M480L MULTICOPTER

INSTRUCTION MANUAL
使用說明書

RM48001XT

ALIGN

Windows

ANDROID APP ON
Google play

Download on the
App Store

For more detailed instructions,
please check our website.
http://www.align.com.tw/multic
opter-en/m480l/

更詳細的組裝說明請上官網。

Congratulations on your purchase of Align M480L multicopter! 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.

承蒙閣下選用亞拓多軸航拍機系列產品，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，以確保您能夠在使用的過程中較得心應手。在開始操作之前，請務必詳閱本說明書，相信一定能夠給您帶來相當大的幫助，也請您妥善保管這本說明書，以作為日後參考。

GPS 4MODES Smart OSD .G+ S.BUS X.BUS iOS Android RoHS

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ALIGN

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INTRODUCTION
前言

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-purpose 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較得心應手。

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，搭配穩定控制系統，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。

為了讓您容易方便使用，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，作為爾後調整的參考。

QR CODE LINKS TO INSTRUCTIONAL VIDEOS
QR CODE教學影片

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/m480lvid/

說明書詳細介紹了本產品的使用說明，供您組裝時參考。另外，亞拓提供了各步驟的組裝教學影片，請利用下方連結處觀看，以確保您是安全且正確的使用本產品。
網頁瀏覽http://www.align.com.tw/m480lvid/

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

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.

遙控飛行機包括遙控直昇機與多軸飛行機（以下簡稱遙控飛行機）並非玩具，它是結合了許多高科技產品所設計出來的休閒用品，所以商品的使用不當或不熟悉都可能會造成嚴重傷害甚至死亡，使用之前請務必詳讀本說明書，勿輕忽並注意自身安全。注意！任何遙控飛行機的使用，製造商和經銷商是無法對使用者於零件使用的損耗異常或組裝不當所發生之意外負任何責任，本產品是提供給有操作過遙控飛行機經驗的成人或有相當技術的人員在旁指導，並於當地合法遙控飛行場飛行，以確保安全無虞下操作使用。產品售出後本公司將不負任何操作和使用控制上的任何性能與安全責任。

遙控飛行機屬於需高操作技術且為消耗性之商品，如經拆裝使用後，會造成不等情況零件損耗，任何使用情況所造成商品不良或不滿意，將無法於保固條件內更換新品或退貨，如遇有使用操作維修問題，本公司全省分公司或代理商將提供技術指導、特價零件供應服務。對使用者的不當使用、設定、組裝、修改、或操作不良所造成的破損或傷害，本公司無法控制及負責。且遙控飛行機與配件之精密電子產品，易受外力、磁場、訊號干擾，在使用過程中如外力、磁場、訊號干擾，導致飛行機本身、及其搭載之攝影設備、器材之損壞或滅失，本公司亦無法控制及負責。

做為本產品的使用者，您，是唯一對於您自己操作的環境及行為負全部的責任之人。

WARNING LABEL LEGEND
標誌代表涵義

⊘ **FORBIDDEN** 禁 止	Do not attempt under any circumstances. 在任何禁止的環境下，請勿嘗試操作。
⚠ **WARNING** 警 告	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。
⚠ **CAUTION** 注 意	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。

SAFETY NOTES
安全注意事項

ALIGN

- 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 of 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.

- 遙控飛行機屬高危險性商品,飛行時務必遠離人群,禁止於室內飛行。人為組裝不當或未定期檢修造成的機件損壞、電子控制設備不良,以及操控上的不熟悉、都有可能導致飛行失控損傷等不可預期的意外,請飛行者務必注意飛行安全,並需了解自負疏忽所造成任何意外之責任。

- 每趟飛行前須仔細檢查機身各部位之零/配件/電子設備之性能是否正常,及無損耗老化現象,並確實將螺絲鎖緊才能升空飛行。並做好定期檢修,避免零件或電子產品異常所造成不可預期意外。

⊘ **FORBIDDEN 禁止** ## LOCATE AN APPROPRIATE LOCATION
遠離障礙物及人群

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.

遙控飛行機飛行時具有一定的速度,相對的也潛在著危險性,場地的選擇也相對的重要,請需遵守當地法規到合法遙控飛行場地飛行。必須注意周遭有沒有人、高樓、建築物、高壓電線、樹木等等,避免磁場干擾、外力訊號干擾及操控的不當造成自己與他人財產的損壞。請務必選擇在空曠合法專屬飛行場地。請勿在下雨、打雷、沙塵等惡劣天候下操作,以確保本身及機體的安全。

⊘ **FORBIDDEN 禁止** ## NOTE ON LITHIUM POLYMER BATTERIES
鋰聚電池注意事項

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.

鋰聚電池跟一般在RC使用的鹼性電池、鎳鎘電池、鎳氫電池比較起來是相對危險的。請嚴格遵守鋰聚電池說明書之使用注意事項。不恰當使用鋰聚電池,可能造成火災並傷及生命財產安全,切勿大意!

⊘ **FORBIDDEN 禁止** ## PREVENT 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.

遙控飛行機內部也是由許多精密的電子零組件組成,所以必須絕對的防止潮濕或水氣,避免在浴室或雨天時使用,防止水氣進入機身內部而導致機件及電子零件故障而引發不可預期的意外!

⊘ FORBIDDEN 禁 止 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.

請勿自行改造加工，任何的升級改裝或維修，請使用亞拓產品目錄中的零件，以確保結構的安全。請確認於產品限界內操作，請勿過載使用，本產品為休閒娛樂專用之精密電子遙控飛行產品，僅限熟練遙控飛行器之個人使用，使用時請遵守當地法律規定，並嚴禁在任何違反公共安全區域操作，請勿利用本產品侵犯他人隱私/公開權、並尊重他人智慧財產權、著作權，且勿用於安全、法令外之其它非法用途。並充分了解您任何的使用與操作必須負完全的責任。

⚠ WARNING 警 告 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.)

至飛行場飛行前，需確認是否有相同頻率的同好正進行飛行，因為開啓相同頻率的發射機將導致自己與他人立即干擾等意外危險。遙控飛行機操控技巧在學習初期有著一定的難度，要盡量避免獨自操作飛行，需有經驗的人士在旁指導，才可以操控飛行，否則將可能造成不可預期的意外發生。(勤練電腦模擬器及老手在場指導是入門必要的選擇)

⚠ WARNING 警 告 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.

請於自己能力內及需要一定技術範圍內操作這台遙控飛行機，過於疲勞、精神不佳或不當操作，意外發生風險將可能會提高。不可在視線範圍外飛行，降落後也請馬上關掉遙控飛行機和遙控器電源。

⚠ CAUTION 注 意 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.

遙控飛行機主旋翼/螺旋槳運轉時會以高轉速下進行，在高轉速下的主旋翼/螺旋槳會造成自己與他人在身體上或環境上的嚴重損傷，請勿觸摸運轉中的主旋翼/螺旋槳，並保持安全距離以避免造成危險及損壞。

KEEP AWAY FROM HEAT
遠離熱源

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.

遙控飛行機多半是以碳纖維、PA纖維或聚乙烯、電子商品為主要材質，因此要盡量遠離熱源、日曬，以避免因高溫而變形甚至熔毀損壞的可能。

FIRE

EQUIPMENT REQUIRED
自備設備

ALIGN

1 RADIO TRANSMITTER AND ELECTRONIC EQUIPMENT REQUIRED
自備遙控及電子設備

R/C Transmitter (8-channel or more,aircraft / multicopter system)
發射機(八動以上具飛機/多軸模式遙控器)

Receiver (8 channel or more)
接收器(八動作以上)

or 或

Satellites Receiver
衛星天線

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.

操控多軸機飛行時，須搭配使用八動以上遙控器，具備2支兩段開關以及2支三段開關功能。
操控多軸機航拍時，須搭配使用十動以上遙控器，具備2支兩段開關以及2支三段開關，並且具備2動撥桿微調開關功能。

2 OPTIONAL EQUIPMENT
另購商品

5,000~12,000mAh Li-polymer Battery 6S
6S鋰電池

Bluetooth Device
藍牙傳輸器 [HERBT001]

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

AERIAL PHOTOGRAPHY EQUIPMENT 航拍設備

G3 3 Axis Gimbal
G3雲台組
G3-GH [RGG301X]
G3-5D [RGG302X]

OSD+FPV Video Transmitter
OSD+FPV 影像發射器 [HED00001]

FPV Monitor
螢幕接收器 [HEM00001]

M480L Multicopter
M480L四軸飛行機

Quick finder
零件快速購

Multicopter Canopy
機身外殼

7.5 Inch Main Rotor x4 Sets
7.5吋主旋翼組 x4 Sets

Clockwise x2 sets
Counter Clockwise x2 sets

External Status LED
外掛用模式燈

Retract x2
多軸起落架伺服器 x2

RCM-BL4213(370KV)
Brushless Motor x4
RCM-BL4213(370KV)無刷馬達 x4
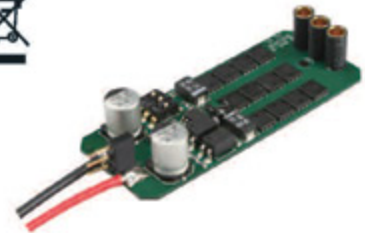
Multicopter Brushless
ESC x4
多軸無刷調速器 x4

PCU Power Control Unit
PCU 電源控制組

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

APS-M Multicopter GPS Sensor
APS-M多軸GPS感應器

Landing Gear Assembly
Gimbal Mount Carbon Tube
腳架組
雲台碳纖管

Parts Box
零件盒

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

Main Body Assembly
機身組

Motor Arm Assembly
馬達軸管組
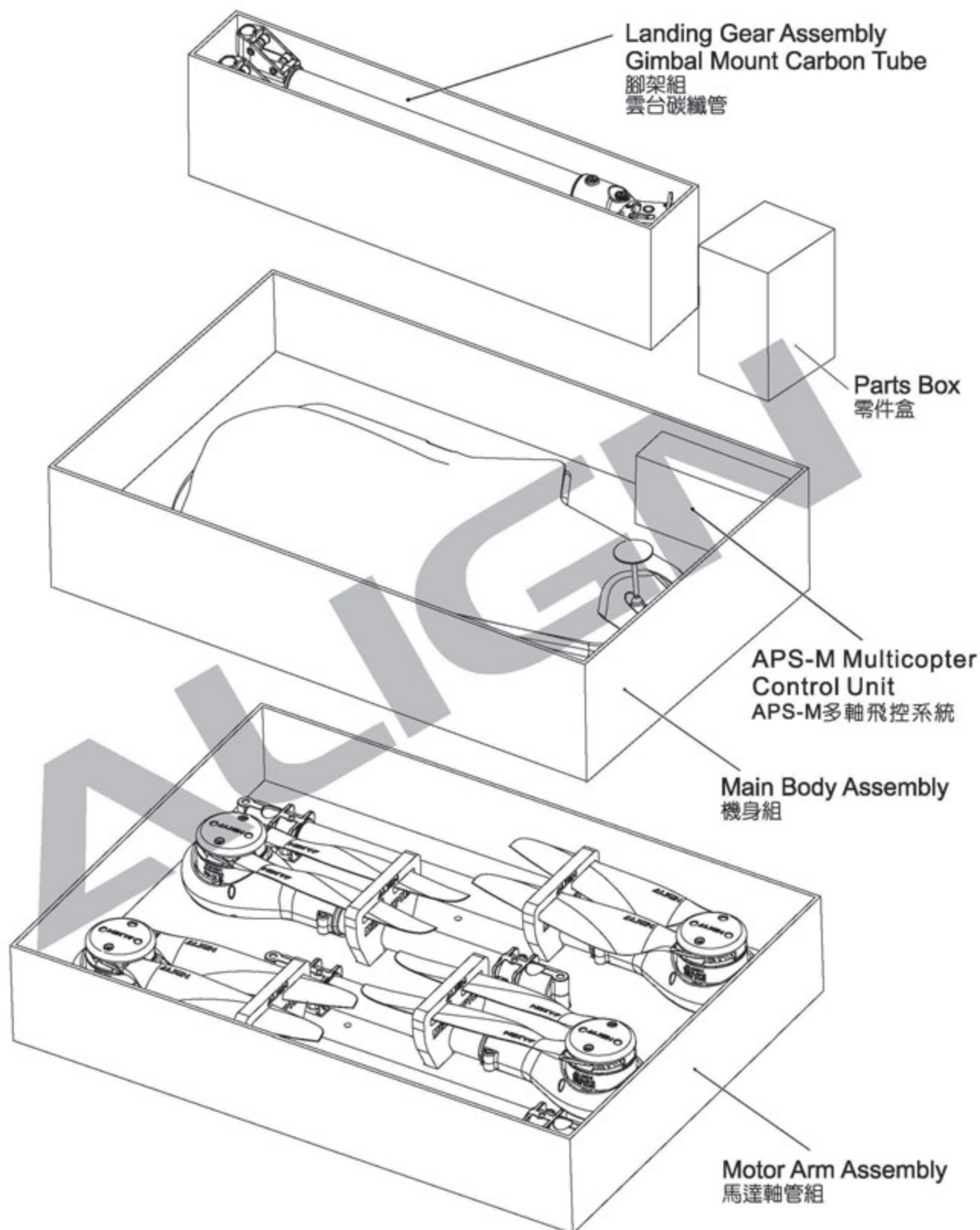
3K carbon fiber is used throughout multicopter frame, arms, and retracts.

多軸機全機機體、軸管、腳架管均採用3K碳纖材質。

1 LANDING GEAR ASSEMBLY
腳架組裝

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。

M2.5 Nut
M2.5防鬆螺帽

12mm Carbon Gear
12mm碳纖管

Socket Collar Screw
圓頭內六角軸套螺絲
M2.5x16mm
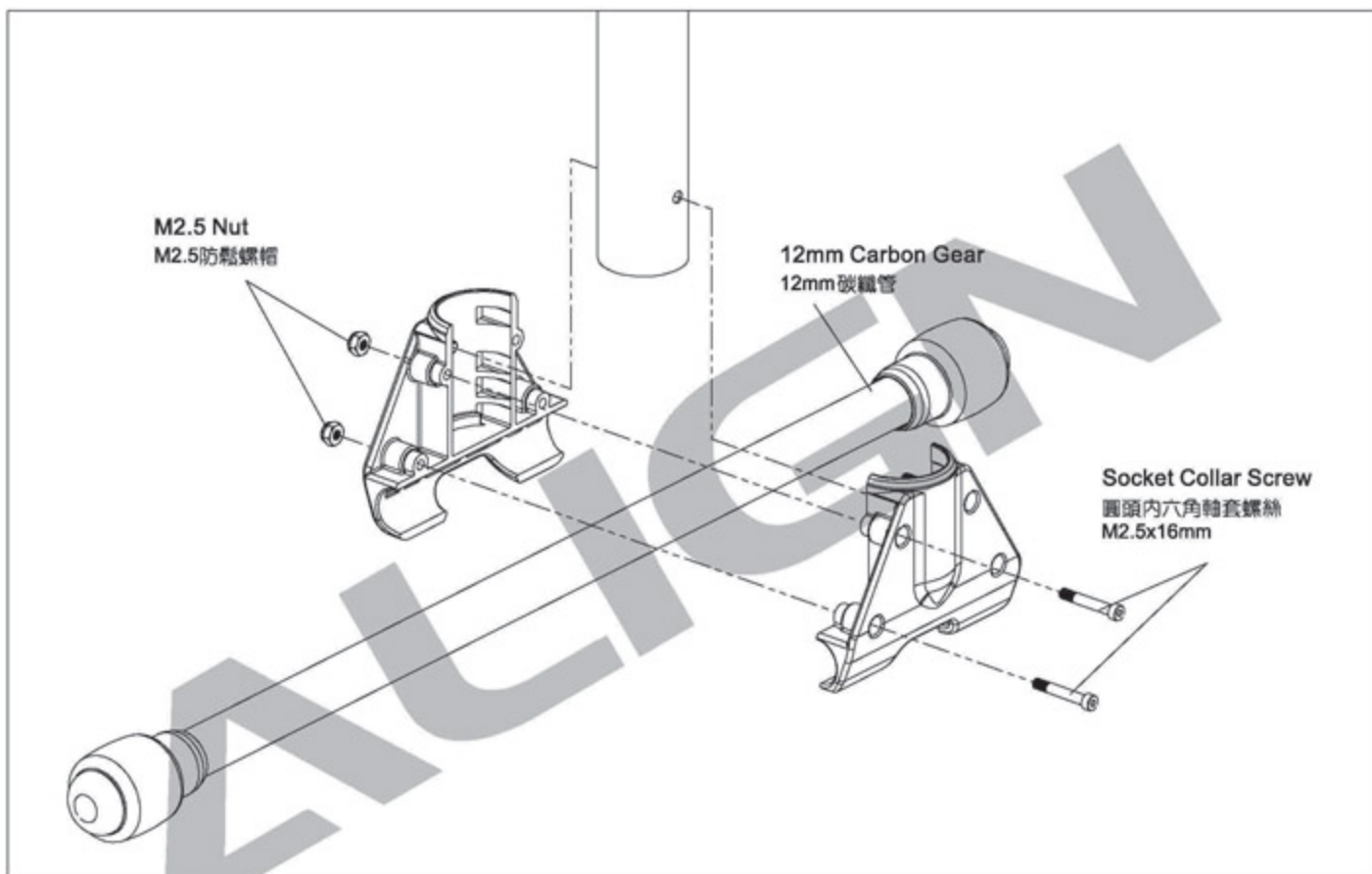
Please adjust the position of landing gear to accommodate the CG location of aircraft.

請依機身重心調整碳纖管
鎖附位置的前後長度。

Front
機頭方向

約140mm   約130mm
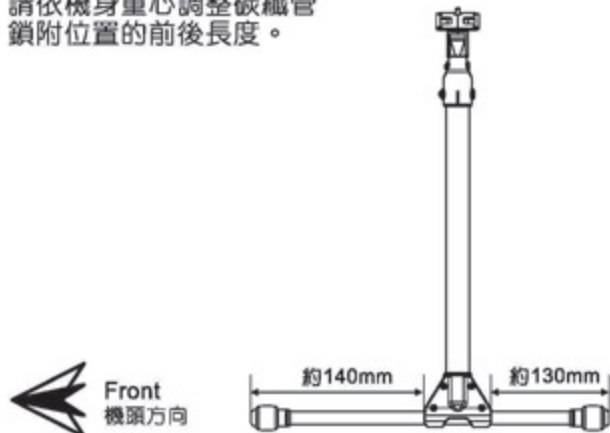
Retractable Landing Gear Installation Orientation
腳架安裝方向示意圖
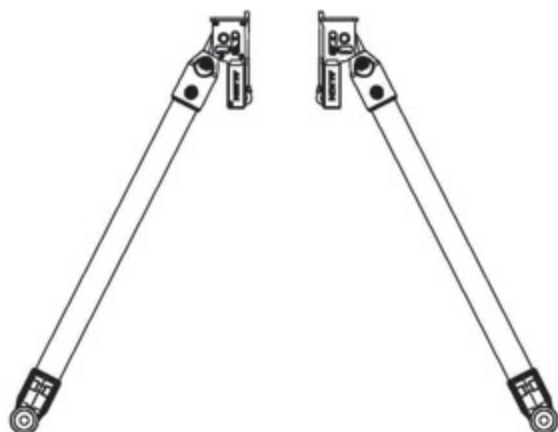
2 MAIN FRAME ASSEMBLY
機身組裝

1 REMOVE CANOPY
拆開機殼

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 注 意

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
向外側輕輕扳開取出機身，以免造成機殼破裂
損壞。

Canopy
機殼

Main Body Assembly
機身組
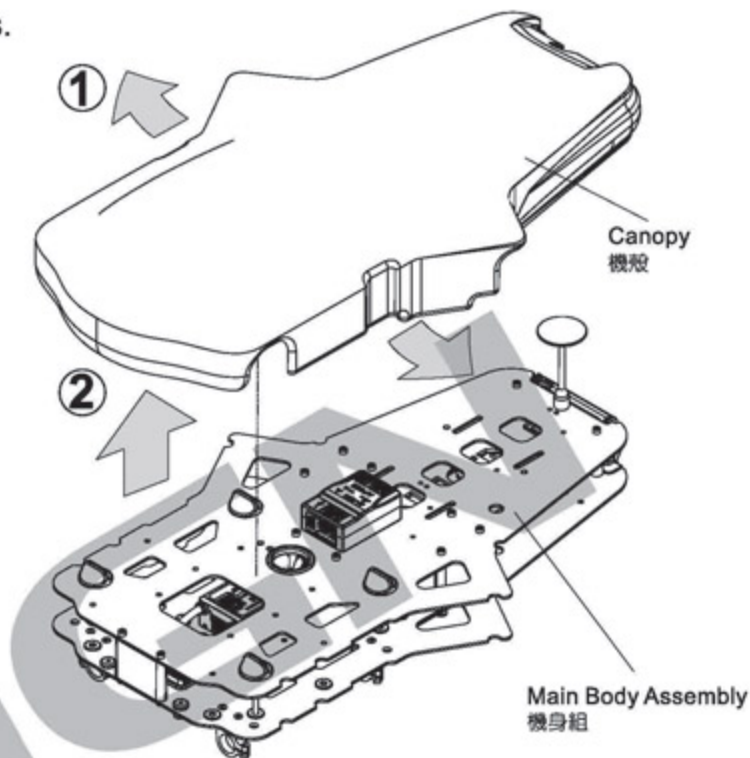
2 GIMBAL MOUNT CARBON TUBE INSTALLATION
雲台碳纖管組裝

Install the gimbal mount carbon tube
onto the tube mount.

將雲台碳纖管組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.
產品機架多半使用高強度碳纖維材料製成，其有高導電率特
性，請注意避免電極碰觸。

Gimbal Tube Mount
雲台管座

Socket Screw
圓頭內六角螺絲
M2.5x6mm

Gimbal Mount Carbon Tube
雲台碳纖管

70mm
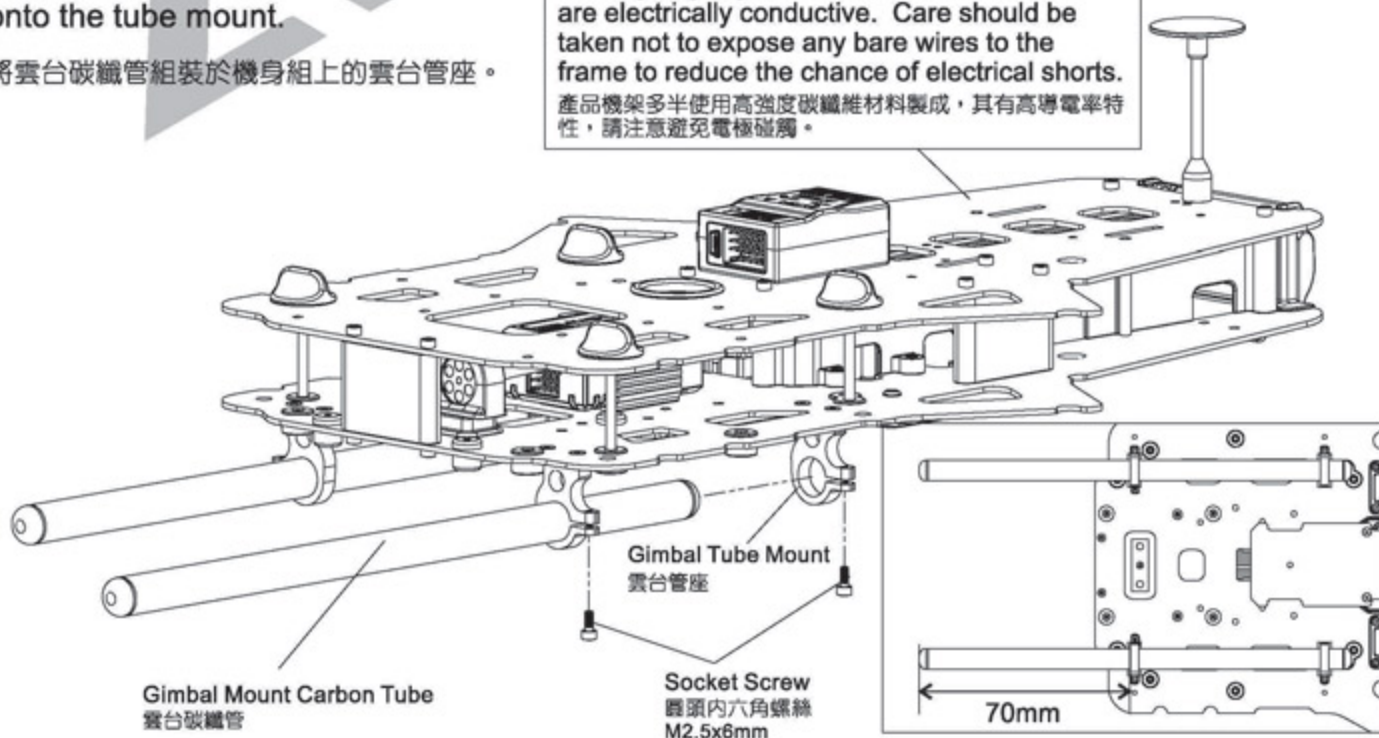
3 LANDING GEAR ASSEMBLY
脚架組組裝

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

M480L可依配重調整脚架組固定位置，請安裝於機身後側。

Retract Mounting Location
脚架固定位置

Clean/Lubrication
清潔/潤滑劑

Washer
華司
φ2.5x φ7x1mm

Socket Collar Screw
圓頭內六角軸套螺絲
M2.5x18mm
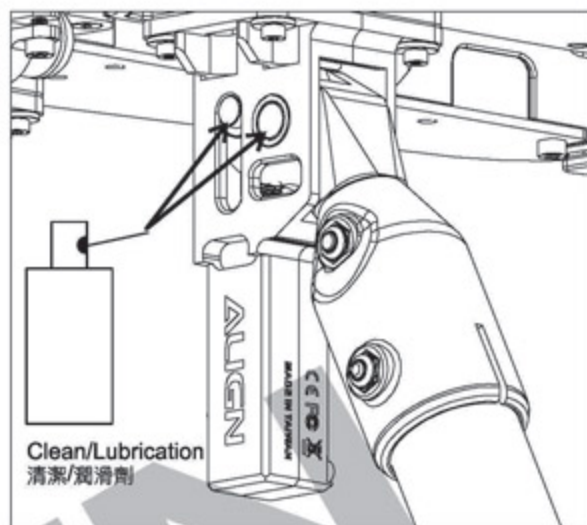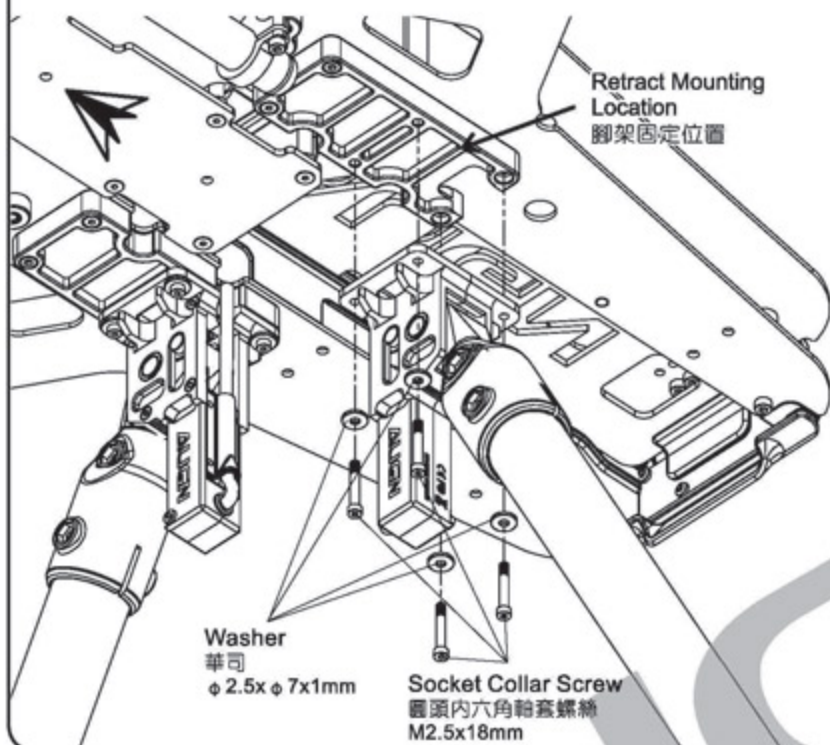
Retracts are prone to dust contamination during use. Periodically clean with pressurized air, and apply lubrication to ensure smooth retract operation.

灰塵容易造成起落架囤積髒污，請定期使用噴霧劑清潔後，添加潤滑劑，確保收脚動作順暢。

4 REMOVE TOP CARBON PLATE
拆開機身上碳纖板

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

鬆開圓頭內六角螺絲和旋鈕螺絲，將機身組的上碳纖板拆開。

Socket Screw
圓頭內六角螺絲
M2.5x6mm

Socket Screw
圓頭內六角螺絲
M2.5x6mm

Twist-off Screws
旋鈕螺絲

Socket Screw
圓頭內六角螺絲
M2.5x6mm
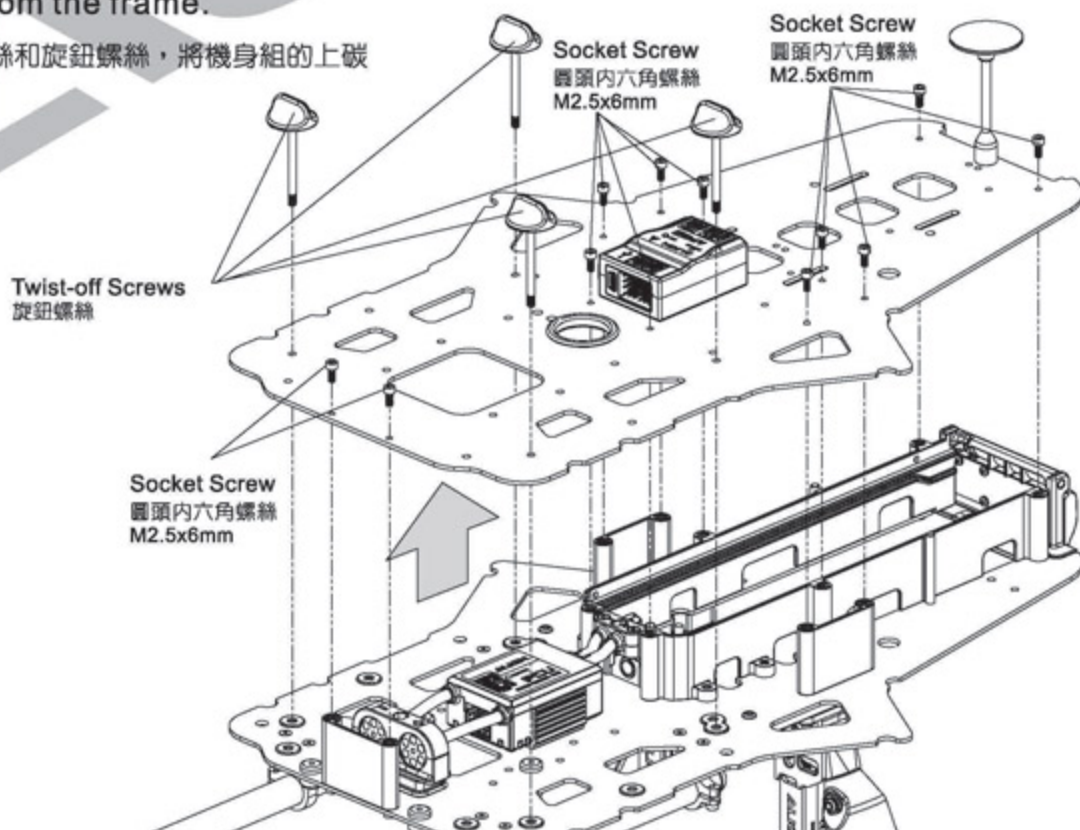
5 PCU POWER CONTROL UNIT WIRING DIAGRAM
PCU電源控制組接線示意圖

⚠ WARNING 警告

Any incorrect wiring or errors in electrode connection will cause electronic burn out.

訊號線誤插或極性錯誤將造成電子設備燒毀。

⚠ WARNING 警告

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.

插線時，請務必將刻有UP字樣端口朝上，對準插座後，確實將插頭完全插入到底，若無確實插入定位，將導致接觸不良、APS-M不動作問題產生！
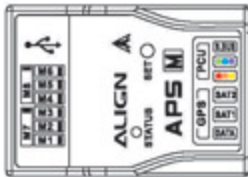
APS-M Multicopter Control Unit
APS-M多軸飛控系統

OSD+FPV Video Transmitter
OSD+FPV 影像發射器
[HED00001]
Optional Equipment
另購品

Gimbal
雲台
[RGG301]
[RGG302]
[RGG201]
Optional Equipment
另購品

Retract
多軸起落架伺服器

① ② ③

DC 5.8V Output
DC 5.8V輸出

Spare
備用

Connector Label
接頭標號

Please connect wires following correct orientation.
請依正確方向接線

External Status LED
外掛用模式燈

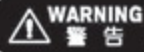## RETRACT WIRES AND EXTERNAL STATUS LED CONNECTION
多軸起落架與外掛用模式燈接線

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).

將多軸起落架上的訊號線，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PUC電源管理系統面板指示位置依序將 ① ② ③ 插入接線。

Retract Wires
多軸起落架接線

EXTERNAL STATUS LED MOUNTING LOCATION
外掛用模式燈固定位置
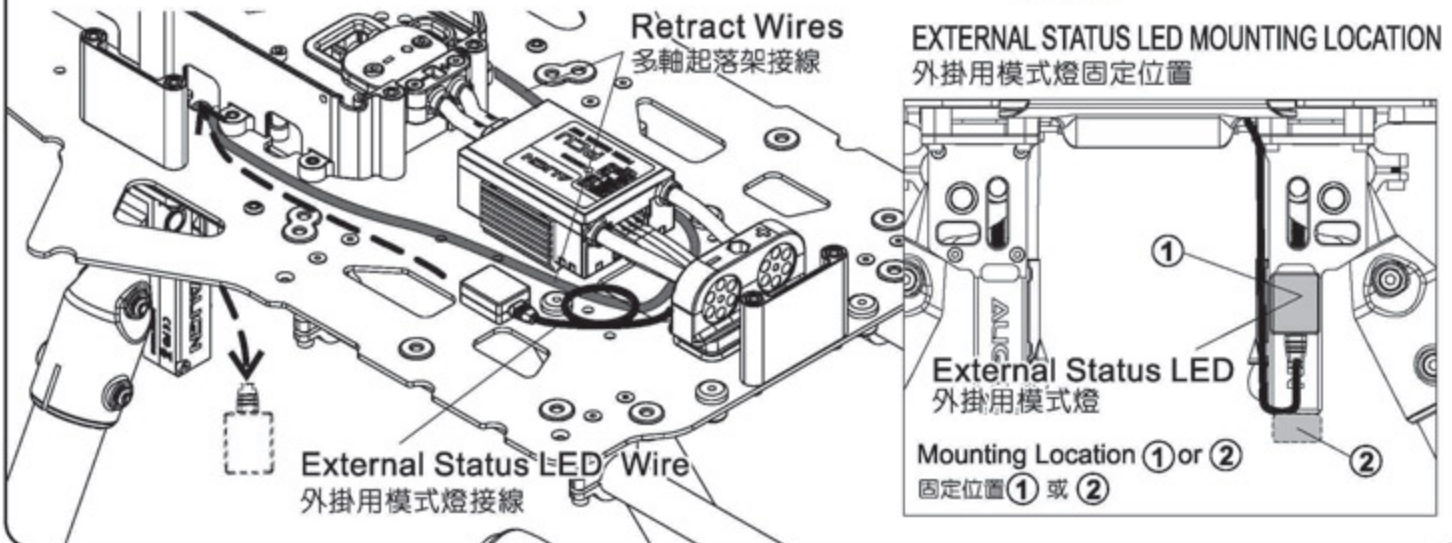
External Status LED Wire
外掛用模式燈接線

External Status LED
外掛用模式燈

Mounting Location ① or ②
固定位置① 或 ②

3 MOTOR ARM ASSEMBLY INSTALLATION
馬達軸管組組裝

1 MOTOR ROTATION DIRECTION
馬達正逆轉方向

⚠ CAUTION
注意

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.

組裝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：正轉

R Rotation Specific Blades
R向專用主旋翼

L: Counter Clockwise
L：逆轉

L Rotation Specific Blades
L向專用主旋翼
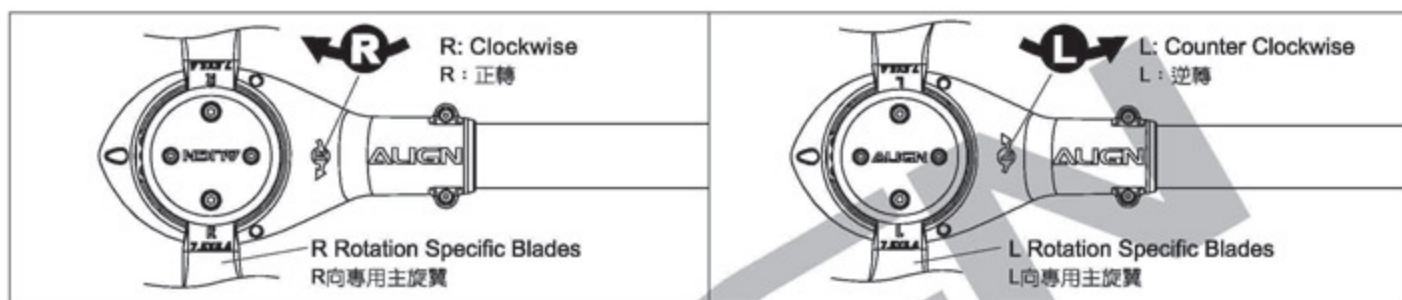
2 MOTOR ARM ASSEMBLY LENGTH
馬達軸管組前後長度

285mm

M1 (L) — M1

M2 (R) — M2

405mm

M3 (L) — M3

M4 (R) — M4
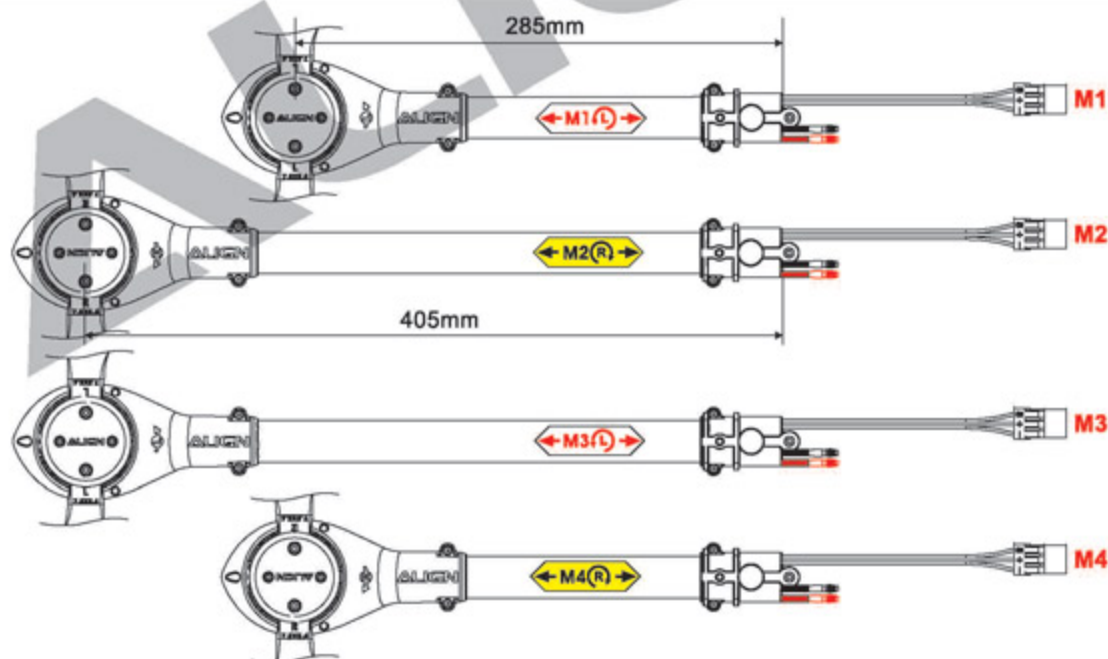
⚠ CAUTION
注意

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
馬達軸管組組裝

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.

取出軸管組時，先將圓頭內六角螺絲M3x6mm鬆開，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。

Screw Driver
螺絲起子

Socket Screw
圓頭內六角螺絲
M3x6mm

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。
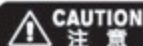
⚠ CAUTION 注 意

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。

M3x10mm socket screws
M3x10mm圓頭內六角螺絲

L

Rotation Direction
旋轉方向
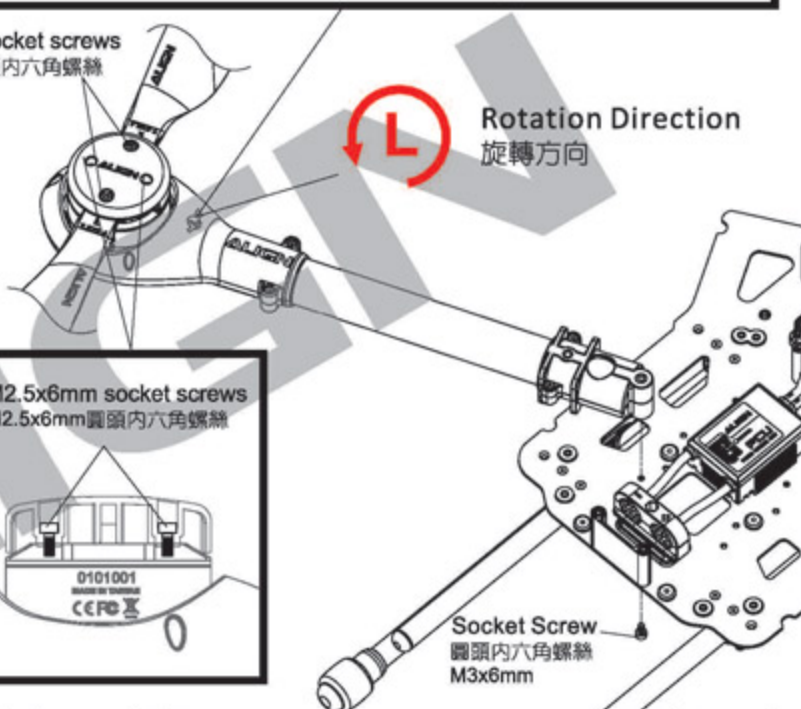
⚠ CAUTION 注 意

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和M2.5x6mm圓頭內六角螺絲，避免鎖過緊造成馬達線圈損壞。

M2.5x6mm socket screws
M2.5x6mm圓頭內六角螺絲

0101001
MADE IN TAIWAN
CE FC ☒

Socket Screw
圓頭內六角螺絲
M3x6mm

MOTOR ARM ASSEMBLY MOUNTING LOCATION
馬達軸管組裝孔位

R M4
L M1
L M3
R M2
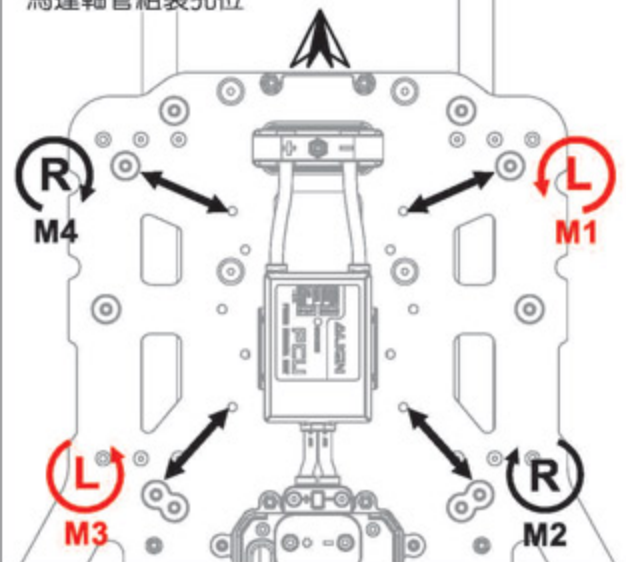
COMPLETED MOTOR ARM ASSEMBLY INSTALL
馬達軸管組裝完成示意

R M4
L M1
Short 較短
Short 較短
Long 較長
Long 較長
L M3
R M2
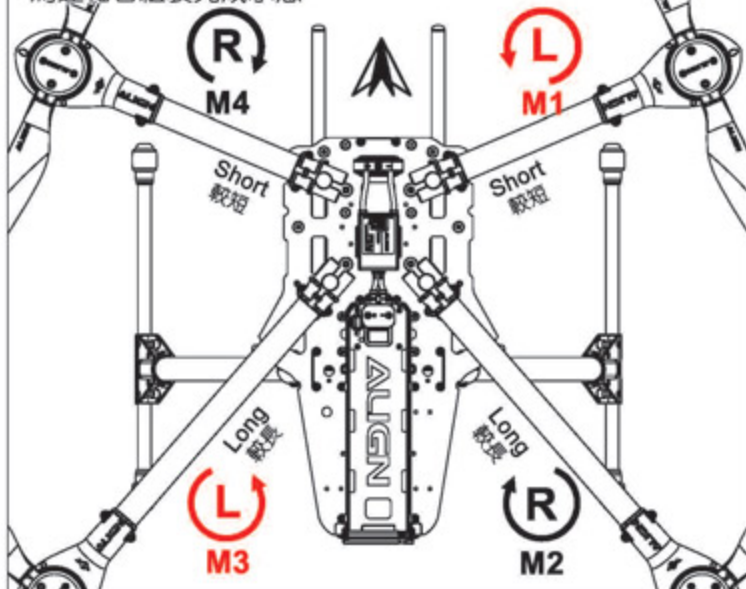
4 MOTOR ARM ASSEMBLY WIRING
馬達軸管組接線

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.

每支馬達軸管組有三條出線，分別接至：紅色電源線－正極；黑色電源線－負極；黑色訊號線－APS-M。先將紅色電源線依序插入分電盤正極／黑色電源線接至分電盤負極。（黑色訊號線留於上側板組裝後再接線到APS-M）。

Recommended plug location shown for ease of maintenance.
建議馬達正負極編號依相對位置接線(如圖)，以利後續配線檢查。

Black signal wire to be attached to APS-M later.
黑色訊號線留於上碳纖板組裝後，再接線到APS-M。

M4 M1
M3 M2

Positive (red)
正極(紅)

Negative (black)
負極(黑)
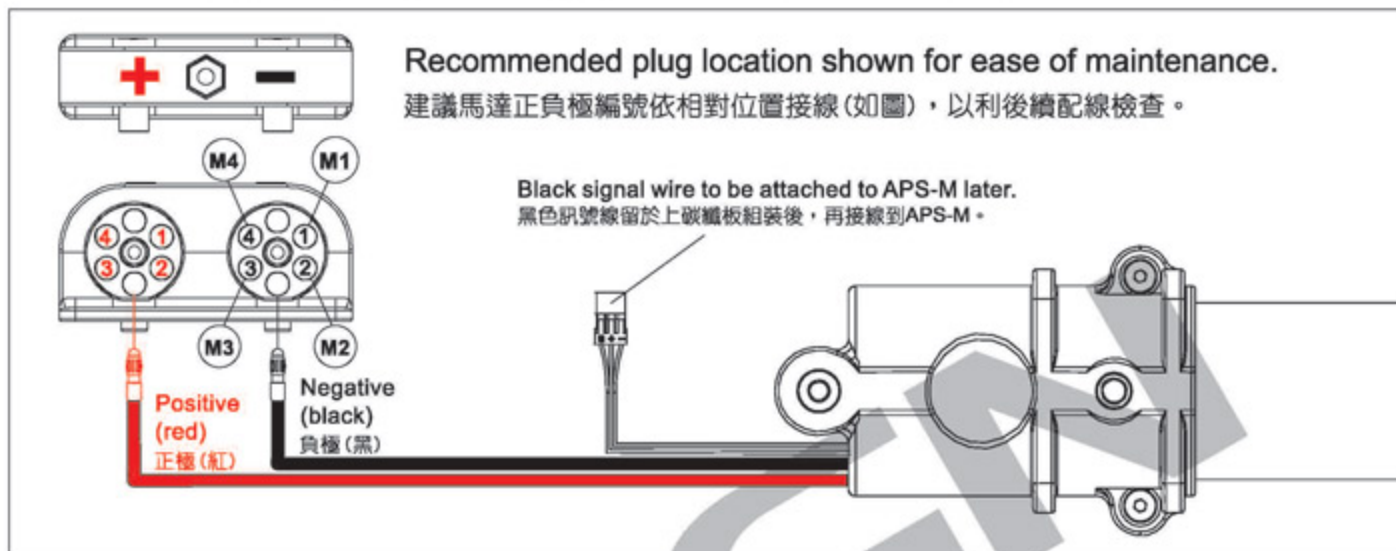
⚠ CAUTION 注意
Avoid pulling wires with excess force during wire management. Pulling the wires too hard may cause them to detach from ESC, resulting in problems with motor startup and navigation lights.
整線時請勿過度拉扯，以免ESC訊號線脫落，造成馬達啟動及飛行指示燈燈號異常。

WIRING OF MOTOR ARM ASSEMBLY
馬達軸管組接線示意圖

Wire straps can be used to fix the wires to the frame.
可利用束帶由下往上穿過機身下碳纖板，將電源線束緊固定。

Wire Straps
束帶(2.5x100mm)
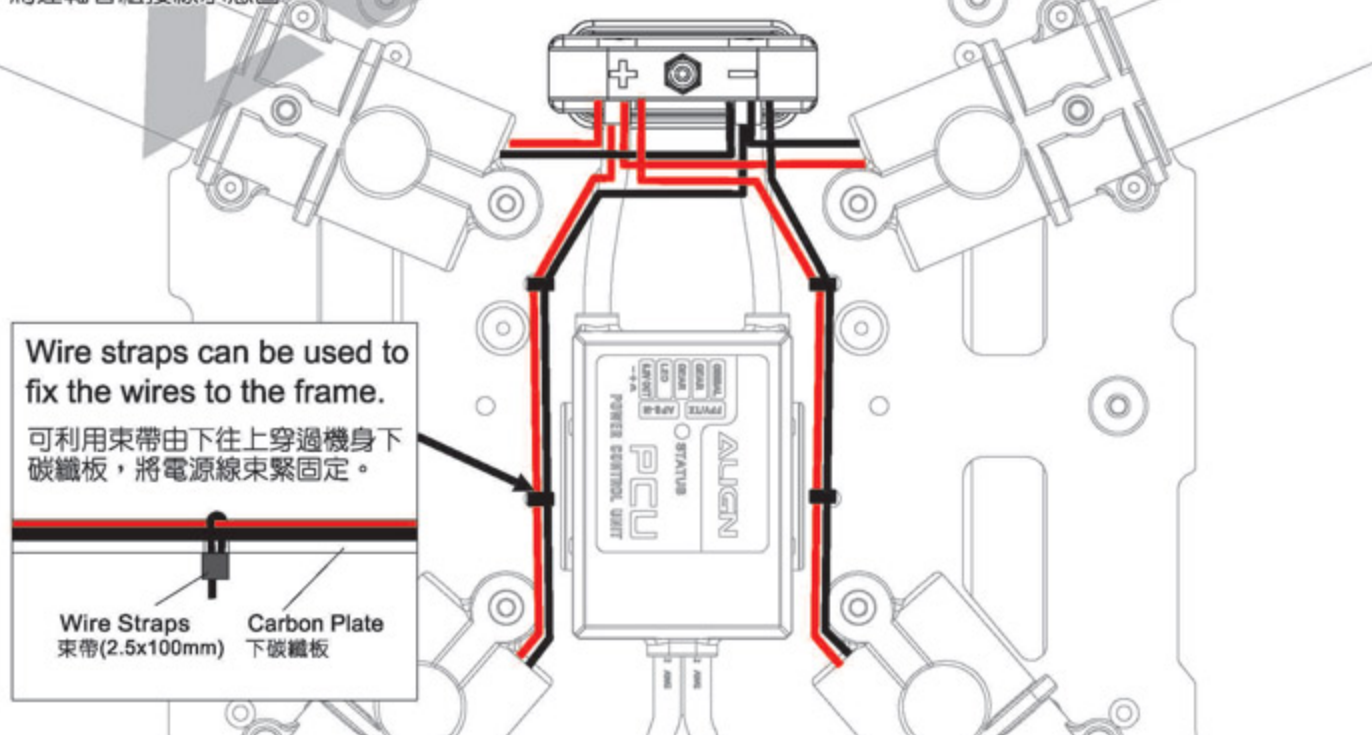
Carbon Plate
下碳纖板

5 INSTALLATION OF TOP CARBON PLATE
機身上碳纖板組裝

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.

將馬達軸管中的黑色訊號線穿過機身上碳纖板，使用原拆下的圓頭內六角螺絲M2.5x6mm將上碳纖板鎖回機身；再以圓頭內六角螺絲M3x6mm固定軸管組。

⚠ CAUTION 注意

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.

組合前，請確認上碳纖板是否能平整置於機體組合的位置，所有線材已經整線固定於下碳纖板，避免組合時夾傷線材。

Socket Screw
圓頭內六角螺絲
M3x6mm

Socket Screw
圓頭內六角螺絲
M2.5x6mm

Socket Screw
圓頭內六角螺絲
M2.5x6mm

Socket Screw
圓頭內六角螺絲
M2.5x6mm
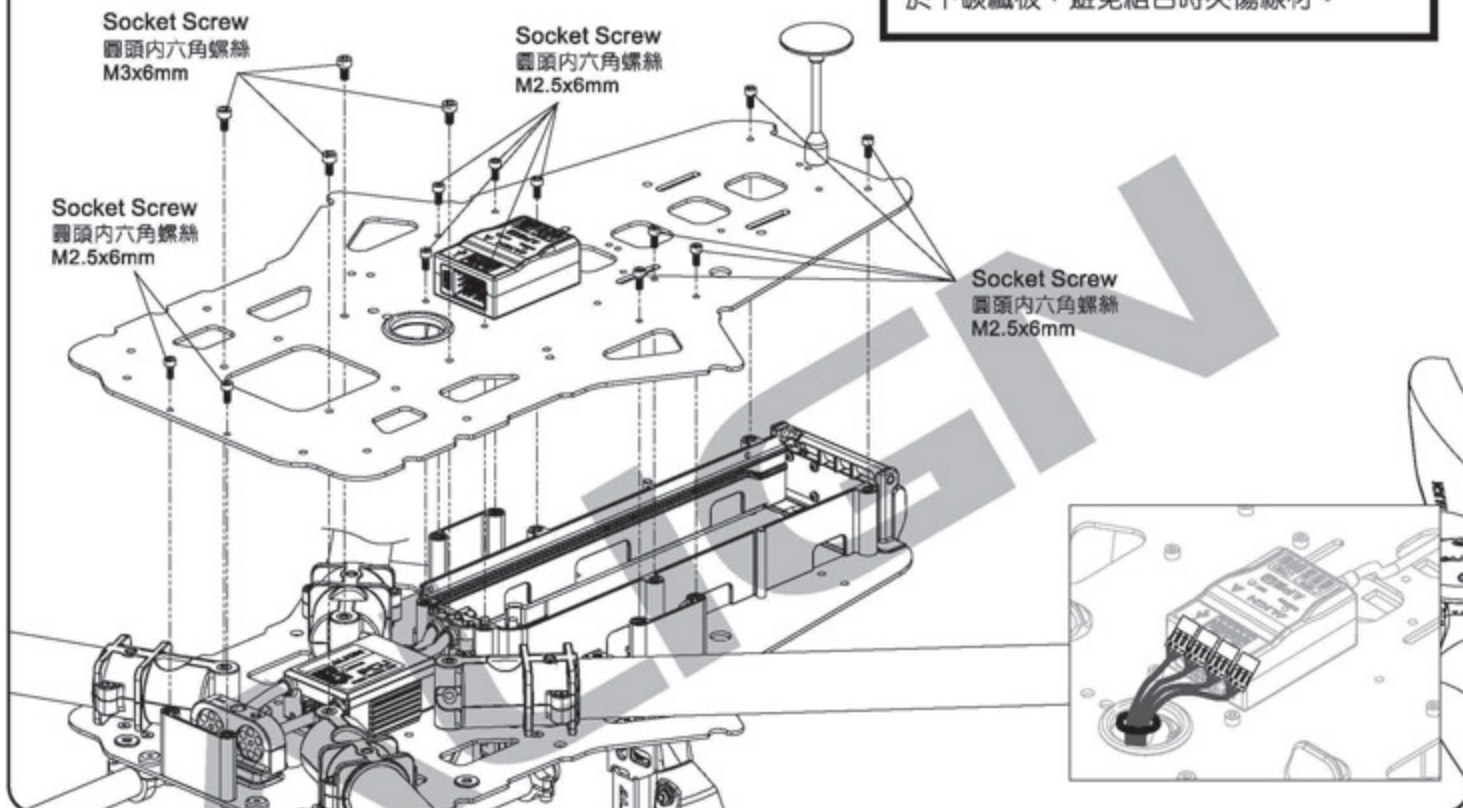
6 SECURING THE MOTOR ARM ASSEMBLIES
馬達軸管組固定

Reattach the 4 twist-off screws from earlier.

使用旋鈕螺絲固定馬達軸管。

Twist-off Screws
旋鈕螺絲

Wire Straps
束帶(2.5x100mm)
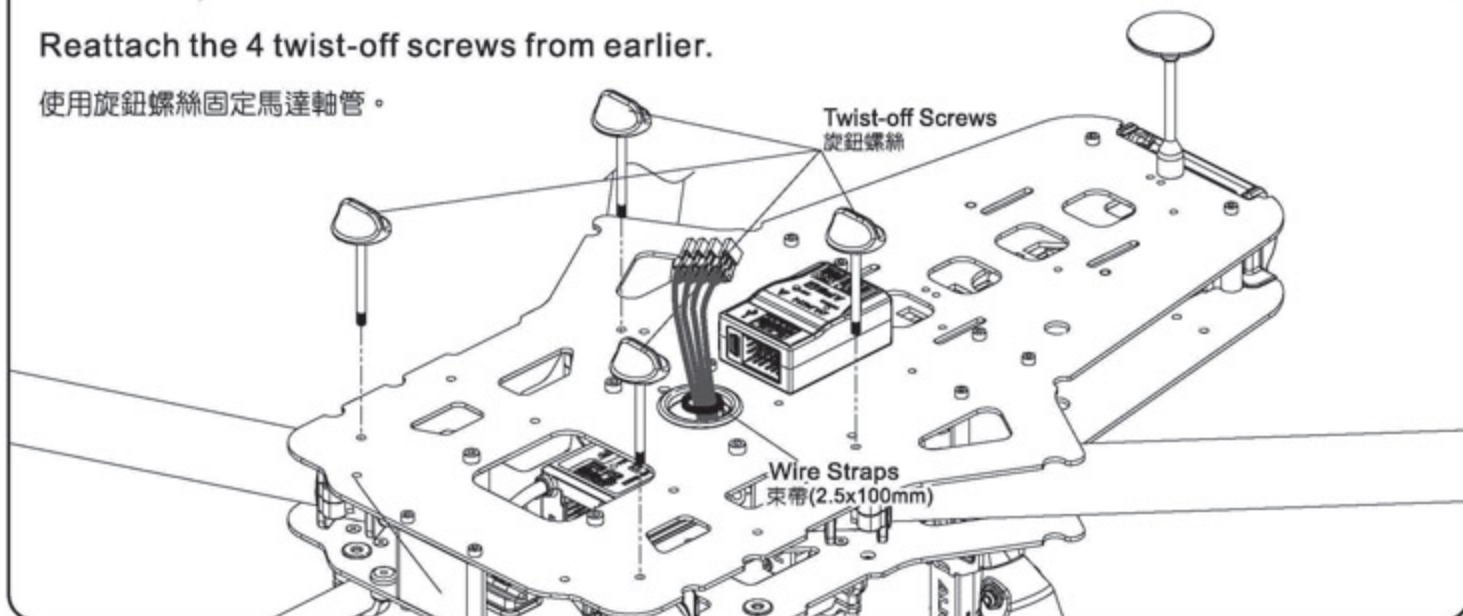
7 APS-M WIRING DIAGRAM
APS-M接線示意圖

M4 ④   ③ M3
M5 ESC   ② M2
M6 ESC   ① M1

CAUTION 注意

Please connect wires following correct orientation
請依正確方向接線

S
+
−

Connector Label
接頭符號

S
+
−

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

− + s   − + s

M7 ESC
M8 ESC

Mini USB

PC
電腦
Equipment Required
自備設備

WARNING 警告

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.

插線時，請務必將刻有UP字樣端口朝上，對準插座後，確實將插頭完全插入到底，若無確實插入定位，將導致接觸不良、APS-M不動作問題產生！

− + s

ALIGN
STATUS
PCU
POWER CONTROL UNIT

PCU Power Control Unit
PCU電源控制組

S + −

CAUTION 注意

Please connect wires following correct orientation
請依正確方向接線

Connector Label
接頭符號

S
+
−

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

APS-M Multicopter GPS Sensor
APS-M多軸GPS感應器

Data Port / Bluetooth Device
資料傳輸埠 / 藍牙傳輸器 (BTH01)
Optional Equipment
另購品

Smart Phone
智慧手機
Equipment Required
自備設備

APS-M AND RECEIVER WIRING METHOD
APS-M與接收器接線方式

⑤ Connect your receiver to the appropriate APS-M port as indicated.
接收機接線方式，請依所使用的接收器類型接於指定孔位。

Please connect wires following correct orientation
請依正確方向接線

Connector Label
接頭符號
S
+
−

a) JR/Spektrum Satellite
JR/Spektrum 衛星天線

b) Futaba S.BUS/ JR X.BUS/ FS iBUS
Futaba S.BUS/ JR X.BUS/ FS iBUS

S
+
−

Please connect wires following correct orientation
請依正確方向接線

1
2
S.BUS
1
3/B

c) Standard Receiver
傳統接收器

S
+
−
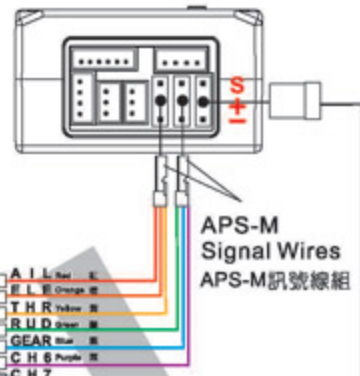
APS-M Signal Wires
APS-M訊號線組

1
2
3
4
5
6
7/B

A I L Red 紅
E L E Orange 橙
T H R Yellow 黃
R U D Green 綠
GEAR Blue 藍
C H 6 Purple 紫
C H 7

⚠ CAUTION
注意

1. When using JR X.BUS connection of DMSS satellite antennas, please select MODE A in your transmitter.
2. The standard receiver only support to 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。

🚫 FORBIDDEN
禁止

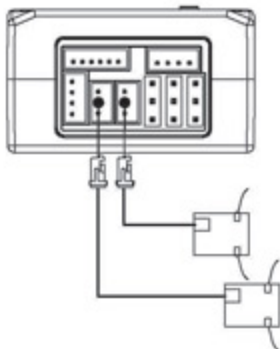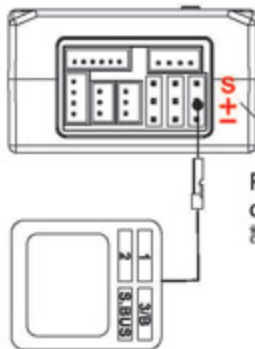Please follow the instruction manual carefully when installing receiver. Traditional receiver channel ports are reserved specifically for the multi-colored ribbon cable. Do not directly connect standard servo plug into this port where power may be introduced into the APS-M. Doing so may cause irreversible 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多軸飛控系統燒毀。

8 PCU UPGRADE CABLE WIRING DIAGRAM
PCU升級更新接線示意圖

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。
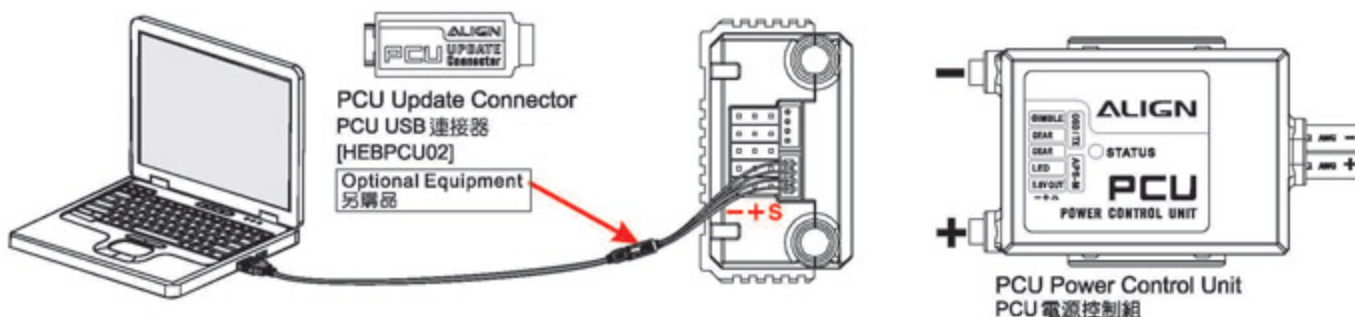
PCU Update Connector
PCU USB 連接器
[HEBPCU02]
Optional Equipment
另購品

− + S

ALIGN
STATUS
PCU
POWER CONTROL UNIT

PCU Power Control Unit
PCU 電源控制組

9 ASP-M MULTICOPTER GPS SENSOR INSTALL AND APS-M WIRING
APS-M多軸GPS感應器安裝及APS-M接線示意圖

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.

1.安裝接收器，並將APS-M多軸GPS感應器貼附於固定架上。
2.依面板指示位置依序① ② ③ ④ 將馬達軸管組訊號線，以及⑤接收機接線至APS-M。

Front
機頭方向

Wire Straps
束帶(2.5x100mm)

Wire Straps
束帶(2.5x100mm)

Receiver
接收器

Ensure the GPS mounting mast is securely fastened to the frame before mounting the APS-M Multicopter GPS Sensor.
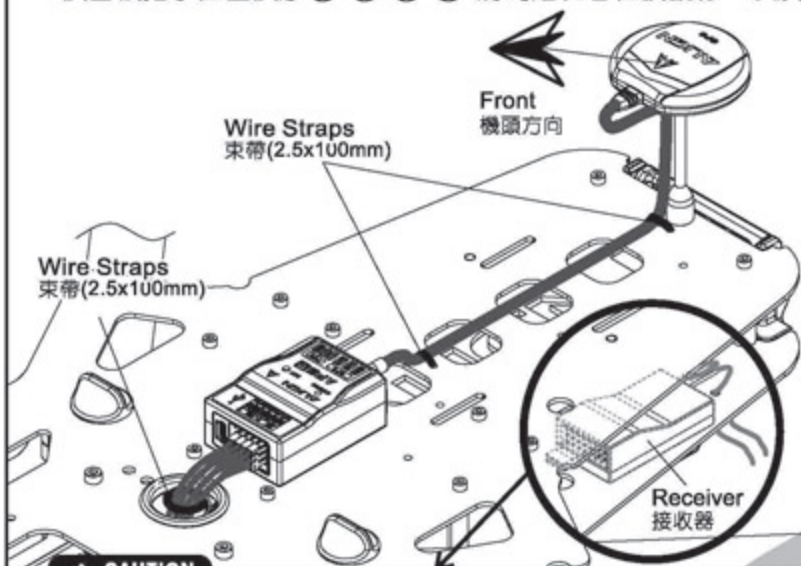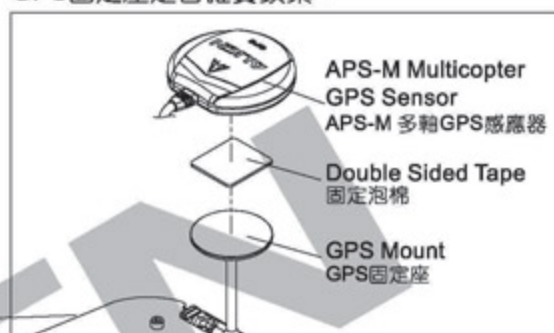
安裝APS-M多軸GPS感應器時，請確認GPS固定座是否確實鎖緊。

APS-M Multicopter GPS Sensor
APS-M 多軸GPS感應器

Double Sided Tape
固定泡棉

GPS Mount
GPS固定座

⚠ CAUTION 注意

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.

接收機建議放置於圖示中位置，天線須穿過下側板孔位確實露出機身外，以增加接收機與遙控器的收訊距離。另外，接收機不可與OSD發射器安裝於同側位置，避免OSD干擾遙控訊號。

10 CANOPY INSTALLATION
機殼組裝

Re-attach canopy to complete installation.
將機殼裝於機身即完成組裝。

Latched to frame
完全卡住機身
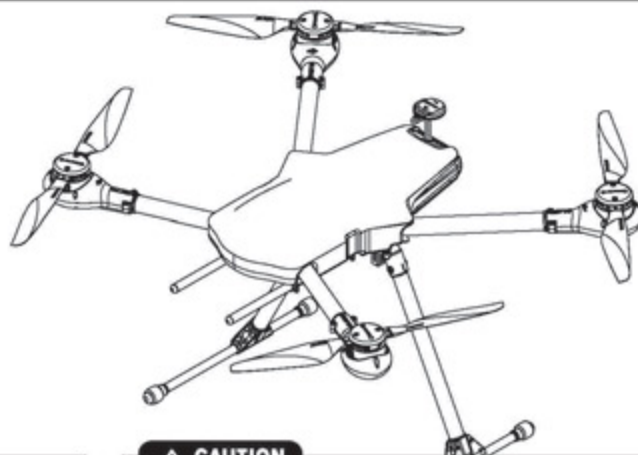
⚠ CAUTION 注意

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

機殼裝上機身時，請務必確認機殼完全卡住機身下碳纖板，避免飛行時脫落，而導致不可預期的意外。

⚠ CAUTION 注意

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

飛行時必須蓋上機殼，以確保飛行機不受氣流干擾達到最佳的飛行效能。

BATTERY INSTALLATION ILLUSTRATION
電池安裝示意圖

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.

雙層設計的電池板，可選用單層電池使用，一顆6S 22.2V 12,000mAh以內 ；或是使用雙層電池板同時安裝兩顆8,000mAh容量以內電池，電池可彈性選擇使用與調整機體重心。電池板內搭載新型"防火花"專利設計，能有效防止電池快拆插入時所產生的火花，降低電子設備傷害及接頭耗損接觸不良問題。

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.
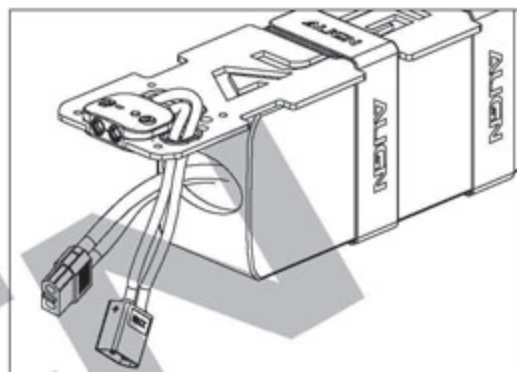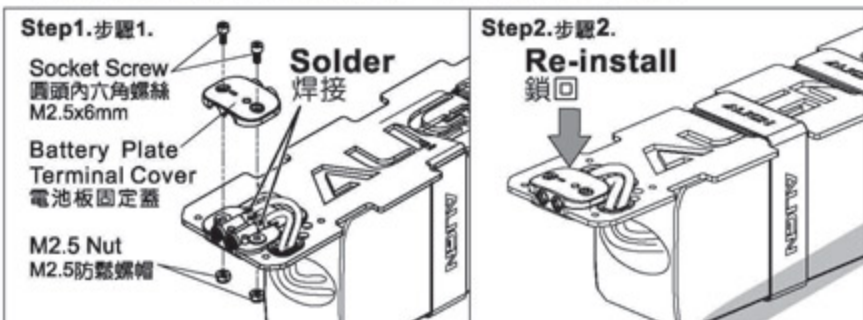
先鬆開電池板固定蓋，將電池電源線依＋－指示焊接於接頭上再鎖回。

Step1.步驟1.

Socket Screw
圓頭內六角螺絲
M2.5x6mm

Solder
焊接

Battery Plate
Terminal Cover
電池板固定蓋

M2.5 Nut
M2.5防鬆螺帽

Step2.步驟2.

Re-install
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搭載雲台建議使用單顆5,200mAh以上的電池，或是2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。

3-1.Single Battery
單顆電池

Main battery plate
主電池板

70mm
180mm
50mm

Max battery size
可容納電池最大尺寸
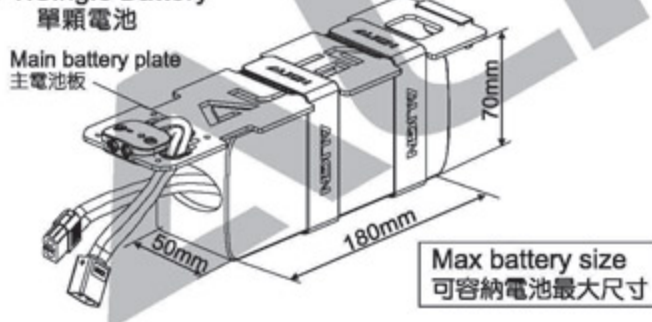
3-2.Double Battery
雙層電池
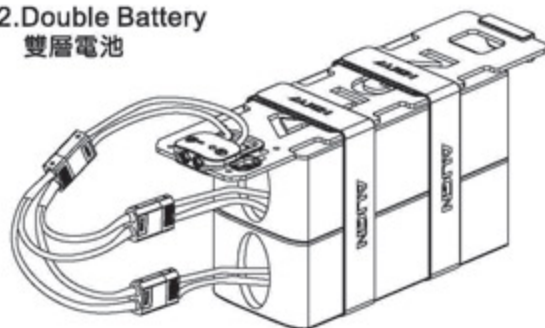
4.BATTERY INSTALL EXAMPLE FOR M690L　M690L電池使用示意圖

4-1.Auxiliary Battery Plate
Battery Install Example
副電池板組裝

Socket Screw
圓頭內六角螺絲
M2.5x6mm

Battery
Plate Standoff
電池板鋁柱

Auxiliary
Battery Plate
副電池板

Auxiliary Battery
Plate can be added
according to needs.
副電池板可依需要選擇加裝。

Flat Head Socket Cap Screw
皿頭內六角螺絲
M2.5x6mm

4-2.Single Battery
單顆電池

Main battery plate
主電池板

Auxiliary
Battery Plate
副電池板

4-3.Double Battery
雙層電池

Auxiliary
Battery Plate
副電池板

Main battery plate
主電池板
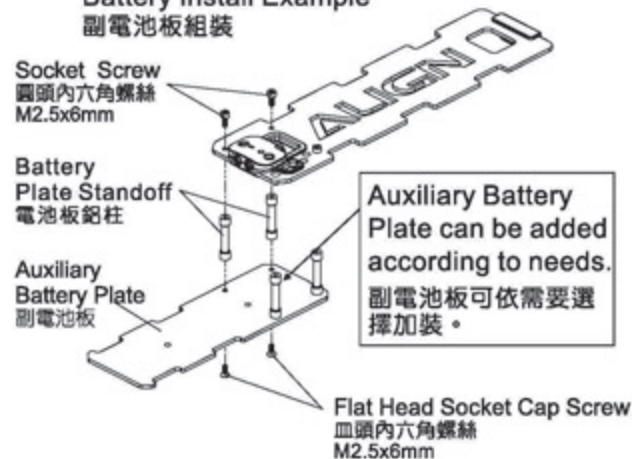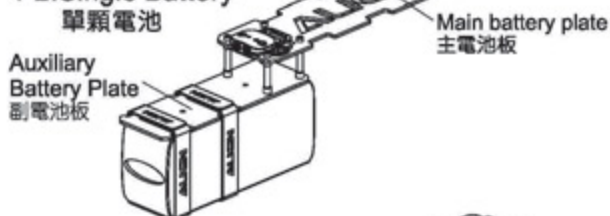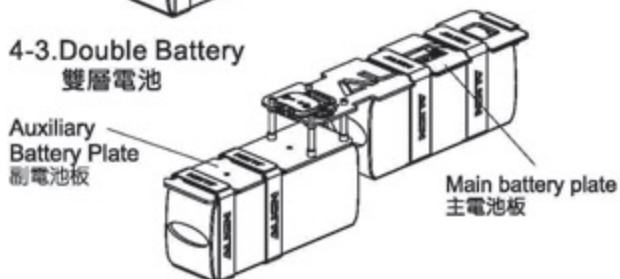
5.M480L BATTERY INSTALLATION ILLUSTRATION
M480L電池安裝示意圖

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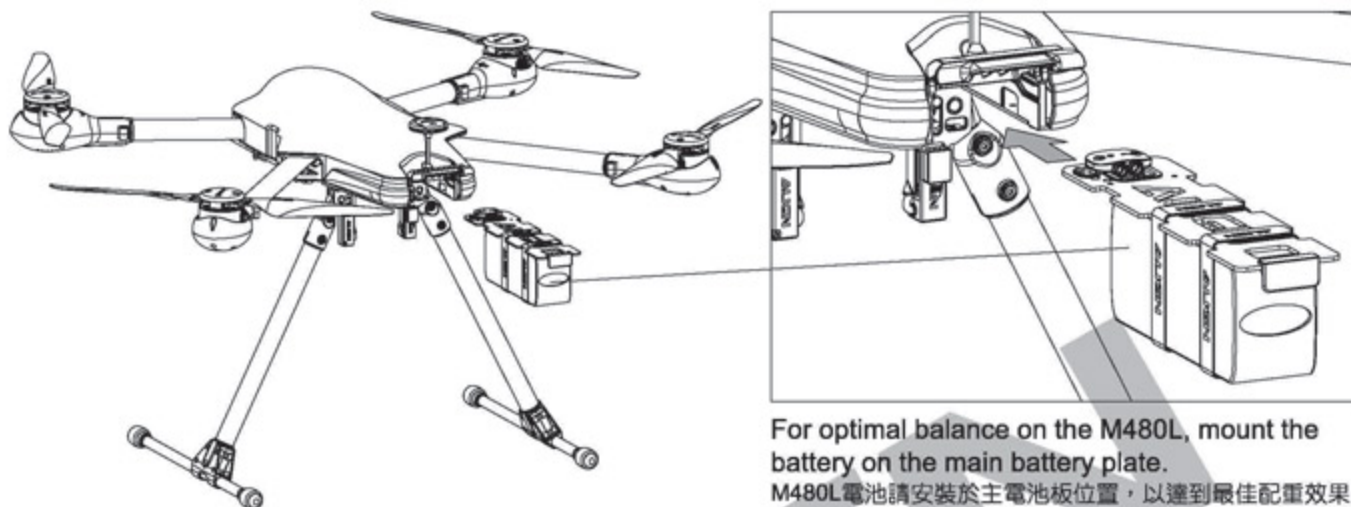
For optimal balance on the M480L, mount the battery on the main battery plate.
M480L電池請安裝於主電池板位置，以達到最佳配重效果。

5 INTELLIGENT POWER MANAGEMENT
智慧型電源控制系統

Status LED
模式燈

Battery level LED display
電池電量指示燈
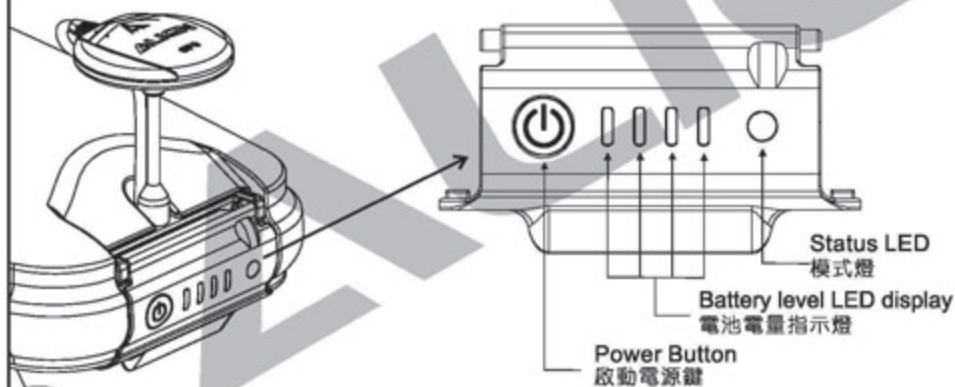
Power Button
啟動電源鍵

BATTERY LEVEL INDICATOR DESCRIPTION
電池電量指示燈說明

Battery level LED display 電池燈號顯示	Battery level indicator 電量顯示
▮▮▮▮	75%~100%
▮▮▮▯	50%~75%
▮▮▯▯	25%~50%
▮▯▯▯	0%~25%

POWER ON 電源開啟

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.

檢查電量：短按電源鍵檢視剩餘電量。
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 funciton 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，當多軸機降落閒置時，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
飛行指示燈

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

1.多軸機開機後指示燈隨之全部開啟。
2.多軸機關機後指示燈隨之全部關閉。

⊘ **FORBIDDEN**
禁 止

Do not operate R/C aircraft if the
flight navigation lights exhibit
abnormal behavior during power up.
飛行指示燈開啟異常禁止飛行。

Red LED
紅色燈
(L) M1

(R) M4
Red LED
紅色燈

(R) M2
White LED
白色燈

(L) M3
White LED
白色燈
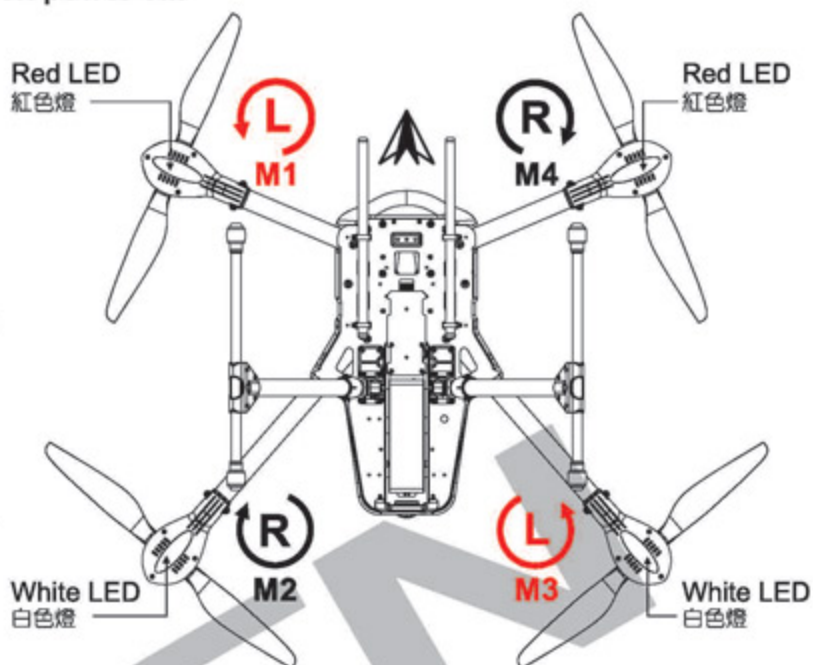
7 COLLAPSIBLE MOTOR ARMS
馬達軸管收納示意圖

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.

多軸飛行機軸管可快速收折設計，只要以手轉開旋鈕螺絲，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
馬達軸管往旁邊兩側收折示意圖

Twist-off Screws
旋鈕螺絲
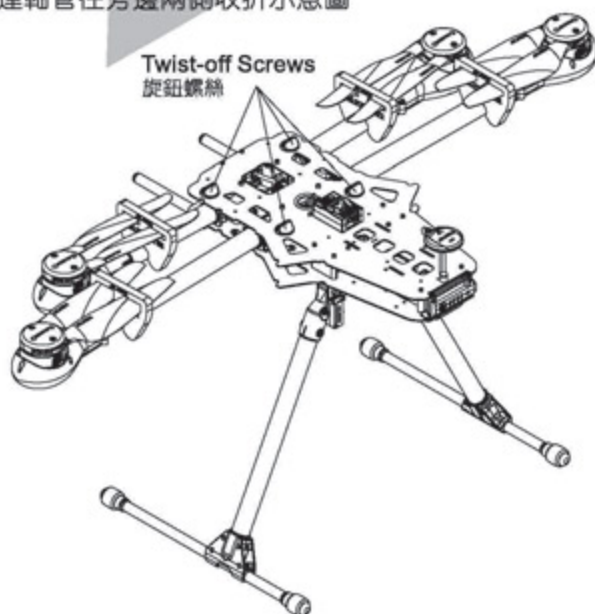
MOTOR ARMS FOLD TOWARD THE REAR
馬達軸管往後側收折示意圖

Twist-off Screws
旋鈕螺絲
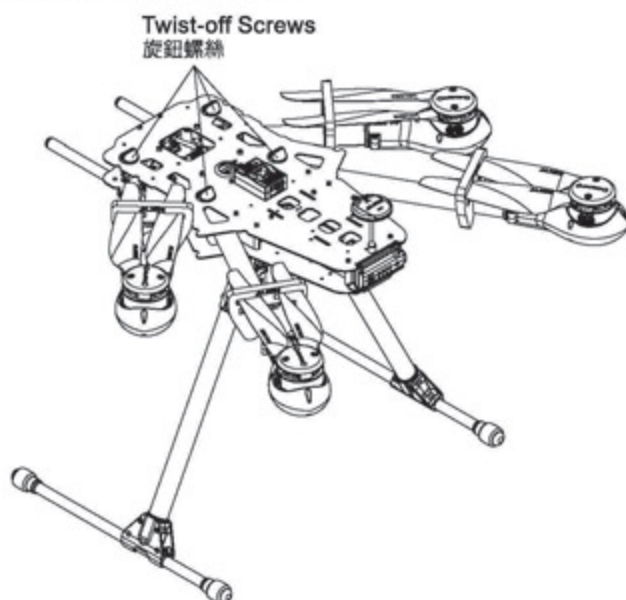
APS-M產品特色

ALIGN

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X型、六軸+型、六軸X型、八軸+型、八軸X型

GPS Build in APS-MMulticopter GPS Sensor for precise location fixing function.
內建APS-M多軸GPS感應器,提供精準的定位功能。
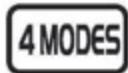
4 MODES Multiple flight modes including manual mode, attitude mode, GPS Angular mode, and GPS Velocity mode.
提供手動模式、姿態模式、GPS角度模式、GPS速度模式,可滿足玩家使用需求。

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。

Smart 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。

OSD Provides real-time OSD flight data output function.
提供OSD飛行及時資訊輸出功能。

Supports G2/G3 gimbal control.
支援G2/G3雲台控制。
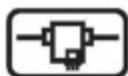
Supports Spektrum and JR satellite receivers.
支援Spektrum與JR衛星天線。

S.BUS X.BUS 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。

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

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

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

RoHS RoHS certified.
符合RoHS限用規章。

- 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).

- 安裝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、電池、電線等影響磁場零組件，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

APS-MMulticopter GPS Senser
APS-M多軸GPS感應器

Wire Straps
束帶2.5x100mm

55mm

149mm

Front
機頭方向

Wire Straps
束帶2.5x100mm

APS-M Multicopter Control Unit
APS-M多軸飛控系統
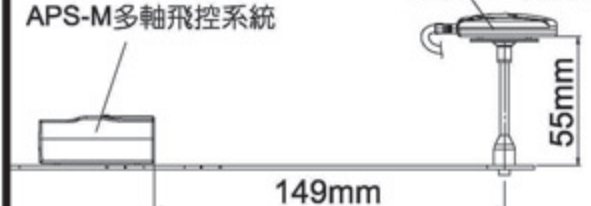
Receiver
接收器

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

APS-M Multicopter GPS Senser
APS-M多軸GPS感應器

55mm

149mm

23

1 SOFTWARE DOWNLOAD AND INSTALLATION
操作介面下載安裝

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.

   遙控器選擇飛機或多軸模式：使用APS-M時，遙控器必須選擇飛機或多軸模式，才能與APS-M正確搭配使用。

```
PARAMETER           (1/3)
RESET▶ Execute
TYPE▶ ACROBATIC

RX▶ S-FHSS
ALT▶ ON
```
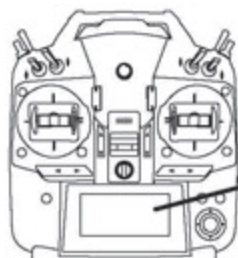
2. PC Software Install: Please go to the following website to download the software and install on your PC.

   電腦安裝操作介面：下載安裝APS-M電腦操作介面請至下列網址
   http://www.align.com.tw/download-en/apsm/

   ⚠ **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.
   http://www.microsoft.com/en-US/download/details.aspx?id=17851

   無法安裝APS-M Windows版本時，請檢查電腦是否有安裝Microsoft .NET Framework 4。
   http://www.microsoft.com/zh-TW/download/details.aspx?id=17851

3. Please scan QR Code for link to ALIGN 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.

   請掃描QR Code連結亞拓網站下載相關軟體，或是在iOS/Android App store搜尋"ALIGN APS-M"。使用手機下載APP請另購藍牙傳輸器[HERBT001]才能與多軸機搭配使用。

   Compatible with **Windows** ▶ **Google play** (ANDROID APP ON) **App Store** (Download on the)

4. Power On Your Transmitter And Multicopter.
   開啟遙控器與啟動電源

   Power ON
   電源開啟

   Press and hold for 3 seconds to power up
   長按3秒開機

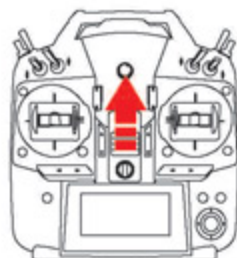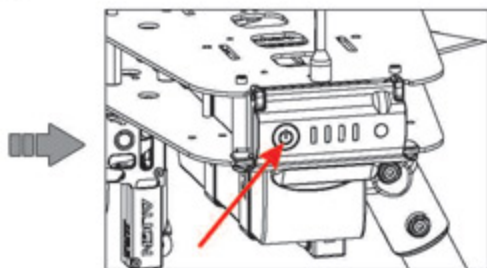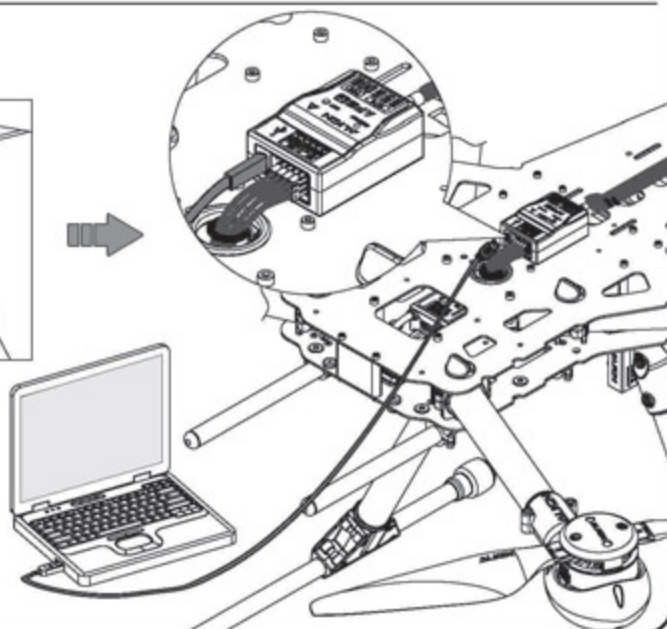1. When using smartphone app to make configuration changes, a Bluetooth password must be set for pairing with the smartphone. The factory default password is "0000". We strongly recommend you to change your password to avoid interference with others during Bluetooth transmission.

   Connection Status:
   Green:Connected;Red:Disconnected.

   使用手機軟體介面(app)調整時,須設定藍牙連線密碼,提供手機連線時使用。預設密碼為"0000",強力建議使用者先更改密碼後再使用,以免對其他藍牙裝置造成干擾。

   連線狀態燈號說明:
   綠燈為正常連線;紅燈為未連線。

Set Bluetooth PW

Password Setting
設定藍牙密碼

● Connected

Connection Status
連線狀態

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搭載亞拓PCU電源管理系統,具備智慧電源管理功能,當多軸機降落閒置時,會執行電源關閉保護。

   APS-M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長短,調整至5分鐘或10分鐘關機。

PCU Hibernation	Hibernate Time
ON OFF	10 minutes ▼

PCU Hibernation / Hibernation Time
PCU自動斷電 / 斷電時間

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。

Receiver Type
Conventional
Futaba S.BUS
Spektrum / JR SAT DSM2
Spektrum SAT DSMX
JR DMSS Remote Ant
JR X.BUS (Mode A only)
FlySky LBUS
Graupner HoTT SUMD

Satellite Binding Mode
None
Binding
Binding with Failed Safe
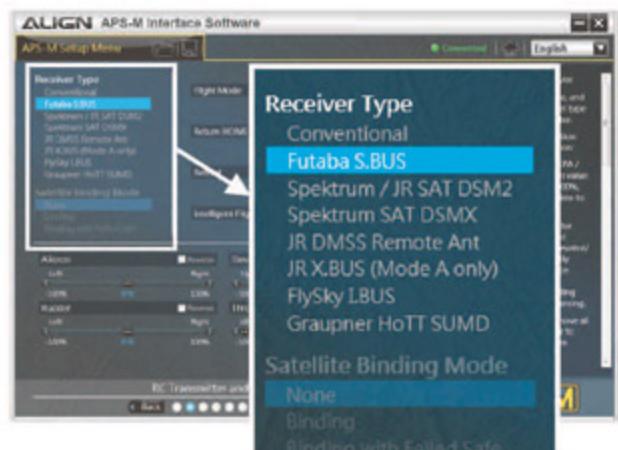
SATELLITE ANTENNA BINDING
使用衛星天線對頻方式

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 failsafe 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) 重新開啟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。

Reboot Power
重新開啟電源
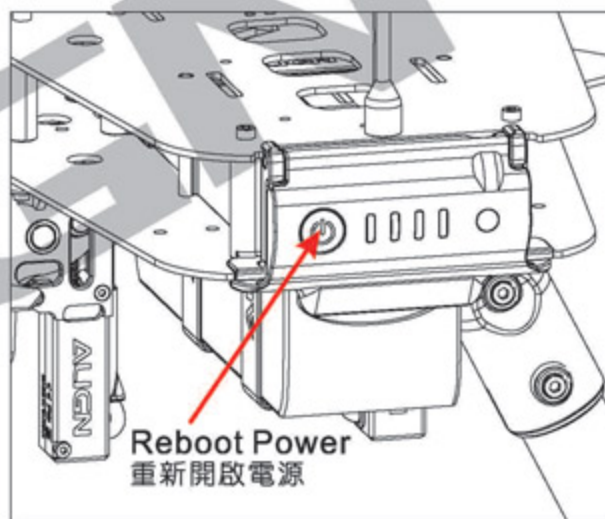
⚠ **CAUTION**
注 意

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，衛星天線上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.

遙控器搖桿方向、行程校正:

1)設定此項目前,所有頻道EPA、Travel ADJ最大最小要為預設值100%,所有微調設為"0"。

2)確認遙控器各動作,副翼、升降、尾舵、油門搖桿方向是否正確,如果介面上顯示方向與搖桿方向相反,可點選該頻道上的"正反向",讓介面與遙控器一致。

MODE 1

Down 下   Full 最大油門

Left 左 ↔ Right 右   Left 左 ↔ Right 右

Up 上   Idle 最小油門

MODE 2

Full 最大油門   Down 下

Left 左 ↔ Right 右   Left 左 ↔ Right 右

Idle 最小油門   Up 上
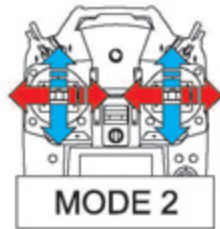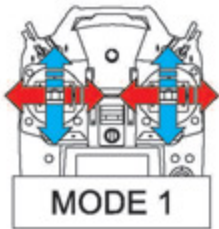
3)Select "Calibrate"and move all sticks on RC transmitter to maximum and minimum position, then click on "Complete"to finish.

3)點選"遙控器行程校正"將遙控器搖桿都推至最大、最小,然後按下"完成"來結束校正。
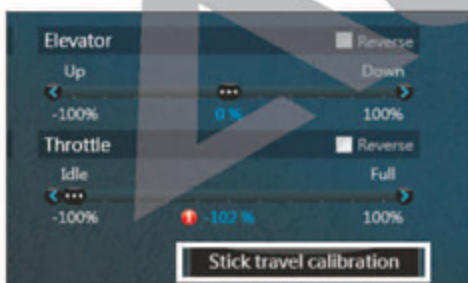
① Click on RC Travel Range Calibraton.
點選遙控器行程校正

② Click on "Calibrate"
點選開始進行遙控器行程校正
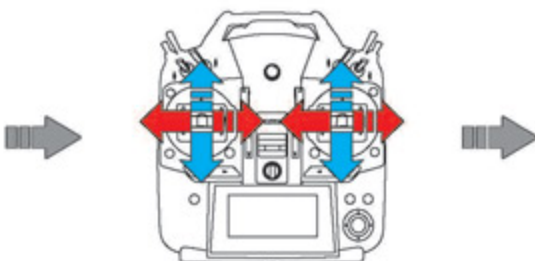
③ Move all sticks on RC transmitter to maximum and minimum position.
將遙控器搖桿推至最大及最小

④ Click on "Complete"
完成

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.

APS-M具備多種飛行模式，姿態、GPS(速度)、GPS(角度)、手動、自動返航、智能飛行與收腳架，可以依喜好習慣選擇指定開關使用。

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 subtrim 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。
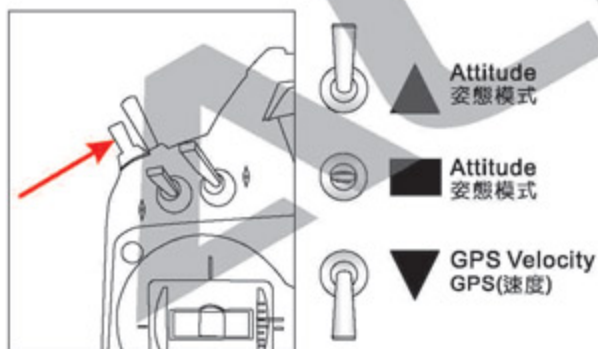
Attitude
姿態模式

Attitude
姿態模式

GPS Velocity
GPS(速度)

⚠ 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!

⚠ CAUTION 注意

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
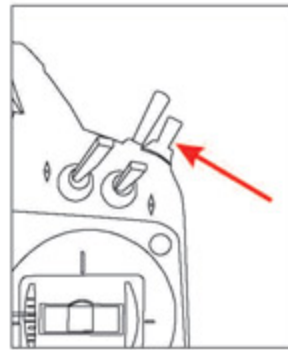
自動返航

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。

Return Home OFF
自動返航關閉

Return Home ON
自動返航開啟

Return HOME | OFF | **ON** | FS

> ### ⚠ CAUTION 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
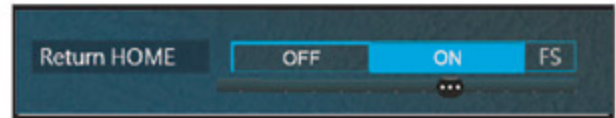   transmitter's CH6 Endpoint (EPA) function so
   the indicator is in the Failsafe region. Write
   down this Endpoint value for next step.

1)將自動返航開關開啟，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。

```
END             1:AIL  100/100
  POINT         2:ELE  100/100
                3:THR  100/100
CH6:FLP         4:RUD  100/100
  L    H        5:GER  100/100
                6:FLP  100/ 90
100  [90]       7:AU1  100/100
                8:AU2  100/100
```


Return Home OFF
自動返航關閉

Return Home ON
自動返航開啟

Return HOME | OFF | ON | **FS**
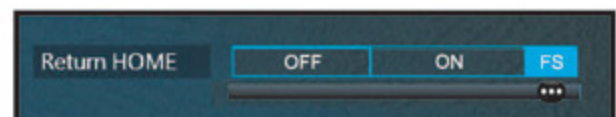
2) Enter the transmitter's Failsafe menu, activate
   Failsafe on CH6, and enter the Endpoint value
   obtained in last step.

2)進入遙控器"Failsafe"功能，將CH6頻道Failsafe開
   啟，並將上述調整數值設定至CH6。

```
FAIL SAFE  (2/2)  SFHSS

5:GER ▶   MOD... POSI
6:FLP ▶   NOR ... - - -
7:AU1 ▶   [F/S]  + 82%
8:AU2 ▶   NOR    - - -
          NOR    - - -
            ▼
```

3) Then adjust CH6 Endpoint (EPA) function on transmitter so indicator returns to the "ON" region.

3)接著將遙控器Endpoint(EPA)功能中的CH6頻道,將指標調回"ON"區間。

```
END                1:AIL  100/100
  POINT            2:ELE  100/100
                   3:THR  100/100
                   4:RUD  100/100
CH6:FLP            5:GER  100/100
  L    H           6:FLP  100/ 60
100  60            7:AU1  100/100
                   8:AU2  100/100
```

Return Home OFF
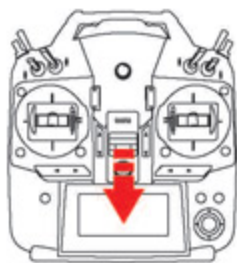自動返航關閉

Return Home ON
自動返航開啟
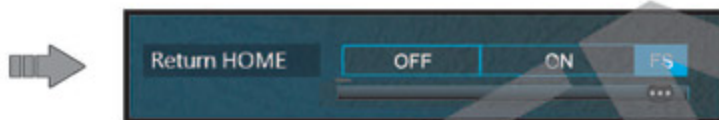
Return HOME   OFF   ON   FS
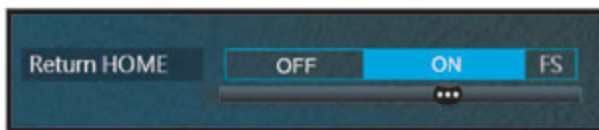
4)Failsafe test: If failsafe is correctly set, the Return Home indicator in the Program Interface will move into the "Failsafe" region once transmitter power is turned off.

4)失控保護測試,此時可開關遙控電源,設定成功時,介面Return Home指標會移動至"Failsafe"區間。

Power OFF
電源關閉

Return HOME   OFF   ON   FS

⚠ WARNING 警告

This operation should only be used for testing of failsafe. Do not turn off transmitter while airborne, otherwise loss of aircraft control or other dangerous scenarios may occur.

此操作僅供保護設定測試用,嚴禁在飛行中將遙控器關機,以免造飛行機失控與發生不可預期的危險。

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.

收腳架開關設定
1)APS-M收腳功能設置於CH7,請先選擇一個兩段開關對應CH7收腳功能
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。

Retract OFF
收腳架關閉

Retract ON
收腳架開啟

Retract   OFF   ON
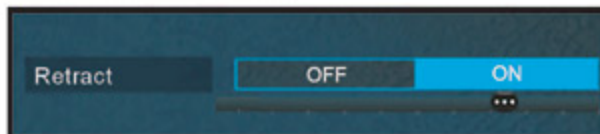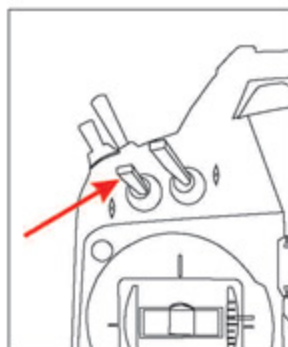
4.INTELLIGENT FLIGHT

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(Carefree orientation). The flight mode can be selected through pull down menu.

智能飛行
1)APS-M智能飛行設置於CH8，請先選擇一個三段開關對應CH8智能飛行。
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。
3)APS-M提供三種智能飛行：定點環繞、返航點鎖定及航向鎖定，可依使用需求下拉選擇。

Note:1)The default setting under GPS mode are POI(Point of Interest) and HCL(Home Course Lock) .
   2)For explanation of Point of Interest (POI), Course Lock, and Home Lock function, please refer to diagrams on page 52~54.

註：1.)出廠預設值為GPS狀態下為定點環繞及返航點鎖定兩種功能。
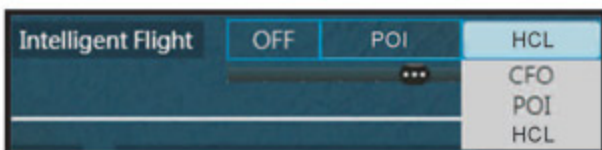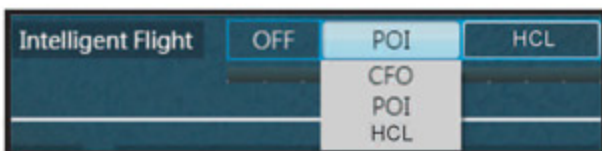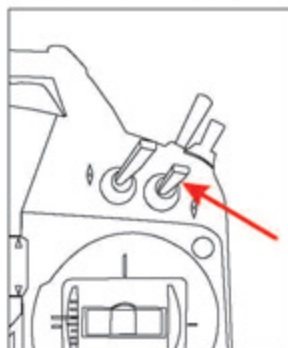   2.)定點環繞、返航點鎖定及航向鎖定功能，請參考飛行前檢查與注意第52~54頁圖解說明。

Intelligent Flight OFF 智能關閉
POI 定點環繞
HCL 返航點鎖定

Intelligent Flight	OFF	POI	HCL
		CFO	
		POI	
		HCL	

Intelligent Flight	OFF	POI	HCL
		•••	CFO
			POI
			HCL

⚠ 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。

4 GIMBAL CONTROL SETTINGS
雲台控制設定

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，也具備單一搖控器可控制雲台六項功能：Pan軸、Tilt軸、Roll軸、拍照/錄影、環景拍照、一鍵回中，可以依喜好習慣選擇開關使用。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) 先將所需要使用的功能配置到所要使用的頻道上。如果遙控器或接收機只具備10動作，則從六項功能中選擇會使用到的兩項功能，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來對應此六項功能。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，如果動作有反向，可由遙控器的正反向功能切換更改。
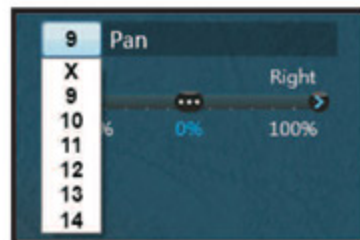
The six gimbal control functions can all be assigned to individualized channel on your RC transmitter.

可依喜好將操作介面上的六項雲台控制功能分別配置到所使用的頻道上。

⚠ CAUTION 注 意

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

沒使用到的功能請切換到X或N/A。

GIMBAL CONTROL SETTING INSTRUCTION

雲台控制設定說明：

1. Pan Control: Controls gimbal's pan movement through a designated stick or switch on the RC transmitter.
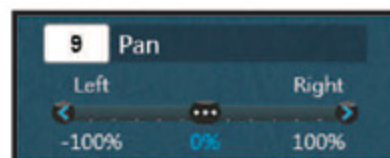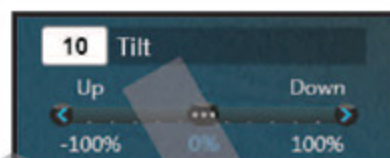
   Pan軸控制：透過遙控器指定一個撥桿或開關，可以控制雲台Pan軸方向動作。

9	Pan
Left	Right
-100%	0%	100%

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。

10	Tilt
Up	Down
-100%	0%	100%

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。

11	Roll
Left	Right
-100%	0%	100%
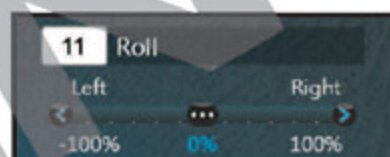
4. Shutter Control: When camera is connected to gimbal's trigger port with optional cable, controls camera's shutter or start/stop recording through a designated stick or switch on the RC transmitter.

   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。

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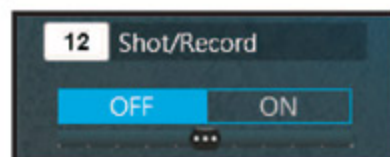
5. Panoramic Photo: When camera is connected to gimbal's trigger port with optional cable, allows camera to take panaromic photos at 0-30-60-90 degrees through a designated stick or switch on the RC transmitter. The number of photos taken at each angle is set through control interface program.

   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。

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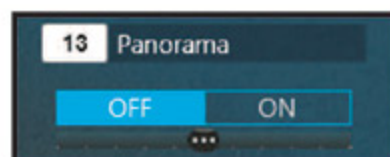
6. Return to Center: Returns gimbal to center position through a designated stick or switch on the RC transmitter.

   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。

14	Return to Center
OFF	ON

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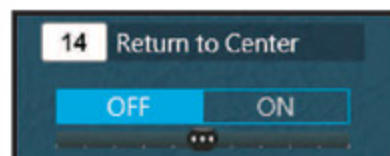
These gimbal control settings are applicable for single RC transmitter controlling the multicopter and G2/G3 gimbal. RC transmitter and receiver must be 8 or more channels.

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。

Multicopter Type

⚠ 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毀的危險。
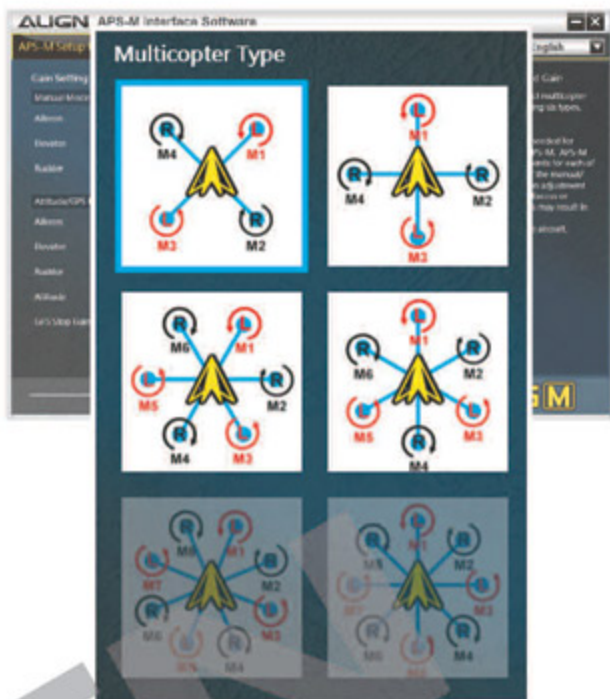
6 GAIN SETTING
感度設定

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 Setting

Manual Mode Gain

Aileron		
	0%	30 % 100%
Elevator		
	0%	30 % 100%
Rudder		
	0%	45 % 100%
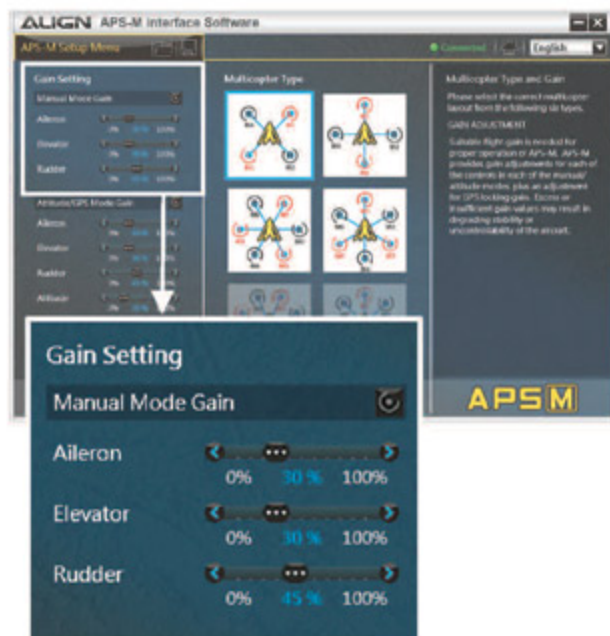
2 GAIN AND FLIGHT CHARACTERISTICS ADJUSTMENTS
感度與飛行特性調整說明

		Gain too high 感度過大	Gain too low 感度過小
Manual Mode 手動模式	Aileron 副翼	Fast lateral oscillation 機體左右快速抖動	Lateral drift 機體左右不安定滑動
	Elevator 升降	Fast fowrard/aft oscillation 機體前進/後退快速抖動	Forward/aft drift 機體前進/後退不安定滑動
	Rudder 尾舵	Fast oscillation of the tail 機尾左右快速抖動	Lateral drift of tail 機尾左右不安定滑動
Attitude Mode 姿態模式 GPS Mode GPS模式	Aileron 副翼	Fast lateral oscillation 機體左右快速抖動	Lateral drift 機體左右不安定滑動
	Elevator 升降	Fast fowrard/aft oscillation 機體前進/後退快速抖動	Forward/aft drift 機體前進/後退不安定滑動
	Rudder 尾舵	Fast oscillation of the tail 機尾左右快速抖動	Lateral drift of tail 機尾左右不安定滑動
	Altitude 高度	Fast up/down oscillation during altitude hold, unable to hold altitude 機體高度定位快速抖動	Vertical drift during altitude hold, unable to hold altitude 機體高度上下飄移
GPS Stopping Power GPS煞車		Shorter distance after airframe come to a stop from rapid position holding action 機體停止定位急煞反應，煞車距離較短	Longer distance after airframe come to a stop from delayed position holding action 機體停止定位緩煞反應，煞車距離較長

(Diagram-1) (表-1)

Below are some recommended gain settings and adjustment instructions
以下列出多軸機感度出廠設定與感度調整表

	Manual Mode 手動模式			Attitude Mode 姿態模式			Altitude 高度	GPS Stopping Power GPS煞車
	Aileron 副翼	Elevator 升降	Rudder 尾舵	Aileron 副翼	Elevator 升降	Rudder 尾舵		
M470/M480L multicopter M470/M480L 多軸飛行機	30	30	45	30	30	45	20	0
M690L multicopter M690L 多軸飛行機	30	30	45	30	30	45	20	0

(Diagram-2) (表-2)

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.

BEFORE ADJUSTMENT

Actual flight path

Commanded flight path

AFTER ADJUSTMENT

θ
Program correction

Actual flight path
Commanded flight path
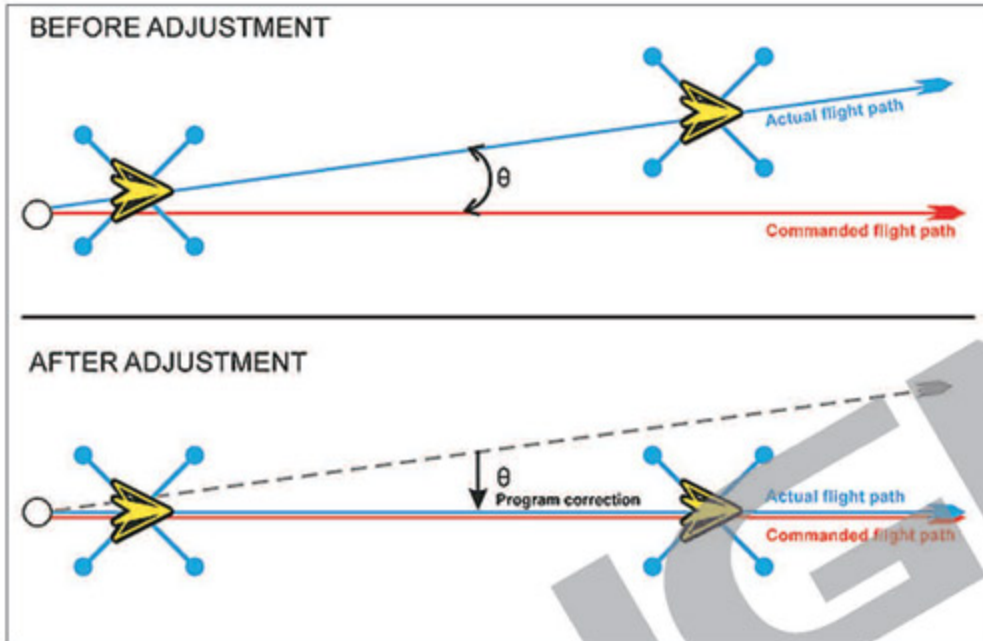
N.O.A.A. Calculator
計算當地磁場偏差數值參考網站
http://www.ngdc.noaa.gov/geomag-web/#declination

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家位置,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。

⚠ CAUTION
注意

Magnetic declination requires correct positive or negative polarity.
磁場偏差值有正、負值之分,請輸入正確偏差值。

ALIGN APS-M Interface Software

Magnetic Field Deviation

-180°   0°   180°
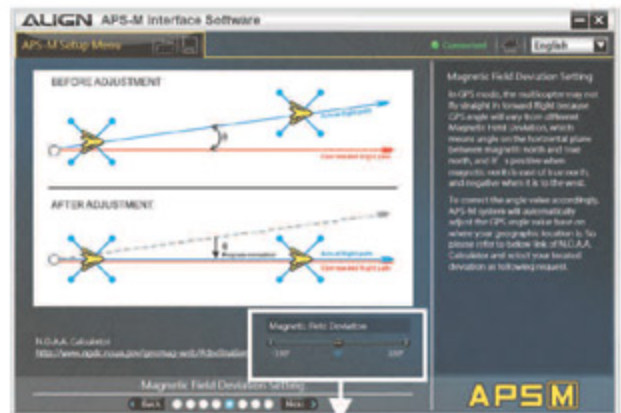
APS-M MULTICOPTER GPS SENSOR LOCATION
APS-M多軸GPS感應器位置

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。
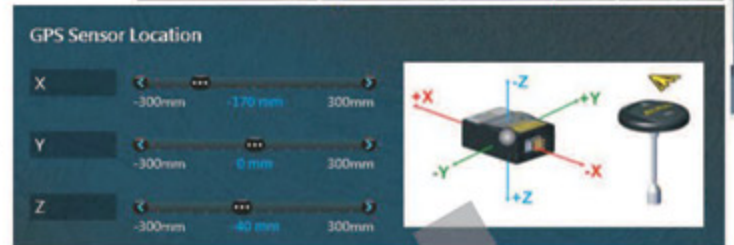
⚠ **WARNING** 警告

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。

GPS Sensor Location

X	-300mm	-170 mm	300mm
Y	-300mm	0 mm	300mm
Z	-300mm	-40 mm	300mm

---

⑨ 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** 注意

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   PCU Voltage **25** V   Calibration
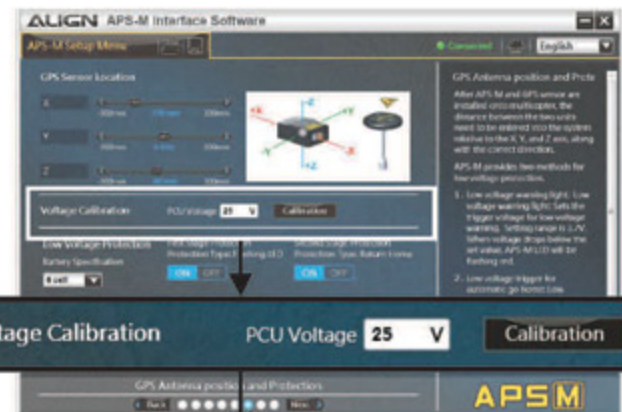
APS M

Calibration

Voltage Calibration

Insert the actual voltage value   **24.6** V

Set   Cancel

LOW VOLTAGE PROTECTION
低電壓保護

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 3.625V, 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.

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能力為(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能力為(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。

Low Voltage Protection	First Stage Protection Protection Type: Flashing LED	Second Stage Protection Protection Type: Return Home
Battery Specification		
6 cell	ON OFF	ON OFF
	Voltage Setting	Voltage Setting
	3.625 V	3.60 V

⚠ CAUTION
注 意

Low voltage protection features require the use of Align PCU.
強烈建議開啓此功能，提供飛行機安全保護。

AUTO RETURN HOME HEADING SELECTION
自動返航頭向

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

Fornt : Nose of mulcitopter points to home position.
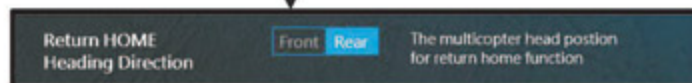
Rear : Tail of multicopter points to home position.

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
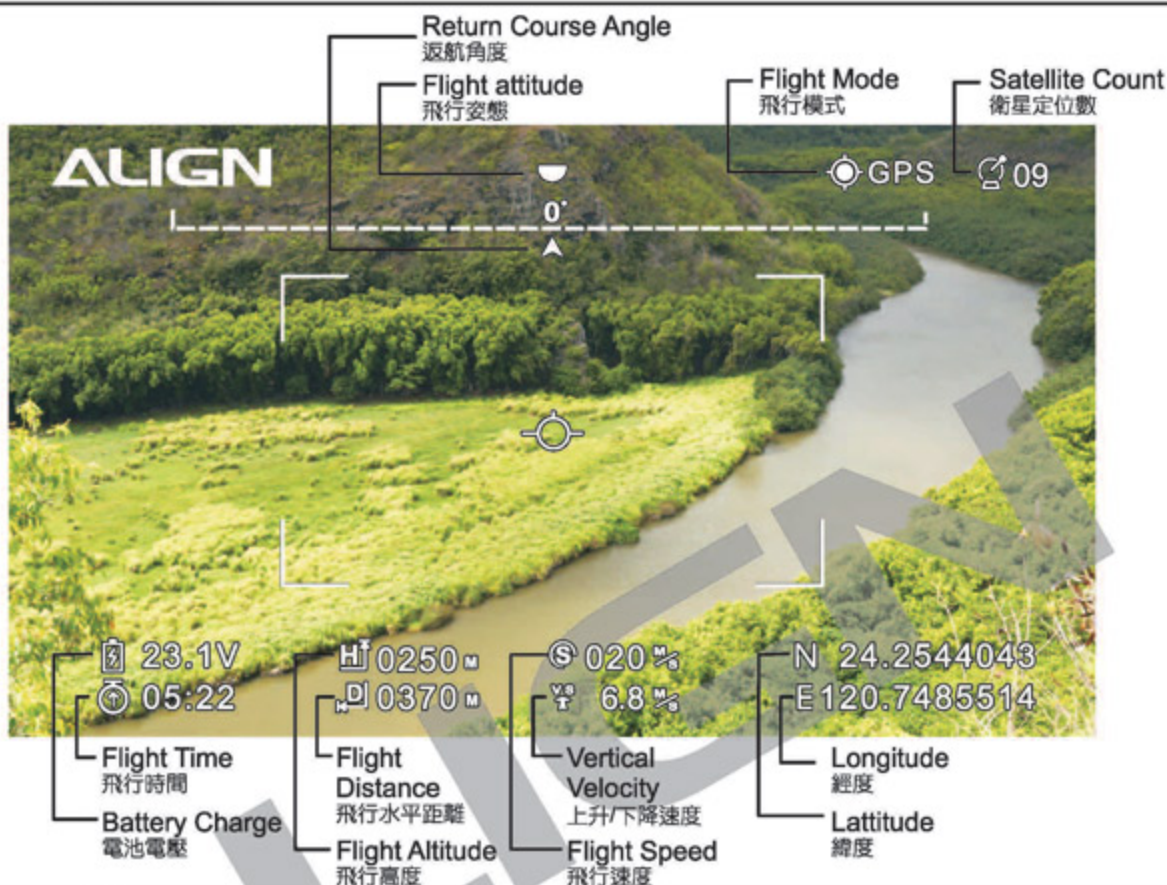
頭：多軸機頭部朝Home點返航。

尾：多軸機尾部朝Home點返航。

預設為多軸機尾部朝Home點返航。

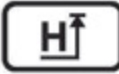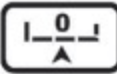| Return HOME Heading Direction	Front Rear	The multicopter head postion for return home function
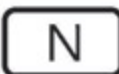
1 OSD+FPV VIDEO TRANSMITTER DISPLAY DESCRIPTION
OSD+FPV影像發射器畫面圖示介紹

Return Course Angle
返航角度

Flight attitude
飛行姿態

Flight Mode
飛行模式

Satellite Count
衛星定位數

ALIGN

GPS   09

0°

23.1V   H 0250 M   S 020 M/S   N 24.2544043
05:22   D 0370 M   VS 6.8 M/S   E120.7485514

Flight Time   Flight   Vertical   Longitude
飛行時間   Distance   Velocity   經度
    飛行水平距離   上升/下降速度
Battery Charge   Flight Speed   Lattitude
電池電壓   Flight Altitude   飛行速度   緯度
    飛行高度   飛行速度

⬤	Flight Attitude : Aircraft's angle of tilt during flight. 飛行姿態：多軸機的飛行傾斜角度。	H⬆	Flight Altitude: Vertical height between aircraft and home location. 飛行高度：多軸機與Home點的垂直高度。
0	Return Course Angle: The angle between aircraft and home position. 返航角度：多軸機頭向與Home點之間的角度。	D	Flight Distance: Horizontal distance between aircraft and home location. 飛行水平距離：多軸機與Home點的水平距離。
⬤	Flight Mode : The current flight mode of multicopter. 飛行模式：多軸機所使用的飛行模式。	S	Flight Speed: Horizontal velocity of aircraft. 飛行速度：多軸機水平移動的速度。
📡	Satellite count: Number of satellites detected by aircraft. 衛星定位數：多軸機接收到的衛星數量。	VS	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. 電池電量：多軸機的電池電壓。	N	Longitude: Current longititude of aircraft. 經度：多軸機目前所在位置的經度。
⏱	Flight Time: Actual flight duration of aircraft. 飛行時間：多軸機實際飛行時間。	E	Lattitude: Current lattitude of aircraft. 緯度：多軸機目前所在位置的緯度。

OPTIONAL EQUIPMENT REQUIRED FOR THIS FUNCTION
此功能須搭配選購商品使用

Optional Equipment
另購品

1. OSD+FPV Video Transmitter
   OSD+FPV 影像發射器 [HED00001]
2. Display Receiver
   螢幕接收器 [HEM00001]
3. G3 3 Axis Gimbal ,
   G3雲台組 [RGG301X] / [RGG302X]。
4. 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.使用不同顯示螢幕，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。

SETTING DISPLAY AND MOTOR TEST FUNCTION
設定顯示與馬達檢測

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.

在執行馬達檢測功能時，介面會顯示所設定的多軸機類型與接收器類型、低電壓保護設定參數、APS-M多軸GPS感應器位置；請再檢查是否與目前多軸機的實際狀況相同。

確認無誤後再執行檢測動作。

PCU Power Hibernation	Low Voltage Protection		GPS Sensor Location	
OFF	Battery Specification:	6 cell	X:	-170 mm
Multicopter Type	1st Stage Protection:	3.625 V	Y:	0 mm
4 rotors ×	2nd Stage Protection:	3.60 V	Z:	-40 mm
Receiver Type	Return HOME Heading Direction			
Spektrum / JR SAT DSM2	Rear			

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.

使用此功能時，馬達會逐一M1、M2、M3、M4慢速轉動約0.5秒，測試時務必仔細檢視各馬達轉向是否正常，錯誤的轉向將導致起飛時翻機意外，馬達主旋翼轉動過程有危險性，檢測時請先確認多軸機旁無雜物，並且人要避開主旋翼轉動範圍，以免發生危險。
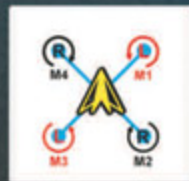
Motor Test

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 is observed.

Begin Test

Begin Test
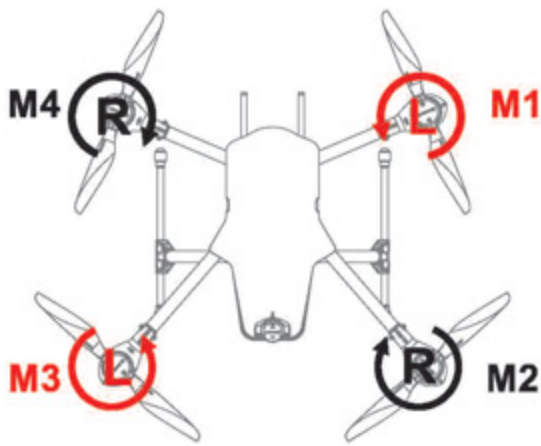
M4 (R) M1 (L)

M3 (L) M2 (R)

Revert to Factory Default.

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

恢復原廠預設值

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。

Reset Factory Default   Reset
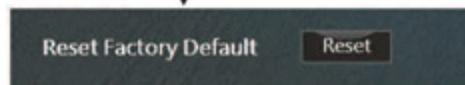
PRE-FLIGHT CHECKLIST AND WARNINGS
飛行前檢查與注意

ALIGN

1 LOCATE AN APPROPRIATE LOCATION
遠離障礙物與人群

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.

遙控飛行機飛行時具有一定的速度,相對的也潛在著危險性,場地的選擇也相對的重要,請需遵守當地法規到合法遙控飛行場地飛行。必須注意同遭有沒有人、高樓、建築物、高壓電線、樹木等等,避免磁場干擾、外力訊號干擾及操控的不當造成自己與他人財產的損壞。請務必選擇在空曠合法專屬飛行場地。請勿在下雨、打雷、沙塵等惡劣天候下操作,以確保本身及機體的安全。

2 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 computer-based flight simulator.)

至飛行場飛行前,需確認是否有相同頻率的同好正進行飛行,因為開啟相同頻率的發射機將導致自己與他人立即干擾等意外危險。遙控飛行機操控技巧在學習初期有著一定的難度,要盡量避免獨自操作飛行,需有經驗的人士在旁指導,才可以操控飛行,否則將可能造成不可預期的意外發生。(勤練電腦模擬器及老手在場指導是入門必要的選擇)

3 CENTER OF GRAVITY ADJUSTMENT
重心調校

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.

飛行前務必確認,並調整好全載重機體的重心位置,偏移的重心容易導致飛行不穩與馬達受力不均的耗電、損傷,嚴重將導致不可預期的失衡摔機。

Center of Gravity (CG)
重心位置

M480L Center of Gravity (CG)
M480L重心位置
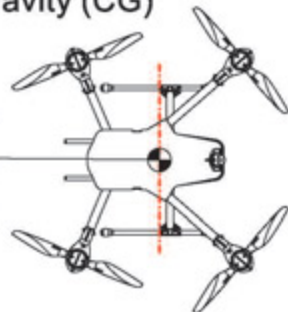
4 CHECK THE WIRE DIRECTION
檢查插線

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.

插線時,請務必將刻有UP字樣端口朝上,對準插座後,確實將插頭完全插入到底,若無確實插入定位,將導致接觸不良、APS-M不動作問題產生!

ALIGN
STATUS
PCU
POWER CONTROL UNIT

ALIGN APS M
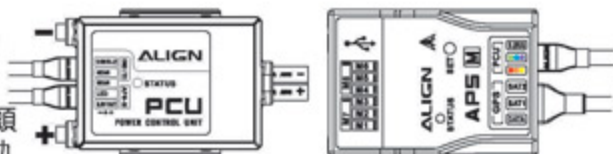
5 MOTOR START AND STOP
馬達電源啓動與關閉

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.

馬達具備安全保護裝置，必須執行遙控器動作才能啓動或關閉馬達電源，避免因誤開電源而啓動或關閉馬達。

1. 開啓馬達電源
   1) 開啓遙控器電源。
   2) 啓動機身主電源，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。
　　　　　　如欲再開啓馬達電源，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：當飛行完後降落地面，油門降至最低點時，如果未手動關閉馬達主電源，5秒後系統會自動關閉馬達主電源停止運轉

① Power ON
電源開啓

② Press and hold 3 seconds to turn on
長按3秒開機

③ Control stick movement diagram
搖桿指示方向示意圖
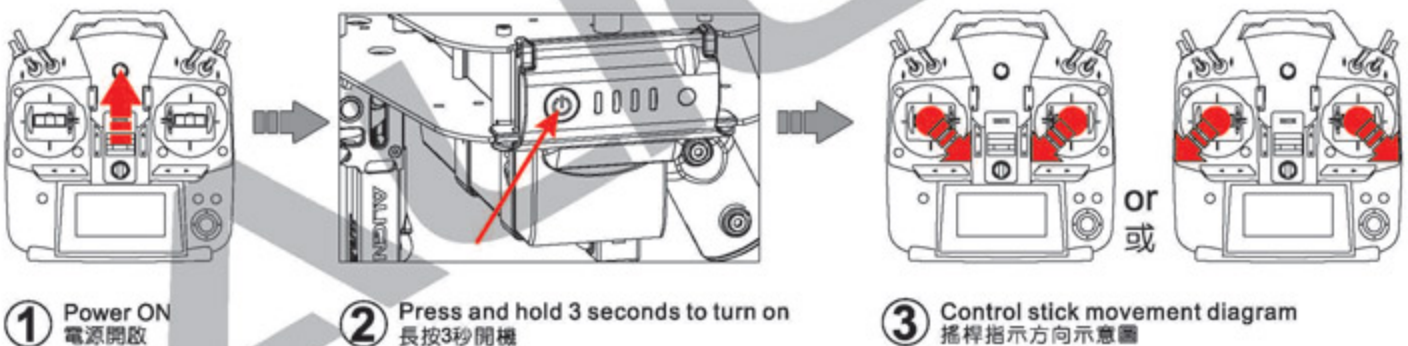
2. To Stop Motor
   1) Push both RC transmitter control sticks toward lower inner or lower outer position.
   2) Press and hold the power button for 3 seconds to turn off multicopter power.
   3) Turn off transmitter power.

2. 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。

① Control stick movement diagram
搖桿指示方向示意圖

② Press and hold 3 seconds to turn off
長按3秒關機

③ Power OFF
電源關閉

6 MOTOR SPIN TEST
馬達運轉測試

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約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，檢測時請先確認多軸機旁無雜物，並避開主旋翼/螺旋槳轉動範圍，
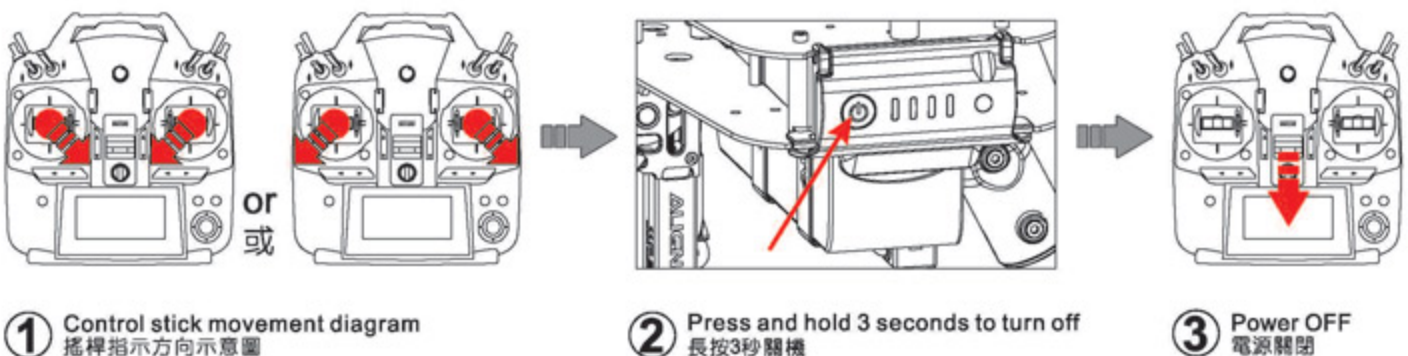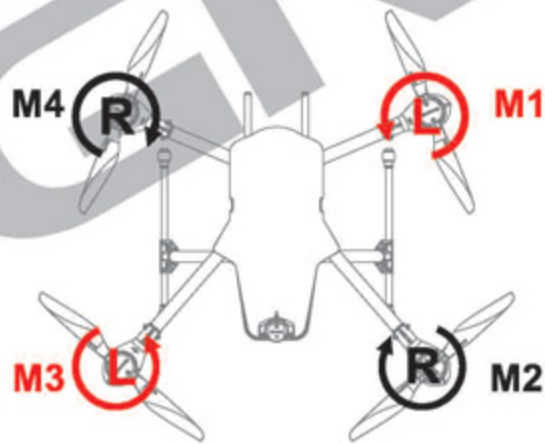 以免發生危險。請參考APS-M操作介面安裝與設定第40頁進行設定顯示與馬達檢測。

1 MOTOR ROTATION DIRECTION
馬達正逆轉方向

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。

R: Clockwise
R：正轉

R Rotation Specific Blades
R向專用主旋翼

L: Counter Clockwise
L：逆轉

L Rotation Specific Blades
L向專用主旋翼

M4 R   L M1

M3 L   R M2
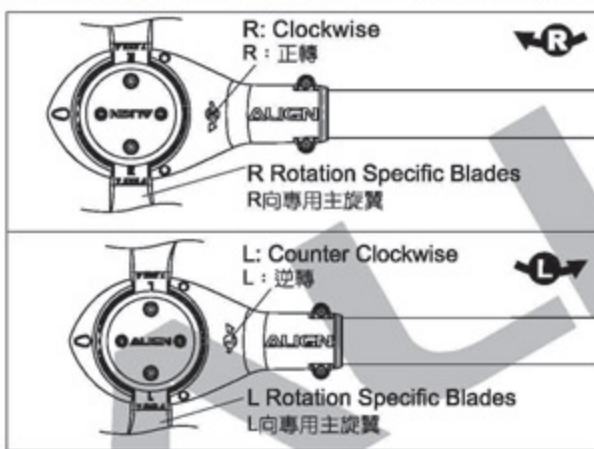
2 RETRACT TEST
腳架收放測試

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，確定收合動作正常。請參考第30頁各頻道動作定義收
腳架開關設定。

Retract OFF
收腳架關閉

Retract ON
收腳架開啟

⚠ CAUTION
注意

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折處，避免
夾手。

7 MAGNETOMETER CALIBRATION
磁力計校正

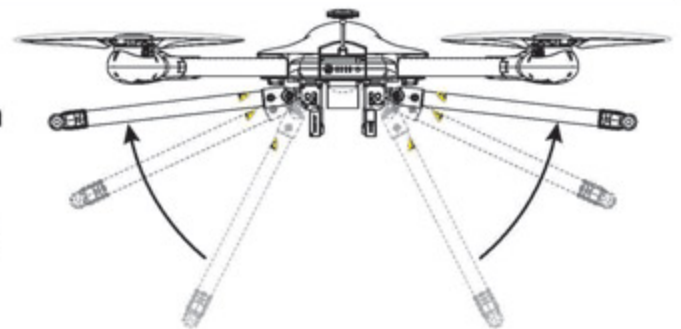Objects on multicopter can interfere with magnetometer's readings, lowering APS-M's heading precision, and even affect position hold ability. To reduce the environmental effect on magnetometer, APS-M must be calibrated prior to use to ensure correct and stable operations. Calibration must be perform 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裡面是扮演辨別頭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、鐵性物質等會干擾磁力計，影響APS-M頭向控制的準確度，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.
>
> 請在空曠且遠離強磁和導磁物質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.
- 在正常的情況下，APS-M所需衛星數量為 7顆。
- 若亮紅燈表示接收不到衛星訊號，或衛星強度不足，禁止飛行。

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

Method1:Press the SET button on APS-M to enter calibration mode.

方式1：按APS-M多軸飛控系統SET鍵，進入校正程序。

Press once.
按一下
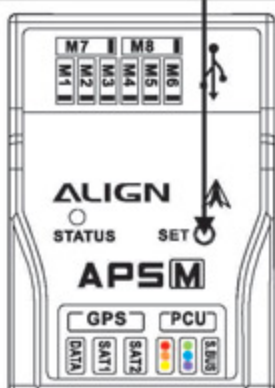
Method2:Quickly slip the flight mode switch 3 times within 2 seconds to enter calibration mode.

方式2：飛行模式開關在2秒時間內，來回切換3次，進入校正程序。

or
或

▲ Attitude 姿態模式
■ Attitude 姿態模式
▼ GPS Velocity GPS(速度)
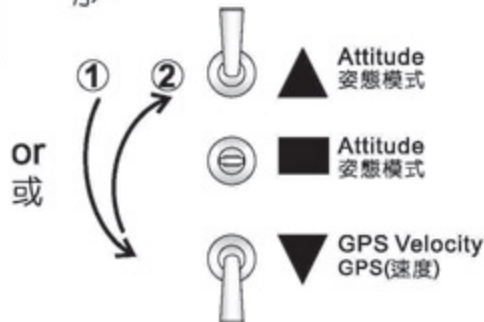
Switch 3 times
來回切換3次

Steady lit red
紅燈恆亮

External Status LED

External status LED will light up red when entering calibration mode.

進入校正程序外掛用模式燈會紅燈恆亮。

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。

Center of spin axis
軸心

360°

Both red and green external status LED light up.
紅/綠燈同時恆亮

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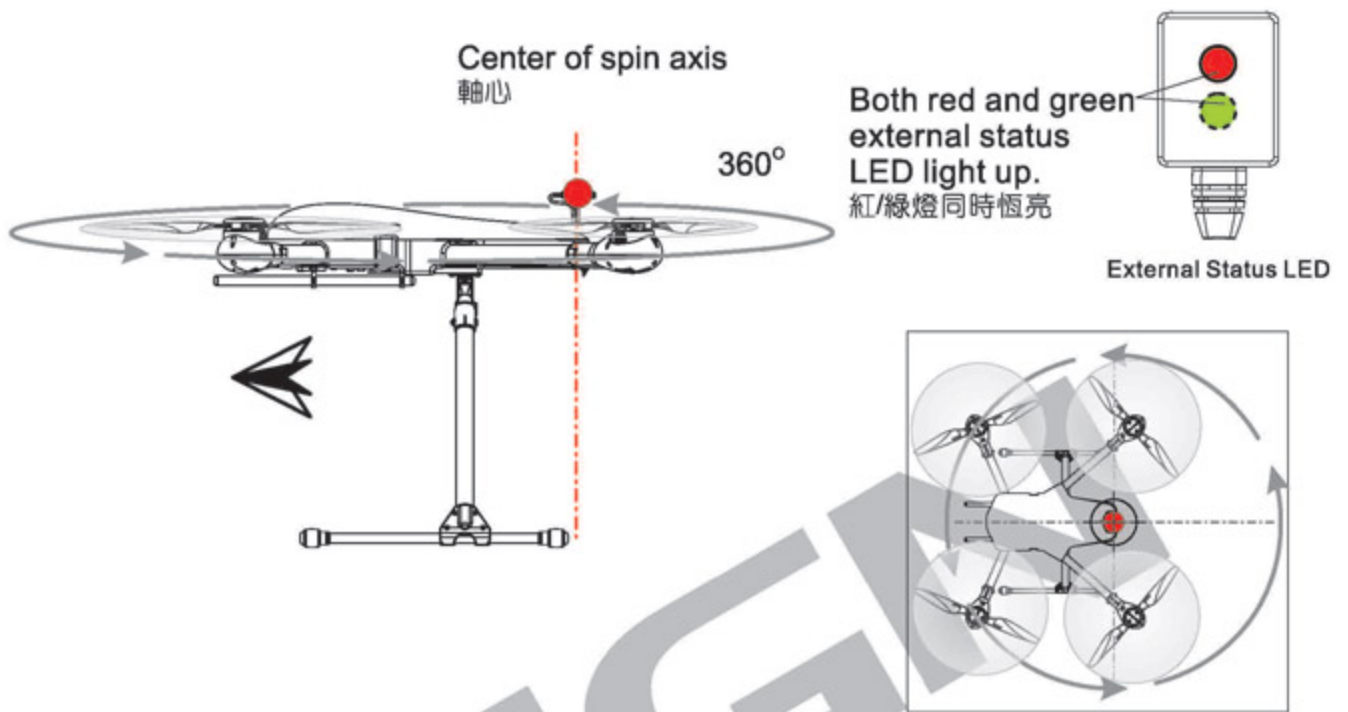
3. With the nose of multicopter pointing up, and APS-M Multicopter GPS Sensor as center of axis, rotate 360° horizontally until external status LED flash green.

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。

Center of spin axis
軸心

External status LED flash green.
綠燈閃爍

External Status LED

360°
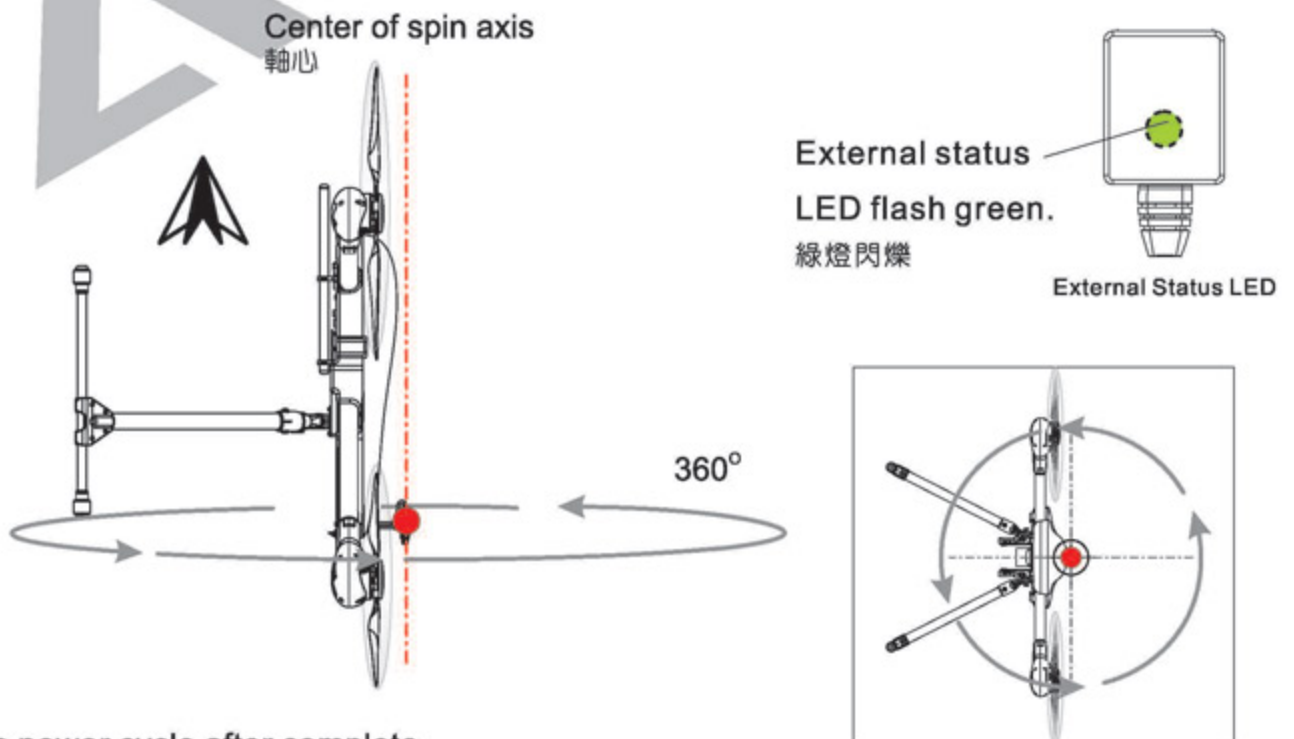
4. Please power cycle after complete.
完成後，請重新開機。

8 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.

多軸機Home點設定是必要且是執行飛行前相當重要步驟之一，主要目的讓多軸機在GPS飛行模式下能正確執行各項智能飛行及必要時能安全返航Home點。

1. 第一次飛行執行完磁力計校正後，必須關閉電源，再次開機後，當接收到衛星定位後，此為這次飛行的Home點。
2. 開啓啓動電源，直到外掛用模式燈亮綠燈前，請勿晃動機體。

⚠ CAUTION 注 意

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

禁止於室內、屋簷下、樹下；周遭務必遠離障礙物15公尺以上的地方設定為Home點。

⚠ WARNING 警 告

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，在飛行時啓動自動駕駛中的自動返航、低電壓自動返航、失控自動返航之功能時，系統將無法辨認並準確的飛回起飛地之HOME點，進而導致飛行航道偏離而飛失，將可能造成財產損失及不可預期的意外發生。

GPS SATELLITE SIGNAL   GPS衛星訊號收訊

Flying field 飛行場地	Satellite Signal 衛星訊號	Satellite Count 衛星數量	Time to Satellite Lock 鎖定時間	Status 狀況	Suitable Flight Mode 適用飛行模式
City high rises 高樓市區	Initial Time to Acquire Satellites 第一次接收	7 or more satellites 7以上	60~90sec	Normal 正常	Attitude 姿態
		7 or more satellites 7以上	30~60sec		Attitude / GPS 姿態/GPS
	Suceeding Time to Acquire Satellites 第二次接收	7 or more satellites 7以上	Exceeded 90 sec. 超過90秒	Abnormal, poor or no GPS signal, may lead to incorrect flight position or home position shift. 異常，衛星訊號差或無訊號，會導致飛行定位及 HOME 點偏移	Attitude 姿態
Open field with no obstructions 空曠無遮蔽物	Initial Time to Acquire Satellites 第一次接收	7 or more satellites 7以上	30~90sec	Normal 正常	Attitude / GPS 姿態/GPS
		7 or more satellites 7以上	15~30sec		Attitude / GPS 姿態/GPS
	Suceeding Time to Acquire Satellites 第二次接收	7 or more satellites 7以上	Exceeded 90 sec. 超過90秒	Abnormal, poor or no GPS signal, may lead to incorrect flight position or home position shift. 異常，衛星訊號差或無訊號，會導致飛行定位及 HOME 點偏移	Attitude / GPS 姿態/GPS

GPS LED INDICATOR
GPS訊號顯示器燈號說明

During initial power up, GPS status indicator will be flashing red. Allow the GPS to remain stationary in open space to acquire GPS signal. The location where initial GPS signal is acquired will become the Home location.

剛開機時，GPS訊號顯示器燈號會紅燈閃爍，在空曠的地方接收GPS訊號需要靜置一段時間，待收到GPS訊號時，首次接受到GPS訊號的位置即為Home點。

FLIGHT MODE STATUS LED DESCRIPTION
飛行模式狀態燈號圖示說明

Description of LED status 其他狀況燈號說明	GPS Signal First Acquired : Continuously Flash 5 Seconds. 首次接收GPS訊號：綠燈連續快速閃爍5秒		
	Low voltage alarm : Red Fast Flash 低電壓警示：紅燈快速閃爍	APS-M Multicopter GPS Sensor Melfunction : Red Flash APS-M多軸GPS感應器故障：紅燈閃爍	Unsuccessful power on : Solid Red 開機未成功：紅燈恆亮

Flight Mode 飛行模式	No GPS Signal 無GPS訊號	With GPS Signal 有GPS訊號
Manual Mode 手動模式	Red Flash 紅燈閃爍	—
Attitude Mode 姿態模式	Flash Red/Green 紅/綠燈交叉閃爍	Flash/Green 綠燈閃爍
GPS Mode GPS模式	Red LED flashes 1 sec and Green LED flashes 2 sec alternatively. 紅燈閃爍1秒/綠燈閃爍2秒，兩燈號交叉閃爍	Slow Flash/Green 綠燈慢速閃爍

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

在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
手動模式

1. Full control by the pilot without any horizontal leveling or position holding capabilities.
   (Highly recommanded not to turn on this function if you're not familiar with it.)
2. 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%。

Futaba	JR
D/R,EXPO CH [1] 2 3 4 (SW:DOWN) D/R<- ▶ 100% -> ▶ 100% EXP<- ▶ − 50% -> ▶ − 50% SW ▶ SWD	◀[D/R & EXP] ▶0 D/R EXP AILE [Pos-0] 100% +50% ◀ 100% +50% Pos-1 100% +50% 100% +50%

⚠ CAUTION
注意

Manual mode is suitable only for experienced pilots. Beginners shold avoid flying in
manual mode. Following functions will be disabled while in manual mode: automatic
return home, intelligent flight mode, failsafe, low voltage return home.

手動模式適合有飛行經驗的玩家使用，並嚴禁初學者使用，否則會造成不可預期的結果。在手動模式下不支援
自動返航、智能飛行、失控保護、低電壓保護等功能。

2 ATTITUDE MODE
姿態模式

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　　　MODE 2

b) Elevator/aileron stick (left and right maximum of 30°)
升降/副翼搖桿(左或右最大30度)

Maximum of 30°
最大30°

MODE 1

MODE 2

Maximum of 30°
最大30°
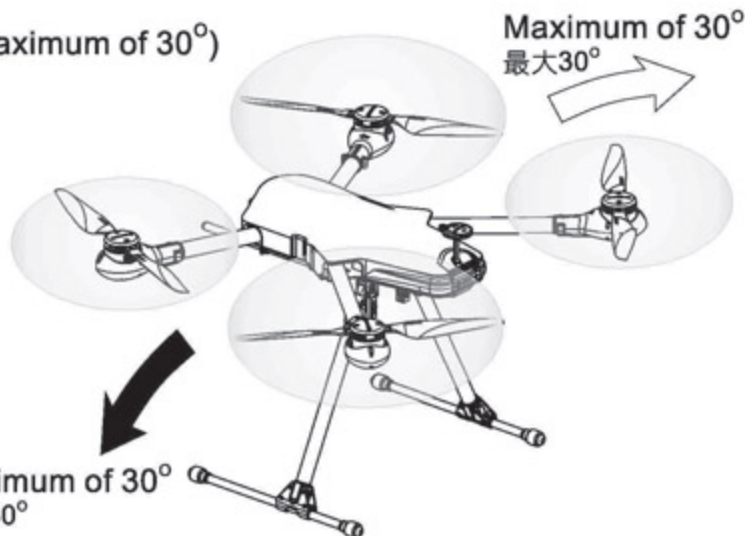
c) Release stick (multicopter automatically levels)
搖桿放開(機體自動回正)

MODE 1

MODE 2
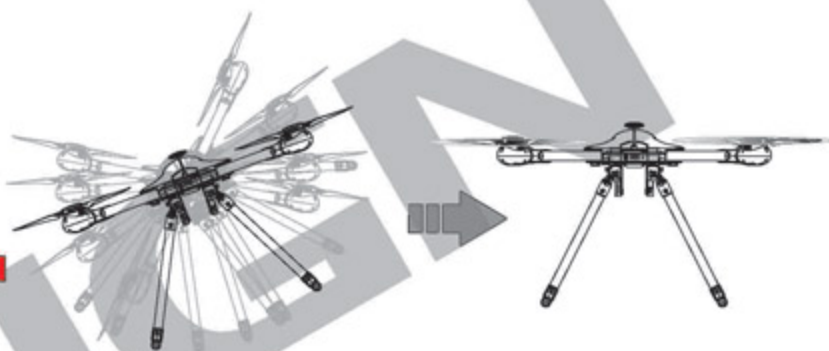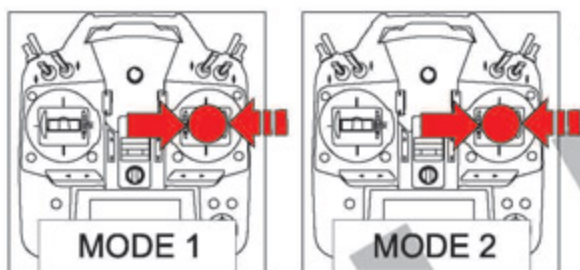
3 GPS(VELOCITY)
GPS(速度)

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。
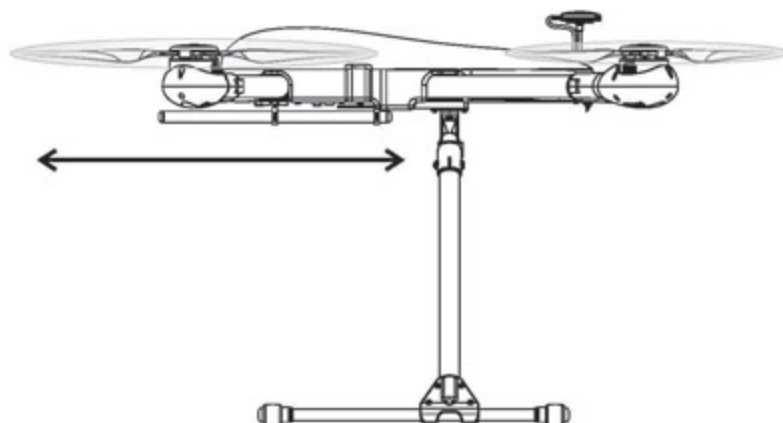
Straight flight speed: 15 m/sec
直線飛行速度:15公尺/秒

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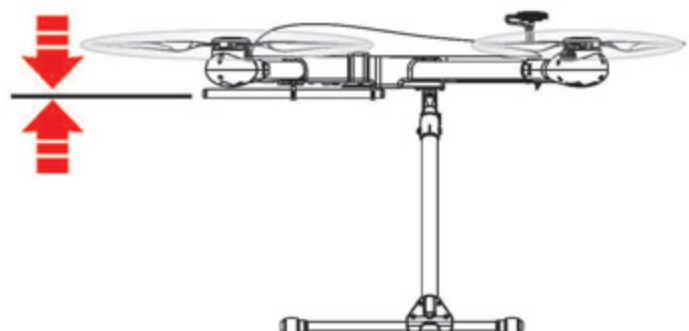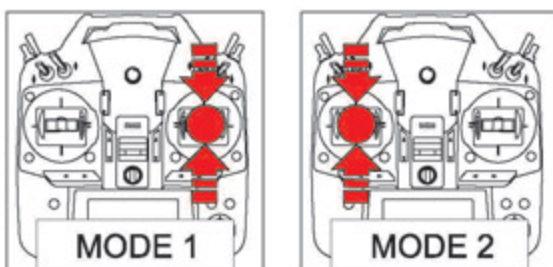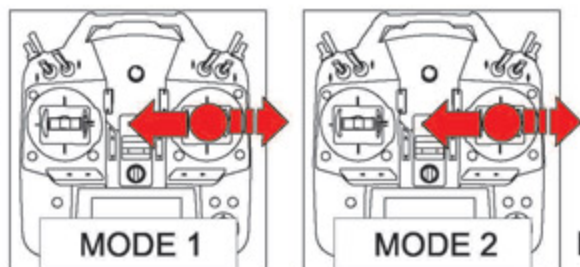
Maintains level and altitude.   Elevator/Aileron/Rudder stick inputs are translated as angular command. Larger stick input translates to steeper angels of multicopter tilt, with maximum of 30 degrees.

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。

30°
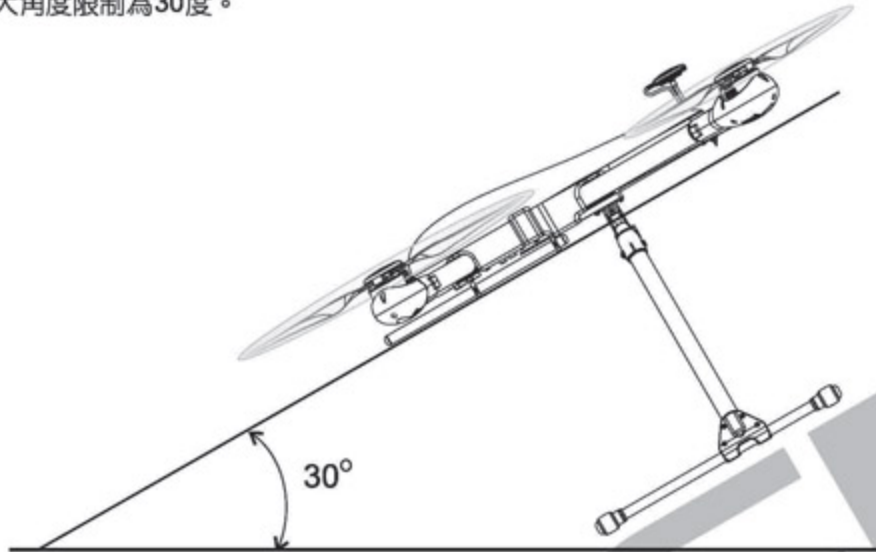
5 FLIGHT MODE FEATURE CHART
飛行模式功能對照表

Control Modes 操作模式 Function 功能	MANUAL MODE 手動模式	ATTITUDE MODE 姿態模式	GPS(VELOCITY) GPS速度	GPS(ANGULAR) GPS角度
Retract 收腳架	√	√	√	√
Intelligent Flight-POI (Point of Interest) 智能飛行-定點環繞			√	√
Intelligent Flight-HCL (Home Course Lock) 智能飛行-返航點鎖定			√	
Intelligent Flight-CFO (Carefree Orientation) 智能飛行-航向鎖定		√	√	
Return Home 自動返航		√	√	√
Failsafe protection 失控保護	√	√	√	√
Low Voltage Protection 低電壓保護	√	√	√	√

1 POI(POINT OF INTEREST)
定點環繞

POI can only be activated under GPS mode. POI is not supported under manunal and attitude modes.
定點環繞只適用GPS模式，姿態和手動模式不支援定點環繞指令。

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.

定點環繞是指多軸機朝向指定的一個景物做環繞或攝影的飛行模式。
當需要針對一個景物做360度定點環繞飛行時，請將多軸機飛行至指定物品上空，在GPS模式下，開啟定點環繞功能，即為設定環繞點。
1.於環繞點上方，將升降舵向後打時多軸機往後飛行，然後退至距離環繞點的位置(至少10M以上)作為環繞半徑距離。
2.機頭朝著環繞點方向，當副翼持續向左打時，多軸機則會以環繞點做為中心，順時針360度飛行；當副翼持續向右打時，多軸機則會以環繞點做為中心，逆時針360度飛行。
3.撥桿角度與飛行速度成正比，撥桿角度動作越大則多軸機飛行速度越快；撥桿角度動作越小則多軸機飛行速度越慢。
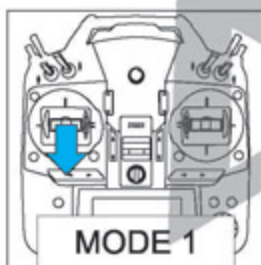
MODE 1
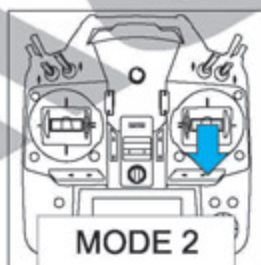
MODE 2

① Back Elevator
升降舵向後
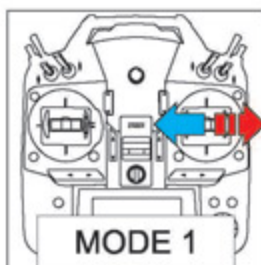
MODE 1
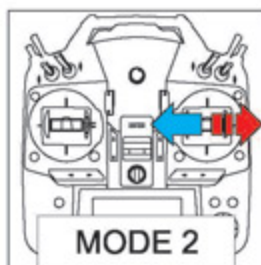
MODE 2

② Right or Left Aileron
副翼舵向左或向右

Point of Interest (POI)
環繞點

Distance between POI center point and multicopter needs to be at least 10M
多軸機與環繞點距離10M以上
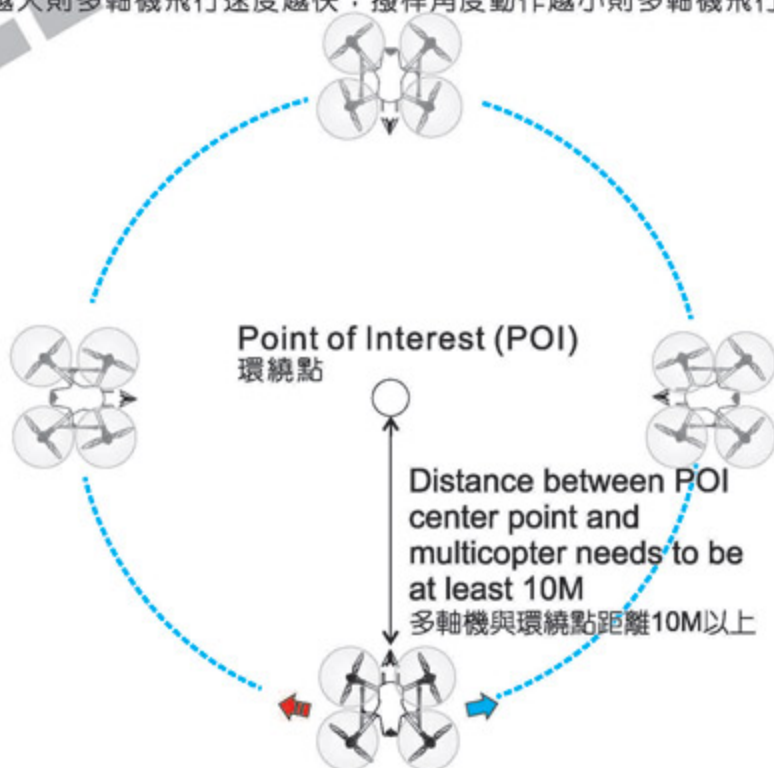
Aircraft can only move backwards, up, and down within 10M after position holding action. Full rudder lock cannot be turned around and it is controlled by APS-M.
定位動作後在10M以內飛行機只能後退、上升、下降，全程尾舵鎖定不能轉頭向，由程式控制。

2 HCL(HOME COURSE LOCK)
返航點鎖定

Home Course Lock is only active in GPS Velocity mode. Manual and attitude modes do not support home course lock.
返航點鎖定只適用GPS速度模式，手動、姿態模式不支援返航點鎖定。

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.

返航點鎖定是以Home點位置為基準，不論飛行中的機頭朝向為何，控制的頭向是以Home點朝向多軸機位置的方向呈十字航道控制模式，當升降往後打時，多軸機不論頭向朝Home點飛回，升降往前打時，多軸機則往外飛離。

1.當開啓此功能將多軸機飛回Home，多軸機回航至離Home點5公尺時，APS-M會將多軸機停止至該位置，並鎖定升降、副翼、尾舵動作，此時可控制油門將多軸機降落，或是解除返航點鎖定使用手動降落。
2.請務必確認開機時Home點位置。

5M
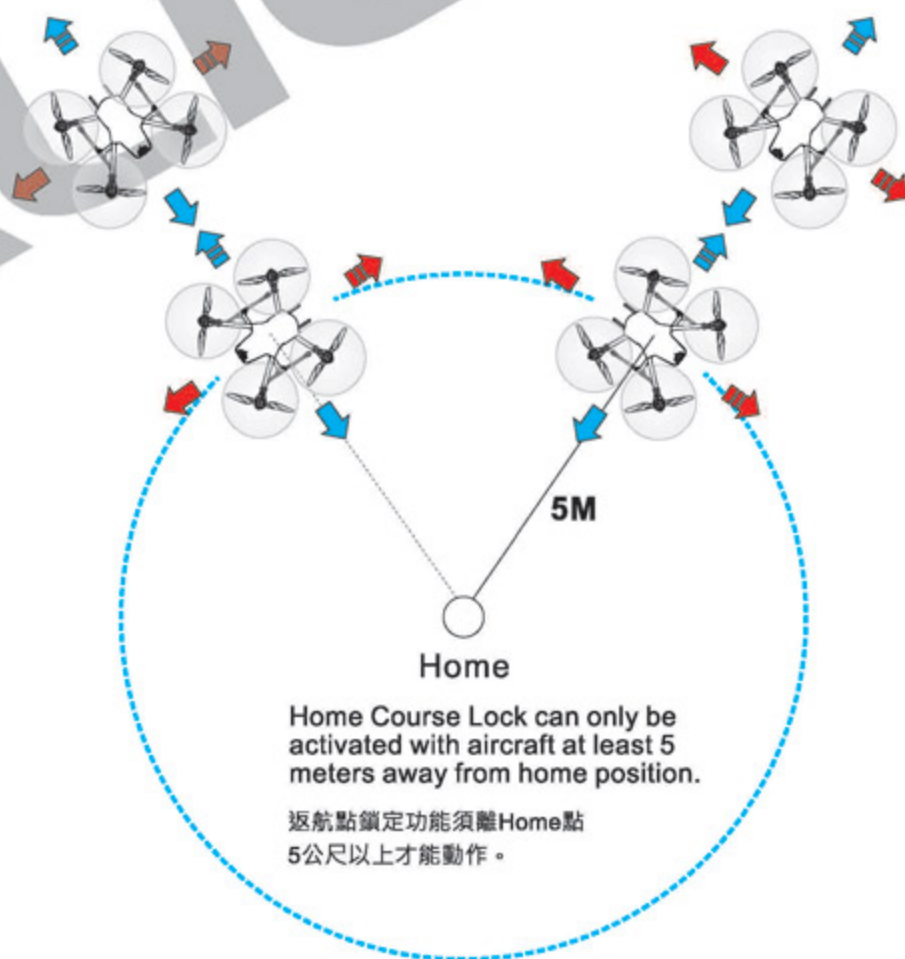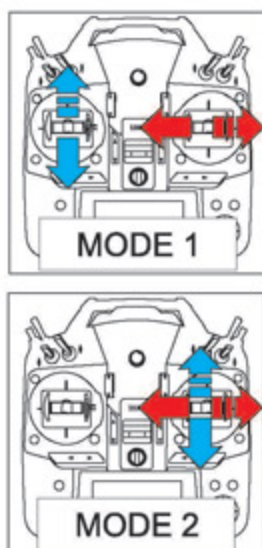
Home

Home Course Lock can only be activated with aircraft at least 5 meters away from home position.

返航點鎖定功能須離Home點
5公尺以上才能動作。

MODE 1

MODE 2

Carefree Mode is suitable only under attitude and GPS Velocity mode. it is not supported under manual mode.
航向鎖定只適用姿態和GPS速度模式,手動模式不支援航向鎖定指令。

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.

航向鎖定是以開機時的機體頭向做為基準,不論飛行中的頭向為何,開啟此模式時飛行機會以開機時的頭向為基準,當副翼向右打時,飛行機則向右飛;副翼向左打時,飛行機則向左飛,與遙控器動作相同。
航向鎖定功能,多軸機為姿態水平與定高功能,搖桿指令為角度命令。

⚠ CAUTION
注 意

Please confirm home position and heading position during power up.

請務必確定開機時Home點位置及開機頭向

MODE 1

MODE 2

Heading during power up.
開機頭向
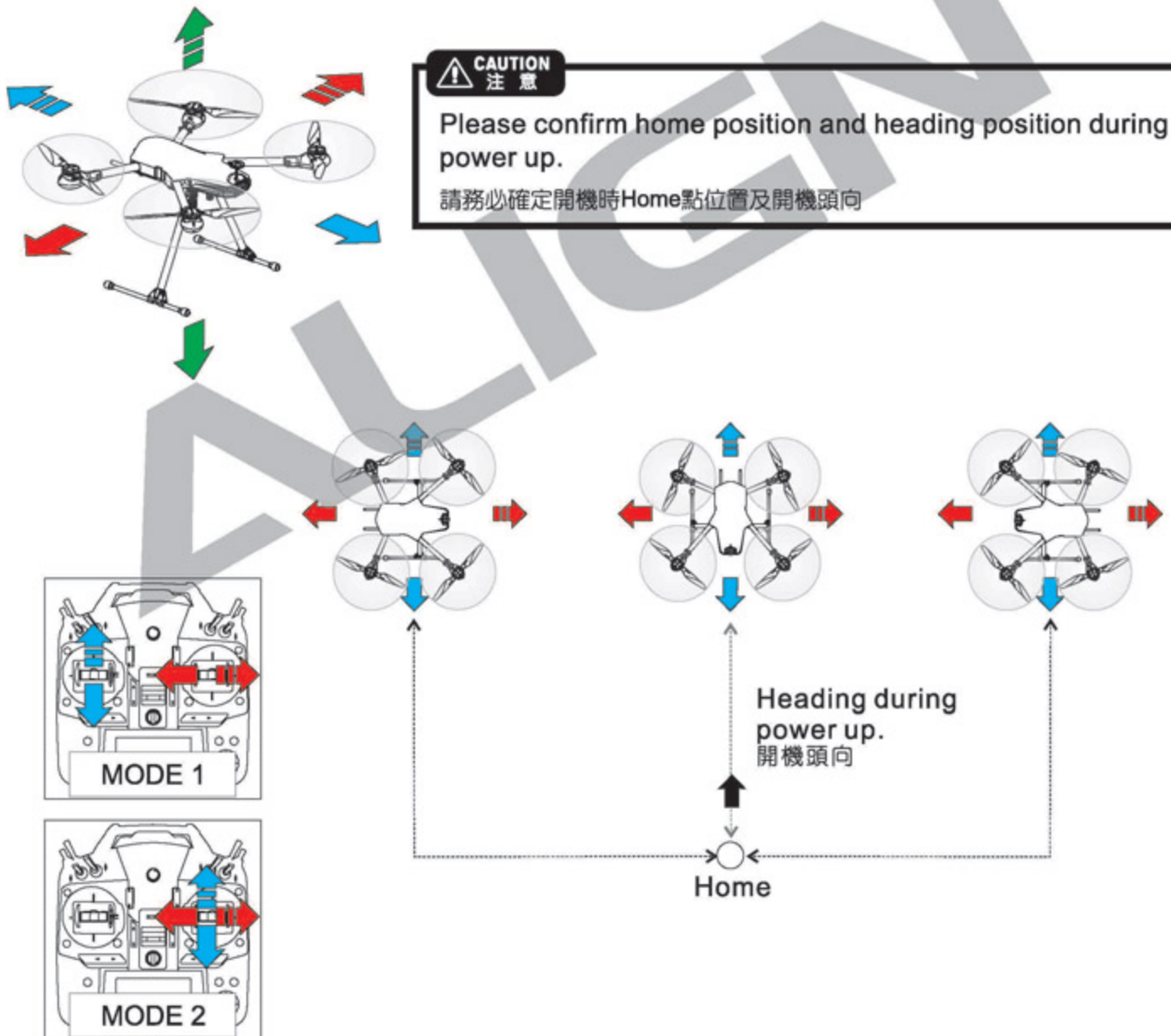
Home

Automatic return home can only be activated under attitude and GPS mode; it is not supported under manual mode.

自動返航只適用姿態和GPS模式，手動模式不支援自動返航指令。

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。

Tail faces Home location to Return Home
機身尾部朝Home點返航
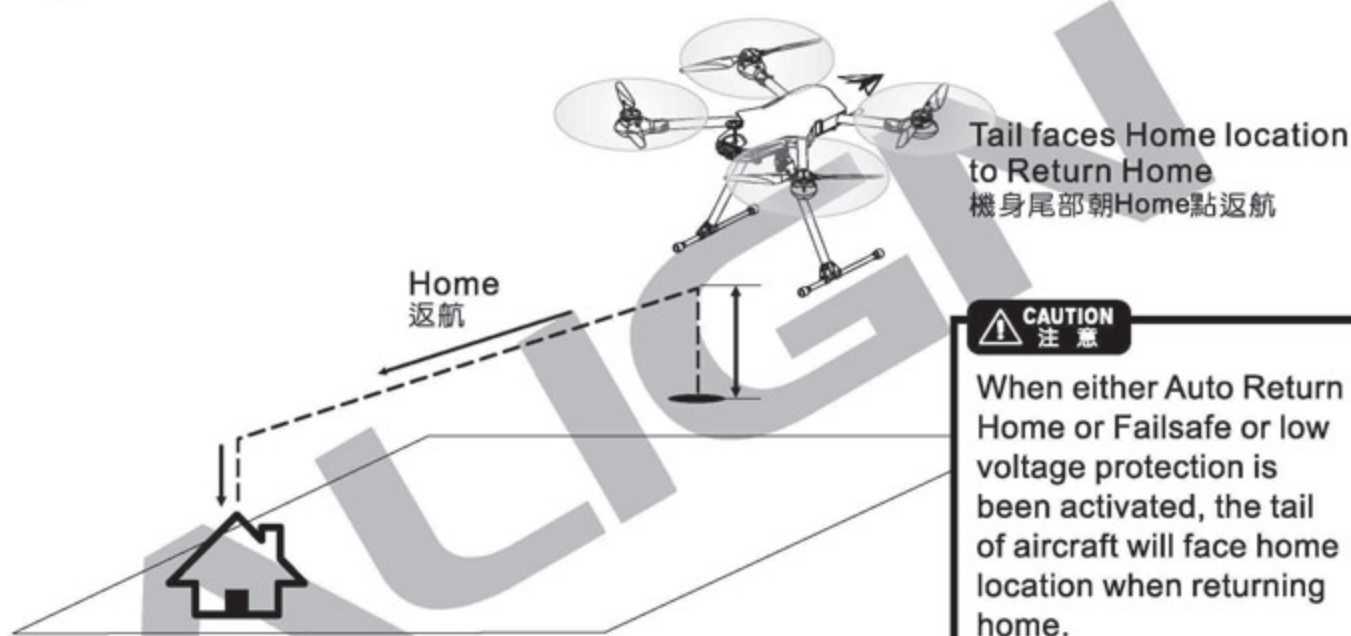
Home
返航

CAUTION 注意

When either Auto Return Home or Failsafe or low voltage protection is been activated, the tail of aircraft will face home location when returning home.

自動返航、失控保護、低電壓保護啓動會機身尾部朝Home點返航。

CAUTION 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。

TO ENGAGE AUTO RETURN HOME COMMAND 開啓自動返航指令	TO DISENGAGE AUTO RETURN HOME COMMAND 解除自動返航指令
△ Return Home OFF 自動返航關閉	▲ Return Home OFF 自動返航關閉
▼ Return Home ON 自動返航開啟	▽ Return Home ON 自動返航開啟
Toggle the Return Home switch to ON position 將自動返航開關切入開啓位置	Toggle the Return Home switch to OFF position 將自動返航開關切回關閉位置

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.返航方式：無論在什麼位置，飛行中如果開啟自動返航功能，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。

⚠ CAUTION
   注 意

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.

失控保護只適用姿態和GPS模式,手動模式不支援失控保護指令。

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.

失控保護:當飛行機丟失遙控器訊號時,在有GPS訊號下,APS-M會執行自動返航。在無GPS訊號下,APS-M會保持姿態水平。
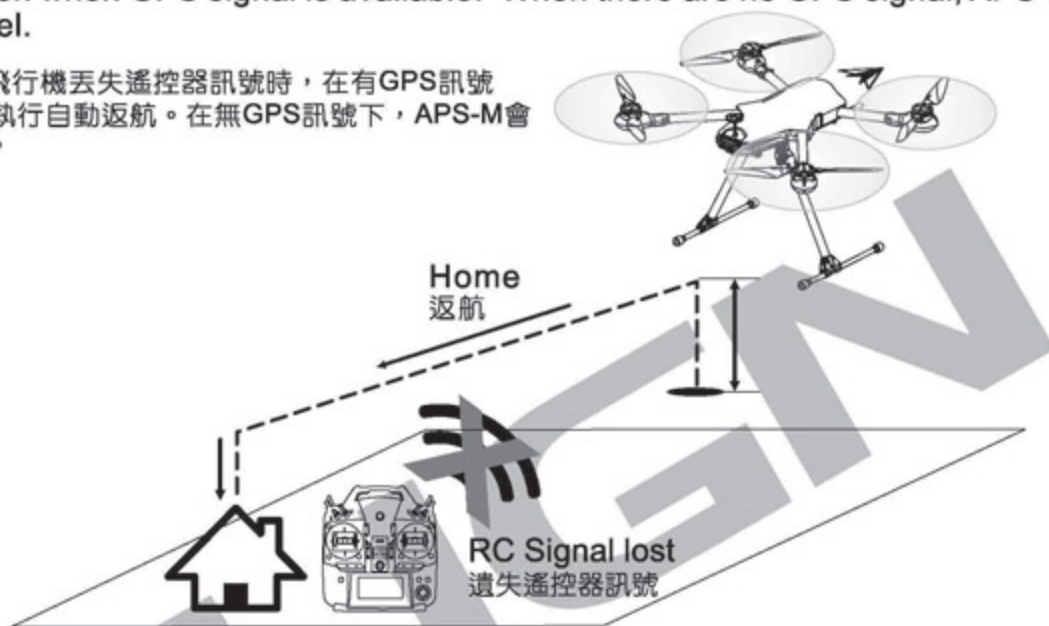
Home
返航

RC Signal lost
遺失遙控器訊號

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
自動返航開關切入開啓再切回關閉位置

① ②

Return Home OFF
自動返航關閉

Return Home ON
自動返航開啟

⚠ CAUTION 注意

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 en route to home position, switch on Return Home mode and immediately switch it off, then control of multicopter can be regained.

1.失控保護只適用於姿態模式與GPS模式下,手動模式無失控保護自動返航。
2.當遙控器失去訊號無法控制時,APS-M會開啓失控保護功能,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控保護指令,只要把自動返航開關切入開啓再切回關閉位置,即能回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.
低電壓保護只適用姿態和GPS模式,手動模式不支援低電壓保護指令。

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.

APS-M提供兩種低電壓保護,請參考APS-M 操作介面安裝與設定第34頁,進行低電壓保護數據設定。

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能力為(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能力為(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。

Main Power Battery low voltage
動力電池電壓過低

Home
返航

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
自動返航開關切入開啟再切回關閉位置

① ②
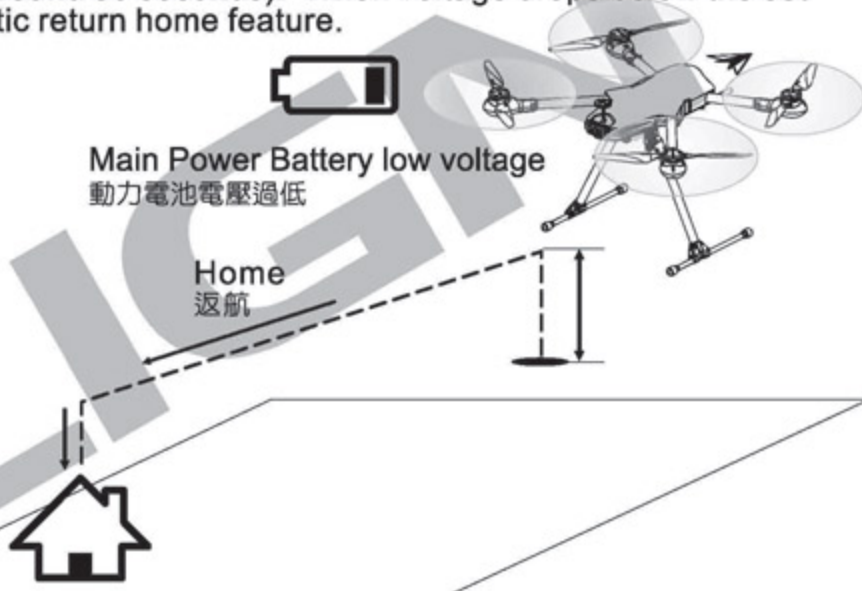
Return Home OFF
自動返航關閉

Return Home ON
自動返航開啟

⚠ CAUTION 注意

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 retractible 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.強烈建議開啟低電壓保護功能,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入開啟再切回關閉位置,即能解除自動返航指令改由手動操作。

SPECIFICATIONS
產品規格

ALIGN

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

Input Voltage 輸入電壓	DC4.5V~8.4V
Operating Current Consumption 消耗電流	＜250mA@ 4.8V
Operating Frequency 工作頻率	400Hz
Operating Temperature 工作溫度	-20˚C ~ 65˚C(-4˚F ~ 149˚F)
Hovering Precision (Depending on Satellite Status) 停懸精度 (受衛星狀況影響)	Horizontal ±1m(3.28ft)，Vertical ±1m(3.28ft) 水平 ±1公尺，垂直 ±1公尺
Maximum Flight Speed 最大飛行速度	Horizontal 15m/sec，Vertical 6m/sec 水平 15公尺/秒，垂直 6公尺/秒
Maximum Altitude Restriction 飛行高度限制	700m(2297ft) above the takeoff point 距起飛點上方700公尺
Maximum Angular Speed 最大角速度	Aileron/Elevator 115˚/sec, Rudder 145˚/sec 副翼 /升降 115度/秒，尾舵 145 度/秒
Maximum Tilting Angle 最大傾斜角度	30 degrees 30度
Supports External Peripherals 支援外接產品	G2/G3 Gimbal、OSD+FPV Video Transmitter G2/G3雲台、OSD+FPV影像發射器
Supports Multicopter Configurations 支援機型	4 rotors+, 4 rotors X, 6 rotors+, 6 rotors X,8 rotors+, 8 rotors X. 四軸＋型、四軸X型、六軸＋型、六軸X型、八軸＋型、八軸X型
Dimension 尺寸	49x34.3x20mm

PCU Power Control Unit   PCU電源控制組

Input Voltage 輸入電壓	13.2V~25.2V(4S~6S Li-Po)
Operating Frequency 工作頻率	500KHz
Dimension 尺寸	62x35x26mm
Operating Temperature 工作溫度	-5C˚~ 45˚C(23˚F~ 113˚F)

Multicopter Brushless ESC   多軸無刷調速器

Input Voltage 輸入電壓	13.2V~25.2V(4S~6S Li-Po)
Max Continuous Current 最大持續耐電流	40A
Dimension 尺寸	74.2x27x12.7mm
Operating Temperature 工作溫度	-5˚C~ 45˚C(23˚F~ 113˚F)

RCM-BL4213 Brushless Motor 370 KV (RPM/V)   RCM-BL4213無刷馬達 370KV(RPM/V)

Input Voltage 輸入電壓	DC 22.2V	Stator Arms 矽鋼片槽數	12
Max Continuous Current 最大持續耐電流	25A	Magnet Poles 磁鐵極數	14
Max Continuous Power 最大持續功率	550W	Dimesion/ Weight 尺寸/ 重量	φ4x φ52x33mm/ 185g

Q & A
問與答

ALIGN

Q&A 1

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.
無法正常開機？
(1)短按電源指示燈的電源鍵檢查電池剩餘電量。
(2)檢查電池接頭是否沒有接好？
(3)PCU 電源控制組與 APS-M 多軸飛控系統之間連線是否沒有接好？

Q&A 2

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開機後，APS-M無法啟動？
(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)檢查操作介面的接收器類型是否正確。
(3)注意APS-M啟動時機體必須保持靜止，當系統開機初始化完成後才會正常啟動。

Q & A
問與答

Q&A 3

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.

為何搜尋GPS時間長?定位偏移大?
(1)首次開機衛星接收時間一般會較長,屬正常現象。
(2)在市區大樓有遮蔽物地點,衛星訊號較弱;建議遠離強磁和導磁在空曠地使用,衛星訊號會較強。
(3)衛星數低於7顆時,LED燈會顯示無衛星訊號,GPS功能不會開啓。
(4)請參考P45磁力計校正/衛星訊號接收表,來判定您的衛星訊號接收狀況。

Q&A 4

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.

為何馬達測試運轉時,馬達轉向錯誤?
馬達與電子變速器之間接線沒依照顏色連接,或電變設定馬達轉向開關設定錯誤。

Q&A 5

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.

馬達測試運轉時,馬達沒依照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,是否有照順序連接。

Q&A 6

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有正常開機,但無法搖桿解鎖起飛?
(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正,重新至操作介面設定搖桿校正。

Q&A 7

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.

起飛時會有後傾或前傾現象?
檢查機體重心是否正確,請調整電池、雲台位置,使重心落在機體中心點位置。

Q&A 8

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.

打尾舵自旋動作,無法在固定點旋轉?
(1)檢查操作介面的APS-M多軸GPS感應器設定是否正確。
(2)檢查機體重心是否正確,請調整電池、雲台位置,使重心落在機體中心點位置。

Q&A 9

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,會有飄移鎖不住的現象?
建議將姿態模式感度增加。

Q&A 10

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

空中飛行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。

Q&A 11

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

飛行或停懸時,頭向或拍攝畫面微量左右晃動?
將手動模式及姿態模式尾舵感度增加。

Q&A 12

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

GPS模式下無法定點垂直爬升?
調高姿態/GPS的升降、副翼感度。

Q&A 13

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.

馬達及飛行指示燈無法啓動?
(1)檢查馬達訊號線是否反插。
(2)拆開馬達固定座,檢查ESC訊號線是否脫落。

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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

484mm

590mm

430mm