

# Instruction Manual

## SKYRC TS160 Pro ESC

SK-300078  
V1.0

### INTRODUCTION

Thanks for purchasing SkyRC TS160 Pro ESC. Before using this product, please read following instructions carefully before using!

### SAFETY NOTE

- It is not a toy and is suitable for users older than 14-year-old. Users under the age of 14 need to use this product under the guidance of an adult.
- Never allow water, moisture, oil, or other foreign materials to get inside ESC, motor, or on the PC Boards. It may damage the ESC.
- Never disassemble the ESC and modify the components on the PC Boards.
- Suggest using the original wires and connectors packed in the box.
- Never solder one part for more than 5 seconds as some components will get damaged by high temperatures.
- Never run the ESC w/o load at full throttle as it may damage the bearings and other moving parts.
- Please make sure the location to fix the ESC has good airflow ventilating, so that the heat could dissipate quickly.
- Please keep the ESC connectors far away from other metal parts to avoid short circuits.
- Never connect the battery in polarity in reverse.
- Electronic motor timing will increase the temperatures of ESC and brushless motors. Use extreme caution when setting up and testing your application to avoid overloading and overheating.
- Incorrect Boost and Turbo timing settings may cause permanent damage to the ESC and motors. Please choose the proper ratio and timing setting according to the motor's instructions.
- To avoid signal interference, please always turn on the transmitter first THEN turn on the speed control. Do the opposite when powering it off.
- Users must always disconnect the battery from the ESC after use. Even if the ESC is turned off, the current on the ESC is consumed continuously if it is connected to the batteries. The battery will be over-discharged and damaged.

Note: We will not be responsible for any damage caused by non-compliance with above instruction.

### FEATURES

- Easy setting by app control.
- Monitor the real-time racing data via the app.
- Boost Timing Activation: RPM Mode & Throttle Mode.
- Aluminum enclosure with better heat dissipation.
- Switch automatically between Sensor and Sensorless modes.
- Over-voltage Protection, Low-voltage Protection, Temperature Protection\*, Motor Stall Protection\*\*

\*Over-voltage Protection, Low-voltage Protection, and Temperature Protection: limit the throttle to under 50%.

\*\*Motor Stall Protection: ESC must be restarted after three consecutive times stalls.

### SPECIFICATION

- Constant/Peak Current: 160A/850A
- Compatible Motor: Brushless Sensored & Sensorless Brushless
- Compatible Car: 1/10 Touring Car, 1/10 Buggy, 1/10 Crawlers
- Motor Turns: 1/10 Touring Car  $\geq$  4.5T; 1/10 Buggy  $\geq$  5.5T
- Battery Cell: 6-9S NiMH/ 2-3S LiPo
- BEC Output: 6V/7.4V (Default: 6V)
- Low-voltage Protection: OFF, Auto, 3-11V Adjustable (Default: Auto, LiPo: 3.2V/cell)
- Over Temperature Protection: OFF, 95°C /105°C /130°C (Default: 105°C)
- Cooling: Fan
- Size: 39x38x19mm
- Net Weight: 97g

### PREPARATION

#### 1. Placement of the ESC

Choose a location for the ESC. Please ensure the location to fix the ESC has good airflow ventilation so that the heat can dissipate quickly.

To prevent radio interference, place the controller as far away from the radio receiver as possible and keep the power wires as short as possible.

#### 2. Mount Speed Control

Use double-sided tape to mount the controller in the vehicle (DO NOT use CA glue).

#### 3. Soldering

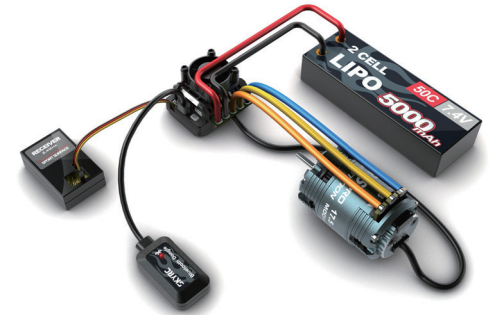
Cut the ESC's BLUE, YELLOW & ORANGE silicone power wires to the desired length and strip about 3.2mm-6.35mm (1/8" -1/4") of insulation from the end of each wire. "Pre-tin" the wire by heating the end and applying solder until it is thoroughly covered.

**CAUTION: Be very careful not to splash yourself with hot solder.**

Place the ESC's BLUE Phase 'A' motor wire onto the motor's 'A' solder tab and solder. Use the soldering iron to apply heat to the exposed wire; begin adding solder to the tip of the soldering iron and wire. Add just enough solder to form a clean and continuous joint from the plated area of the solder tab up onto the wire. Solder the ESC's YELLOW Phase 'B' motor wire to the motor's 'B' solder tab and Solder the ESC's ORANGE Phase 'C' motor wire to the motor's 'C' solder tab.

### CONNECTION

1. Connect the motor sensor harness to ESC. Insert the 6-pin connector on the end of the motor's sensor wires into ESC's sensor harness socket.
2. Connect the Throttle lead to ESC and another end to the Receiver (Throttle Channel, Ch2)
3. Solder the motor and the ESC.
4. Connect ESC to the battery pack.



### CALIBRATION

The full-throttle/ full-brake/ neutral of different transmitters are different. When using the ESC or transmitter for the first time, you must recalibrate your ESC.

#### How to calibrate the ESC?

1. Connect the ESC to the battery and motor. Make sure the ESC is OFF.
2. Turn on the transmitter.
3. Long press the power button of the ESC until the red & blue LEDs light on. The ESC enters the calibration mode after one beep.
4. Hold full throttle until you hear one beep, which indicates the full throttle calibration complete.
5. Move the throttle trigger to full brake and hold full brake until you hear two beeps, which indicates the full brake calibration complete.
6. Release the throttle to leave it at the neutral position until you hear three beeps, which indicates the neutral position calibration complete.
7. After the calibration is complete, the LED will flash blue' or stays on blue<sup>2</sup>.

\* 1. LED flashes blue: Boost & Turbo Timing are OFF, and the LED flashes blue once every 0.5 seconds.

2. LED stays on blue: turn on either Boost or Turbo Timing.

- NOTICE:**
1. Calibration steps: full throttle → full brake → neutral
  2. If the calibration fails, please turn off the ESC and recalibrate it.
  3. Never connect the battery in polarity in reverse while connecting it to the ESC, it will damage the ESC.

### ESC ON/OFF AND LED INDICATOR

#### 1. ESC ON/OFF

- 1) Short-press the ON/OFF button to turn on the ESC.
- 2) Long-press the ON/OFF button to turn off the ESC.

#### 2. LED Indicator

- Full throttle: both the blue & red LEDs stay on
- Full brake: blue LED OFF, red LED stays on

Notice: If the LED keeps flashing blue while the throttle trigger reaches FULL BRAKE, please calibrate the ESC.

#### 3. Explanation of LED Indicator

Troubles	LED Indicator
Abnormal Voltage	RED LED flashes ONCE every one second
Abnormal Temperature	RED LED flashes TWICE every one second
Abnormal Vol. & Temp.	RED LED flashes ONCE and TWICE every one second circularly
Abnormal Throttle	BLUE LED flashes TWICE every two seconds

Notice: the faster the LED flashes, indicates more throttle output.

### ESC PROGRAMMING

Program the ESC through an external Bluetooth module\* connected to the RC Gears app, and the users can read the data through the app in time.

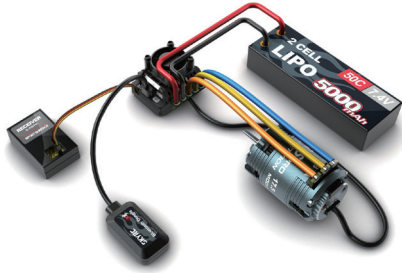
**The Bluetooth module work with the RC Gears app only. DO NOT connect the Bluetooth module through "Phone>Settings>Bluetooth"!**

**Please turn on the Bluetooth of the mobile phone, start the RC Gears app, and search for and connect the Bluetooth module in the app.**

\*Bluetooth module (SK-600135-02) needs to be purchased separately.

## How to Use the App?

1. Connect the ESC, battery, and Bluetooth module according to the diagram.



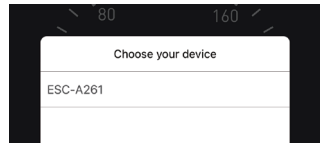
2. Short press the power button to turn on the ESC.
3. Open the RC Gears app.



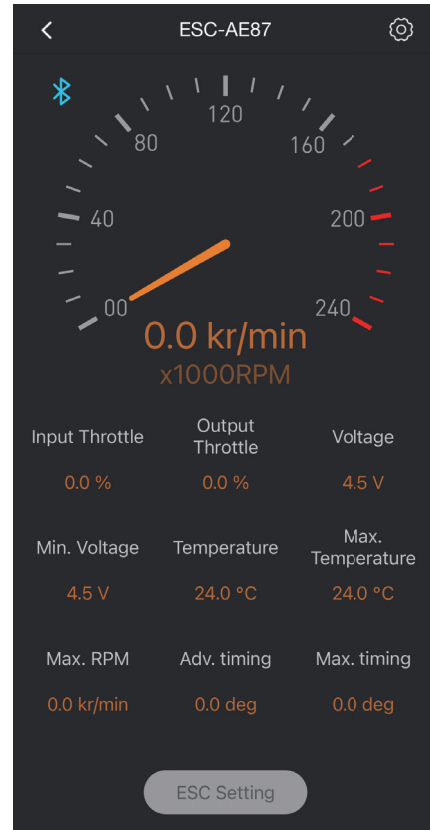
\* Please scan the QR code to download the RC Gears app from App Store or Google Play!

4. Select the searched device\*

\*If there is more than one device, you can rename the ESC in the setting to distinguish them.



## Monitor the Data on App



## Programmable Items and Description

Setting Category	Item	Value
Throttle Setting	Throttle Response	0.1-3.0 (Default: 0.1)
	Coast	0(OFF)-30 (Default: OFF)
	Neutral Range	3-12 (Default: 5)
	Initial Throttle	2-16 (Default: 5)
	Max. Forward Force	25-100 (Default: 100)
	Max. Reverse Force	25-100 (Default: 100)
Brake Setting	Brake Response	0.1-3.0 (Default: 0.1)
	Initial Brake Force	0(OFF)-50 (Default: OFF)
	Max. Brake Force	10-100 (Default: 100)
	Fwd. Drag Brake Force	0(OFF)-100 (Default: OFF)
	Fwd. Drag Brake Response	0.1-3.0 (Default: 0.1)
	Rev. Drag Brake Force	0(OFF)-100 (Default: OFF)
	Rev. Drag Brake Response	0.1-3.0 (Default: 1)
	PWM Freq.	0.1-1.0, 2-8, 12, 16 (Default: 1)

Setting Category	Item	Value
Boost Timing	Boost Timing	0(OFF)-64 (Default: OFF)
	Trigger	Throttle/RPM (Default: throttle)
	Throttle Threshold	10-90 (Default: 50)
	RPM Threshold	8.0-50.0 (Default: 18)
	Initial Angle	1-64 (Default: 1)
	Angle Inc. Rate Angle Dec. Rate	1-64 (Default: 1)
Turbo Timing	Turbo Timing	0(OFF)-64 (Default: OFF)
	Angle Inc. Rate Angle Dec. Rate	1-64 (Default: 2/3)
	Delay	0.00-0.50, 0.5-1.0 (Default: 0)
	Motor Rotation	CW/CCW (Default: CCW)
General Setting	Motor Poles	2-30 (Default: 2)
	Running Mode	Forward/Brake Forward/Brake/Reverse (Default) Forward/Reverse
	Reverse Mode	One shot/Two shots (Default: One Shot)
	Drive PWM Freq.	1-8, 12, 16, 24, 32 (Default: 8)
	Cutoff Voltage	0(OFF), Auto, 3.0-11.0 (Default: AUTO)
	Cutoff Thermal	0(OFF), 95, 105, 130 (Default: 105)
	BEC Output	6.0/7.4V (Default: 6V)

\*If you set the cut-off voltage manually, please note the adjustable voltage is TOTAL cut-off voltage of the battery pack. In AUTO mode, the default cut-off voltage is 3.2V/S. For example, the cut-off voltage of a 3S battery pack is 3.2V\*3=9.6V in AUTO mode.

**Notice:** The motor output will be improved when you adjust the motor timing. Electronic motor timing will increase the temperatures of ESC and brushless motors. Use extreme caution when setting up and testing your application to avoid overloading and overheating. Incorrect Boost and Turbo timing settings may cause permanent damage to the ESC and motors.

## WARRANTY AND SERVICE

### Liability Exclusion

This ESC is designed to be used only with the battery and motor types listed in these operating instructions. We are unable to ensure that you follow the instructions supplied with the ESC, and we have no control over the methods you employ for using, operating, and maintaining the device. For this reason, we are obliged to deny any liability for loss, damage, or costs that are incurred due to the incompetent or incorrect use and operation of our products, or which are connected with such operation in any way. Unless otherwise prescribed by law, our obligation to pay compensation, regardless of the legal argument employed, is limited to the invoice value of those SkyRC products which were immediately and directly involved in the event in which the damage occurred.

### Warranty and Service

We guarantee this product to be free of manufacturing and assembly defects for a period of one year from the time of purchase. The warranty only applies to material or operational defects, which are present at the time of purchase. During that period, we will repair or replace free of service charge for products deemed defective due to those causes.

This warranty is not valid for any damage or subsequent damage arising as a result of misuse, modification, or as a result of failure to observe the procedures outlined in this manual.

### Note:

1. The warranty service is valid in China only.
2. If you need warranty service overseas, please contact your dealer in first instance, who is responsible for processing guarantee claims overseas. Due to high shipping costs, and complicated custom clearance procedures to send back to China, please understand that SkyRC can't provide warranty service to overseas end users directly.
3. If you have any questions which are not mentioned in the manual, please feel free to send an email to info@skycrc.com

Manufactured by SKYRC TECHNOLOGY CO., LTD.

The manual is subject to change without notice; please refer to our website for the latest version!