

# Answers for Frequently Asked Questions ( FAQ )



Zero UAV (Beijing) Intelligence Technology Co.,Ltd

# Flight Controller

## Universal

1. **Q: How many meters can WiFi and Data Link transmit and which frequency do they use? Which communication protocol do they use ?**

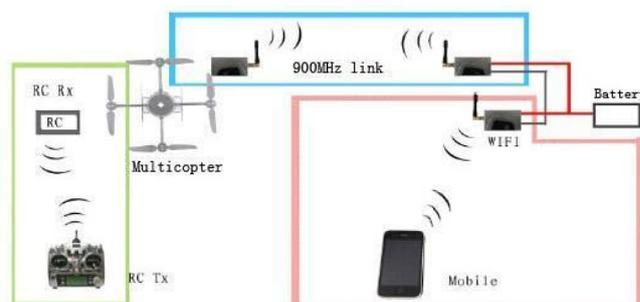
A: Transmission distance of WiFi is about 100 meters, it depends on the cellphone, frequency of WiFi is 2.4GHz; Transmission distance of Data Link is about 1000 meters, frequency of Data Link is 900MHz. Communication protocol of WiFi and Data Link are RS232.

2. **Q: What to do if forgetting the configured WiFi password ?**

A: Just reconfigure the WiFi, usually model AP (Point to Point) is selected, username should with no space and password is only five digits.

3. **Q: Which Baud Rate does multi-copter Data Link of Zero company use ? Should it be configured before use ?**

A: Baud Rate of Data Link is 115200bps, no need to configure, connect it by the following figure, plug in and play.



Note: wireless router is unnecessary if AP(Point to Point) is selected.  
Power supply of Data Link and WiFi are 3s-6s LiPo battery (same with Flight Controller mainboard), power line is dual color of black and red, red is positive pole, black is negative pole.

**4. Q: How many waypoints can S4V2,X4V2 and GEMINI support ?**

**A:** S4V2: does not support waypoint

X4V2: support 50 waypoints

GEMINI: support 255 waypoints

**5. Q: When does the back landing happen? Why does the copter climb first sometimes ?**

**How to exit back landing mode ?**

**A:** Back landing can only happen when remote controller switching to this mode or power off or losing control. Back landing can only be executed when GPS is effective positioning, back landing position is the place where more than 7 satellites locked.

If the distance is more than 25 meters and the height is lower than 20 meters, copter will climb to 20 meters and fly back when switching to this mode; but if the height is higher than 20 meters, copter will return by that altitude. If the distance is less than 25 meters, the copter will return by its altitude.

If back landing activated, X4 series can only exit when CH5 switching to position 1(manual mode), S4V2 can only exit when CH6 switching to position 1.

**6. Q: Which KV value does the motor use when the customer who only buy the Flight Controller ?**

**A:** Motor KV value only involves with ESC, nothing to do with Flight Controller, Flight Controller only control ESC, but not motor. Flight Controller output frequency is 400Hz, 1000-2000 standard Pulse Width signal.

**7. Q: How to differentiate GPS from different Flight Controller ?**

**A:** GPS line sequence of S4V2 and X4 is the same, but not universal, it is advisable to

protect the label on the GPS or label it to distinguish. X6, X4V2 and Gemini are universal.

**8. Q: How to get the flight path files? How to read the flight path files by cellphone ?**

**A:** To get the flight path files as the following 3 methods:

1: Customer with WIFI module can get the complete flight data (no matter which kind of flight controller) after connecting WIFI, it saves at folder *YShj* (folder *hj* for PC), file name means the flight time.

2: Flight Controllers with black box function (X4, X6 series) record the last one minute data before motor stopping. After landing, do not flight the copter or unlock remote controller to throttle the motor if last one minute data need to be taken. Reading data in details refer to *data recording black box function* part in Flight Controller manual.

3: If there is Micro-SD card in OSD, the card will record the complete flight path data.

Flight path data can only be read by PC GCS.

**9. Q: What is the difference between manual mode and auto hovering mode ?**

**A:** When CH5 at position 1, it is manual mode, GPS does not take part in flying, copter altitude and position can not be fixed, and copter will compensate the attitude according to current attitude. (Note: motor will stop if throttle down)

When CH5 at position 3 (S4 series at position 2), it is GPS mode, GPS positioning take part in flying, Flight Controller compensate attitude also. When CH6 at position 1, it is auto hovering mode, copter can hold the altitude when throttle at middle position,

copter can hold the position if the other rod at middle position, copter will fly up or down at configured maximum speed from GCS when throttle top or down

**10. Q: Why can not find COM port after installing USB drive software ?**

A: Please read drive software instructions again to ensure the correct operation. If failing, try to make a line: computer port connect with USB port, flight controller port connect with RS232 port, white line at FC side connect with pin 2(receive) of RS232, red line to 5(ground), black line to 3(send). Win7 user can try downloading new drive software from QQ group.

**11. Q: Which kind of connection type does receiver support for different flight controller ?**

A: S4V2: support normal receiver connection type or PPM receiver (connect to AIL).

X4, X4V2: support normal receiver, S-BUS receiver (connect to CH7 of FC), PPM receiver (connect to CH8 of FC).

Gemini: gimbal master FC: support S-BUS receiver (support normal receiver with S-BUS converter module).

## S4

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**1. Q: How much grades does S4V2 low voltage have ? How does copter react for each grade act ?**

A: There are two grades for low voltage alarm: first grade alarm voltage of each cell is set by user, the second grade alarm voltage is 0.05V lower than the first grade's.

LED light will alarm for continuous twice red flash when first grade voltage alarm, interval vibration in cellphone reminds customer low battery. Copter will not

execute special action at that time, it is advisable to back landing.

LED light will alarm for continuous triple red flash when second grade voltage alarm, continuous vibration in cellphone reminds customer low voltage to customer.

Copter will be forced to land on the spot. (nothing will be done for X4 series). User can adjust landing position during landing, but can not throttle up.

**2. Q: Does S4V2 support Y type shape copter ?**

A: S4V2 only support quad-rotor cross or X shape, hex-rotor cross or X shape.

**3. Q: Where to download the manual and software of S4V1 ?**

A: S4V1,X6 and stedi470 stop producing, there is not any documents at Zero's website, contact with Zero technical support if need.

**4. Q: Why is it different between S4V2 flight status display and reality ?**

A: Flight status can be seen on the S4V2 cellphone GCS, X4 series GCS are not right. Besides, please set CH5 to position 1 and CH6 to position 3 if CH5 and CH6 are set to 3 way switch. Displayed hj file is different with reality because hj file is read by PC X4 series GCS.

**5. Q: Why does S4V2 can not switch to Magnetic Compass Alignment mode by RC ?**

- A:
1. It is manual stabilization mode when RC CH5 at position 1 and auto hovering mode at position 2(manual altitude hold is displayed when it can't be positioning).
  2. Check whether FC attitude is right before Magnetic Compass Alignment, LED is also not green if not right.
  3. CH5 should switch from position 1 to position 3 three times if set on a 3-way switch.

4. Throttle bottom during Magnetic Compass Alignment.

5. It could be set bigger to CH5's stroke.

It also could be done by PC X4 GCS, but USB-serial switch line needed; or android cellphone GCS, but WIFI should be prepared by customer.

**6. Q: Why does motor stop suddenly when throttle up to 50% ?**

**A:** Please check whether cell number is right, if not right, set it again and click Send a few times and click Get a few times, set successfully if number doesn't change. Only few brands ESC is not compatible well with flight controller, leading to this phenomenon.

## X4,X6 and Gemini

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**1. Q: Is X4P still in production ?**

**A:** X4P production has been stopped, single Gemini controller (Gemini M or Gemini S) product now replace X4P. Single Gemini can be used alone and the function is same with X4P, Gemini M and Gemini S can be used in group. User can read Gemini FC manual instead of X4P manual.

**2. Q: What is carefree mode ? Is locked course by carefree saved all the time ?**

**A:** The direction entering into carefree mode is as the benchmark of the forward direction of elevator and aileron stick on remote controller. The locked course is only effective one time, it will save another direction if coming into carefree again.

**3. Q: Is S-BUS2 available if using Futaba 14SG and R7008SB receiver ?**

**A:** No, set receiver to mode B or D, s-bus port in flight controller connect with S-BUS

(CH8).

## FLYING

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### Before flying

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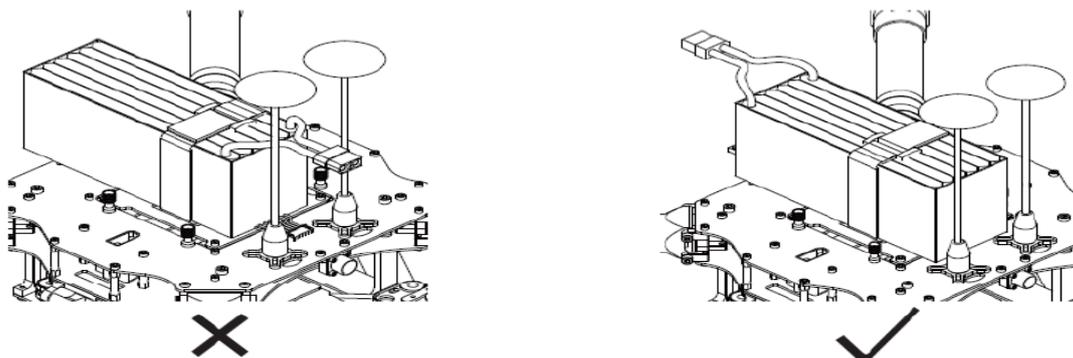
1. **Q: When test out of control protection on the ground, motor stops if switching to back landing or closing remote controller, is that normal? Will it happen in the air ?**

**A:** Back landing function: copter flying height is from flight controller program by reading barometer value, motor will stop by flight controller program to avoid accident when landing on the ground. Copter is considered as landing already when testing because the copter is on the ground, thus motor stop. This phenomenon is normal and will not happen when copter in the air.

2. **Q: Is there any demand for GPS installation ?**

**A:** GPS modules must keep flat and be raised (standard support must be used), try to avoid all kinds of magnetic field devices (such as cable, transmitter, battery, etc.

Battery line output should be far away from GPS to avoid Magnetic Compass interface); the side with word on GPS should face up, little arrow face forward.



**3. Q: Why does copter can not do vertical Magnetic Compass alignment ?**

A: Confirm whether GCS has come into vertical alignment mode already, if there isn't vertical alignment display, repeat sending instruction until displaying successfully.

Then check whether copter has faced down, alignment can be done only when attitude is between 0-5 degree on GCS , keep LED light blue(S4V2 is green).

**4. Q: Why does LED light keep white(X4 series keep white, S4V2 keeps yellow) ?**

A: GPS or IMU doesn't work. Please check GPS or reset Gyro.

**5. Q: Why does motor not rotate when unlocking remote controller stick and throttle up ?**

A: 1. Check whether ESC and remote controller have been calibrated well.

2. Remote controller can't be unlocked within No-fly area (within fifth ring road, nearby airport).

3. User need to set remote controller F/S correctly, check whether F/S setting is correct after closing remote controller every time power on.

4. Make sure that the unlock gesture is correct and should keep at that gesture for seconds, please refer to the unlock part of the flight controller manual for details.

**6. Q: Why the GCS shows IMU or compass fault when Gemini powered on ?**

A: First, we have to check whether the wirings are correct or not, the flight controller and the drive power should be power on together; The GPS should be far away from the interference, for example, the output line end of the battery. Re-power on to try again.

**7. Q: When do we need to calibrate the compass ?**

A: 1. When GPS or flight controller moved/re-installed, or far away from the area

where compass calibrated, like you go another city, then you have to do that.

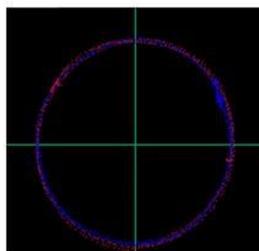
2. We can check whether the compass data are correct or not, for example, when the copter turned a circle, whether the data of the course angel or magnetic course should has a 360° change or not, whether the difference between the Master/Slave flight controller's magnetic course and course angel are within 10° or not, if not, compass need to be calibrated.

**8. Q: Why it is not manual attitude mode when CH5 switched to the second position ?**

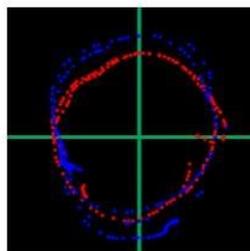
**A:** There is no manual attitude channel in new firmware. It will automatically switch to the manual attitude mode when the GPS can not search enough satellites at auto-hovering mode. Nowadays, the second channel used as a function channel.

**9. Q: After calibrating the compass, the two circles are round, but not overlap so nicely, is that okay ?**

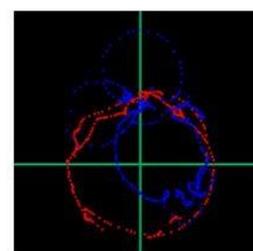
**A:** That's okay.



excellent



qualified



unqualified

**10. Q: When X4 powered by the power module, do I need to cut off the power line of the ECS with the BEC ?**

**A :** If you use a servo gimbal, the servo can power by the red line of any one ECS with the BEC function, other red lines should be cut off. If don't use a servo gimbal, all the

red lines should be cut off.

**11. Q: Why the motors aren't synchronous when throttle ?**

A: If only a little throttle, the motors will not synchronous, they will synchronous with bigger throttle, it is normal. But when throttle bigger, the motors still aren't synchronous, ECS should be re-calibrated.

**12. Q: Why one motor doesn't spin when throttle ?**

A: Take out the correspond ECS line of the motor connected to the flight controller, to connect again with a normal motor's ECS line, if still doesn't work, that indicates the output channel of the flight controller has problems. If works, we need to check the wiring connection, or there are problems from the motors/ECS.

**13. Q: Why the copter turn to one side directly after take off ?**

A: 1. Please check whether take off at the settings state or not. Be sure to keep in mind that the X4 series can not take off at settings state.

2. Please check whether the spinning direction is correct or not, whether the propellers are anti-installed or not, whether the ECS has been calibrated well or not, whether the wirings of the flight controller are correct or not.

3. Please check whether the type of the frame has been chosen correctly or not.

4. Please check the attitude of the flight controller is normal or not.

**14. Q: Do we need to fill the declination angel ?**

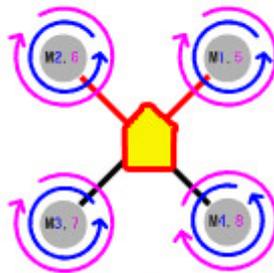
A: Nowadays, the FC can correct the compass errors automatically, no need to fill, please update the FC firmware. The new version GCS has deleted the declination angel fill part.

15. Q: Why the height on the GCS changes when the copter put on the ground ?

A: The barometer has temperature drift, so it is normal when the height changes slowly. The barometer will be reset when unlock and throttle over 20%.

16. Q: What is the layout of the aircraft drive power of the 4 axis X and 8 motors frame ?

A: As showed below( the yellow arrow is the head of the copter, the blue circle is the spinning direction of the upper side propeller, the purple circle is the spinning direction of the downward side propeller)



17. Q: Why the servo of the parachute has no reflection when click open the parachute on the cellphone GCS?

A: First, make sure that the servo power supply is normal, then on manual mode, when the throttle is on the bottom, click the default button on the Android GCS, and try again.

## During flight

1. Q: When S4V2 on auto-hovering mode, the copter can not stable on height, it will up and down, why?

A: S4V2 is sensitive to the shake, we need to reduce the shake to stable the height.

Please plus more shock absorption to FC or change a frame with less shake.

2. **Q: During the flight, LED has a white light(X4 series the LED flashes white light, S4V2 flashes yellow light), does that matter ?**

**A:** When do the radical operation and it flash and then disappear, also the Shaking coefficient and the motor balance has a warning, these are normal. We advise the user to operate softly, please put more shock absorption on the S4V2 flight controller.

3. **Q: How to adjust when the copter fly in circle itself or tend to one side?**

**A:** The user need to check whether the attitude data are normal or not, then switch to manual mode, if under the situation that the copter fly in circle itself, you have to adjust the copter until the GCS shows that there is good motor balance. (About how to adjust, please refer to the part 2 of after the flight of the FAQ)

If the copter only fly in circle itself on GPS mode, so you have to check whether the installation of the GPS is correct or not, whether have locked more than 7 satellites or not, whether the GPS compass is not calibrated well or interference.

4. **Q: When the copter hovering after fly, it will shake, why?**

**A:** 1. Please check the throttle whether less than 40 or not when hovering, if too low, you have to increase weight.

2. Check the parameters, if the roll sensitivity or pitch sensitivity is too high, that will lead the shake, try to decrease the value; if the copter sways, you have to increase the sway compensation, if it shakes, try to decrease the value, these data can be changed during the flight.

3. It may be from the frame, you have to change the frame, for example, reduce the shock absorption.

**5. Q: Why the GCS doesn't show the declination angle when fly in manual mode ?**

A: Only in GPS mode and the GPS has to lock more than 5 satellites, can you see the declination angle on the GCS, you will not see that when fly in manual mode.

**6. Q: Whether we can quit the waypoint mode when fly in auto navigation mode ?**

A: Yes, you can take the control right when you switch to auto-hovering mode or manual mode on the RC.

**7. Q: Can we open the parachute manually when use Gemini fly ?**

A: No. It will open the parachute automatically when the copter tilts more than 70 degree. when the parachute opened in GPS mode, at the same time, the motors will stop spinning automatically, but in manual mode, they will not stop spinning.

**8. Q: When in the air switch the auto-aviation mode, why the copter doesn't fly according to the waypoint ?**

A: The user has to upload the waypoint correctly and check the waypoint, and switch to the auto-aviation mode, you need to click *Enable skyway*, when use the auto-waypoint mode, you have to fill 2 in *Target* button and then click *Target* button; when use *semi-auto skyway*, you have to operate the RC elevator, then the copter will fly with the waypoint. Pay attention here: if the waypoint not uploaded correctly, when switch auto-aviation, the copter will fly away.

## After flight

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**1. Q: When problems occur, how to send back to factory?**

A: Please contact the ZERO technical support by the information on the official

website. When sure to send back, you have to print the Repair table and fill, then send back.

**2. Q: How to adjust when showing the motor unbalance?**

**A:** 1. Check whether all the propellers are installed horizontally, the screws are loose or not, the propellers are balance or not, the center of the gravity of the copter is on the center or not.

2. Check whether there is one motor is over-heat after landing, throttle and check motors are synchronous or not, feel whether each arm is un-normal shake or not by hand.

## Gimbal

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**1. Q: Whether the X4V2 can connect the ZeroTech brushless gimbal or not ?**

**A:** X4V2 only support servo gimbal. The Gemini can support the servo gimbal and the ZeroTech brushless gimbal.

**2. Q: Can the ZERO brushless gimbal support the ordinary receiver ?**

**A:** ZERO brushless gimbal only support S-BUS receiver; S-BUS converter need be used when you want to connect ordinary receiver.

**3. Q: When the gimbal can not detect the signal of the gimbal remote control, how does it act ?**

**A:** It will keep the status before close the remote control.

**4. Q: For ZeroTech RTF system, do we need to power on the gimbal and the image transmitter separately ?**

**A:** No need.

**5. Q: What's the format of video signal output by gimbal ?**

**A:** It is the AV signal.

**6. Q: When gimbal works, why the gimbal turn slowly when even not operate the remote control ?**

**A:** When the temperature changes too large(extreme cold, over-heat ), the gyro will drift, thus lead the gimbal turn slowly when not operate the RC. Then we need to reset the gyro. About how to reset the gyro, please refer to the correspond part of the gimbal manual.

**7. Q: Why the gimbal turn a lot when working ?**

**A:** It will have this problem when there is no self-check the gimbal. But even when you have done this, the problem still exists, then you have to check the FC or the gimbal's attitude controller, to see whether the attitude data are normal or not. Also, the problem will occur when the gimbal lost its middle position, then you have to contact the support guys.

**8. Q: Why the picture took by the camera with jelly ?**

**A:** 1. Please check whether the shock absorption ball broken or ageing?

2. It will also lead to jelly when the shutter speed is not proper.

3. It will also lead to jelly when the gimbal not fixed well or the copter shakes a lot.

**9. Q: Can the ZERO Gimbal used separately ? If use other brand FC, can the ZERO**

**Gimbal compatible with that ?**

**A:** Yes, but still need FC (Gemini or X4P) or gimbal attitude controller connected to the gimbal to provide the attitude data.