

USER MANUAL PLATINUM Brushless Electronic Speed Controller Platinum HV 200A SBEC V4.1 Platinum HV 200A OPTO V4.1



Thank you for purchasing this HOBBYWING product! Please read this declaration carefully before use, once you start to use, we will assume that you have read and agreed with all the content. Brushless power systems can be very dangerous and any improper use may cause personal injury and damage to the product and related devices, so please strictly follow the instruction during installation and use. Because we have no control over the use, installation, or maintenance of this product, no liability may be assumed for any damage or losses resulting from the use of the product. We do not assume responsibility for any losses caused by unauthorized modifications to our product. Besides, we have the right to modify our product design, appearance, features and usage requirements without notification. We, HOBBYWING, are only responsible for our product cost and nothing else as result of using our product. Regarding the possible semantic difference between two different versions of declaration, for users in mainland China, please take the Chinese version as standard; for users in other regions, please take the English version as standard.

01 Warnings

- Read through the manuals of all power devices and aircraft and ensure the power configuration is rational before using this unit, as improper power configuration will overload the motor and damage the unit.
When installing this unit, relevant operations like soldering, connecting will be needed, so please ensure all wires and connections are well insulated before connecting the unit to related devices, as short circuit will damage the unit.
When soldering relevant wires of the unit, please use a soldering iron with sufficient power to do the soldering, as poor connection may cause your aircraft to lose control or other unpredictable issues like damage to the device.
Always keep your aircraft away from unsafe elements like obstacles, crowd, high-voltage power lines. Please fly your aircraft in the working environment as regulated in this manual. Although there are some protections, improper use may still cause permanent damage to the product.
Always disconnect and remove batteries after use, as the ESC may drive the motor to rotate and cause unpredictable danger if it's still connected to the battery. Long-time contact will cause the battery to completely discharge and result in damage to the battery and/or the ESC. This will not be covered under warranty.

02 Features

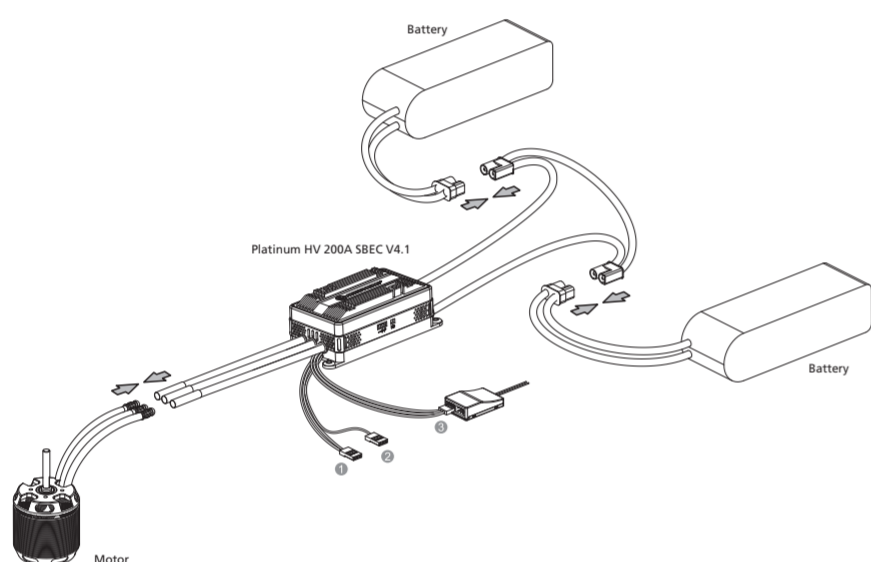
- High performance 32-bit microprocessor with the running frequency of up to 72MHz for excellent performance. The microprocessor powered by the separate voltage-regulating IC, which features great anti-interference performance, greatly reduces the possibility of losing control.
Separate switch-mode voltage-regulating BEC with adjustable voltage of 5-8V and continuous/peak current of 10A/30A. The BEC is separated from other circuits, its normal output will be guaranteed to protect your aircraft from crash when issues like the power board of the ESC is burnt occur.
Special BEC (Battery Eliminator Circuitry), which can prevent voltage from flowing backward in operation, can be connected to a backup battery in parallel.
DEO (Driving Efficiency Optimization) technology or Freewheeling for smoother throttle response, higher driving efficiency and lower ESC temperature.
Four flight modes: Fixed-wing, Helicopter (External Governor), Helicopter (EIF Governor), and Helicopter (Store Governor).
Soft start-up in the three Helicopter modes.
Throttle response time is adjustable. You can adjust the response time when using big-sized motors & propellers to protect your ESC.
Helicopter speed-governing function, which features adjustable "Governor Parameter P", is easy to use. It can guarantee the stable rotation of main blades when the load changes dramatically.
Auto Restart Time allows you to interrupt the shutdown and landing during the preset time and restart the motor promptly to avoid crash caused by improper operation.
LED indicator for indicating the running status and possible troubles of the ESC.
Data Logging can record the minimum voltage, the maximum temperature, the maximum current and the standardized RPM of the current flight and output the running data of the ESC in real time (HOBBYWING WiFi Express module, HW Link mobile phone APP are needed).
RPM Signal Output port for outputting the electrical RPM of the motor (calculated in 2 poles) in real time.
Separate programming port for connecting HOBBYWING LCD program box or WiFi Express module or powering an external cooling fan.
ESC programming, firmware upgrade, and data checking via HOBBYWING WiFi Express module, HW Link mobile phone APP allows you to program your ESC, upgrade its firmware and check relevant data wirelessly (HOBBYWING WiFi Express module is needed).
Real-time data checking for checking the running data of your ESC in real time via HOBBYWING WiFi Express module, HW Link mobile phone APP.
Online data checking, ESC programming, firmware upgrade are supported (HOBBYWING LCD program box & PC or WiFi Express module & Smartphone are needed).
Multiple protections like start-up protection, ESC thermal protection, capacitor thermal protection, over-current protection, overload protection, and throttle signal loss protection.

03 Specifications

Table with 3 columns: Model, Platinum 200A HV SBEC V4.1, 200A/200A, Platinum 200A HV OPTO V4.1. Rows include Cont./Peak Current, Input Voltage, BEC, Input / Output Wires, Separate Programming Port, LED Indicator, Size / Weight, and Application.

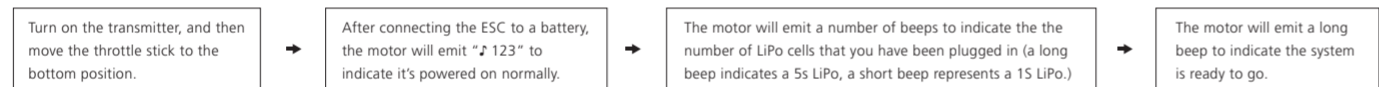
04 User Guide

1 Wiring

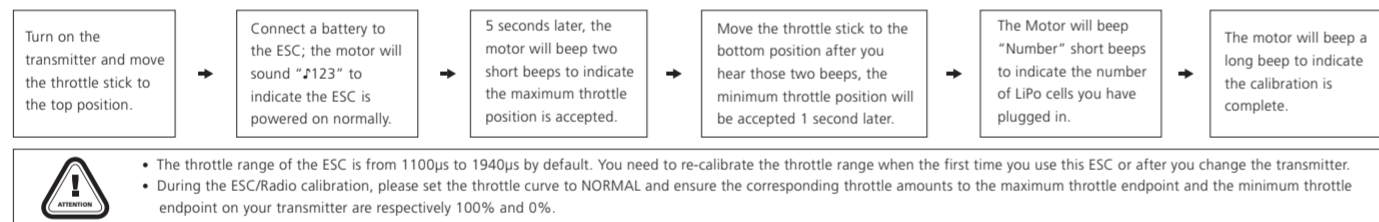


- BEC Output Wire (Red/Brown): plug this extra BEC output wire into the special battery channel or any unoccupied channel on the receiver.
RPM Signal Wire (Yellow): plug it into the RPM input channel on the Flybarless system.
Throttle Signal Cable (White/Red/Black): plug it into the TH throttle on the receiver or the corresponding channel on the Flybarless system.

2 Normal Start-up Process



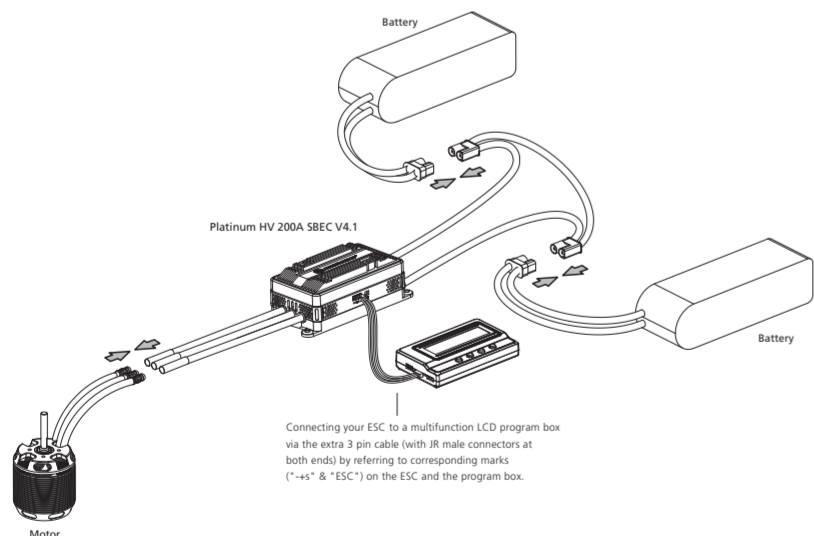
3 ESC/Radio Calibration



05 ESC Programming & Data Checking

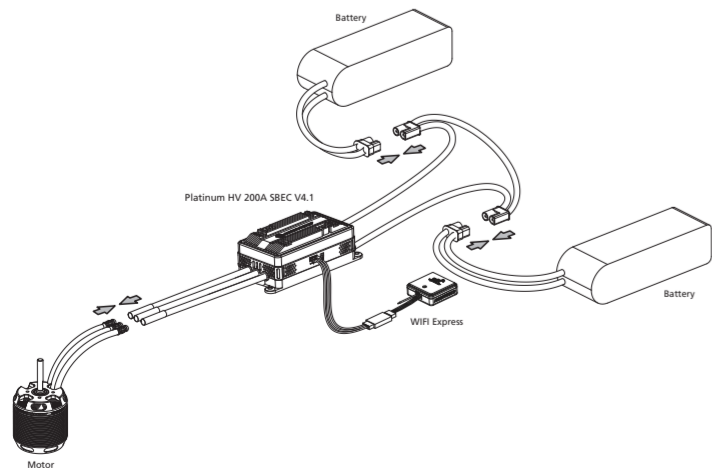
- The parameters of this ESC are programmable, you can adjust relevant parameter settings to meet different flight demands.
The ESC will record relevant data like the standardized speed (it can only be checked and won't disappear when the ESC is disconnected from the pack in "Helicopter (Store Governor)" mode), the minimum voltage, and the maximum temperature of the current flight. Therefore, if you want to check the relevant data after the flight, please keep the ESC connected to the pack and then connect the LCD program box or WiFi Express module to the ESC to check the data. Those data won't be stored after the pack is disconnected from the ESC.

1 Program Your ESC with a Multifunction LCD Program Box



- ESC Programming: Connect the LCD program box to the ESC as shown above, then connect the battery to the ESC.
Press the "OK" button (on the program box) to connect the program box to your ESC, the firmware version of the ESC will be displayed on the screen of the program box after the connection succeeds.
After successfully entering the "Parameters/Programmable Items" page, press the "ITEM" button (on the program box) to browse the parameter(s) and then press the "VALUE" button to adjust the parameter value(s).
Press the "OK" button to save the new value(s) to your ESC, after adjusting.
Repeat "step 3" and "step 4" will allow you to adjust the value(s) of other parameter(s).
After the programming, disconnect the ESC from the battery, unplug the cable for connecting the program box to the ESC, and then power the ESC off and then back on will allow you to run your system with those new parameter settings.
Attention! You need to power the ESC off and then back on after adjusting parameter settings, otherwise, the new values won't come into effect.
Check the Running Data of Your ESC: (With the battery connected to the ESC), connect the LCD program box to the ESC as shown above.
Press the "OK" button (on the program box) to connect the program box to your ESC, the firmware version of the ESC will be displayed on the screen of the program box after the connection succeeds.
Press the "RP" button to enter the "Data Record" page after successfully entering the "Parameters/Programmable Items" page, continue to press the "RP" button to browse all the running data of your ESC.

2 Program Your ESC with a WiFi Express (Item sold separately)



- ESC Programming: Connect the ESC to the WiFi Express module as shown above, and then connect the battery to the ESC.
Open the WiFi setting on your smart phone and then connect (the phone to) the WiFi Express module (the WiFi name is HW-WIFILINK and the password is 12345678 by default, you can change them by yourself).
After the connection succeeds, open the "HW Link" APP on your phone (the APP needs to be installed in advance), click the "connect to ESC" icon (in the upper right corner), and then you can adjust parameter values, check the running data of the ESC, or carry out other operations.
After successfully saving the new value(s) to your ESC, disconnect the ESC from the "HW Link" APP, unplug the WiFi Express module, and then power the ESC off and then back on will allow you to run your system with those new parameter settings.
Data Checking: (With the battery connected to the ESC), connect the ESC to the WiFi Express module as shown above.
Open the WiFi setting on your smart phone and then connect (the phone to) the WiFi Express module (the WiFi name is HW-WIFILINK and the password is 12345678 by default, you can change them by yourself).
After the connection succeeds, open the "HW Link" APP on your phone (the APP needs to be installed in advance), click the "connect to ESC" icon (in the upper right corner), and then click the "Data Record" icon and "Aircraft" to check the recorded data.

3 Real-time Data Checking

- (With the battery connected to the ESC), connect the ESC to the WiFi Express module as shown above.
Open the WiFi setting on your smart phone and then connect (the phone to) the WiFi Express module (the WiFi name is HW-WIFILINK and the password is 12345678 by default, you can change them by yourself).
After the connection succeeds, open the "HW Link" APP on your phone (the APP needs to be installed in advance), do not click the "connect to ESC" icon (in the upper right corner) but directly click the "Data Record" icon to enter the "Data Record" page.
After entering the "Data Record" page, click "Aircraft" and then "Real-time Data" to enter the "Real-time Data" page, fill in the gear ratio (if it's not applicable, then fill in 1) and the pole pairs of the motor (that's to halve the motor poles), and then click "OK".
The ESC will transmit the real-time data to the "Real-time Data" page when it starts to function, you can check the data on that page.

After adjusting parameters, you need to power your ESC off and then on. Otherwise, those new parameters won't take effect.

06 Programmable Parameters & Explanations

Table with columns: Flight Mode, Fixed-wing, Helicopter (External Governor), Helicopter (EIF Governor), Helicopter (Store Governor). Rows include Lipo Cells, Voltage Cutoff Type, Cutoff Voltage, BEC Voltage, Response Time, Governor Parameter P, Auto Restart Time, Restart Acceleration Time, Brake Type, Brake Force, Timing, Motor Rotation, DEO Technology, Start-up Force.

Explanations for Programmable Parameters

- Flight Mode: In this mode, the motor only starts up when the throttle amount reaches 5% or above and it responds to the throttle input rapidly.
Fixed-wing: This mode is applicable to helicopters which do not use any kind of speed-governing device or helicopters which use external governors.
Helicopter (Linear Throttle/Enabled/Disabled): In this mode, the motor only starts up when the throttle amount reaches 5% or above; and it will run in either way: 1) when setting to "Soft Start-up Enabled" (with the Response Time is set to any value between 1 and 21), the motor will start up in a soft way and then quickly accelerate to the speed corresponds to the current throttle amount after the soft start-up completes.
Lipo Cells: This item will automatically calculate the number of Lipo cells you have plugged in as per the "3.7V/Cell" rule if "Auto Calc" is selected.
Voltage Cutoff Type: If this item is selected, the ESC will gradually reduce the output to 50% of the full power when the voltage cutoff protection is activated.
Cutoff Voltage: This item is adjustable between 2.8V and 3.8V with the step of 0.1, it's 3.0V by default.
BEC Voltage: This item is for adjusting the output voltage of the BEC from 5V to 8V (it's 7.4V by default).
Response Time: This item is for adjusting the throttle response, the higher the value, the slower the throttle response.
Governor Parameter P: This item is for controlling the ESC compensate the amount of the motor speed during the process of maintaining the speed-governing effect; the higher the value, the bigger the amount, and vice versa.
Governor Parameter I: This item is for adjusting the response speed of the "Governor Parameter P". The higher the value, the slower the response speed; and vice versa.
Auto Restart Time: This function is effective only in the "Helicopter (EIF Governor)" mode and the "Helicopter (Store Governor)" mode.
Restart Acceleration Time: This item is adjustable between 1s and 3s with the step of 0.5s, it's 1.5s by default.
Brake Type: Normal Brake: after selecting this option, if you move the throttle stick to the bottom position, then the ESC will brake the motor as per the preset brake force.
Brake Force: This item is for only effective in the "Normal Brake" mode.
Timing: This item is for adjusting the ESC timing, it's adjustable between 0 and 30° with the step of 1° (it's 15° by default).
Motor Rotation: This item is for setting the rotation direction of the motor, it's "CW" by default.
DEO Technology/Freewheeling: This item can be enabled or disabled when the "Flight Mode" is set to the "Fixed-wing" or "Helicopter (External Governor)" mode.
Start-up Force: This item is for adjusting the start-up force of the motor (during the start-up process). The higher the value, the larger the start-up force.

07 Speed-governing Function

1 Explanation for ESC Speed-governing

- Establish the "Motor RPM-Throttle Amount Curve" via the speed standardization, and then set the throttle amount to some fixed value on the transmitter, in that condition, the motor will output the RPM corresponds to the throttle amount and keep rotating at that speed.
In the "Helicopter (EIF Governor)" mode, the ESC won't save the "Motor RPM-Throttle" curve after it's disconnected from the battery, so every time the ESC is connected to the battery, it will standardize the speed, otherwise you cannot use the speed-governing function normally.
In the "Helicopter (Store Governor)" mode, the ESC will save the "Motor RPM-Throttle" curve, and then you can use the speed-governing function.

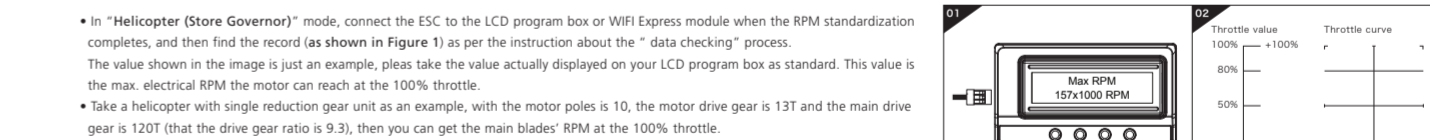
2 RPM Standardization

- Theory of RPM Standardization: During the RPM standardization, the ESC will establish a "Motor RPM-Throttle" curve by itself based on the actual battery voltage and the actual KV rating of the motor.
Procedures of RPM Standardization: We recommend using the default "Throttle Curve & Pitch Curve".
Attention! Please standardize the throttle range before the RPM standardization.

3 How to Set the Speed-governing Function

- The best throttle amount (set in the Helicopter "Store Governor" mode) of the ESC ranges from 70% to 90%, so please try to set the throttle amount (set in the Helicopter "Store Governor" mode) within this range.
Attention! Please standardize the throttle range before the RPM standardization.

- In "Helicopter (Store Governor)" mode, you can check the standardized speed (Max. RPM) and needn't standardize the speed every time when the ESC is connected to the battery as in the "Helicopter (EIF Governor)" mode, so it's more convenient.
In "Helicopter (Store Governor)" mode, connect the ESC to the LCD program box or WiFi Express module when the RPM standardization completes, and then find the record (as shown in Figure 1) as per the instruction about the "data checking" process.



- Formula: Main Blades' RPM (at the 100% throttle) = Max. RPM * (Motor Poles / 2) / Drive Gear Ratio.
Notes: In general, you can set and save 2/3 sets of throttle curve IDLE settings on a high quality transmitter (and you need to adjust the main blade pitch of each set of IDLE setting as per the actual demands), and switch between these settings during the flight and have the different throttle amount (set in the Helicopter "Store Governor" mode) to meet the different RPM demands.
In the "Helicopter (EIF Governor)" mode, you are not allowed to check the Max. RPM, so you need to set the transmitter in advance and check the main blades' RPM with the help of some external device (like RPM viewer) and then decide the throttle amount you need to set. Here you can calculate the throttle amount roughly. For example, if the KV rating of the motor is 480KV, the battery is 12S LiPo, the motor drive gear is 13T and the main drive gear is 110T, then the main blades' RPM is: KV Rating * Battery Voltage / Drive Gear Ratio = 480 * 12 * 4.2 / 13 * 110 = 2850. So if you want your motor to rotate at the speed of 2150RPM, then the throttle amount is: 2150 / 2850 = 0.75 (that is 75%), and then you adjust it accordingly as per your preference or the data you read on the RPM viewer.

08 Warning Tones & Protections

- Warning Tones: Table with columns: Trouble, Warning Tone, LED Status, Cause.
Protections: Power-on Abnormal Voltage Protection, Start-up Protection, Throttle Signal Loss Protection, Overload Protection, Low-voltage Cutoff Protection, Over-current Protection.