Swordfish 240A ESC Manuals

Thanks for purchasing **Swordfish** series speed controllers. **Swordfish** series ESC are specifically developed to supply stable and strong power for r/c model boats beyond you expected. Please read the instruction booklet carefully before use.

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 running, power off the receiver BEFORE turning off the transmitter.

• 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 **(In factory, LVC of Swordfish HV 240A is preset in '12.0V. Before using, please carefully set the LVC to protect Lipo cells from discharging.)**

NOTE: When the working volts reach to the set LVC value, the ESC will cutoff output to motor, which indicates it's time to change Lipo cells. But in the beginning start from stop, even though the battery volts is lower than set LVC, the ESC also can start for **3 SECONDS** and then LVC functions and cutoff output. Because the start volts of ESC is not changeable with the change of LVC. The ESC can start when the input volts reach to 9V.

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

Ⅰ **ESC Features**

· Microprocessor controlled,   extremely low resistance

· Water-proof PCB, and aluminum water-cooler for thermal dissipation

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

· Fully program by software on computer, or by Hifei LCD program box, or by TX stick

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

· Compatible to use with both general board transmitters and pistol transmitters with programmable brake setting for any competitions.

Ⅱ **Specifications**

ESC	Swordfish 40A	Swordfish 90A	Swordfish 120A	Swordfish 240A
Voltage	2-3s Lipos 6-10s Ni-xx	2-6s Lipos 6~20s Ni-xx	2-6s Lipos 6~20s Ni-xx	4-12s Lipo 12~38s Ni-xx
Current/Max	40amp/65amp	90amp/110amp	120amp/150amp	240amp/280amp
BEC	5V, 2A (linear)	5V, 3.5A (switching)	5V, 3.5A (switching)	no
Size(mm)	59 x 23 x 10	90 x 36 x 20	90 x 36 x 20	112 x 53 x 22
Weight	26g (incl. wires)	103g(incl. wires)	108 (incl. wires)	250 (incl. wires)

Ⅲ **Using the ESC**

· **Connect ESC to motor, receiver and battery**

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

Because 240A ESC has no built-in BEC. Please refer to the following steps when use it. (Only for HV 240A ESC)

- Keep the switch of ESC in '**OFF**' position. Please solder good quality golden bullet connectors and correctly connect ESC to brushless motor.

- Plug the receiver lead (the three small color cables)of ESC to the throttle channel of receiver.

- Use separate receiver battery or UBEC (**5V~6V**) to supply power for receiver and servos.

- Connect the ESC to battery. DO NOT switch '**ON**' the ESC until it is time to go.

- ## **Calibrate the throttle range of transmitter** *(Recommend)*

A.   **Board Style** transmitter calibration

   - Keep the switch of ESC in '**OFF**' position. Correctly connect the ESC with brushless motor and battery pack, plug the receiver lead of ESC into the throttle channel of receiver;
   - Use separate receiver battery or UBEC to power receiver.
   - Put the throttle to the forward top position, turn on the transmitter;
   - Switch '**ON**' the Swordfish HV ESC. 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 immediately the throttle stick to the '0' position you want to set after any one beep of the 4 long beeps, at this point, you have calibrated the throttle range of your transmitter;
   - Waiting one second, there will be two beeps emitted from the motor
   - Calibration of throttle is completed.

Note: 1)Recommend the '0' position should not be set higher beyond the 50%.
Note: 2) Motor is needed to install for acoustic guide. Meanwhile, please keep the propeller away from human beings or any objects.

B.   **Pistol style** transmitter calibration

   - Keep the switch of ESC in '**OFF**' position. Correctly connect the ESC with brushless motor and battery pack, plug the receiver lead of ESC into the throttle channel of receiver;
   - Use separate receiver battery or UBEC to power receiver.
   - Put the throttle to the forward full position, turn on the transmitter;
   - Switch '**ON**' the ESC, 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 stick to the neutral position immediately after any one beep of the 4 long beeps. Two beeps emitting out indicates calibrating is completed.
   - Following two beeps are powering beeps, it is time to go now!

- ## **Program the ESC**

The Swordfish ESC programmable settings

LVC	Auto *	12.0V (4s Lipo)	15.0V (5s Lipo)	18.0V (6s Lipo)	21.0V (7s Lipo)	24.0V (8s Lipo)	27.0V (9s Lipo)	30.0V (10s Lipo)	33.0v (11s Lipo)	36.0v (12s Lipo)
Brake Type	Close *	Soft 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						
Throttle Range	640 uS									

*Note: 1. Parameters with asterisk * behind is the default settings of ESC.*
         2. LVC of Swordfish HV 240A is preset in '12.0V' in factory.
         3. The throttle range can be read on PC after installing 'Swordfish Program' software. It is Auto changed after calibrate the throttle range of transmitters.
         4. When use Lipo-Polymer battery pack, please carefully set the LVC to efficiently protect the battery against discharging.

A. Program by TX stick

Swordfish ESC support to fully program by TX stick, please refer to the setting diagram in the last page.

B. Program by Hifei LCD Program box

Program box is auto identify the ESC model and clearly display the corresponding programmable parameters in LCD. It is pocket size and conveniently take to use at fields. Please read the instructions of Program box to correctly set the **Swordfish** ESC.

C. Program by software 'Swordfish Program' on PC.

The set-up software of **'Swordfish Program'** is recorded in a CD and always attached with each **Swordfish** ESC. You must install the software on PC. Please refer to the Ⅳ sections.

- ## It Is ready to go now!

- After changing the ESC's parameters, It is suggested to firstly have a test on the test-bed before assembling it to hull so that to choose appropriate settings for the matched power configuration.

   Please always keep the prop far away from human and objects In testing.

- Switch '**ON**' the ESC, the green LED on ESC will light for a second. And two beeps emitting out from motor while indicates to successfully detect the signal. It is time to go now.
- *It is needed to use separate receiver battery or UBEC (5V~6V) to supply power for receiver and servos.*

   NOTE: If the LVC of ESC is set in ''Auto', after the two beeps there will follow beeps to detect the Lipo cells while the red LED flashing.

Ⅳ Installing 'Swordfish Program' Software to PC

- ## System Requirement

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

- ## Hardware

    The hardware include a Swordfish ESC, a USB Linker (sold separately), a Set-up CD.

Swordfish ESC   **USB Linker**   **Set-up CD**

STEPS to install the soft:

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

- Double click the **'Swordfish ESC setup. exe'**.

Silicon Laboratories CP210x VCP Drivers for Windows 2000/XP - InstallShield ...

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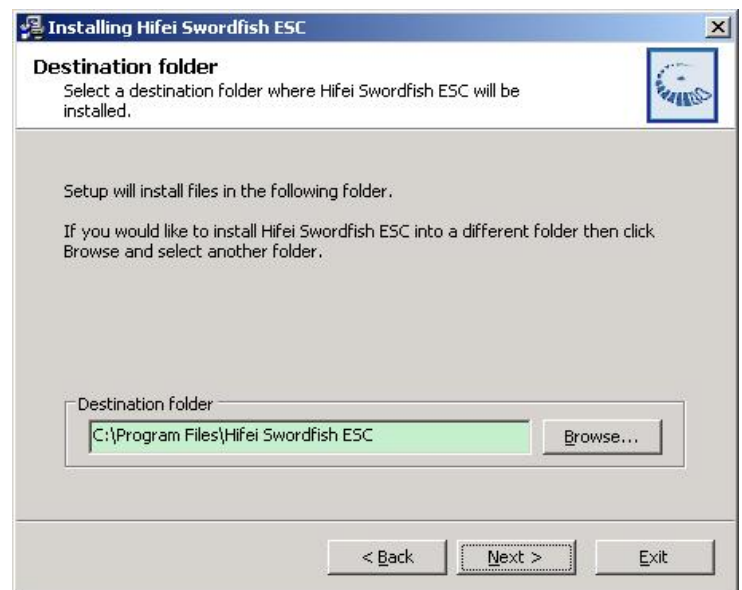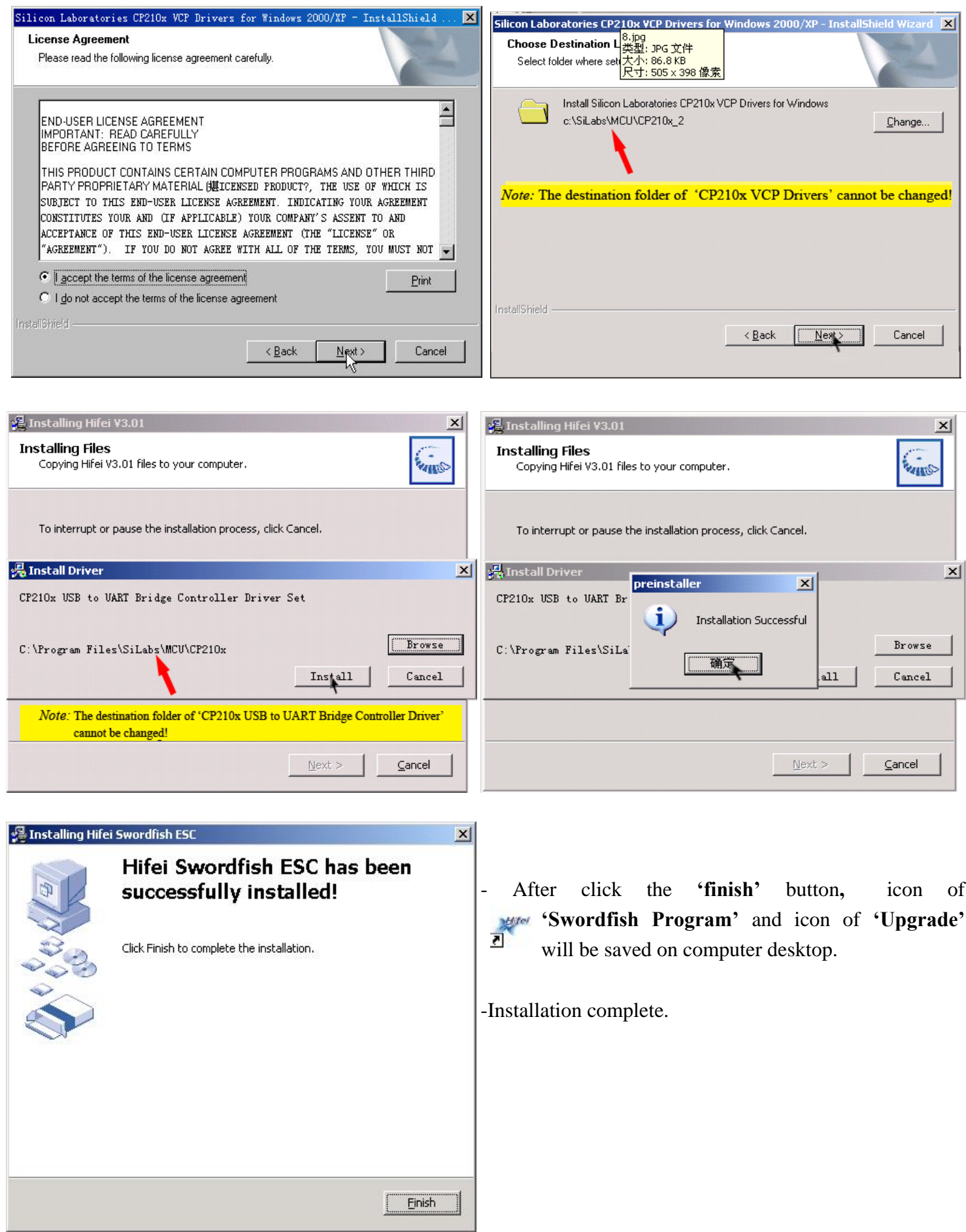ACCEPTANCE OF THIS END-USER LICENSE AGREEMENT (THE "LICENSE" OR
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InstallShield

< Back   Next >   Cancel

Silicon Laboratories CP210x VCP Drivers for Windows 2000/XP - InstallShield Wizard

Choose Destination L   8.jpg
                          类型: JPG 文件
Select folder where set   大小: 86.8 KB
                          尺寸: 505 x 398 像素

Install Silicon Laboratories CP210x VCP Drivers for Windows
c:\SiLabs\MCU\CP210x_2   Change...

Note: The destination folder of 'CP210x VCP Drivers' cannot be changed!

InstallShield

< Back   Next >   Cancel

Installing Hifei V3.01

Installing Files
Copying Hifei V3.01 files to your computer.

To interrupt or pause the installation process, click Cancel.

Install Driver

CP210x USB to UART Bridge Controller Driver Set

C:\Program Files\SiLabs\MCU\CP210x   Browse

                                   Install   Cancel

Note: The destination folder of 'CP210x USB to UART Bridge Controller Driver'
cannot be changed!

Next >   Cancel

Installing Hifei V3.01

Installing Files
Copying Hifei V3.01 files to your computer.

To interrupt or pause the installation process, click Cancel.

Install Driver

CP210x USB to UART Br   preinstaller

                          (i) Installation Successful   Browse

C:\Program Files\SiLa   确定   all   Cancel

Next >   Cancel

Installing Hifei Swordfish ESC

Hifei Swordfish ESC has been successfully installed!

Click Finish to complete the installation.

Finish

- After click the **'finish'** button, icon of **'Swordfish Program'** and icon of **'Upgrade'** will be saved on computer desktop.

-Installation complete.
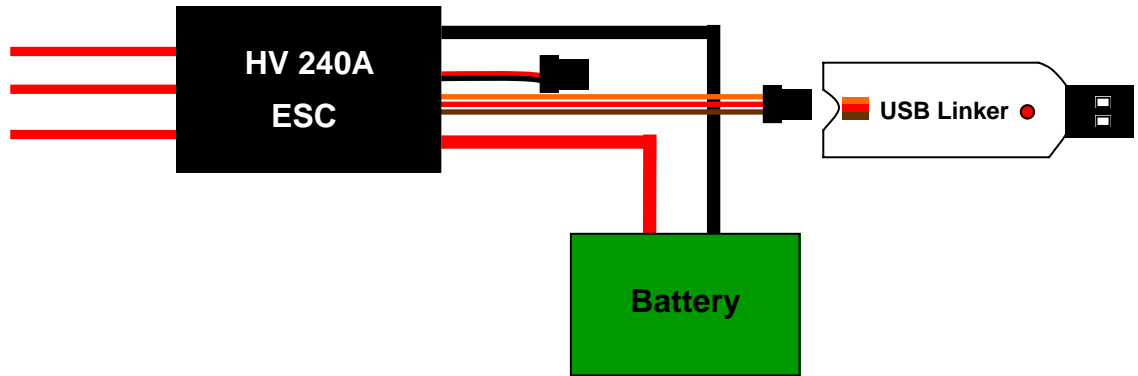
• Connect ESC to PC

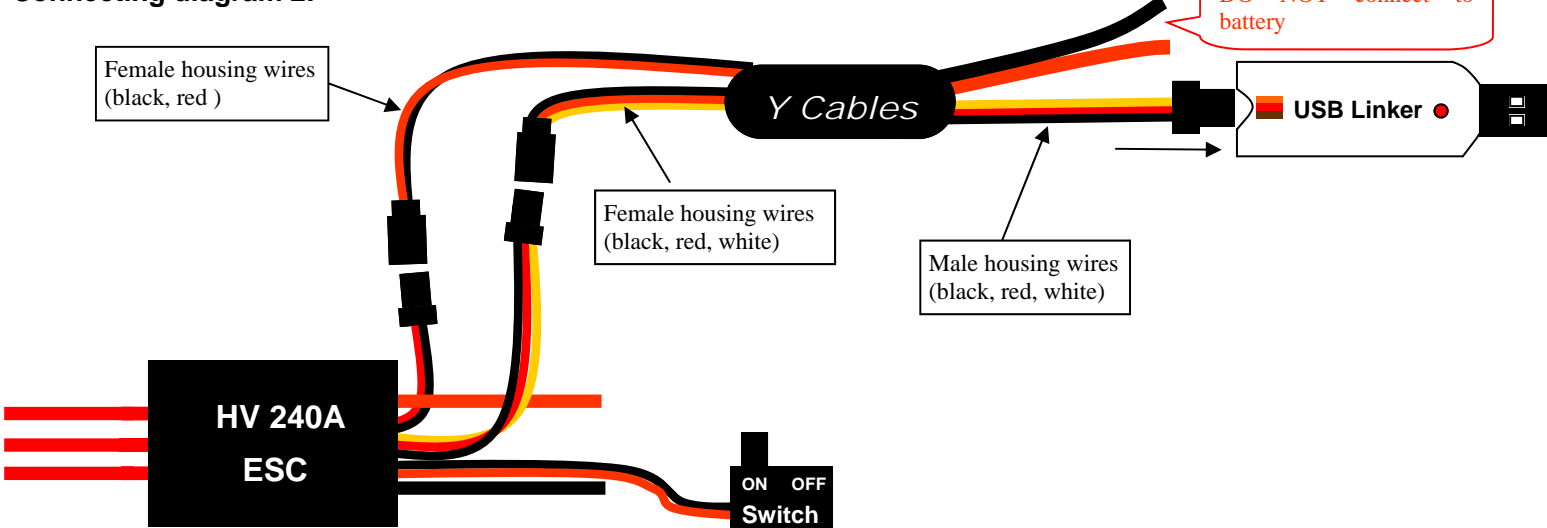*NOTE: Never plug the USB Linker to USB port of PC BEFORE installation of software is successfully completed.*

▶ Check and keep the switch of ESC in '**OFF**' position.

▶ As the Swordfish HV 240A ESC has no built-in BEC, it need to connect the ESC to battery pack or an auxiliary 'Y Cables' to correctly connect ESC to USB linker while not connect ESC to battery. Please refer to following two wiring diagrams and select the either method to correctly connect the ESC to PC.

Connecting diagram 1:

Connecting diagram 2:

Female housing wires (black, red)

Female housing wires (black, red, white)

Male housing wires (black, red, white)

DO NOT connect to battery

ON OFF
Switch

▶ **Switch 'ON' the switch**. The red LED on USB Linker will light, and the green LED of ESC would light. (If there is fault in connecting, the green LED of ESC would not light)

When successfully connect to PC, the computer will automatically recognize a 'com port' as the name **"CP210 × USB to UART Bridge Controller"**, please find the correct 'com port' number on you PC in this way.

The com port is generally 'com 3' or 'com 4,' but there are different 'com port' 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). The 'com port' after **"CP210×USB to UART Bridge Controller"** is the right one.

*Note: If you cannot find such kind of 'com port' in the 'Device Manager', please check whether the connection of ESC to USB Linker is correct and ensure they are tightly connected without any loose. If they are both right, the problem is probably that the software has not been successfully installed on your PC. Please Install the soft again.*
     The 'Y Cables' is always packed with a HV ESC.
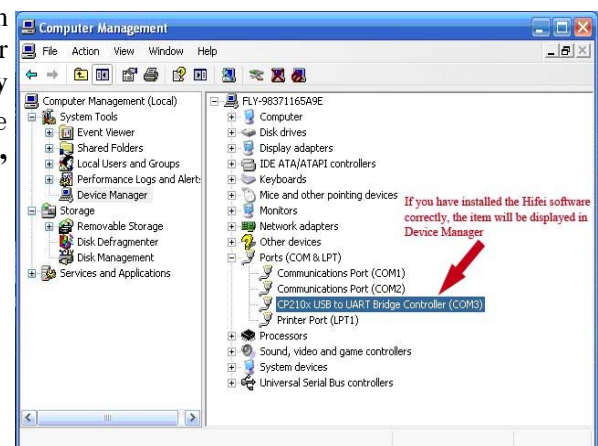
Program the ESC

▶ Open the software by double left clicking the icon 🔲 'Swordfish Program' on desktop.

▶ Select the com port by clicking the menu of 'Port Num' and input the right one.

▶ Click 'Open', then click 'Connect'. The current setting of ESC will be displayed.

▶ Single left click the down arrow to choose the parameter you want to set
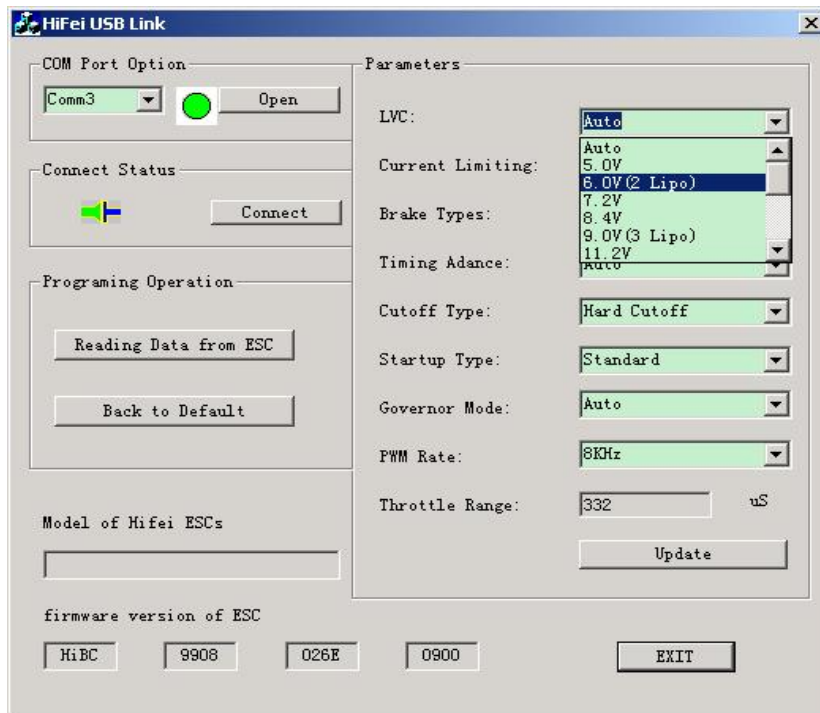
▶ Click the 'Update' button to save the modification.

NOTE：Please according to the instructing turn and program ESC's settings always after ESC's parameters have been read out in window, otherwise programming of ESC will be defeated and ESC will still keep the parameters set in last time.

Upgrade the firmware of ESC

- Correctly connect ESC with USB Linker, and insert USB Linker to one of USB Ports of PC, switch 'ON' the switch.

- Click the icon ' 🔲 Upgrade' on desktop and open the 'Upgrade' software.

- Input the correct 'Com port', click 'Open' button.

- Single left click 'Get ESC's Ver' to read out the version number of the ESC.
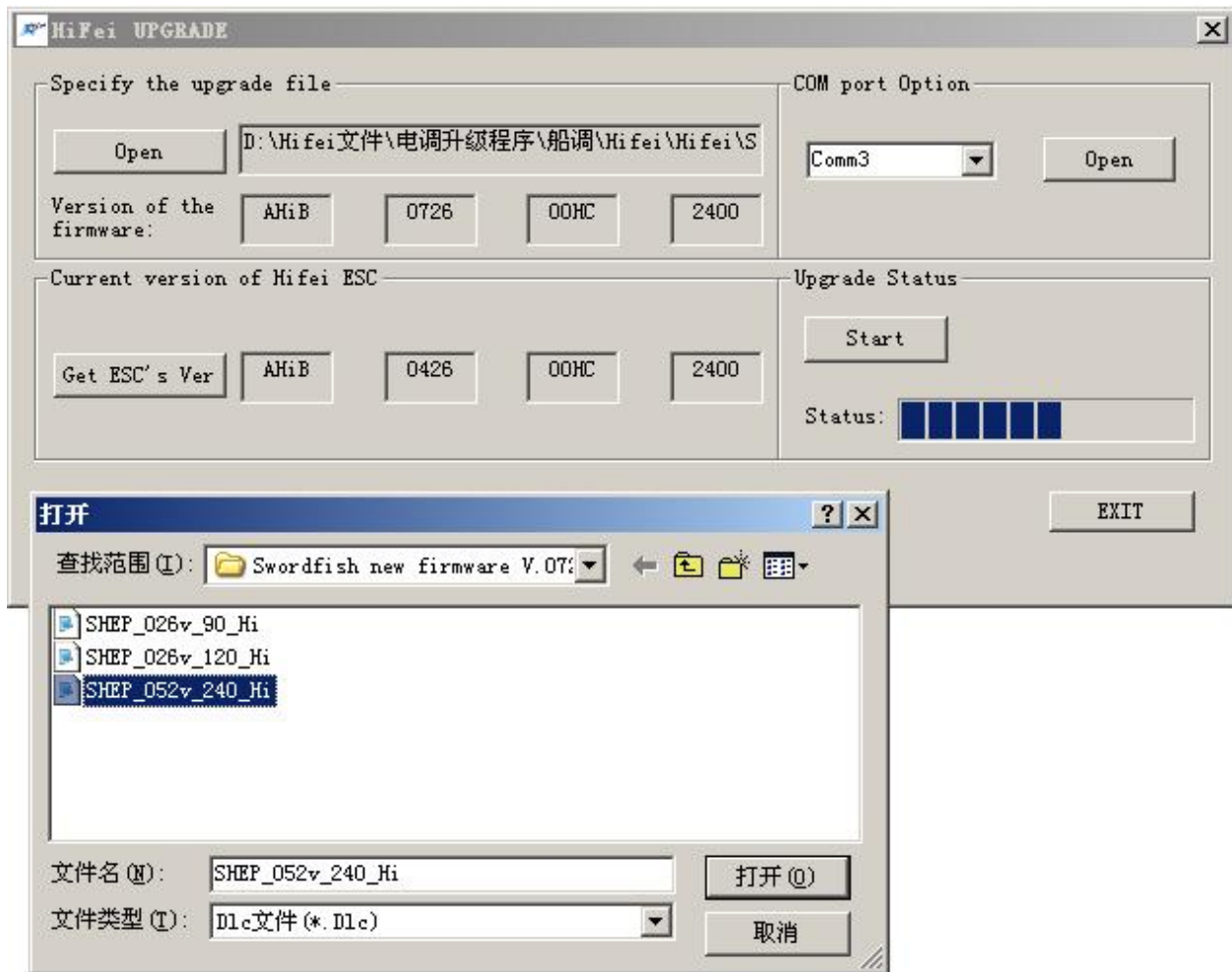
-Single left click **'Open'** to open the latest upgradeable firmware, which can be downloaded from website once a new one is released.
(IT IS MUST TO HAVE A NEW FIREWARE FOR UPGRADING BEFORE CLICK 'START')

- Click **'Start'** to upgrade the firmware of ESC to the latest version while the green LED on ESC is blinking, it will be completed in 3-5 seconds.

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Swordfish settings' features

- Low Cut-off Voltage

Option 1:Auto Lipo	Auto Lipo Cells Detecting
Option2: 12.0V(default)	4 Lipo cells
Option 3: 15.0V	5 Lipo cells
Option 4: 18.0V	6 Lipo cells
Option 5: 21.0V	7 Lipo cells
Option 6: 24.0V	8 Lipo cells
Option 7: 27.0V	9 Lipo cells
Option 8: 30.0V	10 Lipo cells
Option 9: 33.0V	11 Lipo cells
Option 10: 36.0V	12 Lipo cells

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.

- 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.

- 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	Recommended for most motors .Gives a good balance of power and efficiency.
Option 3: High advance timing	Recommended for most of higher pole count motors
Option4:Auto(default)	Recommended for most of all brushless motors.

Note: Because there are various brushless motors with different dynamic response in the market, we suggest to test each timing setting in test-bed first and choose the appropriate setting for your configuration.

- 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	Very soft and smoothly start the motor, it will takes more time
Option 2:standard start (default)	Start the motor at normal speed
Option 3: Fast start	Fast star up, recommended to use it for racing.

- 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.

Keep the Switch of ESC in 'OFF'. Correctly connect the ESC with brushless motor, receiver and battery pack. Move the throttle to the highest position, turn on the transmitter, use separate battery to power on receiver, switch 'ON' the switch of ESC. There are three beeps emitted from the motor, which indicates the electronics are correctly power on for the setting.

There are 4 beeps emitted from the motor

7 beeps indicate you have already entered the programmable setting

Main Loop

Step	Setting	Description	Options
The 1st beep:	Low Cutoff Voltage	One beep indicates you have entered the Low Cutoff Voltage Setting.	1st beep:Auto (default); 2nd beep:12.0v; 3rd beep:15.0v; 4th beep:18.0v; 5th beep:21.0v; 6th beep:24.0v; 7th beep:27.0v; 8th beep:30.0v; 9th beep:33.0v; 10th beep:36.0v
The 2nd beep:	None		
The 3rd beep:	Brake Type	Three beeps indicates you have entered the Brake Type Setting.	1st beep: Close (default); 2nd beep: Soft Brake
The 4th beep:	Timing Advance	Four indicates you have entered Timing Advance Setting.	1st beep:Low; 2nd beep:Middle; 3rd beep:High; 4th beep: Auto (default)
The 5th beep:	Cutoff Type	Five indicates you have entered the Cutoff Type Setting.	1st beep: Hard Cutoff (default); 2nd beep: Soft Cutoff
The 6th beep:	Start Type	Six beeps indicates you have entered the Soft Start Setting.	1st beep: Soft Start; 2nd beep: Standard Start (default); 3rd beep: Fast Start
The 7th beep:	None	Eight beeps indicates you have entered the PWM Switching Rate Setting.	
The 8th beep:	PWM Switching Rate	Eight beeps indicates you have entered the PWM Switching Rate Setting.	1st beep: 8K (default); 2nd beep:12K; 3rd beep:16K
	reserve		
The 10th beep:	EXIT	GO	

Move the throttle to the lowest position

Move the throttle to the highest position

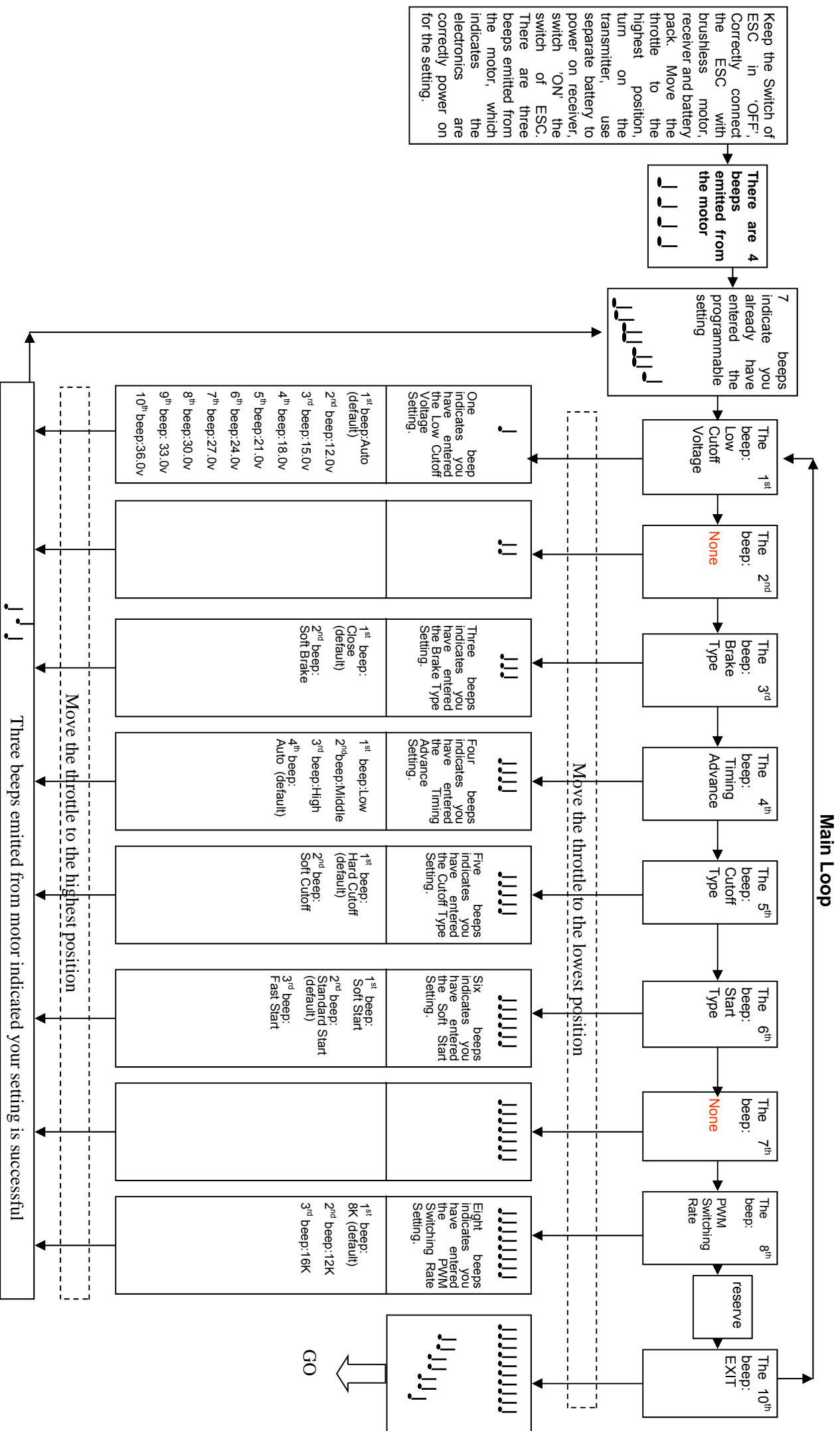Three beeps emitted from motor indicated your setting is successful

Figure. 1 : Operational Flowchart for Programming the ESC with Throttle