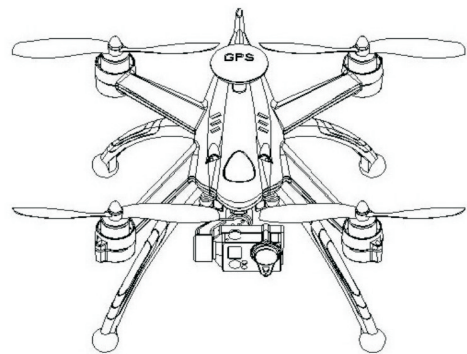


FLYING3D

FY-X8

The Flying X8 Quadcopter Flight Manual



2.4 HZ **AFHDS 2A**
AUTOMATIC FREQUENCY
HOPPING DIGITAL SYSTEM

<http://www.flying3d.cn>

FLYING3D RC

WARNING:
This product is suitable for
14 years old and above.
警告：此产品适合14岁及以上年龄者使用。

Congratulations on purchasing your Flying X8 Quadcopter. We suggest you read this manual to fully understand the functions of this X8 and the operation of its transmitter. Please read our flying tip sheet at the end of this manual. Should you have questions please mail us for more details.

Disclaimer

Please read the instructions carefully before using this product, you are deemed to have read this manual at least once before using this product. This product is not suitable for minors under 18 years old. This product is Multi Rotor Quadcopter with a Remote Control System. The System can control the Quadcopter's attitude with highly targeted and high precision position control. Under the normal power and power supply circumstances, this Quadcopter can provide you an excellent flight experience and flight performance. However, even though the safety of the flight control system has been optimized and upgraded, we still suggest you to remove the propellers during debugging or upgrading. Also, please make sure you fly the Quadcopter away from crowds, flammable items and anything it could damage. Enjoy your flying time and please fly responsibly and with respect to other people's privacy.

Our company will not undertake the responsibility for any loss, personal injury, accident caused by any of the below reasons:

1. The damages caused by using the product under any drink, drugs, drug anesthesia, dizziness, fatigue, nausea, and other physical or mental condition.
2. The personal injury and the property damage, etc. that is caused by the users willful intention or compensations caused any accident that leads to mental damage.
3. Assembly or manipulation by not following the correct guidance of the product's manual.
4. The defective operation damages caused by modification in any way.
5. The damages caused by the user's operation and bad judgment.

6. The damages caused by the Quadcopter's natural wear and tear corrosion and aging processes.

7. The crashes Quadcopter damages that were caused by not landing the Quadcopter after being given abnormal warnings.

8. The damages caused by flying the Quadcopter in an abnormal state i.e. filled with water, oil, soil, sand and other unknown substances and not assembly completely, or the main components have obvious defects or faults.

9. The damages caused by flying the Quadcopter when there is magnetic field interference, radio interference, and government's no-fly zone or by a drivers backlight, blocked by a barrier, blurred vision, fog and other condition that is not suitable for controlled flight.

10. The damages caused by flying in adverse weather condition, such as rain strong wind, snow, hail and other inclement weather.







11. The damages caused when the Quadcopter has suffered a collision, overturning, fire, explosion, lightning, storms, tornadoes, storms, floods, tsunamis, subsidence, ice trapped, avalanche, hailstorm, debris flow, landslide, earthquake, etc.




12. The losses caused by using the Quadcopter to obtain any infringement data, either audio or video, or by invading privacy.

13. The damages that were caused by improper use of the battery protection circuit, battery pack, Quadcopter and matching chargers.



14. Any losses caused outside the scope of our Company's responsibility.

Always Follow the Safety Guide

-  Don't fly at night or in bad weather, in rain or thunderstorms as this can cause erratic operation or loss of control. It's irresponsible and dangerous so don't do it.
-  Make sure the moving direction of all motors is in accordance with the operating instructions. If incorrect please adjust the direction first.
-  The shutdown sequence must be to first disconnect the Quadcopter battery then to switch off the transmitter, (If the transmitter is switched off while the receiver is still powered, it may lead to uncontrolled movement or the engine starting and this can lead to an accident. Please be sure to always follow this sequence otherwise you may cause unwanted issues.
-  Always remember that the 2.4G RC system could affect a plane or the car in your vicinity when you power up the transmitter.
-  Do not operate in the following places:
 - Near other sites where other radio controlled activity may occur.
 - In the vicinity of people or public highways.
 - On any water mass where passenger boats may be present.
 - Near high tension power lines or communication broadcasting antennas as interference could cause loss of control.
 - Improper installation of your Radio Control System in your Quadcopter could result in serious injury.
-  Never operate outdoors when it's raining or rain is forecast or fly when visibility is limited. Should any type of moisture (water or snow) enter the components of the system, erratic operation and loss of control may occur.

-  Do not operate this R/C system when you are tired, not feeling well or under the influence of alcohol or drugs. Impaired judgment may lead to dangerous situations including injuries to yourself or others.
-  Do not touch the engine, motor, speed controller or any other parts of the Quadcopter that will generate heat while the Quadcopter is operating or immediately after use. Those parts may be very hot and can cause serious burns.
-  Please make sure you thoroughly check the Quadcopter before every flight. Any problem in radio control system or improper installation may cause loss of control.

Simple test methods

-  Please stop the operation if any exceptional movement occurs.
-  Turn on the power; please ensure the throttle is in the neutral position at its lowest position every time the transmitter is turned on. When making adjustments to the Quadcopter make sure the engine is turned off otherwise you may unexpectedly lose control and create a dangerous precedent.

Contents

1. Introduction to the Quadcopter and its functionality, and all the parts
 2. Introduction of the transmitter and the button of the transmitter
 3. How to mount the propeller and the landing stand
 4. Compass calibration and other calibrations
 5. Flying mode, flying function introduction
 6. How to control the Flying X8 Quadcopter including changing modes, using the one key return and the AOC (headless) function
 7. How to start and launch the Quadcopter
 8. How to turn off the Flying X8 Quadcopter
 9. The low battery alarm and auto low battery return functions
 10. The OSD
 11. The transmitter
 12. The specification of the Quadcopter, battery and transmitter
- Appendix: Flying tips for the X8 Quadcopter

1. Introduction of the Quadcopter's functionality

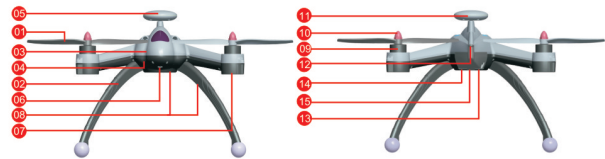
1.1 Function Overview

Aircraft Control System Overview

1. Integrated with Balance Meter, pressure meter & Gyroscope
2. 3 flight modes (Stated Mode, Height Mode, GPS Mode), 2 flying function (Self Returning & AOC)
3. High precision GPS support, high precision fixed-point, constant speed, and with good resistance to wind.
4. High precision high, climbing at a constant speed, automatic landing, and with good resistance to wind
5. Effectively enhancing the flight safety and reduce drop probability by self-course reversal and hover when losing control.
6. Intelligent landing detecting, the power output will stop at landing--providing a perfect landing.
7. Low voltage protection, low voltage automatic landing, significantly prolongs the service life of the battery.
8. Automatic course control, in spite of the Quadcopter's heading direction. (Headless)

- 9. Calibrating and starting flying with no need to contact the computer.
- 10. USB hub available, no driver required.
- 11. Flying log recording and playback, massive SD card ensuring long data record.
- 12. Automatically firmware upgrading online.
- 13. System one key recovery.
- 14. Flying area restriction the height and distance can be auto controlled.

1.2 Flying X8 Quadcopter Parts



Number	Name	Lcon	Number	Name	Lcon
FY-X8-01	The propellers		FY-X8-09	The motors	
FY-X8-02	The landing stand		FY-X8-10	Motor cap	
FY-X8-03	Upper bldy shell		FY-X8-11	The GPS module	
FY-X8-04	Bottom bldy shell		FY-X8-12	The LED lights	
FY-X8-05	GPS cover		FY-X8-13	The gimbal mounting interface	
FY-X8-06	USB Interface		FY-X8-14	The battery compartment	
FY-X8-07	PB2.6*6 Screw		FY-X8-15	Battery	
FY-X8-08	M3*6 Screw		FY-X8-16	Charger	

2. Introduction to the remote control transmitter and the switches and buttons on the transmitter

The 2.4GHz radio band has a completely different behavior than previously used lower frequency bands. Keep always your Quadcopter in sight as any large object can block the RF signal and lead to loss of control and danger. The 2.4GHz RF signal propagates in straight lines and cannot get around objects in its path. Never grip the transmitter antenna when operating a Quadcopter as this degrades significantly the RF signal quality and strength and may cause loss of control and danger

This radio system works in the frequency range of 2.405 to 2.475GHz. This band has been divided into 142 independent channels. Each radio system uses 16 different channels and 160 different types of hopping algorithm. By using various switch-on times, hopping schemes and channel frequencies, the system can guarantee a jamming free radio transmission.

This radio system uses a high gain and high quality multi directional antenna. It covers the whole frequency band. Associated with a high sensitivity receiver, this radio system guarantees a jamming free long range radio transmission.

Each transmitter has a unique ID. When binding with a receiver, the receiver saves that unique ID and can only accept from that unique transmitter. This avoids picking another transmitter signal and dramatically increases interference immunity and safety.

This radio system uses low power electronic components and a very sensitive receiver chip. The Modulation uses intermittent signal transmission thus reducing even more power consumption. Comparatively, this radio system uses only a tenth of the power of a standard FM system.

AFHDS2A system has the automatic identification function, which can switch automatically current mode between single-way communication mode and two-way communication mode according to customer needs. The two-way communication mode with data return function can help users understand current working status better and make the fight more enjoyable.

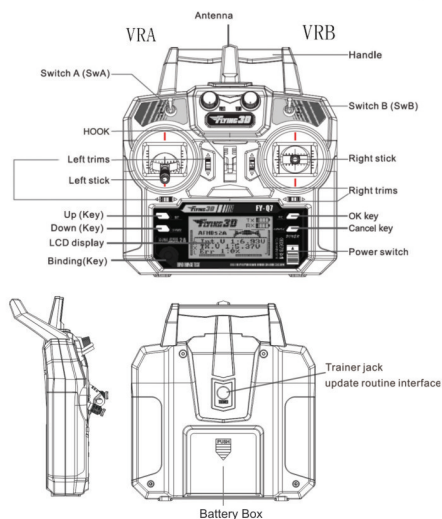
AFHDS2A has built-in multiple channel coding and error-correction, which improve the stability of the communication, reduce the error ratio and extend the reliable transmission distance.

2.1 Main controlling panel

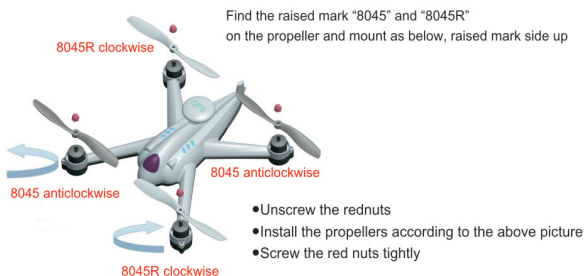
1. Switch A (SwA), a three steps switch with 3 positions (1.2.3): Upper position For Stated mod; Middle for altitude mode; Bottom position for GPS mode.

2. Switch B (SwB), a three steps switch with 3 positions (1.2.3): Upper position for normal flying; middle to trigger AOC (headless) function; bottom position to trigger automatic return.

3. Control Knob VRA, VRB for Gimbal or servo rudder controlling.



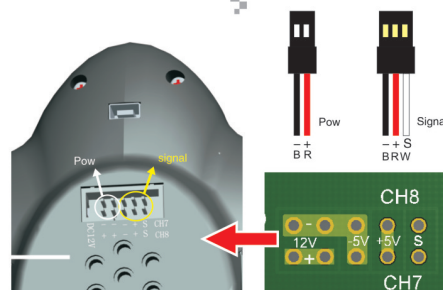
3. Mounting the propeller and the landing stand



- The screws and the landing stand are in the box
- Use a screwdriver to fix it on the underside of the body



3.1 How to connect the Gimbal and image transmission system



1. There are power lines and signal lines come from the brushless gimbal or servo gimbal. Power lines has two strings, red for "+" and black for "-". Signal line has three strings and three interfaces, besides red and black, there is a white string "S" used for signal. Please connect those interfaces to the interface panel on the bottom of the body shield, according to the pic illustrated above.
2. For Servo gimbal you have to connect the signal line to both CH7 and CH8, for brushless gimbal you only have to connect to Ch7.
3. Please be careful when you connect, don't reverse the "- "+".

4. Compass calibration

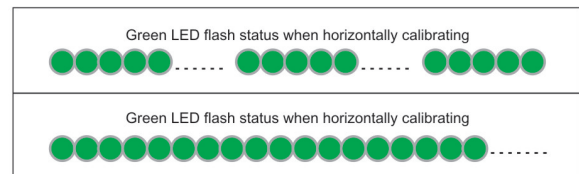
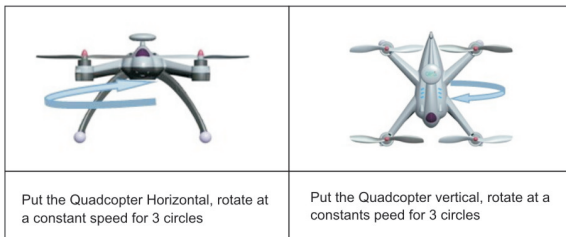
By measuring the earth's magnetic field to calculate the Quadcopter' course a different environment will cause the change of the magnetic field. So you must calibrate the electronic compass the first time you use it or after any crash. If you don't it may cause a malfunction in flying and could lead to an accident.

Once any of the following circumstances happen, must always recalibrate the electronic compass

- When used and installed to the Quadcopter for the first time.
- More than 10 km from the last calibration.
- If a crash occurs.

4.1 Calibration Process

1. Turn on the transmitter, keep the throttle at the lowest neutral position and then connect the system power supply.
2. Quickly move the mode switch A fully up and down a few times (see switch SWA) until the LED is continuously rapidly flashing green. The LED is located at the bottom of the aircraft as shown on section 1.
3. Put the Quadcopter in a horizontal position and apply a uniform and continuous rotation in one direction until the green LED stops flashing.
4. Turn the Quadcopter head down; keep the vehicle vertical and apply a uniform and continuous rotation in one direction until the green LED stops flashing.
5. Now the LED become blue, put it horizontal and cut off the power for a second and turn on again.



If a cycling phenomenon occurs after correctly installing the electrical compass calibration and GPS installation, please ensure you calibrate the electrical compass again.

5. Flying mode, flying function introduction

	Stated mode	Height mode	GPS mode
The transmitter input	linearity control		
The steering Lever	Push lever to middle can keep fuselage Horizontal, push lever Max can keep fuselage in 45° tilt	Push lever to middle to lock position automatically. Push lever in Max can keep 4m/s speed	
The throttle lever	The throttle lever Controls the motor speed directly	Push lever to the middle to lock height. Push forward to ascend. Pull backwards, to descend.	
Position lock	NO	NO	YES
Lifting speed	unlimited	Max 4m/s	
Self-course reversal	support	support	support
Flying pace	Unlimited	Unlimited	Max 5m/s

5.1 Flying modes

5.1.1 Stated Mode

In the stated mode, the Quadcopter will control the flight balance automatically. The transmitter lever can control the attitude accordingly, such as pushing forward, the Quadcopter fuselage, pushing to middle the Quadcopter can keep fuselage Horizontal. The Quadcopter will enter into the hover state automatically at the runaway site, while, if the signal received again, users can control the Quadcopter again.

5.1.2 Height Mode

Under this mode, Quadcopter will not only keep steady automatically, but also lock the flying height when the throttle lever is in the middle. When the stick is push forward, the Quadcopter ascends; when the stick is pushed back the Quadcopter will descend.

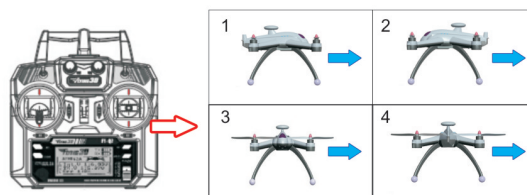
The Quadcopter will enter into the hover state automatically when losing signal, when the signal is received again the user can control the Quadcopter again.

5.1.3 GPS Mode

The Flying X8 Quadcopter provides users with a more simple and easy flying experience, when the steering stick is pushed to the middle, the position of the Quadcopter will be locked automatically and maintain high-precision hovering. It can perform a stable hover in light wind as it has been designed for effective wind-resistance. In this mode, the lever can control the flying speed accordingly. With the stick in Max can it can reach 5m/s speed.

For the satellite GPS, you must ensure that the satellite has been found, otherwise the Quadcopter will not be able to hover.

5.2 AOC(automatic course control)

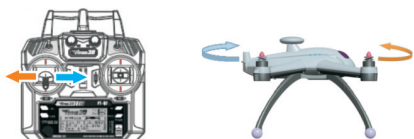


By Switch the SwB to middle position, you can turn on the AOC function, the course of the aircraft can be controlled by this function. The forward direction of the aircraft has nothing to do with its actual course. This is often known as "Headless" flying.

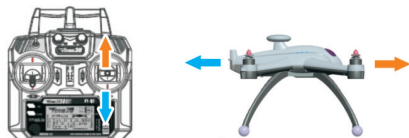
6. Controls



- The throttle stick controls the Quadcopter's elevation.
- Push the stick forward and the Quadcopter will ascend
- Pull the stick backwards and the Quadcopter will descend.
- Under the Height or GPS Mode,
 - a. The Quadcopter will automatically hover and hold its altitude if the sticks are centered at Height or GPS mode.
 - b. Pushing the throttle stick above the centered position will result in the Quadcopter taking off.
- We suggest that you push the throttle stick slowly to prevent the Quadcopter from sudden and unexpected ascent.



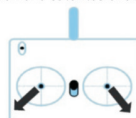
- The throttle stick also acts as the yaw and controls the Quadcopter's rudder.
- Push the stick left and the Quadcopter will rotate Counter clock-wise.
- Push the stick right and the Quadcopter will rotate Clock-wise.
- The throttle stick controls the rotating angular velocity of the Quadcopter. Increasing movement of the stick results in faster Quadcopter rotation velocity.



- The steering stick controls the Quadcopter's tilt
 - a. Push the stick forward and the Quadcopter will tilt and fly forward.
 - b. Pull the stick backwards and the Quadcopter will tilt and fly backwards.
 - c. Pull the stick sideways and the Quadcopter will tilt and fly sideways.
- The Control knob VRA VRB as shown on Section 2 is used to adjust the angle of the camera (if you have assembled a 2D or 3D gimbal)
- The trim buttons as shown on Section 2 are used to adjust any drifting that may occur when in stated mode.
 - a. If the Quadcopter drifts backwards, repeatedly press the trim button forward until the drifting stops.
 - b. Repeatedly press the trim backward if the Quadcopter drifts forward until the drifting stops.
 - c. Apply similar process if the Quadcopter drifts left or right

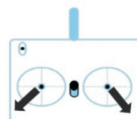
7. How to start and launch the Quadcopter

- Connect the battery
 - Power on the transmitter, set all buttons in the original positions
 - Wait until transmitter connects with a satellite and the Quadcopter (check in the OSD)
- Connection of 8 satellites or above are recommended for a perfect performance in GPS mode.



- Pull the throttle like this to launch the motor
- Start the flight

8. How to Land the Quadcopter



- Pull the throttle like this to stop the motors
- Disconnect the battery
- Power off the transmitter

9. The low battery alarm and auto low battery return functions

9.1. Preset Low Voltage & Time for Return Flight

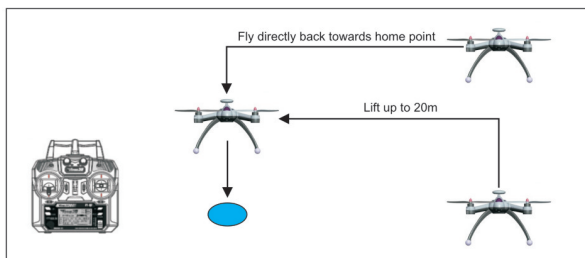
A Low Voltage is preset by default to indicate the time for user to start return flight. When the Quadcopter's battery voltage is lower than the preset Low Voltage, the battery sign on the transmitter will flash with an alarm. In this case, you are advised to start to fly this Quadcopter back to home point for ensuring enough power in the course of return.

9.2. Preset Return Voltage & Auto Return

The preset Return Voltage serves as a final warning, and it is the voltage lower than the Preset Low Voltage. When it occurs, the Quadcopter will completely take over your control and launch its procedure for auto return to the home point.

Warning: If this Quadcopter is forced to take over your control due to voltage dropping to the Present Return Voltage, the power remaining may be insufficient for a successful return flight if it is over 50 metres away from the home point. Therefore, when the battery power drops to the Preset Low Voltage, you are recommended to fly this quadcopter back to the home point or to an area within 50 meters away from the home point, either by manually flying it back or by using the auto return feature.

9.3 The Auto Return Procedure



The auto return works in the below procedure:

1. Hover & Wait for 3 seconds
2. Lift up to 20m
3. Fly directly back towards home point
4. Hover for 10 seconds above home point and start the intelligent self-landing.

Apart from the Return Voltage mentioned above, the auto return procedure can also be activated by manually moving the Switch B to position 3 under the GPS mode, or by unexpected signal disconnection under GPS mode (if not it would keep hovering at where it loses its signal).

10. The OSD

Push up or down the button on the transmitter to enter the OSD panel.

You can find all your flying information here (Longitude, altitude, battery voltage, speed satellite etc.)

Important: When you find the satellite details in the OSD, please make sure you have connected with more than one satellite before using the GPS mode or recording the home point. The Home point will record as soon as you have connected to one satellite.

Altitud 0.0 m	Voltage 0.0 v
Distanc 0.0 m	Speed 0.0 m

Satelli 0	Course 0
HDOP 0	HCourse 0

Lon 0	Lat 0

11. Introduction to the Transmitter menu

11.1 Warning



For your safety, the 4 switches on the transmitter must be in their off position and the throttle stick must be the lowest position when turning the transmitter on. If not, a warning screen will be displayed until all switches are in the right position.

11.2 Main menu



The main menu is separated into two main sections, system setup and functions setup. The system menu allows you to set up the transmitter and manage up to 20 Quadcopters. The function menu is used to set up each Quadcopter separately. To enter the main menu, long press the "OK" key. Use the "Up" and "Down" Key to select the desired section and press "OK". Then, use the "Up"

And "Down" Key to select the desired submenu and press again "OK". Most of the following screen work is in accordance with this simple scheme:

1. Use the "OK" key to select the parameter to modify.
2. Use the "Up" and "Down" key to modify the value of the selected parameter.
3. Press the "Cancel" key to exit and save the new parameters.
4. Press the "Cancel" key to exit without saving the new parameters.

To return to the previous screen, press the "Cancel" key. You can repeat that operation until the main screen shows.

11.3 System settings



11.4 RX Battery



Low voltage setting: Set the minimum voltage value. The battery is empty when the actual battery voltage value is lower than this value.

Alarm voltage: set the alarm voltage. An audible alarm rings and the receiver battery icon in the top tray blinks when the actual battery voltage value is lower than this value.

High voltage: set the maximum voltage value. The battery is in full charge state when the actual battery voltage is equal to this value.

11.5 Firmware update



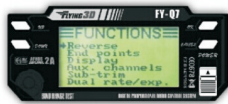
Prior to activating this function, connect the USB cable between the back interface of the transmitter and a PC computer. A confirmation will be asked since all functions will be halted. Turn off any receivers before entering this mode. To exit this mode, simply turn the transmitter off and on.

11.6 Factory reset

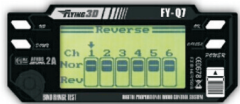


This function will restore all of the transmitter settings to their factory default. All system and modes settings will be lost. Since this function will delete saved setting a confirmation will be asked.

11.7 Functions settings



11.8 Reverse settings



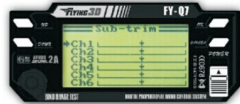
This function allows you to reverse a channel. Set all channels according to your Quadcopter mechanics.

11.9 Display settings



This screen displays the status of all the 6 channels as they are transmitted to the Quadcopter. It includes all the mode settings and algorithms if the student mode is not activated.

11.10 Sub-trim Menu



This function allows you to adjust the middle point of each servo. This is especially useful when this middle point cannot be mechanically fine adjusted.

12. Specification of Quadcopter and battery and transmitter

Aircraft	Weight (Battery & Propellers Included)	860G
	Hover Accuracy (Ready To Fly)	+/-0.2m/s
	Max Yaw Angular Velocity	30°
	Max Tilt Angle	45°
	Max Ascent / Descent Speed	5M/S
	Max Flight Speed	GPS Mode 5m/s Stated Mode 10m/s
	Diagonal Length	350mm
	Power Consumption	5V/2A
	Flight Time	7-10 Minutes or 26 minutes (5000mah battery)
	Take-Off Weight	less than 1300G
	Operating Temperature	10C° to 50C°
	Supported Battery	11.1V 2200mah----5000mah
Battery	Type	Li-based
	Capacity	11.1V 2200mah or 11.1V 5000mah
	Charging Environment Range	0C° to 40C°
	Discharging Environment Range	20C° to 60C°
2.4GHz Remote Control	Operating Frequency	2405 to 2475HMZ
	Communication Distance (Open Area)	more than 500m
	Receiver Sensitivity (1%PER)	-105dbm
	Working Current/Voltage	120ma
	Battery	1.5VAAA*4
	Channels	141 channles

Appendix: Flying tips for the X8 Quadcopter

We want YOU our valued customer to get the best out of your flying experience with the FX8 Quadcopter, please read the FX8's flying tips. The FX8 is a great flying machine look after it, fly safe and it will give you endless hours of pleasure.

- Firstly always fly with the sun behind you to avoid getting the sun in your eyes and losing sight of your FX8.
- Never fly the Quadcopter behind you or above you, make sure it is always in front of you.
- Try and find a large grass field, take off gently.
- When flying any new machine keep to the rule of fly low and fly slow.
- If you crash land your FX8 on grass you are unlikely to inflict any serious damage but after any crash landing be sure to check carefully for any damage, check you propellers making sure they spin freely and make sure there is no grass or fibers wrapped around the propeller shafts.
- Try not to fall inverted as the chances of damaging your motors are greatly increased.
- Always take a rest between flights.
- Don't over kill the batteries. (One battery is never enough, always have a few spares charged and ready).
- Don't over heat the motors; let them cool down between flights.
- Always re-calibrate the FX8 after crashes.
- If you find a drift and you nail it down to a bad motor don't continue to fly and stress the good 3 motors.
- If you crash always inspect the X8 Quadcopter, no matter how small the crash.
- Check for propeller being loose after a crash. Chances are if they loosen during a crash and you take the Quadcopter up without checking the propeller will pop out mid spin..
- Fly low, fly slow and fly small. Begin with small areas, focus on controlled movements. You've seen some flyers rip it up, but remember we were beginners too at some point. When you fly in small areas your muscle memory develops and you can learn throttle management after your hands get the right feel of the Remote Control. So be patient and take it slow.
- Know where you fly, learn about the location you are in.
- If taking video or stills, respect other people's privacy.
- Don't over charge your battery as it will degrade over time, resulting in lesser flight times, continue and they will puff up and end up causing serious damage to you and others.
- Always store the batteries at half charge or discharge them for storage mode if you don't

plan to fly for a few weeks

•Fly basic movements, back and forth side to side nose out, tail in. Once you know those movements properly, move up to repeating the same movements with nose in, tail out. Remember your rudder, ailerons and elevators are reversed when the Quadcopter is facing you. When you are ok with these movements learn to incorporate rudder with ailerons for bank turns and other advanced maneuvers.

- Don't ever take risks that may endanger others.
- Do not fly indoor unless you are really skillful.
- Don't use other batteries apart from we supply, always use 11.1V battery.

Thanks again for choosing the Flying FX8 Quadcopter it is a remarkable flying machine.