，保证 FPV 穿越机的安全运行。

六、起飞 / 降落步骤及注意事项

起飞步骤:

需要先将油门 (throttle) 推至最低位置, 然后慢慢提升油门, 使穿越机离地约 10-20 厘米。观察穿越机的姿态稳定后, 收油门遥控器上锁。再戴上 FPV 眼镜或者面对查看显示器 (如小飞手), 解锁缓慢提高油门, 使其平稳升空。

降落步骤:

1. 降低高度, 在降落前, 先将穿越机逐渐降低至合适高度, 保持稳定的飞行速度和姿态。
2. 靠近降落点, 控制穿越机慢慢接近预先选好的降落区域, 尽量采用滑翔方式接近, 才能更好控制距离点位。
3. 减小油门, 缓慢减少油门输出, 让穿越机缓慢下沉。
4. 接触地面或距离地面 5-10cm 即可上锁, 小心周围环境避免硬着陆损坏。
5. 降落后后拿到电机优先将电池插头拔掉使设备断电。

注意事项:

- 电池电量过低, 飞行中可查看 FPV 眼镜或显示器中的 OSD 电池电量显示, 按飞行距离自行判断 (越远需提前返航), 电池单片电芯电压在 3.7V 时就需要注意返航降落。
- 观察四周, 在降落前再次确认周围环境安全, 没有人员或动物进入降落区。
- 降落后后优先将电池插头拔掉使设备断电, 避免再次误触遥控器开关 再次解锁极其危险。应优先在取下电池前, 确保遥控器上的油门归零并断开与飞行器的连接。

七、对频成功无法解锁的可能原因

1. 检查实际接线的串口和接收机协议设置是否和接收机所连接的串口一致;
2. 模式设置有冲突导致解锁失败, 检查地面站模式设置;
3. 检查地面站电机选项是否开了双向 dshot, 电调是否支持双向 dshot;
4. 检查接收机通道预设是否和遥控器的通道预设一致;
5. 飞机在倾斜角度下无法解锁, 检查地面站配置页面的最大解锁角度;
6. 带 GPS 的套机无法解锁, 检查失控保护设置是否开启了 GPS 救援, 搜星不成功导致无法解锁。

免责声明

本产品非玩具，使用者需具备相应的操作知识与技能。建议循序渐进地进行学习与练习，并在首次使用前仔细阅读本声明中的所有注意事项与警告。惠州市翼飞智能科技有限公司（iFlight）保留随时更新本《免责声明与概要》的权利，恕不另行通知。

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星河仲恺人工智能产业园 B2 栋厂房第 5-6 层



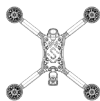
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I. Overview

Mach R5 Ultra Trainer is a lightweight high-speed racing drone designed for FPV pilots, offering both DIY customization flexibility and reliable ready-to-fly performance. Built with a compact 190mm True-X T700 carbon fiber frame and a lightweight 7075 aluminum center plate, it weighs only 260g for reduced drag, lower cornering inertia, and enhanced crash resistance. The optimized internal wiring layout simplifies maintenance and helps prevent hardware damage from impacts. Powered by the Borg H7 FC, Borg 60RS ESC, and 2207 racing motors, it reaches speeds of up to 245 km/h with rapid power response. Built-in receiver, anti-spark filter, and polymer capacitors make it ideal for racing and high-speed training.

Packing List



Mach R5 Ultra Trainer x 1



CW propellers x 2



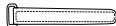
CCW propellers x 2



Sharkfin x1



Receiver antenna x1



Battery strap x1



Anti-slip pad x1



Accessory pack x1



Sticker x1

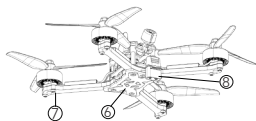
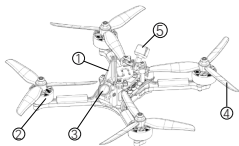


Safety warning card x1



Disclaimer x1

Appearance Components



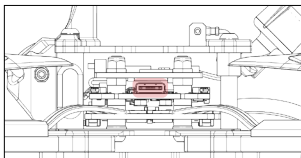
① Sharkfin ② Motor ③ Camera ④ Propeller ⑤ Antenna

⑥ Anti-slip pad ⑦ Arm ⑧ XT60

II. Binding Instruction

ELRS Protocol: Binding Methods + Steps

Method1: Traditional Binding Procedure (Take iFlight Commando 8 binding to ELRS 2.4GHz module as an example. For specific operations of other remote controllers, please refer to the corresponding remote controller's manual.)



Receiver Binding Method 1:

Plug and unplug the USB port for three times

Power on and off the aircraft for three times, or plug and unplug the USB port for 3 times to supply power to the receiver when the aircraft is power off, the LED will start to double flash continuously. BIND mode active.



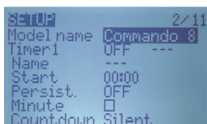
Receiver Binding Method 2:

Enter Binding Mode via Betaflight

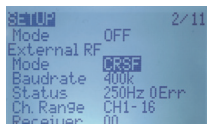
In the Betaflight Receiver tab, click Bind Receiver. When the receiver LED start to double flash rapidly, the receiver has successfully entered binding mode. Proceed to bind the remote controller.



1. Once you power on, long press the the Model setup to enter the MODELSEL page.



2. Short Press Next Page to enter the SETUP page.



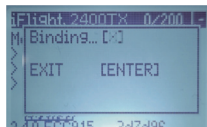
3. Scroll down to External RF and select CRSF.



4. Long press System Settings to enter the TOOLS interface, move the cursor to ExpressLRS, and long press Enter to enter the next interface/option.



5. Scroll down to [Bind], press Enter to enter the binding mode. Bind mode active.



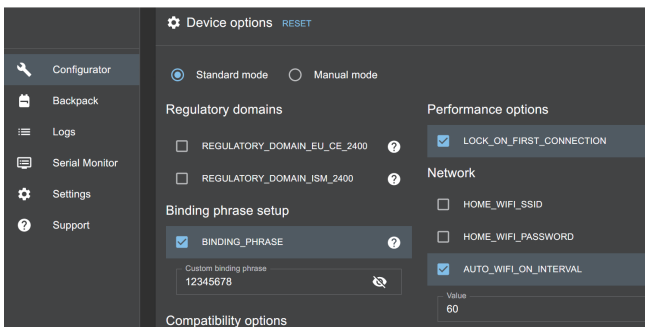
6. After successful binding, the receiver LED will change from a double flash to a solid light. Bind was successful.

[Note]

1. Be quick with this process and set the receiver in binding mode first, then put the remote controller into binding mode.
2. After the binding process is completed, it's recommended to re-power receiver.
3. The distance of receiver and remote controller should be more than 1m during the process.
4. The receiver firmware version should be consistent with the RF module firmware version. If binding fails, update both the receiver and RF module to the latest firmware version, then try binding again.
5. If binding fails, try reboot both the remote controller and the receiver.

Method 2: Using Custom Binding Phrase

When flashing the latest ELRS firmware for Receiver and RF module, just set a unique custom binding phrase to automatically bind all your hardware. Do not set a simple binding phrase, otherwise other pilot's aircraft with the same binding phrase might be bound as well.



For more specific information please refer to the ELRS quick start tutorial on the official website.

III. Betaflight Installation and Setup

a. Receiver Port/Protocol

(Take the built-in ELRS receiver on this aircraft as an example)

The screenshot shows the Betaflight Configuration tab, specifically the Receiver section. The 'Serial Rx' dropdown is set to 'Serial (via UART)'. A yellow warning box states: 'The UART for the receiver must be set to 'Serial Rx' (in the Ports tab)' and 'Select the correct data format from the drop-down, below:'. The 'CRSF' dropdown is set to 'Serial Receiver Provider'. The 'Telemetry' section shows the 'TELEMETRY' toggle is turned on, with 'Telemetry output' selected.

b. Channel Map Setting

Receiver Channel Map: "AETR1234" Mode 1 Throttle, "TAER1234" Mode 2 Throttle

The screenshot shows the Betaflight Configuration tab, specifically the Receiver section. The 'Serial Rx' dropdown is set to 'Serial (via UART)'. A yellow warning box states: 'The UART for the receiver must be set to 'Serial Rx' (in the Ports tab)' and 'Select the correct data format from the drop-down, below:'. The 'CRSF' dropdown is set to 'Serial Receiver Provider'. The 'Telemetry' section shows the 'TELEMETRY' toggle is turned on, with 'Telemetry output' selected. The 'RSSI (Signal Strength)' section shows the 'RSSI_ADC' toggle is turned on, with 'Analog RSSI input' selected. The 'Channel Map' section shows 'AETR1234' selected for the 'Channel Map' and 'Disabled' for the 'RSSI Channel'. The 'Stick Low' Threshold is set to 1050, 'Stick Center' is 1500, and 'Stick High' Threshold is 1900. The 'RC Deadband' is set to 0, 'Yaw Deadband' is 0, and '3D Throttle Deadband' is 50. The 'RC Smoothing' section shows the 'On' toggle is turned on, with 'Smoothing Mode' selected. The 'Refresh' and 'Save' buttons are at the bottom right.

C. Mode Switch

The default mode is Angle, and users can also switch to other modes.

ARM: The ARM/DISARM channel switch for arming and disarming the aircraft. Default factory setting is AUX1, low position for disarm, high position for arm. The icon is lit to indicate arm, the icon is gray to indicate disarm.

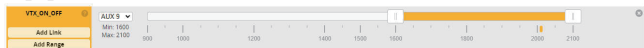


ANGLE: The Angle channel switch is used to enable the aircraft's Angle flight mode, the default factory setting is AUX2, this mode remains on throughout the flight. The icon is lit to indicate Angle mode is on, the icon is gray to indicate Angle mode is off.

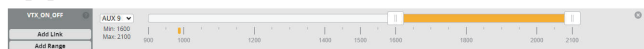


The flight controller's 12V power output is used to control the VTX power switch. The default setting is always ON, with the control channel set to AUX9. Users can set the AUX channel according to actual needs.

VTX_ON_OFF Mode On



VTX_ON_OFF Mode Off



To control VTX on/off, please drag the range to 1600-2000. If the icon is yellow, it is on, and if it is gray, it is off.

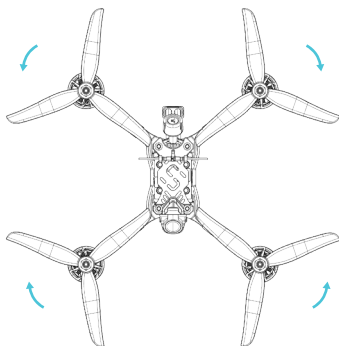


Note: Reflashing firmware or restoring the default factory settings requires manually entering the following commands in Betaflight CLI to re-enable VTX switch control:

```
resource PINIO 1 D10
set pinio_config = 1,1,1,1
set pinio_box = 40,41,255,255
set box_user_1_name = VTX_ON_OFF
aux 0 40 8 900 2100 0 0
save
```

IV. Propellers Installation - Diagram

Identify CW & CCW propellers and install them correctly on the aircraft.



V. Pre-Flight Check

1. Make sure the aircraft batteries are fully charged and there is no obvious damage, deformation or leakage in the battery.
2. Make sure the battery model is compatible with the aircraft and the voltage specification is correct (e.g. for 6S battery, it should be about 22.2V).
3. Make sure the aircraft battery is properly connected and secure, there is no looseness, dirt or damage.
4. Make sure the remote controller is powered on and bind to the aircraft, and verify the receiver indicator light flashes normally or indicates a connection.
5. Make sure the motor rotates in the right direction, take off the propellers and connect the aircraft to Betaflight Configurator, then push the throttle to confirm the rotation on the motor page.
6. Make sure propellers are in good condition and mounted onto the motors correctly and securely.
7. Make sure the takeoff area is open and free of obstacles. Keep a safe distance from people and valuable objects to prevent potential damage in case of loss of control.
8. If it is the first flight or after a major upgrade, it is recommended to conduct a ground test first to make sure all functions are normal before flying in the air.

These preventive inspections can effectively reduce flight accidents caused by negligence and ensure the safe operation of FPV drones.

VI. Takeoff/Landing

Takeoff Procedure:

Start by pushing the throttle to the lowest position, then gradually increase it to lift the aircraft approximately 10–20cm off the ground. Once the aircraft's attitude is stable, throttle down and disarm the remote controller. Put on FPV goggles or face the monitor (such as a handheld monitor), arm the remote controller and slowly increase the throttle to smoothly ascend.

Landing Procedure:

1. Decrease altitude, before landing, gradually lower the aircraft to an appropriate altitude, maintaining a stable flight speed and attitude.
2. Approach landing spot, control the aircraft to slowly approach the pre-selected landing area, preferably using a gliding approach to better control the distance.
3. Reduce throttle, slowly decrease throttle output to allow the aircraft to land slowly.
4. Disarm the aircraft when it touches the ground or is 5–10cm away from the ground, be careful to avoid hard landings that could cause damage.
5. After landing, immediately unplug the battery to power off the device to avoid injury.

Precautions:

- Monitor battery level: You can check the remaining battery power by checking the OSD information in the FPV goggles or the monitor during flight. You need to judge the remaining flight time and leave enough redundancy for safe landing. When the voltage of a single battery cell approaches 3.7V, you need to pay attention to return and land. Over-discharge will cause irreversible damage to the battery.
- Observe surroundings: Before landing, double-check the surrounding environment for safety, ensuring no people or animals are in the landing area.
- Disconnect battery: After landing, it is important to first power off the aircraft to avoid accidentally triggering the remote controller switch to arm it again, preventing potential accidents and injury.

VII. Possible Reasons for Successful Binding but Failure to Arm

1. Check whether the actual UART connection and receiver protocol settings match the UART port connected to the receiver.
2. Check the flight mode settings. Conflicting mode configurations may prevent arming.
3. Check whether Bidirectional dshot is enabled and that the ESC supports it.
4. Check whether the receiver channel mapping matches the transmitter channel mapping.
5. The aircraft cannot arm when tilted beyond the maximum arm angle. Check the Maximum Arm Angle setting in Betaflight.
6. For GPS-equipped models, check whether GPS Rescue is enabled in Failsafe settings. The aircraft may not arm if GPS satellite lock is not achieved.

Disclaimer

This product is not a toy and requires some basic knowledge to control, so please pay special attention to the warnings and cautions before you start using it. iFlight reserves the right to update this Disclaimer.

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Declaration of Conformity.

This declaration of conformity is issued under the sole responsibility of the manufacturer

1. Manufacturer info

Name : Huizhou Iflight Intelligent Technology Limited
Address : F6, Building B2, Galaxy IMC, Beixin Road, No.6, Zhongkai Avenue,
Huizhou 516006,
Guangdong, CHINA
Contact : Winky Zhong
Tel : 0086-752-3866695
Email Address : sales@iflight.com

2. Product info

Product Name : FPV Drone
Model No. : Mach R5 Ultra Trainer
Brand Name : iFlight

3. Technical Description

Frequency : ISM 2400400000MHz - 2479400000MHz
range
Input Level : 14dBm-32dBm
Range
Operational : - 10°C~40°C
Temperature
Hardware : V1.0
Version
Software : V1.0
Version
Power Supply : 22.2V~, 31.08Wh

4. Applied Standard

2014/35/EU) Health and Safety (Conform)

BS EN 62368-1:2020+A11:2020

BS EN 62311:2020

EN50665:2017

2014/30/EU) Electromagnetic Compatibility(Conform)

ETSI EN 301 489-1 V2.2.3 (2019-11);

Draft ETSI EN 301 489-17 V3.2.6 (2023-06)

ETSI EN 301 489-19 V2.2.1 (2022-09);

ETSI EN 301 489-3 V2.3.2 (2023-01);

ETSI EN 301 328 V2.2.2 (2019-07);

ETSI EN 301 440 V2.2.1 (2018-07);

ETSI EN 301 413 V1.2.1 (2021.04);

EN 55032, EN 55035, EN 61000-3-2, EN 61000-3-3

2014/53/EU) Effective Use of Radio Spectrum(Conform)

ETSI EN 300 328 V2.2.2 (2019-07)

(EU)2015/863 RoHS(Conform)

IEC 62321-5:2013, IEC 62321-4:2013+AMD1:2017,

IEC 62321-7-1:2015 & IEC 62321-7-2:2017,

IEC 62321-6:2015, IEC 62321-8:2015,

5. Test Lab

All the relevant harmonized standards test were performed by

Shenzhen CTB Testing Technology Co., Ltd (CNAS Register number: L9438, A2LA Register number: 5599.01).

6. CE marking



7. Technical Construction File (TCF) and Test Reports

Furthermore, the ISO requirement for the in-process quality control procedure as well as the manufacturing process has been reached. The technical document as well as the test reports will be kept for a period at least 10 years after the last product has been manufactured at the disposal of the relevant national authorities of any Member State for inspection.

8. Authorized representative

The manufacturer's obligations set out in this declaration letter may be fulfilled or his authorized representative, on his behalf and under his responsibility. (Need Select)

Manufacturer contact

Declared by: Winky Zhong

Company name: Huizhou Iflight Intelligent Technology Limited

Contact person (print name): Winky Zhong

Email address: sales@iflight.com

Tel: 0752-3866695

Date: 2026/6/17

Signature:



