Thank you for purchasing a Radient Electronic Speed Controller (ESC). Please note that this is a potentially powerful R/C hobby tool and is not a toy. It must be operated with care, common sense and with safety in mind. Incorrect operation may result in damage to the product or, worse, personal injury. Before installation and use, please read and follow the operating procedures in this manual. We do not assume any liability arising from the use of this product, including, but not limited to, compensation for incidental or indirect loss. Similarly, we do not assume any liability arising from unauthorised modifications to the product.

Warnings

- Always make safety a priority when you use this product.
- An electric motor that is connected to a battery pack and ESC may start unexpectedly and cause serious injury. Always treat this combination with great respect.
- Always remove the propeller when working on an aerolane that has the battery connected.
- Observe all local laws when operating your R/C product.
- Never fly over others or near crowds.

Key Features

- New ultra-reliable, low heat generation MOSFET with high, instant current capability.
- Faster 32 bit microprocessor.
- Super-smooth start-up and accurate throttle linearity.
- Higher energy-saving qualities and efficiency
- Adjustable SBEC output voltage (5V / 6V) on 40, 50, 60, 80 & 100A ESCs.
- Multiple protections include start-up, over-heat, low-voltage cut-off, signal loss and phase loss.
- Compatible with most motors on the market including high RPM.
- Programming via LCD ‘card’ for easier and more convenient operation. LCD program card sold separately.

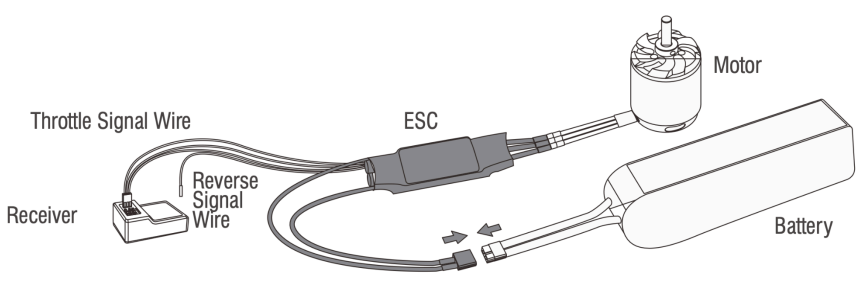
Specification

Amps (A)	Part Number	Continuous / Burst (A)	Battery Cell NiXX / LiPo	Weight (g)	BEC Output	Size(mm) LxWxH	Connector (mm)	User Program
20	RDNE2024	20/30	5-12NC / 2-4 LiPo	25	5.5V / 4A	60x25x10	3.5	Yes
30	RDNE3024	30/40	5-12NC / 2-4 LiPo	25	5.5V / 4A	60x25x10	3.5	Yes
40	RDNE4024	40/55	5-12NC / 2-4 LiPo	37	5.5V-6V / 4A	68x25x10	4	Yes
50	RDNE5024	50/65	5-12NC / 2-4 LiPo	37	5.5V-6V / 4A	68x25x10	4	Yes
60	RDNE6026	60/80	5-18NC / 2-6 LiPo	50	5.5V-6V / 8A	70x34x10	4	Yes
80	RDNE8026	80/100	5-18NC / 2-6 LiPo	75	5.5V-6V / 8A	90x37x10	4	Yes
100	RDNE10026	100/120	5-18NC / 2-6 LiPo	80	5.5V-6V / 8A	90x37x10	4	Yes

Wires & Connections

The speed controller can be connected to the motor by soldering directly or by using high-quality connectors. Always use new connectors which should be soldered carefully to the cables and insulated with heat-shrink tube. The maximum length of the battery pack wires should be no greater than 6 inches.

- Solder or connect the ESC to the motor wires.
- Solder appropriate connectors to the battery wires.
- Insulate all solder connectors with heat-shrink tube.
- Plug the ‘JR’ connector into the receiver throttle channel.
- Before connecting the battery always make sure the wire run black to black and red to red.



Throttle Calibration
With any new installation always calibrate the throttle, making sure that, for safety reasons, the propeller is not attached to the motor.

1. Turn on your transmitter. Check that the EPA on the throttle channel is set to factory default and the throttle is working in the right direction. Set the throttle trim to 0.
2. Move the throttle stick to 100% (full power).
3. Connect the battery to the ESC and wait for the motor to beep twice. Move the throttle stick to 0%.
4. The motor will beep twice indicating that calibration has been performed. Disconnect the battery.

Normal Operation
1. Turn on the transmitter, check the selected model memory and set the throttle to 0%.
2. Connect the battery to the ESC. The motor will bleep confirming connection and the number of cells in the battery.
3. At the end of the confirmation bleeps the motor will bleep twice to confirm that it is armed.

Programming Features (note that the default setting is highlighted in **bold**)
1. SMR (Selective Motor Reverse) – **OFF** / ON
   This function supports switching the motor direction to decelerate the aircraft when it has fully alighted and is rolling along the runway. To activate this function enter the programming mode and select ON, connect the 1 pin reverse signal wire into an AUX channel that is controlled through a two position switch. The SMR function is now activated by the two position switch to change the forward and reverse directions of the motor.

   WARNING: This function only works when the throttle is below 50% and must **ONLY** be used when the aircraft has landed and is on the ground. Please note that misuse of the SMR function (i.e. when airborne) may cause the ESC to burn out.

2. Brake Type **– OFF** / Soft / Mid / Hard.
3. Timing – **Auto** / Low / Mid / High (5°/15°/25°).
4. Motor Rotation – **CW** / CCW.
5. SR (Synchronous Rectification) – ON / **OFF.**
   The Synchronous Rectification function improves the efficiency of the ESC.
6. Battery cells – **Auto** / 2S / 3S / 4S / 5S / 6S.
7. Low Voltage Cut-off (LVC) Threshold – OFF / NIMH50% / NIMH60% / **3.0V** / 3.2V / 3.4V / 3.6V.
   Example: With 3 lithium batteries and an LVC of 3.0V, the low voltage protection threshold will be 9.0V (3x3.0V).
8. Low Voltage Cut-off Type – **Reduce Power** / Cut-Off Power.
   Reduced power: When the voltage drops to the set low-voltage protection threshold the ESC will reduce power to 70%. Cut-off power: When the voltage drops to the set low-voltage protection threshold the ESC will cut off the power immediately.
9. SBEC Adjust – **5V**/6V This is a function of the 40A / 50A / 60A / 80A and 100A ESCs only.
10. Acceleration – **Normal** /Soft.

Entering Program Mode
1. Turn on the transmitter and move the throttle stick to 100%.
2. Connect the battery to the ESC.
3. Wait for 2 seconds; the motor will emit a ‘beep beep beep’ tone.
4. Wait another 3 seconds; the motor will emit three further beep tones that increase in pitch (1-2-3) which indicates that Program Mode has been entered.

Identification of Programming Features
After entering Program Mode – referring to the Tone Reference Table below – you will hear 11 tones in a loop with the following sequence.

Tone Reference Table

Tones	Program	Time
beep	SMR	1 short beep
beep beep	Brake Type	2 short beeps
beep beep beep	Motor Timing	3 short beeps
beep beep beep beep	Motor Rotation	4 short beeps
beeeep	Synchronous Rectification (SR)	1 long beep
beeeep beep	Battery Cells	1 long, 1 short beep
beeeep beep beep	Low Voltage Cut-off Threshold	1 long, 2 short beeps
beeeep beep beep beep	Low Voltage Cut-off Type	1 long, 3 short beeps
beeeep beep beep beep beep	BEC Voltage	1 long, 4 short beeps
beeeep beeeep	Acceleration	2 long beeps
beeeep beeeep beep	Restore Factory Setup Defaults	2 long, 1 short beep
NOTE: 1 long beep = 5 short beep		

Setting an Item Value

1. Within 2 seconds of hearing the tone for the program you require, move the throttle stick to the 0% position to select that program.
2. Once the program has been selected, you will hear the ‘parameter tones’ as stated in the Program Reference Table (below).
3. To set the desired parameter within the program, advance the throttle to 100% after hearing the tone that represents your requirement.
4. The motor will emit three further beep tones that increase in pitch (1-2-3). This indicates that your value has been set.

Example: Reversing the Motor Rotation to CCW

1. When you hear four short beeps, move the throttle stick to the 0% position within 2 seconds. You are now in the Motor Rotation program.
2. When you hear two short beeps, move the throttle to 100% position. You will hear the confirmation tone 1-2-3. CCW is now saved.

Leaving the throttle at 100% after your selection will leave you in the parameter setting field ready to make more changes. If you want to exit parameter setting you must shut the throttle to 0% within 2 seconds of your selected parameter change, whereupon you will be returned to the program selection list to make further changes. If you don't shut the throttle to 0% you will be returned to Program Mode where you can simply unplug the battery.

Program Reference Table

Parameter Tones	beep	beep beep	beep beep beep	beep beep beep beep	beeeep	beeeep beep	beeeep beep beep
Program	1 short beep	2 short beeps	3 short beeps	4 short beeps	1 long beep	1 long beep 1 short beep	1 long beep 2 short beeps
SMR	**OFF**	ON					
Brake Type	**OFF**	SOFT BRAKE	MID BRAKE	HARD BRAKE			
Motor Timing	**AUTO**	LOW	MID	HIGH			
Motor Rotation	**CW**	CCW					
SR	ON	**OFF**					
Battery Cells	**AUTO**	2S	3S	4S	5S	6S	
Low Voltage Cut-off	OFF	NIMH50%	NIMH60%	**3.0V**	3.2V	3.4V	3.6V

Low Voltage Cut-off Type	**REDUCED POWER**	CUT OFF POWER					
BEC Voltage	**5V**	6V					
Acceleration	**NORMAL**	SOFT					
Factory Default	RESTORE						

Protection Function

1. **Start-up protection** – If the motor fails to start normally within 2 seconds of increasing the throttle, the ESC will cut off the output power and you will need to perform a throttle calibration (see above) again. Reasons for this could be due to disconnection or poor connection between the ESC and motor. Alternatively the propeller or motor could be blocked by foreign objects etc.
2. **Over-heat protection** – When the temperature of the ESC is over 1100C it will automatically reduce the output power. This will reduce the motor power output to 70%, whereupon an emergency landing must be made.
3. **Throttle signal loss protection** – The ESC will reduce the output power if the throttle signal is lost for 1 second. If the throttle signal is lost over 2 seconds the motor power will be shut down. If the throttle signal recovers during power, the ESC will immediately resume throttle control.
4. **Overload protection** – The ESC will cut off power automatically when it exceeds the load capability. If the overload is removed the motor will restart automatically once the throttle is brought back to 0% and then advanced again.

Fault	**Possible Cause**	**Action**
When connecting the battery to the ESC the motor emits the sound of the battery cell count but the motor can't arm.	1. ESC calibration has not been performed.	1. Perform calibration.
After powering up, the motor does not run and does not emit any sound.	1. Bad connection between ESC and battery. 2. Low voltage of the battery.	1. Clean or replace the connectors. 2. Solder the connections again.
The motor does not work and does not emit a sound after connecting the battery, and the servos do not work.	1. Poor connection between battery and ESC. 2. No power. 3. Poor soldering on connectors. 4. Wrong battery polarity. 5. ESC signal cable is connected incorrectly.	1. Check all connections and check solder joints.
The motor does not work but the servos do.	1. Poor connection between battery and ESC. 2. The motor is damaged. 3. Battery pack voltage exceeds the correct range. 4. Throttle stick is not at 0% position. 5. ESC throttle calibration has not been performed.	1. Perform calibration. 2. Replace the motor. 3. Check connections and solder joints. 4. Check that the battery is fully charged.
When the ESC is powered on the motor does not arm and just emits a continuous beep.	1. The throttle stick is not in the bottom 0% position.	1. Move the throttle stick to 0%. 2. Move the throttle trim to 0% 3. Perform calibration.
Motor runs in reverse rotation.	1. The cables between the ESC and motor are incorrectly connected.	1. Swap any two wires around between the ESC and motor. 2. Correct the motor direction in the program facility.

CE / UKCA CONFORMITY

J Perkins (Distribution) confirms this product is in compliance with the relevant harmonised European directives relating to its safe operation.

WEEE

This appliance is labelled in accordance with European Directive 2012/19/EU & UKCA Directive concerning Waste Electrical and Electronic Equipment (WEEE). The WEEE Directive came into force to reduce the disposal of domestic waste and promote recycling. Any electrical item that carries the crossed out wheelie bin logo must not be disposed of in domestic waste but should be taken to a designated collection facility. J Perkins (Distribution) are a member of an approved compliance scheme to encourage consumers to recycle unwanted items. Your local authority will be able to provide details of your nearest approved waste disposal site.

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