Kingkong ESC Manuals

Thanks so much for purchasing Kingkong-series speed controllers manufactured by Chongqing HIFEI Technology Ltd., please read the instruction booklet carefully before flying to ensure to get optimal performance with least damage as possible and enjoy your flying.

Warnings

• Strongly **recommend** to calibrate the throttle range of transmitter when you first use the controller or when using a new/different transmitter or receiver.

• When connecting the ESC to battery pack, please ensure the polarity is correct. Incorrect polarity may cause permanent damage to the ESC and such damage is not covered by manufacturer's WARRANTY.

• When you use the ESC, turn on the transmitter BEFORE powering on the receiver.

• When you finish the flying, power off the receiver BEFORE turning off the transmitter.

• It is very **IMPORTANT** to make sure the ESC is mounted in a good air flowing place for heat sinking.

• The limiting current is set to the 'standard mode' in factory. It is suitable for use in most configurations. Only experienced technicians can adjust this programming.

• In Governor Mode, the brake is always disabled and the soft cutoff is always active.

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

• Never disconnect the battery pack while the motor is running, as this could cause damage to the speed controller and/or motor.

• Connectors with low conductivity may cause erratic motor rotations or other unexpected movements.

• If you do not use the BEC function of the ESC and are using a separate receiver pack or UBEC to power receiver and servos instead, please disconnect the red wire from the ESC's receiver lead.

• The controller will automatically power off the motor if the battery voltage drops below the programmed cut-off voltage. Try using a smaller prop on the motor, or using batteries with a higher rating. It is especially important for the user of Li-poly cells.

• Allowing water, lubricants, moisture or other foreign objects inside the ESC will VOID the WARRANTY. Exposure to CA glue or its fumes can cause damage and malfunctions; this will also VOID the WARRANTY.

Ⅰ Introduction

Hifei 'Kingkong' series controllers are outstanding and unique products in the R/C industry. They represent a great advance in electric flight by integrating a data logger with an electronic speed controller. There is no need for a separate logging device if you have a Hifei 'Kingkong' controller! In addition, software updates for the controller can be downloaded from the Internet so your controller will never become obsolete. The 'Kingkong' series give you all the data you need to be sure your aircraft is set up for its optimum performance. With the 'Kingkong', all you have to do is going to fly and having fun!

Ⅱ Unique Features

• **Supports the 'Hifei USB Linker' to program the ESC by computer.**

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

• **Innovate intelligent Governor Mode, especially for 3D helicopter. Please see appendix for more details.**

• **Integrated with the flight data logger, records data for the ENTIRE flight such as:**

   - Voltage

   - Current

   - Temperature

   - Motor RPM

   - Throttle travel

• **Compatible with Hifei Program Card and Hifei Program Box.**

Ⅲ Specifications

ESC	Voltage	Current / Max	BEC	Size(mm)	Weight (incl. wires)
Kingkong 20A	2-3s Lipos 6-10s Ni-xx	20amp/ 30amp	5V, 2A (linear)	55 x 27 x 13	23g
Kingkong 40A	2-3s Lipos 6-10s Ni-xx	40amp/ 50amp	5V, 2A (linear)	58 x 27 x 13	25g
Kingkong 45A	2-6s Lipos 6-20s Ni-xx	45amp/ 65amp	5V, 3.5A (switching)	58 x 26 x 17	40g
Kingkong 60A	2-6s Lipos 6-20s Ni-xx	60amp/ 70amp	5V, 3.5A (switching)	71 x 26.5 x 15	50g
Kingkong 80A	2-6s Lipos 6-20s Ni-xx	80amp/ 90amp	5V, 3.5A (switching)	71 x 26.5 x 15	52g

Ⅳ Using the ESC

• **Calibrate the throttle range of transmitter at the first time to use the controller** *(Recommend)*

- Correctly connect the ESC with brushless motor, plug the receiver lead of ESC into receiver (usually into Channel 3);
- Put the throttle to the highest position, turn on the transmitter;
- Power on the receiver, ESC and motor. There are 3 beeps emitted from the motor, which indicates all electronics are correctly power on for the setting.
- Then there are 4 long beeps emitted from the motor ♪ ♪ ♪ ♪ .
- Move the throttle to the lowest position after each one beep of the 4 long beeps, which will calibrate the '0' position of the transmitter;
- Waiting one second, there will be two beeps emitted from the motor ♪ ♪

> **NOTE: 1).** If you have succeeded in calibrating the throttle range of transmitter, the throttle range will be displayed in **'Programming Set' window** when you connect the controller to PC. The factory preset throttle range is 640 uS.

- Calibration of throttle is completed.

• **Program the ESC' s settings or use the default setting (by Hifei Program Card/ on PC/ by throttle stick)**

Recommend: Please always clearly know current parameters of ESC before use, and program it according to your configuration. Please take the following form as reference to program the ESC (Default setting is displayed in blue. Throttle range in gray cannot be programmed but be auto changed after calibrating the throttle travel of transmitter.) Seeing the appendix about the detail programmable features of Hifei ESC-40A-K.

LVC (note 1)	Auto	5.0V	6.0V (2 Lipo)	7.2V	8.4V	9.0V (3 Lipo)	12.0V (4 Lipo)	
LVC (note 2)	Auto	6.0V (2s Lipo)	7.2V	8.4V	9.0V (3s Lipo)	12.0V (4s Lipo)	15.0V (5s Lipo)	18.0V (6s Lipo)
Current Limiting	Sensitivity		Standard		Insensitivity		Disabled	
Brake Type	No brake		Soft brake		Hard brake			
Timing Advance	Auto		Low		Middle		High	
Cutoff Type	Hard cutoff		Soft cutoff					
Start Type	Soft start		Standard		Fast start			
Governor Mode	Auto		Governor Low		Governor High			
PWM Rate	8KHz		12KHz		16KHz			
Throttle Range	640 uS							

LVC (note 1) is low voltage cutoff options for Kingkong 20A and Kingkong 40A ESC.
LVC (note 2) is low voltage cutoff options for Kingkong 45A, Kingkong 60A and Kingkong 80A ESC.

・In order to well record flight data and utilize the storage space of the integrated logger, please first set the logger in menu **'Logger Configuration'** after installing Hifei V4.0 software on PC. (see instructions in Ⅸ)

・When you finish all the setting, re-power the ESC, there are two beeps emitted from the motor, then is ready to go fly and enjoy the flying.

Ⅴ <u>Installing Hifei Software</u>

NOTE: Never plug the USB Linker to USB port of PC BEFORE installation of software is successfully completed.

A. System Requirement
・Personal Computer with WINDOWS 2000 or WINDOWS XP operation system
・CD-ROM drive (or access to Internet)
・USB port available
・4 Megabytes hard disk space
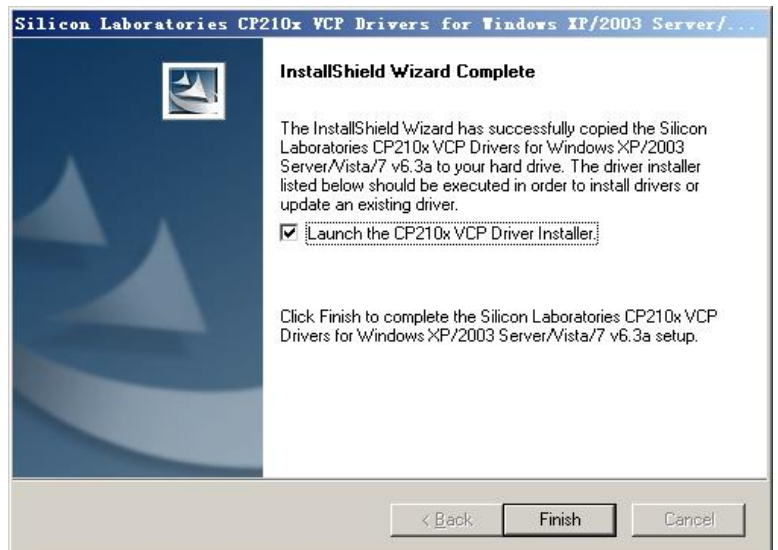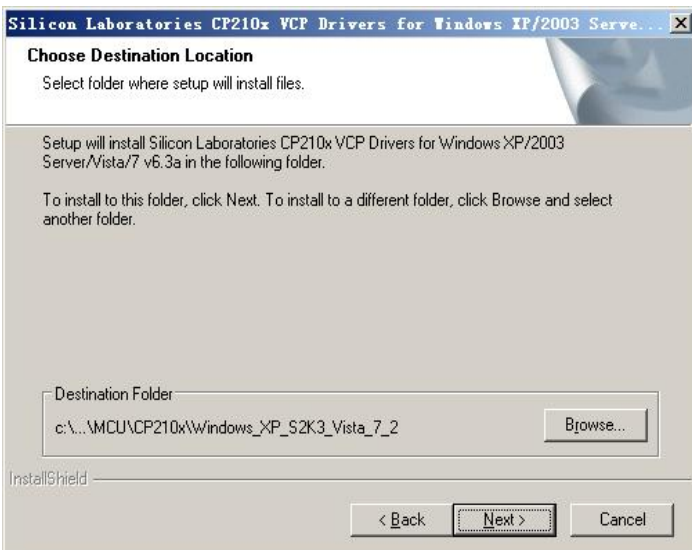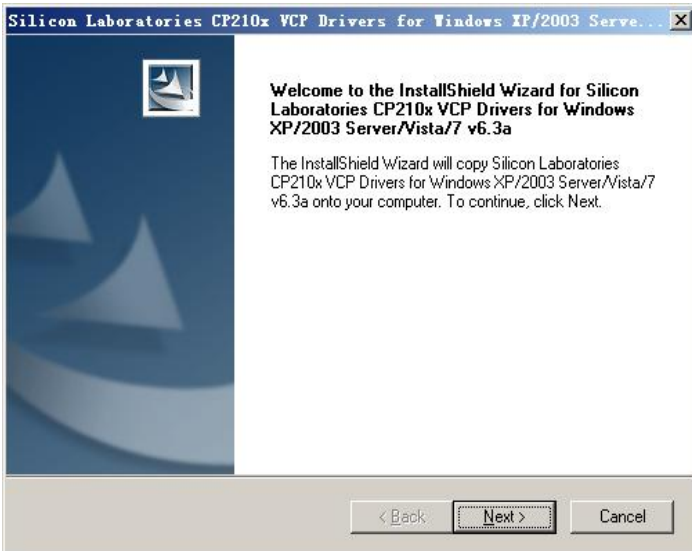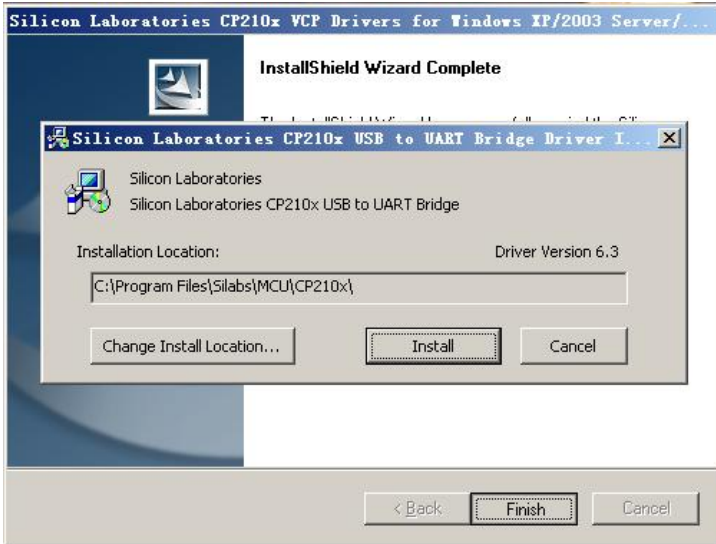・Computer screen resolution with 800×600, 1024×768 (*Recommend*), 1280×1024.

B. Hardware
One Hifei Kingkong ESC，Hifei 'USB Linker' and a Hifei setup CD.

Hifei Kingkong ESC

USB Linker

Setup CD

C. Steps to install Hifei software

・Insert the CD in the CD driver of the computer. (CD is packed with each Kingkong ESC)
・Double click the icon**'HiFei V4.0 Setup'**

Installing HiFei V4.0

Welcome to the HiFei V4.0 Installation!

This setup program will install HiFei V4.0 on your computer. Click Exit if you do not want to install this application. Click Next to continue the installation.

WARNING: This program is protected by international copyright law and treaties.

Unauthorized reproduction or distribution of this program, or any portion of it, may result in severe civil and criminal penalties and will be prosecuted to the maximum extent of the law.

[Next >]   [Exit]

Installing HiFei V4.0

Destination folder
Select a destination folder where HiFei V4.0 will be installed.

Setup will install files in the following folder.

If you would like to install HiFei V4.0 into a different folder then click Browse and select another folder.

Destination folder
C:\Program Files\HiFei V4.0   [Browse...]

[< Back]   [Next >]   [Exit]

Silicon Laboratories CP210x VCP Drivers for Windows XP/2003 Serve...

Welcome to the InstallShield Wizard for Silicon Laboratories CP210x VCP Drivers for Windows XP/2003 Server/Vista/7 v6.3a

The InstallShield Wizard will copy Silicon Laboratories CP210x VCP Drivers for Windows XP/2003 Server/Vista/7 v6.3a onto your computer. To continue, click Next.

[< Back]   [Next >]   [Cancel]

Silicon Laboratories CP210x VCP Drivers for Windows XP/2003 Serve...

License Agreement
Please read the following license agreement carefully.

END-USER LICENSE AGREEMENT
IMPORTANT: READ CAREFULLY
BEFORE AGREEING TO TERMS

SILICON LABORATORIES INC., SILICON LABORATORIES INTERNATIONAL PTE. LTD., AND THEIR AFFILIATES (COLLECTIVELY, "SILICON LABS") HAVE DEVELOPED CERTAIN MATERIALS (E.G., DEVELOPMENT TOOLS, EXAMPLE CODE, EMBEDDABLE CODE, DLLs, SOFTWARE/COMPUTER PROGRAMS AND OTHER THIRD PARTY PROPRIETARY MATERIAL) ("LICENSED MATERIALS") THAT YOU MAY USE IN CONJUNCTION WITH SILICON LABS' MCU PRODUCTS. ANY USE OF THE LICENSED MATERIALS IS SUBJECT TO THIS END-USER LICENSE

◉ I accept the terms of the license agreement   [Print]
○ I do not accept the terms of the license agreement

InstallShield

[< Back]   [Next >]   [Cancel]

Silicon Laboratories CP210x VCP Drivers for Windows XP/2003 Serve...

Choose Destination Location
Select folder where setup will install files.

Setup will install Silicon Laboratories CP210x VCP Drivers for Windows XP/2003 Server/Vista/7 v6.3a in the following folder.

To install to this folder, click Next. To install to a different folder, click Browse and select another folder.

Destination Folder
c:\...\MCU\CP210x\Windows_XP_S2K3_Vista_7_2   [Browse...]

InstallShield

[< Back]   [Next >]   [Cancel]

Silicon Laboratories CP210x VCP Drivers for Windows XP/2003 Server/...

InstallShield Wizard Complete

The InstallShield Wizard has successfully copied the Silicon Laboratories CP210x VCP Drivers for Windows XP/2003 Server/Vista/7 v6.3a to your hard drive. The driver installer listed below should be executed in order to install drivers or update an existing driver.

☑ Launch the CP210x VCP Driver Installer.

Click Finish to complete the Silicon Laboratories CP210x VCP Drivers for Windows XP/2003 Server/Vista/7 v6.3a setup.

[< Back]   [Finish]   [Cancel]

 • After you click button **'finish',** the shortcut icon **'Hifei'** would be automatically saved on computer desktop.

 • Installation finished.

Ⅵ Connect Kingkong ESC to PC

 • Plug the *receiver lead* of Kingkong ESC into the Hifei USB Linker, please pay attention to the polarity for correct connecting by referring to the label on the USB Linker)

 • Connect the USB Linker to one of available USB ports of your computer. The red LED on USB Linker will light up. At the same time, a green LED on the controller would light up when correctly connected, otherwise not.
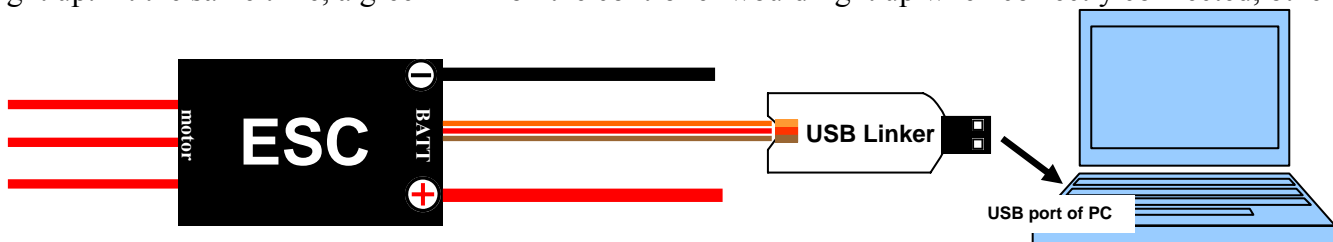
NOTE: **DO NOT CONNECT ESC TO BATTERY.**
        The receiver lead of Hifei controllers are consisted of three small colored wires and adopt JR wire configuration, i.e, red (+), brown (-) and orange (signal)

Ⅶ Using the software

· Open the software by double clicking the shortcut icon of **'Hifei V4.0'** on desktop.
· Click button **'Set Com Port'** to choose the correct com port, and click **'OK'.**
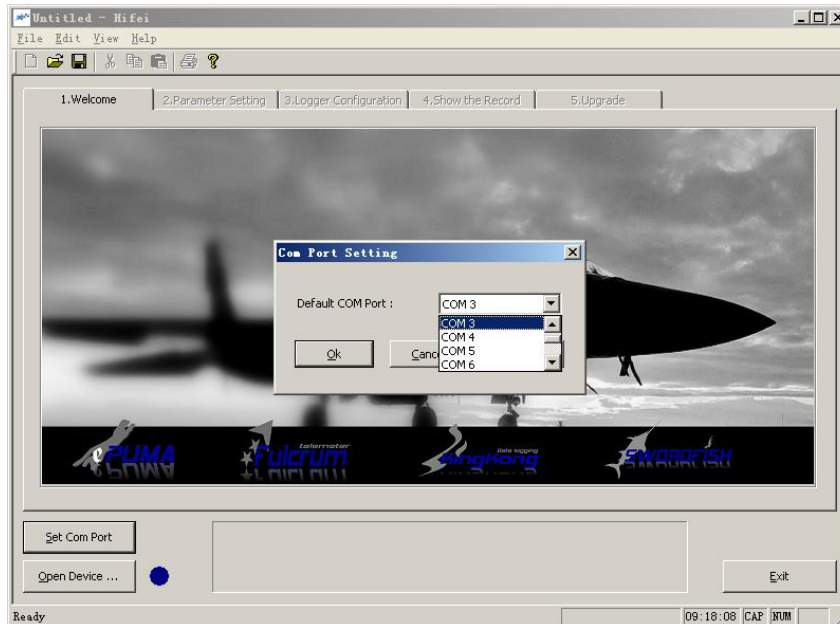
*The com port is generally 'com 3' or 'com 4,' but there are different com ports on different computers. You can find the accurate com port on your computer in this way: Click the right button of mouse the icon 'My Computer'→Manage → Device Manager →Ports(Com & LPT). Choosing the CORRECT com port in the menu of 'Port Num.

· Then click button **'Open Device'** to enter into the software interface.
When ESC is correctly connected to PC, and 'com port' is right, the main menu of software would high light.
You can finish programming ESC's parameters or upgrading ESC's firmware much easily within dozens of seconds.

.
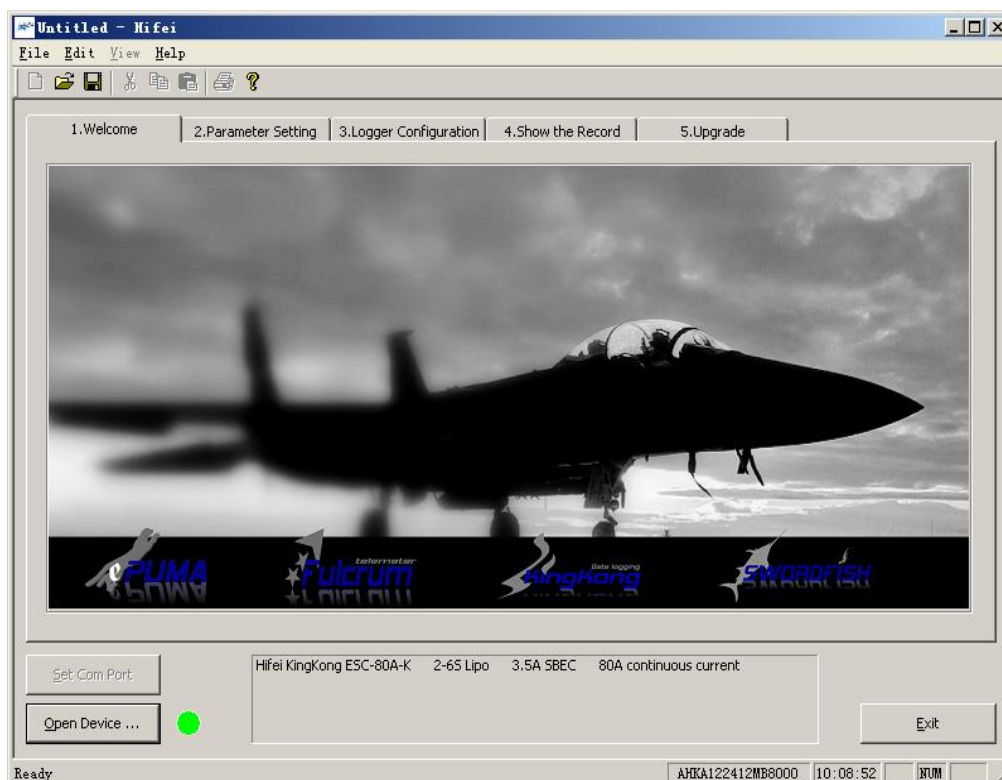
· **Programming the parameters of the ESC:**

- Click menu **'Parameter Setting',** the software would read out the current settings of controller.

- Click down arrow to choose the parameters you wanna to set.

- Click button '**Update**' to save the changing.
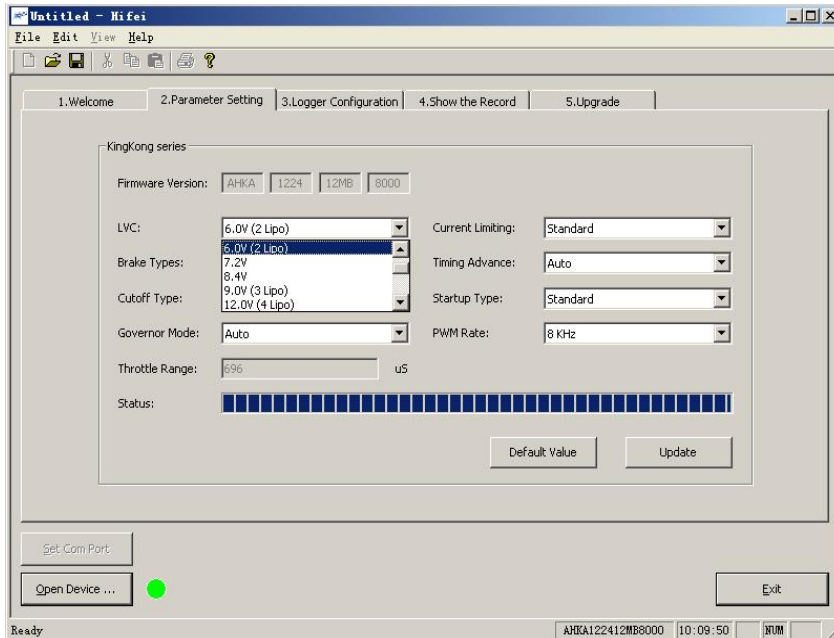
- Clicking button **'Default Value'** will modify the parameters of ESC to factory default.

· **Updating the firmware of the ESC**

- Click menu **'update'**, the software would read out the current version number of controller.

- Click button **'Browse'** to find out the new firmware you want to upgrade the ESC into.

- Click button '**Start'** to upgrade the firmware of ESC to new version.

Upgrading will be finished in 3-5 seconds.
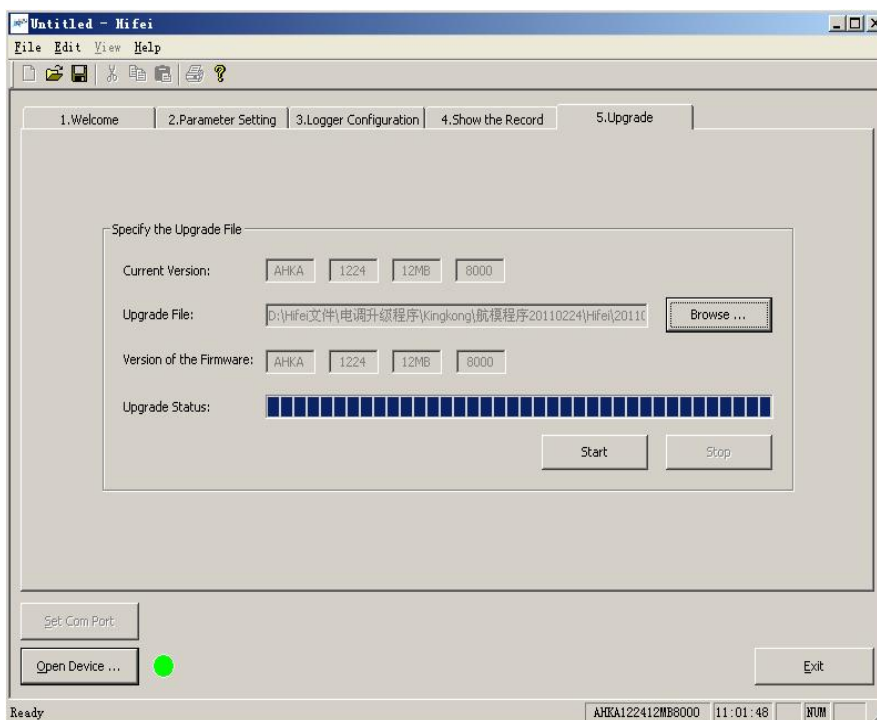
- **Reading flight data**

    - Click menu **'Show the Record'**

    - Input correct info in the area of **'User Parameter'**: include '**Gear Rate' and 'Magnet Poles of motor'** . The info is very important to get the correct motor RPM information.

    - Then click button **'Upload Record Data'** to upload the flight data from the controller.

    - After clicking the 'upload record data' button, the flight data in ESC will be shown as curves in the display window.
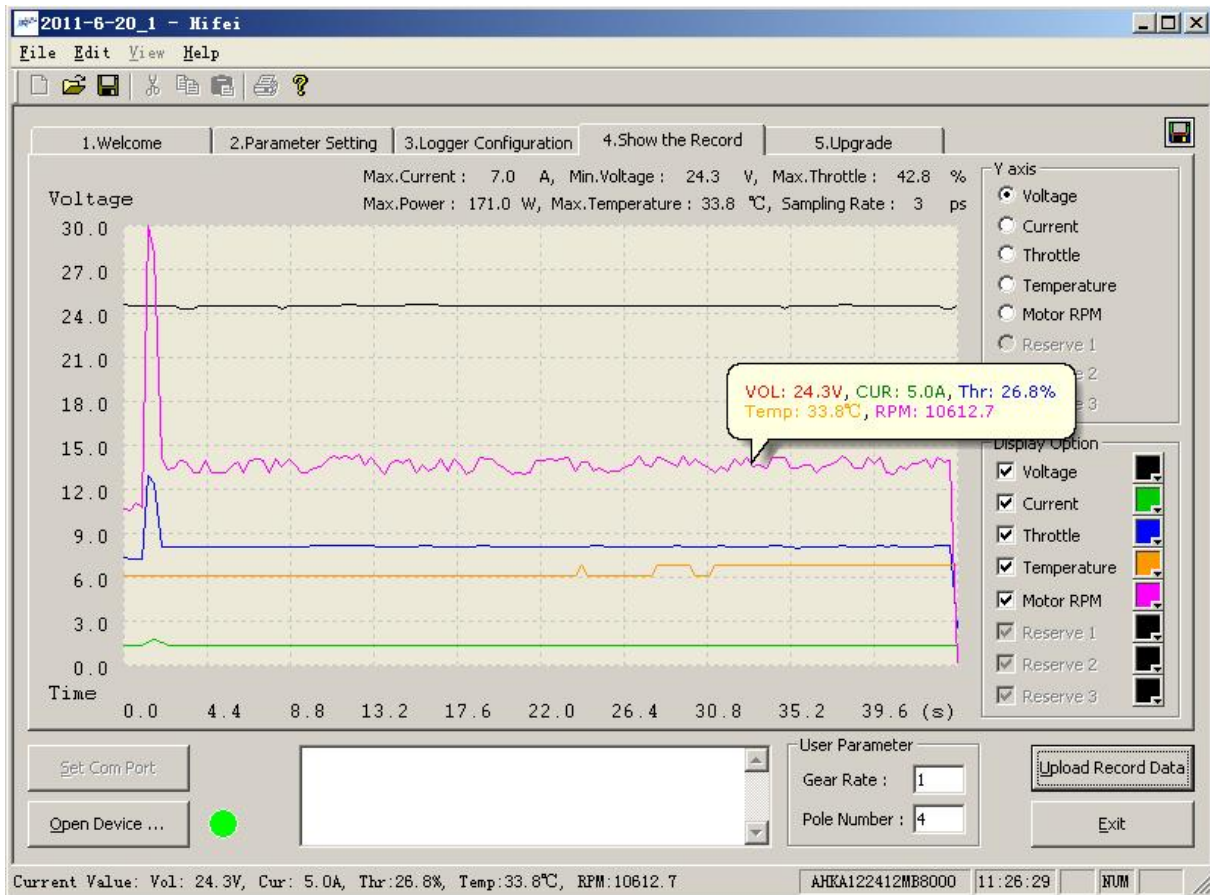

NOTE: 1) The software always displays the latest flight data.
    2) Wherever the mouse points, a groups of data displayed below in the 'data display area' indicates current, voltage, throttle, motor RPM and temperature on the point. The data within the 'data display area' is changing when the mouse is dragging.

- In 'Show the Record' interface, you can choose a range of curves to analyze the data clearly in this way: left click mouse on the start point and left click mouse again on the end point of chosen area, such as the below picture (the range shown in translucent is the chosen area):
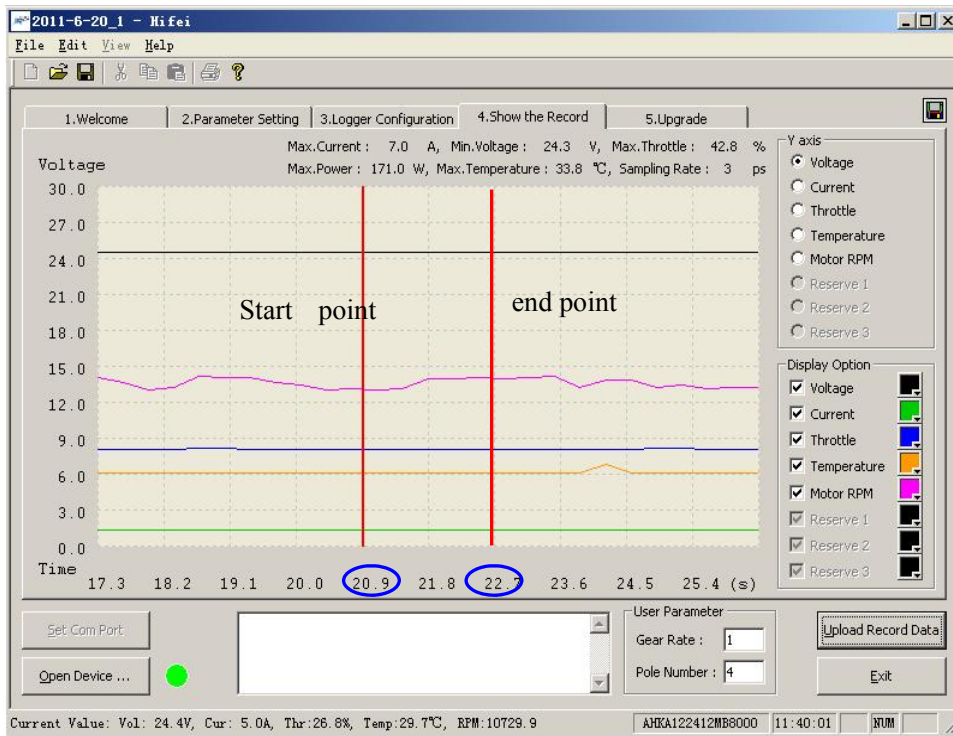

- Much clearer curves of the chosen area is displayed as following:
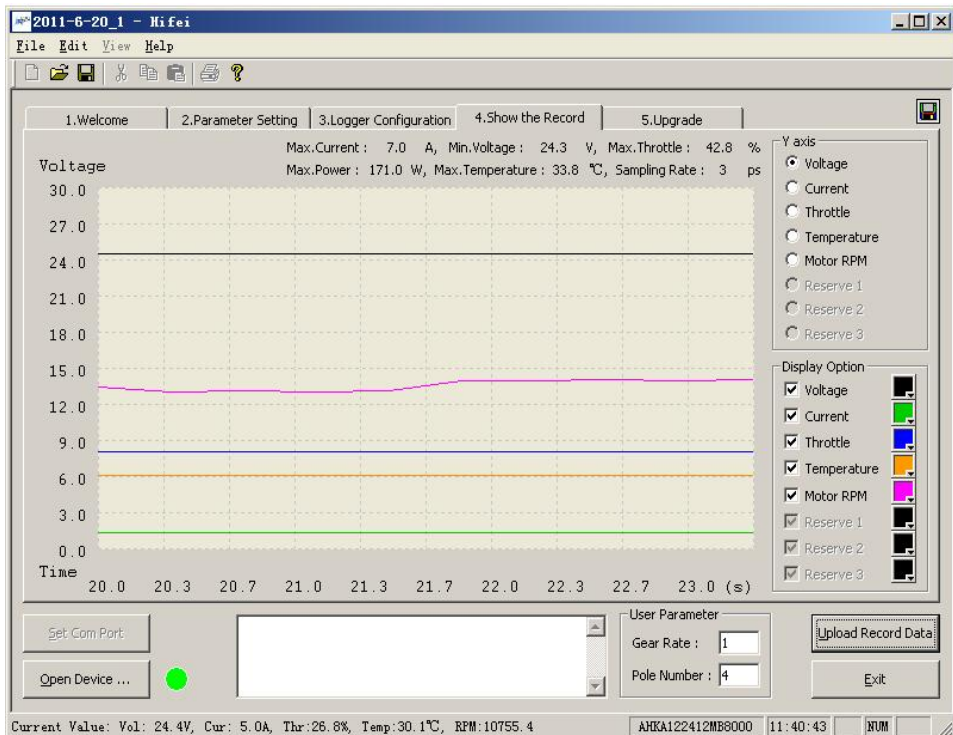
- **Right click mouse to display the original curves.**

- **Changing the recording parameters**

Recommend: In order to well and accurately record the flight data, please know and program the recording configurations first before use, otherwise may cause losing of some data.

- Click the menu **'Data Logger'**.

- **'Recorder Configuration'** (Shortcuts button [R]) .
- Click **'Connect'** button to display current configuration.
- Sampling Rate (1,2,3,5,10,20,30) times/a second.*****

*The default sampling rate of ESC-40A-K is 3 times in a second. The possible recording time is decided by the storage and set sampling rate. The longest recording time is 68 minutes.

Sampling Rate	Possible Recording Time	Minimum Flying 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 the recorder can record with the set sampling rate.
Minimum Flying Time: with the set sampling rate, the minimum flying time of ESC should be more than the listed above form, otherwise the software can not read out 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 flight date will be unavailable.
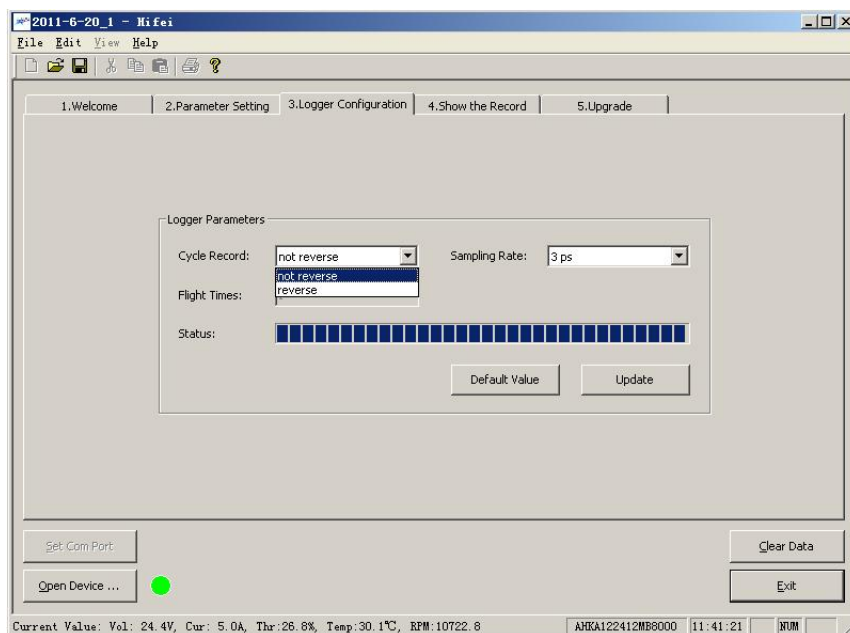
- Record type. **'Not reverse' and 'reverse'**.*****

*'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 default.**

- **'Cur fly times'** button is never highlighted.*

*'**Cur fly times' button records the times you have flown. The ESC can record most 16 times flying. You can clear it by clicking the 'Clear Logger Data' button. ESC in power is calculated as once.**

- Select the configuration you wish to set, and click **'Update'** to save modifications.

- Click the button **'Clear Logger Data'** to clear the data in the ESC for enough space to record for the next flying.

   Recommend to always clear all data before next flying and to save the useful data as a file on PC before clearing.
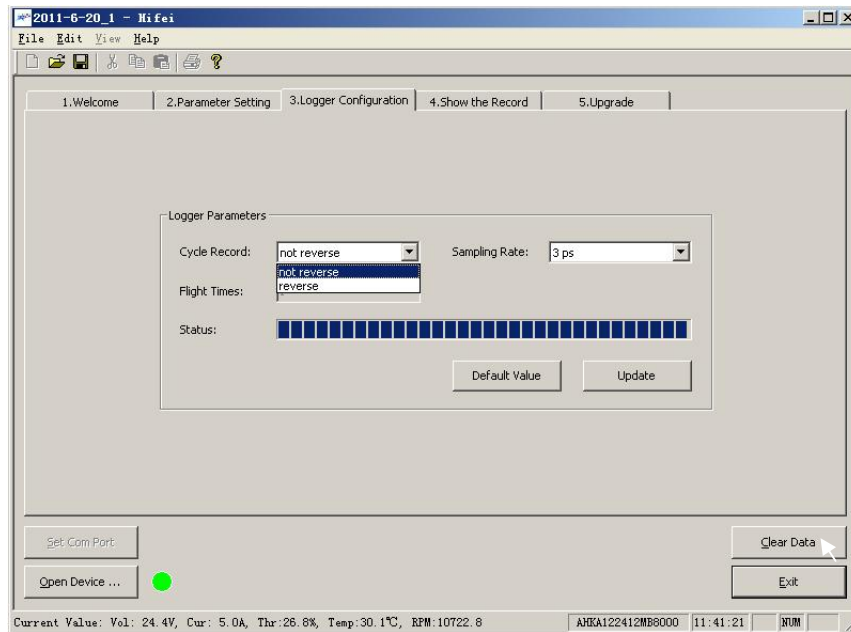
• **Changing the display channel**

- Y axis reference

The 'X' axis presents the flying time, but the 'Y' axis can present the corresponding numerical value according to your selected category in the 'Y axis' zone.
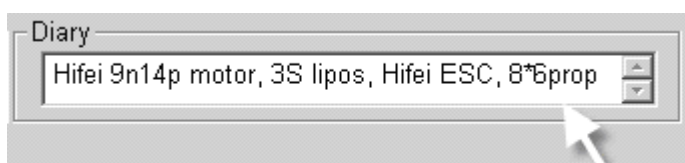
- Parameter color
- Diary
- Save the flight data. Click the menu **'File'** to save data on PC.

• **Diary panel**

The logbook can be filled in ' Diary ' window.
Writing down some illustration about the power system or your opinions or feelings in the diary panel and save it just like your private flying diary.

Appendix

Kingkong ESC can be fully programmed in eight parameters, including low voltage cutoff (LVC), current limiting, brake type, timing advance, cutoff type, start type, governor mode and PWM switching rate.

You can fully program them by TX, Hifei program card, PC, and LCD program box.

- ## Low Voltage Cut-off (LVC)

LVC options for Kingkong 20A, Kingkong 40A ESC

Option 1:Auto Lipo	Auto Lipo Cells Detecting
Option2:5.0V(default)	6-8 cell NiCad or NiMH packs, or 2 cell Lithium packs
Option3:6.0V	8 cell NiCad or NiMH packs, or 2 cell Lithium packs
Option 4:7.2V	9 cell NiCad or NiMH packs
Option 5:8.4V	10 cell NiCad or NiMH packs, or 3 cell Lithium packs
Option 6:9.0V	12 cell NiCad or NiMH packs, or 3 cell Lithium packs
Option 7:12.0V	4 cell Lithium packs

LVC options for Kingkong 45A, Kingkong 60A and Kingkong 80A ESC

Option 1:Auto Lipo	Auto Lipo Cells Detecting
Option3:6.0V (default)	8 cell NiCad or NiMH packs, or 2 cell Lithium packs
Option 4:7.2V	9 cell NiCad or NiMH packs
Option 5:8.4V	10 cell NiCad or NiMH packs, or 3 cell Lithium packs
Option 6:9.0V	12 cell NiCad or NiMH packs, or 3 cell Lithium packs
Option 7:12.0V	4 cell Lithium packs
Option 8: 15.0V	5 cell Lithium packs
Option 9: 18.0V	6 cell Lithium packs

NOTE: Low Cut-off Voltage can protect the main battery from being discharged too low, and provide the normal operating voltage to receiver and servos.

- ## Current Limiting

NOTE: Default setting is recommended. If you change the setting, damage to the controller as a result of over current will be not covered by the manufacturer's warranty.

Option 1: Very Sensitivity	Low over-current threshold, will rapidly shut-down.
Option 2:Standard(default)	Moderate over-current threshold, will shut down after a slight delay. Recommended for inrunner motors.
Option 3:Insensitivity	High over-current threshold, will shut down after a slight delay. Recommended for outrunner motors. **Only experienced modelers should use this programming feature**
Option 4: disabled	Current limiting detection disabled. **Only experienced modelers should use this programming feature.**

- Brake Type

Option 1:Brake disabled (default)	Brake disabled is mainly used for helicopters.
Option 2:Soft brake	Soft brake provides 50% of full braking power. General aircraft use, with fixed or folding prop
Option 3:Hard brake	Hard brake is 70% braking power. Direct drive applications where more braking power is required. Hard brake should only be used below 12V.

- Timing Advance

Option 1: Low advance timing 0°~15°	Recommended for more lower pole count motors. Gives more power and slightly less efficient.
Option 2: middle advance timing 5 °~ 20 °	Recommended for most motors .Gives a good balance of power and efficiency.
Option 3: High advance timing 15° ~ 30 °	Recommended for most of higher pole count motors
Option4:Auto(default)	Recommended for most of all brushless motors.

- Cutoff Type

Option 1 :Hard cutoff (default)	When battery voltage reaches cut-off voltage the motor will shutdown immediately. Motor can be restarted by closing the throttle to the lowest position and then move the throttle as normal
Option 2: Soft cutoff	When battery voltage reaches cut-off voltage, the ESC will slowly reduce motor power to zero, you will notice a decrease in power and it is time to land, the throttle maintains its full linear response.

NOTE: Soft cutoff is always automatically active in Governor Mode.

- Start Type

Option 1: Soft start	Recommended for helicopters
Option 2:Standard start (default)	Recommended for most of the fixed or folding prop airplanes, and some helicopters.
Option 3: Fast start	Recommended for fastest startup.

- Governor Mode

Option 1: Auto calibrating throttle (default)	Recommended for general aircraft
Option 2: Governor Low	For helicopter application. Controlling frequency becomes slow, control gain becomes increasing.
Option 3: Governor High	For helicopter application. Controlling frequency becomes faster, control gain becomes decreasing.

NOTE:

1. In helicopter application, setting in 'Governor Low' or 'Governor High' is required. And we recommend to set the start type in 'Soft start' to get much smooth start for your helicopters.

2. In 'Governor Mode', the start time is generally between 8~15 seconds, which is different depend on the load.

3. In Governor Mode, the brake is always disabled and soft cutoff is automatically active.

- PWM Switching Rate

Option 1:8KHz(default)	Recommended for most brushless motors
Option 2: 12KHz	Recommended for low inductance motors
Option 3: 16KHz	Recommended for very low inductance motors

Note: we strongly recommend only the experienced modeler could change this setting.

Ⅹ **All models of Hifei Kingkong-series controllers**

Products	Voltage	Current/Surge	BEC	Dimension (mm)	Weight (with cables)
Hifei ESC 20A-K	2~3S Lipo	20/30amp	2amp (Linear)	55×27×12	23g
Hifei ESC 40A-K	2-3S Lipo	40/50amp	2amp (Linear)	55×27×12	25g
Hifei ESC-45A-K	2-6s Lipo	45/65amp	4amp(Switching)	58×26×17	40g
Hifei ESC 60A-K	2-6S Lipo	60/70amp	4amp (Switching)	71×26.5×15	50g
Hifei ESC 80A-K	2-6S Lipo	80/90amp	4amp (Switching)	71×26.5×15	52g
Hifei ESC 120A-K	2-6S Lipo	120/140amp	4amp(Switching)	90×52×16	118g
Hifei ESC 100A-K	4-12S Lipo	100/120amp	no (OPTO)	69×52×24	109g
Hifei ESC 150A-K	4-12S Lipo	150/180amp	no (OPTO)	94×59×38	282g
Hifei ESC 200A-K	4-12S Lipo	200/230amp	no (OPTO)	94×59×38	294g
Hifei USB Linker	Connector for Kingkong speed controllers to PC				6g

Chongqing HIFEI Technology Ltd.