

Thank you for purchasing the CORE RC Pace 100R ESC. This is our new generation of high performance sensored brushless electronic speed controller (competition version). The high power systems for RC models can be very dangerous, we strongly suggest that you read this manual carefully before using your speed control. CORE RC have no control over the use, installation, application, or maintenance of these products, thus no liability shall be assumed nor accepted for any damages, losses of costs resulting from the use of this item.

Caution

- Do not let children use this product without the supervision of an adult.
- The ESC might get hot during use, be careful when handling it.
- When soldering input/output wires and connections, set the iron to 60W minimum.
- Always disconnect the battery after use, do not store with the battery connected.
- Do not use near flammable materials.
- If the ESC overheats, emits smokes or burns, immediately stop use, disconnect the battery and seek assistance.

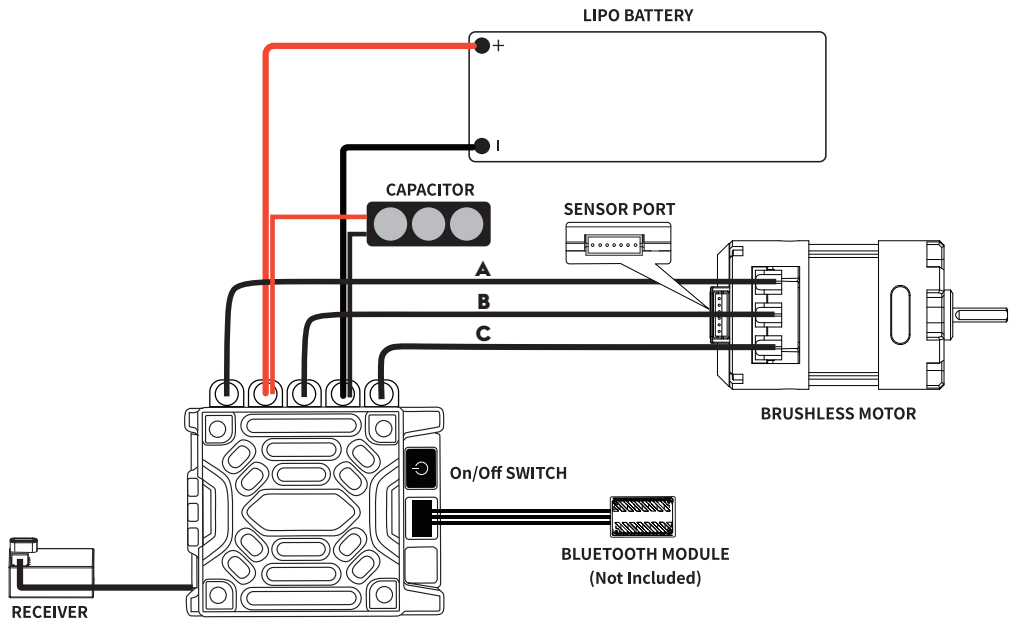
Features

- Full aluminum case and heat sink design, with highly efficient heat dissipation system.
- Plenty of adjustable parameters allows adjusting the settings for most of racing, such as Modified, stock, zero timing, drifting etc.
- 32-bit microprocessor can support more powerful processing capability and more accurate motor output.
- Enhanced throttle response, excellent acceleration, linearity and drive ability.
- Multiple protection features: Low voltage cut-off protection, over-heat protection and throttle signal loss protection.
- Built-in Bluetooth allows programming the parameter settings and firmware upgrades via app (support real time programming,no need restart the esc).
- Data logging for real-time maximum ESC temperature, motor RPM, Voltage and Adv. Timing and so on.

Specification

Product Name	PACE 100R
Sensored/Sensorless	Sensored
Cont. Current	100A
Burst Current	360A
Input Voltage	1S LiPo
BEC Output	6.0V,7.4V/5A
Size(L*W*H)	37.0*38.2*17mm
Weight	83g
ESC Programming Via	Mobile Phone APP
Firmware Upgrade	Supported
Waterproof	No

Connection



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 (+) battery port, and the negative (-) wire is to the (-) battery port.

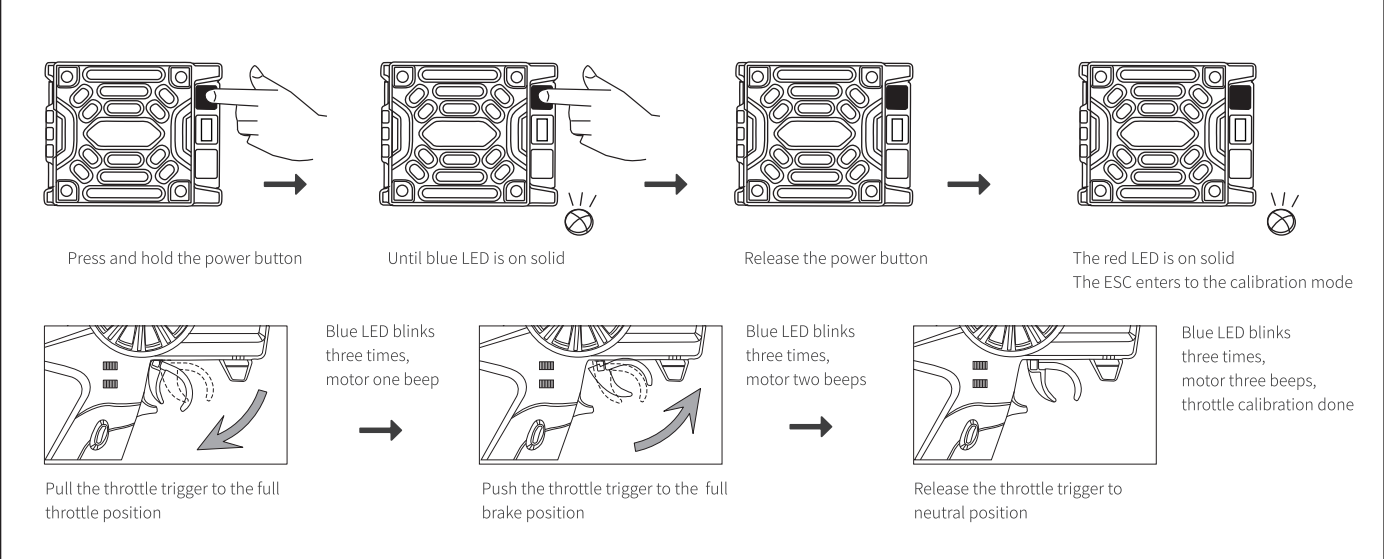
Motor Wire Connection
1. Sensored Mode:
When using a sensored brushless motor, the three A/B/C ESC wires must connect to the three A/B/C motor wires correspondingly. It is necessary to connect the Sensor wire to the "Sensor" socket on the ESC. Don't change the wires sequence optionally.
2. Sensorless Mode:
When using a sensorless brushless motor, the #A, #B, #C 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 6.0V to the receiver, servo, etc. So 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

Software Functions and Settings

Power On/Off ESC
1. Press the power button. The ESC will be powered on.
2. Press and holding the power button until the all LEDs turn off, the ESC will be powered off.
(Note: Please place the throttle trigger on the neutral position: within 10%, otherwise the ESC can not be powered off.)

Throttle Calibration
1. Connect the ESC with the battery and receiver, then turn on the transmitter.
2. Press and holding the power button until the blue LED is on solid, the motor will make a long beep at the same time, then release the power button, the red led will be on solid, the ESC enters the calibration mode.
3. Pull the throttle trigger to the full throttle position, the blue led blinks three times and the motor beeps once, the full throttle position is saved.
4. Push the throttle trigger to the full brake position, the blue led blinks three times and the motor beeps twice, the full brake position is saved.
5. Release the throttle trigger to the neutral position, the blue led blinks three times and the motor beeps three times, the throttle calibration is completed.
6. The ESC can support reverse throttle calibration, if the transmitter throttle is set to reverse throttle: (trigger, pull, will go to 1/3rd of the position, normally 2/3rds. Trigger, push, will go to 2/3rds position, normally 1/3rd. Then set calibration as above, it will not effect the ESC forward and reverse way even if the transmitter throttle set reverse.
Note: No need to restart the ESC again after throttle calibration is finished. Do not move the throttle during the time that the blue led blinks.



LED Status

1. During operation

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

Note: When you pull the throttle from neutral position to full throttle position, the Blue LED will blink, and the blink frequency will speed up as the throttle goes higher.

2. When protection is activated
The RED LED is always on solid once the power button is pressed.
• The RED LED blinks, single flash every second. Repeats like "a a a" indicates that the voltage is abnormal.
• The RED LED blinks, double flash every second. Repeats like "aa aa aa" indicates that the temperature is abnormal.
• The RED LED blinks, single and double flash alternately every second. Repeats like "a aa a aa a aa" indicates that both of the voltage and temperature is abnormal.
• The RED LED will not blink even the voltage or temperature is abnormal if no signal is detected.
• The BLUE LED blinks, double flash every two seconds. Repeat like "aa aa aa" 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 450Hz maximum PPM throttle signal.
2. The ESC throttle protection will be activated under the following situation, and the BLUE LED blinks double flash:
 - The throttle trigger is not on the neutral position when the ESC turns on.
 - Lost the throttle signal.
3. If the ESC loses throttle signal during the operation, the BLUE LED will blink double flash, and will start to work again when the throttle signal is back to normal.

Sensored & Sensorless

1. The sensored mode is activated once the ESC detects the sensor signal at any time.
2. The ESC will work on sensorless mode if the ESC doesn't detect the sensor signal at any time.
3. The ESC will have a slight power drop during the moment of sensored and sensorless mode switching.
4. The PWM driving frequency will be selected automatically by the ESC on sensorless mode, and the manual setting is invalid.
5. It is invalid to set the brake PWM frequency less than 1KHz and forced recognized as 1KHZ, if the ESC is on 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 get hotter. Timing and timing increased rate, will effect the battery/ESC/motor service life.
2. The difference of the Boost and Turbo Timing:
 - The Boost timing will be triggered even though you do not pull the throttle trigger to the full throttle position.
 - The Turbo timing will be triggered only when you pull the throttle trigger to the full throttle position.
3. If set the low voltage or over temperature protection, and the protection is activated, then all the timing will be closed.

Protection

1. High Voltage Protection:
If the ESC detected that the voltage is too high (Higher than the esc standard voltage), when the ESC turns on, and the voltage protection 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 moment of the ESC turns on, and it will not work on the other stages even it detected the high voltage, once the high voltage protection opened, even though the voltage comes down to the normal voltage, the protection will not be relieved.)
2. Low Voltage Protection:
If the ESC detected the voltage is less than the set value at anytime, and this voltage stays constant, 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 back to normal, the protection can not be relieved.)
3. 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 65°C)
4. If the voltage protection and temperature protection set off, and when the voltage and temperature become abnormal, the LED status will indicates the problems correspondingly, but will not limit the throttle output and will not close all ESC timing.
5. If something happens that causes the ESC to drive the motor failure, it will go into a protection; you will hear motor "beep beep beep", and it will stop beeping until throttle is released to neutral position for at least 0.2s.

Bluetooth

1. Reset password: When the ESC turns on, press and hold the power button for around 10 seconds, the ESC will restore the Bluetooth password to default setting 0000.
2. With Bluetooth, connected to the ESC1 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 metal objects or other strong interference signals or obstacles around it will shorten the operational range).
4. The Bluetooth name can not be changed.
5. The Bluetooth connecting will be off during the ESC throttle calibration process.

Programmable Items

1. The user can program parameters at any status when the ESC is on, any new programmed parameters will take effect immediately, no need to restart the ESC. There will be some impacts on the battery/ESC/motor if you program some parameters when the motor in a high-speed rotation. For example, if you change the motor rotation when the motor in a high-speed rotation, the ESC will drive the motor reverse immediately, but the motor can not be reverse immediately because of its inertia, it will cause big current and vibration. Or when the Boost or Turbo timing opened, but you set it off when the motor in a high-speed rotation, it also will cause a big current, so we would like to recommend not programming parameters when the motor in a high-speed rotation.
2. The programming parameters are saved in the ESC embedded flash memory, and the flashed card have a limited programming life (around 10K times), so don't program the ESC very often.

Real-time Data

1. The real-time data can be read only when the ESC have the throttle signal.
2. The real-time data is just a reference data with ±10% accuracy.
3. The description of the real-time data items:

Number	Item	Description
1	Input Throttle	The throttle from the Receiver to the ESC
2	Output Throttle	The throttle from the ESC to the Motor
3	Voltage	The battery voltage is being read by the ESC
4	Min. Voltage	The minimum voltage was read by the ESC
5	Temperature	The ESC temperature
6	Max. Temperature	The maximum temperature was read by the ESC
7	RPM	Revolutions per minutes
8	Max. RPM	The maximum RPM was read by the ESC
9	Adv. Timing	Advance Timing. The ESC total timing (Boost & Turbo)

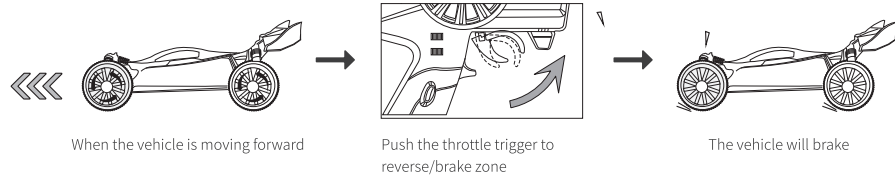
Firmware Upgrade

1. If the ESC firmware upgrade failed during the upgrading process, please restart the ESC again, and upgrade the ESC firmware via the APP again (all the other functions are not available).
2. The Red Led will blink a faint light when the ESC in the firmware upgrade mode, and the Blue Led will blink a faint light when the ESC has data transmission.
3. 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).

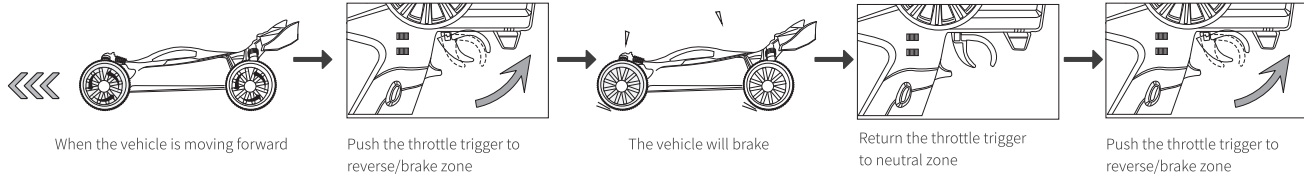
Programmable Items Description

SECTION	PROGRAMMABLE ITEMS	PROGRAMMABLE ITEMS DESCRIPTION
THROTTLE	Throttle Response	The shorter the time, the quicker the acceleration.
	Coast	With this function activated, the car won't slow down immediately but coast for a while when reducing the throttle input.
	Neutral Range	The wider the neutral range, the further the throttle trigger/stick must be moved away from the neutral point. Otherwise, the car won't move.
	Min. Throttle	The larger the value, the more aggressive the start-up when moving the throttle trigger/stick away from the neutral range.
	Minus	The larger the throttle minus value, the lower the car speed.
	Minus Range	It determines the throttle range within which the (Throttle) Minus function works. The larger the value, the wider the effective range.
BRAKE	Max. Forward force	The lower the value, the slower the maximum speed in the Forward direction.
	Max. Reverse force	The lower the value, the slower the maximum speed in the Reverse direction.
	Brake Response	The shorter the time, the quicker the braking.
	Min. Brake Force	After entering the braking mode, the higher the value, the stronger the brake force when moving the throttle trigger/stick away from the neutral range.
	Max. Brake Force	The lower the value, the weaker the maximum brake force.
	Fwd. Drag Brake Force	The brake force when the throttle trigger/stick is at the neutral position. The lower the value, the further the coast.
BOOST	Rev. Drag Brake Force	The shorter the time, the faster the braking in the forward direction.
	Rev. Drag Brake Force	The brake force when the throttle trigger/stick is at the neutral position. The lower the value, the further the coast.
	Rev. Drag Brake Response	The shorter the time, the faster the braking in the Reverse direction.
	PWM Freq.	The PWM frequency for braking.
	Boost Timing	With this function activated, the motor will be able to get a higher RPM.
	Trigger	Is how Boost Timing is triggered, it can be triggered by throttle input or RPM.
TURBO	Throttle Threshold	The throttle threshold at which the Boost Timing will be triggered. The Boost Timing will be activated when the Boost Triggering is set to "By Throttle" and the throttle input exceeds the threshold.
	RPM Threshold	The RPM threshold at which the Boost Timing will be triggered. The Boost Timing will be activated when the Boost Triggering is set to "By RPM" and the motor RPM exceeds the RPM threshold.
	Initial Angle	Is the timing value when the Boost Timing is initially activated. The higher the value, the more aggressive the power, and the more difficult to control it.
	Angle Inc. Rate	The higher the value, the more aggressive the power, and the more difficult to control it.
	Angle Dec. Rate	The higher the value, the quicker the speed decrease. The effect, similar to braking, will be generated when the speed is really high.
	Turbo Timing	Is the timing activated when the throttle input reaches 100%.
GENERAL	Angle Inc. Rate	The higher the value, the more aggressive the power, and the more difficult to control it.
	Angle Dec. Rate	The higher the value, the faster the speed decrease. The effect, similar to braking, will be generated when the speed is really high.
	Turbo Delay	With this function activated, the Turbo Timing won't be activated immediately after the throttle trigger/stick is moved to the 100% position.
	Delay Reload	It determines whether or not to delay and reload when the throttle trigger/stick is moved away and quickly returned to the 100% point with the Turbo Timing is activated. There are two options: Wait (reload after the turbo timing is decreased to 0), Instant (reload immediately when the throttle trigger/stick is moved away from the 100% position).
	Motor Rotation	Is the direction in which motor spins. With the factory default setting, it may run in the opposite direction in some scenarios. This function allows users to switch the rotational direction if necessary.
	Motor Poles	It allows users to manually set the pole count of the motor, so to get the correct RPM threshold at which the Boost Timing will be triggered. And users are able to check the actual motor RPM in the real-time data part of the mobile phone App.
GENERAL	Running Mode	There are three running modes: Forward/Brake, Forward/Brake/Reverse, and Forward/Reverse.
	Drive PWM Freq.	Is the PWM frequency ESC used for driving motor. The lower the PWM driving frequency, the faster the acceleration, and the worse the throttle linearity; the higher the PWM driving frequency, the smoother the throttle linearity, and it will result in fast temperature increase.
	CutOff Voltage	With it set to "Auto", the ESC will automatically identify the number of LiPo cells you've plugged in the moment it's powered on.
	CutOff Thermal	The ESC will automatically cease operation when the internal temperature rises above user-selectable values.
	BEC Output	Select the output of the Battery Eliminator Circuit depending on the operating voltage requirements of the servos.
	A/C Swap	Used for switching the motor wires: A & C. When setting to "No", the output wires at the ESC side will be connected to the motor in the following sequence: A-A, B-B, and C-C; when setting to "Yes", the wiring sequence will be: A-C, B-B, C-A.

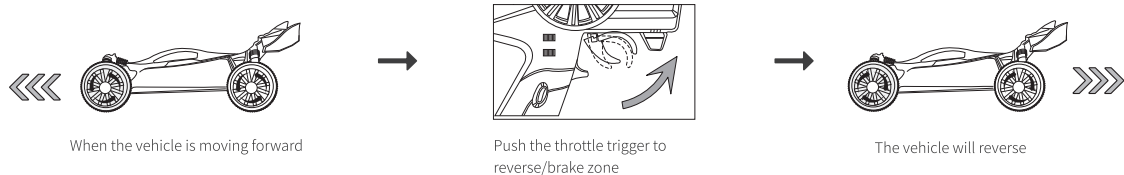
Running Mode: In the Forward/Brake



Running Mode: In the Forward/Brake/Reverse



Running Mode: In the Forward/Reverse



Trouble Shooting

Trouble Shooting	Possible causes	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 if all ESC & battery connectors have been well soldered or firmly connected. 2. Replace the broken switch.
The motor suddenly stopped or significantly reduced the output in operation.	1. The receiver was influenced by some foreign interference. 2. The ESC entered the battery LVC (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 points, please re-solder if necessary. 2. Contact the distributor for repair or other customer services.
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. Replace your transmitter 2. Re-calibrate the throttle range or fine tune the neutral position on the transmitter.