Congratulations on your purchase of Align M480L multicopte! The M480L is a representation of the latest technology in rotary RC models. Please consult this manual carefully before assembling and flying the new M480L multicopter. We recommend that you keep this manual as a tuning and maintenance reference for future use.
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**Align**
INTRODUCTION

We appreciate your patronage of Align products. To ensure your success with this product, we would like to present the following information and important reminders.

Align Multicopter represents the latest innovation in multi-rotor aircraft design. Amongst its design features:
Innovative, streamlined splash resistant shape at the pinnacle of power and beauty, industrial and structural design. Encompass stability control system, features light weight, strong payload, and long flight time. Superior in both high speed agility and static stability, this multi-purposed professional multicopter exceeds in all areas such as aerial photography or as leisurely sports flyer; yet its light weight allows for easy transport anywhere.

In order for you to thoroughly enjoy the Multicopter experience, please read through this manual prior to assembly and setting up the M480L Multicopter. Please keep this manual handy for future reference.

承蒙閣下選用亞拓遙控世界系列產品，謹表謝意。進入遙控世界之前必須告訴您許多相關的知識與注意事項，以確保您能夠在學習的過程中得心應手。

亞拓多軸飛行機的設計特點為:
前衛流線防潑水造型，極致力與美，工業與結構設計，整合穩定控制系統，輕量載重力強，飛行時間長特點，其動靜皆強的高速運動飛行與穩定特性，兼具航拍、娛樂、休閒、攜帶輕便多用途專業多軸飛行機。

為了讓您方便使用，在開始操作之前，請您詳細的閱讀完這本說明書之後再進行安裝與設定，同時請您妥善保存這本說明書，作為日後調整的參考。

QR CODE LINKS TO INSTRUCTIONAL VIDEOS

While this manual provides instructional information and references for this product, Align also produced instructional videos covering various topics pertaining to this model. The videos are available at the following link:

http://www.align.com.tw/m480lv/id/

QR CODE
Assembly Tutorial 組裝教學
PC Interface Program Download Tutorial 介面下載教學
Configuration Tutorial 設定教學
Operation Tutorial 操作教學
IMPORTANT NOTES

重要聲明

Radio Control (R/C) multicopters are not toys. R/C multicopters utilize various high-tech components to achieve superior performance. Improper use of this product can result in serious injury or even death. Please read this manual carefully before operating, and make sure to be conscious of your own personal safety and the safety of others nearby when operating all ALIGN products. Manufacturer and seller assume no liability for the operation or the use of this product. This product is intended for use only by adults with experience flying remote control aircraft at legal flying fields. After the sale of this product we cannot be held liable over its operation or usage.

We recommend that you seek the assistance of an experienced pilot before attempting to fly our products for the first time. A local expert is the best way to properly assemble, setup, and fly your model for the first time. This product requires a certain degree of skill to operate, and is an expendable item. Any damage or dissatisfaction as a result of accidents or modifications are not covered by any warranty and cannot be returned for repair or replacement. Please contact our distributors for free technical consultation and parts at discounted rates when you experience problems during operation or maintenance. As Align Corporation Limited has no control over the use, setup, assembly, modification or misuse, no liability shall be assumed nor accepted for any resulting damage or injury. By the act of use, setup or assembly, the user accepts all resulting liability.

In addition, R/C multicopters and its components are precision electronics susceptible to interferences from external forces such as magnetic field and radio signal. Should the multicopter or any onboard photographic equipment suffers loss or crash damage as result of external magnetic or radio interferences, Align cannot be held liable as the cause is beyond our control.

As the user of this product, you are solely responsible for operating in a manner that does not endanger yourself and others or result in damage to the property of others.

WARNING LABEL LEGEND

標誌代表涵義

<table>
<thead>
<tr>
<th>符號</th>
<th>意思</th>
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<tr>
<td>Forbidden 禁止</td>
<td>Do not attempt under any circumstances. 在任何禁止的情況下，請勿嘗試操作。</td>
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<tr>
<td>Warning 警告</td>
<td>Mishandling due to failure to follow these instructions may result in serious damage or injury. 因為疏忽這些操作說明，而使用錯誤可能造成財產損失或嚴重傷害。</td>
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<td>Caution 注意</td>
<td>Mishandling due to failure to follow these instructions may result in danger. 因為疏忽這些操作說明，而使用錯誤可能造成危險。</td>
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SAFETY NOTES

安全注意事項

- Fly only in safe areas, away from other people. Do not operate R/C aircraft indoors or within the vicinity of homes or crowds of people. R/C aircraft are prone to accidents, failures, and crashes due to a variety of reasons including: lack of maintenance, pilot error, and radio interference. Pilots are responsible for their actions and damage or injury occurring during the operation or as a result of R/C aircraft models.

- Prior to every flight, carefully check all parts such as blades, screws, frame, arms, etc; ensure they are firmly secured and show no unusual wears, or unforeseen danger may happen.

- 遠離飛行場離障礙物及人群

R/C aircraft can fly at high speed, thus posing a certain degree of potential danger. Choose a legal flying field consisting of flat, smooth ground without obstacles. Do not fly near buildings, high voltage cables, or trees to ensure the safety of yourself, others, and your model. Avoid location with magnetic and radio interferences. Please choose a legal flying field. Do not fly your model in inclement weather, such as rain, wind, snow or darkness.

- 鋰聚合物電池注意事項

Lithium Polymer batteries are significantly more volatile than alkaline or Ni-Cd/Ni-MH batteries commonly used in RC applications. All manufacturer's instructions and warnings must be followed closely. Mishandling of Li-Po batteries can result in fire. Always follow the manufacturer's instructions when disposing of Lithium Polymer batteries.

- 遠離潮濕環境

R/C aircraft are composed of many precision electrical components. It is critical to keep the model and associated equipment away from moisture and other contaminants. The introduction or exposure to water or moisture in any form can cause the model to malfunction resulting in loss of use, or a crash. Do not operate or expose to rain or moisture.

- 遠離潮濕環境

R/C aircraft are composed of many precision electrical components. It is critical to keep the model and associated equipment away from moisture and other contaminants. The introduction or exposure to water or moisture in any form can cause the model to malfunction resulting in loss of use, or a crash. Do not operate or expose to rain or moisture.
PROPER OPERATION
勿不當使用本產品

Do not attempt to modify the aircraft to alter its intended design. Please use only designated replacement parts listed in the manual to ensure its design structure integrity. Operate this product within its intended design parameters; do not overload it with excess cargo. This product is limited to personal hobby use, and pilot should be proficient with operation of this model. Follow all local law and ordinances when operating. Do not use this product for purposes which may violate others’ personal privacy, and respect other’s intellectual properties. Do not use this product for illegal purposes or beyond the bonds of common safety.

WARNING DO NOT FLY ALONE
避免獨自操控

Before turning on your model and transmitter, check to make sure no one else is operating on the same frequency. Frequency interference can cause your model, or other models to crash. The guidance provided by an experienced pilot will be invaluable for the assembly, tuning, trimming, and actual first flight or unforeseen danger may happen. (Recommend you to practice with experienced pilots or with computer-based flight simulator firstly.)

WARNING SAFE OPERATION
安全操作

Operate this unit within your ability. Do not fly while feeling impaired, as improper operation may result in danger. Never take your eyes off the model or leave it unattended while it is turned on. Immediately turn off the model and transmitter when you have landed the model.

CAUTION ALWAYS BE AWARE OF THE ROTATING BLADES
遠離運轉中零件

During the operation of the multicopter, the rotor will be spinning at a high rate of speed. The blades are capable of inflicting serious bodily injury and damage to surrounding properties. Be conscious of your actions, and careful to keep your face, eyes, hands, and loose clothing away from the blades. Always fly the model a safe distance from yourself and others, as well as surrounding objects.
KEEP AWAY FROM HEAT

R/C aircraft are made of various forms of plastics, such as carbon fiber and polyethylene. Plastics are very susceptible to damage or deformation from extreme heat and cold climate. Make sure not to store the model near any source of heat such as oven or heater. It is best to store the model indoors, in a climate-controlled, room temperature environment.

EQUIPMENT REQUIRED

1. RADIO TRANSMITTER AND ELECTRONIC EQUIPMENT REQUIRED

R/C Transmitter (8-channel or more, aircraft / multicopter system) 無線電機接收器
Receiver (8 channel or more) 接收器 (八動作以上)
Suitable RC transmitter for multicopter use must have at least 8 channels, with two 2-position switches and two 3-position switches. Suitable RC transmitter for multicopter and gimbal use must have at least 10 channels, with two 2-position switches, two 3-position switches, and two slider controls.

2. OPTIONAL EQUIPMENT

5,000~12,000mAh Li-polymer Battery 6S 6S鋰電池
Bluetooth Device 藍芽傳輸器
Clockwise x2 sets Counter Clockwise x2 sets
7.5 Inch Carbon Main Rotor x4 sets 7.5吋碳纖主旋翼組 x4 sets
G3 3 Axis Gimbal G3-GH [RGG301X]
G3-SD [RGG302X]
OSD+FPV Video Transmitter OSD+FPV 影像發射器 [HED00001]
FPV Monitor 螢幕接收器 [HEM00001]
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<td><strong>APS-M Multicopter Control Unit</strong></td>
<td>APS-M多軸飛控系統</td>
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<td>APS-M多軸GPS感應器</td>
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3K carbon fiber is used throughout multicopter frame, arms, and retracts.
多軸機主機體、軸管、腳架管均採用3K碳織材質。
1. LANDING GEAR ASSEMBLY

Remove landing gear assembly from box, loosen the 4 M2.5x16mm Socket Collar Screw from M2.5 nuts. Install the 12mm carbon landing gear into the T mount and re-tighten the screws.

取出腳架組，先鬆開腳架T座上的圓頭內六角軸套螺絲M2.5x16mm，M2.5防鬆螺帽，將12mm碳纖管鎖入腳架T座。

Please adjust the position of landing gear to accommodate the CG location of aircraft.

請依機身重心調整碳纖管鎖附位置的前後長度。

Retractable Landing Gear Installation Orientation

腳架裝卸方向示意圖

Front 機頭方向

約140mm 約130mm
1 REMOVE CANOPY

Remove main frame assembly from box. Temporarily remove canopy from frame.
1. Firstly, pull on two latching sides outwards.
2. Then gently remove the canopy upward from frame.

取出機身組，先將機殼拆下。
1. 先扳開機殼側邊。
2. 再往上提起機殼。

**CAUTION**

Use suitable force when removing canopy. Gently pull on two latching sides outwards to remove from frame.

機殼拆卸時請使用適當力道，將機殼兩側卡槽向外側輕輕拉開取出機身，以免造成機殼破裂損壞。

2 GIMBAL MOUNT CARBON TUBE INSTALLATION

Install the gimbal mount carbon tube onto the tube mount.

將雲台碳纖維裝於機身組上的雲台管座。

The high rigidity carbon fiber used on airframe are electrically conductive. Care should be taken not to expose any bare wires to the frame to reduce the chance of electrical shorts.
3 LANDING GEAR ASSEMBLY

Retracts can be mounted in either front or rear 4 bolts pattern based on CG. Rear is recommended for this aircraft.

M480L可依配重調整腳架組固定位置，請安裝於機身後側。

Retracts are prone to dust contamination during use. Periodically clean with pressurized air, and apply lubrication to ensure smooth retract operation.

4 REMOVE TOP CARBON PLATE

Temporarily remove all the twist-off screws and socket screws, and remove the upper carbon plate from the frame.

鬆開圓頭六角螺絲和旋鈕螺絲，將機身組的上碳纖板拆開。
Any incorrect wiring or errors in electrode connection will cause electronic burn out.

Make sure to install the wires with "UP" imprint facing up, and ensure the plug is inserted deep enough. Improper plug insertion may lead to poor connection or even malfunction of the APS-M unit.

Retract Wires and External Status LED Connection

Route the retract wires up through opening in lower carbon plate. Route the external status LED down through opening in lower carbon plate. Using double sided tape, mount the external status LED module to the retract facing rear of frame. Insert all 3 plugs into the PCU according to PCU wiring diagram (labeled as ① ② ③).

将多轴起落架上的訊號線，向上穿過下碳纖板孔洞，外掛用模式燈，由上往下穿過下碳纖板孔洞，沿腳架內側，黏貼於多軸起落架上（朝機尾方向），再依PCU電源管理系統面板指示位置依序將① ② ③ 插入接線。
3 MOTOR ARM ASSEMBLY INSTALLATION

1 MOTOR ROTATION DIRECTION

**CAUTION**

Identify the direction identifier on each motor mounts: R (clockwise) rotation motor must match R rotation blades; L (counter-clockwise) rotation motor must match L rotation blades.

組件前請確定馬達固定座上所標示的正、逆轉方向符號：R向馬達組必須搭配R向主旋翼；L向馬達組必須搭配L向主旋翼。

- R: Clockwise
  - R Rotation Specific Blades
  - R向專用主旋翼

- L: Counter Clockwise
  - L Rotation Specific Blades
  - L向專用主旋翼

2 MOTOR ARM ASSEMBLY LENGTH

馬達軸管組前後長度

Incorrect sequence of motor tube assembly or changes made to rotational directions of motor / blades may cause immediate flip-over on takeoff, and result in unforeseen dangerous situation.

馬達軸管順序組裝錯誤或自行更改馬達、主旋翼R/L轉向，將會造成機體升空後翻滾、撞毀，嚴重的將導致不可預期的意外發生。
3 MOTOR ARM ASSEMBLY INSTALLATION

Temporarily remove the socket hex screws M3x6mm from motor arm assembly. Based on the motor direction identifier label, attach the motor tube assemblies to the correct positions on the frame.

取出軸管時，先將圓頭內六角螺絲M3x6mm松開，依照馬達固定座上所標示的正、逆轉方向符號，將軸管組鎖上，固定於機身下碳纖板的正確位置。

**CAUTION 注意**
Double check the sequence and blades R/L rotation direction during motor tube assembly, ensure the install matches exactly with the instruction manual. Incorrect assembly or modifications may cause unexpected result or bodily injuries.

組裝馬達軸管時，務必再次檢查及確認，馬達組編號順序及主旋翼R/L轉向是否與說明書標示一致，錯誤或任意變動機體，將會導致不可預期嚴重的意外或人員傷害。

Insert a small screw driver into threaded sleeve to fix it in place while tightening the hex screws back.

可利用螺絲起子來固定鋁柱，將圓頭內六角螺絲鎖回。

**CAUTION 注意**
Use suitable force to tighten the M3x10mm and M2.5x6mm socket screws when adjusting the main rotor tightness and fixing main rotor upper cover to avoid motor winding failure.

調整主旋翼緊度及固定主旋翼上蓋時，請以適當力道鎖附M3x10mm及M2.5x6mm圓頭內六角螺絲，避免鎖過緊造成馬達線圈損壞。

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**MOTOR ARM ASSEMBLY MOUNTING LOCATION**

馬達軸管組裝孔位

**COMPLETED MOTOR ARM ASSEMBLY INSTALL**

馬達軸管組裝完成示意
There are 3 wires coming out of the motor arm assembly: red (+), black (-), and signal (APS-M). Connect the red (+) wire to positive power distribution cylinder, black (-) wire to negative power distribution cylinder. The signal wire will be connected to APS-M later.

Avoid pulling wires with excess force during wire management. Pulling the wires too hard may cause them to detach from ESC, resulting in problems with motor startup and navigation lights.

Wire straps can be used to fix the wires to the frame.
5 INSTALLATION OF TOP CARBON PLATE

Route the black signal wires from motor tubes through upper carbon plate. Re-install the upper carbon plate using the M2.5x6mm screws removed from earlier step. Then install the M3x6mm socket screw removed earlier from motor arm assembly.

Prior to re-assembly, ensure upper carbon plate can lay flat onto the frame, and that all wires are neatly tucked underneath without any pinching.

6 SECURING THE MOTOR ARM ASSEMBLIES

Reattach the 4 twist-off screws from earlier.

使用旋鈕螺絲固定馬達軸管。
Make sure to install the wires with "UP" imprint facing up, and ensure the plug is inserted deep enough. Improper plug insertion may lead to poor connection or even malfunction of the APS-M unit.

WARNING 警告

Please connect wires following correct orientation. Please connect wires following correct orientation.
5. Connect your receiver to the appropriate APS-M port as indicated.

1. When using JR X.BUS connection of DMSS satellite antennas, please select MODE A in your transmitter.
2. The standard receiver only support Channel 7.
   1. 使用JR X.BUS接線或DMSS衛星天線時，遙控器請選擇"MODE A"模式。
   2. 使用傳統接收器，只支援至第7頻道。

Please follow the instruction manual carefully when installing receiver. Traditional receiver channel ports are reserved specifically for the multi-colored ribbon cable. Do not directly connect standard servo plug into this port where power may be introduced into the APS-M. Doing so may cause irreversible damage to the APS-M. 安裝接收器時，請遵循說明書組裝方式接線，傳統接法的接口為彩虹線專用訊號頻道，禁止接入電源否則會造成APS-M多軸飛控系統損壞。

8. PCU UPGRADE CABLE WIRING DIAGRAM

Connect the PC to PCU’s APS-M port with USB adapter to perform firmware updates through PC interface program. 使用轉接線將USB接頭接到電腦端，另一端接PCU的APS-M孔位，透過電腦介面做升級更新。
1. Install your radio receiver, and attach APS-M Multicopter GPS Sensor to GPS mount.
2. Following the label on APS-M, connect motor arm signal wires into M1~M4 ports, as well as receiver wire(s) to APS-M.

Ensure the GPS mounting mast is securely fastened to the frame before mounting the APS-M Multicopter GPS Sensor.

Please install receiver at the recommended location as shown. Route the signal wire down through opening in lower plate and make sure the wire is out of the frame to boost the signal's range. To prevent the OSD interfering the signal, the receiver and OSD cannot be installed on the same side of the position.

Ensure canopy is latched to the lower carbon frame plate to prevent accidental separation during flight.

CAUTION

Canopy must be installed to avoid turbulence disturbance and ensure optimal flight performance.

CAUTION

Ensure the GPS mounting mast is securely fastened to the frame before mounting the APS-M Multicopter GPS Sensor.

Please install receiver at the recommended location as shown. Route the signal wire down through opening in lower plate and make sure the wire is out of the frame to boost the signal's range. To prevent the OSD interfering the signal, the receiver and OSD cannot be installed on the same side of the position.

Ensure canopy is latched to the lower carbon frame plate to prevent accidental separation during flight.

CAUTION

Canopy must be installed to avoid turbulence disturbance and ensure optimal flight performance.

CAUTION

Ensure the GPS mounting mast is securely fastened to the frame before mounting the APS-M Multicopter GPS Sensor.

Please install receiver at the recommended location as shown. Route the signal wire down through opening in lower plate and make sure the wire is out of the frame to boost the signal's range. To prevent the OSD interfering the signal, the receiver and OSD cannot be installed on the same side of the position.

Ensure canopy is latched to the lower carbon frame plate to prevent accidental separation during flight.

CAUTION

Canopy must be installed to avoid turbulence disturbance and ensure optimal flight performance.
Double-decker battery plate design for a single 6S 22.2V 12,000mAh (or less) battery (physical dimension permitting), or two batteries with 8,000mAh or less capacity. Battery selection is flexible, and can be used to adjust the CG location of aircraft. Battery plate feature patented anti-spark design, effectively minimize sparks during connection of battery, lowering problems such as damages to electronics and poor connection due to premature connector wear.

1. FIXED BATTERY WIRING METHOD
   電池固定式接線方式
   Loosen battery plate terminal cover, solder the wires to the corresponding + - terminal, and re-install the battery plate terminal cover.

   先鬆開電池板固定蓋，將電池電源線依 + - 指示焊接於接頭上再鎖回。

2. PLUG TO BATTERY WIRING METHOD
   電池插頭接線方式

3. BATTERY INSTALL EXAMPLE FOR M480L
   M480L電池使用示意圖
   M480L with gimbal is suggested to fly using a single 5,200mAh (or more) battery, or two batteries with 5,200mAh to match perfect CG balance and reach longer flight time.

   M480L 專機建議使用單顆5,200mAh以上電池，或是兩顆5,200mAh電池重疊並聯使用，可以達到最佳的重心搭配，以及更長的飛行時間。

4. BATTERY INSTALL EXAMPLE FOR M690L
   M690L電池使用示意圖
   4-1. Auxiliary Battery Plate
   副電池板組裝

   4-2. Single Battery
   聯電池板

   4-3. Double Battery
   雙層電池
5. M480L BATTERY INSTALLATION ILLUSTRATION

Lift open the multi-function battery hatch. With battery securely strapped to battery mounting plate, slide the whole plate assembly into the rail, push all the way in until a latching sound is heard. Then close the multi-function battery hatch.

先將多功能電池蓋掀開，把固定好電池的電池板順著滑軌推入，確認發出“喀答”聲響完全裝入，再將電池蓋蓋回。

For optimal balance on the M480L, mount the battery on the main battery plate. M480L電池請安裝於主電池板位置，以達到最佳配重效果。

5. INTELLIGENT POWER MANAGEMENT

智慧型電源控制系統

Battery level check: Momentary press of power button to check remaining power.
Power On: Press and hold power button for 3 seconds until battery indicator LEDs light up and Status LEDs flash.
Power Off: Press and hold power button for 3 seconds until all LEDs shut off.

检查電量：短按電源鍵檢測剩餘電量。
開啟電源：長按電源鍵3秒，電池電量指示燈亮起與模式燈閃爍，即完成開機動作。
關閉電源：長按電源鍵3秒，所有燈號熄滅，即完成關機動作。

AUTOMATIC POWER SHUT-OFF 智慧型電源自動關閉

Align’s Power Control Unit (PCU), has intelligent power hibernation function where the multicopter will power down automatically minutes after landing. The default hibernation function is OFF, but can be adjusted according to actual needs. Please refer to page 25 for setting instruction.

亞拓PCU電源管理系統，具備智慧電源管理功能，當多軸機落地關置時，會執行電源關閉保護。自動關閉時間原廠預設值為關閉，您可以依實際需求設定關機時間。設定方式請參考第25頁。
6 FLIGHT NAVIGATION LIGHTS

1. Flight navigation lights will light up when power on.
2. Flight navigation lights will shut off when power off.

1. 飞行指示燈開時指示燈隨之全部開啟。
2. 飞行機開機後指示燈隨之全部關閉。

Do not operate R/C aircraft if the flight navigation lights exhibit abnormal behavior during power up.

飛行指示燈開異常禁止飛行。

7 COLLAPSIBLE MOTOR ARMS

The motor arm assemblies feature foldable design. Simply loosen the twist-off screws for the arms to swivel, reducing the footprint for ease of transport.

多軸飛行機臂可快速收折設計，只要手轉開旋鈕螺絲，就能輕鬆收折馬達軸管，調整軸管位置，減小體積方便攜帶，輕鬆收納不佔空間。

MOTOR ARMS FOLD TOWARD THE SIDES

MOTOR ARMS FOLD TOWARD THE REAR

Twist-off Screws 旋鈕螺絲
Brand new APS-M Multicopter Control Unit with superior performance through cutting edge information technologies, utilizing high precision sensors and modern system control subroutines. Support quad(4), hex(6), and octo(8) rotors. Flight modes include attitude, GPS velocity, GPS angular, intelligent, and manual. In addition, it features failsafe auto return home, low voltage failsafe (through LED indicator and auto Return Home), OSD signal output, gimbal control, and Point of Interest (POI) function.

全新的APS-M多軸飛控系統，尖端IT工業創造出卓越性能，採用高精度感應元件與先進的演算法程式控制，發揮出高穩定性、多功能、高可靠度的性能。支援四軸、六軸與八軸多軸機，具備多種飛行模式（姿態、GPS速度、GPS角度、智能、手動）、自動返航與失控保護自動返航、低電壓保護（閃燈警示與自動返航）、OSD訊號輸出、雲台控制、定點環繞等功能。

Supports 6 multicopter configurations: 4 rotors +, 4 rotors X, 6 rotors +, 6 rotors X, 8 rotors +, 8 rotors X.
支援6種多軸飛行機，四軸+型、四軸×型、六軸+型、六軸×型、八軸+型、八軸×型

Build in APS-MM Multicopter GPS Sensor for precise location fixing function.
內建APS-MM多軸GPS感應器，提供精準的定位功能。

Multiple flight modes including manual mode, attitude mode, GPS Angular mode, and GPS Velocity mode.
提供手動模式、姿態模式、GPS角度模式、GPS速度模式，可滿足玩家使用需求。

Equipped with automatic return home function with remote activation ability from R/C transmitter. When RC transmitter signal is lost, multicopter will automatically fly back to home position.
具備自動返航，可由遙控器開關開啟返航，當失去遙控器訊號，飛行機會自動飛回Home點。

Features two stage battery low voltage protection system; Stage 1 provides visual warning through flashing LEDs, stage 2 will initiate automatic return home.
提供兩階段電池低電壓保護，第一階段閃燈警示，第二階段啟動自動返航。

APS-M provides 3 intelligent flight modes: CFO, HCL, and POI.
具有航向鎖定、返航點鎖定、定點環繞三種智能飛行。

Provides real-time OSD flight data output function.
提供OSD飛行實時資料輸出功能。

Supports G2/G3 gimbal control.
支援G2/G3雲台控制。

Supports Spektrum and JR satellite receivers.
支援Spektrum與JR衛星天線。

Supports Futaba S.BUS / JR X.BUS / FS iBUS.
支援Futaba S.BUS / JR X.BUS / FS iBUS功能。

Retractable landing gear, controllable through RC transmitter.
具備收腳架功能，可由遙控器開關控制。

Configuration changes through iOS APP.
支援iOS手機APP調整功能。

Configuration changes through Android APP.
支援Android手機APP調整功能。

Supports Bluetooth connectivity with smartphones.
支援藍牙功能，可透過手機設定調整。

RoHS certified.
符合RoHS規範。
CAUTION

- Install APS-M Multicopter GPS Sensor with arrow pointing toward front of the multicopter on GPS mount to avoid interference with power and video transmission system.
- Follow the instruction manual exactly for ESC signal wire connection. Incorrect connection may result in abnormal multicopter control behavior.
- APS-M utilizes a magnetometer which is prone to interference from surrounding environment. Keep it away from servos, ESC, magnets, iron metals, batteries, power wires, and other electrical components. Any strong magnetic field will cause poor attitude stability and affect the APS-M flight performance.
- Wireless transmission signal may cause interference to the APS-M, affecting the position hold performance. It should be kept away from wireless transmitter and its antennas (such as RF module antenna).
- 安装APS-M多軸GPS感應器時請依照面板上指示朝機頭方向安裝於GPS固定座上，以避免電池電源及無線通訊的設備互相干擾。
- 連接ESC訊號線時，請遵循說明書組裝步驟安裝，連接錯誤會影響多軸機運作異常而造成無法操控的危險。
- APS-M包含磁力計，磁力計很容易受到環境的干擾，安裝時請遠離伺服機、電子變速器、磁鐵、鐵質金屬、
- 电池、電線等影響磁場的零件，避免磁力計讀取到錯誤地球磁場。
- APS-M也會受到無線通訊的訊號干擾，會造成定位控制性能不佳，安裝時請遠離無線通訊設備。

Directional arrow must point toward the front of multicopter.
指示箭頭朝向機頭

Wire Straps
束帶2.5x100mm

Front
機頭方向

Wire Straps
束帶2.5x100mm

Do not mount with label facing down. 面板標籤不可朝下

Do not mount with label facing to the side. 面板標籤不可朝向側面

APS-M Multicopter Control Unit
APS-M多軸飛控系統

149mm

55mm
1. **SOFTWARE DOWNLOAD AND INSTALLATION**

1. Select either Airplane or Multicopter model type on RC transmitter. APS-M will only work with transmitter set to either Airplane or Multicopter model type.

2. **PC Software Install:** Please go to the following website to download the software and install on your PC.


   **CAUTION 注意**

   *If you are having difficulties installing Windows version of the APS-M software, please check whether you have Microsoft .NET Framework 4 installed.*


   **無法安裝APS-M Windows版本時，請檢查電腦是否有安裝Microsoft .NET Framework 4。**


3. **Please scan QR Code for link to ALIGNS website to find related software, or search "ALIGN APS-M" in iOS / Android app store. Optional Bluetooth module [HERBT001] is required for connectivity between iOS/Android app and Multicopter.**

4. **Power On Your Transmitter And Multicopter.**

   - **Power ON 電路開通**
   - **Press and hold for 3 seconds 長按3秒開機**
   - **to power up 上電開機**
2. When equipped with PCU Power Control Unit, APS-M will gain power hibernation function where auto power-off will occur in a specific duration after landing.

APS-M’s factory default hibernation function is OFF, which can be adjusted to 5 or 10 minutes based on actual needs.

APS-M搭載PCU電源管理系統，具備智慧電源管理功能，當多軸機器觸發斷電時，會執行電源關閉保護。

APS-M自動關閉時間原廠預設為關閉，您可以依實際需求設定開機時間長短，調整至6分鐘或10分鐘關機。

3. RC Transmitter and Receiver:
Please select the receiver type, and confirm the transmitter model type is set to airplane or multicopter.

遙控器與接收器，請選擇所使用接收器類型。遙控器模式請確認設定為飛機模式或多軸模式。
SATELLITE ANTENNA BINDING

使用衛星天線對頻方式

1) Binding: (Hold last command)
2) Binding with FailSafe: (Go to preset position). Select the "Reverse" on corresponding channels that needs reversing.
   a) Power on M480L, select the satellite receiver type and fail safe type.
   b) Reboot Power to M480L, satellite receiver's LED will blink, indicating entering binding mode.
   c) Enter the receiver binding mode on your transmitter. Once binding is complete satellite receiver's LED will be steady lit.

1) 對頻：(保留最後指令)
2) 對頻與失控保護：(回復預設值)
   a) 將M480L電源開啟，選擇所使用的衛星天線及失控保護方式。
   b) 重新開啓M480L電源，此時衛星天線LED燈會開始閃爍進入對頻狀態。
   c) 將遙控器開啟對頻模式，對頻完成衛星天線LED燈會恆亮。

CAUTION

In binding with failsafe mode, receiver's LED will go from fast blink to off immediately after successful binding, followed by slow blinks. Move the transmitter sticks to desired position to set the failsafe position, which will be confirmed with steady lit of LED after 5 seconds.

如果選擇"對頻與失控保護"，遙控器對頻完成瞬間，衛星天線LED會由快速閃爍狀態熄滅，之後再亮起改為慢速閃爍：在慢速閃爍狀態時，將遙控器上的所有搖桿放置於您所需要的預設安全位置，5秒後LED燈會恆亮，完成對頻。
4. RC Transmitter Stick Direction and Travel Range Calibration:

1) Before starting, set all EPA/Travel ADJ max and min value on your TX to default 100%, and neutralize all subtrims to 0.

2) Move your RC transmitter sticks and confirm travel direction on aileron/elevator/rudder/throttle correctly matches the PC interface display. Select the "Reverse" on corresponding channels that need reversing.

3) Select "Calibrate" and move all sticks on RC transmitter to maximum and minimum position, then click on "Complete" to finish.

Remotely control stick direction and travel range calibration:

1) Set all EPA, Travel ADJ max and min values to 100%, and neutralize all subtrims.

2) Confirm the stick movements on the interface display. If the displayed direction does not match the physical movement, select "Reverse" on the corresponding channel.

3) Select "Calibrate" and move all sticks to their maximum and minimum positions.

Click on "Complete" to finish.
CHANNEL FUNCTIONS
各頻道動作定義

Attitude, GPS (Velocity), GPS (Angular), Manual, Return Home, Intelligent Flight, as well as Retract functions can all be assigned to individualized switches on your RC transmitter.

1. FLIGHT MODES:
1) APS-M Flight mode control is on CH5. Assign a 3-step switch on your RC transmitter to CH5.
2) Flip the switch and see if correct mode is selected. If slider falls outside the correct position, adjust the EPA/Travel ADJ trim in RC transmitter until correct mode is achieved.

飛行模式:
1) APS-M飛行模式設置於CH5，請先選擇一個三段開關對應CH5飛行模式。
2) 切換開關，查看操作介面上指標是否正確對應到正確位置。如果指標位置錯誤，可用微調與EPA/Travel ADJ功能，將指標調整至正確位置。

- CAUTION
注意
Switch settings vary between different transmitter models, and can be set according to user preference.
各型號遙控器開關配置設定不相同，可依使用習慣選擇開關！

1. Default for first and second position is Attitude mode, but can be changed to Manual using the pull down menu.
2. GPS mode can be switched between velocity and angular GPS mode using the pull down menu.
3. Beginners should not select Manual mode on first position. Inexperiences with manual flying may lead to control difficulties or even crash.

1. 出廠預設值開關第一、二段為姿態模式，可依使用需求，下拉選擇手動模式或姿態模式。
2. GPS模式則有GPS速度模式與GPS角度模式兩種選擇。
3. 初學者不建議設定第一段為手動模式，手動模式在不熟練飛行控制者的操作下飛行，可能會造成不可預期的意外發生。
2. RETURN HOME

1) APS-M Return Home function is on CH6. Assign a 2-step switch on your RC transmitter to CH6 for the Return Home feature.

2) Flip the switch and see if correct mode is selected. If slider falls outside the correct position, adjust the EPA/Travel ADJ subtrim in RC transmitter until correct mode is achieved.

自动化返航

1) APS-M 返航功能設置於CH6，請先選擇一個兩段開關對應CH6 返航功能。
2) 切換開關，查看操作介面上指標是否正確對應到正確位置。如果指標位置錯誤，可用微調與EPA/Travel ADJ功能，將指標調整至正確位置。

注意

Return Home Function can only be activated with aircraft at least 20M away from home position.

在HOME點半徑20M之內，不執行自動返航功能。

Failsafe protection

APS-M failsafe protection must work in conjunction with the RC transmitter's failsafe function. Following is a setup example using Futaba T8J:

失控保護

APS-M失控保護設定必須搭配遙控器Failsafe功能。以下設定以Futaba T8J為例：

1) Activate automatic return home. Adjust transmitter's CH6 Endpoint (EPA) function so the indicator is in the Failsafe region. Write down this Endpoint value for next step.

1) 將自動返航開關開放，接著調整遙控器

Endpoint(EPA)功能中的CH6頻道，將指標調整至"Failsafe"區間。

2) Enter the transmitter's Failsafe menu, activate Failsafe on CH6, and enter the Endpoint value obtained in last step.

2) 進入遙控器"Failsafe"功能，將CH6頻道Failsafe開啓，並將上述調整數值設定至CH6。
3) Then adjust CH6 Endpoint (EPA) function on transmitter so indicator returns to the "ON" region.

4) Failsafe test: If failsafe is correctly set, the Return Home indicator in the Program Interface will move into the "Failsafe" region once transmitter power is turned off.

---

3. RETRACT SETTING

1) APS-M Retract function is on CH7. Assign a 2-step switch on your RC transmitter to CH7 for retract activation.

2) Flip the switch and see if correct mode is selected. If slider falls outside the correct position, adjust the EPA/Travel ADJ subtrim in RC transmitter until correct mode is achieved.

---

4. INTELLIGENT FLIGHT

1) APS-M Intelligent flight mode selection is on CH8. Assign a 3-step switch on your RC transmitter to CH8 for the Intelligent Flight Mode feature.

2) Flip the switch and see if correct mode is selected. If slider falls outside the correct position, adjust the EPA/Travel ADJ subtrim in RC transmitter until correct mode is achieved.

3) APS-M provides 3 intelligent flight modes: POI(Point of Interest), HCL(Home Course Lock), and CFO(Carfree orientation). The flight mode can be selected through pull down menu.
4 GIMBAL CONTROL SETTINGS

When APS-M is used with G2/G3 gimbals, now you will have full 6 function controls with single RC transmitter: Pan, Tilt, Roll, Shutter Trigger, Panoramic Photo, and Return to Center. User can customize switches on RC transmitter for each of the functions. If you use dual RC transmitter, please pass over to next setting.

APS-M搭配G2/G3雲台使用時，也具備單一遙控器可控制雲台六項功能：Pan軸、Tilt軸、Roll軸、拍攝/錄影、環景拍照、一鍵回中，可以依喜好習慣選開關使用。使用雙遙控器則跳過此設定。

1) First assign the desire function to an RC channel. If the RC transmitter or receiver is 10 channels, you must select 2 functions from the 6 available functions and assign to channel 9 and 10.

2) On the RC transmitter select the applicable switch, dial, or slider to map to these 6 functions. We recommend using a dial or slider for gimbal’s Pan/Tilt/Roll controls.

3) Correct direction for each function. Use the reverse function on RC transmitter to reverse direction if needed.

1) 先將所需要使用功能配置到所要使用的頻道上。如遙控器接收機只具備10動作，則從六項功能中選擇使用到的兩項功能，且將功能配置到第9與第10頻道。

2) 在遙控器選擇開關、旋鈕開關或滑軌開關對應此六項功能。雲台的Pan軸、Tilt軸與Roll軸控制建議設置在旋鈕開關或滑軌開關。

3) 確認各功能是否有正常動作，如動作有反向，可由遙控器的正反向功能切換更改。
The six gimbal control functions can all be assigned to individualized channel on your RC transmitter.

Please set the unused functions to X or N/A.

GIMBAL CONTROL SETTING INSTRUCTION

1. Pan Control: Controls gimbal's pan movement through a designated stick or switch on the RC transmitter.

Pan軸控制：透過遙控器指定一個撥桿或開關，可以控制雲台Pan軸方向動作。

2. Tilt control: Controls gimbal's tilt movement through a designated stick or switch on the RC transmitter.

Tilt軸控制：透過遙控器指定一個撥桿或開關，可以控制雲台Tilt軸方向動作。

3. Roll Control: Controls gimbal's roll movement through a designated stick or switch on the RC transmitter.

Roll軸控制：透過遙控器指定一個撥桿或開關，可以控制雲台Roll軸方向動作。

4. Shutter Control: When camera is connected to gimbal's trigger port with optional cable, controls camera's shutter or start/stop recording through a designated stick or switch on the RC transmitter.

拍照/錄影：透過遙控器指定一個撥桿或開關，且雲台與相機需搭配快門線，可以使用遙控器開關來控制相機拍照/錄影功能。

5. Panoramic Photo: When camera is connected to gimbal's trigger port with optional cable, allows camera to take panoramic photos at 0-30-60-90 degrees through a designated stick or switch on the RC transmitter. The number of photos taken at each angle is set through control interface program.

環景拍照：透過遙控器指定一個撥桿或開關，且雲台與相機需搭配快門線，可以使用遙控器開關來拍攝水平0度、30度、60度、90度環景照片，各角度拍攝張數可由操控介面調整。

6. Return to Center: Returns gimbal to center position through a designated stick or switch on the RC transmitter.

一鍵回中：透過遙控器指定一個撥桿或開關，可以使用遙控器開關來讓雲台各動作回到中立點位置。

These gimbal control settings are applicable for single RC transmitter controlling the multicopters and G2/G3 gimbal. RC transmitter and receiver must be 8 or more channels.

此雲台控制設定是運用在單一遙控器控制多軸機與G2/G3雲台時，遙控器與接收機必須具備8動作以上。
5 MULTICOPTER TYPE
多軸機類型

Please select the correct multicopter layout from the following six types.

Select 4 rotor X configuration for M480L
支援六種多軸機類型(四軸、六軸、八軸)，請依所使用的多軸機選擇正確的類型。

M480L多軸機請選擇四軸X。

⚠️ WARNING
警告
Arrow points toward the nose of aircraft. Incorrect type selection may lead to unflyable multicopters or even crash.
指示箭頭朝向機頭，如果多軸器類型選擇錯誤，會造成多軸機無法飛行且有摔毁的危險。

6 GAIN SETTING
感度設定

1 GAIN ADJUSTMENT
感度調整

Suitable flight gain is needed for proper operation of APS-M. APS-M provides gain adjustments for each of the controls in each of the manual/attitude modes, plus an adjustment for GPS locking gain. Excess or insufficient gain values may result in degrading stability or uncontrollability of the aircraft.

使用APS-M需設定適當的飛行感度。APS-M提供手動、姿態，模式各動作的感度調整與GPS定位感度。感度過大或過小會造成穩定性或操控性變差。
# Gain and Flight Characteristics Adjustments

<table>
<thead>
<tr>
<th>Manual Mode</th>
<th>Gain too high</th>
<th>Gain too low</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Aileron</strong></td>
<td>Fast lateral oscillation</td>
<td>Lateral drift</td>
</tr>
<tr>
<td><strong>Elevator</strong></td>
<td>Fast forward/aft oscillation</td>
<td>Forward/aft drift</td>
</tr>
<tr>
<td><strong>Rudder</strong></td>
<td>Fast oscillation of the tail</td>
<td>Lateral drift of tail</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Attitude Mode</th>
<th>Gain too high</th>
<th>Gain too low</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Aileron</strong></td>
<td>Fast lateral oscillation</td>
<td>Lateral drift</td>
</tr>
<tr>
<td><strong>Elevator</strong></td>
<td>Fast forward/aft oscillation</td>
<td>Forward/aft drift</td>
</tr>
<tr>
<td><strong>Rudder</strong></td>
<td>Fast oscillation of the tail</td>
<td>Lateral drift of tail</td>
</tr>
<tr>
<td><strong>Altitude</strong></td>
<td>Fast up/down oscillation during altitude hold, unable to hold altitude</td>
<td>Vertical drift during altitude hold, unable to hold altitude</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>GPS Stopping Power</th>
<th>Shorter distance after airframe come to a stop from rapid position holding action</th>
<th>Longer distance after airframe come to a stop from delayed position holding action</th>
</tr>
</thead>
</table>

 Below are some recommended gain settings and adjustment instructions:

<table>
<thead>
<tr>
<th>Manual Mode</th>
<th>Attitude Mode</th>
<th>GPS Stopping Power</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Aileron</strong></td>
<td><strong>Elevator</strong></td>
<td><strong>Rudder</strong></td>
</tr>
<tr>
<td>M470/M480L Multicopter</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>M690L Multicopter</td>
<td>30</td>
<td>30</td>
</tr>
</tbody>
</table>

(Diagram-1) (表-1)
In GPS mode, the multicopter may not fly straight in forward flight because GPS angle will vary from different Magnetic Field Deviation, which means angle on the horizontal plane between magnetic north and true north, and it’s positive when magnetic north is east of true north, and negative when it is to the west. To correct the angle value accordingly, APS-M system will automatically adjust the GPS angle value base on where your geographic location is. So please refer to below link of N.O.A.A. Calculator and select your located deviation as following request.

GPS實際飛行路徑會受地磁偏角影響產生偏差值。地磁偏角是地球上任一處的磁北方向和正北方向之間的夾角，當地磁北向實際偏東時，地磁偏角為正，反之為負。

請根據您目前所在之國度位置，設定相對的GPS偏差角度，系統會自動為您修正偏差值。否則，在GPS的模式下做直線飛行時，可能會產生不同程度的偏移現象。

Magnetic declination requires correct positive or negative polarity.
磁場偏差角有正、負之分，請輸入正確偏差角。
APS-M MULTICOPTER GPS SENSOR LOCATION
APS-M多軸GPS感應器位置

1. After APS-M and APS-M Multicopter GPS Sensor are installed onto multicopter, the distance between the two units need to be entered into the system relative to the X, Y, and Z axis, along with the correct direction. The default location values for factory installed APS-M is X: -170, Y: 0, Z: -40.

APS-M與APS-M多軸GPS感應器安裝完畢後,需填入GPS感應器與APS-M的相對距離,請依照圖示正確填入X、Y與Z軸距離,並注意方向。出廠時，APS-M已安裝完成，預設值為X: -170、Y: 0、Z: -40。

**WARNING**
Incorrect value or directional polarity of APS-M Multicopter GPS Sensor mounting location will affect aircraft stability or induce drifts.
如果APS-M多軸GPS感應器數值方向填寫錯誤，會直接影響飛行器穩定性或飄移。

VOLTAGE CALIBRATION
電壓校正

APS-M additional function PCU Voltage Deviation Calibration, the interface shows the latest voltage value detected from PCU. If there is voltage gap between PCU and actual battery voltage value, click on “calibration” and correct actual value accordingly.

APS-M提供PCU電壓校正功能，操作介面上顯示的數據為目前PCU偵測到的電壓。如果介面上電壓與您使用電池電壓不同時，請點選校正鈕，輸入目前電池實測的電壓數據。

**CAUTION**
Make sure to turn the multicopter on and firmly connect to APS-M software while testing actual battery voltage by voltage tester (Multi-function Tester RCE-MT9).
測量電池電壓時，請使用電壓檢測器(多功能檢測計RCE-MT9)，且必須是在多軸機開機並連上操作介面情況下測量。

Voltage Calibration
Insert the actual voltage value 24.6 V
10 LOW VOLTAGE PROTECTION

APS-M provides two methods for low voltage protection.

1. First Stage Protection: low voltage warning light
   Low voltage warning light: Sets the trigger voltage for low voltage warning. Recommended value is 3.525V, at which point the aircraft will have approximately 200M range left (around 1 minute). When voltage drops below the set value, APS-M LED will be flashing red.

2. Second Stage Protection: low voltage trigger for automatic go home
   Low voltage Return Home: Sets the trigger voltage for low voltage return home. We highly recommend the value of 3.60V to be used, at which point the aircraft will have approximately 100M range left (around 30 seconds). When voltage drops below the set value, APS-M will initiate automatic return home feature.

APS-M 提供兩種低電壓保護

1. 第一階保護：低電壓警示閃燈
   設定低電壓警示閃燈電壓，出廠設定為3.625V(建議值)。此電壓預估可安全飛行距離為約1分鐘200M。當飛行中電池電壓低於此設定電壓時，APS-M即會閃爍紅燈提醒。

2. 第二階保護：低電壓自動返航
   設定低電壓自動返航電壓，出廠設定為3.60V(建議值)。此電壓預估可安全飛行距離為約30秒100M。當飛行中電池電壓低於此設定電壓時，APS-M即會執行自動返航。

11 AUTO RETURN HOME HEADING SELECTION

Select the multicopter heading toward home position during auto return home.

Front: Nose of multicopter points to home position.
Rear: Tail of multicopter points to home position.

Automatic return home heading default is tail in.

選擇在執行自動返航時，多軸機朝向Home點飛行的頭向
頭：多軸機頭朝Home點返航。
尾：多軸機尾朝Home點返航。
預設為多軸機尾朝Home點返航。
OSD+FPV VIDEO TRANSMITTER
OSD+FPV影像發射器

1. OSD+FPV VIDEO TRANSMITTER DISPLAY DESCRIPTION
OSD+FPV影像發射器畫面圖示介紹

- **Flight Altitude**: Aircraft’s angle of tilt during flight.
  - 飛行姿態：多軸機的飛行傾斜角度。
- **Return Course Angle**: The angle between aircraft and home position.
  - 逆航角度：多軸機與Home點之間的距離。
- **Flight Mode**: The current flight mode of multicopter.
  - 飛行模式：多軸機所使用的飛行模式。
- **Satellite Count**: Number of satellites detected by aircraft.
  - 衛星定位：多軸機接收到的衛星數量。
- **Flight Time**: Actual flight duration of aircraft.
  - 飛行時間：多軸機實際飛行時間。
- **Flight Speed**: Horizontal velocity of aircraft.
  - 飛行速度：多軸機水平速度。
- **Vertical Velocity**: Speed in which aircraft moves up/down.
  - 上升/下降速度：多軸機垂直移動的速度。
- **Battery Charge**: Aircraft’s battery voltage.
  - 電池電壓：多軸機的電池電壓。
- **Longitude**: Current longitude of aircraft.
  - 經度：多軸機目前所在位置的經度。
- **Latitude**: Current latitude of aircraft.
  - 緯度：多軸機目前所在位置的緯度。

**Optional Equipment Required for This Function**

- OSD+FPV Video Transmitter
  - OSD+FPV 影像發射器 [HED00001]
- Display Receiver
  - 螢幕接收器 [HEM00001]
- 3. G3 3 Axis Gimbal
  - G3電臺板 [RG3301X / RG3302X]
- Camera (GH/5D-Series)
  - 相機 (GH/5D系列)
2 OSD+FPV VIDEO TRANSMITTER CONTROL INTERFACE

OSD+FPV影像發射器操作介面

Provides flight data output function such as satellite count, battery voltage, flight time, latitude/longitude, altitude, horizontal distance, horizontal speed, vertical speed, and flight mode.

具備飛行資訊輸出功能，內容有衛星數量、電池電壓、飛行時間、經緯度、高度、水平距離、水平速度、高度速度、飛行模式顯示。

1. OSD display unit and format can be customized based on actual needs.

1. 依實際使用需求選擇OSD顯示單位、格式。

2. OSD display may shift to the side with different display screens. When that happens, use the position adjustment below to center the display.

2. 使用不同顯示幕，OSD數據顯示可能會偏移一邊，可以使用下方位置調整功能，將OSD調整至正中位置。

3. OSD also provides warning function which can be set according to your needs. For example, if minimum satellite count is set to 6, the satellite count on LCD screen will flash when APS-M locks on to less than 6 satellites.

3. OSD也具備警示功能，您可以依使用需求設定此功能。例如：設定衛星數為6，當APS-M接收衛星數低於6時，螢幕上的衛星數則會閃爍警示。
When performing motor test function, configuration interface will display the multicopter type, receiver type, low voltage protection parameters, and APS-M Multicopter GPS Sensor position. Please double check the settings match that of multicopter before performing motor test function.

In executing motor test function, interface will display the multicopter type, receiver type, low voltage protection parameters, and APS-M Multicopter GPS Sensor position. Please double check the settings match that of multicopter before performing motor test function.

When this function is activated, motor will sequentially rotate approximately 0.5 seconds. Ensure each motor is turning the correct direction, as any incorrect rotating direction may lead to immediate flip-over on takeoff. Rotating motor poses certain danger, so please ensure there are no obstacles or people nearby when performing this test.

When this function is activated, motor will sequentially rotate approximately 0.5 seconds. Ensure each motor is turning the correct direction, as any incorrect rotating direction may lead to immediate flip-over on takeoff. Rotating motor poses certain danger, so please ensure there are no obstacles or people nearby when performing this test.

Motor Test
Warning:
1. Each of the motors will rotate slowly for 0.5 seconds during this test. Please ensure there are no obstacles near the rotating blades, and keep all bodily parts away.
2. During the test, motors will rotate sequentially starting with M1. Double check the correct motor is spinning, and the direction of the spin is correct. Do not attempt to fly if any discrepancies are observed.

Begin Test
Revert to Factory Default.

This function will revert all APS-M multicopter flight controller settings back to factory default.

警告

During the test, confirm motor is spinning in sequence from M1, M2, M3, M4, and double check the rotating direction matches the imprint on motor mounting pod. Do not fly if any inconsistency is observed.

檢測時，請確認馬達是否由M1、M2、M3、M4依序轉動，請核對是否與馬達座印刷轉動方向正確。如果不正確，請勿飛行。

復原預設值

使用此功能，APS-M多軸飛控系統會將您所設定的內容，恢復為原廠出廠時的預設值。
1. LOCATE AN APPROPRIATE LOCATION

R/C aircraft can fly at high speed, thus posing a certain degree of potential danger. Choose a legal flying field consisting of flat, smooth ground without obstacles. Do not fly near buildings, high voltage cables, or trees to ensure the safety of yourself, others, and your model. Avoid location with magnetic and radio interferences. Please choose a legal flying field. Do not fly your model in inclement weather, such as rain, wind, snow or darkness.

2. DO NOT FLY ALONE

Before turning on your model and transmitter, check to make sure no one else is operating on the same frequency. Frequency interference can cause your model, or other models to crash. The guidance provided by an experienced pilot will be invaluable for the assembly, tuning, trimming, and actual first flight or unforeseen danger may happen. (Recommend you to practice with computer-based flight simulator.)

3. CENTER OF GRAVITY ADJUSTMENT

The aircraft needs to be balanced at the Center of Gravity (CG) point with full payload onboard. Improper CG balance may cause flight instability and/or uneven power consumption of the motors, and may even leads to crash in worse case scenario.

4. CHECK THE WIRE DIRECTION

Make sure to install the wires with "UP" imprint facing up, and ensure the plug is inserted deep enough. Improper plug insertion may lead to poor connection or even malfunction of the APS-M unit.
Safety feature to allow spin-up of motors only when specific transmitter stick movement is executed, so that accidental start/stop is prevented.

1. To Start Motor
   1) Turn on transmitter power.
   2) Press and hold power button for 3 seconds to turn on multicopter power.
   3) Start the motor by pushing both RC transmitter control sticks toward lower inner or lower outer position.

Safety Mode 1: Motors will power off if throttle is not raised within 5 seconds. To re-start Motor by pushing both RC transmitter control sticks toward lower inner or lower outer position.

Safety Mode 2: Motors will power off automatically after landing and throttle is lowered, even without the shutoff routine.

馬達電源啓動與關閉

開機
1) 開啓遙控器電源。
2) 啟動機身主電源，長按電源鍵3秒開機。
3) 將遙控器兩支搖桿同時向內向下45°或向外向下打45°，才會啓動主馬達。

安全模式1：當啓動馬達後若5秒內未推升油門，系統會自動關閉馬達電源停止運轉。
如欲再啓開馬達電源，將遙控器兩支搖桿同時向內向下45°或向外向下打45°，才會啓動主馬達。

安全模式2：當飛行完成降落落地後，油門歸至最低點時，若未手動關閉遙控器電源，5秒後系統會自動關閉馬達電源停止運轉。

2. To Stop Motor
   1) Push both RC transmitter control sticks toward lower inner or lower outer position.
   2) Press and hold the power button for 3 seconds to turn off multicopter power.
   3) Turn off transmitter power.

關閉馬達電源
1) 將遙控器兩支搖桿同時向內向下45°或向外向下打45°，才會關閉主馬達。
2) 關閉機身主電源，長按電源鍵3秒關機。
3) 關閉遙控器電源。

電源開閉
6 MOTOR SPIN TEST

1. When motor spin test is activated, motor will sequentially rotate approximately 0.5 seconds. Check correct motor location and spin direction is correct.
2. Rotating motor poses certain danger, so please ensure there are no obstacles or people nearby when performing this test. Please refer to page 40 on motor spin test function in the APS-M installation and Setup manual.

1. 馬達運轉測試功能開啓時，馬達會依序慢速轉動0.5秒，檢查安裝位置及主旋翼/螺旋槳旋轉方向是否一致。
2. 馬達主旋翼/螺旋槳旋轉過程有危險性，檢測時請先確認無障礙物，並避開主旋翼/螺旋槳轉動範圍，以免發生危險。請參考APS-M操作介面安裝與設定第40頁進行設定顯示與馬達檢測。

1 MOTOR ROTATION DIRECTION

Incorrect sequence of motor tube assembly or changes made to rotational directions of motor / blades may cause immediately flip-over on takeoff.

組裝前請確定馬達固定座上所標示的正、逆轉方向符號，以及前後軸管組長度。

2 RETRACT TEST

The retracts should be tested prior to flight by flipping the retract switch on RC transmitter 2 to 3 times. Please refer to RC control channel definition on page 30 for retract switch setup.

飛行前應測試腳架收放功能，使用遙控器切換腳架收放動作2-3次，確定合閉動作正常。請參考第30頁各頻道動作定義收腳架開關設定。

To avoid getting your hands pinched, do not touch retracts while in motion.

請勿觸碰正在進行收放腳架的收放處，避免夾手。
MAGNETOMETER CALIBRATION
磁力計校正

Objects on multicopter can interfere with magnetometer’s readings, lowering APS-M’s heading precision, and even affect position hold ability. To reduce the environmental effect on magnetometer, APS-M must be calibrated prior to use to ensure correct and stable operations. Calibration must be perform whenever one of the following condition occurs:

- The initial install of APS-M modules.
- Changes to the GPS module.
- Additions or removal to electronic equipment near the magnetometer (Servos, ESC, etc).
- When flying location differs from last compass calibration position by 100 km or more.

磁力計在APS-M裡面是扮演辨别方向與多軸機姿態的角色，而多軸機上的電子變速器、馬達、電線、銅性物質等會干擾磁力計，影響APS-M功能控制的準確性，甚至影響定位控制的效果。為了減少環境對磁力計的影響，所以使用APS-M前務必要執行磁力計校正的工作，才能讓APS-M有正確與穩定運作。

在以下情況，必須做磁力計的校正：

- 第一次安裝APS-M時。
- 更換或移動GPS感應器時。
- 增加或減少磁力計附近的電子裝置（伺服器、電子變速器等）時。
- 當變更飛行場地，位於上一次做磁力計校正動作的位置，兩地相隔距離100公里以上時，請必須重新校正一次。

WARNING
警告

Please perform calibration in open space, at least 10 meters away from strong magnetic field and conductive materials (magnets, metal table, metal buildings, concrete floors, high voltage electrical tower etc). External environment factors may affect the accuracy of magnetometer. Should multicopter experience poor position holding performance while in APS-M flight mode, please perform magnetometer calibration steps again.

請在空曠且遠離開磁和導電物質10公尺以上（磁鐵、鐵桌、鐵皮屋、鋼筋水泥地板、高電壓線路等）的地方校正，外在環境的改變會影響磁力計的準確度，當多軸機於APS-M飛行模式下，發生定位效果不佳時，請重新校正磁力計。

- APS-M requires a minimum of 7 satellites.
- Red LED indicates insufficient or no satellite signals. Do not fly under this condition.
- In normal condition, APS-M requires at least 7 satellites.
- If less than 7 satellites are detected, the red LED will flash to indicate the lack of satellite signals. Do not fly.

1. Two methods to enter calibration mode.
有兩種方法可以進入校正程序

Method 1: Press the SET button on APS-M to enter calibration mode.
方式1：按APS-M多旋翼系統SET鍵，進入校正程序。

Method 2: Quickly slip the flight mode switch 3 times within 2 seconds to enter calibration mode.
方式2：飛行模式開關在2秒內，來回切換3次，進入校正程序。

External Status LED

Steady lit red
紅燈恆亮

External status LED will light up red when entering calibration mode.
進入校正程序外掛式模式燈會紅燈恆亮。
2. Pick up the multicopter. With the APS-M Multicopter GPS Sensor as center of axis, rotate 360° horizontally until both red and green external status LED light up.

拿起多軸飛行機，且以APS-M多軸GPS感應器為軸心，水平旋轉360度直到外掛用模式燈，紅/綠燈同時恆亮。

3. With the nose of multicopter pointing up, and APS-M Multicopter GPS Sensor as center of axis, rotate 360° horizontally until external status LED flash green.

將多軸飛行機朝上立起，以APS-M多軸GPS感應器為軸心，再水平旋轉360度直到外掛用模式燈，綠燈閃爍。

4. Please power cycle after complete.

完成後，請重新開機。
HOME POSITION SETTING
返航點設定(HOME)

Setting the home position is a necessary and important step during pre-flight check. The goal of home position setting is for multicopter to properly perform intelligent flight modes and return home feature.

1. After performing magnetometer calibration, the power must be turned off. Once the power is turned back on and satellite lock is acquired, the Home location is recorded for this flight.
2. Power on multicopter. Do not move the multicopter until external status LED turns green.

CAUTION

Avoid setting Home location while indoor, or at location near obstacles within 15 meter such as trees or houses.

WARNING

Before flying, ensure battery is fully charged, magnetometer calibration has been performed, and confirm HOME position has been registered. If HOME position has not been registered before each flight, and automatic return home or low voltage / failsafe return home was activated during flight, the system will not be able to recognize and accurately fly back to the home position, resulting in deviation from intended path and unexpected fly away, causing damages and unforeseen danger.

起飛前請檢查電源是否足夠，並做好磁力校正，及確實執行HOME點設定。若每次飛行前未確實執行HOME點設定，在飛行時啓動自動返航中的自動返航、低電壓自動返航、失速自動返航之功能時，系統將無法辨認並準確的飛回起飛之HOME點，進而導致飛行軌道偏離而飛失，將可能造成財產損失及不可預期的意外發生。

<table>
<thead>
<tr>
<th>Flying field</th>
<th>Satellite Signal</th>
<th>Time to Satellite Lock</th>
<th>Status</th>
<th>Suitable Flight Mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>City high rises</td>
<td>Initial Time to Acquire Satellites</td>
<td>7 or more satellites 7以上</td>
<td>60~90sec</td>
<td>Normal</td>
</tr>
<tr>
<td>Open field with no obstructions</td>
<td>Initial Time to Acquire Satellites</td>
<td>7 or more satellites 7以上</td>
<td>30~60sec</td>
<td>Abnormal, poor or no GPS signal, may lead to incorrect flight position or home position shift</td>
</tr>
<tr>
<td>City high rises</td>
<td>Succeeding Time to Acquire Satellites</td>
<td>7 or more satellites 7以上</td>
<td>Exceeded 90 sec, 超過90秒</td>
<td>Abnormal, poor or no GPS signal, may lead to incorrect flight position or home position shift</td>
</tr>
<tr>
<td>Open field with no obstructions</td>
<td>Succeeding Time to Acquire Satellites</td>
<td>7 or more satellites 7以上</td>
<td>Exceeded 90 sec, 超過90秒</td>
<td>Abnormal, poor or no GPS signal, may lead to incorrect flight position or home position shift</td>
</tr>
</tbody>
</table>

GPS SATELLITE SIGNAL
GPS衛星訊號收訊
**FLIGHT MODE STATUS LED DESCRIPTION**

<table>
<thead>
<tr>
<th>Flight Mode</th>
<th>No GPS Signal</th>
<th>With GPS Signal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manual Mode</td>
<td>Red Flash</td>
<td>—</td>
</tr>
<tr>
<td>Attitude Mode</td>
<td>Flash Red/Green</td>
<td>Flash/Green</td>
</tr>
<tr>
<td>GPS Mode</td>
<td>Red LED flashes 1 sec and Green LED flashes 2 sec alternatively.</td>
<td>Slow Flash/Green</td>
</tr>
</tbody>
</table>

While in GPS mode, green LED indicates normal flight condition. Should LED changes to red color, please land immediately.

In GPS模式下，燈號為綠色表示可正常飛行，若燈號顏色出現紅色時，建議將多軸機立刻停飛降落，避免造成危險與損壞。

Signal acquisition is quicker if in wide open space. If the multicopter is in area with weak GPS reception, only attitude and manual control is available.

若在GPS訊號較弱的地方，沒有足夠穩定的資訊，就只有姿態和手動控制。
1. **MANUAL MODE**

   Full control by the pilot without any horizontal leveling or position holding capabilities. (Highly recommended not to turn on this function if you're not familiar with it.)

   Does not support intelligent flight mode (Carefree Orientation or POI), automatic return home, failsafe, or low voltage protection.

   1. 完全由操控者控制，無自動水平與定位功能。(強烈建議，不熟悉操作者勿開啟此功能)。
   2. 不支援智能飛行(航向鎖定、定點環繞)、自動返航、失控保護、低電壓保護功能。

   **Control Response adjustment:**

   Set the exponential (EXP) of Aileron/Elevator/Rudder according to your control feel in manual mode.

   When control response is too fast, decrease EXP -10%~60% for Futaba radios; increase EXP +10%~+60% for JR radios.

   When control response is too sluggish, increase EXP +0%~+30% for Futaba radios; decrease EXP -0%~30% for JR radios.

   **動作靈敏度調整:**

   手動模式可依個人飛行操控手感調整遙控器副翼、升降、尾舵的EXP；

   當手動模式動作靈敏度太大，Futaba調低範圍-10%~60%；JR的調高範圍+10%~+60%。

   當手動模式動作靈敏度太小，Futaba調高範圍+0%~+30%；JR的調低範圍-0%~30%。

   2. **ATTITUDE MODE**

   Maintains level and altitude. Elevator/Aileron/Rudder stick inputs are translated as angular command. Larger stick input translates to steeper angels of multicopter tilt, with maximum of 30 degrees.

   姿態模式會自動保持多軸飛行機姿態水平與定高功能，升降、副翼、尾舵搖桿指令為角度命令，搖桿動作越大飛行機動作角度越大，最大角度限制為30度。

   **a) Center stick = altitude hold**

   油門搖桿置中=定高

   ![MODE 1](image1) ![MODE 2](image2)
b) Elevator/aileron stick (left and right maximum of 30°)
升降/副翼搖桿(左或右最大30度)

MODE 1  MODE 2
Maximum of 30°
最大30°

Maximum of 30°

3 GPS (VELOCITY)
GPS(速度)

Maintains level, altitude, and position through GPS lock. Elevator/Aileron/Rudder stick inputs are treated as speed command. Larger stick input translates to faster flying speed, with maximum horizontal velocity of 15 meters/sec and vertical speed of 6 meters/sec.

會自動保持多軸飛行機姿態水平、定高與GPS定位，升降、副翼、尾舵搖桿指令為速度命令，搖桿動作越大飛行機飛行速度越快，最大飛行速度水平15公尺/秒，垂直6公尺/秒。

Straight flight speed: 15 m/sec
直線飛行速度: 15公尺/秒
Maintains level and altitude. Elevator/Aileron/Rudder stick inputs are translated as angular command. Larger stick input translates to steeper angles of multicopter tilt, with maximum of 30 degrees.

会自動保持多軸飛行機姿態水平與定高功能，升降、副翼、尾舵搖桿指令為角度命令，搖桿動作越大飛行機動作角度越大，最大角度限制為30度。

### 5 FLIGHT MODE FEATURE CHART
飛行模式功能對照表

<table>
<thead>
<tr>
<th>Function 操作模式</th>
<th>Control Modes 操作模式</th>
<th>MANUAL MODE 手動模式</th>
<th>ATTITUDE MODE 姿態模式</th>
<th>GPS(VELOCITY) GPS速度</th>
<th>GPS(ANGLULAR) GPS角度</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retract 收腳架</td>
<td>Retract 收腳架</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Intelligent Flight-POI (Point of Interest) 智能飛行-定點環繞</td>
<td>Intelligent Flight-POI (Point of Interest) 智能飛行-定點環繞</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Intelligent Flight-HCL (Home Course Lock) 智能飛行-返航點鎖定</td>
<td>Intelligent Flight-HCL (Home Course Lock) 智能飛行-返航點鎖定</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Intelligent Flight-CFO (Carefree Orientation) 智能飛行-航向鎖定</td>
<td>Intelligent Flight-CFO (Carefree Orientation) 智能飛行-航向鎖定</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Return Home 自動返航</td>
<td>Return Home 自動返航</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Failsafe protection 失控保護</td>
<td>Failsafe protection 失控保護</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Low Voltage Protection 低電壓保護</td>
<td>Low Voltage Protection 低電壓保護</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>
POI (Point of Interest) is a mode where multicopter flies in a circular pattern surrounding a designated object. To initiate POI flight, fly the multicopter over the object of interest in either GPS mode, switch on POI function to set the object location as center point.

1. From the top of POI center point, use back elevator to fly the multicopter backwards at least 10M away from the center point to set the diameter of circular pattern.
2. With the nose of multicopter still pointing at the POI center point, left aileron will initiate a clockwise 360° circular pattern flight around the POI center point; right aileron will initiate a counter-clockwise 360° circular pattern flight around the POI center point.
3. Stick movement angle is proportional to the speed of the aircraft. Larger the stick movement equates to faster multicopter flying speed, while smaller stick movement equates to slower flying speed.

Aircraft can only move backwards, up, and down within 10M after position holding action. Full rudder lock cannot be turned around and it is controlled by APS-M.
Home Course Lock is only active in GPS Velocity mode. Manual and attitude modes do not support home course lock.

Home course lock utilizes the home position as base point. Pushing elevator stick back will force the multicopter to fly toward the home position regardless of its current heading, and pushing elevator stick forward will force it to fly away from home position.

1. When this function is active and multicopter returns home, once it reaches the 5 meters point from home, APS-M will put the multicopter into hover, and lock out elevator/aileron/rudder control. At this time throttle can be used to land the multicopter, or Course Lock can be disengaged for manual landing.

2. Please confirm home position during power up.

Home Course Lock can only be activated with aircraft at least 5 meters away from home position.
Carefree Mode is suitable only under attitude and GPS Velocity mode. It is not supported under manual mode.

While in CFO (Carefree Orientation) mode, any control command direction will be based on the initial direction of multicopter during power up, regardless of which direction it’s currently pointing. The aircraft will fly right with right aileron stick input, and fly left with left aileron stick input, regardless of the current heading. While in CFO Mode, multicopter will be in attitude/altitude mode, with stick control translated as angular command.

Please confirm home position and heading position during power up.

Heading during power up.

Home
Automatic return home function is a flight aid in scenario where the pilot has lost sight of the aircraft, or is unable to tell its orientation due to excessive distance, the aircraft will automatically and securely fly back to the home position under GPS mode with good GPS satellite reception.

自動返航功能是輔助多軸飛行機在操控過程中，若發生迷航或距離太遠無法辨識正確飛行方向時，在GPS模式下且衛星訊號良好的狀態下，可藉由飛控系統執行自動返航指令，讓多軸飛行器在安全機制下自動駕駛安全返回Home點。

**CAUTION**

Return Home Function can only be activated with aircraft at least 20M away from home position.

在Home點半徑20M之內，不執行自動返航功能。

### TO ENGAGE AUTO RETURN HOME COMMAND

![Toggle the Return Home switch to ON position](image)

### TO DISENGAGE AUTO RETURN HOME COMMAND

![Toggle the Return Home switch to OFF position](image)
1. Home Position: When GPS signal is first received after power on, the mode LED will flash rapid green to indicate home position has been recorded.

2. Return Home Method: Regardless of current position, when Return Home is activated, multicopter will rise, rotate until the rear points toward home position, then proceed to fly toward home position. If retracts are in the up position, APS-M will lower the retractable landing gears down, then proceed to land at the home location.

---

1. Home點：開機後，第一次收到GPS訊號的位置，此時模式燈會快速閃爍綠燈表示以記錄Home點位置。
2. 飛行模式：無論在什麼位置，飛行中如果啟動自動返航功能，多軸飛行機會先自動上升再轉動尾部朝向Home點，然後飛回Home上方。如果飛行機有收腳架，此時APS-M會把腳架放下，然後降落在Home點位置。

---

1. During automatic Return Home function, multicopter will choose the shortest path between current location and home location, flying with multicopter's tail pointing at the pilot.
2. If the flight path deviates from the intended path to home during return home function, immediately disengage auto return home function, and manually fly the aircraft back home.
3. If automatic Return Home function needs to be disengaged while returning home, flip the Return Home switch on and off to regain manual control.

---

1. 執行自動返航功能時，多軸機會從飛行位置與Home點最短的距離做為飛行路徑，以機尾方向朝操作者返航。
2. 若在飛行機抵達Home點或返航途中，發生衛星定位回Home點航線偏移，請立即解除自動返航指令，以手動操控回Home點。
3. 解除自動返航指令：把自動返航開關切回關閉位置，即能解除自動返航指令改由手動操作。
Failsafe Protection is only active under attitude and GPS mode; it is not supported under manual mode.

Failsafe Protection: When multicopter loses radio control signal, APS-M will initiate Return Home function when GPS signal is available. When there are no GPS signal, APS-M will maintain level.

**TO DISENGAGE AUTO RETURN HOME COMMAND**

Return Home Switch to ON position and immediately switch it to OFF

1. Failsafe Protection is for use while in attitude and GPS mode only. Failsafe auto return home is not available in manual mode.
2. Should the RC transmitter signal is lost, APS-M will activate Failsafe Protection function to automatically fly the aircraft back home.
3. If failsafe auto return home function need to be disengaged while on route to home position, switch on Return Home mode and immediately switch it off, then control of multicopter can be regained.

1. 幫控保護只適用於姿態和GPS模式下，手動模式不支援失速保護指令。
2. 當遙控器失去訊號無法控制時，APS-M會激活失速保護功能，使多軸機自動返航至Home點。
3. 若在抵達Home點或返航途中需解除失速保護指令，只要把自動返航開關切於開啓再切回關閉位置，即能恢復手動操控多軸飛行機。
Low voltage protection is only active under attitude and GPS mode; it is not supported under manual mode.

APS-M provides two methods for low voltage protection. Please refer to page 34 in the APS-M instruction manual for low voltage cutoff parameters.

1. First Stage Protection: low voltage warning light

   Low voltage warning light: Sets the trigger voltage for low voltage warning. Recommended value is 3.625V, at which point the aircraft will have approximately 200M range left (around 1 minute). When voltage drops below the set value, APS-M LED will be flashing red.

2. Second Stage Protection: low voltage trigger for automatic go home

   Low voltage Return Home: Sets the trigger voltage for low voltage return home. We highly recommend the value of 3.60V to be used, at which point the aircraft will have approximately 100M range left (around 30 seconds). When voltage drops below the set value, APS-M will initiate automatic return home feature.

---

**TO DISENGAGE AUTO RETURN HOME COMMAND**

解除自動返航指令

Return Home Switch to ON position and immediately switch it to OFF

自動返航開關切換開啟再切回關閉位置

---

**CAUTION**

1. We highly recommend activating low voltage protection function to ensure the safety of aircraft.
2. When executing return home function, the aircraft will automatically lower its retractable landing gears after reaching the home position.
3. To disengage auto return home command: Switch on Return Home mode and immediately switch it off, then control of multicopter can be regained.

1. 強烈建議啓動低電壓保護功能，提供飛行機安全保護。
2. 在執行自動返航動作時，當飛行機返回至Home點上方會自動放下腳架，準備降落。
3. 解除自動返航指令：先把自動返航開關切換開啟再切回關閉位置，即可解除自動返航指令改由手動操作。
# Specifications

## APS-M Multicopter Control Unit

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input Voltage</td>
<td>DC 4.5V~8.4V</td>
</tr>
<tr>
<td>Operating Current Consumption</td>
<td>&lt; <a href="mailto:250mA@4.8V">250mA@4.8V</a></td>
</tr>
<tr>
<td>Operating Frequency</td>
<td>400Hz</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>-20°C to 65°C (-4°F to 149°F)</td>
</tr>
<tr>
<td>Hovering Precision (Satellite)</td>
<td>Horizontal ±1m(3.28ft), Vertical ±1m(3.28ft)</td>
</tr>
<tr>
<td>Maximum Flight Speed</td>
<td>700m(2297ft) above the takeoff point</td>
</tr>
<tr>
<td>Maximum Altitude Restriction</td>
<td>700m</td>
</tr>
<tr>
<td>Maximum Angular Speed</td>
<td>Aileron/Elevator 115°/sec, Rudder 145°/sec</td>
</tr>
<tr>
<td>Maximum Tilt Angle</td>
<td>30°</td>
</tr>
<tr>
<td>Supports External Peripherals</td>
<td>G2/G3 Gimbal, OSD+FPV Video Transmitter</td>
</tr>
<tr>
<td>Supports Multirotor Configurations</td>
<td>G2/G3 flight, OSD+FPV transponder</td>
</tr>
<tr>
<td>Dimension</td>
<td>49x34.3x20mm</td>
</tr>
</tbody>
</table>

## PCU Power Control Unit

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input Voltage</td>
<td>13.2V<del>25.2V (4S</del>6S Li-Po)</td>
</tr>
<tr>
<td>Operating Frequency</td>
<td>500kHz</td>
</tr>
<tr>
<td>Dimension</td>
<td>62x35x26mm</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>-5°C<del>45°C (23°F</del>113°F)</td>
</tr>
</tbody>
</table>

## Multicopter Brushless ESC

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input Voltage</td>
<td>13.2V<del>25.2V (4S</del>6S Li-Po)</td>
</tr>
<tr>
<td>Max Continuous Current</td>
<td>40A</td>
</tr>
<tr>
<td>Dimension</td>
<td>49x34.3x20mm</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>-5°C<del>45°C (23°F</del>113°F)</td>
</tr>
</tbody>
</table>

## RCM-BL4213 Brushless Motor 370 KV (RPM/V)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input Voltage</td>
<td>DC22.2V</td>
</tr>
<tr>
<td>Max Continuous Current</td>
<td>25A</td>
</tr>
<tr>
<td>Max Continuous Power</td>
<td>550W</td>
</tr>
<tr>
<td>Stator Arms</td>
<td>12</td>
</tr>
<tr>
<td>Magnet Poles</td>
<td>14</td>
</tr>
<tr>
<td>Dimension/Weight</td>
<td>4x4x52x33mm/185g</td>
</tr>
</tbody>
</table>

## Q&A

### Unable to Power On?

1. Press power button momentarily to check remaining battery level.
2. Check if battery plug is connected properly.
3. Check for proper connection between APS-M and PCU.

### APS-M will not start up after power up?

1. Check for any abnormalities in power source. Verify connection between APS-M/PCU/Receiver are correctly connected.
2. Check for correct Receiver type selection in configuration interface.
3. NOTE: APS-M must remain stationary, and will start properly only after system initialization is completed.

### APS-M 規格

1. 檢查系統電源是否正常，APS-M與PCU、接收器之間連線是否正常連接。
2. 檢查接收器類型是否正確。
3. 注意APS-M啓動時必須保持靜止，當系統開機初始化完成後才會正常啓動。
Q&A
問與答

Long GPS acquisition time? Wide variance during position hold?
(1) Initial acquisition time will be longer for first time power ups.
(2) Satellite signal will be weaker in urban area with highrise or other obstacles. Ideal location should be an open field free of magnetic interferences.
(3) If 7 or less satellites were acquired, LED warning light will be displayed and GPS functions will not activate.
(4) Please refer to the satellite acquisition table on page 45 to determine satellite reception status.

為何延遲GPS時間長？定位偏差大？
(1) 次開機幾秒鐘接收時間一般會較長，屬正常現象。
(2) 在市區大樓有遮臘物地點，衛星訊號較弱，建議遠離遮臘物。
(3) GPS接收器預設至少能接收到9顆衛星才開始定位，故需稍等。
(4) 請參考P45磁力計校正/衛星訊號接收狀況，來判定您的衛星訊號接收狀況。

Motor spins the wrong direction during motor spin test?
Connection between motor and ESC did not follow proper color coding, or direction switch on ESC set incorrectly.

為何馬達測試旋轉時，馬達轉向錯誤？
馬達與電子變速器間接線沒有依照顏色連接，或電變設定馬達轉向開關設定錯誤。

Motor did not follow M1/M2/M3/M4 sequence during motor test?
Check the ESC signal wires are connected to correct ports on APS-M.

馬達測試順序時，馬達沒有依照M1、M2、M3、M4順序轉動。
檢查電子變速器訊號線與APS-M之間接線，是否有接線序錯誤。

APS-M powered up properly, but will not fly after performing the startup stick sequence?
(1) Check and ensure D/R (Dual Rate) function is not configured on transmitter.
(2) Check if stick calibration was done. Go to the configuration program and run the stick calibration again.

APS-M正常開機，但無法搖桿指揮飛行？
(1) 檢查遙控器是否有設定D/R，使用APS-M不可設定D/R功能。
(2) 檢查遙控器是否有執行搖桿校準，重新設定操作界面設定搖桿校準。

Airframe tilts forward or backwards during takeoff?
Check for proper balance on CG point. Adjust the battery or gimbal position to achieve proper CG balance.

飛機飛行時會前傾或後傾現象？
檢查飛機重心是否正確，請調整電池、雲台位置，使重心落在機體中心點位置。

Airframe fails to stay in one spot during pirouetting maneuver (spin of airframe with rudder applied)?
(1) Check for proper APS-M Multicopter GPS Sensor location configuration in configuration program.
(2) Check for proper balance on CG point. Adjust the battery or gimbal position to achieve proper CG balance.

無人機作転動時，無法在固定點旋轉？
(1) 檢查操作界面的APS-M多旋轉GPS感應器設定是否正確。
(2) 檢查機體重心位置是否正確，請調整電池、雲台位置，使重心落在機體中心點位置。

Airframe experiences slow response during flight, and drifts as if it's not holding position?
Increase the gain value under attitude mode.

飛行時動作反應較慢，會有漂移不穩定的現象？
建議將姿態模式感度增加。

Excessive or insufficient stopping power during while flying?
Adjust the stopping power parameter in program interface to increase or decrease accordingly.

飛行時停止剎車力道過強或過弱？
調整介面GPS剎車感度，剎車力道過強，降低感度；剎車力道過弱，增加感度。

Slight left/right shakes of video footage or aircraft heading during flight or hover?
Increase the rudder gain value under manual and attitude mode.

攝影畫面出現稍微向左/右晃動？
將手動模式及姿態模式尾槳速度感度增加。

Unable to hold position for vertical climb in GPS mode?
Increase the elevator and aileron gain under attitude and GPS modes.

GPS模式下無法固定點垂直爬升？
提高姿態/GPS的升降、副翼感度。

Motor and Navigation lights do not turn on?
(1) Check if signal wire from motor arm assembly is plugged in backwards.
(2) Open the motor mounting pod to see if ESC signal wire is detached.

馬達及電子訊號線無法啟動？
(1) 檢查馬達訊號線是否反接。
(2) 拆開馬達固定座，檢查ESC訊號線是否脱落。
Specifications & Equipment/規格配備:

Airframe Diameter/軸距: 800mm
Main Blade Length/主旋翼長: 190mm
Main Rotor Diameter/主旋翼直徑: 416mm
Height/機身高: 430mm
Flying Weight(without battery)/全配重(不含電池): Approx. 2700g