

# OPALE BRUSHLESS ELECTRONIC SPEED CONTROLLER



**Safety precautions :**  
**Read carefully the instructions enclosed with the product before use**

Thank you for purchasing Opale Brushless Electronic Speed Controller (ESC). High power systems for RC models can be very dangerous and we strongly suggest that you read this manual carefully.

This user's guide content includes all the informations you need to get your brushless controller ready. A good knowledge of your equipment will allow you to safely obtain most of its performances for your greatest pleasure! Thanks for giving this manual to the new owner in case you decide to sell your Opale brushless controller.

Best regards,  
The Opale-Paramodels Team

## Safety Information

You should be properly insured according to the country regulation you are using our equipment in. You hereby accept the inherent risk of flying radio-controlled models.

Using our equipment in a bad way may increase risks. Neither Opale-Paramodels nor any other seller will be liable for any damage caused by any accident whatever the circumstances are. The way our equipment is used is incumbent upon the final user, including towards the law.

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## Warranty

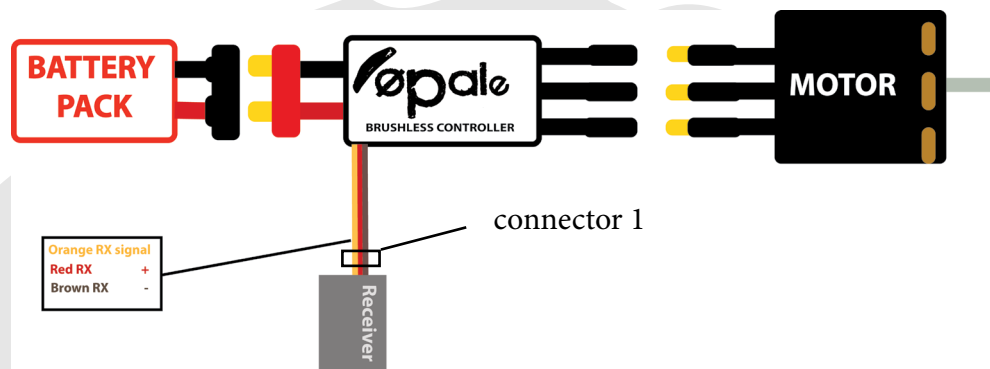
Our products are guaranteed against any manufacturing defects. This warranty does not apply to improperly installed, handled, abused, damaged in crash, nor to any unit which has been repaired or altered by unauthorized agencies. Under no circumstances will the buyer be entitled to consequential or incidental damages.

This warranty applies only to Opale products purchased from authorized dealers/distributors.

## Wires connection

The Electronic Speed Controller (ESC) can be connected to the motor by soldering directly or with 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 shall be within 6 inches.

### Brushless speed controller:



- ◆ Connect ESC to the motor wires.
- ◆ Solder appropriate connectors to the battery wires.
- ◆ Insulate all soldering connectors with heat shrink tubes.
- ◆ Plug the connector 1 into the receiver throttle channel.
- ◆ Controller Red and Black wires connects to battery pack Red and Black wires respectively.

## Features

- ◆ Excellent startup performance, great throttle linear and quick throttle response, excellent low-speed performance.
- ◆ Separate voltage regulator IC for MCU (Micro Controller Unit), high capability of anti-interference.
- ◆ Low-voltage protection, block-rotation protection and signal lose protection. All these functions can effectively prolong ESC service life.
- ◆ Programming by Trx is simple and allows to conveniently change parameters at any time anywhere.
- ◆ Safe start-up. The motor won't be started no matter which position the throttle stick is on when battery connected.
- ◆ Motor rotating direction can be changed by exchanging two of three wires from ESC.

## Normal Startup Procedure

- ◆ Plug the connector 1 into the throttle control channel of the receiver.
- ◆ Switch on the transmitter and move the throttle stick to the lowest position.
- ◆ Connect the main power pack to ESC (pay attention to the polarity).
- ◆ The motor emits “♪” or “♪♪” to confirm the correct connection. (A single “♪” means the brake Medium; “♪♪” means brake off.) The ESC is ready for flight.
- ◆ If you didn't hear the above “♪” or “♪♪”, please disconnect the ESC to battery pack and check whether the connector 1 is well connected to the throttle control channel, or whether the throttle stick is at the lowest position or you choose the right direction of “NOR/REV” of throttle channel in transmitter.

## Programming ESC by transmitter

### ◆ Programmable parameters by Transmitter: Brake Mode / Battery Type / Timing Mode

*Note1: By transmitter, one parameter can be set at a time. To set several parameters, please repeat the following procedures.*

#### ◆ Program Brake Mode (Factory Default: Medium)

1. Plug the connector 1 to throttle control channel of receiver;
2. Switch “on” the transmitter and move the stick to “full throttle” (highest position);
3. Connect the main power pack to the ESC (pay attention to the polarity);
4. Wait 5 seconds;
5. After 5 seconds, you will hear 4 continuous “♪”;
6. Swiftly move the throttle stick to position “close” (lowest position);
7. After moving, if you hear 1 “♪” that means the brake is Medium; if you hear “♪♪” that means the brake is off.

*Note: If you want to change the brake mode again, disconnect the motor battery pack and then repeat the procedure.*

## ◆ Program Battery Type (Factory Default: Li-Ion/Li-Po)

1. Switch "on" the transmitter and move the stick to "full throttle" (highest position);
2. Connect the main power pack to the ESC (pay attention to the polarity);
3. After 5 seconds, you will hear 4 continuous "♪" (Here don't move the stick);
4. After further 5 seconds, you will hear:
  - 4-1) 5 continuous "♪", which means Li-XX battery; if you require this function, move throttle stick to the lowest position;
  - 4-2) then 5 continuous "♪♪", which means NiCd/NiMH battery; if you require it, move throttle stick to the lowest position;
  - 4-3) then 5 continuous "♪♪♪", which means LiFe battery; if you require it, move throttle stick to the lowest position.
5. After moving throttle stick, you will hear one "♪" or "♪♪", which means the setting saved.

**Note:** If you want to change the battery type again, disconnect the motor battery pack and repeat the procedure.

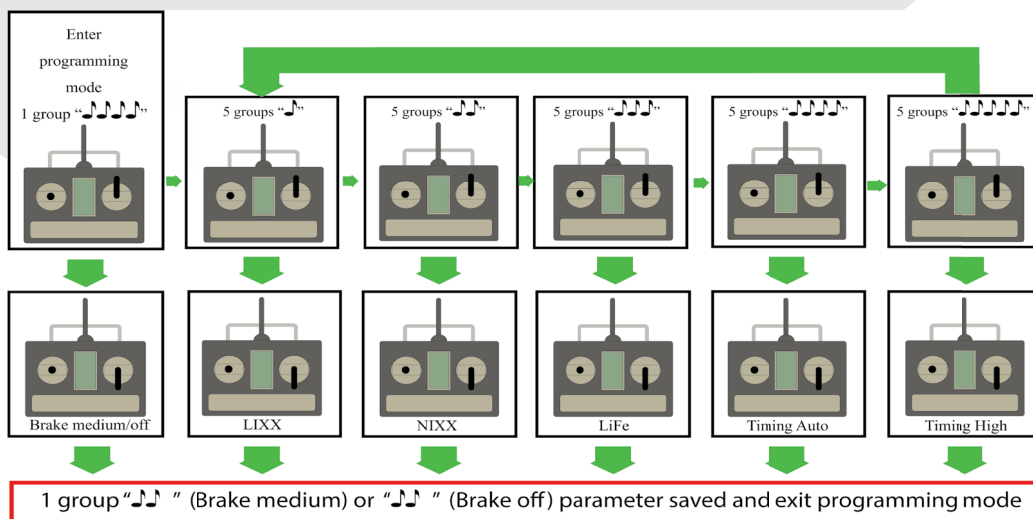
## ◆ Program Timing Mode (Factory Default: Automatic)

1. Switch "on" the transmitter and move the stick to "full throttle" (highest position);
2. Connect the main power pack to the ESC (pay attention to the polarity);
3. After 5 seconds, you will hear 4 continuous "♪" (Here don't move the stick);
4. After another 5 seconds, you will hear: 5 continuous "♪", (Li-XX battery), then 5 continuous "♪♪", (NiCd, NiMH battery), 5 continuous "♪♪♪" (LiFe battery). (Here don't move the stick);
5. After further 5 seconds, you will hear:
  - 5-1) 5 continuous "♪♪♪♪", which means the Timing Mode Automatic; if you require this function, move throttle stick to the lowest position;
  - 5-2) then 5 continuous "♪♪♪♪♪", which means the Timing Mode High; if you require this function, move throttle stick to the lowest position;
6. After 1-2 seconds, you will hear one "♪" or "♪♪", which means the setting has been saved.

**Note:** If you want to change the timing mode again, disconnect the motor battery pack and repeat the procedure.

**ATTENTION:** When the timing mode is saved, please adjust the motor on the ground before flight.

## Program parameters by transmitter diagram



## Programmable parameters

### 1. Brake Mode:

- **Off:** Brake is off;
- **Medium:** less forceful and brake time is longer;
- **Hard:** more forceful and brake time is shorter .

### 2. Timing Mode:

- **Automatic:** for all motor types;
- **High:** hard (recommended for more than 10 poles motors and outrunners motors);
- **Low:** soft (recommended for motors of 2-8 poles motors and inrunner motors).

*Note: For some high KV motors, if it shakes while rotating in high speed, the "High" timing mode is recommended.*

*Note: When the timing mode is saved, please adjust the motor on the ground before the flight.*

### 3. Acceleration:

- **High:** fast acceleration or deceleration of motor;
- **Medium:** acceleration or deceleration at middle speed;
- **Low:** slow acceleration or deceleration.

### 4. Cut-off Voltage:

Cut-off voltage mode	Li-ion & Li-po	Ni-Cd & Ni-Mh	Li-Fe
High	3,2V	0,9V	2,8V
Medium	3,0V	0,8V	2,5V
Low	2,8V	0,6V	2,2V

### 5. Cut-off Mode:

- **Hard:** the motor immediately stops as voltage drops to the cut-off voltage;
- **Slow down:** motor slowly reduces power when voltage drops.

### 6. Motor rotation Direction:

In most cases motor rotation is usually reversed by swapping two motor wires.

