

AI-POWERED UAV TEST SYSTEM

智能体无人机技术专家系统

AI-powered UAV technical expert system

面向中小型无人机的 AI 智能体性能测试系统

An AI agent performance testing system for small and medium UAVs

一柜集成功率、负载与分析：基于 AI 智能体自主编排测试任务、联动控制设备、识别异常并生成报告，把分散搭建的传统测试台，收敛成一台可交付、可复制的整机。

Power, load and analysis in one cabinet: AI agents orchestrate tests, coordinate equipment, detect anomalies and generate reports, bringing a distributed test bench into a complete, repeatable system ready for delivery.

95%
测试自动化率
Test automation

1000 TOPS
AI 算力
AI performance

200 MHz
示波器带宽
Oscilloscope bandwidth

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01 产品概述

Product overview



平台采用「AI 智能体核心层 + 算力支撑层 + 硬件采集测试层 + 数据输出层」四层架构：

The platform has four layers: an AI agent core, computing support, hardware acquisition and testing, and data output.

AI 智能体自主编排测试任务、联动控制设备、识别异常并生成报告，英伟达 GB10 算力工作站承载本地大模型推理与模型迭代，智能测试柜与示波器、电子负载、万用表完成电气与动力指标的高精度采集，高清显示器与专用打印机完成可视化监控与报告输出。

AI agents orchestrate tests, coordinate equipment, detect anomalies and generate reports. An NVIDIA GB10 workstation supports local large-model inference and iteration. The test cabinet, oscilloscope, electronic load and multimeter acquire high-precision electrical and propulsion measurements, while a display and dedicated printer provide visual monitoring and report output.

覆盖电池充放电性能、整机功耗与负载极限、电路板电压电流电阻精度、飞控信号时序与稳定性、长时间工况稳定性与高低负载切换适应性等场景，适配消费级与工业级小型无人机。

Designed for small consumer and industrial UAVs, the platform tests battery charge/discharge performance, power consumption and load limits, board-level voltage/current/resistance accuracy, flight-control signal timing and stability, long-duration operation, and transitions between high and low loads.

02 核心特点

Key features

供电、负载与信号测量集成在同一台机柜内。AI 智能体统一调度仪器，从执行测试到生成报告，一套流程即可完成。

Power supply, load control and signal measurement are integrated into one cabinet. AI agents coordinate the instruments through a single workflow, from test execution to report generation.

高集成度

High integration

稳压供电、可编程负载和测量仪器统一上架，减少现场逐台布置和接线的工作。

Regulated power, programmable loads and measuring instruments share a rack, reducing on-site equipment setup and wiring.

多仪器协同

Coordinated instruments

统一控制示波器、电子负载和万用表，把信号波形与电气读数记录在同一测试流程中。

Coordinated control of the oscilloscope, electronic load and multimeter records waveforms and electrical readings in a single test workflow.

仪表级精度

Instrument-grade precision

六位半万用表测量电压、电流与电阻，四通道示波器观测飞控时序和电源纹波。

A 6½-digit multimeter measures voltage, current and resistance, while a four-channel oscilloscope observes flight-control timing and power ripple.

自动化测试

Automated testing

智能体编排并执行测试、识别异常、生成报告，让同一工况可以按相同流程复测。

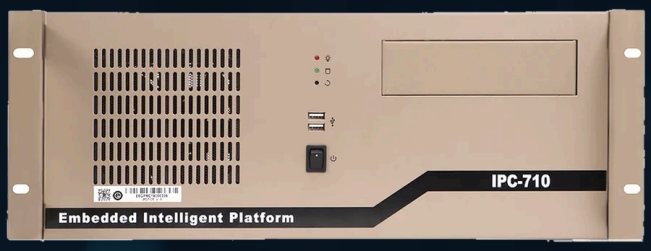
Agents orchestrate and execute tests, detect anomalies and generate reports, allowing repeat tests under the same conditions and workflow.

03 柜内每一台，都是选型过的

Every instrument is selected for the task

工控机负责调度，示波器捕捉时序，电子负载复现工况，万用表提供精密读数。四台仪器各司其职。

The industrial PC orchestrates tasks, the oscilloscope captures timing, the electronic load reproduces operating conditions, and the multimeter provides precision readings.



主控 Controller

IPC-710 上架式 4U 工控机

IPC-710 rackmount 4U industrial PC

柜内主控负责执行测试流程、联动仪器并调度数据采集，适配实验室和产线的标准机柜。

The cabinet controller executes test workflows, coordinates instruments and schedules data acquisition in standard laboratory and production-line racks.

- 多串口、双网口与 VGA 接口
  Multiple serial ports, dual Ethernet ports and VGA
- 前后通风，支持 7×24 小时运行
  Front-to-rear ventilation; supports 24/7 operation
- 可按需扩展采集卡与运动控制卡
  Expandable with data acquisition and motion control cards



测量 Measurement

四通道数字示波器

Four-channel digital oscilloscope

200 MHz 带宽与 1 GS/s 采样率，用于观测飞控信号时序和稳态纹波。

200 MHz bandwidth and a 1 GS/s sample rate for observing flight-control signal timing and steady-state ripple.

- 四通道输入，支持同时观测多路信号
  Four input channels for simultaneous signal observation
- 波形与测量读数分区显示
  Separate display areas for waveforms and measurements
- 刻度网格辅助判读波形细节
  Graticule helps interpret waveform details



负载 Load

可编程直流电子负载

Programmable DC electronic load

0–150 V、0–60 A、3000 W，用于测试整机负载极限和复现高低负载切换。

0–150 V, 0–60 A, 3000 W for testing aircraft load limits and reproducing transitions between high and low loads.

- 支持恒流、恒压、恒阻和恒功率模式
  Supports constant current, voltage, resistance and power modes
- 红黑分极性的螺纹输入端子
  Red and black threaded input terminals identify polarity
- 同屏读取电压、电流、功率与电阻
  Voltage, current, power and resistance readings on one screen



精度 Precision

台式数字万用表

Benchtop digital multimeter

六位半读数，直流电压精度 0.001%、电阻精度 0.002%，用于核对板级电气参数。

6½-digit readings, 0.001% DC voltage accuracy and 0.002% resistance accuracy for verifying board-level electrical parameters.

- 绿色数码屏显示测量读数
  Green digital display shows measurement readings
- 四线制接线端子，电压和电流端子分组
  Four-wire terminals with separate voltage and current groups
- 测量功能按键分区布置
  Grouped buttons for measurement functions



柜内主控后面板：工业接口与扩展插槽 Cabinet controller rear panel: industrial interfaces and expansion slots

04 技术参数
Technical specifications

参数 Parameter	规格 Specification
算力工作站 Computing workstation	**英伟达 GB10，1000 TOPS AI 算力，128GB 统一内存，1TB SSD** NVIDIA GB10, 1000 TOPS AI performance, 128 GB unified memory, 1 TB SSD
数字示波器 Digital oscilloscope	**四通道，带宽 200MHz，采样率 1GS/s** Four channels, 200 MHz bandwidth, 1 GS/s sample rate
可编程直流电子负载 Programmable DC electronic load	**0–150V / 0–60A / 3000W，恒流、恒压、恒阻、恒功率** 0–150 V / 0–60 A / 3000 W; constant current, voltage, resistance and power modes
高精度台式万用表 High-precision benchtop multimeter	**六位半，直流电压精度 0.001%，电阻精度 0.002%** 6½ digits; DC voltage accuracy 0.001%, resistance accuracy 0.002%
高清工业显示器 High-resolution industrial display	**27 英寸 4K，广色域，支持 7×24 小时运行** 27-inch 4K, wide color gamut, supports 24/7 operation
工业级专用打印机 Dedicated industrial printer	**A4 高清激光，报告与数据台账批量打印** High-resolution A4 laser printing; batch output of reports and data logs
测试流程自动化率 Test workflow automation rate	**95% 以上** Over 95%
部署环境 Operating environment	**18–28°C，湿度 40%–60%，接地电阻 ≤4Ω** 18–28°C, humidity 40%–60%, grounding resistance ≤4 Ω
质保与维护 Warranty and maintenance	**硬件 1 年质保、终身维护，AI 系统终身基础版本迭代** One-year hardware warranty, lifetime maintenance, and lifetime basic-version updates for the AI system

05 应用场景
Applications

- 电池充放电性能
  Battery charge/discharge performance
- 整机功耗与负载极限
  Aircraft power consumption and load limits
- 电路板电压电流电阻
  Board voltage, current and resistance
- 飞控信号时序与稳定性
  Flight-control signal timing and stability
- 长时间工况稳定性
  Long-duration operating stability
- 高低负载切换适应性
  Adaptability to high/low load transitions

06 运行流程
Operating workflow

01 测试准备
Test preparation

02 自动化测试
Automated testing

03 数据处理
Data processing

04 报告归档
Report archiving

07 系统架构

System architecture

智能体下发测试任务，本地工作站提供推理算力，柜内仪器采集数据，测试结果最终汇入报告。

Agents issue test tasks, a local workstation provides inference computing, cabinet instruments acquire data, and test results are compiled into reports.

AI 智能体核心层

AI agent core layer

自动化测试算法、设备联动控制、异常识别与报告生成，包含部署与培训，是整个平台的调度中枢。

The platform's orchestration hub provides automated test algorithms, coordinated equipment control, anomaly detection and report generation, including deployment and training.

算力支撑层

Computing support layer

英伟达 GB10 算力工作站，1000 TOPS AI 算力、128GB 统一内存、1TB SSD，承载本地大模型推理与模型迭代。

An NVIDIA GB10 workstation with 1000 TOPS AI performance, 128 GB unified memory and a 1 TB SSD supports local large-model inference and iteration.

硬件采集测试层

Hardware acquisition and testing layer

智能测试柜与四通道示波器、可编程直流电子负载、六位半万用表完成电气与动力指标的高精度采集。

The test cabinet, four-channel oscilloscope, programmable DC electronic load and 6½-digit multimeter acquire high-precision electrical and propulsion measurements.

数据输出层

Data output layer

27 英寸 4K 工业显示器可视化监控，配合专用打印机完成报告与数据台账批量输出。

A 27-inch 4K industrial display provides visual monitoring, while a dedicated printer produces reports and data logs in batches.

08 系统组成

System composition

按承载、测量、算力与输出四份清单交付，柜内设备、线缆与接口一次配齐，到场即可开机。

Delivered against four lists covering housing, measurement, computing and output, with cabinet equipment, cables and interfaces supplied together for startup on arrival.

承载与供电

Housing and power

- 无人机专用智能测试柜
  Dedicated intelligent UAV test cabinet
- 稳压供电与信号隔离模块
  Regulated power and signal isolation module
- 过载保护与设备收纳舱
  Overload protection and equipment storage

测量与加载

Measurement and load control

- 四通道数字示波器
  Four-channel digital oscilloscope
- 可编程直流电子负载
  Programmable DC electronic load
- 六位半高精度台式万用表
  6½-digit high-precision benchtop multimeter

算力与输出

Computing and output

- 英伟达 GB10 算力工作站
  NVIDIA GB10 computing workstation
- 27 英寸 4K 工业显示器
  27-inch 4K industrial display
- 工业级专用打印机
  Dedicated industrial printer

智能体编排 · 仪器联动 · 报告闭环

Agent orchestration · Coordinated instruments · Complete reporting