



YS-X4 Multi-Rotor Autopilot

Quick Start Guide

V1.0



www.zerouav.net

Zero UAV (Beijing) Intelligence Technology Co. Ltd.

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1 In Box

■Hardware ●Software (Download)

Electronic Device

■All-in-one Box (MC+ IMU) X1

1 It is integrated with built-in Inertial Measurement Unit (IMU), communicates with GPS/Compass and other external electronic devices to carry out autopilot functionality.



2 Update firmware via PC RS232 serial port.

3 Display real time flying situation assist with GCS via bluetooth or wifi module.

■GPS+Compass X1

It is for locating and sensing direction.



■LED Indicator X1

It is for indicating current flight states via blinking in different colours.



■Bluetooth Module X1

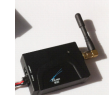
It is for communicating with the Bluetooth in Phone/Tablet.



■WIFI X1 (Data link can be added to extent range)

1 It is for communicating with the hot spot of Phone/Tablet.

2 It is for data communication by building up AP (Wireless Network).



■ Power Module X1

It is for connecting Battery and MC to provide power supply to YS-X4.

Input Voltage 3S~6S, output voltage 5.7v



Accessory

■GPS BracketX1

GPS/Compass is sensitive to magnetic interference, please use this bracket to mount GPS module.

■3-PIN Servo Cable X8

Used to connect MC to RC Receiver.

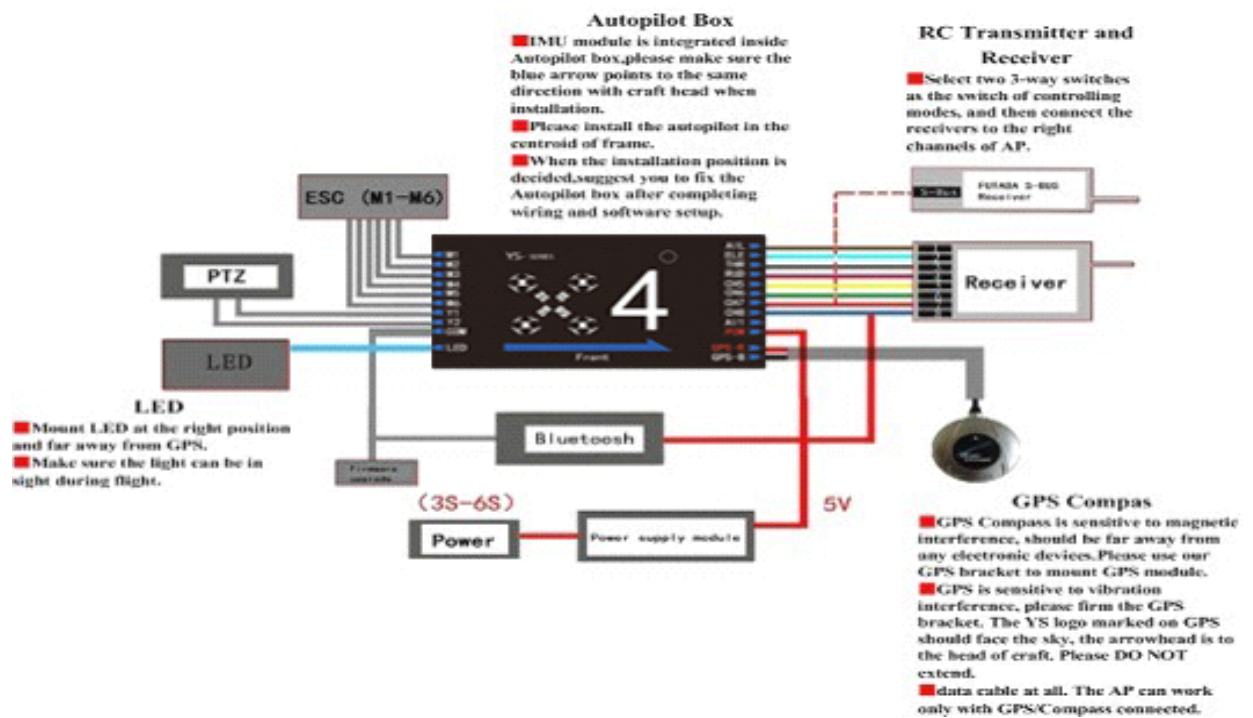
■Sticker Paper X1 & Cable Label Paper X1

Used to mark different electronic devices and cables.

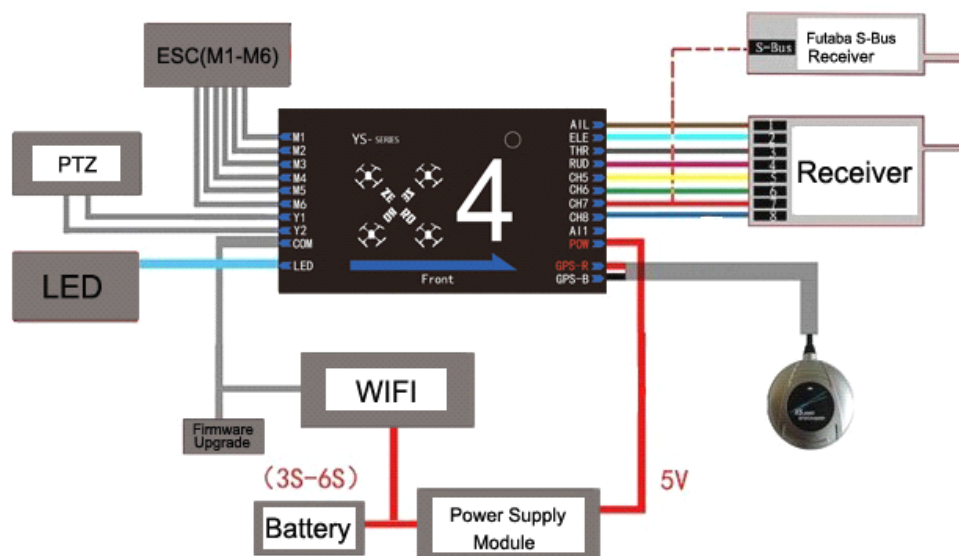
■USB Cable X1
Used for connecting PC to MC and firmware upgrade.
■Warranty Information Card X1
It provides Product Serial No., Purchase Date. Please fill out related information and return back to Zero UAV for registering your product warranty.
Software (Download on website)
●GS Software for Android System
●GS Software for PC Windows XP/7/SP3 system
●Firmware Program on PC.
●Firmware updating assistant.

2 Assembly

❖ Assembly of Bluetooth Version



❖ Assembly of WIFI Version & Navigator Version



3 Power Supply & Magnetic Interference

3.1 Power Supply

- The supply voltage of MC (Autopilot) is 5.7V. Power supply module, supply range of which is 3S~6S (Power remains a little), namely 10.8V~25.5V, output voltage 5.7v, is specially supplied by Zero UAV to connect battery and MC ("POW port").
- MC provides 5.7v supply voltage to Bluetooth via CH8 port.
- The power supply range of WIFI is 3S~6S.
- MC provides power to RC receiver via CH1~CH7 port, no need to add any out-built power module. S-Bus receiver only can be connected to port CH7.
- When using gimbal, user need to power on servo. Only leave one ESC powered on if ESC has bec function. If without bec function, need to provide extra power to servo and connect servo to any port of M1~M8.

3.2 Magnetic Interference

- When ESC and motors working, they will produce serious magnetic interference, so GPS and magnetic sensor module must be installed by nonferrous to keep far away from motor and ESC (especially Octo-rotor), and the arrow on GPS must point to aircraft nose. Otherwise, the aircraft will fly circling around and incorrectly hover.
- As there are rich electric current in the batterywire which can produce magnetic field, users must place the batterywire far away from GPS and magnetic sensor module, otherwise the craft will fly in circle in GPS mode.

Warning:

When using video transmission, must keep the video transmission away from IMU as far as possible, otherwise serious magnetic interference will occur!

4 Data Communication

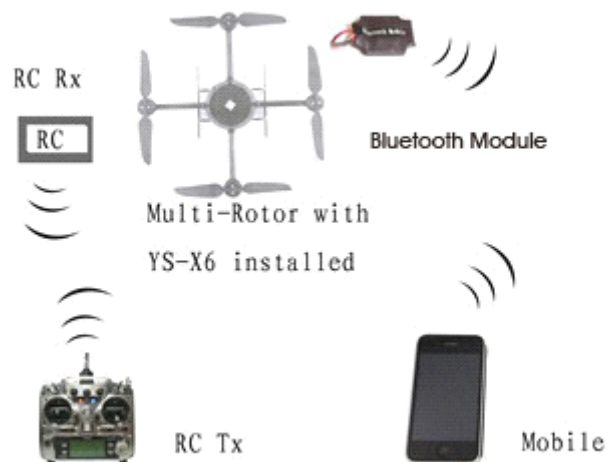
There are two ways of communicating YS-X4 and Phone/Tablet, via WIFI or Bluetooth.

1) Via Bluetooth

Step1: Download YS-GCS.

It must be installed to the Mobile memory card. Android system can be installed automatically via running file installation once in the file manager.

Step2 : Bluetooth Communication



Power on the Bluetooth Module on craft, then enable the Bluetooth of phone, look for and connect the Bluetooth named "ZEROUAV" (Note: The letters must be in Capital), Password :1234. If communication is successful, the Bluetooth light will keep going on.

Only one Bluetooth name: ZEROUAV, Password:1234

Notice

Only Android GCS is available when using Bluetooth to communicate with YS-X4.

Step3 : Commissioning

Enable the GCS, Click on [Menu] and [Enable Bluetooth], then commissioning can be started.

2) Via WIFI

Tips

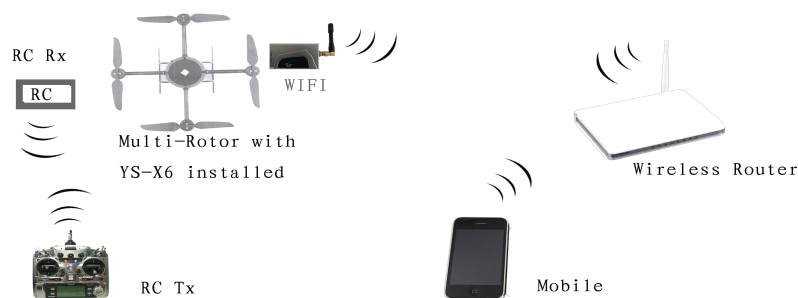
WIFI communication can be setup in two modes: "Router Mode" or "Point-to-Point Mode". The default communication mode is "Router Mode". If need to configurate "Point-to-Point Mode" to "Router Mode", Please refer to video "WIFI configuration" for the details:

<http://www.youtube.com/watch?v=Mr-wstSz3as>

Step1: Download YS-GCS.

It must be installed to the Mobile memory card. Android system can be installed automatically via running file installation once in the file manager.

Step2 : Router Settings



Please prepare extra wireless router to build up AP. Setup the router as below:

SSID: "ZERO-TECH" (Note: The letters must be in Capital)

Password: 82890430

Encryption Method: WPA2-PSK AES

IP : 192.168.1.1

Tips

Phone with Hotspot also can be used instead of router, but must make sure SSID and password can be set up on the phone, in same way IP should be: 192.168.1.1.

Step3 :WIFI Communication

Then enable the WLAN on Phone/Tablet to communicate with router.

Notice:

Only one WIFI name: ZERO-TECH, Password:82890430

5 Installation Guide

Check out whether the connection is correct or not before power on the Autopilot. When powered, LED is solid in red and Autopilot will complete initialization in few seconds. Then **LED light starts to blink in red for three times one loop**, it indicates the whole system of Autopilot is correctly connected and motivated successfully.

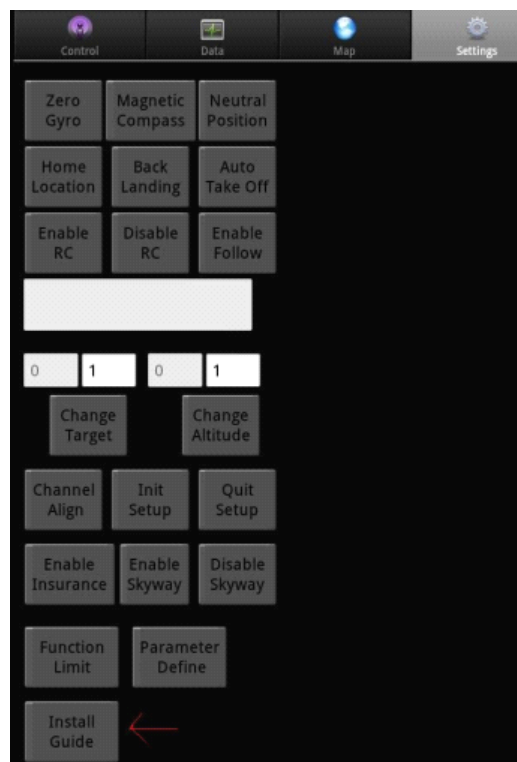
Tips

The above "**the light blinks in red for three times one loop**" is a sign to check whether all hardware are working normally or not, all data communication is based on this. After powering if no "the light blinks in red for three times", please contact Zero UAV (Beijing) Intelligence Technology Co. Ltd. or local distributors directly. Otherwise, please check the assembly carefully.

Attention:

Any wrong assembly of YS-X4 may result in burning out the devices!

When data communicated, you can set up below options following the "Install Guide" in GCS "Settings" page. (If data not communicated, please read the above two steps carefully).



Please strictly follow "Install Guide" shown as below:

(1)Channel Calibration.

(2)Check CH5 & CH6, set up F/S (Fails safe).

(3) ESC stroke calibration ("Yinghao" ESC is taken as an example here, this step is no need for 500HZ ESC).

(4)Set up aircraft type and parameters. Fill in local magnetic declination (to West is positive, to East is negative).

Please refer to the below website for magnetic declination

<http://www.ngdc.noaa.gov/geomagmodels/struts/calcDeclination>

[http:// magnetic-declination.com/](http://magnetic-declination.com/)

(5)Check the configuration direction of IMU & GPS.

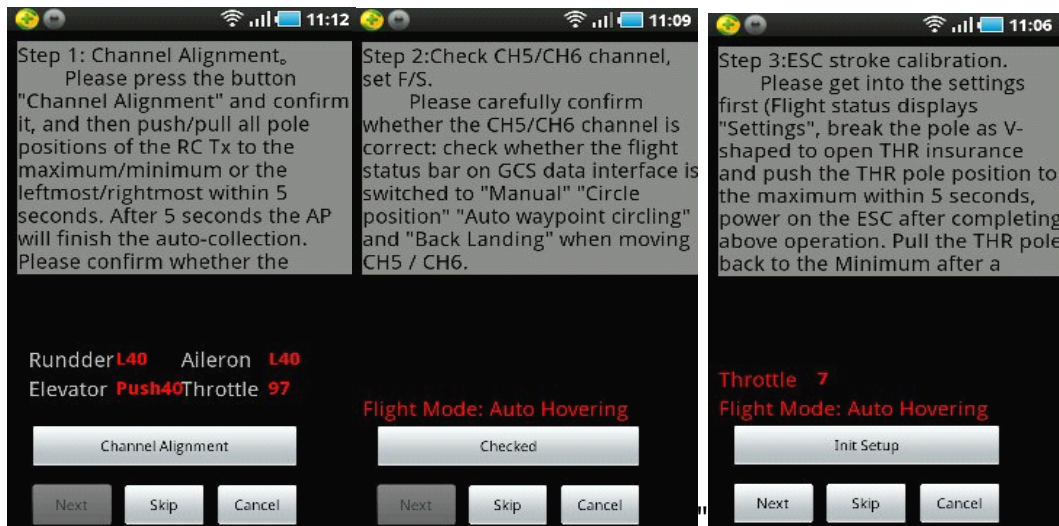
After the "Install Guide" completed, can start to fly in manual mode to have a test.

Tips

About RC transmitter

- RC transmitter must be set to "Fixed-Wing Mode". DO NOT set any mix-control. All of the channels can't be inverted on FUTABA RC transmitter, but all of the channels on Jr and WFLY RC transmitters must to be inverted.
- For the RC transmitters of other branches, after channel calibration, check whether the actual servo operation is the same as "Manual servo position" showing on GCS, orientation/aileron/elevator display as "left/right and push/pull", release RC transmitter displays as "Neutral position", the max servo position is 40, example: the max value of left servo displays as left40; the mini value of throttle displays as 7 and the max as 90.

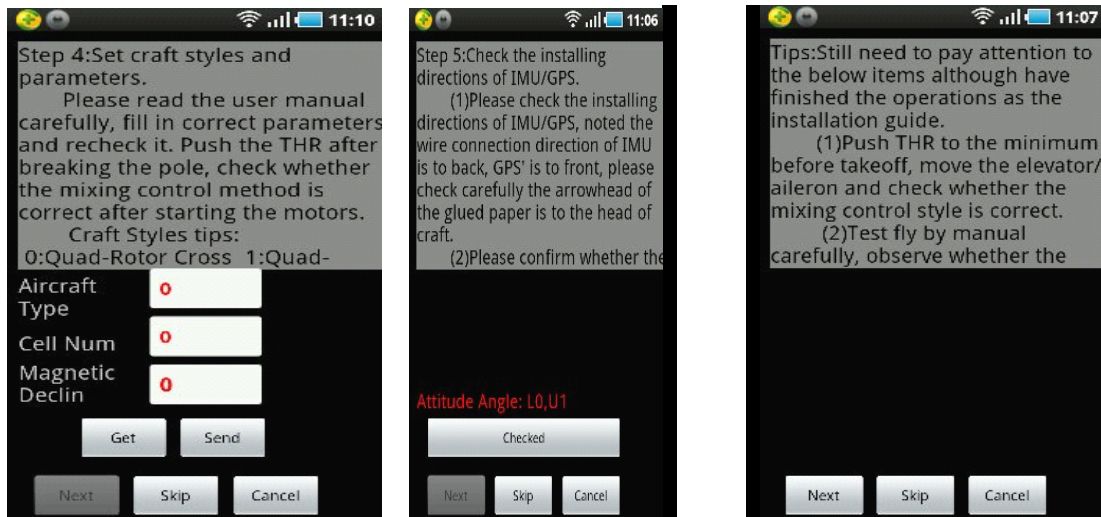
The steps of "Install Guide" shown on GCS:



1 Channel Calibration

2 Check CH5 & CH6

3 ESC stroke calibration



4 Aircraft type & parameters

5 Direction of IMU & GPS

6 Tips

6 Compass Calibration

Notice

There is no need to calibrate the magnetic compass in manual mode, and the [Course Angle]" in "Data" page of GCS will keep displaying as 0.

But in GPS mode, compass calibration must be finished before take-off. Ferromagnetic substances placed on multi-rotor or around its working environment will affect the reading of earth magnetic for digital compass, it also reduces the accuracy of the multi-rotor control, or even reads incorrect heading. Calibration will eliminate such influences, and ensure MC system performs well in a non-ideal magnetic environment.

The magnetic data will display once after calibration and be saved to the autopilot.

Only in GPS mode, the actual course angle will display in [Course Angle]" in "Data" page of GCS.

STEP1 Calibration in horizon:

Enter Calibration by clicking [Magnetic Compass]-->[Horizontal Alignment]--> [OK] to send the command to autopilot in "Setting" page of GCS.

After confirmation, the status bar in the middle will display "Success" meaning the autopilot received the command of Horizontal Alignment, can start the Calibration:

Rotate your aircraft 2~3 laps along with the horizontal surface, ask a helper to monitor the [Attitude Angle] changing in "Data" page and try best to keep the value of Pitch and Roll be smaller than 3 degree (you can also check the LED light which is connecting with autopilot, if the light is keeping on it means attitude is good, if the light is off it means the attitude is too big). After completing 2-3 laps horizontal rotation, then go to the next step;

STEP2 Calibration in vertical:

Rotate the craft nose vertically facing the ground, in GCS select

Enter Calibration by clicking [Magnetic Compass]-->[Vertical Alignment]--> [OK] to send the command to autopilot in "Setting" page of GCS.

After "Success" displays in the status bar in the middle, it means the autopilot received the command of Vertical Alignment and then the roll and pitch will change close to 0 degree slowly via checking the [Attitude Angle] in "Data" page (namely changed reference coordinate system, it's level when the craft

head face the ground).Then hold your Multi-rotor vertically and rotate it along with its vertical axis keeping the attitude angle smaller than 3, after completing 2-3 laps vertical rotation, then go to the next step; you can also check the LED light which is connecting with autopilot, if the light is keeping on it means attitude is good, if the light is off it means the attitude is too big.



STEP3 Calibration Saved

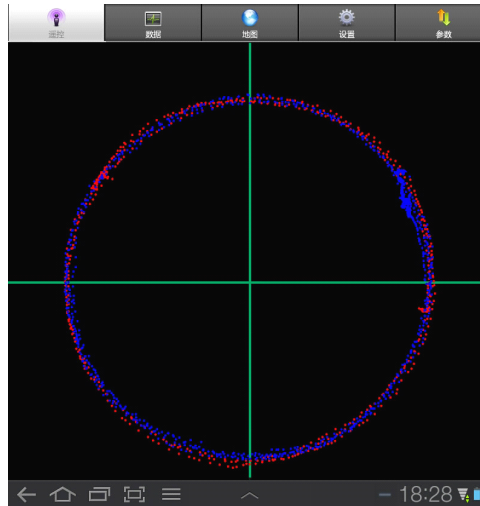
After rotating, in "Settings" page of GCS click on [Magnetic Compass]---> [Save Magnetic Compass]---[OK]. After finishing the calibration, GCS will go to "Control" interface automatically. After waiting for scores of seconds (the purple light keeps going on during data reading, mobile will display the magnetic sensor data of AP. Only need to observe the red and blue circles in the middle of cross coordinates, if they are close to standard round, then it indicates a successful calibration and data in good condition.

Two round circles will show whether the calibration was successful or not:

If two round circles show up in the "Control" interface (one blue circle one red circle), calibration succeeds, can exit ;

If no circle or only one circle shows up in the "Control" interface, the calibration has failed. Re-start from step1for re-calibration.

Successful Calibration Image:



Notice:

1. There is no calibration order in horizon and in vertical.
2. When "Horizontal Alignment" or "Vertical Alignment" button has been pressed, please make sure to check whether current calibration command displays in the data bar.

Tips

After correct assembly and successful magnetic compass calibration once, no need to recalibrate without any constructional reconfiguration or only upgrade the firmware.

7 Control Mode

Notices:

- User must select two 3-position switches and set them to CH5 & CH6 by RC transmitter.
- Manual/Manual Altitude Hold /GPS three modes can be switched through CH5

(Note:the flight status on "Data" page of GCS separately displays as "Manual" "Manual altitude hold" "Auto-hover").

- CH6 can work only when CH5 stays at position 3 (namely GPS mode). CH6 is for switching modes among Auto-hovering/ Auto-navigation /Auto go home.

RC Status	CH5 Status	CH6 Status	Craft Status
Receiver on	CH5 Position1	X	In full Manual Mode, it's fully controlled by RC Transmitter only. Warning: Do not switch into GPS Mode when flying in big actions or fast speed in Manual Mode until flying gets into stable.
	CH5 Position2	X	Manual Stabilize & Altitude Hold mode
	CH5 Positions3	CH6 Position1	Craft Auto-hover, hover position can be controlled by RC transmitter.
		CH6 Position2	Click on "Enable Waypoints" on Phone to enter "Auto-navigation" Mode (before enable the function please make sure waypoints are uploaded successfully)
		CH6 Position3	"Auto Go Home" Mode

Notice

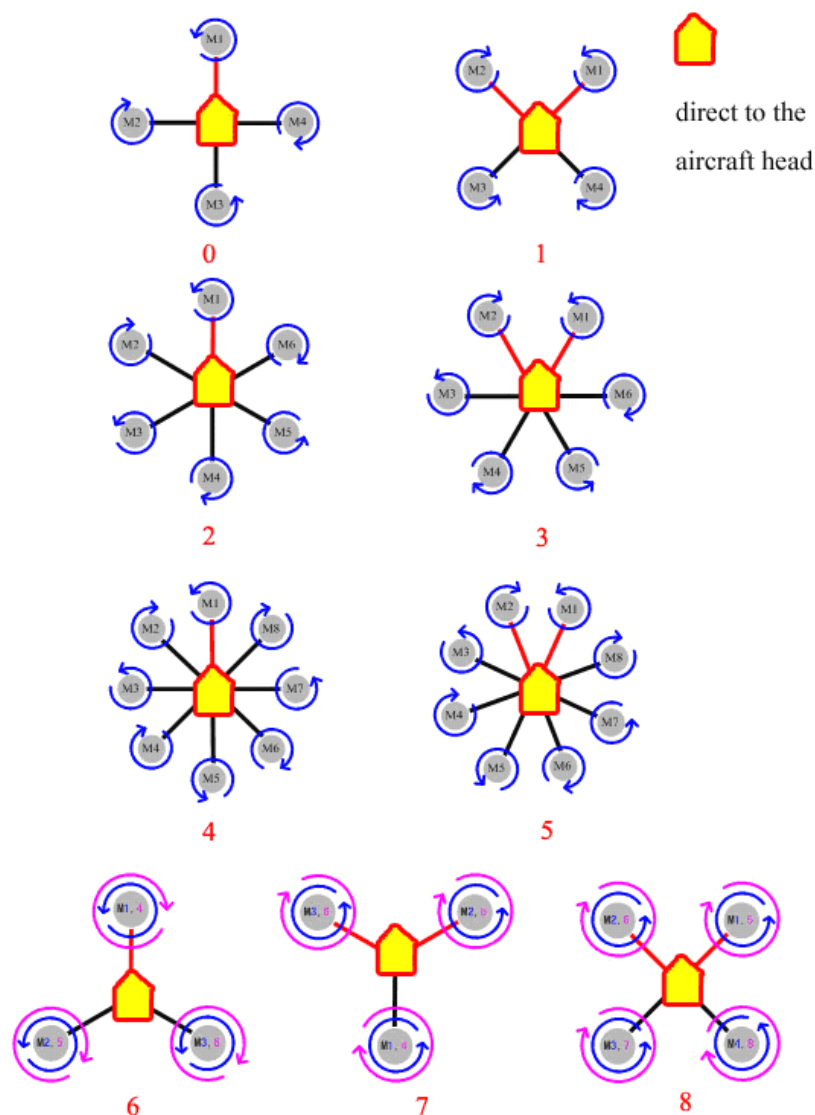
- "X": means irrelevant, any kind of status.
- "RC status": means "Receiver on" or "Receiver off" status in GCS.

Attention

The receiver can't be shut down when using YS-X4.

8 Aircraft Type

To coaxial propellers: **Blue propeller** is at Top; **Purple propeller** is at Bottom. Otherwise all propellers are at top. The arrow means the orientation of aircraft head should point to. Fill in "Aircraft Type" in the parameter settings with below numbers.



Customized parameters can be setup by self to allocate the mix-control of motor. And the proportion coefficient of pitch, roll and turning of each motor also can be customized for applying to the irregular Multi-rotor frame.

Warning

- Very important: Please shut down the power supply of motors before modifying customized parameters.

Customized Parameters Setup

Step 1

First check out whether the customized parameters are correct or not, then change "aircraft type" to 10.

Warning

If the parameters are not modified or incorrectly modified, propellers will immediately rotate out of control when the "aircraft type" is changed to 10. So to ensure your absolute safety, it's strongly suggested that Do NOT power on motors before take off all of the propellers!

Step 2

In GCS, please click on "Setting"-->[Parameters Define] to fill in the parameters, **make sure the parameters are totally correct, then change the parameter of [Aircraft Type] to 10.**

Step 3

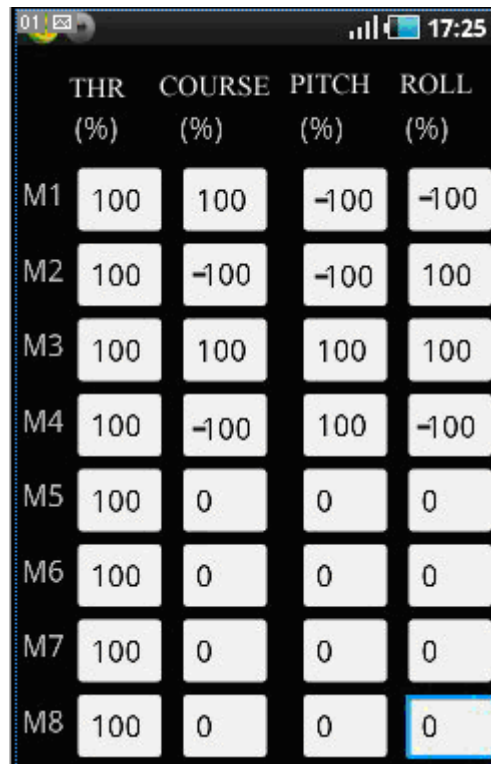
Then click on "Setting"-->[Parameters Define]-->[Get] to **verify the changing is successful. Repower autopilot on** after verification, push the throttle stick to the minimum position to make motor rotate in slow speed and meanwhile carefully check whether the mix-control is consist with settings, after verification can start to fly .

Customized Parameters

- Customized parameters of [Throttle]: all of them must be 100.
- Customized parameters of [Course Angle]: to make the aircraft **rotate to right**, the changing method of corresponding motor speed should be decreased to -100, and increase to 100.

- Customized parameters of [Pitch]: to make the [aircraft head face the ground](#), the changing method of corresponding motor speed should be decreased to -100, and increase to 100.
- Customized parameters of [Toll]: to make the aircraft [roll to right](#), the changing method of corresponding motor speed should be decreased to -100, and increase to 100.

Now let's take the Quad-X parameters setting for an example:



	THR (%)	COURSE (%)	PITCH (%)	ROLL (%)
M1	100	100	-100	-100
M2	100	-100	-100	100
M3	100	100	100	100
M4	100	-100	100	-100
M5	100	0	0	0
M6	100	0	0	0
M7	100	0	0	0
M8	100	0	0	0

9 Motors and Failsafe

Enable Motor Protection

Any time after landing or before take-off, only if it is in Manual Mode and the throttle stick is at the bottom position, motors can be locked up completely after 5 seconds; After locked up, motors won't rotate even if push the throttle stick. Only through "Enable Insurance" on phone or through Motor Arming, motors can be unlocked.

Shut down motor

Only in manual mode and without holding altitude, the motors stop rotating with pulling the throttle stick back to the bottom. Other time, if pull back the throttle stick to the bottom, the motors won't stop rotating but only decrease altitude.

Attention

During flying, if there is no accidents please Do Not at the same time switch to manual mode and push the throttle to the minimum, otherwise motors will immediately shut down, craft will free-fall to the ground and never be rebooted!

Tips

Whenever need to stop the motors urgently, below ways can help:

- (1) Switch CH5 to position 1, namely in Manual Mode but without holding altitude, what's more the throttle stick must be in the minimum.
- (2) After Auto Go Home and landing on the ground, according to method (1);

RC Transmitter Signal Lost

Users must refer to the instruction of RC transmitter to correctly set up F/S, set CH5 to position 3, CH6 to position 3, throttle stick to the middle position (installation guide has tips).

If enable F/S for any reason in "RC on" status, the autopilot will be switched to Auto- hovering status (continue flight path for 5 seconds in Auto-waypoints Mode, wait for 5 seconds and start to go home if the signal can't recover after 5 seconds).

10 Flight

10.1 Motor Arming

Unlock throttle: Move rod as V shape when the throttle is in the bottom. After that push throttle stick **in 5 seconds**, motor can be enabled. But motor will be locked up automatically if exceeding 5 seconds.

Notices:

Rod moving: **Rudder in the left- most position, elevator in the bottom, aileron in the right-most position,throttle in the bottom**. For the right or left throttle, user need to judge by self that the motor arming direction is V or reversd V . After moving rod as V shaped, **motor will not be enabled automatically**, user need to push the throttle stick to the minimum position to enable the motor after moving rod.



Motor Arming

10.2 Vibrating and Shaking

During flight, user need observe the "Vibrate State" and "Shake State " in "Data" page to judge the shaking status of IMU. In stable flight, it is normal when the "Vibrate State" and "Shake State " range from 0~9, the smaller the number the smaller the shaking, the number will directly affect flying performance.

Tips

Vibrating coefficient: the maximum acceleration of alternate motion(vibrate) in up/down,left/right,back/forth three directions.

Shaking coefficients: the maximum angular velocity of rotary movement around X/Y/Z three axes.

10.3 Manual Servo Position and Real Servo Position

Manual servo position

After channel calibration on transmitter, when user put the stick in the middle position, the value of rudder, elevator and aileron in "Manual Servo Position" in GCS should be in middle position. If user already has tuned but the manual servo position is not near the middle position when releasing the sticks, need to click on "Neutral Position" button in "Settings" interface to make the autopilot record the correct center position of sticks.

Real Servo Position

Real servo position is the relation of differential rotation speed outputted by motor to keep aircraft stable during flight.

Tips

User can judge the balance of motors and propellers by observing the Real Servo Position in level flying.

Example: when clockwise and anticlockwise propellers lose balance (suppose clockwise motor is not level, the reaction torque generated by which is smaller than that generated by anticlockwise motor), when in level flight and heading unchangeable, the real rudder position will keep stable with left to 5~7. With the same pulse width output, the reaction torque generated by clockwise motor is smaller than that generated by anticlockwise in the same rotation speed, which lead aircraft rotate to the right, autopilot will output levorotation torque automatically, namely the differential make the clockwise rotation speed faster and anticlockwise slower. In this condition, aircraft can fly normally and do not need hover any more, but the power consumption and temperature of clockwise motor are higher than the anticlockwise motor's.

At the same time, since the servo effect of clockwise is smaller than anti-clockwise's, which will affect flying stabilization and cause shaking after correction(especially for Quad-copter).

So, it is suggested that user need to **precisely detect the balance and level symmetry of motor and propeller to get a more stable flight. Until level flight and hovering, if do not push rudder, the rudder of real servo position will be smaller (about 1~2) or around neutral position.**

10.4 Auto-takeoff and Auto-landing

● Semi-auto takeoff

When get **7 or more GPS satellites locks**, switch CH5 to position 3 and CH6 to position 1, that is the flight status is "Auto-hovering", then move rod in V shape before push the throttle stick. when throttle stick is more than 50%, aircraft will take off automatically and auto-hover about **3 meters** from the ground getting into auto-hovering status.

● Full-auto takeoff

Attention:

Aircraft can take off fully-automatic only if the aircraft has completed semi-automatic takeoff and the flying is successful.

Step 1

Wait until get 7 or more GPS satellites locked, put the THR stick in the minimum position, **switch CH5 to GPS Mode (Position 3), CH6 to Position 1.**

Step 2

Click on [**Enable Insurance**] or move rods **as V shape to make the throttle unlocked**, then continue the next step **within 5 seconds.**

Step 3

Click on "Auto-takeoff ", the aircraft will be powered on and take off slowly, hovering in the height of 2~3 meters from ground.

Step 4

If the THR sticks is in the minimum position in auto-takeoff mode, only if move the THR to the middle position can control the flying altitude.

Notice

All of Rudder, Aileron and elevator can be controlled in Auto Take Off mode. Please test semi-auto mode first and then test full-auto mode.

- Auto go home

Autopilot can set the home position automatically when GPS has locked or aircraft takes off in manual/auto mode.

In GPS mode, when switch CH6 to position 3 or select "Auto go home"--> "OK" in GCS of mobile phone, AP will automatically go home after 5 seconds; and the motor will auto-fly to 20 meters if the altitude is less than 20 meters; during returning, the throttle servo is unavailable; autopilot will descent to the ground automatically when reaching the start position and landing position can be set; After enabling "Auto go home", it can't prevent autopilot from returning and auto-landing even If switch CH6 back to "Auto-hovering" or "Auto-navigation", unless switch CH5 to Manual Position(Position 1 or 2) and then back to Position Hold, hovering can be continued.

Notice

Click on "Motor off" -> "OK" to shut down the motor.

10.5 Click & Go

MODE : GPS Auto-hover Mode

Step1:

Click any point on the map and it can appear a yellow smile there.

Step2:

Click on "FlyToPP" button in "Map" interface of GCS (the button will get gray if no clicking exceeding several seconds, then need to click on the map once

more to make the yellow smile reappear), the yellow round smile will change to purple star smile. Flying to the next position is same as above.

Warning:

If the target point clicked on map is too far, the craft will possibly fly out of sight, so user need to be cautious when using the Fly to Point function.

10.6 Target Lock & Fly Encircle

MODE: **Auto-hover mode**

Solution1:

Step1:

It will appear a yellow smile while clicking any point on the map;

Step2:

Click [PTZ Lock] button in "Map" interface. When yellow round smile changed to purple star smile, the aircraft head will keep facing the target point;

Solution2:

Step1:

In any time (including before takeoff or manual/auto mode after takeoff) fly/take the craft to the target point to be locked , then within 3 seconds switch between position1 and position3 on CH6 for three times (that is 1->3->1->3->1->3->1), FC will record the longitude&latitude of GPS as the target point to be locked.

Step2:

In GPS Auto-hover mode, within 3 seconds switch between position1 and position2 on CH6 for three times(do not switch to position3 which is invalid, that is 1->2->1->2->1->2->1), then FC will enter Target Lock & Fly Encircle Mode.

Tips

After target point locked according to solution1 or solution2, users can operate flying by transmitter.

Remark1: When left aileron outputs in RC interface, the aircraft will hover clockwise around the target point. When the right aileron outputs, it will hover anti-clockwise.

Remark2: Pushing the stick can decrease the hovering radius and drag the stick can increase the hovering radius. Do Not push or pull sticks if Target

Lock enabled but hovering radius is not enough, only need to push aileron stick until craft start to hover.

Remark3: Only when selecting "Quit PTZ Lock" in "Tools" interface or switch back to Manual Mode, the elevator and aileron can be controlled normally.

10.7 Waypoints Flying

Step1:

In "Map" interface of GCS, click [Tools]-> [Design Waypoints] to design the flying path. Click on map once can get one waypoint, get all waypoints one by one. Click [Default Tool] to complete the waypoints design.

Tip

If the firmware version is later than Sept.15th, 2012, "Height", "Hovering time", "Speed" and other key parameters are added to each waypoint, so must make sure to click each waypoint to select "Edit waypoint" and correctly setup.

"Height" indicates the point where craft is staying, which can be set as negative value below zero (when the takeoff position is too high and the craft need to fly under the takeoff position). If the height between two waypoints are different, craft will climb up. The default value of height is 9999, that is to say since the altitude is too high to reach, craft will fly according to the current height.

"Hovering time" means the time that craft stays in the present position before going to the next waypoint (the default hovering time in first waypoint is 65535 seconds).

"Speed" means the flying speed that craft flies to the next waypoint from present position.

Step2:

After the waypoints design is completed, it can be saved as file which can be used next time. User can also click on [Upload Waypoints] to upload the flying path to Autopilot. Please check whether each waypoint has been changed

to blue or not, if blue it means uploading is successful (orange is not successful), and then get into [Target Point] to check whether the number displays there is the same as uploaded waypoints, if not need to upload once

more; If any waypoint is not changed to blue, please also upload the waypoints once more.

Step3:

Click [Remove Waypoints] to make the blue waypoints recover to red; then Select [Verify Waypoint] from "Tool" interface, load waypoints from Autopilot to Ground Station for comparing, if all waypoints are blue it means the uploaded waypoint path is the same as that in Ground Station and waypoints verification is successful. Otherwise need to upload waypoints once more.

Step4:

Switch CH5 to Position 3 and CH6 to Position 2, then click on [Enable Skyway] in "Setting" interface of GCS, the craft will fly to the first waypoint and hover there. Set [Change Target] as 2 and upload it, then craft will fly in order to waypoint 2、3、4...and fly back to waypoint 1 and hover there after finishing all waypoints.

Notice

If waypoints incorrectly uploaded, when switch to Auto-navigation Mode the aircraft will fly far away automatically and out of control.

Free Course Mode

Generally, when it's waypoints mode, craft nose faces flying orientation in real time. When user want to freely control the course of craft, in Waypoints Mode can click on [Intelligent Course Locked] in "Setting" interface of GCS.

After that the "Intelligent Course Locked] doesn't mean Care Free function, it means Free Course Mode. That is though craft will fly according to skyway, the craft nose will not face the flying orientation in real time, and the course of craft can be freely controlled by rudder on RC transmitter.

Click on [Disable Intelligent Course Locked] and [OK], then the craft nose will face flying orientation again.

10.8 Follow Me

This function only can be used in the condition that GPS on phone is enabled and meanwhile [GPS of this phone has been located](#) showing on "Data" interface of GCS.

In GPS Hover Mode, after all the sticks on transmitter are set in the neutral position, user can click on [Enable Follow] in "Setting" interface, the craft can

fly following the mobile phone GPS and the craft nose orientation will be locked.

If to quit this function, just click on [Disable Follow] on "Setting" interface.

10.9 Care Free

Only in GPS Hover Mode, "Carefree" is available.

Option 1

Click on [Enable Course Locked] button in "Setting" interface, autopilot can record the current orientation of craft head. Then users can freely adjust the orientation of craft head with rudder stick; when users operate the left/right aileron and push/pull sticks on transmitter, the autopilot will fly to the orientation according to the course being locked, not the current orientation of craft head.

Option 2

Within 5 seconds please switch between position1 and position2 on CH6 for five times (do not switch to position3 which is invalid, that is 1->2->1->2->1->2->1->2->1->2->1), then FC will enter "Care Free Mode".

To exit "Care Free", click on [Disable Course Locked] button in "Setting" interface or switch to Manual Mode.

11 Parameter Setup

Default Parameters

The Factory Default Parameters are shown as below. It is the Quad-X flying mode and can be applied to most crafts for flying.



Notice

"PTZ Roll Sensitivity" & "PTZ Pitch Sensitivity" can directly affect the touch sensitivity of transmitter.

Please Do NOT change the default parameters of Roll/Pitch,THR P/I,Rotate P/D. If parameters are incorrectly changed, can push the THR to the minimum and switch to Manual Mode, then click on [Default Settings] in "Setting" interface, the parameters can recover to factory defaults.

The meaning of other parameters are described as below:

Cell Num Cell No.

The autopilot can calculate the low voltage alert according to the Cell Number filled in by users. When the mobile vibrates once each 2 seconds, it means the power is getting low and remind user to note. When the mobile keeps vibrating it means the power is getting very low and request the craft to land at once.

Ctrl Type Control Type

Complete default number 2.

1. Attitude Mode, only fit to adjust parameters/dynamic flight.
2. Acceleration Mode, fit to autostability, common mode.

Magenetic Declin Magnetic Declination

Fill in local magnetic declination, **deflection to West is Positive/to East is negative (most regions in China are deflecting to West).**

Example: Magnetic declination in Beijing is 6° 30' to West, that is 6.5 degree, then fill in 6.5. When magnetic declination is more than +10degree(to west) or smaller than -10degree(to east), after that autopilot will rounding down decimal places and just leave the integers.

Please refer to the below website for magnetic declination

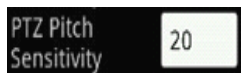
<http://magnetic-declination.com/>

<http://www.ngdc.noaa.gov/geomagmodels/struts/calcDeclinat>

Aircraft type Aircraft Type

Fill in mix control type, please refer to Part 6.

PTZ Roll Sensitivity PTZ Roll Sensitivity



PTZ Pitch Sensitivity

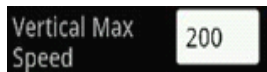
EXT1 is the PTZ roll output and EXT2 is the PTZ pitch output. Roll/Pitch sensitivity is used to adjust the compensation angle of PTZ. If user feel the compensation angle is small, can fill in bigger number, on the contrary fill in smaller number (Note: negative value can be filled in to be reversed).

When using PTZ, transmitter must be enabled and CH7&CH8 are correctly set to two knob switches, which makes it more convenient for autopilot reading CH7&CH8 to output the PTZ position.



Attitude Sensitivity

It is the revised coefficient of inclined angle generated by aircraft when resisting the external force. The bigger the number, the more sensitive to the external force, default value is 50, fit to most crafts.



Max Vertical Speed

In GPS mode, the max default speed of up/down (unit:cm/s) is 200, that is 2m/ sec., the max value can be set as 255.



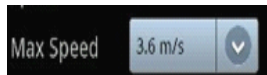
Motion Compensation

The default value is 80 fit to most crafts. When the sticks back to neutral position on transmitter, increase the value to get a more stable flying if the aircraft is shaking heavily. But it will result in high-frequency vibrating if the number is too big. Setup range:0~255.



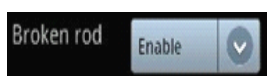
Vertical Stable

It is only available in Manual Mode to increase the comfortable level of THR, default value 150. The air pressure has big influence on motor stability when the value is too big. If the air pressure is not stable in windy days, too big number will affect the comfortable level of THR in Manual & without Holding Altitude Mode.



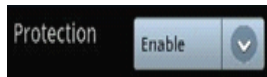
Max Speed

Maximum flying speed. Optional speed: 3.6m/sec, 4.8m/sec, 6.0m/sec, 8.0m/sec, 10.2m/sec, User-define is under 2m/sec, such as 1.9m/sec, 0.3m/sec and so on;



Motor arming

To use motor arming to remove throttle protection or not



Protection

Whether to enable the THR protection or not



Overload control

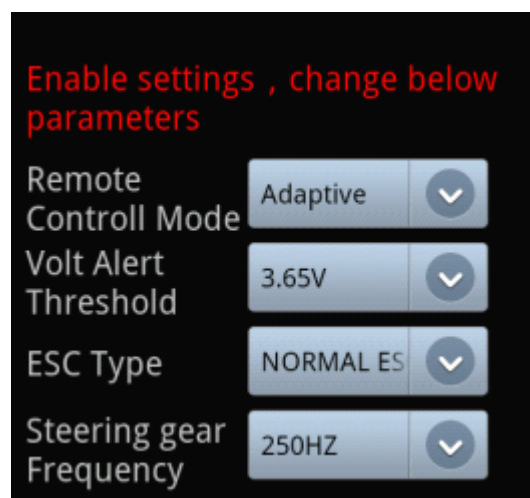
The acceleration of craft in GPS Hover Mode is optional.

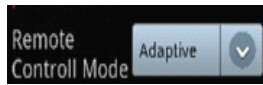
Soft, Common and Hard

Notice

The 4 parameters below need to be filled in when Flight Controller is used for the first time, when filling in the values must make sure the THR stick is in the bottom;

Click on "Settings"→[Enter Setting], when "Setting Status" displays in "Data" interface can update the parameters. Then click on [Send] to give the command to autopilot and click on [Get] to confirm the update is correct. After verifying, click on "Settings"→ [Exit Setting], then can start to fly .





Remote Control Mode

User can select the options below according to yourself RC transmitter mode.

PLEASE SET UP CAREFULLY!

Self-adaptive: AP will auto select the options according to the RC Tx being used.

Attention: The RC Tx must be enabled first before autopilot enabled.

Ordinary : Ordinary FUTABA Receiver, AP CH1 connect to Receiver CH1, AP CH2 connect to Receiver CH2.

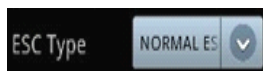
S-BUS: Only connect AP CH7 to the Receiver S-BUS port.

PPM: PPM is supported, connect AP CH8 to Receiver PPM port.



Volt Alert Threshold

Fill in the alert voltage of each battery which is been using, need user to fill in after measuring by self. Usually fill in 3.65.

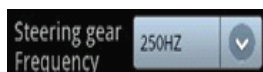


ESC Type

Fill in the ESC type which is been using.

Warning

Fault filling of NORMAL ESC(400HZ) and XA ESC(500HZ) will result that the **propellers go out of control after power connected, very dangerous!**



Steering Gear Frequency

Input the correct value according to your servo type: 50HZ for Analog Servo, 250HZ and 333HZ for Digital Servo.

12 Craft Shaking Adjustment

Step 1

Deviation of installation /vibration/shaking will make the test of flying status by IMU delayed. So user need to check whether the installation direction of IMU is correct and try to install it in a stable place on craft where there is no resonance.

Notice

The IMU of YS-X4 has damper inside, so there is no need using external damper.

The [vibration coefficient](#) and [shaking coefficient](#) showing on GCS mean the shaking status of IMU. Before configurate motors and propellers, users must make balance test to [reduce the vibration and shaking coefficient smaller than 10, the smaller the better.](#)

Step 2

The attitude of Multi-rotor is up to motor speed adjustment, so servo sensitivity will directly affect the accuracy of Multi-rotor attitude adjustment. User need to adjust weight and pitch of propeller to be proper, so that motors can rotate in enough speed and generate enough servo effect. For the craft seeking for high efficient configuration, it is inevitable that the flight stability will reduce, user only can select one between flight efficiency and stability;

Step 3

The symmetry of Multi-rotor has significant effect on flying stability. In quarter 3 "real servo position" of Part 9, user can estimate the symmetry of motor and propeller in level flight. If fail to adjust the symmetry, must spend more energy on frame and dynamic configuration;

Step 4

If the problem of three steps above are solved, can adjust [\[Toll Sensitivity\]](#), [\[Pitch Sensitivity\]](#) in " Parameters Setting", that is to set the strength of correction of craft ; And adjust [\[Motion Compensation\]](#), that is to set the correction of stabilization of craft to realize a limited adjustment.

Note

"Toll sensitivity", "Pitch sensitivity" have been set the correction value with same angular velocity error, 60 is default, the bigger the sensitivity value the quicker the correction, that is the manual control is more flexible. But too big sensitivity value will lead to high-frequency vibrating, so need to decrease the sensitivity value for high-speed craft (smaller propellers).

"Motion compensation" is set for correction of low-speed craft shaking, default value is 80. Without the compensation, since the servo effect of low-speed craft (bigger propellers) is too small, when sticks on transmitter back to neutral position, the craft will jerk to be stable. User can gradually increase the "Motion Compensation" value to get the best stabilize effect without jerking when the sticks back to neutral position. But for the high-speed craft (smaller propellers), the value should be decreased, otherwise the craft will highly-frequency vibrate. The minimum value of the parameter is 0 and the max value is 255.

13 Related Electronic Device

✓ Power Management Module

When YS-X4 and power management module connected, discharge current and battery consumption can be seen directly in "Data " interface of GCS.

Operation Steps

- 1) Connect power management module with YS-X4 (to AI1 port of YS-X4)
- 2) Push the throttle stick to the bottom position
- 3) Repower on YS-X4
- 4) After powered, FC will zero sensor automatically, the discharge current (ampere A) and battery consumption(MAH) start to be output according to the detection by power management module.



✓ Data Link

Tips

- Datalink XB-PRO900 is used to extend communication distance, making the GCS control distance avoid from WIFI distance limit.

- Data link XB-PRO900 Technical Specifications

Transmitted power: 100 mW

Frequency : 900 MHZ

Communication Distance: not less than 2 ~ 3 km (open areas).

Physical Port : RS232

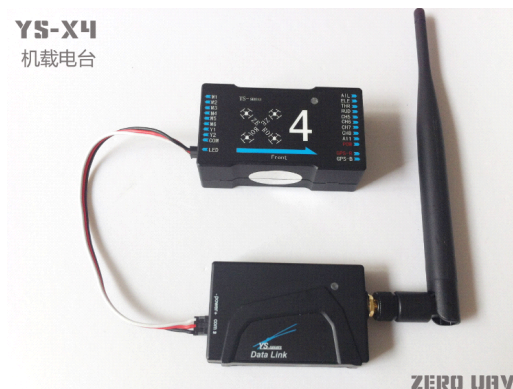
Communication Baud Rate : 115200 BPS.

- A pair of datalink XB-PRO900 contains two data links, one is on craft and another on ground station. But the encapsulations are same and can be interchanged.

(1) Data Link (on Craft) Connection

Install one data link on craft instead of Bluetooth/WIFI module, connect the data link to YS-X4 COM port referring to Bluetooth/WIFI module connection.

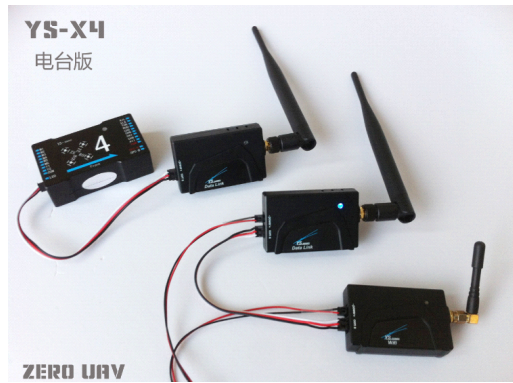
Power supply of Data link is **3S~6S**.



Data link on Craft

(2) Data Link (on ground) Connection

Connect Bluetooth/WIFI module with another data link on ground (using line coming with data link), which can supply power together with wireless router on ground. That is there are three parts on the ground: Data Link, Wireless Router.



Notice

- Data link is powered by 3 S ~ 6 S lithium battery, the power line is in red-black two colours, red is positive pole and black is negative pole.

14 Firmware Upgrade

The upgrade of YS-X4 firmware is very simple. Before upgrade, please download the special firmware upgrade tool on Zero UAV official website: <http://www.zerouav.net/kefu.aspx>

USB Cable Connection: plug one end of USB cable to PC USB port , and the other end to FC COM port.

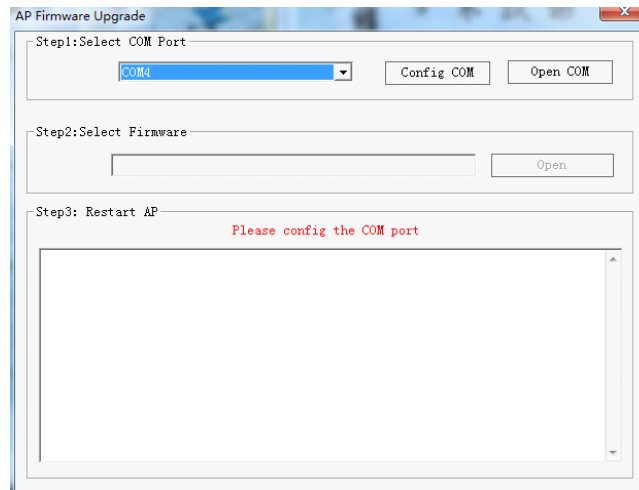
Upgrade Steps:

Step1

Notice

Please Do Not enable the power of FC when upgrading. If enabled please shut off the power.

Enable the special programme "YS-X4 PC Firmware Upgrade" for upgrade ,click on "AP Firmware Upgrade",the software will be enabled and shown as below:



Step2

Select COM port of PC to upgrade (Note: if do not know which COM to use on PC, please click with right mouse "My Computer"->"Attribute"->"Device Manager"->"Port"(COM/LPT) to have a check).

Click on "Config COM", then setup its property (as the diagram below):

Baud rate: 115200

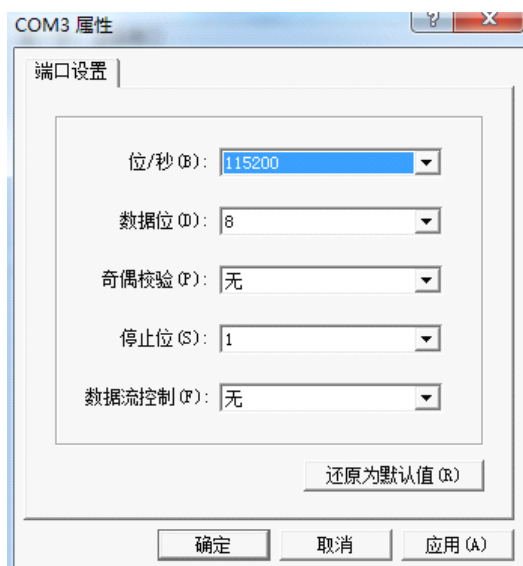
Data bite: 8

Parity: None

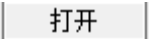
Stop bit: 1

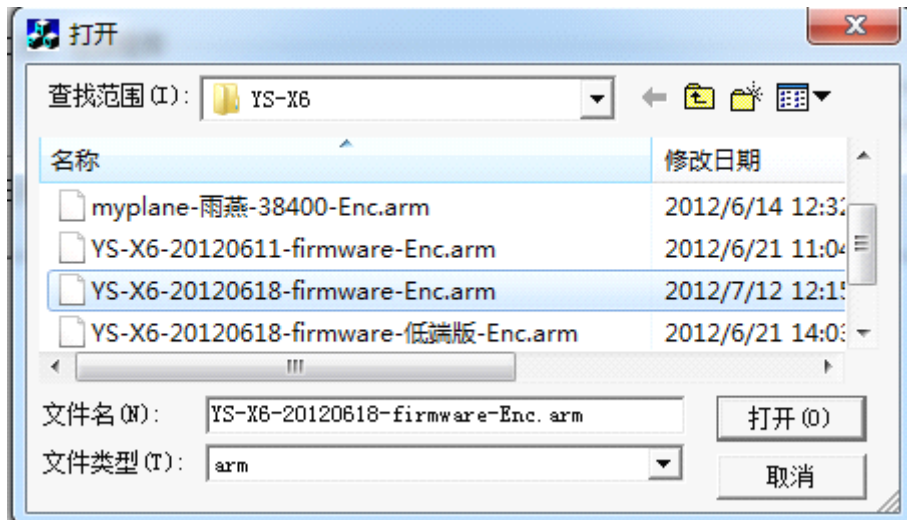
Data flow control: None

When setting finished, click on



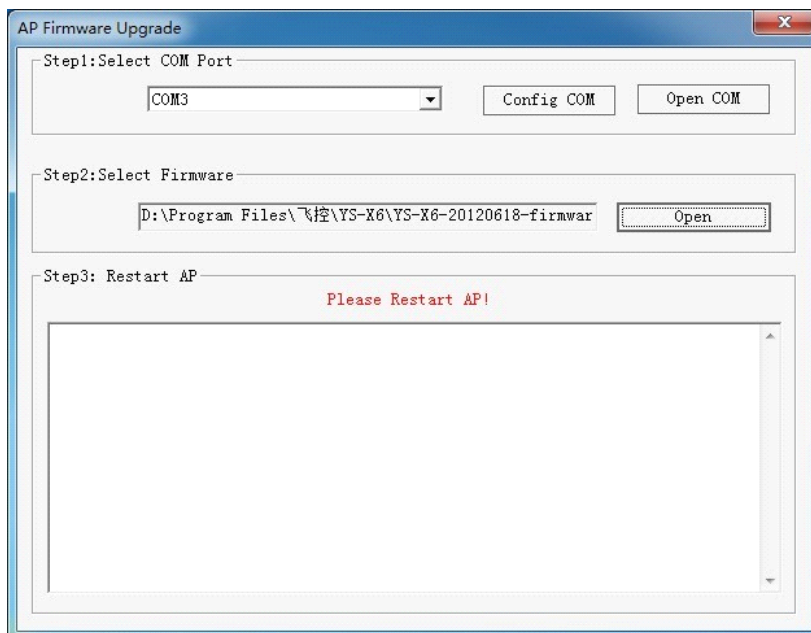
Step3

Click on  button, Select a ".arm" file offered by Zero UAV to upgrade(shown as below diagram).



Step4

Repower on the FC and the upgrade will be enabled automatically. When it says in red words **"Please Restart AP!"**, then autopilot can be powered off.



Warning

- 1, When all settings are finished, if repower on AP but the upgrade software doesn't work, please disable the software and replug the USB cable.
- 2, when select firmware versions, the below warning shows up





Please redownload the upgrade firmware or update the date later than the present date(within 30days) , then upgrade once more.


15 Warning and Disclaimer

1. The manual contains information about installation, debugging and how to use the product. Please read it thoroughly before using the product.
2. Zero UAV (Beijing) Intelligence Technology Co. Ltd. assumes no liability for damage(s) or injuries incurred directly or indirectly from the use of this product.
3. Please keep far away from the crowd, children and property when using the product.
4. Install propeller after completing all the debugging and checking, to avoid damage(s) or injuries.
5. When any of the following events or incidents has taken place, we will not offer any warranty and service:
 - (1) The product has been repaired, modified, or any parts of the product have been substituted or replaced by anyone not expressly authorized by Zero UAV.
 - (2) The warranty card, the serial number of the hardware and the flight data or any of these items is lost.
 - (3) Damaged caused by user's faults such as attempting wiring not in accordance with the manual, which may cause short circuit.
- 6 This product and manual are copyrighted by Zero UAV with all rights reserved. No part of this product or manual shall be reproduced in any form without the prior written consent or authorization of Zero UAV. No patent liability is assumed with respect to the use of the product or information contained herein.

Appendix 1: LED Description

1) GPS unlocated, red light blinks for 3 times one loop. 

GPS satellites=5, red light blinks for 2 times one loop. 

GPS satellites=6, red light blinks for 1 time one loop. 

GPS satellites>7, the Led doesn't blink.

2) Abnormal craft status=White light blinks

When the difference of GPS and attitude is too big, Led blinks in white (craft status is abnormal).

When craft gets stable after big flying action:

If white light is off, craft can continue to fly;

If white light keeps going on, need to land craft urgently.

3) Altitude hold in the Stabilization Mode=Blue light periodically blinks

Blue light blinks for one time one loop means users is operating;



Blue light blinks for two times one loop means Altitude hold.



4) GPS mode=Green light periodically blinks

Green light blinks one time one loop means the user is operating;



Green light blinks for two time one loop means Auto-hover and Altitude Holding.



Low voltage alert

Low voltage alert=Red light blinks fast ; 

Low voltage alert urgently=Red light keeps going on.



Compass Calibration

Attitude error< 3°, light keeps going on, it means can go around to calibrate.

Attitude error> 3°, light will be off, it means the craft is not placed in horizontal and need to be adjusted to be level.

After Magnetic data calibration, the Purple light keeps going on during data reading. LED will get normal when data reading is finished.



Abnormal Electronic Device

Barometer, IMU and GPS abnormal, white light keeps going on.

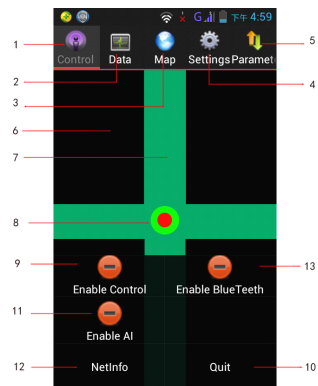
Appendix2: Port Description

MC

A/CH1	Aileron-For roll control (left/right)
E/CH2	Elevator-For pitch control (front/back)
T/CH3	Throttle-For throttle control
R/CH4	Rudder-For rudder control
CH5	Manual/Auto Mode Switch
CH6	Auto-Hover/Auto-waypoints/Returning&Landing Switch
CH7	For gimbal pitch servo control/ Or for S-BUS
CH8	For gimbal roll servo control/ Or for PPM receiver
AI1	Connect Power Calculate Module
POW	To AP Power Supply
GPS-R	To GPS power
GPS-B	To GPS data
M1	Motor 1
M2	Motor 2
M3	Motor 3
M4	Motor 4
M5	Motor 5
M6	Motor 6
Y1	Motor 7/ Gimbal Roll
Y2	Motor 8/ Gimbal Pitch
COM	Connect RS232 port and to PC for firmware upgrades.

Appendix 3: GCS Interface Introduction

The software interface:



Buttons and Functions

No.	Buttons	Functions
1	Remote Control	Unavailable for YS-X4
2	Data	Real time flight data
3	Map	Real time map or saved map
4	Settings	Setup various states of craft
5	Parameters	Adjust craft parameters
6	Cross Interface	Unavailable for YS-X4
7	The Cross	Unavailable for YS-X4
8	Round Circle in Cross	Unavailable for YS-X4
9	Enable/Disable Remote Control	Unavailable for YS-X4
10	Quit	Quit from GCS
11	Enable/Disable Attitude Control	Unavailable for YS-X4
12	Net Information	Used to set service information
13	Enable Bluetooth	Used to enable Bluetooth

Note

When the data is connected, the Serial No. and firmware version will display on the "Control" interface.

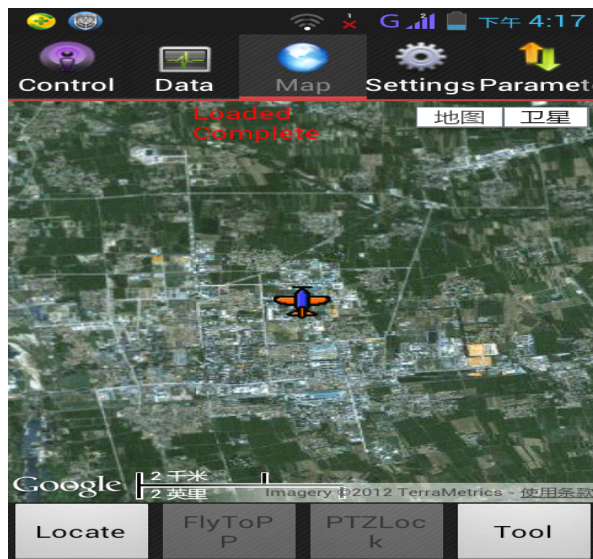
Data Interface

Get into the "Data" interface by touching the button "Data", shown as below:
It will display "Communication disconnected" on the interface if data is not connected.

GPS Satellites	It shows how many satellites were researched and reached.
GPS velx(cm) 0 GPS vely(cm) 0	GPS velocity. It displays a value below 10 when the aircraft is static.
xekf velx 0 xekf vely 0 xekf veld 0	The velocity after Kalman Filtering. It displays a value between 0-20 and increase constantly. When the velocity exceeds normal range, LED will be in solid white, suggest you land the aircraft urgently.
Attitude Angle	Display real time attitude during flight.
Static Angle	Display real attitude of the static aircraft. Static Angle can work only with no any vibration, used to check whether the aircraft is in all good conditions before takeoff.
Target Point	You can fill the waypoints number which you want the aircraft fly to.
Flight Mode	It displays the craft states: Manual, Manual Altitude Hold, Auto Hover, Auto Navigation, Auto Go Home and Land, setup status.
Flight Altitude	Barometer altitude of the craft, unit is meter.
Course Angle	Course Angle means the directions which the crafthead points to. Due North=0 degr

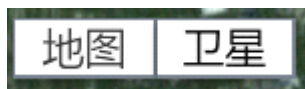
	ee, clockwise direction is positive, counterclockwise direction is negative. For example: Due East=+90 degree, Due West=-90 degree, Due South=+180 degree or -180 degree. Notice: It works only when in GPS mode and flying in Auto Modes, it will not work when in Manual mode or Attitude mode.
AP Volt	Autopilot Voltage
GPS Lat GPS Lng	GPS longitude and latitude
Target point longitude	Longitude and latitude of target point.
Target point latitude	
Manual Servo Position	Display of rudder, aileron, elevator, throttle and manual servo position. Please check more details in "RC Transmitter Settings".
Rudder Aileron	
Elevator Throttle	
Vibrate state	Vibrations from IMU.
Shake state	Display of shaking state

Map Interface



+: Zoom in

- :Zoom out



Map: map mode.

Satellite: satellite mode

Tips:

1 The map which you used last time was saved in default, when you open it next time, it shows up the saved map.

2 There is no network. Enable WIFI, cached data can be displayed.

Notes:

Cached map: when network is on, enable the software to download the map. If finishing downloading the cached map, if enable WIFI, the cached map will be displayed.

Locate



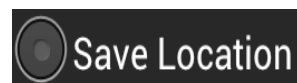
After the GPS was located, click this button can find where your aircraft



Phone/Tablet position. The GPS of Phone/Tablet need to be enabled.



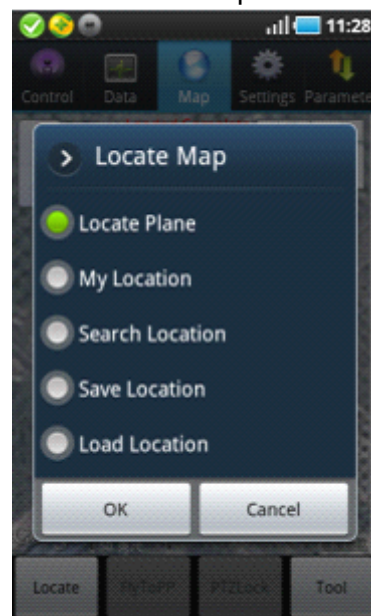
Search the position where you want to check.



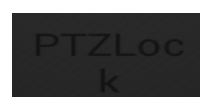
Save the current position on map.



Load the saved position on map.



Fly to Point Fly. Please check "Fly To Point Fly" page.



Target Lock Fly. Please check "Target Lock Fly" page.



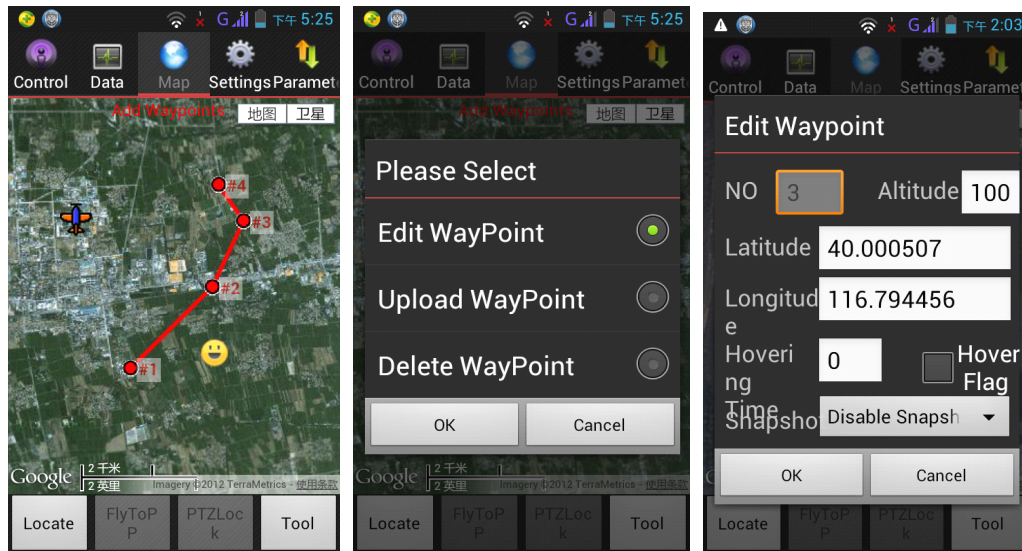
Click it to enter editing waypoints, please check "Waypoints Fly" Page.

Locate FlytoPP/PTZLock: Move Map center to operation area.

Exit FlytoPP/PTZLock: Remove the FlytoPP/PTZLock mode.

Waypoint edition

Click on waypoint, there will be a text box display as below:



Single waypoint edit

Used to edit waypoint attribute, such as longitude and latitude, altitude and speed.

Single waypoint upload

To upload the waypoint.

Single waypoint delete

To delete the waypoint

Number

Waypoint number.

Altitude

The height of waypoint, unit: meter

Longitude

Longitude of this waypoint.

Latitude

Latitude of this waypoint.

Hovering time

Time of hovering, unit is second, zero means no hover(the default hovering time is 65533 seconds of first waypoint).

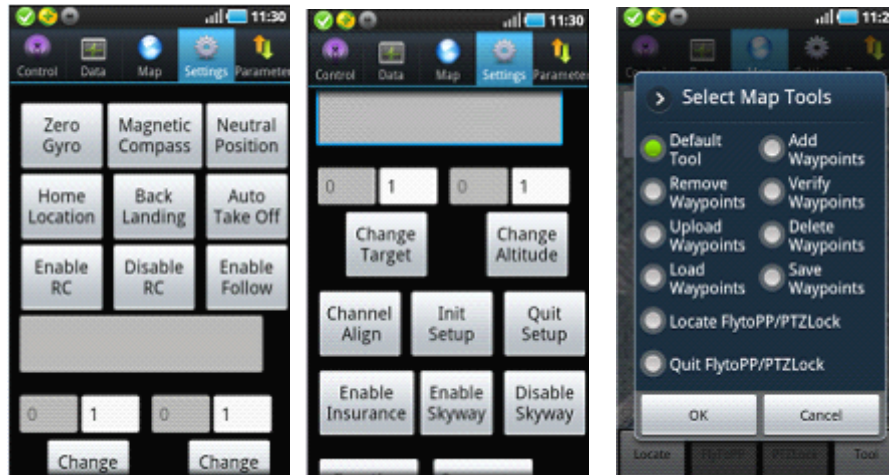
Camera setting

Optional of camera attribute.

Target speed

It means the flying speed of craft from present position to next waypoint.

Settings Interface



Notice:

All operations in settings are vitally important, please operate seriously.

**Magnetic
Compass**

Click it enter into "Magnetic Compass" Calibration.

**Neutral
Position**

It's used to capture Neutral Position after flight and Transmitter adjustments, please operate it by manually in no wind.

Notes: When capture neutral position, please move all sticks to middle position. It has nothing to do with THR position.

**Home
Location**

It's used to change home position or record new home position.

**Back
Landing**

Auto Go Home and Landing. After the aircraft reaches home location, the craft can be controlled manually.

Auto Take Off

Take off fully automatically, please check Part 9 (3) "Auto Take Off".

Enable RC Disable RC

Enable receiver/ Disable receiver

Notice : The receiver can't be disabled for YS-X4.

Enable Follow

This function can be used only when your phone has GPS hardware and got more than 5 satellites locked, and in Auto-hover mode. After enabled Follow Me, the aircraft will fly automatically following mobile GPS location.

Notice: Generally, phone position has error about 5~10 meters.

Change Target

In Auto Navigation mode, fill in the new waypoint number which you will fly to.

Attention:

Fill in a number which is in the range of uploaded waypoints number.

Change Altitude

In Auto-Hover mode, it's used to set flight altitude, put in altitude needed here. Example: filling in 10 means setting flight altitude as 10 meters.

Channel Align

Please confirm to align the channel without any electric power connected. Example: When moving Throttle stick as Minimum-Maximum-Minimum, if GCS data displays as below: Manual Throttle is 7 when Throttle stick is at the Minimum position and 90 when at the Maximum position, that means Channel Align is completed successfully.

Special Attention

Please don't configure propeller when power first time, only power the autopilot and need to calibrate Channel Align first.

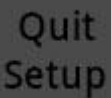
Operation as blow:

Select "Channel Align" in Settings, push/pull Elevator sticks of RC Transmitter to the Maximum/Minimum, move Aileron sticks of RC Transmitter to the leftmost/rightmost within 5 seconds. After 5 seconds, autopilot will complete collecting data automatically. User can observe whether the data shown in GCS can match with real manual operation when was moving the sticks.

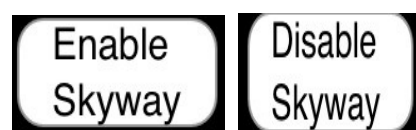
Example: When pulling Throttle stick to the Minimum, the " Throttle" showing in GCS displays 7; Pushing to the Maximum, it displays 90.

A dark grey rectangular button with the text "Init Setup" in white.

It's used to align channels or complete parameters of craft. After clicking this button, **flight state** will display "Settings". After getting into settings, the control channels for each motor on craft is directly connecting to throttle channel of RC Transmitter and no any mix control output, **it is equal to like a Y-line** of "one to many" , it's convenient for users to set strikes for all rotors at the same time.

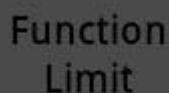
A dark grey rectangular button with the text "Quit Setup" in white.

After completing Throttle channel calibration and all parameters filled, click this button to exit from settings.



The craft can be switched to Auto-navigation mode only after set CH6 to Auto-navigation and then click this button "Enable Skyway" to open the waypoints first.

Enable Skyway/Disable Skyway is used when receiver is off.

A dark grey rectangular button with the text "Function Limit" in white.

Click on "Function Limit", the dialog box will show as below:



click "Get"



Users can observe the functions which have been opened or not in yourself FC.

Parameter Define

User can define the parameters by yourself.

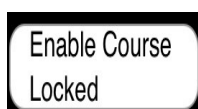
	油门 (%)	航向角 (%)	俯仰 (%)	横滚 (%)
M1	-1	-1	-1	-1
M2	-1	-1	-1	-1
M3	-1	-1	-1	-1
M4	-1	-1	-1	-1
M5	-1	-1	-1	-1
M6	-1	-1	-1	-1
M7	-1	-1	-1	-1
M8	-1	-1	-1	-1

Mix-control

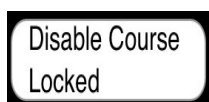
The up/down,turning, pitch ,toll of multi-rotor is caused by mix-add of different output of motors, and the control process is called mix-control. The ratio of mix-output is up to the mechanical structure of craft. User can configure the output coefficient of motors to make the fix-control realized. Please refer to the Part 6 Craft Type for details.

Install Guide

Click on "install guide". User can install the software following the guide step by step.



To enable the intelligenet course lock. It can be used in GPS auto-hover mode.



To quit intelligent course lock.

Parameters Interface

Please refer to chapter11 for the details

Appendix4 Technical Specifications

Basic performance

- Multi Rotor Types supported

Quad-Rotor: +4, x4;

Hexa-Rotor +6, x6, Y6, Rev Y6;

Octo-Rotor +8, x8, V8(Gimbal is unavailable)

- Supported ESC output

400Hz refresh frequency

- Recommended Transmitter

PCM or 2.4GHz with 6 channels at least and Failsafe function available on all channels

- Recommended Battery 3S~6S LiPo

- Power Consumption MAX 2.5W

- Operating Temperature -5°C to +60°C

- Ground Control Software Requirement Android / IOS / Windows XP sp3 / Windows 7

Flight performance

- Hovering position accuracy (GPS mode):Vertical: $\pm 1m$ Horizontal: $\pm 2m$

- Max Tilt Angle 35°

- Max Ascent/Descent Speed 6m/s

- Suitable Wind Condition < 8m/s (17.7mph)

Hardware

- Weight

107g(without WIFI) 146g(with WIFI)

- Size

Main Controller: 70.5mm×43mm×25mm (integrated with IMU)

LED Indicator: 17mm x 17mm x 5.5mm

GPS : 55mm (diameter) x 11mm

Wifi: 65mm x 40mm x 14.4mm

Built-in Functions

1 Auto (Takeoff/ Go Home/Landing)

2 Target Lock & Fly encircle

3 Click & Go

4 Realtime Flight status (Google Earth Map)

5 Auto-Navigation

6 Fail/Safe (Auto Hover--Go home--Landing)

7 Low Voltage Alert

- 8 Gimbal Stabilization
- 9 Flight Control Mode(Auto-Navigation/ Auto-go home/Attitude Mode/ Manual Mode)
- 10 WIFI Module Supported
- 11 Built-in Damper Module
- 12 Optional S-BUS/Ordinary/Self-Adapted Receiver
- 13 Carefree
- 14 Follow Me
- 15 Intelligent Motor off

Contact

Zero UAV (Beijing) Intelligence Technology Co. Ltd.
TEL 0086-10-57250711
FAX 0086-10-82890430-8078

Sales

Email: sales_zerouav@yeah.net
Skype: sales.zerouav
MSN: sales_zerouav@hotmail.com

Technical Support

Email: support_zerouav@yeah.net
Skype: support.zerouav
MSN: support_zerouav@hotmail.com

Complaints

Email: zerouav@yeah.net

Address: Room 102 Building 39 Block 2B, Xi'erqi Lingxiu New Silicon Valley,
Haidian District, Beijing, China
Post Code : 100085