

Unmanned Aerial Vehicle(UAV) 無人機

產品及產業化 Product and Industrialization



高負載無人機高功率密度電源轉換器

High Power Density DC-DC Converters for High payload Drones

簡介 Introductions

因應工業級無人機輕量化需求，適用於中大型無人機之繫留電源管理模組，具備高功率密度與輕量化特色，相較現有商用品（功率與重量比 1w/g），本模組功重比達 2.5w/g 以上，已領先市售商用產品指標，可滿足多數大型旋翼無人機的繫留電源管理模組需求。

In response to the lightweight requirements of industrial-grade drones, it is suitable for tethered power management modules for medium and large drones. It has high power density and lightweight features. This model is an improvement compared to existing commercial products (power to weight ratio 1w/g). The power-to-weight ratio is more than 2.5w/g, which is ahead of the commercial products on the market and can meet the tethered power management module requirements of most large-scale rotor drones.

特色與創新 Features and Innovations

- 輕量化：模組本體 1.45 公斤，較市售品減重 50%。
- 高擴充性：垂直擴充從 4 kW 到 8/16/24 kW，達到 1+N 並聯冗餘。
- 高功率：額定 4kW，並聯冗於最大 24kW 輸出。
- 易搭配：適用於無人機 50V 工作電壓系統。
- 寬電壓：輸入電壓：200 ~ 420 Vdc。
- 國產化：在地生產，自主開發。
- 最安全：過溫保護、限流保護、過電壓保護。
- Lightweight：module body weighs 1.45 kg, which is 50% lighter than commercially available products.
- High scalability：vertical expansion from 4 kW to 8/16/24 kW, achieving 1+N parallel redundancy.

- High Power：4kW rated, parallel redundant for maximum 24kW output.
- Easy to match：suitable for drone 50V working voltage system.
- Wide voltage range：input voltage: 200 ~ 420 Vdc.
- Localization：locally manufactured and developed.
- Safest：over-temperature protection, current limiting protection, over-voltage protection.

應用與效益 Applications and Benefits

- 工業 / 商用無人機。
- Industrial/commercial drones.



4 kW 高功率密度電源模組
4 kW High Power Density Module



中大型無人機繫留電源管理模組
Tethered Power Management Module for Medium to Large-sized Drone



聯絡 contact

林正軒 Cheng-Hsuan Lin
E-mail: CH.Lin@itri.org.tw

TEL:886-3-5916691
FAX:886-3-5820454

多旋翼無人機用馬達

Motors UAVs' Electric Propulsion

簡介 Introductions

高推力電機，適用於中大型多旋翼無人機之動力，與市售同級產品相較下，MD1506 於 20 公斤推力時，電流減少 3%；MD1508 在 37 公斤推力時，力效提高 1.5%，重量減輕 4.36%，可有效提升多旋翼無人機續航力。

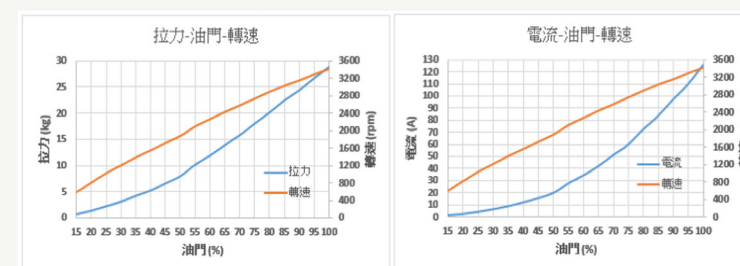
A high-thrust motor applied to the power of medium and large multi-rotor UAVs. Compared with similar products on the market, the current of MD1506 is reduced by 3% when the thrust is 20 kg; the pull/power efficiency of MD1508 is increased by 1.5% when the thrust is 37 kg, and the weight is reduced by 4.36%. In summary, we can substantially improve the endurance of the multi-rotor UAV.

特色與創新 Features and Innovations

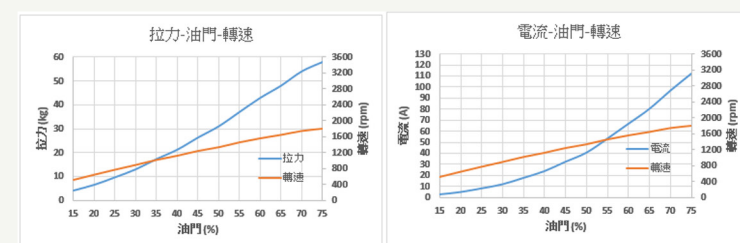
- 最佳效率與重量之匹配。
- 提供客製化設計與製作。
- Best compatibility of efficiency and weight.
- Design and production customization.

應用與效益 Applications and Benefits

- 應用於中大型多旋翼無人機，提高效率與減輕重量，提高續航力。
- Design a motor applied to medium and large multi-rotor UAVs through improving efficiency and reducing weight to improve the endurance of the multi-rotor UAV.



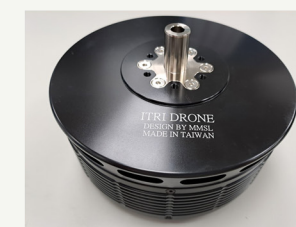
馬達 MD1506 性能圖
Motor MD1506 Performance graph



馬達 MD1508 性能圖
Motor MD1508 Performance graph



馬達 MD1506
Motor MD1506



馬達 MD1508
Motor MD1508



聯絡 contact

林正軒 Cheng-Hsuan Lin
E-mail: CH.Lin@itri.org.tw

TEL:886-3-5916691
FAX:886-3-5820454

多用途高續航無人機

Long Flight Endurance Drone for Multi-missions

簡介 Introductions

四軸八槳高續航無人機，動力具備冗餘設計，最多 4 顆馬達停止下可安全降落。飛控模組透過減振設計，搭配 FHSS 通訊技術提高抗干擾與穩定飛行能力。機身下方配置模組化快拆設計機構，實現多種功能酬載快速切換，及多用途特色。整機已導入物流遞送、風機葉片巡檢及地磁探勘等實際應用飛行調校，具安全與穩定性。

The four-axis eight-propeller high-endurance UAV has a redundant power design and can land safely even when up to four motors fail. The flight control module improves anti-interference and stable flight capabilities through vibration reduction design and FHSS communication technology. The modular quick-release design mechanism is configured under the fuselage to realize the quick switching of multiple functional payloads, and has multi-purpose features.

The UAV platform has proven to be safe and stable in various flight tests such as logistics delivery, wind turbine inspection and geomagnetic prospecting and other practical application adjustments.

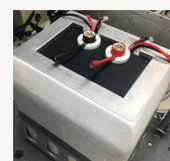
特色與創新 Features and Innovations

- 輕輕量化機身 (7kg，不含電池)
- 動力冗餘 (最多 4 顆馬達)
- 停止高續航力 (35 分鐘，酬載 5kg)
- 高抗風 (12m/s 風速 max)
- 結構模組化，機臂可收折
- 酬載與機身連接快拆界面，切換快速與簡單
- 自動換電
- Lightweight fuselage (7 kg, without battery).
- Power redundancy (≤ 4 motors).

- High endurance (35 min@5 kg payload).
- Gust wind resistance (12 m/s max).
- Modular and foldable fuselage design.
- Quick-release modular payload mechanism design for easy switch.
- Supports battery replacement.

應用與效益 Applications and Benefits

- 風機維運
- 物流遞送
- 空拍測繪
- 地磁探勘
- 電力線巡檢
- Fan maintenance.
- Delivery service.
- Aerial photography.
- Geomagnetic exploration.
- Inspection of transmission line.



換電功能
Battery replacement



物流遞送作業無人機
Delivery service UAV



聯絡 contact

林正軒 Cheng-Hsuan Lin
E-mail: CH.Lin@itri.org.tw

TEL:886-3-5916691
FAX:886-3-5820454

精準作業無人機

Utility Drones with Precision Servo Control at Hovering Mode

簡介 Introductions

具伺服雙軸控制之定向噴灑功能無人機，在空中可精準控制噴灑頭，將目標物之髒汙清洗乾淨。應用如電塔礙子清洗維運與商業大樓牆面清洗、風機維運。克服須使用大型直升機或人工攀爬至高空的危險作業，具快速派工、靈敏作業、高效率的特色。

This drone is equipped with a servo dual-axis control and directional spraying function, which can precisely control the spraying head in the air to clean the dirt on the target object. It can be used for cleaning insulators on electric towers, maintaining and cleaning walls of commercial buildings, and wind turbine maintenance. It overcomes the danger of using large helicopters or manual climbing to high altitudes and features rapid deployment, sensitive operation, and high efficiency.

特色與創新 Features and Innovations

- 非對稱無人機機身結構與可收折機臂，更高的機載容量。
- 具伺服雙軸控制之定向噴灑系統，具追瞄目標物與高壓清洗功能。
- 國內首架具高空精準作業之清洗無人機。



精準作業無人機
Precision Operation UAV

- Asymmetric UAV fuselage structure and retractable arms, higher payload capacity.
- Directional spraying system with servo dual-axis control which accurately tracks and cleans target object.
- First domestic precision operation cleaning drone.

應用與效益 Applications and Benefits

- 電塔礙子清洗維運、風機維運、太陽能廠維運。
- Applications: insulator cleaning and maintenance, wind turbine maintenance, solar power panel maintenance.



空中清洗示範
Demonstration of Cleaning Mid-air



聯絡 contact

林正軒 Cheng-Hsuan Lin
E-mail: CH.Lin@itri.org.tw

TEL:886-3-5916691
FAX:886-3-5820454