

Elite

Rev D X ELITE ESC Introduction Users Manual

Welcome to Rev D Corporation !

Team Rev D release our high-performance sensorless brushless electronic speed controller the Brush Drive Series ESC. Designed specifically for competition drift models.

As you venture into the exciting world of RC drift, it is important to understand the inherent risks associated with high-power systems. To ensure your safety and maximize the performance of our speed control, we strongly urge you to carefully read and familiarize yourself with this user manual.

Practicing your safety, an encouragement to carefully review the user manual provided, we are aware that the Rev D Corporation cannot assume liability for use, installation, application, or maintenance of our products. We are committed to providing you with a premium RC experience, and we trust that our Brush Drive Series ESC will deliver the performance and reliability you expect. Should you have any questions or require further assistance, our dedicated support team is here to help.

Important Safety Guidelines

- Adult Supervision:** Ensure that children do not use this product without adult supervision.
- Heat Caution:** The ESC may become hot during use, so exercise caution when handling it.
- Soldering Precaution:** When soldering input/output wires and connections, use a soldering iron with a minimum power rating of 60W.
- Battery Disconnection:** Always disconnect the battery after use and avoid driving the ESC with the battery connected.
- Flammable Materials:** Keep the ESC away from flammable materials to prevent any potential fire hazards.
- Overheating Warning:** If the ESC overheats, emits smoke, or shows signs of burning, immediately stop using it, disconnect the battery and seek assistance.
- Important notes:** Please make sure to follow these safety guidelines to ensure a safe and enjoyable experience with our product.

Performance Features

The Brush ESC is a high-performance sensorless brushless electronic speed controller designed specifically for competition drift models.

With its advanced features and robust construction, it offers you the RC drifting experience to new heights. Here are the key features:

- Five Unique Function Modes:** General, Throttle, Brake, Boost, and Turbo, offering a range of performance enhancements tailored to RC drifting.
- Full Maximum Torque and Heat Sink Design:** Ensures efficient heat dissipation for consistent performance even under demanding conditions.
- Adjustable Parameters:** Fine-tune settings for different racing scenarios, including Modified, Stock, Zero Torque, and Drifting.
- Powerful 32-Bit Microprocessor:** Provides enhanced throttle response, acceleration, linearity, and drivability.
- Comprehensive Protection Features:** Includes low-voltage cut-off, over-heat protection, and throttle signal loss protection for safe operation.
- Builds in Bluetooth Connectivity:** Allows convenient programming and firmware updates via the dedicated app for Apple / Android.
- State-of-the-Art Components:** Incorporates real-time ESC temperature, motor RPM, voltage, and advanced timing for performance analysis.

Throttle Calibration and Settings

Power Off/Off ESC:

- To power on the ESC, press the Power Switch Button.
- Power off the ESC, press and hold the button until all LEDs turn off. Ensure the throttle trigger is in the neutral position (within 30%) for successful power-off.

Throttle Calibration:

- Connect the ESC to the battery and receiver, and turn on the transmitter.
- Press and hold the power switch until the Blue LED starts on, accompanied by a long beep from the motor. Release the power button to enter calibration mode.
- Push the trigger to the full throttle position. The Blue LED will blink three times, and the motor will "beep twice" to use the full throttle position.
- Push the trigger to the neutral position. The Blue LED will blink three times, and the motor will "beep three times" to indicate the completion of throttle calibration.

The ESC supports Reverse throttle calibration. If the transmitter throttle is set to reverse, follow the same calibration process as above without affecting the forward/reverse operation.

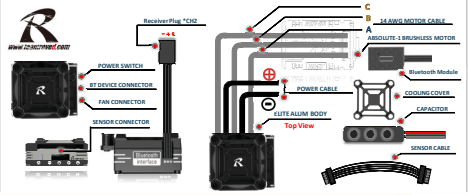
Note: Avoid driving the ESC while the Blue LED blinking phase.

Remark: There is no need to restart the ESC after completing throttle calibration.

Performance Specifications

Product Name	Brush Competition Class	STANDARD ACCESSORIES
Contact Current	30A	Accessories Items
Rated Current	60A	Independent Body
Input Voltage	2S-5S 11.1V	Instructions Sheet
REC Input	6.0V/7.4V/AA (REC Switch)	
Size (L*W*H)	78*38.5*73.5 mm	Cooling fan
Weight (Weight)	48.5g (Net)	10-Channel Motor Alarm
Program via	Smart Phone	Cooling Fan Cover (ABS)
APP Support	Apple iOS / Android	Capacitor Pack (1500uF/16V 1+1)
Firmware Update	Manufacturer Support	Double-sided Tape
Waterproof	Not Available	
ESC Application	1/20 Scale Drifting	

Electrical Connectivity



Cable linkage Guidelines

Battery Wire Connection

When connecting the battery, pay attention to polarity; incorrect connection will damage the ESC and Battery.

As shown in the figure above, connect the positive (+) wire to the positive (+) battery port, and the negative (-) wire to the negative (-) battery port.

Motor Wire Connection

- Sensorless Mode:** When using a sensorless brushless motor, the three A/B/C wires of the ESC must be connected to the three A/B/C motor wires correspondingly.
- It is necessary to connect the sensor wire to the "Sensor" socket on the ESC. Don't change the wire sequence optionally.**
- Sensorless Mode:** When using a sensorless brushless motor, the AA, AB, AC wires of the ESC can be connected with the motor wires freely (without any sequence). If the motor runs in the opposite direction, please swap any two wire connections.

Receiver Wire Connection

The signal wire supplies 6V to the receiver, sensors, etc. If there is no need to connect an additional battery, external power connected to the receiver may damage the ESC.

Black wire: RX-
Red wire: RX+6.0V
White wire: RX Signal

ESC Troubleshooting

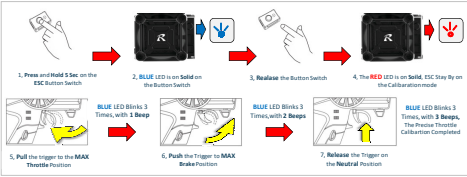
Troubleshooting	Issues Caused	Issue Solutions
-The ESC was unable to start the status LED, the motor, and the cooling fan after it was powered on.	1. No power was supplied to the ESC. 2. The ESC switch was damaged.	1. Check all ESC & battery connectors have been well soldered or firmly connected. 2. Replace the broken switch.
-The motor suddenly stopped or significantly reduced output to operation.	1. The receiver was influenced by some foreign interference. 2. The ESC entered the thermal protection (Low Voltage Cut-off) protection. 3. The ESC entered the thermal (over-heat) protection.	1. Check all devices and try to find out all possible causes, and check the transmitter's battery voltage. 2. The RED LED blinks, single flash between every one second. 3. The RED LED blinks, double flash between every one second.
-The motor stuttered but couldn't start.	1. Some soldering between the motor and the ESC was not good. 2. The ESC was damaged (some MOSFETs were burnt).	1. Check all soldering joints, please re-solder if necessary. 2. Contact the distributor for repair or repair customer service.
-The car ran forward/backward slowly when the throttle trigger was at the neutral position.	1. The neutral position on the transmitter was not stable, so signals were not stable either. 2. The ESC calibration was not proper.	1. Recalibrate the throttle trigger or fine tune the neutral position on the transmitter.

Rev D Corporation

Address: 12121, Indokun, Matsudo-City, Chiba, Japan
TEL: +81-293-721-1111 FAX: +81-293-721-2244
Email: info@revd.com Website: www.revd.com
Technical Support department: eod@revd.com

Please often to check our website, Instagram, Facebook for details on the features and the latest information.

Calibration Status



Throttle Position	Blue LED	Red LED
Neutral	ON	OFF
Full Throttle	ON	ON
Full Brake	OFF	ON

Note: When you put the throttle from neutral position to full throttle position, the Blue LED will blink, and the blink frequency will go faster when the throttle goes higher.

When some protection is activated

- The RED LED blinks, single flash between every one second. Repeat like "x x x" indicates that the voltage is abnormal.
- The RED LED blinks, double flash between every one second. Repeat like "x x x" indicates that the temperature is abnormal.
- The RED LED blinks, single and double flash alternately between every one second.
- Repeat like "x x x x x x x" indicates that both of the voltage and temperature is abnormal at the same time.
- The RED LED will not have any response when the voltage or temperature is abnormal if not detect the signal.
- The Red LED blinks double flash between every two seconds. Repeat like "x x x" indicates that the throttle is abnormal. (No throttle, or the throttle is not on the neutral position.)

Throttle Signal

- 1. The ESC can support the 400Hz maximum PWM throttle signal.
- 2. The ESC throttle protection will be activated under the following situation, and the BLUE LED blinks double flash:
 - The throttle trigger does not place on the neutral position when the ESC turns on.
 - Lost the throttle signal.
 - 3. If the ESC lost throttle signal during the operation, the BLUE LED will blink double flash, and the ESC will start to work again until the throttle signal is back to normal.

Sensorless & Sensors

- 1. The sensorless mode is activated once the ESC detected the hall sensor signal at any time.
- 2. The ESC will work on sensorless mode once the ESC didn't detect the hall sensor signal at any time.
- 3. The ESC will have a slight power drop and reduced spin during the moment of sensorless and sensorless mode switching.
- 4. The PWM driving frequency will be selected automatically by the ESC in sensorless mode, and the manual setting is invalid.
- 5. It is invalid to set the brake PWM frequency less than 10Hz and forced recognized as 100Hz, if the ESC is in sensorless mode.
- 6. Boost and turbo functions are not available on sensorless mode.

Boost & Turbo

- 1. After the boost or turbo timing triggered, the RPM and current will be increased, and the battery/ESC/motor will be heating, so setting the proper timing and timing increased ones, the time of timing will affect the battery/ESC/motor's service life.
- 2. The difference of the Boost and Turbo Timing:
 - The Boost timing will be triggered even though you do not put the throttle trigger to the full throttle position.
 - The Turbo timing will be triggered only when you put the throttle trigger to the full throttle position.
- 3. The Boost timing plus the Turbo timing is equal to the final speed timing when the throttle reaches its maximum position, and the final total timing is 50 degrees. For example: Boost timing set at 45 degrees, and Turbo Timing set at 45 degrees, so when the the throttle reaches its maximum position, the Boost timing will be 45 degrees, and Turbo Timing only can be opened at 25 degrees.
- 4. Set the low voltage or over temperature protection, and the protection is activated, then the timing will be closed.

Voltage Protection

- High Voltage Protection**
If the ESC detected the voltage phase does not higher than 12.0V (higher than the ESC standard voltage), when ESC turns on, and the AA.Cut-off volt (VDS) was not set "OFF", then the voltage protection will be activated, and the maximum throttle output will be limited within 50%. (The high voltage protection only worked on the other stages even if detected the high voltage, even the high voltage protection opened, even though the voltage comes down to the normal voltage the protection will not be relieved.)
- Low Voltage Protection**
If the ESC detected the voltage less than the set value at anytime, and this voltage keep for a while, then the low voltage protection is activated, and the maximum throttle output will be limited within 50%. (Once the low voltage protection activated, even though the voltage comes down to the normal voltage the protection will not be relieved.)
- Thermal Protection**
The output throttle from the ESC will be limited (not over 50%) with the thermal value you have preset. (The Thermal protection will be dismissed when the ESC temperature drop to 60°C.)
- 4. If the voltage protection and temperature protection set off, and when the voltage and temperature become abnormal, the LED status will indicate the problems correspondingly, but will not limit the throttle output and will not close at ESC timing.
- 5. If the ESC detected the motor have the driving problem (the motor rotor locked or motor phase lost problem) which can cause the motor lost run smoothly, and when the throttle trigger have the ESC driving abnormal protection will be activated, and the motor will emit special tone (like beep-beep-beep) (note: some motor can not keep or beep with a low sound if motor have phase loss problem), and the protection will be closed until you released the throttle trigger to neutral position for 0.2 seconds. If this problem occurs three times continuously, then you have to solve the motor driving problem first, or the protection will exist all the time.

Bluetooth Program

Bluetooth module is an optional purchase

- 1. Reset password: When the ESC turns on, press and holding the power button around 10 seconds, the ESC will restore the Bluetooth password to default setting "0000".
- 2. With Rev D Bluetooth, connected the Rev D app to the ESC, the user can program parameters, upgrade firmware and check the real-time data of the ESC on the APP.
- 3. Due to the range limit of Bluetooth, the operational distance is around 10 meters.
 - (If there are many metals or other strong interference signals or obstacles around will short the operational distance.)
- 4. The Bluetooth device name can not be changed.
- 5. The Bluetooth connecting will be failed during the ESC throttle calibration process.

Program Items

- 1. The user can program parameters at any status if the ESC turns on, and new programmed parameters will be took effect immediately, no need to restart the ESC, it means the programming parameters can provide a very intuitive feeling between the before programming and after programming. There will be some impacts to the battery/ESC/motor, if you program some parameters when the motor is a high-speed rotation when the ESC will drive the motor reverse immediately, but the motor can not be reverse immediately because of its inertia, then it will cause a big current and vibration. 0. When the Boost or Turbo timing opened, but you set it off when the motor is a high-speed rotation, it will cause a big current, so we would like to recommend not programming parameters when the motor is a high-speed rotation.
- 2. The programming parameters are saved in the ESC embedded memory, and the Refresh card have a limited programming life (around 100 times), so don't program the ESC any often.

Real-Time Data

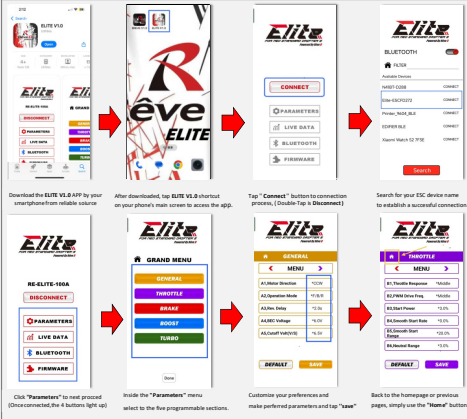
- 1. The real-time data can be read only when the ESC have the throttle signals.
- 2. The real-time data is just a reference data with ±20% accuracy, if you want to get the more accurate real-time data, you need to use the more professional equipment.
- 3. The description of the real-time data items:

NO	BATE-Live Item	Trigger Position
1	Input Throttle	The throttle from receiver to the ESC
2	Output Throttle	The throttle from the ESC to the Motor
3	Voltage	The battery voltage being detected by the ESC
4	Min.Voltage	The minimum voltage was detected by the ESC
5	Temperature	ESC Low temperature
6	Max.Temperature	The maximum temperature detected by the ESC
7	RPM	Revolutions Per Minutes "LIVE"
8	Max. RPM	The maximum RPM detected by the ESC
9	Adv. Timing	Advance Timing - The ESC total timing (Boost & Turbo)
10	Max. Timing	The Boost/Turbo total maximum drive value

Firmware Update

- 1. If the ESC firmware upgrade failed during the upgrading process, please restart the ESC again, and must upgrade the ESC firmware via the APP again.
- 2. If the other functions are not available, the ESC will get right after the firmware upgraded successfully.
- 3. The ESC will get right after the firmware upgraded successfully.
- 4. The Red led will blink a fast light when the ESC in the Firmware upgrade mode, and the Blue will blink a fast light when the ESC data transmission.
- 5. Please do not turn off the ESC during the time of the ESC firmware upgrading process.
(And the ESC only can be switched off after pressing the power button around 5 seconds.)

App Installation Guide



Mobile Phone App Installation Guide

- 1. Download the ELITE VLB APP on your smartphone from a reliable source.
Apple's URL: <https://apps.apple.com/my/app/elite-v-lb/id147438043>
Android URL: <https://play.google.com/store/apps/details?id=com.bdc.elf>
- 2. Open the ELITE VLB APP and tap the "Connect" button to initiate the connection process. (Note: Quick double-tap will disconnect the connection.)
- 3. Once connected, the app will automatically navigate to the Bluetooth page. Search for your ESC device name to establish a successful connection. (The app will remember the device name for future connections.)
- 4. After establishing the connection, you will see four box buttons on the screen: "Parameters", "Data", "Bluetooth", and "Firmware". Tap on "Parameters" to proceed. (once connected, the 4 buttons light up.)
- 5. Inside the "Parameters" menu, you will find the five programmable sections: GENERAL, THROTTLE, BRAKE, BOOST, and TURBO, to select the desired section to begin setting up your parameters.
- 6. For example, if you choose the General parameters section, you can customize your performance and make necessary adjustments. Once you are satisfied, press the "Save" button. Be cautious when using the "Default" button, as it will restore all values return to the factory settings.
- 7. To navigate back to the homepage or previous pages, simply use the "Home" button, which will provide easy access to different sections.
- 8. Now you are ready to enjoy the enhanced performance of your ELITE VLB ESC. LET'S START TO ENJOY YOUR RC DRIFTING!!!

Please note that this is a general guide, and specific instructions may vary depending on the exact model and version of the Brush ESC you are using.

Take a note: To set a custom password, Go to Bluetooth Menu in the main settings.