



RC Crawler Brushless Power System User Manual

This kit includes: Brushless Electronic Speed Controller (ESC) + Brushless Motor

Designed for 1:10 scale RC crawlers

ESC Model: SwiftR 10BL60

Brushless Motor: 2826 2000KV outer rotor motor

Bluetooth Programming Module: MINI28BL15

Power System Kit Code: 2826 outrunner motor + 60A brushless ESC (H0157)



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1. Safety Statements & Disclaimer

Thank you for purchasing this product! This brushless power system delivers substantial power, and improper use can cause personal injury and property damage. Please read this section carefully before use. Using this product means you accept all of the terms below.

Always follow the precautions in this manual. Riverhobby Tech(Shenzhen) Co., Ltd. assumes no liability for any damage arising from the use of this product or from unauthorized modification or improper operation, including but not limited to indirect or consequential losses. Riverhobby Tech(Shenzhen) Co., Ltd. reserves the right to change the product design, appearance, performance, and usage requirements without prior notice.

1.1 Safety Precautions

- Before connecting the ESC and its related wiring, make sure all wires and connectors are properly insulated — a short circuit will destroy the ESC;
- Connect all components carefully. A poor connection can leave you unable to control the vehicle, damage equipment, or cause other unpredictable situations;
- Before using this ESC, review the manuals for the power system components and the chassis to make sure the power combination is appropriate. An incorrect power match can overload the motor and ultimately damage the ESC;
- When soldering the ESC input/output wires or connectors, use a soldering iron of at least 50W to ensure solid, reliable joints;
- Never allow the ESC surface temperature to exceed 90°C / 194°F. Overheating will destroy the ESC and may damage the motor as well;
- Always disconnect the battery from the ESC after use. As long as the battery is connected, the ESC keeps drawing current even with the switch off; leaving it connected for a long time will fully discharge the battery and may damage the battery, the ESC, or both.

2. Product Overview

This kit is the VRX RACING brushless power system for RC crawlers (kit code: 2826 outrunner motor + 60A brushless ESC, H0157), designed for 1:10 scale RC crawlers. It consists of a vehicle brushless electronic speed controller (SwiftR 10BL60, 60A) and a 2826 2000KV outer rotor motor, and supports convenient wireless parameter adjustment through the Bluetooth programming module (MINI28BL15).

2.1 Kit Contents

1) Brushless Electronic Speed Controller (ESC) — the core control module with cooling fins. It is the control hub of the whole system: it receives radio signals from the transmitter and controls motor speed.

2) Brushless Motor — the cylindrical power-output component. It receives three-phase power from the ESC and delivers rotation to drive the vehicle.

3) Bluetooth Programming Module — connects to a smartphone app over Bluetooth to read and modify ESC parameters wirelessly, so you can fine-tune the setup without taking anything apart.

2.2 Power System Wiring Diagram

The connection logic of the power system is as follows:

Battery — its output connector plugs into the ESC power input leads, supplying power to the whole system;

Electronic Speed Controller (ESC) — draws power from the battery and connects to the receiver and the switch; its three output leads (#A/#B/#C) feed the brushless motor's three phase wires;

Receiver — receives the radio control signal and passes throttle and on/off commands to the ESC;

Switch — turns the power system on and off;

Brushless Motor — receives three-phase power from the ESC and outputs rotation.

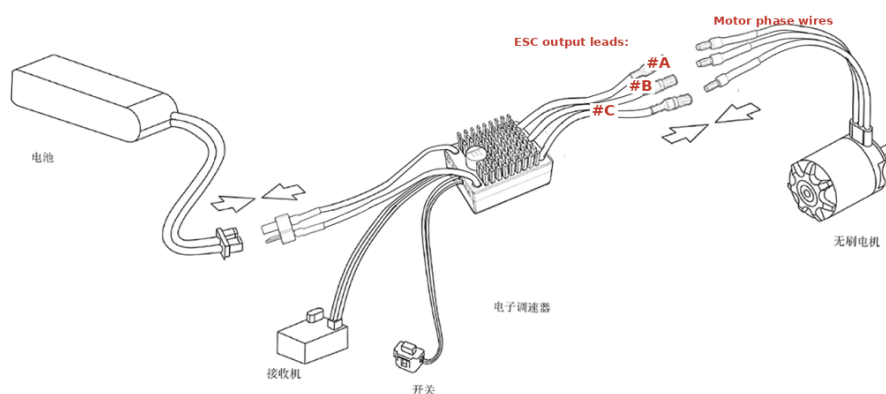


Figure 1: Wiring diagram of the brushless power system (ESC output leads #A/#B/#C connect to the motor phase wires; interfaces to be connected are marked with double-headed hollow arrows)

WARNING! For your own safety and the safety of those around you, we strongly recommend removing the motor pinion before calibrating and setting up the system, and switching the ESC on only with the wheels off the ground!

3. ESC Specifications

This kit comes with the SwiftR 10BL60 vehicle brushless electronic speed controller, designed for 1:10 scale RC crawlers.

Item	Specification
Model	SwiftR 10BL60
Continuous / Peak Current	60A / 300A
Supported Motor Type	Sensorless brushless motor
Best Suited For	1/10 scale crawlers
Motor KV Limits	2S: <6000KV; 3S: <4000KV
Battery	2-3S LiPo / 6-9 cell NiMH
BEC Output	6V @ 3A
Dimensions	47.6×37.4×21.1mm
Weight (with wires & connectors)	71.6g
Programming Port	Shared with the throttle signal connector

Auto alert: if the ESC sees no operation for 10 minutes, it enters an alert state (the motor will keep beeping: beep, beep, beep).

4. Motor Specifications

Product model: 2826 2000KV outer rotor motor

Brand: VRX RACING — Riverhobby Tech(Shenzhen) Co., Ltd.

4.1 Performance Parameters

No.	Item	Requirement	Remarks
1	Rated Voltage	11.1V	2-4S
2	No-Load Current (A @ 11.1V)	≤6.5A	Factory test item
3	No-Load Speed (rpm @ 11.1V)	22200 ±5%	Factory test item
4	KV Rating	2000KV	—
5	Motor Resistance (mΩ)	8mΩ ±3%	25°C ambient; factory test item
6	Slots / Poles	12N14P	—
7	Total Weight	160g	Factory test item
8	Dielectric Withstand (DC)	DC500V (3S)	Factory test item
9	Rotor Balance	≤7mg	Factory test item
10	Rotation (viewed from shaft end)	CW / CCW	Factory test item
11	Operating Temperature	-10°C ~ 65°C	—
12	Storage Temperature	-10°C ~ 50°C	—
13	Storage Humidity	≤85%	—

4.2 Dimensions & Mounting

No.	Item	Specification	Remarks
1	Overall Appearance Tolerance	$\leq 0.1\text{mm}$	Factory test item
2	Overall Height	$62.2 \pm 0.2\text{mm}$	Factory test item
3	Motor Body Height	$44.1 \pm 0.2\text{mm}$	Factory test item
4	Overall Diameter	$35 \pm 0.1\text{mm}$	Factory test item
5	Mounting Holes	6× M3, 25mm hole pattern	Factory test item
6	Wire / Sequence	14AWG silicone wire (black)	—
7	Lead Length	130 $\pm 5\text{mm}$ (with 4.0mm banana plugs)	Factory test item
8	Shaft Extension Length	15mm	Factory test item
9	Shaft Diameter	$\phi 3.175 (-0.01/-0.03)$	Factory test item
10	Shaft Shoulder Thickness	2.8 $(-0.01/-0.04)$	Factory test item
11	Locating Pilot Diameter	$\phi 25\text{mm}$	Factory test item

5. Wiring & Installation

5.1 Connecting the Motor

There is no required phase order between the ESC and the motor — the ESC's output leads #A / #B / #C (see Figure 1) can connect to any of the motor's three phase wires. If the rotation direction is reversed, simply swap any two of the motor wires.

5.2 Connecting the Receiver

Plug the ESC's throttle lead into the receiver's throttle channel (the TH channel). Because the red wire in the throttle lead outputs BEC voltage to power the receiver and servos, do not power the receiver separately. If separate power is required, disconnect the red wire of the ESC throttle lead.

5.3 Connecting the Battery

The ESC input leads are polarity-sensitive. When connecting the battery, make sure the ESC's (+) lead goes to the battery's (+) terminal and (–) to (–). **Reversed polarity will destroy the ESC, and ESC damage caused by reverse connection is not covered by the warranty.**

5.4 Throttle Range Calibration

Important: recalibrate the throttle range before first use of the ESC, and again after changing the transmitter or receiver — otherwise the ESC may not work or may behave unpredictably. We also recommend setting the transmitter's throttle-channel failsafe (F/S) to the "no output" mode or to the neutral position, so the motor stops if the receiver loses the transmitter's signal.

Calibration steps:

1. Switch on the transmitter and push the throttle trigger fully to the full-reverse position;

2. Switch on the ESC; after one beep, pull the trigger fully to the full-throttle (forward) position;
3. After two beeps (beep-beep), release the trigger and let it spring back to neutral;
4. Hold the trigger at neutral; after three beeps (beep-beep-beep), the throttle range calibration is complete and the motor is ready to run.

6. Programmable Items

All ESC parameters are set through the Bluetooth programming module together with the mobile app — Bluetooth programming is the only programming method this ESC retains (see Chapter 7 for the full procedure). The white-on-black options in the table below are the factory defaults.

No.	Programmable Item	Option 1	Option 2	Option 3	Option 4	Option 5	Option 6	Option 7	Option 8
1	Running Mode	Forward with brake	Fwd/Rev with brake	Fwd/Rev direct	—	—	—	—	—
2	Low-Voltage Cutoff Threshold	Disabled	2.6V/cell	2.8V/cell	3.0V/cell	3.2V/cell	3.4V/cell	—	—
3	Punch (Start Acceleration)	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	Level 8
4	Drag Brake Force	0%	5%	10%	20%	40%	60%	80%	100%
5	Max Brake Force	Disabled	25%	50%	75%	100%	—	—	—
6	Max Forward Force	25%	50%	75%	100%	—	—	—	—
7	Max Reverse Force	25%	50%	75%	100%	—	—	—	—
8	Neutral Range	6%	9%	12%	—	—	—	—	—
9	Timing	0°	3.75°	7.5°	11.25°	15°	18.75°	22.5°	26.25°
10	Motor Rotation	CCW	CW	—	—	—	—	—	—
11	Sinusoidal Power	20%–100% adjustable	—	—	—	—	—	—	—
12	Sinusoidal Range	5%–50% adjustable	—	—	—	—	—	—	—
13	Sinusoidal Low/High Speed	100–1000 0 adjustable	—	—	—	—	—	—	—

6.1 Detailed Description of Each Programmable Item

1. Running Mode

Option 1: Forward with brake — while driving forward, pulling the trigger to reverse only brakes; after returning to neutral once, pulling reverse again engages reverse. While reversing, pushing forward first decelerates to a stop and then drives forward directly.

Option 2: Forward/Reverse with brake — the first time the trigger enters the reverse zone, the motor only brakes and does not reverse; after returning to neutral and entering the reverse

zone a second time, reverse engages. This prevents accidental reverse from repeated taps on the brake while driving.

Option 3: Forward/Reverse direct — single-click reverse: pulling the trigger into the reverse zone immediately reverses. This mode is generally used on special-purpose vehicles.

2. Low-Voltage Cutoff Threshold

This function mainly prevents over-discharging a LiPo battery and causing irreversible damage. The ESC constantly monitors battery voltage; once it drops below the set threshold, power output is cut off completely. When low-voltage cutoff triggers, the red LED flashes to alert you. For NiMH batteries, set this item to Disabled.

3. Punch (Start Acceleration)

Controls how quickly throttle output builds. Higher settings mean harder acceleration. Choose a value based on your terrain, tire grip, and vehicle setup. Setting it too high can cause wheelspin and excessive startup current, which is hard on the motor, ESC, and battery.

4. Drag Brake Force

Drag brake is the braking force the motor produces when the trigger sits in the neutral zone. Choose a suitable value based on your vehicle type, setup, and terrain.

5. Max Brake Force

This ESC provides proportional braking — the braking force depends on trigger position. Max Brake Force is the braking force produced when the trigger is at full brake. Choose a suitable maximum based on your vehicle.

6. Max Forward Force

The maximum forward drive torque the system allows when throttle input is at maximum. Different values give different forward speeds. Choose based on your vehicle.

7. Max Reverse Force

The reverse force produced when the trigger is at full reverse. Different values give different reverse speeds. In general, use a lower reverse speed to avoid mistakes from reversing too fast.

8. Neutral Range

Adjusts the width of the throttle neutral zone to suit different transmitters and driving habits. If your transmitter's neutral tends to drift, fine-tune the throttle trim, or widen the neutral deadband (e.g., from 9% to 12%).

9. Timing

This function serves three purposes:

- 1) It fine-tunes the motor's maximum RPM — higher timing gives higher top RPM, but also higher current;
- 2) It improves compatibility with different motors — some motors run abnormally at the default timing and need adjustment to work properly;
- 3) By adjusting timing, you can put the motor at its best efficiency point.

10. Motor Rotation

This option tells the motor which way to spin when the ESC receives a forward throttle signal. CCW means counterclockwise; CW means clockwise.

11. Sinusoidal Power

20%–100% (adjustable).

12. Sinusoidal Range

5%–50% (adjustable).

13. Sinusoidal Low/High Speed

100–10000 (adjustable).

7. Bluetooth Programming Tutorial

This ESC is programmed exclusively over Bluetooth through the mobile app (Bluetooth programming is the only programming method), using the MINI28BL15 Bluetooth programming module. Factory defaults can also be restored in the app.

7.1 What You Need

Have the following ready before you start:

- Brushless ESC;
- 2–3S LiPo battery;
- Bluetooth connection board;
- A smartphone with the ESC TOOLS app installed.

7.2 Downloading the App

The app used for Bluetooth programming is **ESC TOOLS**. Search "ESC TOOLS" on the App Store and tap Get to download and install it. To avoid downloading a similarly named app, verify the following before installing:

- App name: ESC TOOLS — check the spelling carefully so you don't install a similarly named app;
- Icon: a blue-purple gradient rounded square with white "EscTool" lettering;
- The app page shows a Get button on the right, as shown below.

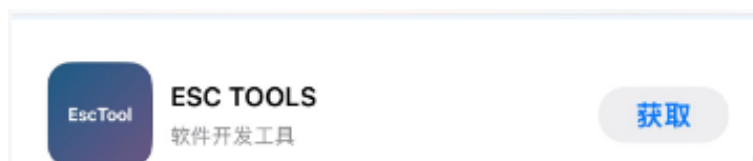


Figure 2: App icon and name (search "ESC TOOLS" on the App Store to download)

7.3 Hardware Connection

Complete the hardware connection as follows:

1. Plug the 1.27mm end of the adapter cable into the ESC/controller's CH1 (programming) port;
2. Plug the Bluetooth module into the 2.54mm end of the adapter cable;
3. Plug the battery into the ESC's battery connector and briefly press the power button to switch on.

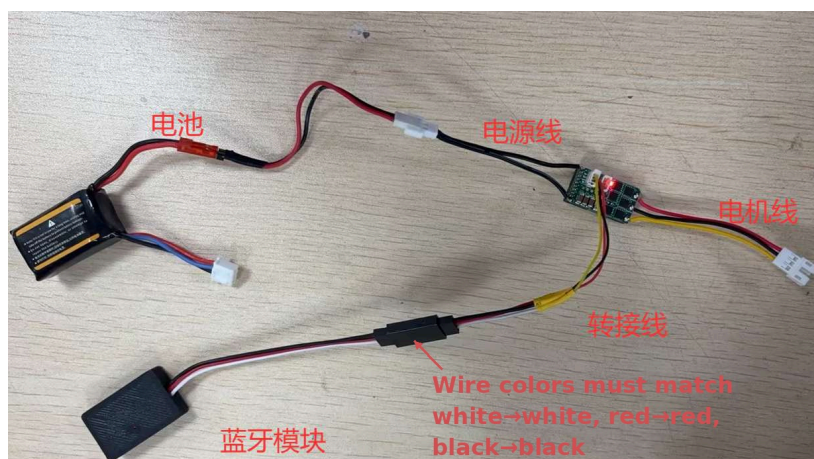


Figure 3: Hardware connections

Note: Wire colors must match — the Bluetooth module's white/red/black wires must connect to the adapter cable's matching white/red/black wires (white to white, red to red, black to black).

7.4 Bluetooth Pairing

Pair and connect over Bluetooth as follows:

1. Open the ESC Tools app; on the home screen, tap the Bluetooth icon in the top right;
2. In the device list, find the device whose name starts with ESC_TOOLS and tap it to connect;
3. On the first connection, if prompted about disabling battery optimization, tap Allow (this prompt will not appear again on later connections);
4. Once connected, the app shows the connected status.



Figure 4: Bluetooth device list



Figure 5: Battery optimization request



Figure 6: Bluetooth connected

7.5 Tuning Steps

Read and set parameters as follows:

1. After connecting Bluetooth, return to the home screen and tap ESC Settings to enter the tuning screen;
2. On the tuning screen, tap Read Parameters first to read the ESC's current settings;

3. After a successful read, "ESC parameters updated" appears at the top — you can now make changes;
4. When done, tap Set Parameters; when "ESC parameters written successfully" appears, the changes are complete;
5. Tap Read Parameters once more to confirm the values read back match what you set.

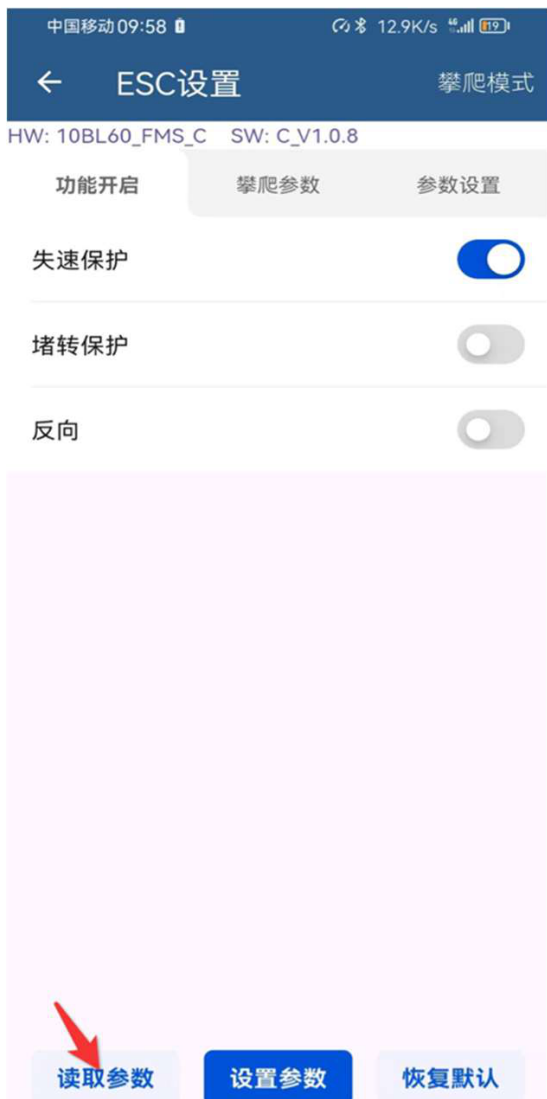


Figure 7: ESC settings screen — Read Parameters



Figure 8: ESC settings screen — Set Parameters

7.6 Tuning Interface

The tuning screen has three tabs:

Functions — enable/disable stall protection, locked-rotor protection, reverse, and other functions;

Crawler Parameters — crawler-specific settings;

Parameters — all adjustable parameters: running mode, max brake force, drag brake, cutoff voltage, punch, max forward/reverse throttle, neutral range, timing, and more.



Figure 9: Parameters tab

7.7 Example: Adjusting Maximum Forward Throttle

1. On the tuning screen, switch to the Parameters tab;
2. Tap Read Parameters to read the ESC's current settings;
3. When reading completes, tap the parameter you want to adjust (e.g., Maximum Forward Throttle);
4. Pick the value you want from the options shown (e.g., 25%, 50%, 75%, 100%);
5. Tap a blank area to close the popup;
6. Tap Set Parameters and wait until "ESC parameters written successfully" appears;
7. Tap Read Parameters again to confirm the change took effect.



Figure 10: Selecting Maximum Forward Throttle



Figure 11: "Parameters written successfully" confirmation

8. Status LEDs & Troubleshooting

8.1 Status LED

- Solid red on power-up;
- LED off with the trigger at neutral; solid red whenever the trigger is off neutral;
- Two red flashes — low-voltage cutoff;
- Three red flashes — over-temperature protection.

8.2 Troubleshooting

Symptom	Possible Cause	Solution
LED stays off on power-up; motor will not start	1. Battery voltage is not reaching the ESC; 2. The ESC switch is damaged.	1. Check the battery and the battery-to-ESC connection; 2. Replace the switch.
Pushing forward throttle makes the vehicle go in reverse	Motor rotation does not match the chassis forward direction	Swap any two of the motor's A/B/C phase wires.
Motor suddenly stops or power drops noticeably while running	1. Receiver interference; 2. ESC entered low-voltage cutoff; 3. ESC entered over-temperature protection.	1. Find the source of interference and check the transmitter battery; 2. Red LED flashes twice — replace or recharge the battery; 3. Red LED flashes three times — over-temperature; let the ESC/motor cool down before continuing (consider reducing the overall load).
Motor judders and will not start	1. Poor connection between ESC and motor; 2. ESC or motor damaged.	1. Check all plugs and solder joints, and re-solder if necessary; 2. Replace the ESC or motor (test at low throttle first to avoid damaging the new unit).
Forward works, but no reverse	1. The transmitter throttle neutral has drifted into the brake zone; 2. Running Mode set incorrectly; 3. ESC damaged.	1. Re-calibrate the throttle range so the LED is off at neutral; 2. Set Running Mode to Forward/Reverse with brake; 3. Contact your dealer or the manufacturer.
Cannot connect to the programming module	Wiring error	Check the wiring against this manual.
Throttle range calibration fails	The ESC is not receiving a correct throttle signal	1. Check for a wrong channel or reversed throttle lead; 2. Check whether the receiver is damaged — plug the throttle lead into a servo channel to test.

9. Motor Usage Precautions

9.1 Safety Advisories

- Before every use, check that the motor is correctly installed and securely fastened;
- Keep clear of the rotating motor to avoid cuts;
- The motor contains strong magnets and has an open structure — keep foreign metal objects away to prevent them being pulled inside and locking the rotor;
- Stay within the motor's normal operating range; never overload it;
- Depending on supply voltage, service life, environment, and other conditions, short circuits, fire, or smoke can occur — take appropriate protective measures around the product;
- During installation (choose screws of a suitable length so they do not bottom out against the windings) and wiring, take care not to damage the windings, leads, or edges; otherwise electric shock, burnout, or fire may result;
- Never lift or move the motor by its wires or shaft;

- If the motor is dropped or receives a comparable impact, its insulation or bearings may be compromised — do not continue using it;
- Never disassemble this product. If you disassemble it yourself, its safety and other performance can no longer be guaranteed;
- Do not use this product in corrosive-gas environments (H₂O, SO₂, NO₂, Cl₂) or near harmful substances (especially silicone, cyano, or phenol series). Also confirm that no such substances are present inside the product — they can cause rust and shorten service life. After 300 cumulative hours of use, service the motor or replace the bearings to keep it running properly;
- For storage, avoid the corrosive gases and harmful environments above, and temperatures beyond -10 to 50°C or humidity above 85%. Take extra care with long-term storage: the allowable conditions are room temperature and humidity for up to 6 months.

9.2 Usage Methods & Conditions

- This product is designed to be installed inside other equipment and carries no warning labels; contact us if labeling is required;
- Temperature strongly affects service life — keep worst-case conditions below the bearing's allowable temperature (100°C max);
- Do not let high bearing temperature persist: sustained high temperature (100°C max) degrades the bearings, causing noise and vibration and shortening life;
- When performing custom speed control, confirm the operating voltage range and load fluctuation, and watch for abnormal noise, abnormal heating, or stalling;
- Always use the correct mounting method. Screws for the pinion and pinion hub must be properly torqued — incorrect mounting is a root cause of noise and vibration and also shortens bearing life;
- As operating time accumulates, bearing clearance gradually increases; the motor can still be used normally.

9.3 Responsibility

- The match between the motor and the equipment's construction, dimensions, life, noise, vibration, and characteristics must be verified by the user;
- Riverhobby Tech(Shenzhen) Co., Ltd. provides no guarantee for use beyond the specification ranges stated in this document;
- Any change to the motor's performance, structural dimensions, or components must be confirmed with Riverhobby Tech(Shenzhen) Co., Ltd.;
- For matters not covered in this document, contact Riverhobby Tech(Shenzhen) Co., Ltd. in advance if agreement is required;
- If any mismatch arises, it shall be resolved and implemented per the terms of this document through mutual consultation;
- Do not disclose this document to third parties.