™

Hifei   SWORDFISH™ PLUS

Brushless ESC Instructions

Thanks for purchasing *Swordfish Plus* brushless speed controllers manufactured by HIFEI. *Swordfish plus* are developed on the basis of our Swordfish ESC which integrate with built-in data logger. *Swordfish plus* ESCs not only provide stable and strong power for R/C model boats, but also log and show the power data for analysis as expected.

Please read the instruction carefully before running.

Contents

Ⅰ Using Warnings

- The brushless ESC is used for R/C electric powered model boats, which are not toys. It is suggested ONLY adults can run it, and little children must run it under wardship of adults.

- Swordfish Plus ESC is water-resistant, please pay attention to not let ESC be soaked in water, as this may cause ESC failure or be burned.

- Please **DO NOT** run Swordfish Plus ESC without water flow.

- Please read the ESC's specifications in Page 3, correctly connect the ESC to the stipulated battery pack numbers.
  It is suggest to add additional capacitor bank (such as HIFEI capacitor-bank 63V) in the following two situations:
  A: When run Swordfish Plus HV ESC with high KV motor with 10s or more lipos.
  B: When run Swordfish Plus HV ESC at max current for a long time.

- For Swordfish Plus 90A, 120A, 200A, 220A ESC (LV ESC), if you do not use the built-in BEC of the ESC, and use the separate receiver battery or UBEC to power the receiver and servos, please disconnect the red wire of the ESC's receiver lead.

- Please calibrate the throttle range of the transmitter when you use a new controller or change a new/different receiver or transmitter.

- Each new Swordfish ESC is preset with default parameters in factory, which can be assembled for running directly. In order to get optimum power performance and well compatible to work with the brushless motor, it is suggest to set the appropriate parameters before assemble it to run.

- Before begin the running, turn on the transmitter **BEFORE** powering on the receiver.
- When finish the running, power off the receiver **BEFORE** turning off the transmitter.

- Never disconnect the battery pack while the brushless motor is running, as this could cause damage to the speed controller and/or motor. And such damage would not covered under manufacturer's WARRANTY.

- It can change the motor's rotation direction by swapping any two motor wires connecting.

- Changing the PWM may cause the motor to heat ahead of time.

- The ESC will cut-off output when no signal is checked within 100ms.

- Please keep the propeller away from humans and any objects.

- **When finish the using of Hifei software ' V4.xx', close the software first, then pull out the USB linker from your PC, or it may cause the crash of the computer.**

Ⅱ ESC Specifications

Ⅱ A: *ESC Features*

• **Microprocessor controlled, extremely low resistance**

• **ESC is water-proof to prevent spill water , and aluminum water-cooler pipe is pre-mounted.**

• **Full protection soft, include signal lose protection, temperature protection, motor block-up protection.**

• **ESC has Auto detect Lipo cells feature. Forward running mode is developed for competitions.**

• **ESC is fully programmable by software on computer, or by Hifei LCD program box, or by smart Prog- card.**

• **The firmware of the ESC is upgradeable from Internet as the new version of the software becomes available.**

• **With built-in data logger.**

• **Read logging data by soft on PC or by Hifei LCD program box.**

Ⅱ B: *ESC Models*

ESC	Voltage	Current / Max	BEC	Size (mm)	Weight (incl. wires)
Swordfish Plus Low Voltage ESC with BEC					
Swordfish Plus 40A-3S	2-3S Lipo	40amp/65amp	2A Linear	59*23*10	26g
Swordfish Plus 90A-6S	2-6S Lipo	90amp/110amp	3.5A Switching	90*36*20	104g
Swordfish Plus 120A-6S	2-6S Lipo	120amp/150amp	3.5A Switching	90*36*20	109g
Swordfish Pro+ 120A-6S	2-6s Lipo	120amp/150amp	3.5A Switching	96*30*20	112g
Swordfish Plus 200A-6S	2-6S Lipo	200amp/220amp	3.5A Switching	91*44*24	156g
Swordfish Pro+ 220A-6S	2-6S Lipo	220amp/300amp	3.5A Switching	104*41*22	164g
Swordfish Plus High Voltage ESC w/o BEC					
Swordfish Pro+ 100A-8S	4-8S Lipo	100amp/150amp	OPTO	96*30*20	115g
Swordfish Pro+ 200A-8S	4-8S Lipo	200amp/240amp	OPTO	104*41*22	164g
Swordfish Pro+ 80A-HV	4-12S Lipo	80amp/120amp	OPTO	96*30*20	117g
Swordfish Pro+ 150A-HV	4-12S Lipo	150amp/200amp	OPTO	104*41*22	164g
Swordfish Pro+ 200A-HV	4-12S Lipo	200amp/250amp	OPTO	120*54*26	258g
Swordfish Pro+ II 240A–HV	4-12S Lipo	240amp/300amp	OPTO	138*60*22	260g
Swordfish Pro+ 300A-SHV	4-15S Lipo	300amp/380amp	OPTO	119*72*27	495g

Ⅱ C: *Programmable Parameters*

LVC (note 1)	Auto	5.0V	2s cells*	7.2V	8.4V	3s cells	4s cells	5s cells	6s cells				
LVC (note 2)	Auto	4s cells*	5s cells	6s cells	7s cells	8s cells	9s cells	10s cells	11s cells	12s cells	13s cells	14s cells	15s cells
Cutoff voltage/ cell	2.5V	2.6V	2.7V	2.8V	2.9V	3.0V *	3.1V	3.2V	3.3V				
Brake Type	Close *		Soft brake		Hard brake								
Timing Advance	Low		Middle		High		Auto *						
Cutoff Type	Hard cutoff *		Soft cutoff										
Startup Type	Soft start		Standard *		Fast start								
PWM Rate	8KHz *		12KHz		16KHz								

LVC **(note 1): It is LVC options for Swordfish plus Low Voltage ESC.**

LVC **(note 2): It is LVC options for Swordfish plus High Voltage ESC.**

Note: a. *The parameters with asterisk behind are the Swordfish ESC's default settings.*

     b. *'LVC/per Lipo cell' is the new improved feature, only ESC manufactured after Nov. 2010 has this feature. If your Swordfish ESC is an old version, please contact dealer or send email to 'techservice.hifei@gmail.com' for the new version firmware to upgrade your Swordfish ESC.*

     c. *When the 'LVC' of ESC is set at 'Auto' detect, after the two power beeps the ESC will beep the number of Lipo cells which the auto detect feature detects, and the red LED on ESC will blink in accompany with the beeps. '3.0v' is the default cut-off voltage of per Lipo cell when the LVC is set at 'Auto' detect.*

For example: If you connect the ESC to a 4s Lipo battery pack, the motor will firstly emit ♪♪ , then detect the Lipo numbers ♪♪♪♪, and the red LED will blink four times. The low voltage cut-off is calculated as '12.0V'.

     d. *Please ensure only when the battery packs is fully charged and it can set the LVC at 'Auto', it is recommended to set the LVC at actual Lipo cells once the battery pack is over 4S cells.*

Ⅱ **D:** *Parameters Features*

Low voltage cut-off (LVC):

The setting of LVC can protect battery from discharging too low and causing permanent damage to battery, especially important for Lithium polymer cells. It is strongly recommended to set the LVC carefully before running.

e.g. If you use 2S(2 Lipo in series), you can choose the "2s cells"; if you use 4S 1P battery packs, please set it at "4s cells".

Cutoff voltage/ cell:

The setting is to set the low voltage cut-off of each Lipo cell.

e.g. If set the LVC of per Lipo cell at '2.8v', the LVC is set at '2s cells', then the cut-off voltage of the whole battery pack is "2.8*2"=5.6v; If the LVC of per Lipo cell is set at "3.2v", the cut-off voltage of whole battery pack is "3.2*2"=6.4v.

Brake type:

'Brake disabled' setting will close the brake function*;*
'Soft brake' will provide 20% of full braking power.

Timing advance

'Low timing' setting adjusts the timing at the range of 0º~15º, recommended for more lower pole count brushless motors (such as 2 poles, or 4 poles). It gives more power and slightly less efficient;
'Middle timing' adjusts the timing at the range of 5º~20º, recommended for most brushless motors. It gives a good balance of power and efficiency;
'High timing' adjusts the timing at the range of 15º~30º, recommended for higher pole count motors. (such as 8, 10, 12, 14 poles or higher brushless outrunner motor)
'Auto timing' setting is automatically adjust the timing degree according to motor's rotating demand.
Newer version ESC released after 4 Dec, 2012 can set more timing advance: 0º; 2º; 4º; 6º; 8º; 10º; 12º; 14º; 16º; 18º; 20º; 22º; 24º; 26º; 28º; 30º. (This setting can be only set via software 'Hifei V4.03' or newer version. If you want to upgrade your old software to have these options, please download the software from www.hifei.com.)

Note: 0º and 30º are special settings, can be only selected for some special motors with manufactures special requirements.

Cutoff type:

Cutoff type settings decide the way in which the ESC cutoff output to brushless motor when the LVC works, or temperature/ signal-lost protection works.
'Hard cutoff' : when the battery volts discharges to the set LVC value or soft protection works, the motor will shut down immediately. Motor can be restarted by closing the throttle to the lowest position and re-move the throttle as normal.
'Soft cutoff': when the battery volts discharges to the set LVC value or soft protection works, the ESC will slowly reduce motor power to zero, you will notice a decrease in power and it is time to dock.

Startup type:

'Soft start': very soft and smoothly start the motor, it will take more time.
'Standard start': start the motor at normal speed, it depends on the motor's quality and dynamic response.
'Fast start': start the motor fast, recommend this for racing.

PWM

8KHz is recommended for most brushless motors.
12KHz is recommended for low inductance motors. (e.g. 8,10,12,14 poles brushless outrunner motors)
16KHz is recommended for very low inductance motors. (e.g. 16,18,20,24 poles brushless outrunner motors)

Note:
a. The poles mentioned above is the magnetic poles of brushless motor, but not the stator numbers of motor.

b. High PWM rate is easier to make motor produce more heat. Cooling jacket for motor is very important, and please be more carefully to choose high PWM rate.

c. It is strongly RECOMMENDED to have bench testing and choose appreciate parameters for your configuration before assembling the ESC to hull for running.

III Using the ESC

III A: _Connect ESC to BL Motor, Receiver, battery_

Please solder good quality connectors to ESC's motor wires and power wires before connect ESC to motor and battery. When connect power wires to battery, it is IMPORTANT to correctly connect positive to positive, and negative to negative

Swap any two motor wires' connecting can change the rotation direction.

In order to prevent and reduce any signal disturbance generated by ESC hardware, please put the ESC far away from receiver.

For Swordfish LV ESC with built-in BEC, please refer to Picture 1 for wiring.

ESC	Voltage	BEC
Swordfish Plus 90A-6S	2-6S Lipo	3.5A
Swordfish Plus 120A-6s	2-6S Lipo	3.5A
Swordfish Plus 200A-6S	2-6S Lipo	3.5A
Swordfish Pro+ 220A-6S	2-6S Lipo	3.5A

Connect the ESC to Battery.
Connect the ESC to BL motor.

Connect the receiver lead to throttle channel of receiver.

Picture 1

For Swordfish HV ESC W/O BEC, please refer to Picture 2 for wiring.

Note: when run the ESC with 8s and more Lipo cells, Please solder anti-spark wire as the picture show below.

ESC	Voltage	BEC
Swordfish Pro+ 100A –8S	4-8S Lipo	OPTO
Swordfish Pro+ 200A-8S	4-8S Lipo	OPTO
Swordfish Pro+80A-HV	4-12S Lipo	OPTO
Swordfish Pro+150A-HV	4-12S Lipo	OPTO
Swordfish Pro+200A-HV	4-12S Lipo	OPTO
Swordfish Pro+ 250A-HV	4-12S Lipo	OPTO
Swordfish plus 240A -HV	4-12S Lipo	OPTO
Swordfish Plus 300A -SHV	4-15S Lipo	OPTO

Picture 2

Step①：Switch off the ESC

Step②：Connect the ESC to the BL motor,

Step③：Connect the receiver lead to throttle channel of receiver.

Step④：Connect UBEC or receiver battery to power receiver.

Step⑤：Connect negative(-) cable of ESC to the negative of battery.

Step⑥：Connect the anti-spark leads together.

Step⑦：After 3 seconds, connect positive (+) cable of ESC to the positive of battery.

Step⑧：Switch on the ESC, after two beeps♪ ♪ ,it is ready to run.

III B: _Calibrate the Throttle Range of Transmitter_

_Note: in the following 3 situations, it is required to calibrate the throttle range of transmitter._

- _When it is the first time to use a new speed controller._
- _When change a new TX or RX, or a set of new radio system._
- _When upgrade the ESC into a new version of firmware._

When running at the calibrated max throttle, the RED LED on the ESC will be blinking on to indicate the ESC is giving the max throttle.
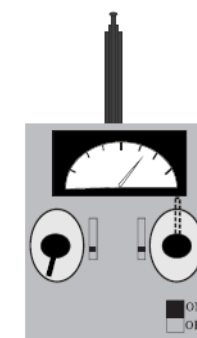
A:Board Transmitter

1st: Correctly connect ESC to brushless motor, plug the receiver lead of ESC into the throttle channel of the receiver (usually CH3);

2nd: Push the joystick of transmitter to the max throttle position, power on the transmitter.
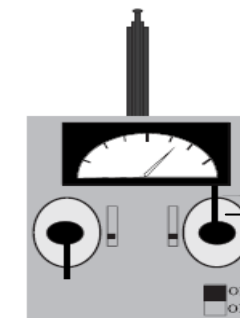
Max throttle (It will be 100% throttle point.)

3rd: Connect the ESC to battery, there are 3 beeps ♪ ♪ ♪ emitted from the motor.

4th: After the following 2 beeps ♪♪, immediately pull joystick to the minimum throttle.

Minimum throttle (It will be Zero throttle point)

5th: ♪ ♪ 2 beeps emitting, the calibrating finished.

Note：Motor is needed to install for acoustic guide. Meanwhile, please keep the propeller away from the human beings or any objects.

B. Pistol Transmitter

1) Calibrate max forward as 100% throttle point, and then neutral as zero throttle point.

       1st: Correctly connect ESC to brushless motor, plug the receiver lead of ESC into the throttle channel of the receiver (usually CH2);

       2nd: Pull the trigger to max forward, power it on.

       3rd: Connect the ESC to battery, there are 3 beeps emitted ♪ from the motor.

       4th: After the following 2 beeps ♪♪ , immediately let the trigger back to neutral position.

       5th: ♪ ♪ 2 beeps emitting, the calibrating finished.

2) Calibrate max forward as 100% throttle point, and max reverse as zero throttle point.

       1st: Correctly connect ESC to brushless motor, plug the receiver lead of ESC into the throttle channel of the receiver (usually CH2);

       2nd: Pull the trigger to max forward, power it on.

       3rd: Connect the ESC to battery, there are 3 beeps ♪ emitted from the motor.

       4th: After the following 2 beeps ♪♪, immediately let the trigger to max reverse position.

       5th: ♪ ♪ 2 beeps emitting, the calibrating finished.

Note: Swordfish ESC can not run in reverse. If throttle range were calibrated from reverse to neutral, the calibrating range will be invalid.

III C: *Ready to Run !*

Note: DO NOT run the Swordfish Plus ESC without water flow.

—Set ESC's parameters. Do testing on test-bed and select appropriate parameters for the configuration.

—Assemble water-cooling tube, make it smooth, tight.

—Check battery's volts

1. LV ESC:

       Connect the ESC to battery, the green LED on ESC will light for a second and then extinguish. And two beeps emitting out from motor while indicates to successfully detect the signal. It is time to go now.

2. HV ESC:

       Use UBEC or separate receiver battery to power the receiver. Switch 'ON', the green LED on ESC will light for a second and then extinguish. After the two power beeps, it is time to go.

       If the LVC of ESC is set in "Auto' detect Lipo cells, after the two power beeps the ESC will beep the number of Lipo cells WHILE the red LED blink.

Note:
       When the battery volts discharge and drop down to the set LVC value, the ESC will cutoff output to motor in the way of set 'Hard' or 'Soft' cutoff type, which notice it's time to change battery pack.
       When ESC cutoff output to motor, you can re-start the motor by moving throttle from 0 position again. But ESC will cutoff again soon in 3 seconds.

Ⅳ Program the ESCs by Soft on PC

Swordfish Plus ESC supports to be fully programmed the parameters by 'Swordfish Program soft' on PC, 'Hifei Program box', and 'Swordfish small Prog-card'.

When program the ESC by soft, a 'USB Linker' is required to link the Swordfish ESC to PC. 'USB Linker', 'Hifei Program box' and 'Swordfish small Prog-card' are the parts sold separately. Here the instructions will guide how to program the Swordfish ESC controllers by soft on PC.

ⅣA: *Install 'Swordfish plus Program' Software to PC*

A-a: Computer Operation System Requirements

A.   Personal computer with Windows XP/ Vista/ Windows 7 operation system.
B.   CD-ROM drive (or access to Internet)
C.   Available USB port
D.   8 Megabytes hard disk space
E.   Computer screen resolution with 800X600, 1024X768*(recommended)* , 1280X1024

A-b: Hardware

The hardware include Swordfish Plus ESC, USB Linker *(sold separately), a set-up CD (free to supply).*
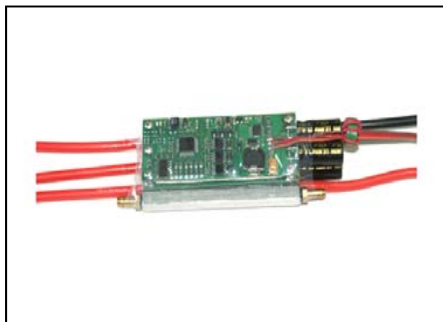
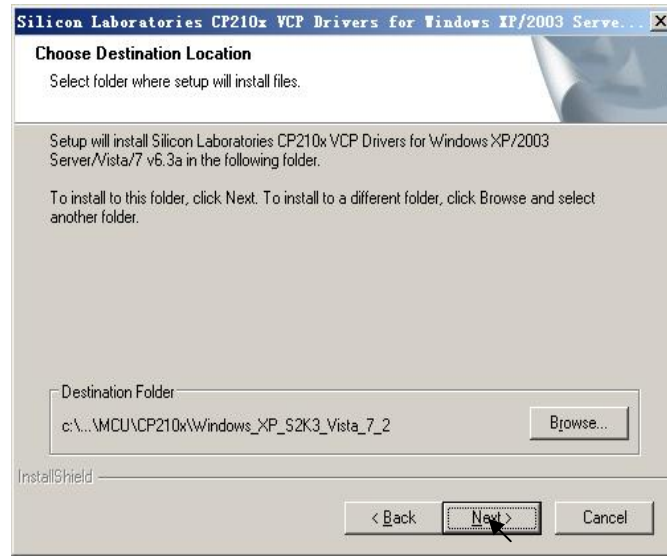| Swordfish Plus ESC | USB Linker | Set-up soft |

A-c: STEPS to install the soft

- Insert the CD in the CD driver of the computer.

- Double click the icon 'HiFei V4. 11' Setup.

Note: if your computer is windows 7 operation system, DO NOT install the soft into hard disk 'C'.

Swordfish Plus series Speed Controller Manuals   www.hifei.com

Swordfish Plus series Speed Controller Manuals   www.hifei.com
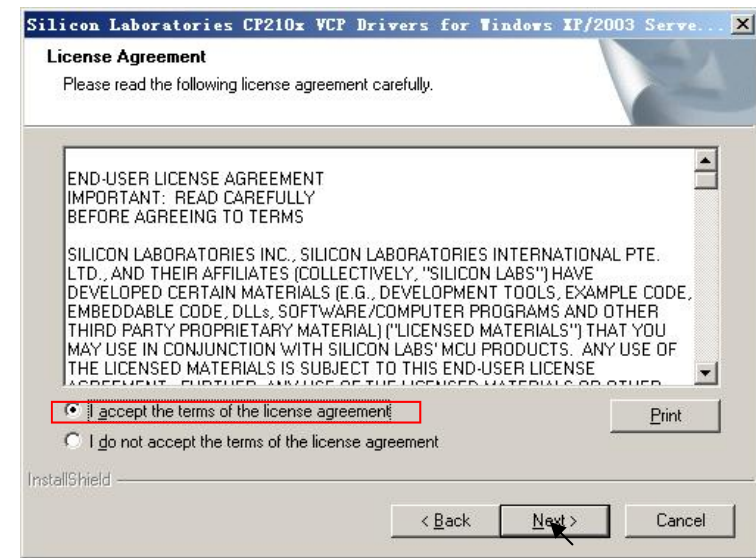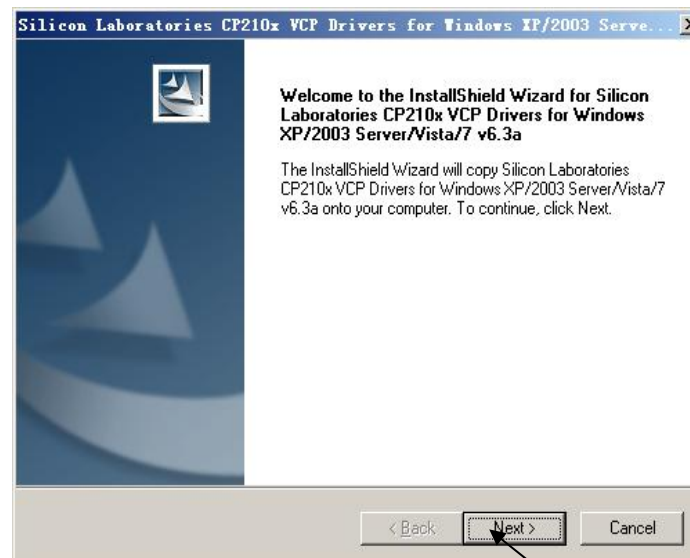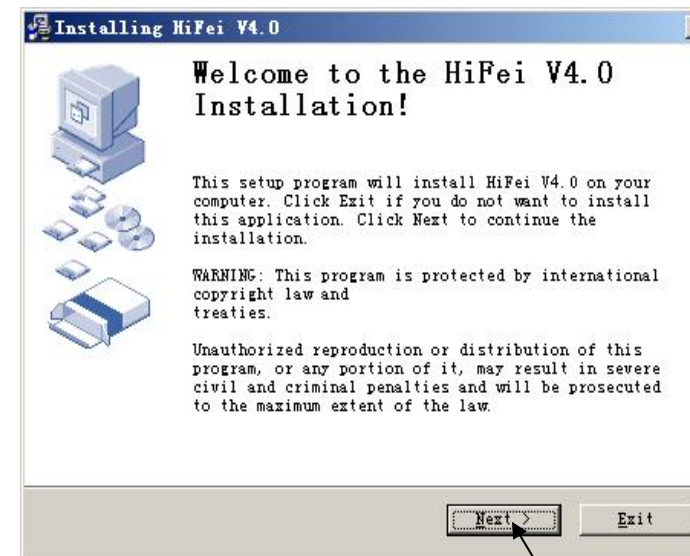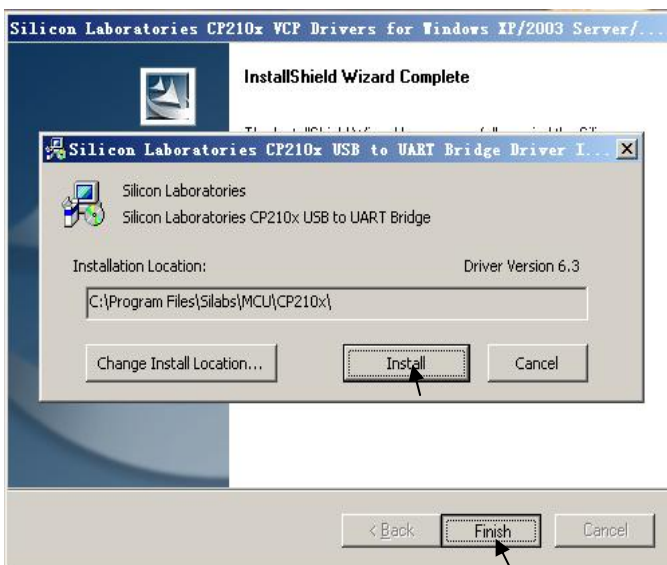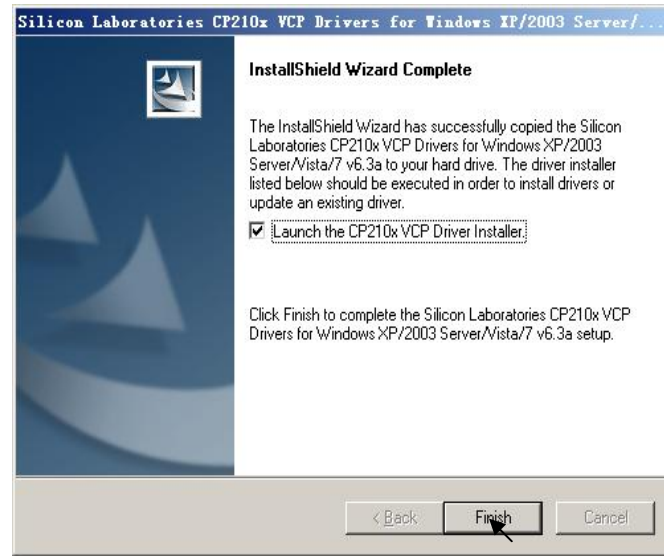
—After click 'Finish' button, the software shortcutting icon 'HiFei Vx.xx' appears on computer desktop.

— Installation completed

Note: if the software 'Hifei Vx.xx' can not run after installation, please check whether your PC operation system is x64 or not. If it is x64 operation system , please back to the installation directory of software 'Hifei Vx.xx' and install the driver of x64 manually.

ⅣB: *Connect 'Swordfish plus ESC' to PC*

B-a: Connect ESC w/ BEC to PC

-Correctly connect the ESC's receiver lead to USB Linker
-Plug the USB Linker to one of computer's USB ports. Red LED of the USB linker and green LED of ESC will light.
-Run the software 'Hifei V'
*(Please DO NOT connect ESC to battery and motor)*
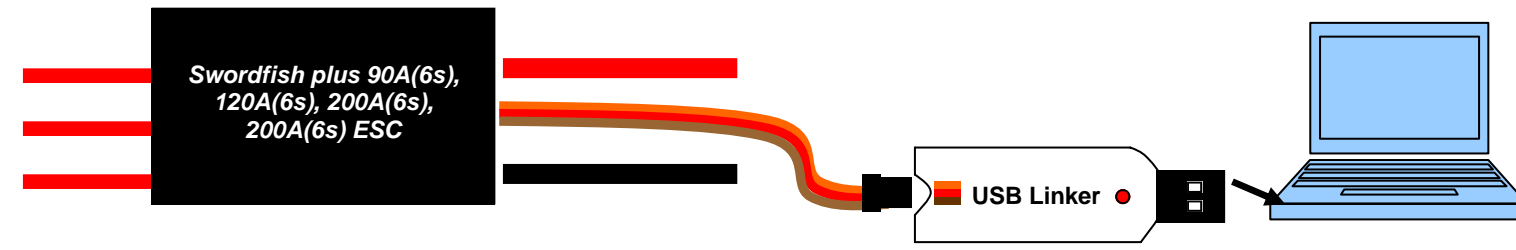
B-b: Connect ESC w/o BEC to PC

Swordfish Plus HV ESC do not have built-in BEC, it need to connect ESC to battery when link them to PC.

Please refer to the following wiring diagram to correctly connect the ESC to PC.

-Check and switch "OFF" the switch of the ESC;

-Correctly connect the receive lead of the receive to the USB linker, plug the USB liner into one of the USB ports on PC;

-Connect ESC to battery;

-Switch "ON" the switch, the green LED on the ESC will light on;

-Run the software "HIFEI V".

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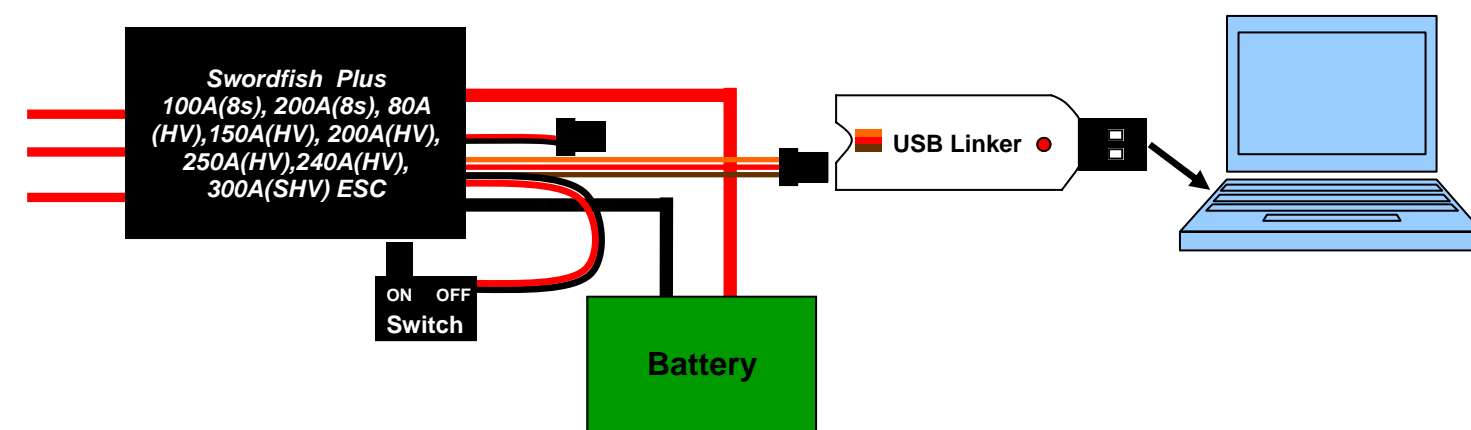
IVC: *Fully Program ESC's Paramaters*

—**Double left click mouse the icon 'Hifei Vx.xx' on desktop;**

— **Click "open device" to enter into operations.**

Note: Software V4.01 or newer version is improved to be able to automatically recognize right 'Com Port', so there is no need to set 'Com Port' by hand, but click 'open device' to get into programming interface.
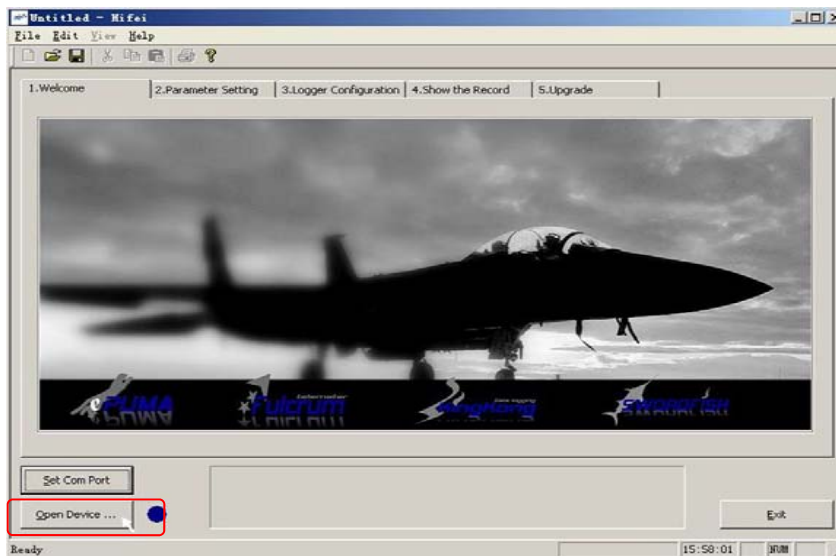
— **If connection succeed, it will jump into the following interface to program ESC settings. See the following picture.**
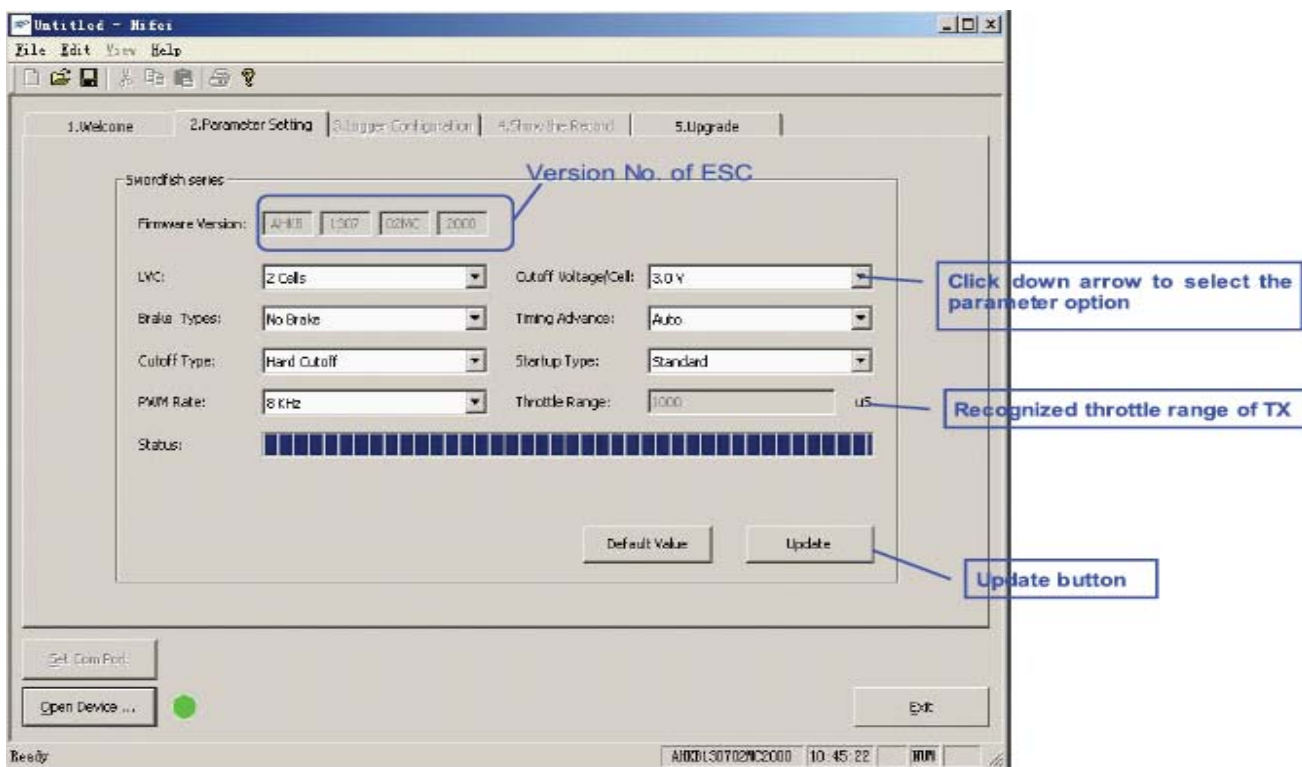
Note: when finish the using of Hifei software ' V4.xx', close the software first, then pull out the USB linker from your PC, or it may cause the crash of the computer.

IVD: *Upgrade ESC's Firmware*

Swordfish plus series controllers' firmware can be upgraded by soft on PC. When manufacturer release a new version firmware, it is much easier to upgrade your Swordfish ESC through Internet in quite short time.

-**Click tab 'upgrade'**
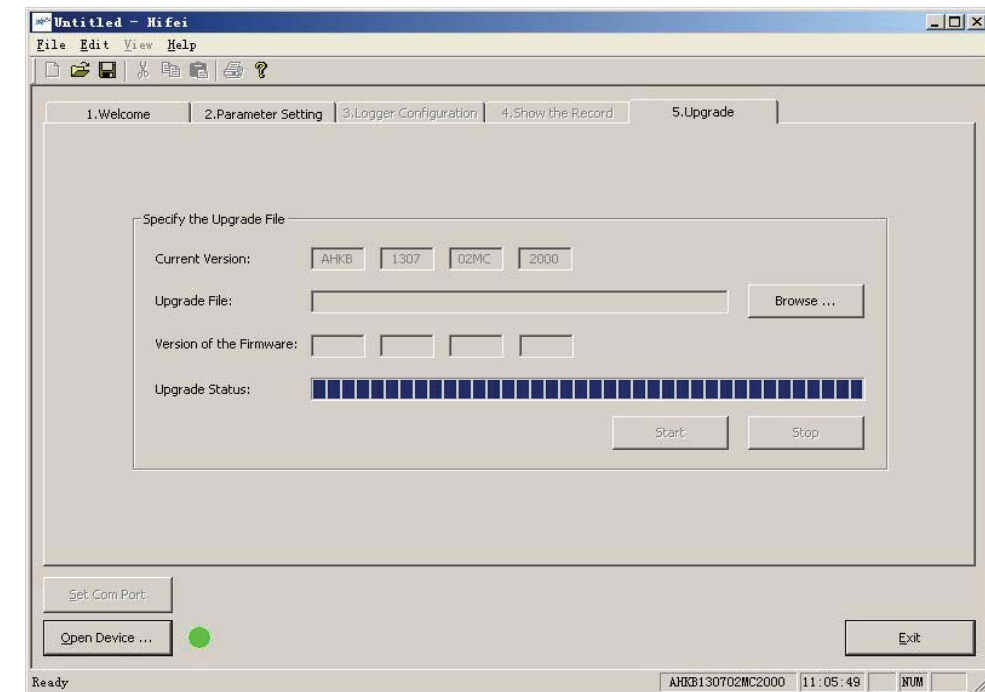
-**Click 'browse' to select the new firmware you wish to upgrade your ESC into.**

When upgrade a Swordfish Plus ESC's firmware, correct firmware for the ESC is required.

For example, if you made a mistake to upgrade a Swordfish plus 90A into a firmware for the HV 240A, your ESC could not work normally, or even the ESC will be damaged. Which is not covered by warranty.
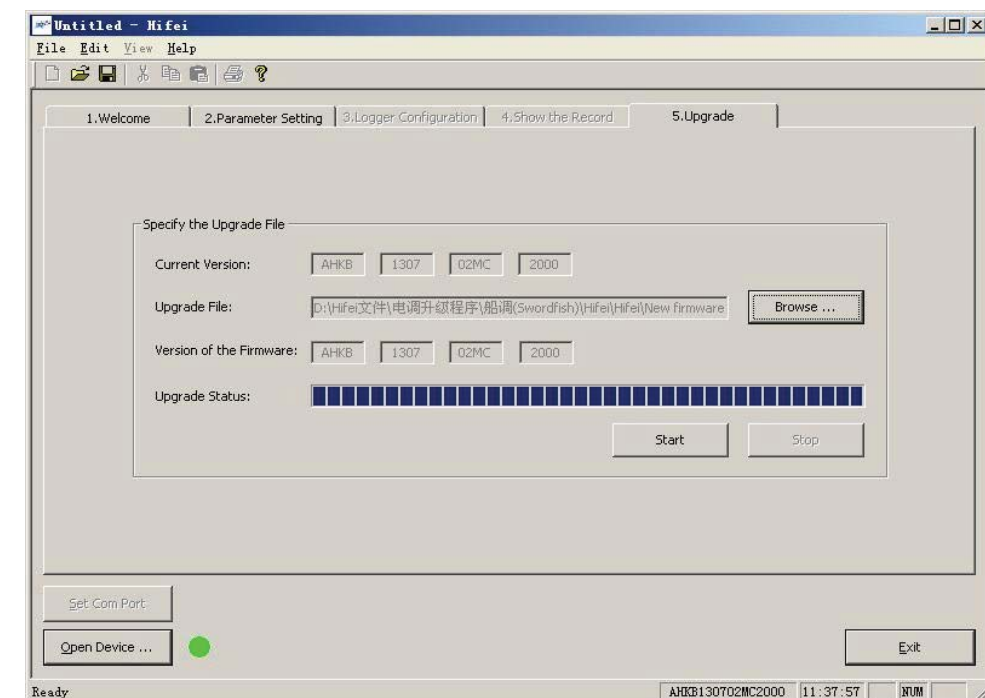
—**Click 'Start' to get into the upgrading process, it will be finished within 15 seconds.**
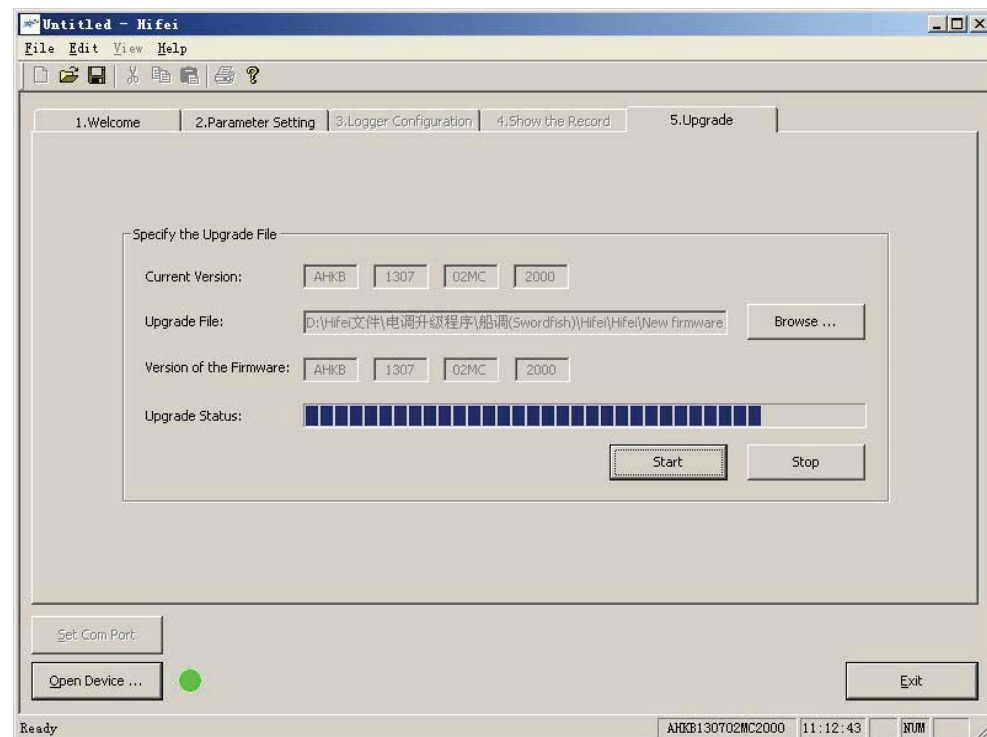
Note:

a. Please read the instructions of Hifei Program box and Swordfish prog-card before programming the ESC.

b. Because the Swordfish prog-card is small, so it cannot set the cut-off voltage of per Lipo cell, It is suggested to have either 'USB Linker' and 'Program box' to set this parameter when you have a prog-card.
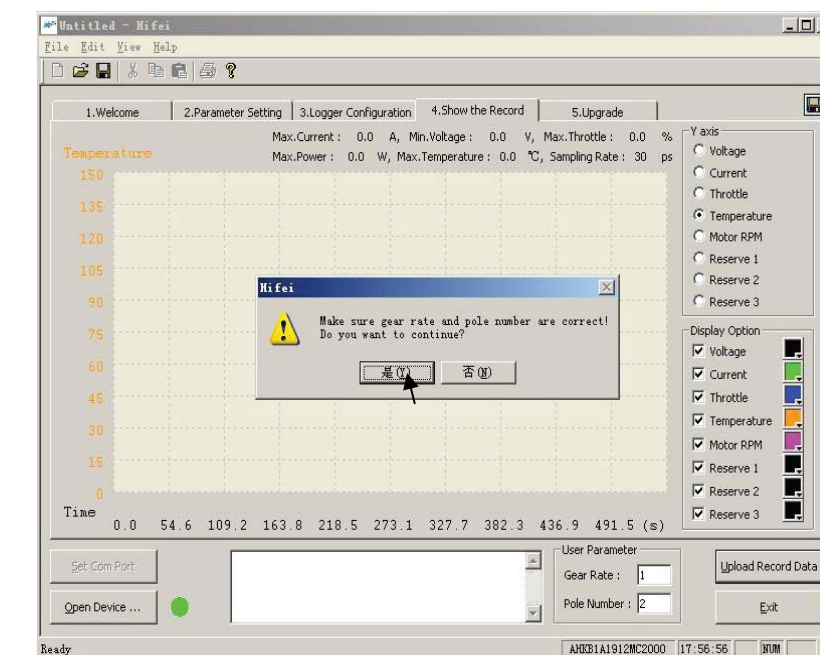
IV E: *Read power data logged by ESC*

—**Click tab ' Show the Record'. Input correct 'Gear Rate' and 'Pole Number' of the used brushless motor at the right bottom of the soft.**
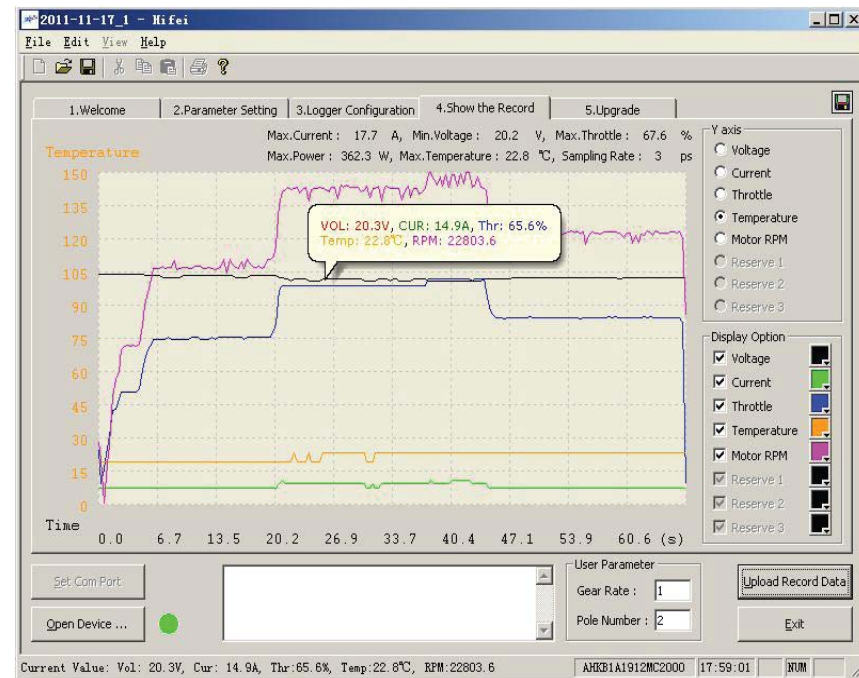   **If not use gear rate, please keep it as '1'.**
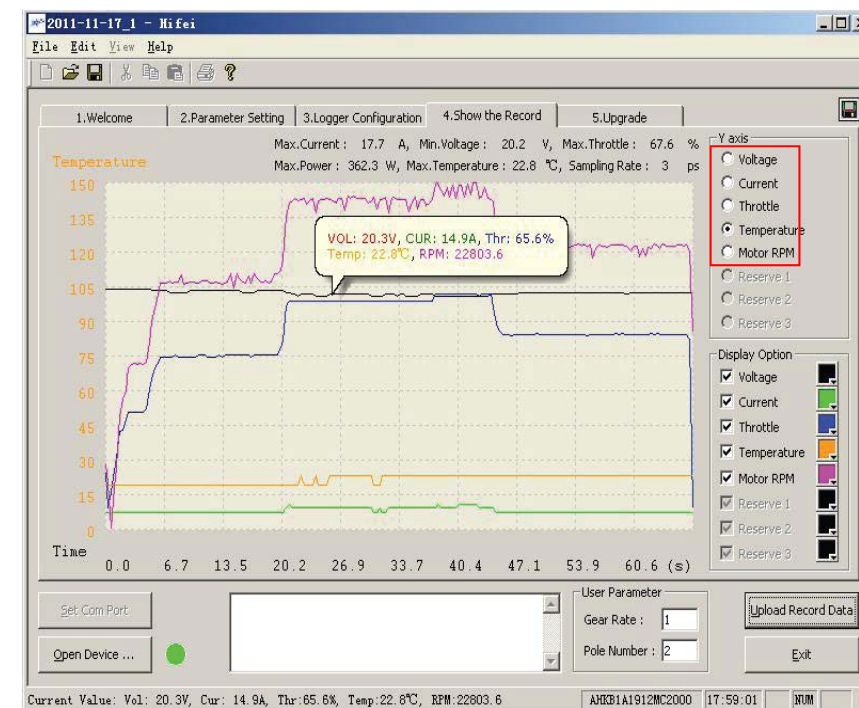   **The pole number here means the magnetic poles of motor.**
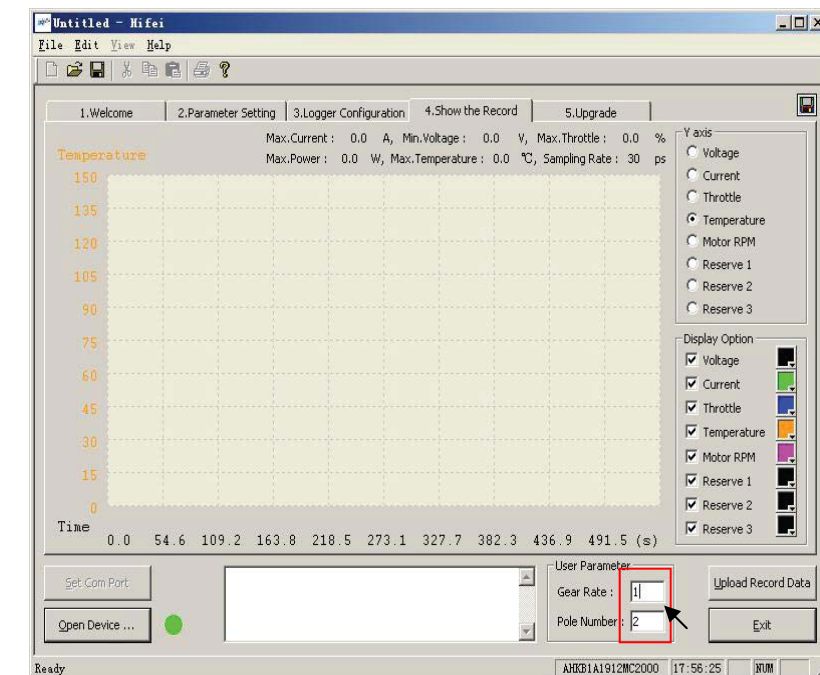
— **Click 'Upload Record Data', and Click 'Yes' in the following window interface.**

一**Data curves are showed in the software interface.**

一 **It can change Y axis displaying content by setting at the top right corner ' Y axis'.**

Note: *a. Input correct poles number of motor is important to get more precise data of RPM.*
   b. Temperature is showed in centigrade.
   c. There is ±2% physical deviation about data of RMP .
    And ±5% deviation about data of max current.
    And ±5% Celsius deviation about data of temperature.

IV F: *Logger Configuration*

一**Click tab ' Logger Configuration' to change setting logger.**
   ➡ **Cycle Record: 'Not reverse' indicates the data logger cannot record any more when the space is filled up; 'reverse' indicates the data logger can record indefinitely by overlapping the former data and do a cycle. ' Not reverse' is the default.**
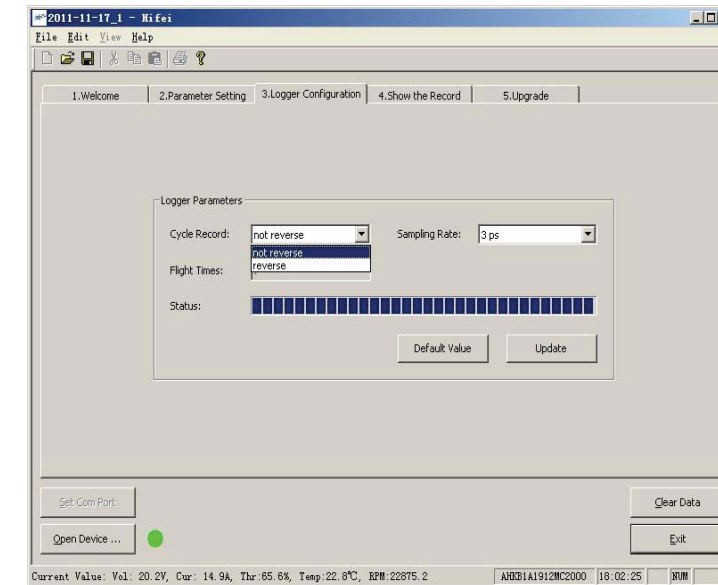
➡ **Sample Rate is the frequency by which data logger samples the power data during running. The default setting is 3 per second.**
   Please refer the following form about the recording time and minimum running time when set sampling rate at different options.

Sampling Rate	Possible Recording Time	Minimum Running Time
Once/ a second	Approx. 68.1 minutes	> 60 seconds
Twice/ a second	Approx. 34.05 minutes	> 30 seconds
3 times/ a second	Approx. 22.7 minutes	> 20 seconds
5 times/a second	Approx. 13.62 minutes	> 10 seconds
10 times/a second	Approx. 6.81 minutes	> 5 seconds
15 times/a second	Approx. 3.405 minutes	> 3 seconds
30 times/a second	Approx. 2.27 minutes	> 2 seconds

Possible Recording Time means longest time data logger can record with the set sampling rate.
Minimum Running Time: ESC must run longer than the minimum running time, otherwise the software can not read and display the data on the PC window.

Note: please DO NOT power off ESC abnormally while not moving throttle back to zero position, otherwise power data will be unavailable.

Ⅴ Trouble shooting

Trouble	Possible reason	Shoot methods
When connect ESC to battery, there is no two power beeps emitted from brushless motor.	1. The battery voltage exceeds the range of ESC's working voltage. May it is too low or too high. 2. Motor is damaged, or the ESC is not well connected with motor.	1. Check battery's voltage and change suitable battery pack. 2.Check the connectors, ensure ESC is tightly connected with motor. Check motor whether it is good.
Motor shut down suddenly even at full throttle or when not decrease the throttle.	1. Battery voltage discharge and drop down to the set low cut-off voltage, the ESC cut-off output to motor to protect the battery. 2. Temperature protection	1. Please stop the running and change a new battery pack. 2. Stop running for a while until the ESC's temperature decrease and recover to be normal.
When connect ESC to PC according to the instructions, it still cannot connect the ESC to PC succefull for programming.	1. There is loose between USB Linker to 'USB port' of PC. 2. The com port is not correct. 3. ESC's receiver lead to USB Linker is wrongly connected.	1.Plug out the USB Linker from the PC, and re-plug it in. 2. Check the correct com port. 3.Check the connecting polarity between ESC to USB Linker.

Part VI ：Warranty Clause

Thanks for purchasing Hifei Brushless Electronic Speed Controller (ESC). Here we guarantee all Hifei ESC is made by strict workmanship standards and rigorously tested before leaving the factory. But as ESCs are usually working under atrocious environment and other possible damage during transportation, we commit under-warranty service and disclaimer in accordance with the following clauses. We reserve the rights to change clauses without notification in advance.

Hifei Brushless ESCs are used for radio controlled electric model airplanes, boat s and cars. Which are not toys, and must be used with much care. It is required to read the ESC user-manuals and warnings before using. This warranty does not cover abuse, neglect, or damage due to incorrect wiring, over voltage, or overloading.

Please read the warranty clause carefully. When request warranty, it is required to fill out the ' Warranty Form' and send one copy of the form and a copy of purchase receipt with the ESC together back to factory. Please note we do not accept request for refunding.

VI A: <u>Under Warranty Conditions</u>

All Hifei ESCs are warranted for one year since the date of purchase from Hifei authorized dealers which comply with the following under-warranty clauses.

1) Replacement

In the following conditions, you can request a new replacement within 15 days since the purchase date. **(Purchase receipt or invoice must be provided)**
The requested ESC must keep in new condition.
a) New ESC you got has defect on components or workmanship;
b) New ESC you got works abnormally in first testing.
Note: any change to a new ESC (such as cutting short cables, unpack ESC, etc) will be disclaimed.

2) Repair

In the following situations, we commit free repairing to requested ESC.
Purchase receipt and warranty form are required to ship back together with the ESC.

a) the date exceeds 15 days , the defective ESC will be repaired and shipped back.
b) the ESC can not work or be damaged in testing, which is caused by the quality defects of ESC within the valid warranty date.

Note: You bear the shipping cost for returning, and we pay the cost for shipping the repaired ESC back to you.

VI B: *Disclaimer Conditions*

In any of the following conditions, we disclaim the warranty

a)   **The purchase date over 1 year.**

b)   **A valid purchase certificate and/or warranty form in not provided.**

c)   **ESC was damaged due to not following the manuals or any misuse, such as overload using ESC, ESC's on-board overloading, affected by the humidity, incorrectly soldered connectors, incorrect polarity the controller, misuse on other application, disconnect ESC from battery while motor is rotating, etc.**

d)   **The ESC is changed, disassembled and repaired by yourself or any other third party without authorization from Hifei in advance.**

e)   **The ESC is severely damaged and be irretrievable.**

VI C: *Charged Repairing Service*

We also provide charge-repairing service to Hifei ESC which is disclaimed warranty. According to the damage degree of the ESC, we will notify you the repairing fee and get your agreement before repair it.

Note: you pay all the shipping cost.

When request warranty service, please firstly contact the shop where you purchase the ESC, or send e-mail to techservice.hifei@gmail.com to describe the ESC problem, you will receive an authorized RMA number from Hifei. Please write the RMP number on ' Warranty Form'.

RAM No.: _____

Warranty Form

Please fill out this **Service-Request form** and ship one copy with the ESC which you will ship back for service. We will keep you informed about the inspection result as soon as possible after carefully checking, so please ensure your email address correct. We sincerely appreciate for your support.
Those with asterisk * behind are required.

ESC Model: *_____   Purchase Date:*_____

Contact Person: *_____   E-mail: *_____

I Using info:

Hull info*	Manufacturer_____ Hull model _____ Length _____	Hull Style (circle one) Rigger, Deep Vee, Hydro, Catamaran, other_____
Battery*	Lithium-PLithium-Polymer Cell Count____; Voltage_____; C Rating_____; Mah Rating_____;	NiCad or NiMH Cell Count_____; Voltage_____; Mah Rating_____;
Motor*	Manufacturer_____; Motor Size or Model _____;	KV No. of poles_____
Propeller*	Prop manufacturer Prop size_____ (inch) / _____ (mm)	
ESC Parameters *	LVC:_____; Cutoff voltage/ cell:_____; Brake type: _____; Timing advance_____; Cut off type:_____; Start up type:_____ PWM:_____	
Radio	Manufacturer_____; TX model _____; RX _____; servo count _____;	

II: Detail Description of problems Symptom*

When the ESC be problemed: (date)/   (month) /   (year)

Detail symptom description:

III Please notify us of your shipping address, phone call and e-mail, so we will ship the ESC after it is repaired back to you. We will keep all your info confidential.

Your name		Telephone		
Shipping address	Street			
	City		Country	Postal code
E-mail				

IV Please ship the ESC to our factory address:

Company: Chongqing HIFEI Technology Ltd.	
Address	Street: 2nd Floor, K Building, 52 Keyuan 4th street, Gaoxin District,
	City: Chongqing Country: P.R.China Postal code: 400041
Contact person	Michelle Lee Telephone: +86 23 68621580
E-mail	techservice.hifei@gmail.com

V Please ship one copy of purchase receipt with the ESC*.