User Manual

MMC DRONE SUPPORT

Contact Shenzhen MicroMultiCopter co. Ltd(MMC) for questions and technical help.

Shilong Community, No.1 Yihe Road,
MMC Tech Park, Shiyan Street,
Bao'an District, Shenzhen City,
Guangdong Province,
PR China

Monday–Friday, 9am-6pm

SMC6-1550 (This model is available in black and white. All circuits and RF modules are the same, only the colors are different.)

User Manual

CONTENTS

STATEMENT 4

1 | PRODUCT PROFILE 5

Introduction
Features & Highlight
Flight Battery
Flight Controller
Body
Plugin Platform
SMC6-1550 2D
Drawings

2 | PACKAGE INCLUDES 7

3 | ASSEMBLY 7

Body & Arm Assemby
Arm & Propeller Assembly
Landing Gear
Battery Strapping

4 | AIRCRAFT (UAS) PROFILE 9

Flight Controller
Flight Modes
Indicator Signals

5 | REMOTE CONTROLLER 11

Key Features
Contents and Technical Specifications
Stick Adjustment
Controller Battery

6 | GROUND STATION 18

Introduction
Features
Specification

7 | BATTERY 28

Battery Charging & Safety
Operating Procedure
Battery Maintenance and Storage
Remote Controller Battery Charge

CHECKLISTS 29

Prefield Checklist
Flight Checklist & Flight Log

TERMS 31

STATEMENT

Please read before using this UAS (sUAS) small Unmanned Aircraft System. The user accepts full responsibility upon use and that all contents of this statement is recognized and accepted. Please follow the manual to install and use the product. Given that the company cannot control the user's specific usage of the product, installation and/or modification (including the use of non-specified parts, such as: motor, ESC, propeller, etc.) as well as other possible improper usages, etc. or damages caused by the above reasons, Shenzhen MicroMultiCopter co. Ltd(MMC)and its affiliates (including vendors), will not be held liable for any losses and liabilities.

CAUTION: This product is not suitable for users under 18 years of

age.

DISCLAIMERS

Each user is responsible for following the flight rules and regulations set forth in their legal city, county, and country. MMC will not be held responsible for your actions, injuries, or damages caused by or through any products sold or endorsed by MMC, our resellers, vendors, affiliates, and hence forth, by improper or even proper use, under any circumstance whatsoever.

MMC provides these instructions as a reference only. All information is subject to modifications or updates. MMC expressly disclaims all warranties and conditions of any kind pertaining to the document, whether expressed or implied.

This product can be widely used in fire rescue, emergency responses, forest fire, aerial surveillance, public security police, power line patrol, power line wiring, exploration and mapping, land resources monitoring, urban planning, film and aerial television and other fields. Under normal power supply, components and in undamaged case, the product is safe to operate.

CAUTION: Always remove propellers (blades) when assembling, setting up parameters, repairing, and performing maintenance. This will avoid any negligence methods. When it is turned on, make sure the power supply system and other functional modules are harnessed correctly, and keep the drone away from the crowds, vulnerable, fragile and dangerous goods.

When using this product, personal injury and property damage (including direct or indirect damages), due to the following causes, will not be covered by MMC:

- Never operate UAS while under the influence of alcohol, drugs or anesthetic drugs, or in other physical or mental conditions of poor health such as dizziness, fatigue and nausea.
- While operating, do not purposefully cause personal injuries, property damage, etc.
- Any modifications or replacement of original parts or components are full responsibility of the user; and will not hold MMC and its affiliates responsible whatsoever of any damages due to operator's errors or subjective misjudgment damage.
- If the UAS sounds off irregular alarms (for example, red light flashing) but is still in the air, please land the UAS as soon as possible.
- If the UAS is in contact with irregular substances (such as water, oil, soil, sand and other unknown substances), not assembled properly, or the main components cause apparent failure, accessories exist obvious defects or missing, the damage caused by such conditions will not be subsidized by the company.
- Do not operate the UAS under magnetic interference area, radio excellent dry zone, or no-fly zone in the operator's field of vision required by the Government, extreme backlight, around obstacle occlusion, or with poor eyesight, etc.
- Do not operate in extreme weather, such as more than the capacity of the device windy or rainy weather (including in snow, hail and other extreme weather flights).
- Ambient temperature range is from -20 up to 50 degrees (°C).

1. PRODUCT PROFILE

INTRODUCTION

- Skylle 1550 is a professional industrial-grade four-axis UAV system specialized for surveillance and inspection.
- Skylle 1550 is equipped with three-axis gimbal mounted with GOPRO4 HD sport, FLIR and real-time HD image transmission systems, which allows ground control central inspection and the aerial imaging through ground station. Other than that Skylle 1550 has different payloads with plugin platform for easily swapping the payloads.
- The ground station is featured with HD output interface that outputs the terminals SD / HD videos to other users.
- Skylle 1550 flight platform is featured with GPS hover system, constant speed cruise control, pointing flight and automatic route flight functions.

FEATURES AND HIGHLIGHTS

Flight Battery

A Couple of 22000mAh lithium polymer ion flight battery features an advanced power management system and provides up to 35+/-5 minutes of flight time with the payloads.

Flight Controller

Flying is easy and safe with a flight controller optimized to enable controlled, stable flight. Critical flight data is collected, computed and communicated to the entire aircraft in real time.

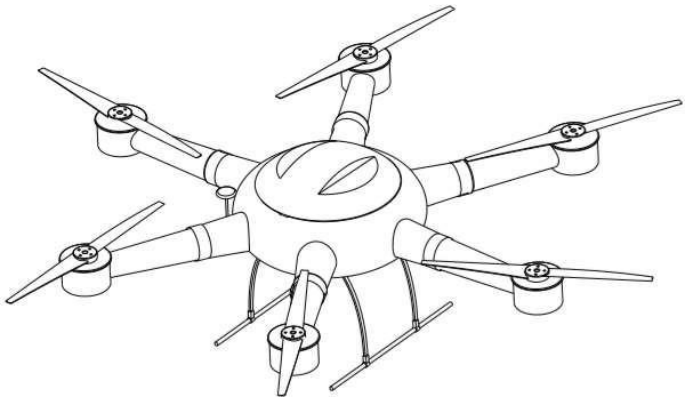
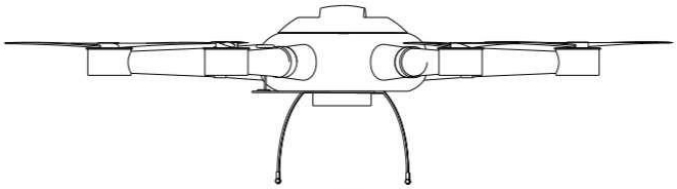
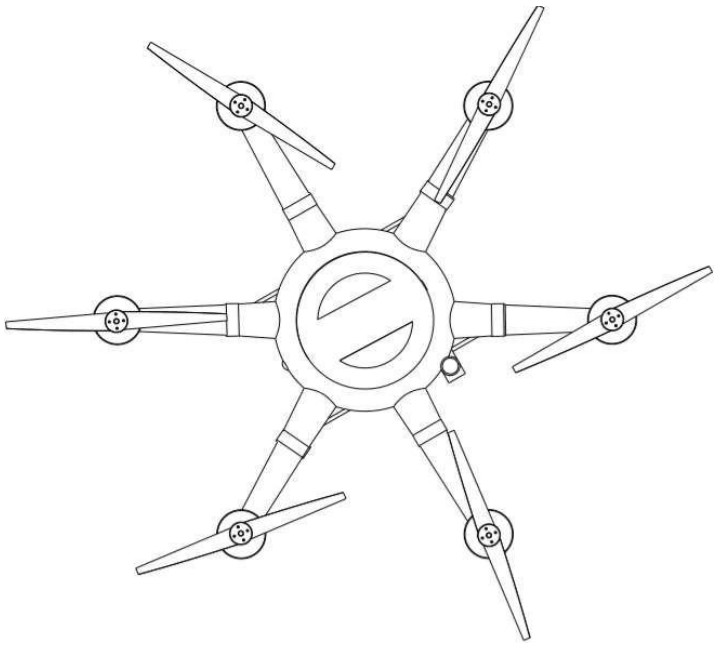
Body

- The fuselage is fully made up of carbon fiber material
- Designed with fire, rain and dust resistance;
- Easy plug and play designed to minimize assembly time under 2 minutes.
- Efficient power configuration with greater endurance.
- GPS hover, pointing flight and automatic route flight function.

Plugin Platform Features:

1. Intelligent and sophisticated plug-and-play connector, aims for industrial application.
2. Perfectly compatible with MMC's various advanced payload.
3. Super easy to plug into the drone, no tool needed.
4. Supported maximum 13 channels.
5. Each channel can be customized to meet the rapid replacement of the usage of multiple payloads, channels include::

- 3- power channel: 1, BAT --GND 2,12V - GND 3,5V –GND
- 7 control link channels: PWM1, PWM2, PWM3, PWM4, NC1, NC2, NC3
- 2 CVBS analog video channels: AV1,AV2
- 1 CAN channel: CANH, CANL

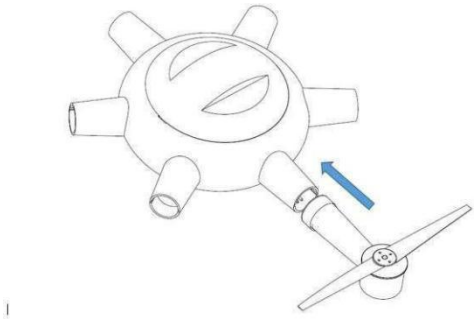
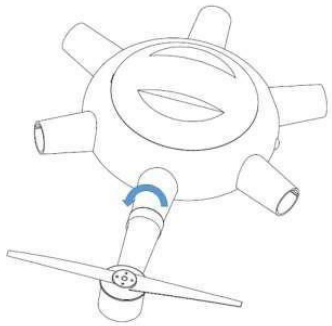
Isometric view of Skylle 1550	
Front view of Skylle 1550	
Top view of Skylle 1550	

2. PACKAGE INCLUDES

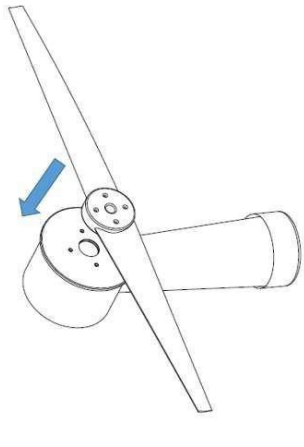
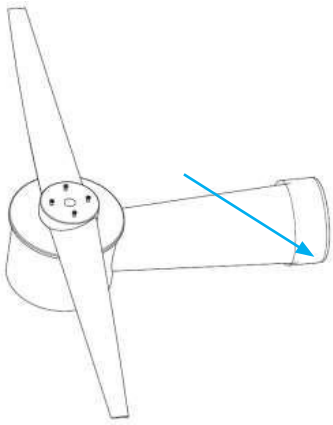
- Main Body
- Arms and Propellers
- Propeller Locking screws
- Landing Gear
- Flight Batteries & charger
- Controller
- Controller Battery & Charger
- Transmission Antenna
- Tool Kit
- Ground Station
- Ground Station Battery & Charger
- Battery Checker
- Body Battery Straps
- GPS Antenna
- Payloads

3. ASSEMBLY

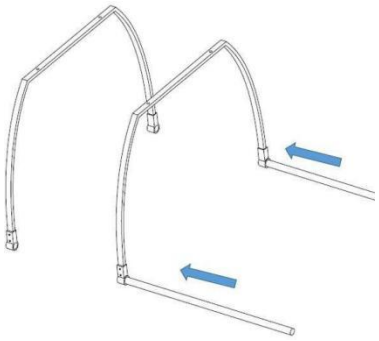
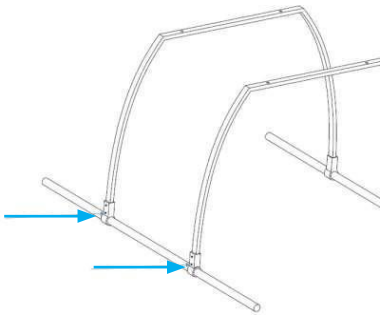
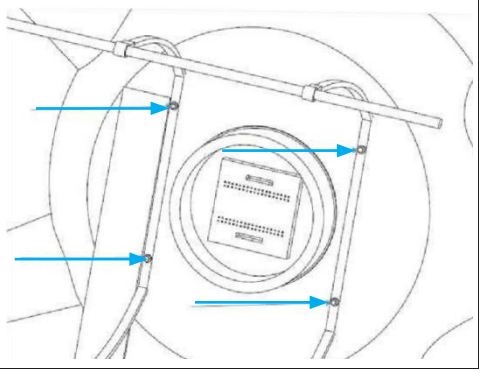
BODY & ARM ASSEMBLY

Step 1:	Step 2:
Take the arm and insert to the body according to the number mentioned in the arm.	Rotate the lock in clockwise direction to tighten the arm.
	

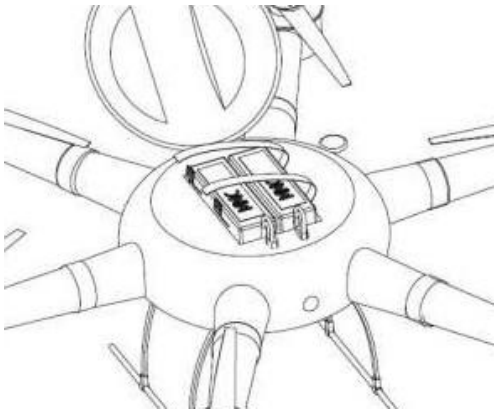
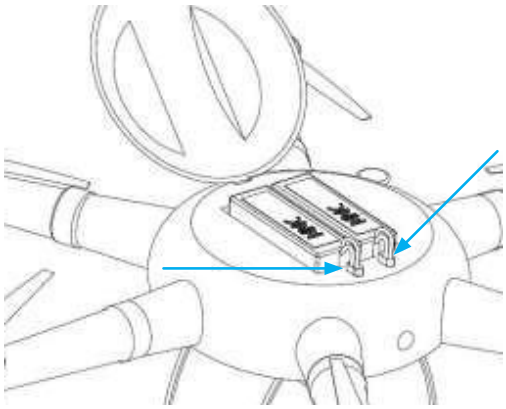
ARM & PROPELLER ASSEMBLY

Step 1:	Step 2:
Take the arm and place the propeller according to the arm number	Insert the screw and tighten it.
	

LANDING GEAR ASSEMBLY

Step 1:	Step 2:	Step 3:
Take the landing leg and connect the carbon rod through the holes in the landing leg on both sides.	Tighten the screws in the landing leg.	Connect the landing gear with the body and tight it with the given plastic nut.
		

BATTERY STRAPPING

Step 1:	Step 2:
Place the battery and strap the battery with Velcro straps.	Connect the battery connector to the drone and close the cap.
	

4. AIRCRAFT PROFILES

FLIGHT CONTROLLER

The A2 flight control system uses the Controller Unit at its core, which is connected with the IMU, GPS-COMPASS PRO PLUS, LED- BT-I, PMU and ESCs to complete the system. The system can achieve the height-lock and position-lock functions by using the IMU and the GPS, to control the aircraft.

Please carry out the following procedures to finish assembly, configuration and flight-testing:

Mount the A2 flight control system on your aircraft finish connection. →	Configure the system using A2 Assistant software. →	Basic flying test →	FailSafe and Low-voltage settings →	Advanced functions: IOC, Gimbal, Gear

SYMBOL INSTRUCTIONS

General Symbols

 Forbidden (Important)	 Cautions	 Tips	 Reference
 GPS Satellite number	 Distance	 TX signal good	 TX signal lost
 Roll to left	 Roll to right	 Pitch up	 Pitch down

LED Symbol

○ (N)	N=1	N=2	N=3	N=4	N=6	N=20	N=∞
Meaning	One Blink	Two Blinks	Three Blinks	Four Blinks	Six Blinks	Twenty Blinks	Continuous Blinks
● (3) means three red blinks. ●● (∞) LED blinks yellow and green alternatively.							

□ (N)	N=∞
Meaning	Continuous Solid on
■ (∞) means continuous blue solid on.	

FLIGHT MODES

Due to betterment of the customers for easy flying the UAV, the flight controller have been designed with 2 set of main control modes. The switches to access the modes are SE and SG is configured as default. If needed to change refer the remote controller section

Switch Features:

Switch	Number	Modes
SE	0 (bottom)	○ Alt Hold
	1 (middle)	● Alt Hold
	2 (upper)	● GPS mode

Failsafe Mode: In case of emergency to make drone to come back to Home point this flight mode will be used.

Attitude Mode: Attitude mode is same as GPS mode which uses onboard barometer to maintain copter stability with altitude.

GPS Mode: GPS mode uses on board GPS for stable flying reliable only on GPS.

LED INDICATOR SIGNALS

Control Mode	GPS signal
Manual Mode: No indicator	Best (GPS >6): No indicator
ATTI. Mode: (1) (sticks not in mid-point (2))	Good (GPS -6): (1)
GPS ATTI. Mode: (1) (sticks not in mid-point (2))	Bad (GPS =5): (2)
Ground Station: (1)	Worst (GPS <5): (3)

Flight Attitude	
Attitude good: No indicator	Attitude status bad: (3)
IMU data lost, calibrate IMU needed: (4)	

Compass calibration	
Horizontal calibration: ■ (∞)	Calibration Failed: (∞)
Vertical calibration: (∞)	Abnormal Compass Data: (∞)

Low voltage alert	
First level alert: (∞)	Second level alert: (∞)

FaillSafe mode	
During the FailSafe: (∞)	Compass Abnormal after power on: (∞)

Errors	
System Error: (4)	Compass Abnormal after power on: (∞)

IOC Recording	
Record home-point successfully	(20)
UAS is in the 8m range of HP	(6)

Record forward direction successfully	(20)
Record a Point of Interest successfully	(20)

Bluetooth
A2 Assistant is connected/disconnected to the flight control system: ●● (∞)

When the LED blinks ○ (3), please hover or land the UAS and wait for the white LED to go off.

When the LED blinks ● (3), it is not recommended to fly.

When the LED blinks ● (4), please contact your dealer.

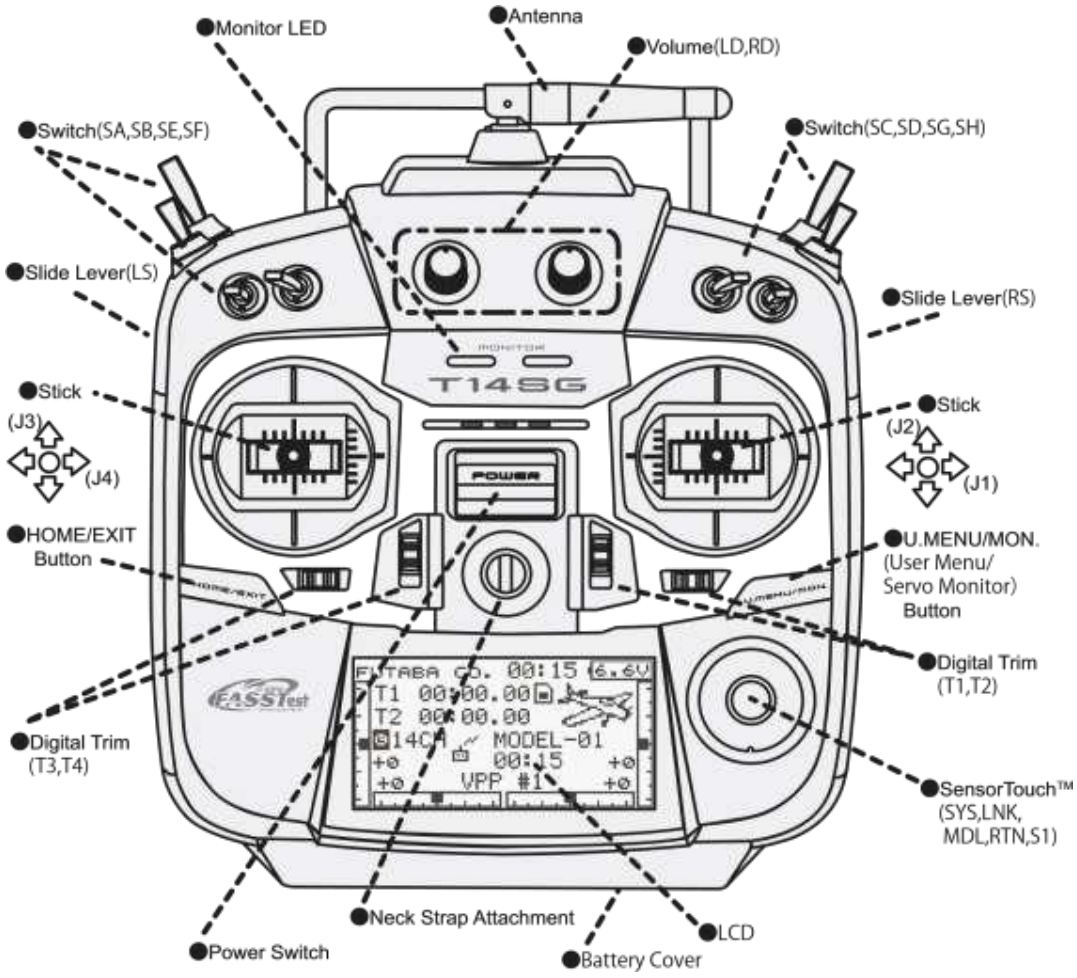
5. REMOTE CONTROLLER INTRODUCTION

MMC uses Futaba T14 channels remote controller model 1 (right hand throttle) as a standard one,
Specific function keys are described below:

KEY FEATURES

FASS test system

The T14SG transmitter has adopted the newly developed bidirectional communication system "FASS Test". Data from the receiver can be checked in your transmitter. FASS Test is a maximum 14 channels (linear 12 channels + switch 2 channels) 2.4GHz dedicated system.



S.BUS2 System

By using the S.BUS2 system multiple servos, gyros and telemetry sensors are easily installed with a minimum amount of cables.

Model Types

Six swash types are available for helicopters. Six types of main wings and three types of tail wings are available for airplanes and gliders. Functions and mixing functions necessary for each model type are set in advance at the factory.

Data Input

Large graphic LCD and new type Touch Sensor substantially improve ease of setup.

Stick

Improved feel, adjustable length and tension.

SD Card (Secure Digital memory card) (Not included)

Model data can be saved to an SD card (SD: 32MB-2GB SDHC: 4GB-32GB).

Edit Button

Two edit buttons are provided, and the operating screen can be immediately "Returned" to the HOME screen during operation. Setting operation can be performed easily by combining this button with a touch sensor.

Vibration function

Selects a function that alerts the operator to various alarms and timers by vibrating the transmitter in addition to sounding a buzzer.

CONTENTS AND TECHNICAL SPECIFICATIONS

14SG includes the following components:	Transmitter T14SG:	Receiver R7008SB:
T14SG transmitter for airplanes or helicopters	(2-stick, 14-channel, FASSTest-2.4G system)	(FASSTest-2.4G system, dual antenna diversity, S.BUS system)
R7008SB Receiver	Transmitting frequency: 2.4GHz band	Power requirement: 3.7V~7.4V battery or regulated output from ESC, etc.
Battery & Charger	System : FASS Test 14CH, FASST MULT, FASST 7CH, S-FHSS, switchable	Size: 0.98 x 1.86 x 0.56 in. (24.9 x 47.3 x 14.3 mm)
Switch harness		Weight: 0.38 oz. (10.9g)
Neck strap		
Content varies on set type		

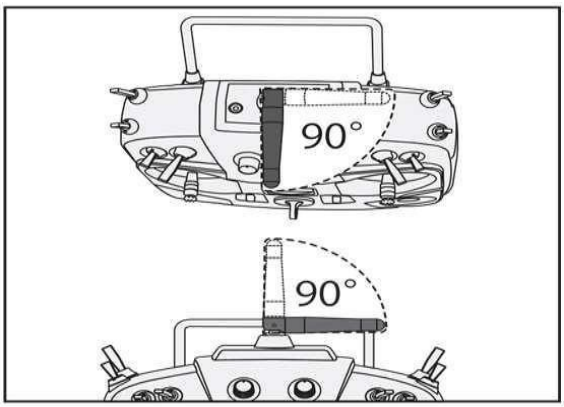
When using ESC's make sure that the regulated output capacity meets your usage application.

Transmitter's Antenna

As with all radio frequency transmissions, the strongest area of signal transmission is from the sides of the transmitter's antenna. As such, the antenna should not be pointed directly at the model. If your flying style creating this situation easily move the antenna to correct this situation.

Rotating antenna

The antenna can be rotated 90 degrees and angled 90 degrees. Forcing the antenna further than this can damage it. The antenna is not removable.



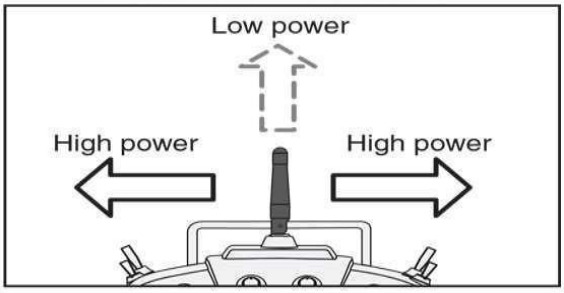
Monitor LED Display

The status of the transmitter is displayed by LED at the bottom left and right sides of the "T14SG" logo.

LED (Left)

Displays the "non-default condition" warning.

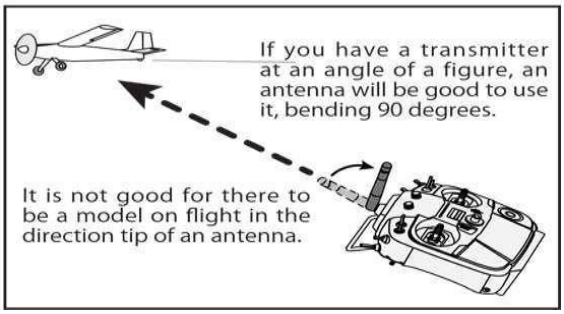
Blinking: Power switch is turned ON when any condition switch is turned ON.



LED (Right):

Displays the state of radio frequency transmission.

- OFF Radio waves are in OFF state.
- ON Radio waves are being transmitted.
- Blinking Range check mode.



Switch (SA-SH):

SA : 3 position; Alternate; Short lever

SB : 3 position; Alternate; Long lever

SC : 3 position; Alternate; Long lever

SD : 3 position; Alternate; Short lever

SE : 3 position; Alternate; Short lever

SF : 2 position; Alternate; Long lever

SG : 3 position; Alternate; Short lever

SH : 2 position; Momentary; Long lever

*You can choose switch and set the ON/OFF – direction in the setting screen of the mixing functions.

Digital Trim

Digital Trim T1, T2, T3 and T4:

This transmitter is equipped with four (4) digital trims. Each time you press a trim button, the trim position moves one step. If you continue pressing it, the trim position starts to move faster. In addition, when the trim position returns to ~ monitor trim positions by referencing the LCD screen.

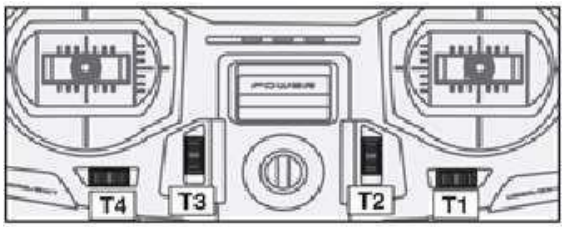
On the home screen on the T1-T4 setting screen within the linkage menu.

Note: The trim positions you have set will be stored in the non-volatile memory and will remain there.

Volume

The volume LD and RD knobs allow for analog input.

* The T14SG transmitter beeps when the volume knob reaches the center position.



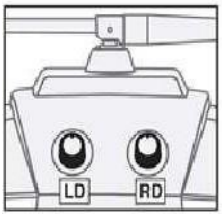
LS (Left), RS (right):

The slide lever LS and RS offer analog input.

* The T14SG transmitter beeps when the lever comes to the center.

Movement of cursor, value input or mode selection

Movement of the cursor on the menu screen and movement of the cursor among items on a setup screen can be controlled by scrolling your ~ also go to the next page, if there is a next page.



This scrolling technique is also used for data input, value input, mode selection, and similar operations. Examples include: Value, ON, OFF, INH, ACT, etc.

RTN button

Touch the RTN button when you want to open a setup screen or to switch between cursor move mode (reverse display) and data input mode (box display).

This button can also be used as the enter button screen, etc.

Exiting Setup Screen

To end the operation on a setup screen and return to the menu screen, move the cursor to the screen title item and touch the RTN button.

To return to home screen directly, touch the S1 button for 1 second. Alternatively, move the cursor to the screen title item and touch the RTN button to return to the home screen from a menu screen.

Note:

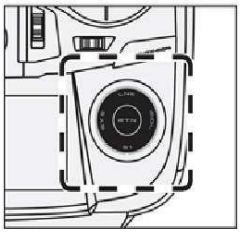
*Scroll operation: circle your finger on the outer edge of the RTN button. The sensors may mis-read your touch as a reverse rotation if the circle is smaller, or performed on the inside edge of the RTN button.w

*The Sensor Touch™ may not operate smoothly if your hand is touching the surrounding case parts. Please make sure that the tip of your finger is actually operating the Sensor Touch™.

*If the Sensor Touch™ does not register your input, please try again after lightly tapping your finger on the sensor once again.

Do not operate the Sensor Touch™ while wearing gloves. The Sensor Touch™ may not work correctly.

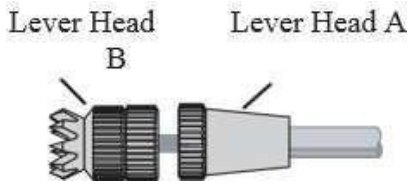
Caution: The touch sensor may not operate correctly if spark noise is generated from a gasoline engine, etc. Please remove the transmitter to a location away from the noise source.



STICK ADJUSTMENT:

Adjustment of the stick lever length

You can adjust the length of stick levers, as you like. It is recommended to adjust the length of the sticks in line with your hand size.



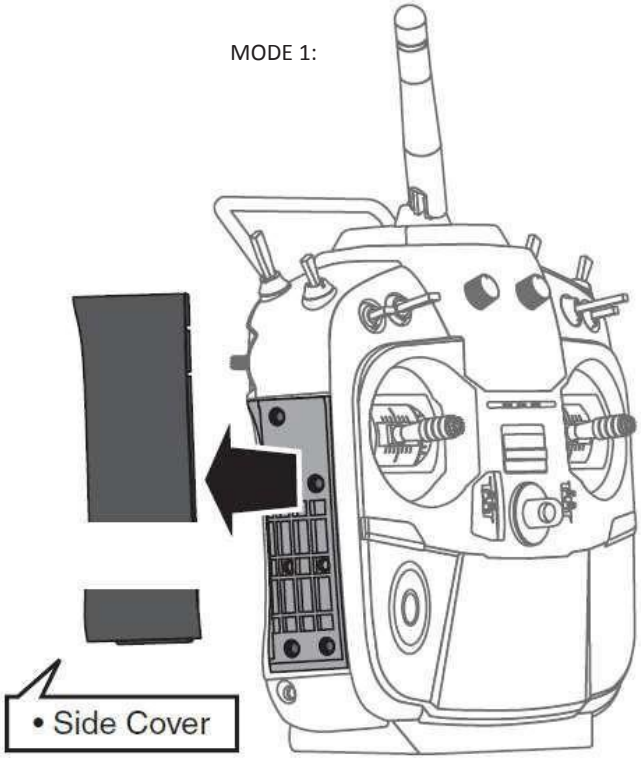
- Hold the lever head "B" and turn the lever head "A" counter ~ clockwise. The lock will be released.
- Turn the lever head "A" clockwise as you hold the lever-head "B" after placing it as you like.

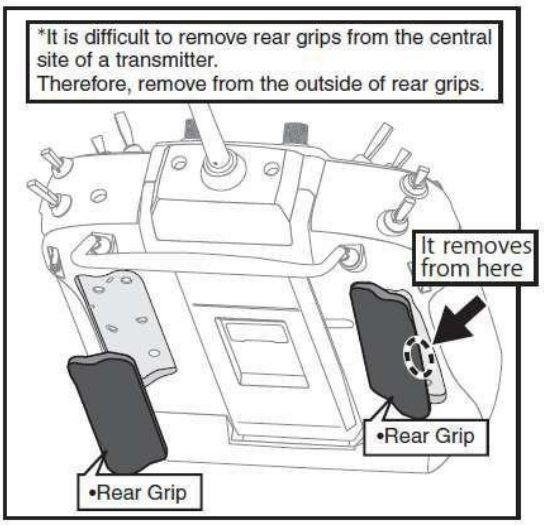
Adjustment of stick lever tension

The tension of the self-return type stick lever can be adjusted.

1. First, remove the battery cover on the bottom of the transmitter. Next, unplug the battery wire and remove the battery from the transmitter.
2. Next, using a hand, remove the transmitter's side cover. When using Mode 1, you will need to remove the side cover to expose the tension screw.

MODE 1:



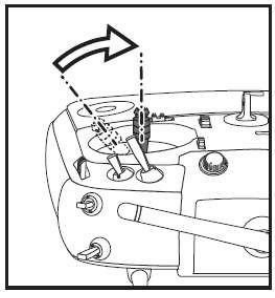


3. Using your hand remove the transmitter's rear rubber grips.
4. Use a small Philips screwdriver to adjust the spring strength as you prefer by turning the adjusting screw of the stick you want to adjust.

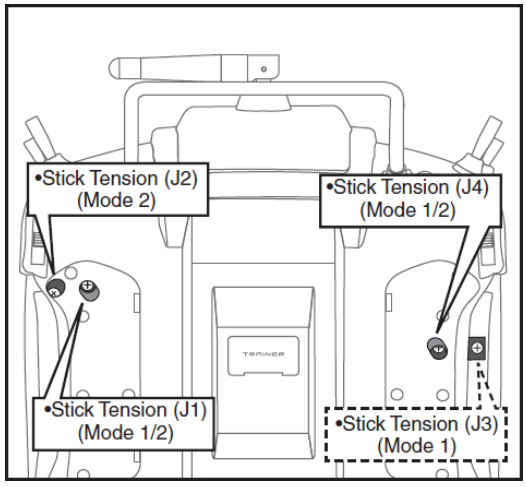
*Turning the screw clockwise increases the tension.

Caution:

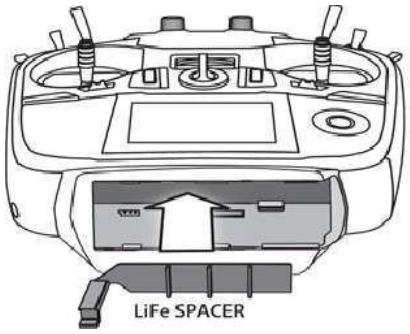
If you loosen the screw too much, it can interfere with the operation of the sticks internally.



The stick can be adjusted to how quickly it returns to neutral.



CONTROLLER BATTERY

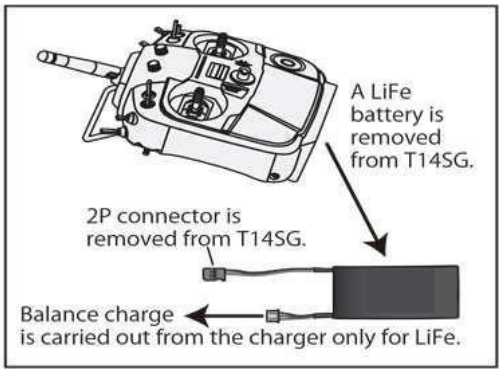


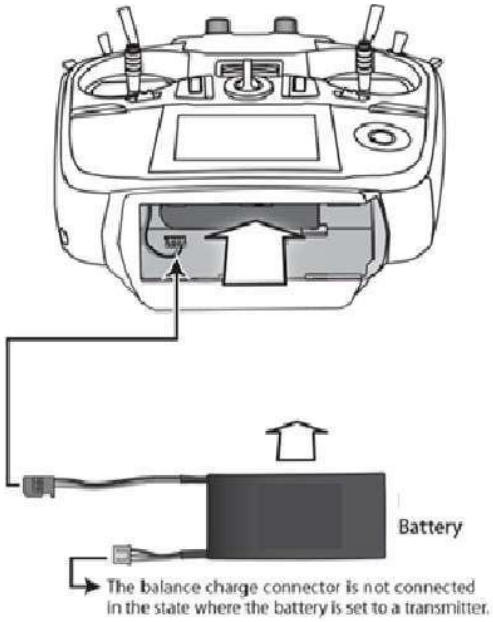
Attachment of the battery

1. T14SG to HTF1800B isremoved.
2. A LiFe spacer (14SG attachment) is inserted as shown in figure.
3. A Controller battery (Option) is inserted as shown in figure.
4. 2P connector of a controller battery is connected.
5. Close the battery covercompletely.
6. T14SG is turned on and [LINKAGE MENU]=>[WARNING]=>[LOW BATTERY] is called.
7. It changes into 6.0V from5.6V.

Charging Controller battery

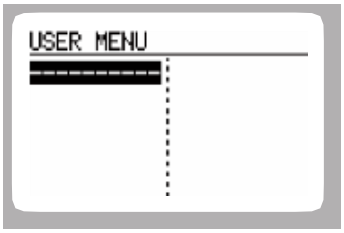
Note: Controller battery cannot be charged with the charger of 14SG attachment.

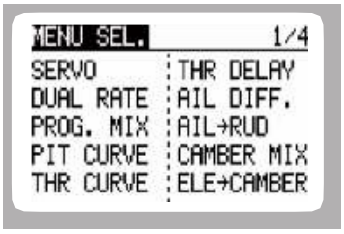




Home Screen

Use the touch sensor to select the following display area to call each setting screen, and touch the RTN button. The setting screen appears.





User Menu

A user menu which allows the user to customize and display frequently used functions has been added.

a. When the "U.MENU" button is pushed for two seconds, the user menu appears.

*Return to the home screen by touching the EXIT button while the user menu is being displayed.

b. When the cursor highlights the dotted line, " ---------- " and the RTN button is touched, the menu selection screen appears.

c. When the cursor is moved to the setting that you to set to the user menu and the RTN button is touched, that setting screen is added to the user menu.

d. The registered setting screen can be called by moving the cursor to it and touching the RTN button.

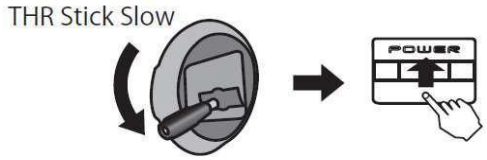
*When you want to delete an added screen from the user menu, highlight item you wish to delete, press and hold the RTN button for one second.

How to turn transmitter power ON/OFF

When turning on the power, the T14SG transmitter will begin emitting RF automatically after it confirms the surrounding RF conditions.

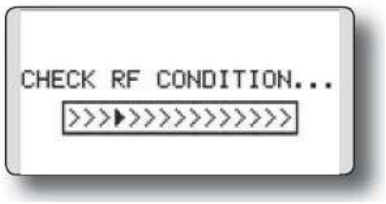
The T14SG transmitter also offers the ability to auto shut-down.

When turning on the power of the transmitter



1. Turn on the power switch of the transmitter.

*The message 'CHECK RF CONDITION' is displayed for a moment. At the same time the left LED monitor blinks.



2. Then, you will see the home screen and the transmitter begins to emit radio waves.

*The left and right LED monitors will change to solid red.

How to stop the transmitter:

Turn off the power switch of the transmitter.

*The transmitter shuts down at once.

Low battery alarm and auto shut-down:

When the battery voltage reaches 5.2V, an audible alarm will sound. Land your aircraft immediately.

When the battery voltage reaches 3.9V, the transmitter will be turned off automatically.

*If you do not operate the transmitter (or move a stick, knob, switch or digital trim) for 30 minutes, the message "PLEASE TURN OFF POWER SWITCH" is displayed and an audible alarm will sound.

Warning display at power ON (UAS):

When the throttle stick during power ON is at the high side (or over 1/3 stick) a warning will be displayed.

*below 1/3 stick, the warning display goes off.

6. GROUND STATION

INTRODUCTION

The 15" Portable Ground Station S85 is a professional, rugged and portable radio station designed for outdoor use. Equipped with magnesium metal shell, quality LCD, Intel core i5-4310M processor, Intel HD graphics core 4600i and 15.6 TFT LCD FHD (1920 x 1080), this Ground Station is an essential device for complicated and demanding UAV task.

FEATURES:

- With design of waterproof, dustproof and shockproof, It's applicable to various tough environment.
- Its total weight is less than 9KG.
- It is compatible with 1080P HD video format, and its transmission distance can reach 5KM.
- It comes with a USB3.0 HD video storage card for faster and more stable data transmission.
- It can display both Video and flight data, and it's easy to switch between these two displays mode.
- Fingerprint identification and other security features make the product more secure.
- Support dual battery system.

SPECIFICATIONS

	Item	Specifications		
Basic Data	Size (LxWxH) mm	290	410	119
	Weight (Kg)	9		
	Waterproof and dustproof level	IP65		
	Material	Magnesium metal shell		
	Color	Metal gray		
	Operating System	Windows®7 professional business version		
Electrical Specifications	Working Voltage	19v		
	Working Current	4.74A		
	Max. Power	90W		
	Battery Capacity	Li-Po battery 8700mAh		
Configuration	CPU	Core i5-4310M		
	Hard Disc/RAM	500 GB/ 8GB DDR3		
	Graphics Card	HD 4600i		
	Display	15.6 TFT LCD FHD (1920 x 1080)		
	Keyboard	LED rubber keyboard		

GROUND CONTROL STATION (GCS)

MGS is the specialized ground control station software where the user can control the UAS and the mounting equipment, simultaneously displaying the images transmitted by the drone in real time.

INSTALLATION

- Operating system requirements: Windows 7/ Windows 8/ Windows 10.
- Install the ground station software.

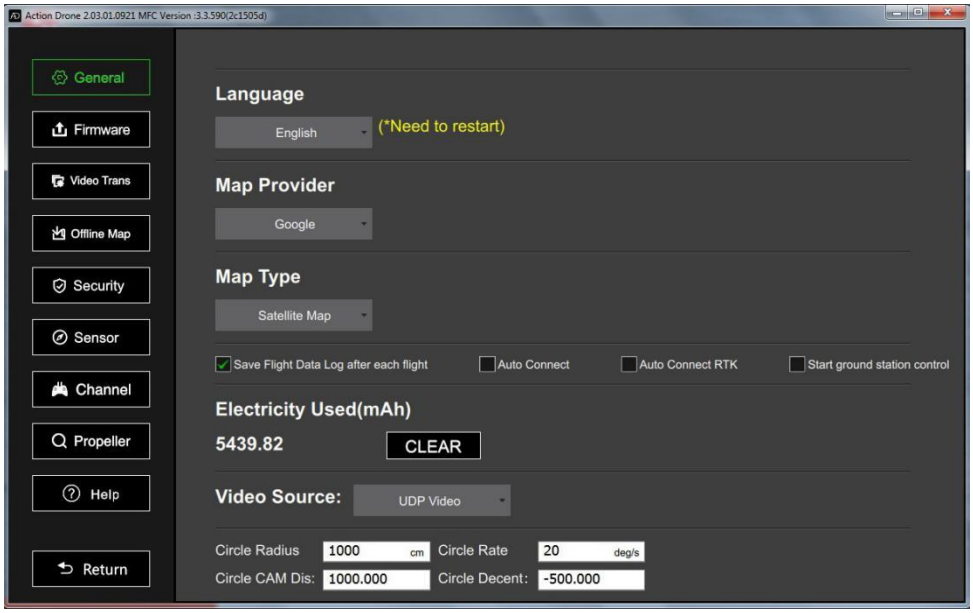
INTRODUCTION TO THE MAIN INTERFACE OF THE GROUND STATION

MGS main interface introduction

SOFTWARE SETTING

Click the setting button, the setting interface will show. In the setting function's interface, there are major functions including 'General Setting', 'Firmware Upgrade', 'Security Setting', 'Sensor Calibration', 'Propellers and Wings Test'.

1. GENERAL SETTING



The settings of the common settings interface can be made.

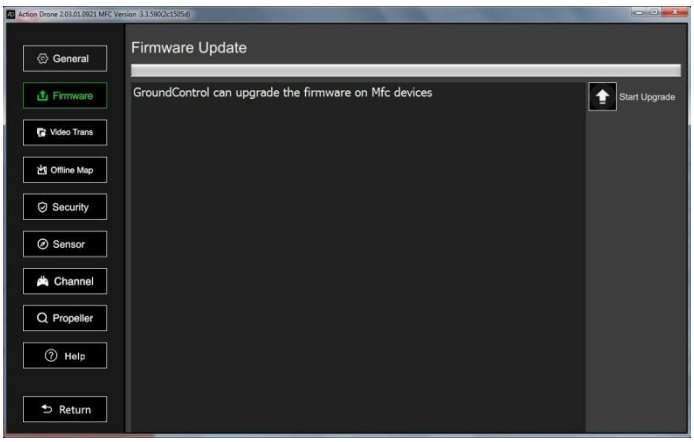
- **Language**: Switch the language displayed on the current interface. This function must be restarted to take effect. When the displayed interface language is English, if you want to change languages, select and restart, the selected language interface will then be displayed.
- **Map**: Switch the map provider of the map area of the current main interface.
- **Map Type**: Switch the type of the current map (street map, satellite map, hybrid map).
- **Data Save**: Select whether to save flight data after each flight.
- **Automatic Connection**: Select to automatically connect to the drone when there is a drone connection, unselect to use the manual connection drone, if it didn't connect to the aircraft when you choose the automatic connection, you need to stop the automatic connection and use the manual connection.
- **Video Source:** You can switch the video source of the video display area of the main interface.
- **Start Ground Station Control**: click to start to control the ground station before you can use the control mount function and control the drone function.

Note: After each battery replacement, you need to click on the "Power to Clear", in order to more accurately count the power usage.

2. FIRMWARE UPGRADE

- Click "Firmware Upgrade" to open the firmware upgrading interface, click the "Start Upgrade" button, follow the prompts to complete the firmware upgrade.

Warning: The firmware has been set at the factory. If you need to modify, please consult our technical staff first!

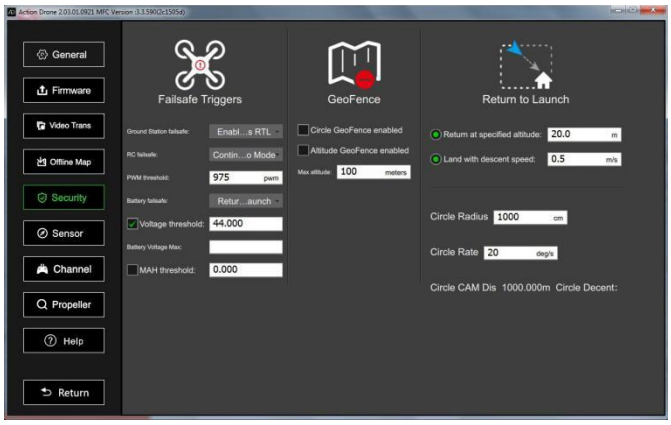


3. SECURITY SETTING

Click "Security Setting" to open the security settings interface. There are mainly fault protection functions such as Failsafe Triggers, Geofence, and Return to Launch (RTL).

The safety fault protection value setting is completed by setting the fault handling method of different fault drones.

Warning: The failsafe trigger value setting is completed by setting the trigger values for the different types of failsafes. If you need to modify, please consult our technical staff first!

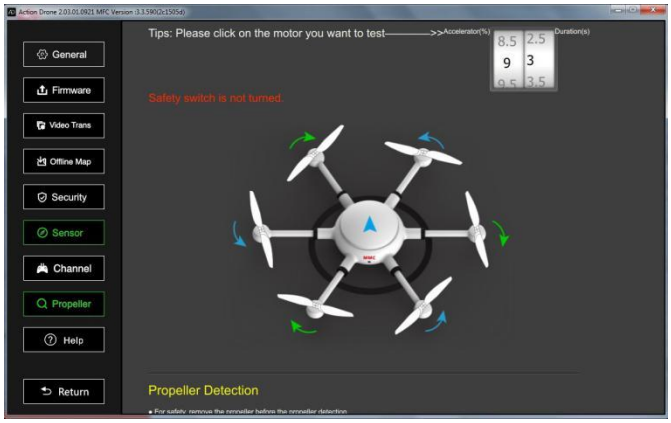


Security Settings

4. SENSOR CALIBRATION

The sensor calibration has "accelerometer", "compass" calibration, sensor settings can choose which sensor to use, sensor installation direction and so on.

Warning: It is not recommended for inexperienced non-professionals to calibrate this function. If the sensor malfunctions, please contact us for customer service.



Propellers Test

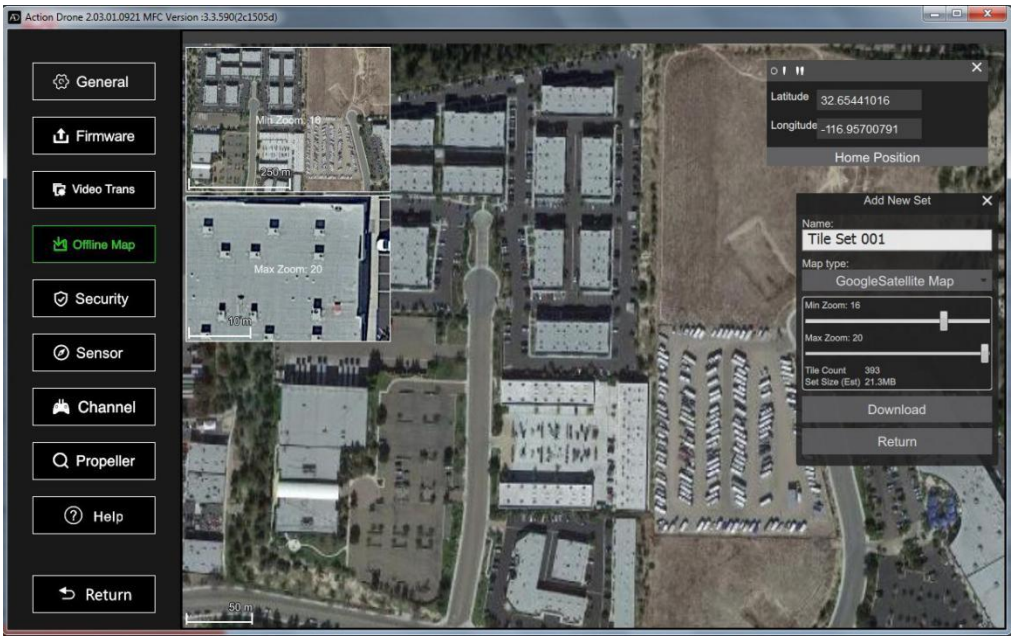
5. PROPELLERS AND WINGS TEST

Follow the prompts for the propellers and wings' test and perform a test before flying.

Click on each propeller to see the drone blade is rotating in the direction of the arrow. If the rotation is not smooth, you can increase the percentage of the throttle. The range of throttle is 1% to 20%. The default value is suggested to be 9%.

6. INDEX OFFLINE MAP

Users are able to save the name and type of map (Google Maps), slide it to select the range and size of the map you want to save, click download button to download the map locally. Click the x on the right in the Figure 3.32 and then quit. Next time when you look at it, click on the offline map and select the name of the map of you downloaded so that it is able to view.



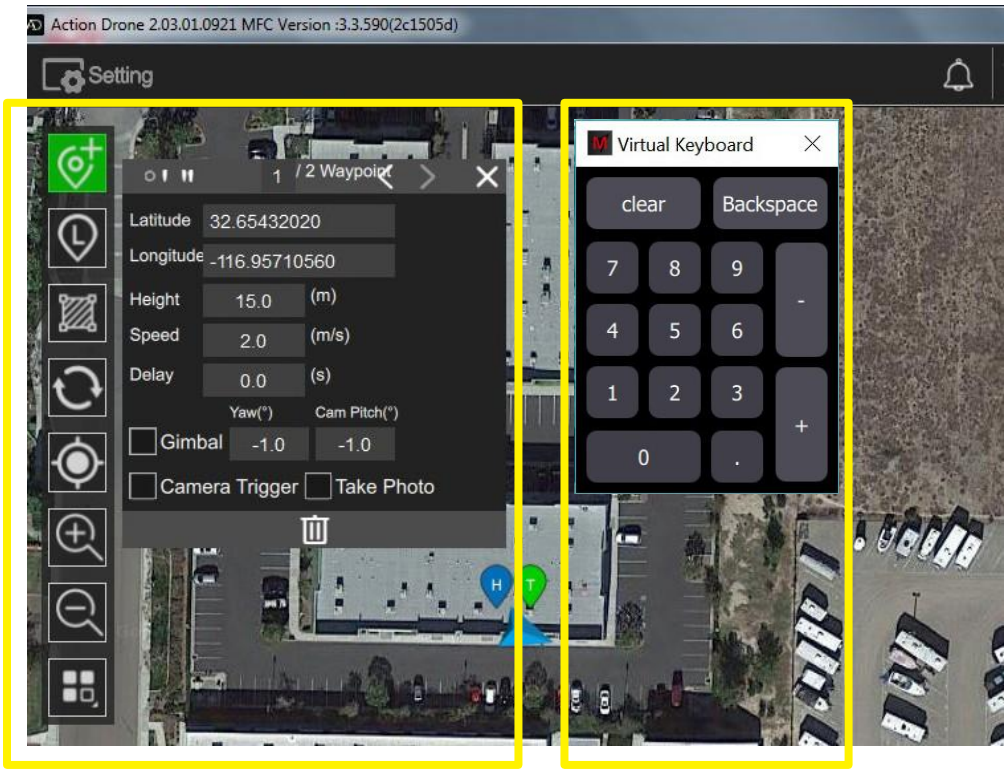
Offline map selection interface

ROUTE PLANNING

1. Click the "location icon" button to start the navigation point planning function.

   When entering the Waypoint Menu, the latitude and longitude of the displayed home point can be manually modified.

   Click the virtual keyboard to modify the latitude and longitude of the home point, use "clear" to delete data, use "Backspace" to remove a single digit, use "+" for value addition, use "-" for value subtracted.

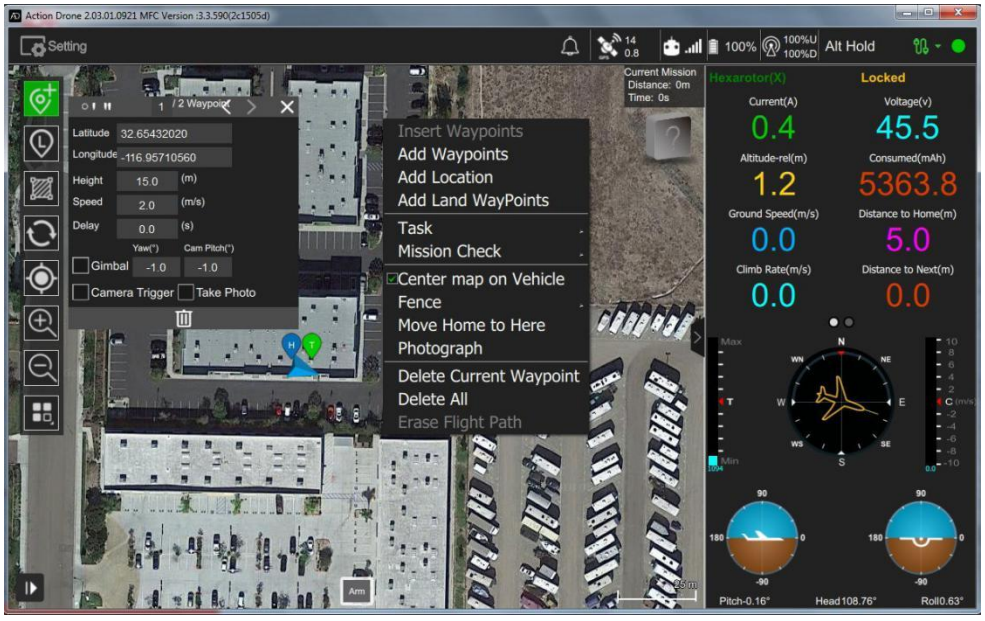


Waypoint Menu Virtual Keyboard

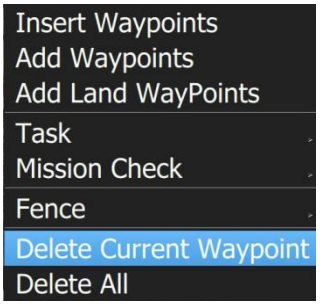
2. Double-click the location you have selected on the map to add Waypoints, or by a long press on the screen, drop down menu appears and click "Add Waypoints".

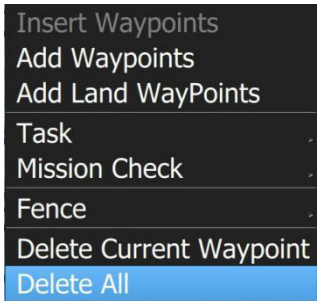
   The latitude, longitude, height, speed, suspension time and other data of the current navigation point will be displayed after adding the current navigation point.

   To change any of the Waypoints, you can click on the Waypoint Number and the Virtual Keyboard will appear, set the altitude, speed, or hover time of the aircraft for the desired Waypoint.

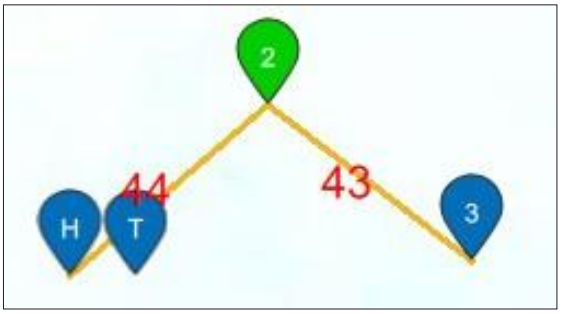


3. If you want to delete the current navigation point, click the trash icon at the bottom of the Waypoint Menu, or right-click for a few seconds. Select as needed and click to Delete Current Waypoint, or Delete All Waypoints.

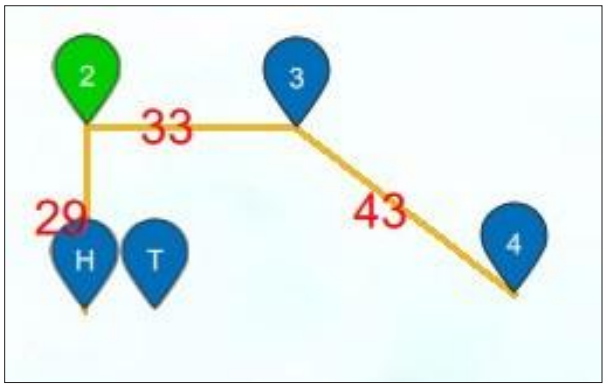


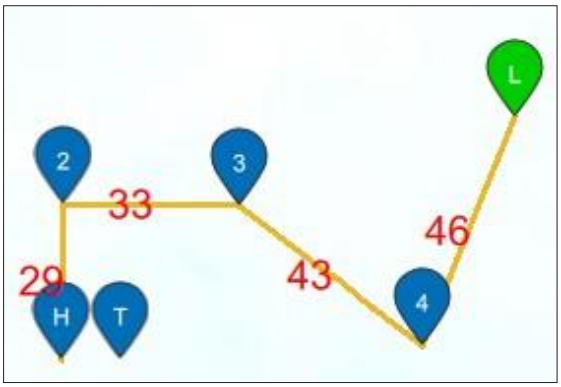


4. Select any waypoint and drag it to modify the position of the waypoint.



5. Select the second waypoint. Long press the screen, click the "insert the waypoint". If clicking "add land point", and add one land point next to the waypoint of 4.

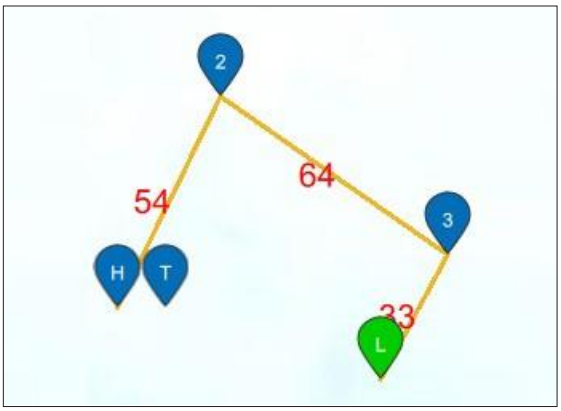




6. If you want the UAS to land in a specific location, select a flat surface location that is close to "HOME point".

   After completing the settings of the mission plan, click to switch to land point adding mode, and double-click the location you want to land on the map.

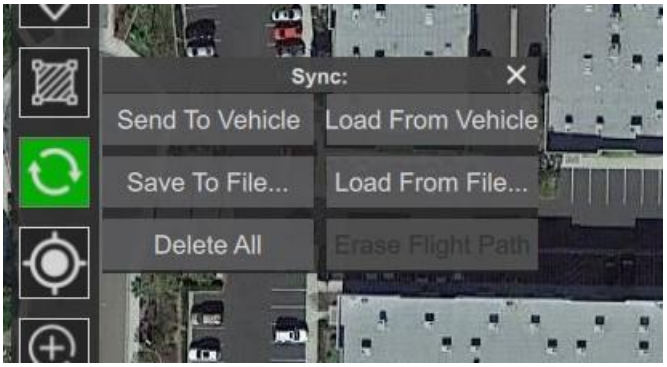
   After setting, "L" is the land point and could be dragged.



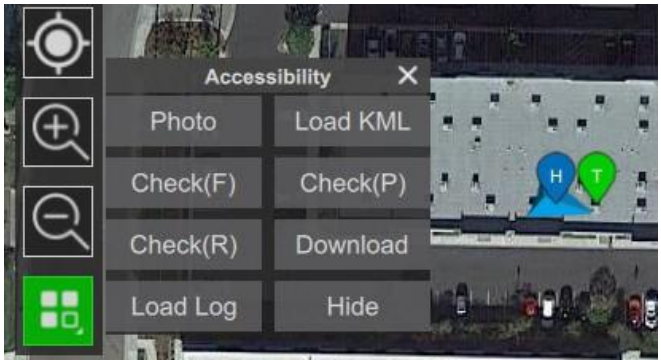
TASK MANAGEMENT

1. Long press the screen after you complete all the needed settings. Select "mission" and click "send to vehicle", clicking Sync to send the mission to the UAS. Then you could ascend the UAS (after 15 meters above the ground), and switch the "auto flight mode" stick in RC.

   Clicking "Photo" during the flight, will send the command to the drone and drone will capture an image accordingly.



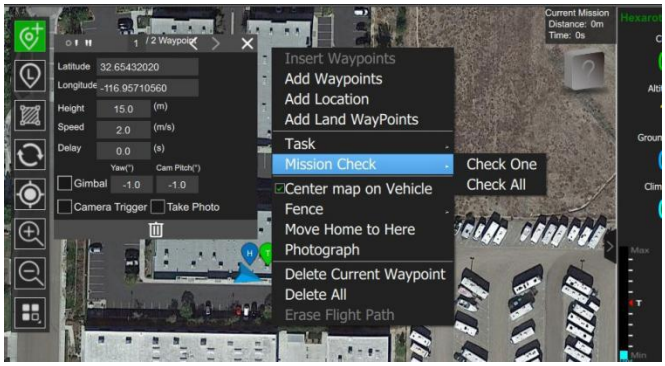
Sync



Accessibility

2. The mission can be downloaded from the drone. After long pressing the screen, click "Mission Check" and download from the drone.

   Or go into Sync, click "Load From Vehicle" to receive the last flight mission set on the drone.

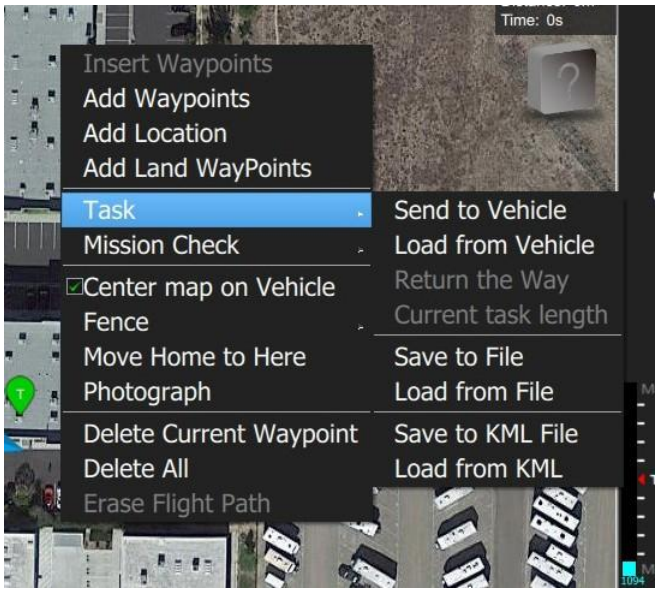


Mission Check

3 Clicking Sync, click "Delete All" to delete route.

4. When the flight is over, click on Sync, or long press anywhere on map, then click "Task", to save the file. Select the save path and file name, then click Save.

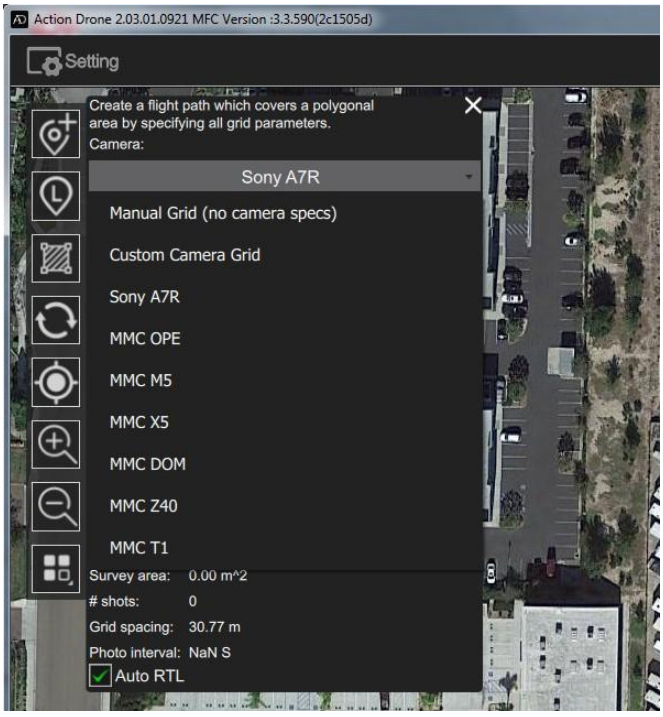
   If you want to perform the same mission next time, click on "Load from File". Then send the mission to the drone, and the aircraft will perform the loaded mission.



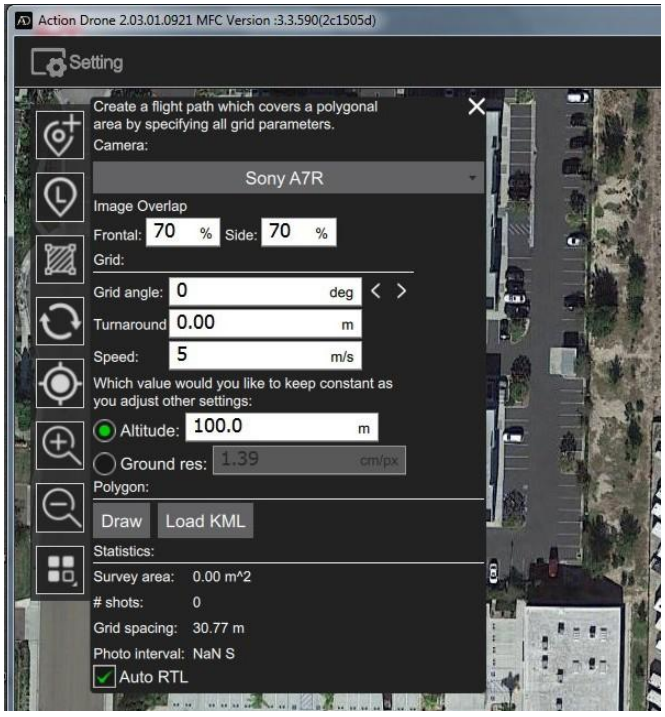
Task

AREA SCAN

Click the area scan button (third icon below the Setting button), and the editing interface will appear.



Camera Selection



Parameter editing interface

1. **AREA SCAN**

   There are a variety of different camera options to select. When selecting a custom camera, follow the steps below to set the parameters:

   1. According to the parameters of the current camera, input the width and height of the sensor. Input the width and height of the photo, the camera focal length, and other basic data. It is suggested to customize parameters for specific cameras, eliminating the trouble of inputting parameters every time;
   2. Image coverage is changeable at front and side coverage;
   3. Change the angle of the waypoint in the drawing area by changing the grid angle (0 degrees in the north);
   4. The turnaround zone is used to control the flight length of the drone outside the drawing area, ensuring a complete scan of the drawn area.
   5. Setting the speed to change the flight speed (cm/s) of the drone during the area scan operation;
   6. Control the resolution of the photo by entering the altitude of the flight or the ground resolution. The scanned area shows the current drawing area. The shooting point shows the approximate number of photos taken by the current parameter. The trajectory of the drone aircraft s the white line that appears after clicking finish scanning.

Selecting the parameter settings for a custom camera grid

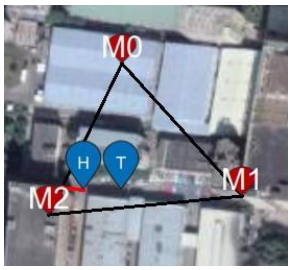
2. **AREA DRAWING**

Method 1

1. Click the "Draw" button;
2. Double-click the position you want to select on the map, then add the point of the polygon you want to scan;
3. When the number of added points is more than three, right click to finish drawing;
4. Click "Finish Draw" or click the right mouse button on the map to complete the area drawing.

Method 2

Draw an area in Google Earth and save it as a .kml file. Then click the button loaded from KML in the drawing function, import the file into the ground station software to complete the drawing.



Selecting the scan area

Scanning area determination

3. AREA ADJUSTMENT (selective use as needed)

1. Click the "Adjust" button, the current area scan area is in the adjustment state;
2. Left mouse click on one of the points, then hold click and drag the current point to the position you want to modify;
3. Complete the adjustment by clicking the "Finish Adjustment" or by right-clicking on the map area.

4. **PATH ADJUSTMENT** (selective use as needed)

Click the "Transpose" button to control the starting point and flight order of the scanned area;

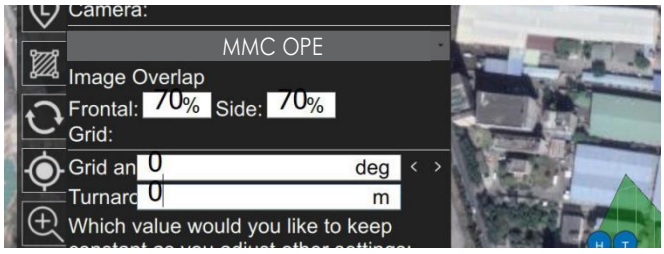
When the drawing is completed, long press the screen to click the task and send to the drone. Then power on the drone. When the drone successfully takes off, switch to the route mode, then the aircraft can automatically perform the task.

5. **WHEN THE SONY A7R IS SELECTED**

Set the grid angle and the turnaround area. Drawing and adjusting are the same as using a custom grid camera.

Using the MMC OPE camera (Figure 3.23), set the grid angle and turnaround area as needed. The drawing and adjustment methods are the same as the custom grid camera. The task is sent to the drone after the drawing is completed.

Sony A7R camera editing interface



PO5 Oblique Photography editing interface

DRONE CONTROL (GCS)

1. **Unlock**

   Click unlock, then swipe to unlock. Click take off. Set the flying height on the right, swipe, and click to take off.

   Note: The aircraft must be unlocked in the ALT Hold mode to unlock!

Switch Mode, Click to switch to the guiding flight

2. **Mode switch and guiding flight**

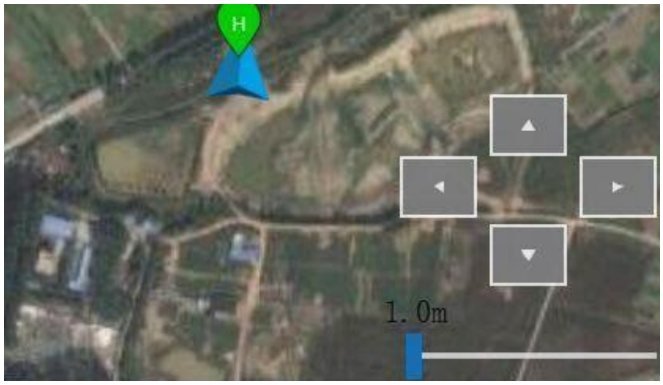
   - When the aircraft is in the air, push the throttle to the neutral position, switch to the guiding flight mode.
   - Select the guiding position on the map, then double-click the map, adding the guiding point, swipe the slide to do guiding flight.
   - Switch to brake mode and the airplane will hover at the current position.

Mouse Guiding Flight

3. **Head direction deflection and aircraft movement**

   This function is used to hover the aircraft at the current position and adjust the direction of the nose while the aircraft is flying in the air. This function also can be used to move the aircraft forward and backward in the direction of the map.

   - Click the upper right of the ground station to switch the flight mode into guidance mode.
   - If clicking yaw towards the left, then the head of the drone will head towards left for 5 degrees, if clicking yaw towards the right, then the head of the drone will head towards right for 5 degrees.
   - Click the upper direction button, the drone will fly towards the upper side of the map, the flying distance can be selected by dragging the slider.
   - Click the downward direction button, the drone will fly towards the downward of the map.
   - Click the left button for flying towards left, click the right button for flying towards the right.



The operation interface of Guidance Mode

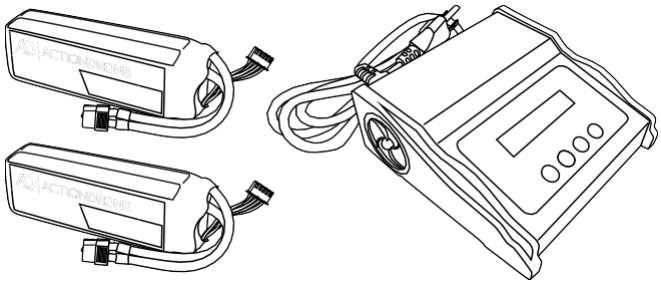
BATTERY SAFETY

BATTERY

Warnings & Usage Guidelines

WARNING: Lithium Polymer (LiPo) batteries are significantly more volatile than alkaline, NiCd or NiMH batteries. All instructions and warnings must be followed exactly to prevent property damage and/or serious injury. Mishandling LiPo batteries can result in fire. By handling, charging or using LiPo batteries, you assume all risks associated with LiPo batteries.

The user declares that he/she has read and understood all safety instructions before use, agrees to take full responsibility of results caused by improper use, and will not hold Shenzhen MicroMultiCopter co. Ltd (including, but not limited to its resellers, vendors, and/or affiliates) accountable whatsoever. See Battery Safety Handling in Safety section.



Battery Charger

Refer to battery charger user manual for detailed operations. Model varies. 22000mAh 6s 25c battery charges within 4.2V-6A. Remote controller battery charges within 4.2V-2A.

While the charger is capable of charging the battery, it also can perform other primary functions such as cell balancing and discharging. Never leave battery charger unattended while charging. Always unplug fully charged batteries from charger (listen for beeping alerts).

Battery Life

The battery life meter can be checked using either the battery charger (prior to flight), a portable LiPo Voltage Checker and Balancer (not included), or by viewing the OSD on the FPV screen during flight. During flight, when the battery is at 20-25% battery life, we recommend landing the drone. Never fully drain battery charge upon use it may significantly reduce battery life and / or destroy the battery.

BATTERY SAFETY HANDLING

- Always keep battery away from flammable objects.
- Never charge above 5A.
- Never disassemble or modify pack wiring in any way or puncture cells.
- Never exceed the maximum of discharge rate or load.
- Never fully drain battery charge upon use.
- Never leave batteries, chargers and power supplies unattended during use.
- Never attempt to charge low voltage, ballooned/swollen, damaged or wet batteries.
- May explode if damaged or disposed of in fire.
- Store long term at 3.8v per cell. Avoid unnecessary charge cycling.
- When charging, transporting or temporarily storing the LiPo battery the temperature range should be from approximately 40–120° F (5–49° C). Do not store the battery or aircraft in a hot garage, car or direct sunlight; the battery may catch fire.
- In cold environments, allow the battery and aircraft to warm up 1-2 minutes before take off.
- Recommended storage: Fire proof cabinets, safes, or ammo cartridge cases.
- Keep a nearby fire extinguisher near charging batteries.

PRE-FIELD CHECKLIST**

Flight assignment unique ID#:_____ Date checklist completed (MM/DD/YYYY):____/_____/ 20____

PREFLIGHT DATA CHECK

- ☐ Weather report OK?
- ☐ Airspace OK?
- ☐ NOTAM OK?
- ☐ Flight location good
  - ☐ No obstructions
  - ☐ No site disturbances
- ☐ Backup Flight location
  - ☐ No obstructions
  - ☐ No site disturbances
- ☐ Flight Mission planned?
- ☐ Obtain all required permissions
- ☐ Insurance OK?
- ☐ Area / task specific clothing and personal equipment checklist OK?

BATTERIES CHARGED

- ☐ UAS Flight Batteries
- ☐ Radio controller
- ☐ Telemetry
- ☐ Ground Station(s)
- ☐ Sensor(s)
- ☐ Comms radios

GROUND STATION

- ☐ Laptop charged and updated?
- ☐ Tablet charged and updated?
- ☐ LCD Screen tested and working?
  - ☐ Antennas

FIELD EQUIPMENT

- ☐ Table
- ☐ Canopy
- ☐ Bench/Chairs
- ☐ Landing Pad
- ☐ Cones
- ☐ Fire Extinguisher
- ☐ Generator
  - ☐ Gasoline
  - ☐ Extension Cords
  - ☐ Power Strip
- ☐ First Aid Kit
- ☐ Tripod
- ☐ Two-way comms radios

UAS FAULT / READY CHECK

- ☐ Arms
- ☐ Propellers
- ☐ Legs
- ☐ Battery Tray / Straps
- ☐ Sensor SD Cards ready?
- ☐ Sensors work and transmit?

TOOLS

- ☐ Hex Screwdrivers
- ☐ Pliers
- ☐ Zip ties
- ☐ Tape
- ☐ Battery Checker

TASK ASSIGNED PERSONNEL:

- ☐ Pilot:_____
- ☐ Co-Pilot:_____
- ☐ Assistant(s): _____

CHECKLIST COMPLETED BY:

- ☐ Name: _____ Signature: _____

FLIGHT CHECKLIST AND FLIGHT LOG

Flight assignment unique ID#: _____

Flight date (MM/DD/YYYY):_____/_____/ 20____ Take-off time (24H - HH:MM):_____: _____

Location:_____ UAS ID#: _____

Assignment / task description:

Pilot:_____ Co-Pilot: _____

BEFORE GOING TO THE FIELD:

- ☐ **PRE-FIELD CHECKLIST completed

IMMEDIATELY BEFORE FLIGHT
(Chronological order):

- ☐ Last UAS hardware check
  - ☐ Propellers and motors secured
  - ☐ Sensors / Payload secured
  - ☐ Visual frame check
  - ☐ Arms locked
  - ☐ Legs secured
  - ☐ GPS secured
  - ☐ Batteries mounted correctly
  - ☐ Antennas on and folded out
  - ☐ SD Card in UAS / Payload
  - ☐ CG checked
- ☐ Flight area clear
- ☐ Take off and landing area safe
- ☐ Check wind conditions
- ☐ Controller on and transmitting
- ☐ Ground Station on and connects
- ☐ UAS on
- ☐ Compass OK
- ☐ Mission uploaded
- ☐ Satellites OK
- ☐ RTK OK
- ☐ Home set correctly
- ☐ Camera(s) on and functioning

LAST CHECK FOR TAKE-OFF
(Chronological order):

- ☐ All downlinks working
- ☐ Personnel informed and ready
- ☐ IMU Temp at 55°C
- ☐ Battery at 100%
- ☐ RSSI signal strong
- ☐ Correct flight mode selected
- ☐ Arm UAS

AFTER FLIGHT DATA:

Total flight time (Minutes): _____

Number of takeoffs: _____

Battery number(s) used: _____ _____

Mission Briefing: _____

_____

_____

_____

_____

CHECKLIST AND LOG DONE BY:

- ☐ Pilot:_____ Signature:_____
- ☐ Co-Pilot:_____ Signature:_____
- ☐ Other: _____ Signature: _____

TERMS

TERMS & CONDITIONS

By using this product, its' website and/or products manufactured by Shenzhen MicroMultiCopter co. Ltd (MMC), you automatically agree to the terms and policies laid out herein, this Manual, and all other revised versions set forth.

GENERAL | MMC sells multi-rotor systems, components, and a variety of products made by manufacturers. MMC requires the Purchaser to be familiar with the proper use of multi-rotor technologies. All products are sold as is, without any guarantee that you have the right to use it in your country. The Purchaser is fully responsible for ensuring and obtaining the proper radio licensing (in the USA, "HAM" required for FPV and/or UHF long range systems or video transmission equipment), adhering to your government's rules and regulations.

ARTTERMS | The recipients of this Manual (and their correspondents) agree not to distribute, sell, or misuse the content and artwork of this material outside the specified MMC intentions. The artwork, background, images and logos are property of MMC and may not be used, sold, or reproduced without written permission whatsoever.

LIABILITY | MMC will not be held responsible for your actions, injuries, or damages caused by or through any products sold or endorsed on this website (including, but not limited to its resellers, vendors, and/or affiliates), by improper or even proper use, under any circumstance whatsoever.

SAFETY | The Purchaser acknowledges full understanding of the inherent danger involved when operating multi-rotor and other aerial models. Spinning propellers can cause severe injury. Warning: Never work on your models with mounted propellers.

WARRANTIES | MMC provides no warranties of any kind with the use of the systems sold. Manufacturer defects will be repaired and replaced by MMC. If damages are caused by user, please see RETURNS section.

LIABILITY | Users and Purchasers accept ALL responsibilities. MMC will NOT be held responsible for your actions, injuries, or damages caused by or through any products sold or endorsed on this website, by improper or even proper use, under any circumstance whatsoever.

SHIPPING | The Purchaser must accept all Mail Carriers used by MMC (USPS, UPS, FedEx, etc). Each product is carefully packaged to prevent shipping damage. MMC has no control over the internal processes, delays of Mail Carriers, nor will be held liable for any damages, mistakes, custom holds, lost packages, or other issues made by the Mail Carriers or the local postal system in your country. For orders shipped outside USA, you are fully responsible for any and all import duties your local customs office may impose on your order. If a package is returned to MMC due to the Mail Carrier's inability to collect customs duties or deliver the package to your provided ship-to address, MMC will not refund shipping costs when and if the package is returned to MMC.

RETURNS | Each assembled Flying Platform is flight tested and approved. MMC will only accept returns for items unused and in their original packaging, manuals, cables, etc. A 10% restocking fee will be required. The Purchaser is responsible for shipping fees and items packaged must be protected with packaging that prevents shipping damage. It may take up to 2-3 weeks for funds to be refunded into the Purchaser's bank.

If the item is repairable, MMC can assist in walk-through repair recommendations via phone or email, but will not be responsible for any damages further caused by the Purchaser or Mail Carrier. MMC can repair the items for a negotiable fee. The Purchaser will be responsible for all shipping fees.

IN NO EVENT SHALL MMC BE LIABLE FOR SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES RELATED TO THE USE OF PRODUCTS SOLD. INDEMNITY: PURCHASER SHALL INDEMNIFY AND HOLD HARMLESS MMC, ITS OFFICERS, DIRECTORS, AGENTS, REPRESENTATIVES, MANUFACTURERS, VENDORS AND EMPLOYEES FROM ANY AND ALL CLAIMS, LIABILITIES, DAMAGES, AND EXPENSES (INCLUDING ATTORNEYS FEES ACTUALLY INCURRED) ON ACCOUNT OF DEATH OR INJURY TO ANY PERSON OR DAMAGE TO ANY PROPERTY ARISING FROM OR IN CONNECTION WITH ANY GOODS SUPPLIED. THIS INDEMNITY SHALL APPLY WITHOUT REGARD TO WHETHER THE CLAIM, DAMAGE, LIABILITY OR EXPENSE IS BASED ON BREACH OF CONTRACT, BREACH OF WARRANTY, NEGLIGENCE, STRICT LIABILITY, OR OTHER TORT.

MMC DRONE SUPPORT

Contact MMC for questions and technical help.
Shilong Community, No.1 Yihe Road,
MMC Tech Park, Shiyan Street,
Bao'an District, Shenzhen City,
Guangdong Province,
PR China

Monday–Friday, 9am-6pm

SMC6-1550 User Manual

This device complies with part 15 of the FCC Rules. Operation is subject to the condition that this device does not cause harmful interference (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.
Changes or modifications not expressly approved by the party responsible for compliance
could void the user's authority to operate the equipment.
NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.
If this equipment does cause harmful interference to radio or television reception,
which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:
-- Reorient or relocate the receiving antenna.
-- Increase the separation between the equipment and receiver.
-- Connect the equipment into an outlet on a circuit different
from that to which the receiver is connected.
-- Consult the dealer or an experienced radio/TV technician for help.
To maintain compliance with FCC's RF Exposure guidelines, This equipment should be installed and operated with minimum distance between 20cm the radiator your body: Use only the supplied antenna.