

# CC3D flight control board

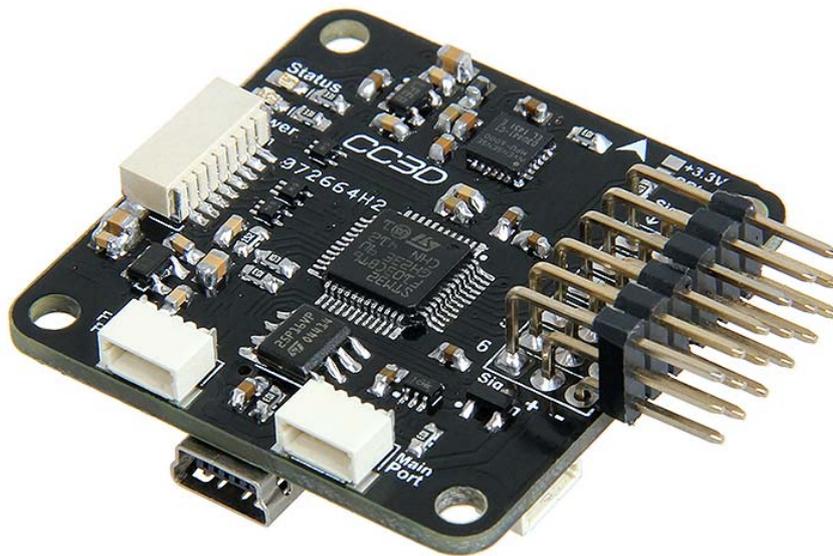
## Users Manual

Compiler: Wallace.You                      Date: Mar 20<sup>th</sup>, 2015

Reviewer: Melody ,Candy

Andy, Rannie                                  Date: Mar 27<sup>th</sup>, 2015

Approver: Linda.Fan                        Date: Mar 28<sup>th</sup>, 2015



## **Copyright Declaration**

The copyright of this specification belongs to the Shenzhen GETECH CO., LTD. (hereinafter referred to as the "Geeetech"), and all rights reserved. No part of this specification should be reproduced or extracted in any forms or means without the prior written consent of Geeetech by any company and individuals.

## **Technical Support**

If you are interested in the technology of 3 D printing, flight control and U-home, welcome to Geeetech, we have series of made-up products, main boards, modules and a variety of peripherals for you. Or if you are looking for relevant information or technical support, please login our forum where you can find anything you want about open source. To know more about our new products, please visit [www.geeetech.com](http://www.geeetech.com), we will serve you wholeheartedly.

## 1 Introduction

The CC3D board is an all-in-one stabilization hardware which runs the OpenPilot firmware. It can fly any airframe from fixed wing to an octocopter and is configured and monitored using the OpenPilot Ground Control Station (GCS) software. The CC3D boards have gained great popularity among UAV fans for its small volume, tidy circuit and affordable price.

1. Powerful STM32 32-bit micro controller running at 72MHz, and can reach at 1.25DMips/MHz when performance at 0 wait state memory access.
2. Integrated with MPU6000 (3-axis high-performance gyros and 3-axis high-performance accelerometer), with 16M IC
3. Support GPS and data transmission
4. Operating voltage: 5V

### Safety

Operating a powered vehicle of any kind can be a lot of fun. However, nothing will ruin your day at the park more quickly than an accident or running afoul of the law. Since we want you to have a great experience, please make sure that you do all of the following:

- **Operate within all local laws and regulations.** For example, in the United States, current regulations require you to operate most UAVs under 400 foot above ground level, within line of site, and away from obstructions and populated areas. Since these regulations vary from place to place, even within the same country, ensure that you understand what you need to do to stay compliant.
- Never operate the vehicle or software in a way that could be dangerous to you, other people, or property. Propellers, while rotating, could easily cut you; if a UAV fell on a person or object, it

could cause injury; a UAV caught in power lines could cause an outage. As Ben Franklin said, “An ounce of prevention is worth a pound of cure.”

- **Always keep in mind that software and hardware failures happen.** Although we design our products to minimize such issues, you should always operate with the understanding that a failure could occur at any point of time and without warning. As such, you should take the appropriate precautions to minimize danger in case of failure.
- **Never use the software or hardware for manned vehicles.** The software and hardware we provide is only for use in unmanned vehicles.

## 1.1 Overview and Hardware Resources

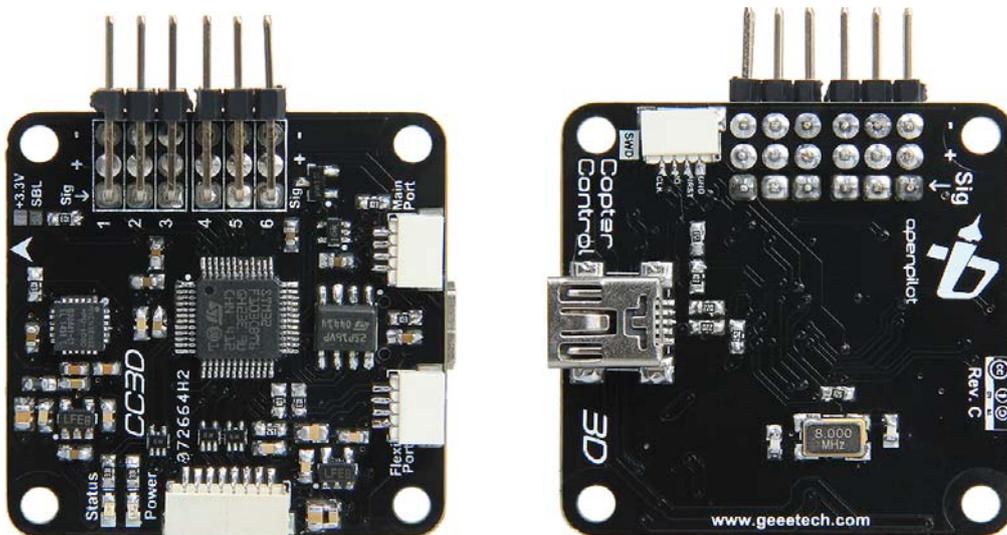


Figure 1-1(front and rare side of CC3D)

### CC3D contains:

1. STM32F103, integrated with 16M FLASH
2. MPU6000:3-axis high-performance gyros and 3-axis high-performance accelerometer

3.6-channel signal input

4. 6-channel input for servo and ESC.

5. External interface for GPS

6. External interface for data transmission

dimension: 36mmx36mmx5mm

weight: 12.6g

## **1.2 Software Resources**

Firmware upload: OpenPilot GCS

Host software: OpenPilot GCS

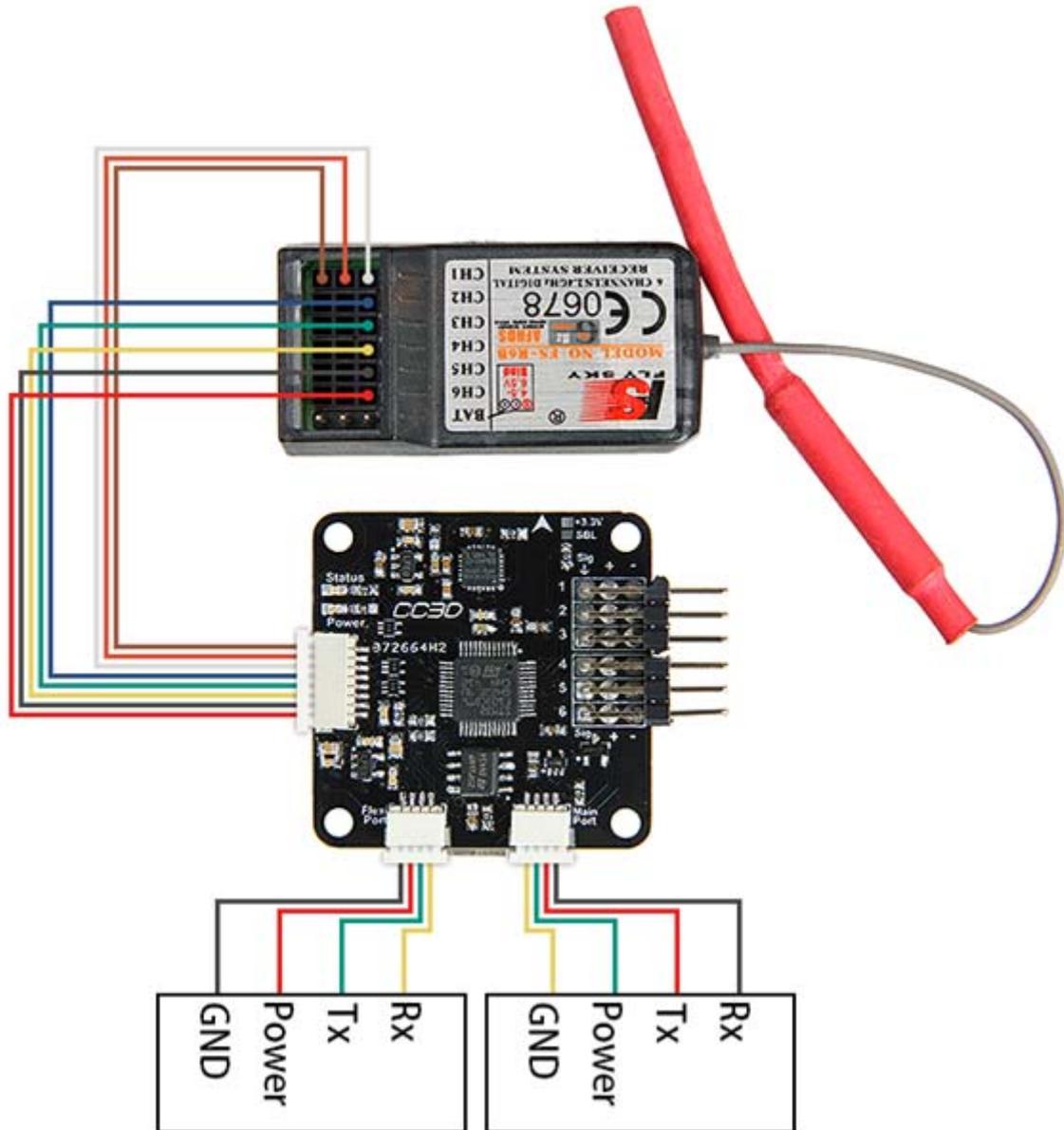
## **1.3 Source**

**OpenPilot GCS :**

<https://wiki.openpilot.org/display/WIKI/Downloading+and+Installing+the+Ground+Control+Station>

## **2 Interfaces**

## 2.1 Interface Layout



2-1

Please note the + and – of the power port, the inverse may burn the chip and circuit board.

## **2.2 Interface specifications**

The main port and the flex port are the GPS and data transmission interfaces of CC3D, when you are using one external port, please choose main port as priority.

## **3 Development Environment setting**

### **3.1 File Burning**

All CC3D board has been through rigorous test and the BOOTLOAD and firmware for X-model has been uploaded, you can use directly.

### **3.2 Software Setting**

1. Connect your CC3D to computer with USB cable, open OpenPilot GCS, then click vehicle setup wizard.

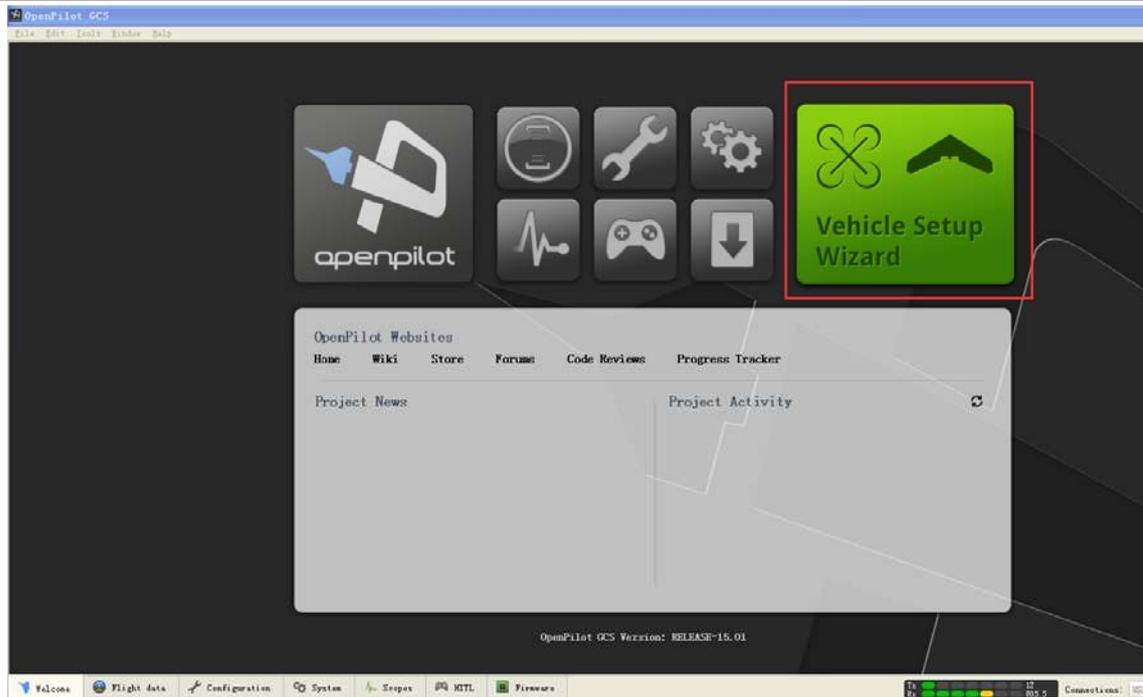


Figure 3-1

2. Click Next



Figure 3-2

3.If you need to upgrade the firmware, please choose Upgrade, or you can choose Next to continue.

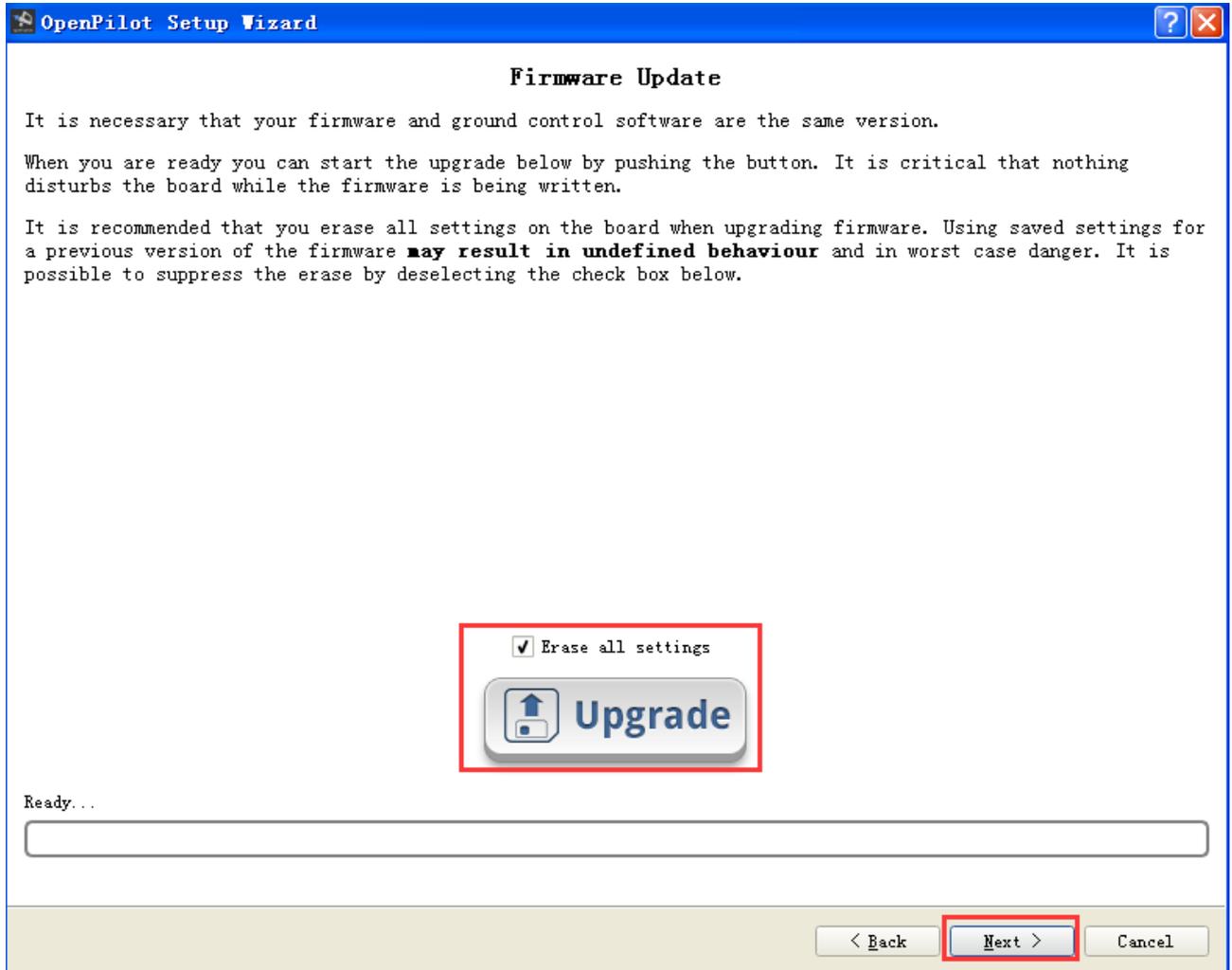


Figure 3-3

4. Choose input signal, please choose PWM as default.

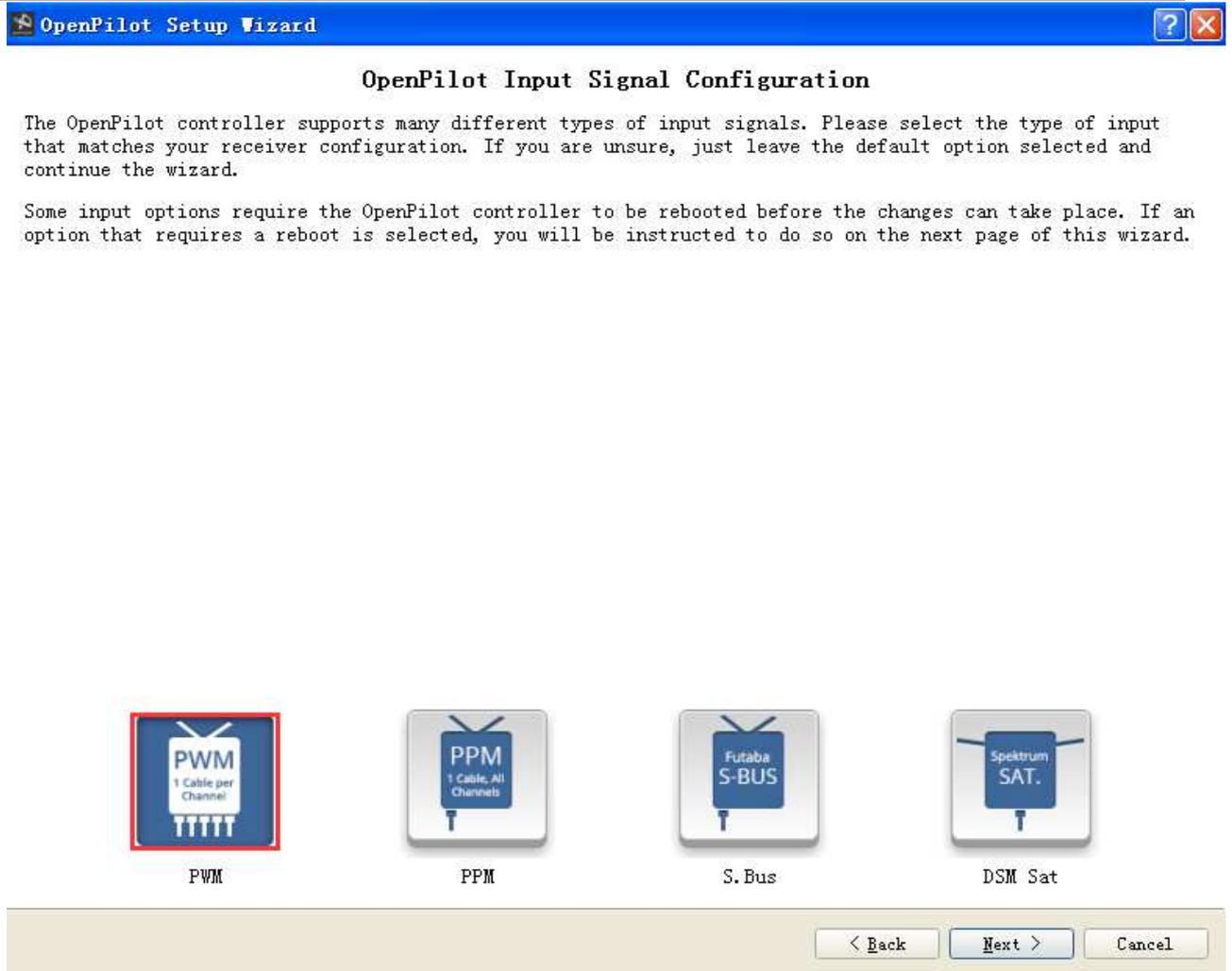


Figure 3-4

5. Choose vehicle type, the default one is Quadcopter. The current version of CC3D only provides functionality for multirotors and fixed-wing aircraft and surface, the helicopter is not applicable for the moment.

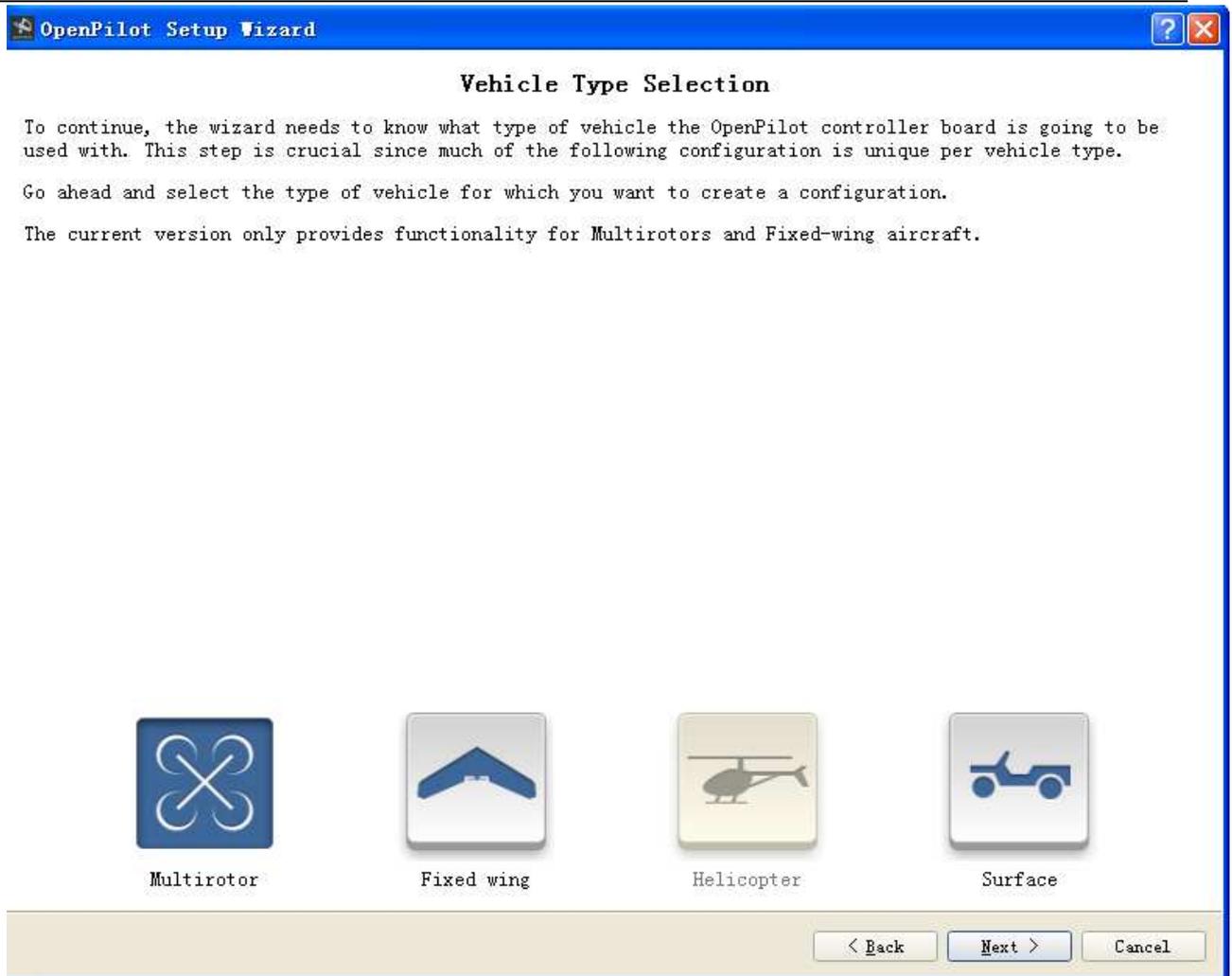


Figure 3-5

6. Click Next to continue to choose flight mode. Users can choose flexibly as you like. If you are using Quadcopter like our FE500, please choose X-model.

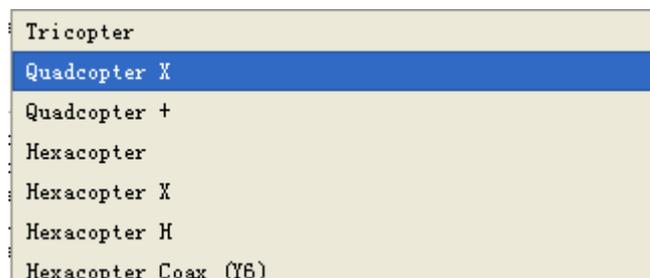


Figure 3-6

7. Choose ECS mode, you can choose from standard esc and rapid esc, if you are not sure about this, please chooses Next to continue.

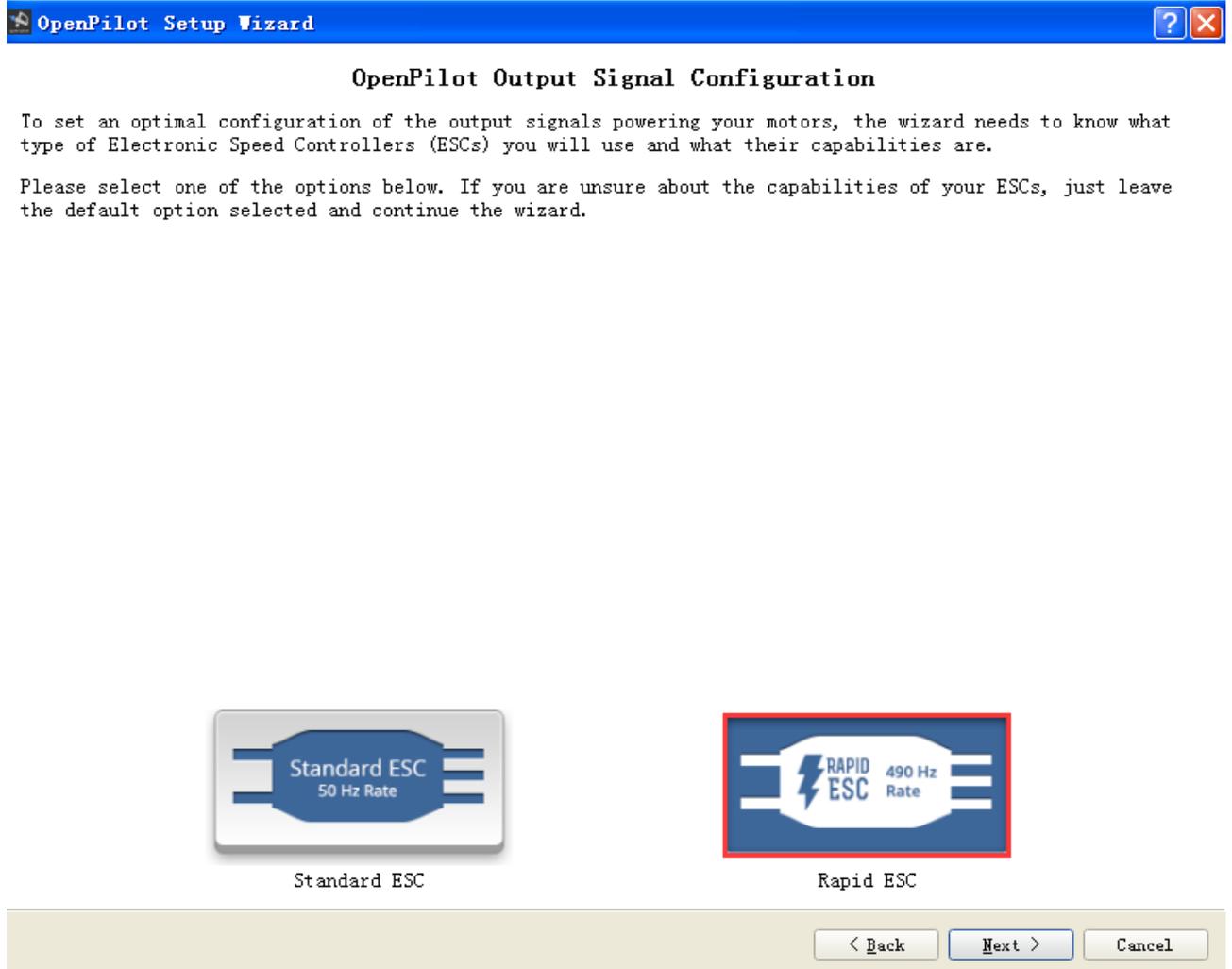


Figure 3-7

8. Calibration: click calculate and keep the board level, when you see done , the calibration is finished.

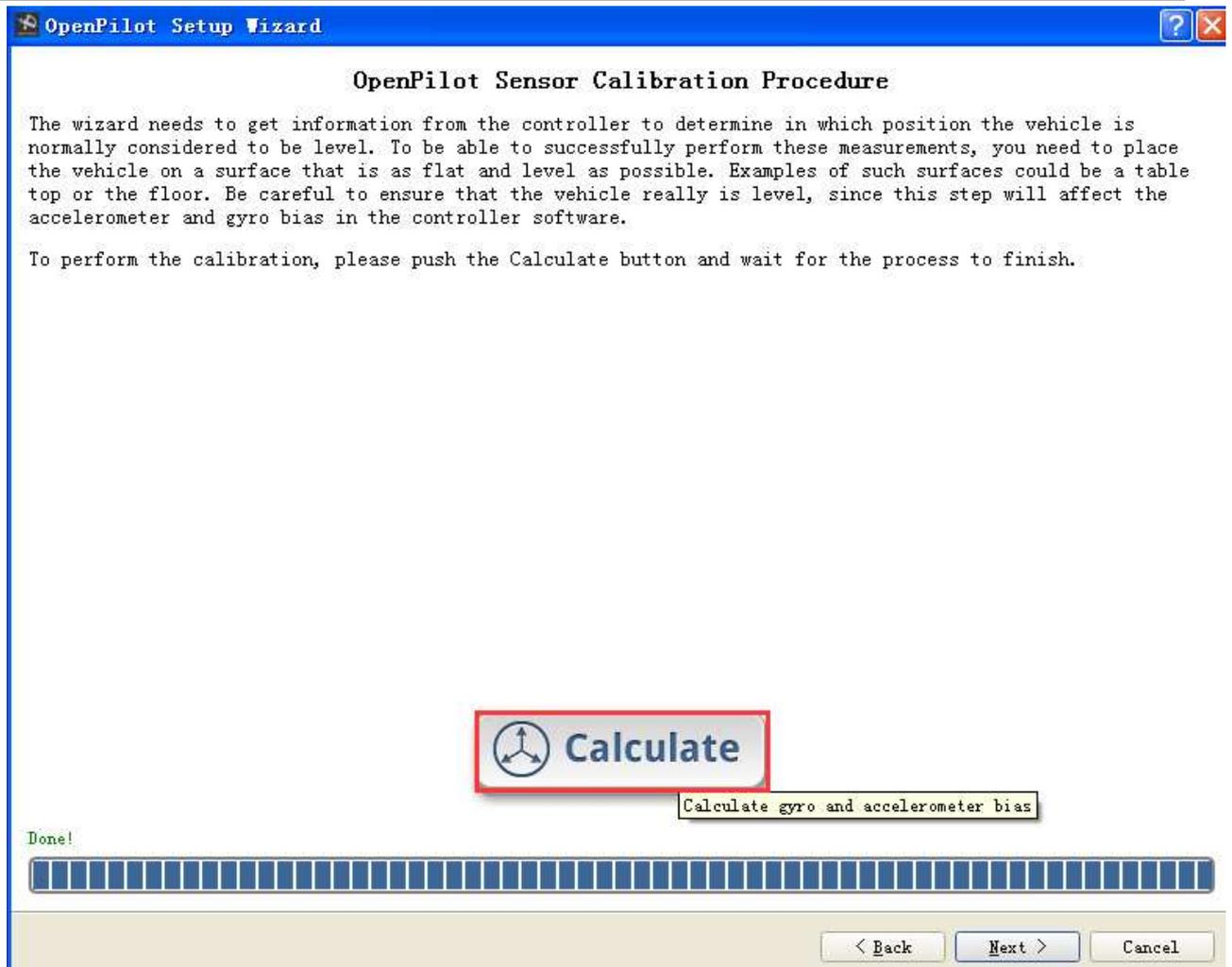


Figure 3-8

9. Calibrate the ESC signal:

Click Next to continue.

Connect the battery and the ESC, (do not mount the syrup now to avoid danger).

If you are just testing the CC3D board, you can skip this step.

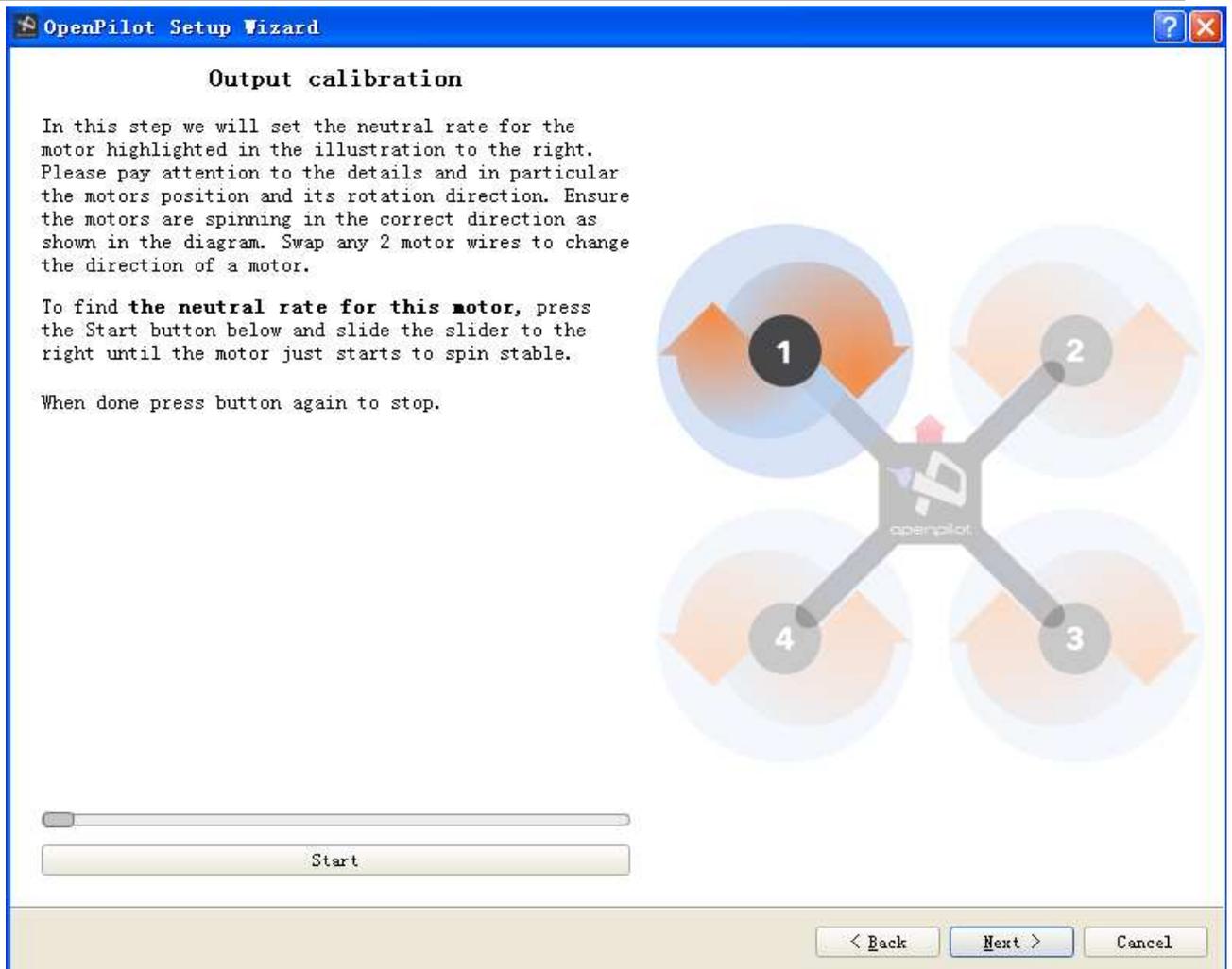


Figure 3-9

Connect the motor and ESC, make sure power supply is normal. Click start button below and slide the slider to the right until the motor starts to spin stable.



After the calibration, the motor will stop and the calibrated data will be saved. You can click Next to continue with the other 3 ESC.

10. Choose the flight model and click SAVE, all the parameters will be saved into CC3D board.

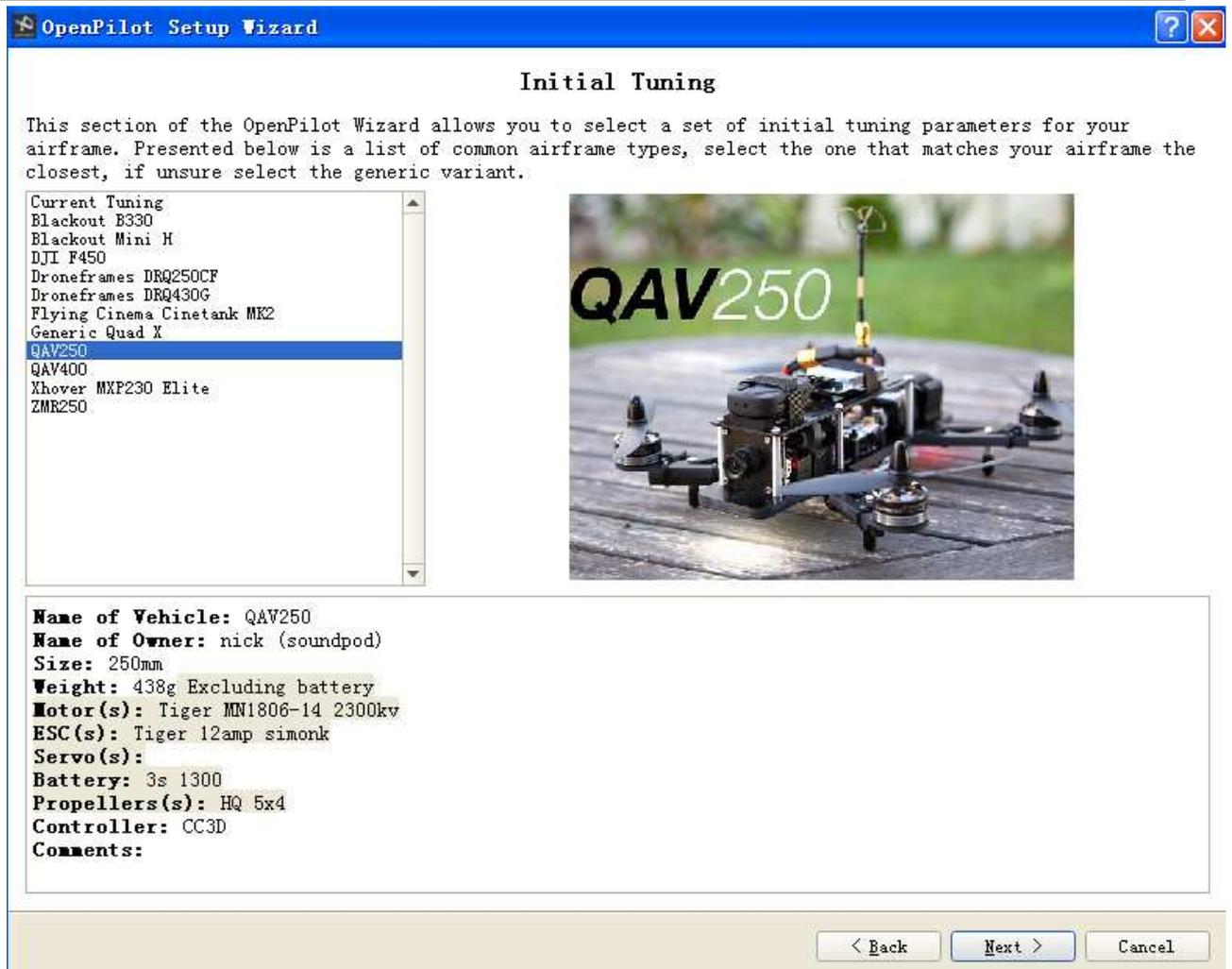


Figure 3-10

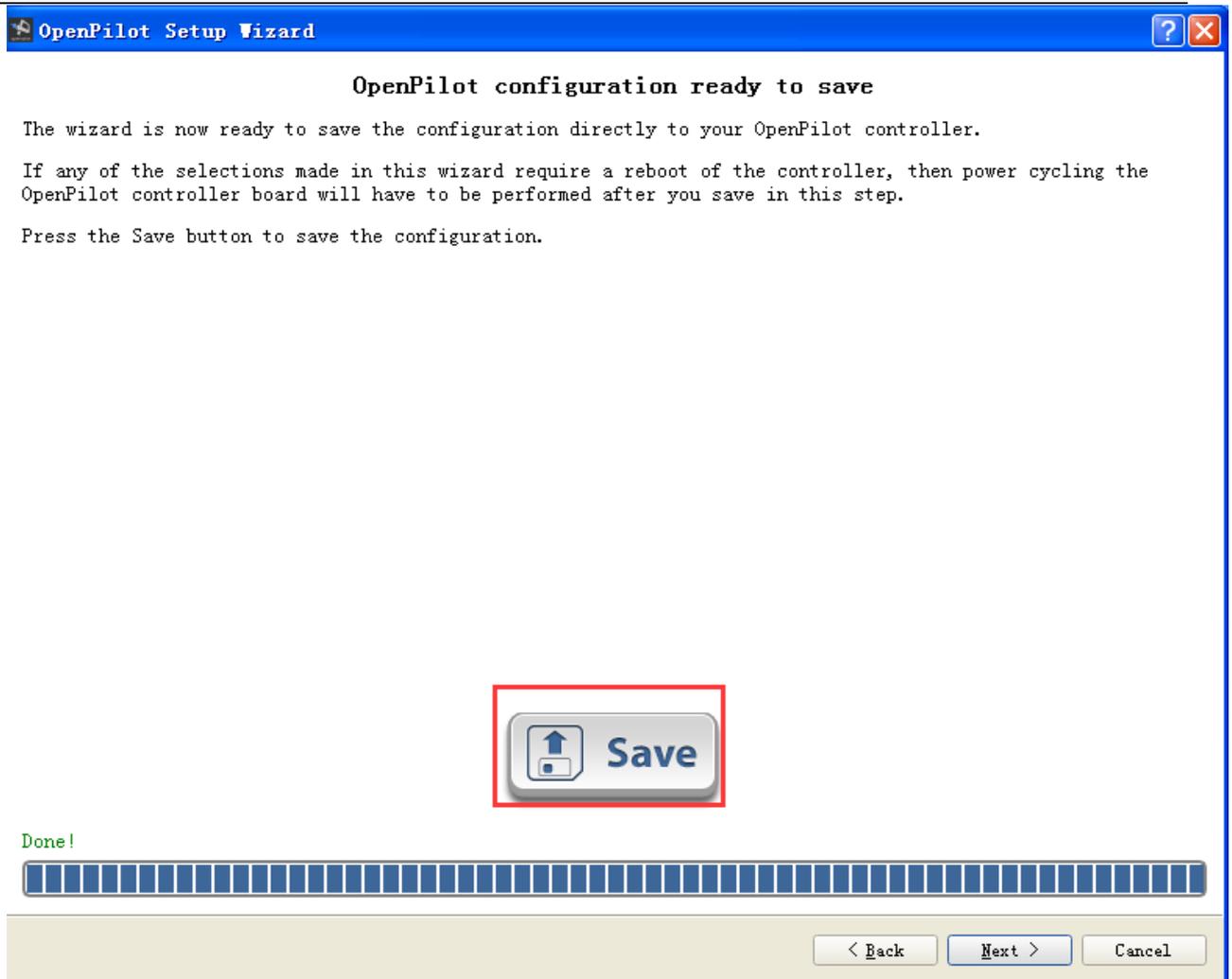


Figure 3-11

### 3.3.2 RC calibrate

1. Connect your CC3D to the receiver and operate as the following steps in the picture:



Figure 3-12

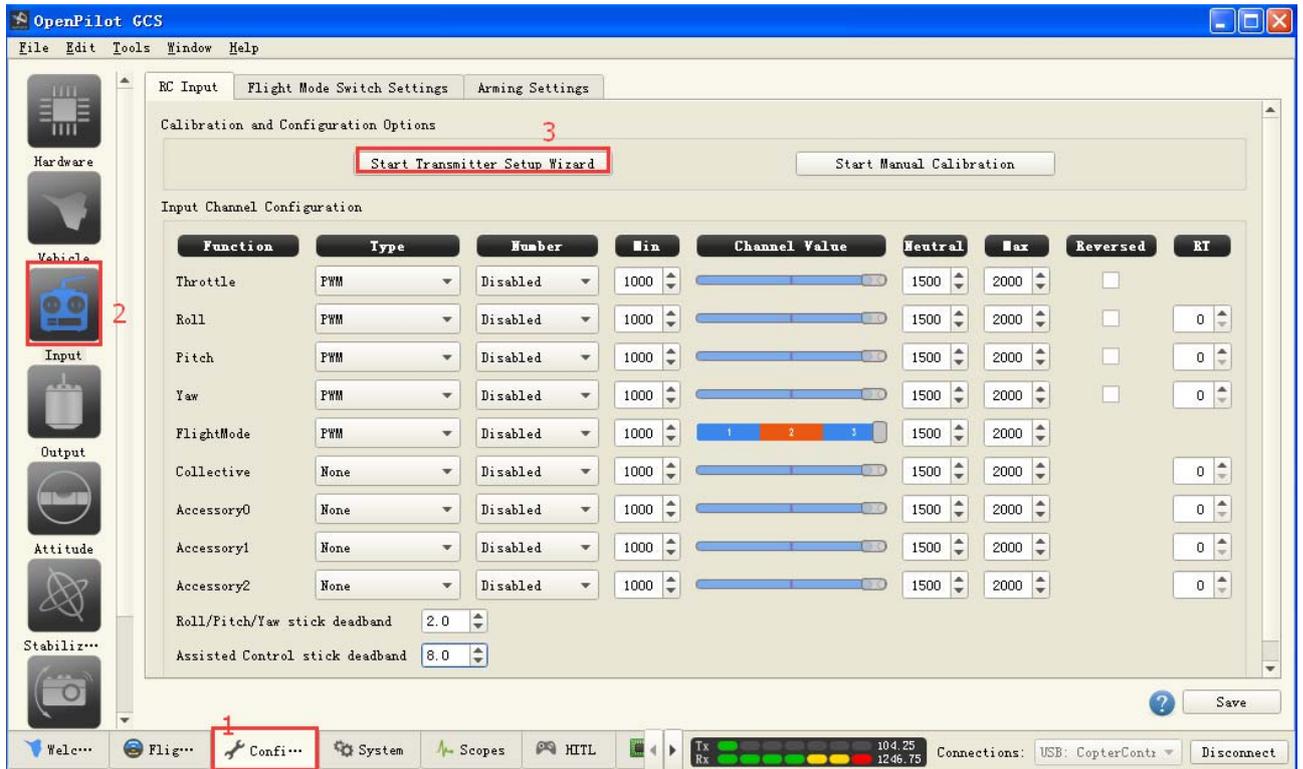


Figure 3-13

2. click next to continue with the flight mode switch setting, as shown in the picture, the default mode is for American: Throttle and Rudder are on the left hand, if you are used to Japanese mode, please choose the one with Throttle and Rudder on the right hand. You can choose as you like.

Then click Next to continue.

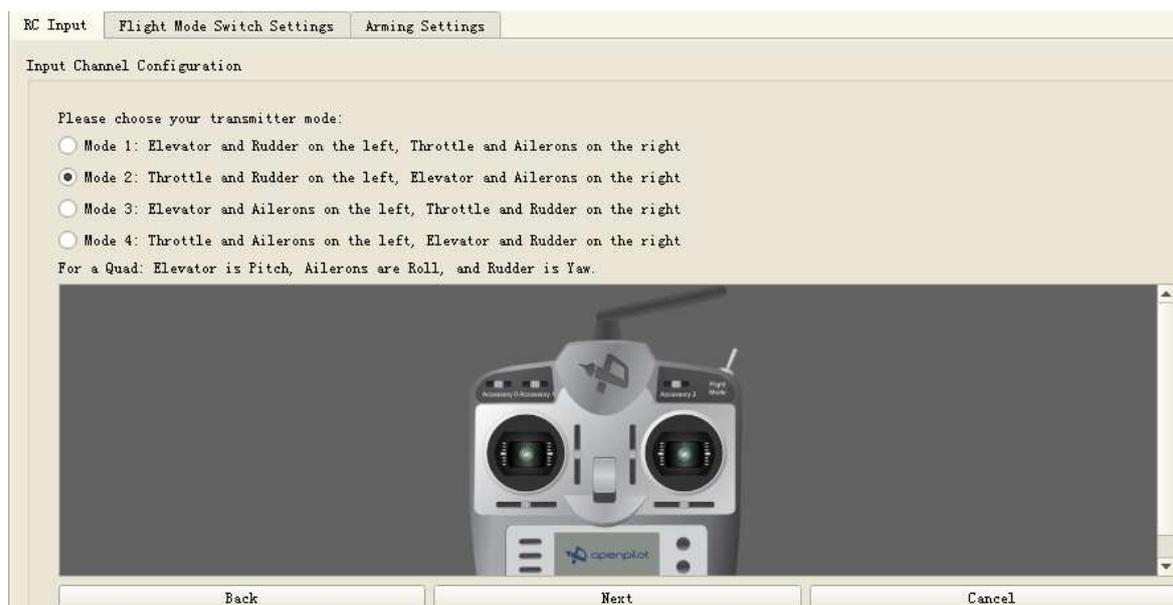


Figure 3-14

3. Move the joystick according to the picture on the screen, after you finished, you will see next/skip.

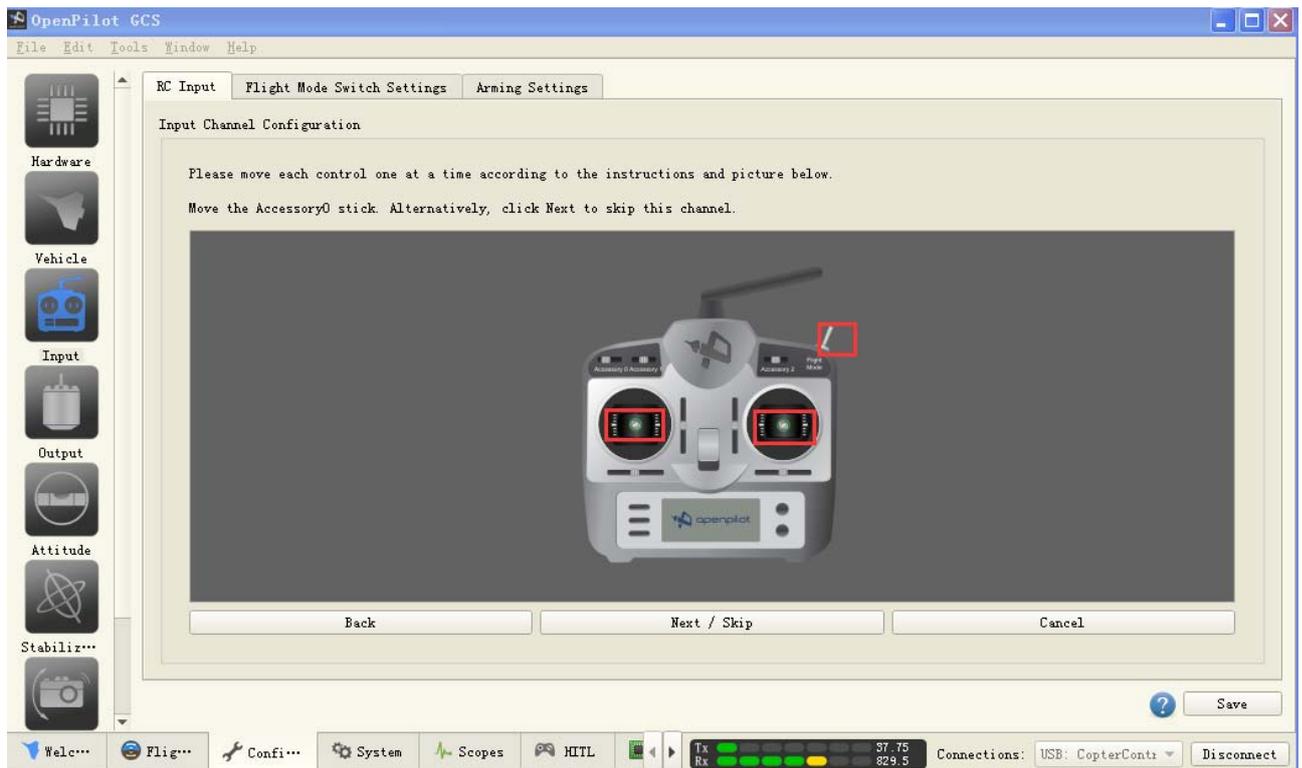


Figure 3-15

Keep the joystick at neutral, as shown in the following picture, click next, then you will be reminded to move the stick to their Maximums and minimums.



Figure 3-16

4. Arm airframe using throttle off and YAW left, arming timeout in 30seconds as default, click save.

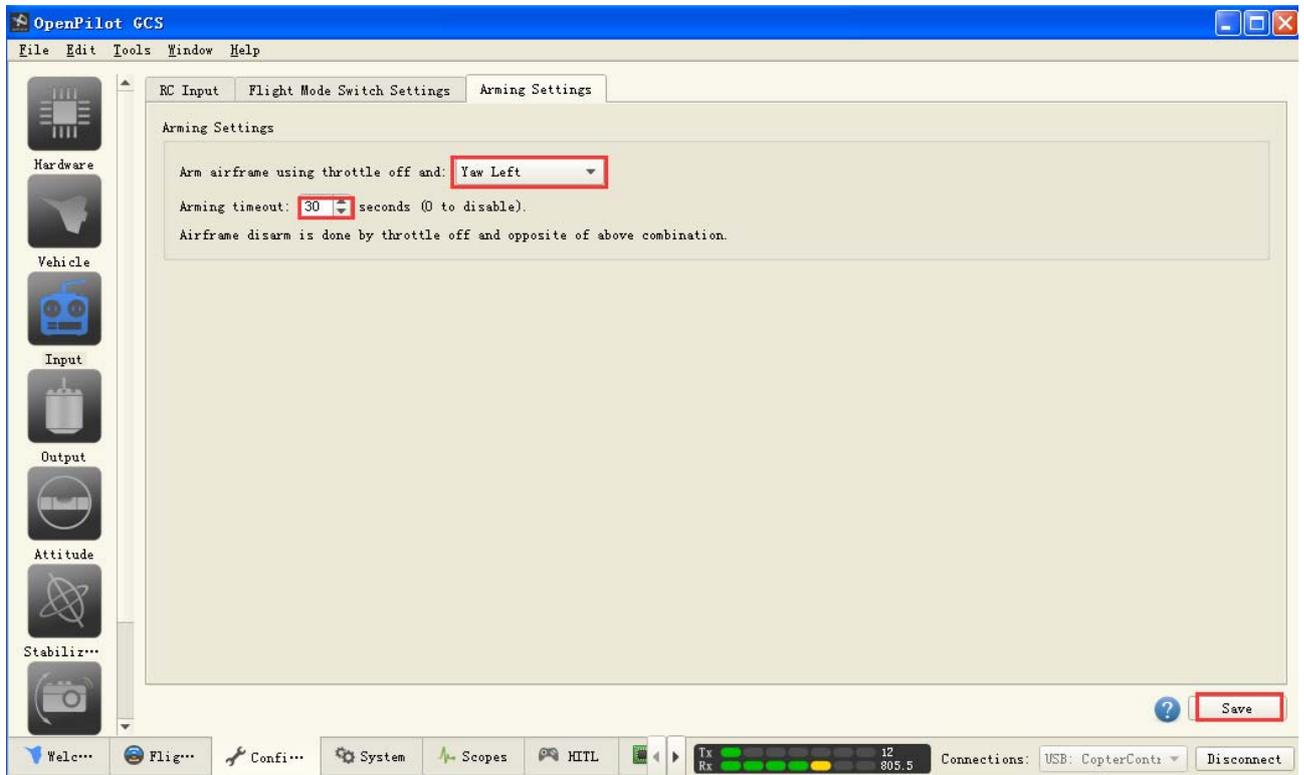


Figure 3-17

## **4 Extensible Applications**

Support GPS and data transmission.