

BIONIC FLAPPING-WING AIRCRAFT

遥控仿生蝴蝶

RC Biomimetic Butterfly

以自然界真实蝴蝶为设计蓝本，精准复刻其灵动外形与绚丽色彩

Modeled on real butterflies, reproducing their agile forms and vivid colours

深度模拟蝴蝶振翅、滑翔等原生飞行姿态；骨架选用高强度轻量化碳纤维，翼膜采用超薄专用涤纶布，兼具韧性与视觉逼真度。

Closely simulates native flight motions such as flapping and gliding; a high-strength lightweight carbon-fibre skeleton carries ultrathin polyester wing membranes, combining toughness with visual fidelity.

16 min	2S 180 mAh	ELRS
最大续航时间 Maximum endurance	电池 Battery	接收机 Receiver

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01 产品概述 Product overview



遥控仿生蝴蝶以自然界真实蝴蝶为设计蓝本，精准复刻其灵动外形与绚丽色彩，同时深度模拟蝴蝶振翅、滑翔等原生飞行姿态，实现了科技与自然美学的完美融合。其核心结构采用现代先进材料打造，骨架选用高强度轻量化碳纤维，翼膜则采用超薄专用涤纶布，经精准印刷工艺还原蝴蝶翅膀的自然纹理，兼具韧性与视觉逼真度。

The RC biomimetic butterfly takes real butterflies in nature as its design blueprint, faithfully reproducing their agile forms and vivid colours while closely simulating native flight motions such as wing flapping and gliding — a fusion of technology and natural aesthetics. Its core structure is built from modern advanced materials: a high-strength, lightweight carbon-fibre skeleton supports ultrathin purpose-made polyester wing membranes, printed with precision to restore the natural texture of butterfly wings, combining toughness with visual fidelity.

02 核心特点 Key features

轻量仿生结构
Lightweight biomimetic structure

骨架选用高强度轻量化碳纤维，翼膜采用超薄专用涤纶布，经精准印刷工艺还原蝴蝶翅膀的自然纹理，兼具韧性与视觉逼真度。

A high-strength, lightweight carbon-fibre skeleton carries ultrathin purpose-made polyester wing membranes, printed with precision to reproduce the natural texture of real butterfly wings — tough, yet faithful to the eye.

稳定动力与长续航
Steady power and long endurance

搭载全金属低功耗数字舵机，动力输出稳定且能耗控制出色，搭配 2S 180 mAh 电池，可实现长达 16 分钟的连续飞行，满足长时间娱乐或展示需求。

Low-power all-metal digital servos deliver steady thrust with tight energy control. Paired with a 2S 180 mAh battery, the aircraft flies continuously for up to 16 minutes — long enough for extended leisure flights or demonstrations.

智能飞控与实时回传
Smart flight control and live telemetry

飞控板集成 ELRS 接收机、陀螺仪与气压计三大核心模块，快速响应遥控指令，确保飞行姿态平稳可控；同时支持姿态数据、电压状态等关键信息实时回传，让使用者随时掌握设备运行情况。

The flight controller integrates an ELRS receiver, a gyroscope and a barometer. It responds quickly to control inputs for stable, controllable attitudes, and streams key telemetry — attitude and voltage status — back to the pilot in real time.

跳跃起飞与轻碰防护
Ground-hop takeoff and impact protection

独特的防撞设计能有效抵御飞行过程中的轻微碰撞，降低设备损坏风险；同时支持地面跳跃起飞模式，无需额外辅助装置，随时随地即可开启飞行。

A dedicated impact-resistant design absorbs light collisions in flight and lowers the risk of damage. Ground-hop takeoff needs no launch equipment, so flight can begin anywhere, at any time.

高级特技飞行
Advanced aerobatics

配备高级特技飞行模式（搭载高功率舵机驱动），可灵活完成前后左右翻滚、垂直爬升、落叶飘等炫酷动作，飞行姿态灵动多变，兼具观赏性与操控趣味性。

Advanced aerobatic mode, driven by high-power servos, performs forward and backward flips, left and right rolls, vertical climbs and falling-leaf manoeuvres — varied, agile flight that is as entertaining to watch as it is to fly.

03 技术参数 Technical specifications

参数 Parameter	规格 Specification
骨架材料 Frame material	**碳纤维**
翼膜材料 Wing membrane material	**超薄涤纶布**
标准舵机 Standard servo	**全金属低功耗数字舵机**
电池 Battery	**2S 180 mAh**
最大续航时间 Maximum endurance	**16 min**
飞控型号 Flight controller model	**OverAir W01**
飞控主控平台 Flight controller platform	**ESP32**
飞控供电接口 Flight controller power input	**XH 3pin**
飞控集成 Integrated flight control hardware	**ELRS 接收机、陀螺仪、气压计**
实时回传 Real-time telemetry	**飞行姿态、电压状态**
起飞方式 Takeoff method	**地面跳跃起飞**

04 产品图版 Product view



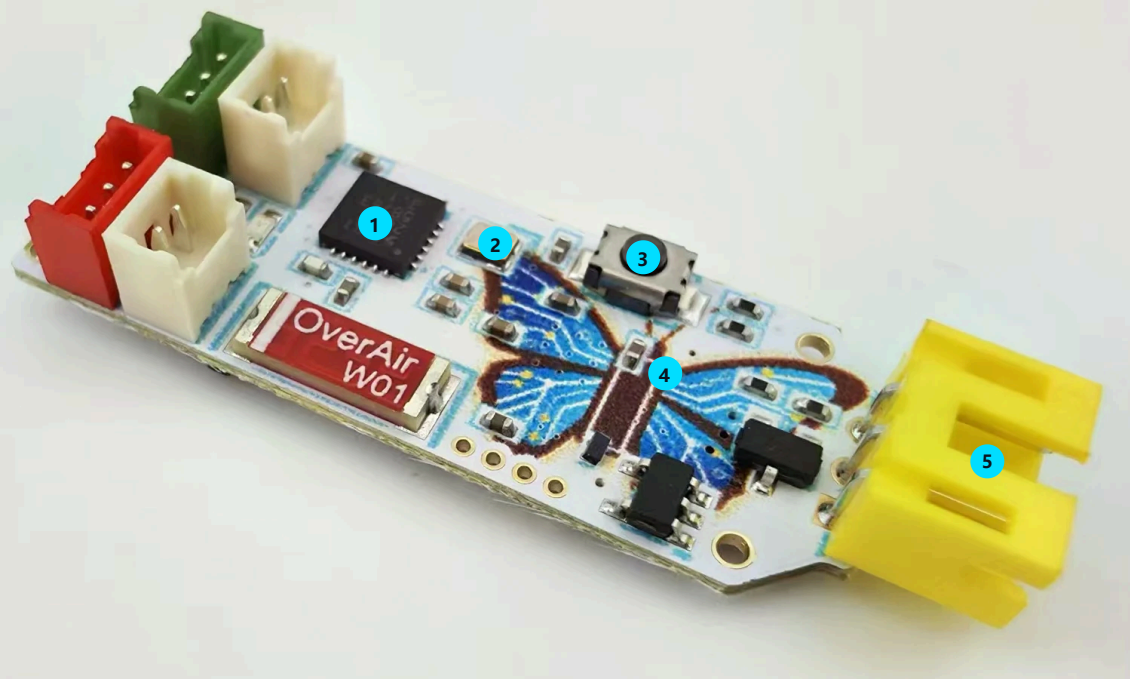
遥控仿生蝴蝶
RC Biomimetic Butterfly
仿生扑翼飞行器 · Biomimetic flapping-wing aircraft

碳纤维骨架 · 超薄翼膜 · 16 分钟续航 · 实时姿态回传 · 地面跳跃起飞
Carbon-fibre frame · Ultrathin wing membranes · 16-minute endurance · Live attitude telemetry · Ground-hop takeoff

05 自研仿生飞控板 In-house biomimetic flight controller

遥控仿生蝴蝶搭载华思未来自研的 OverAir W01 飞控板。板载 ESP32 负责飞行控制，XH 3pin 接口直接接入整机线束。控制策略与异常处置逻辑随整机联调迭代，板底测试焊盘用于研发与产线点测。

The RC biomimetic butterfly uses HUASI FUTURE's in-house OverAir W01 flight controller. An onboard ESP32 handles flight control, and an XH three-pin power connector plugs into the aircraft wiring harness. Control strategies and fault handling are refined during aircraft integration testing. Test pads along the bottom edge support development and production checks.



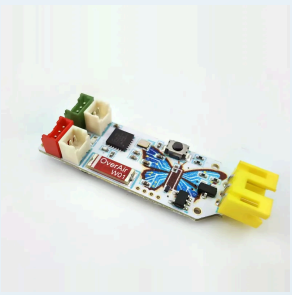
1 主控
Controller
QFN 封装的 ESP32 主控，板上集成晶振、电源管理与外围器件。
QFN-packaged ESP32 controller with an onboard crystal oscillator, power management and peripheral components.

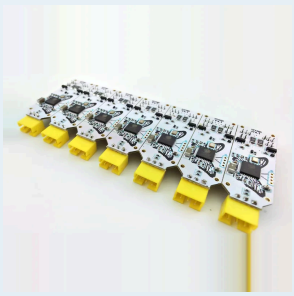
2 晶振
Crystal oscillator
紧邻主控布置，为主控提供稳定时钟基准。
Located next to the controller to provide a stable clock reference.

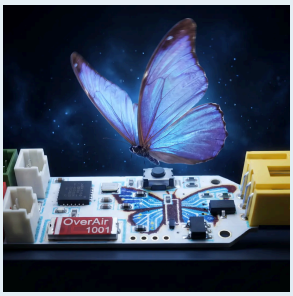
3 复位与下载按键
Reset and firmware download buttons
板载按键，调试与固件烧录不必拆板。
Onboard buttons allow debugging and firmware programming without removing the board.

4 仿生丝印
Biomimetic silkscreen
板面以蝴蝶为形做丝印，翅脉与躯体顺着走线排布。
The butterfly-pattern silkscreen has wing veins and a body that follow the circuit traces.

5 XH 3pin 取电
XH three-pin power input
三针接口从板边直接引出，插拔即可接入整机线束。
A three-pin connector at the board edge plugs directly into the aircraft wiring harness.


仿生飞控板 OverAir W01 型号实物
OverAir W01 flight controller


仿生飞控板批量实拍
Production batch of biomimetic flight controllers



仿生飞控板与蝴蝶意象
Biomimetic flight controller with butterfly imagery