



Thank you for purchasing a Cobra Electronic Speed Controller (ESC). The Cobra ESC's are designed to work well with many different types of brushless motors. Please read this manual carefully and follow all of the instructions to ensure safe operation. On the back of this manual is a copy of our 6-month warranty policy. There is also a place to write down the the purchase information for your ESC. If you have any questions, you can consult your local dealer or contact us directly by email at Service@CobraSystem.net.

INTRODUCTION

Cobra Electronic Speed Controllers (ESC) are designed with a relentless pursuit of exceptional product quality. Cobra takes great efforts to develop ESC's, and has complete intellectual property rights over them. This ensures full control over the products, and allows us to make improvements as needed. In order to increase the reliability of the ESC's, Cobra uses only the best components, such as expensive "Chemi-con" brand electrolytic capacitors and extremely low resistance PC Boards. To increase the overall stability of Cobra ESC's, a separate voltage regulator IC is used for the microprocessor. Cobra ESC's are built with attention to detail in every step of the manufacturing process to provide the best customer experience possible.

FEATURES

1. Easy set-up and operation: In most cases, the ESC's can be used right out of the package.
2. By using a single movement of your RC throttle stick, some basic functions can be programmed. By using the optional Programming Card (available separately), all of the ESC functions can be programmed quickly.
3. The throttle range is automatically detected and set to provide smooth, linear throttle response.
4. Safe Start-up System: When the battery is connected, in order to avoid personal injury, the motor will not start no matter which position the throttle stick is in. The throttle must be at idle for the ESC to initialize.
5. Locked-Rotor Protection: If the motor is blocked so it cannot rotate, the power to the motor will be cut off automatically in order to avoid damage to the ESC.
6. Cobra ESC's are provided with an internal BEC circuit that supplies power to the receiver and servos. The 11A and 22A models have a 2 amp 5.0 volt Linear BEC. The 33A model has a 3 amp 5.5 volt Switching BEC. The 40A through 150A models have a 6 amp 5.5 volt Switching BEC.
7. Pulse Width Modulation (PWM): The PWM Frequency of the Cobra ESC's is fixed at 8KHz.
8. Over-Temp Protection: The power to the motor will be cut off if the ESC temperature exceeds 110°C. (230° F)
9. Over/Under-Voltage Protection: The motor will not start if the input voltage is too high or too low.
10. Automatic Power Cut-off: The power to the motor will be cut off automatically if the radio signal between the transmitter and receiver is lost for more than 3 seconds.

OUT OF BOX

The package includes an ESC and its manual. Please check to see if there is a manual in the package, and whether there is any physical damage to the ESC. If you find any of the above problems, please repack the ESC and contact your local dealer. You may also download the manual at CobraSystem.net.

HOW TO CONNECT ESC

Connect the Motor, ESC, Battery, and Receiver together as shown below. If the motor runs backwards, swap the positions of any two of the three motor leads (red, yellow and black) and the motor will reverse its rotation.



OPERATIONS BY USING RC THROTTLE STICK

By using a single movement of RC throttle stick, three of the ESC parameters can be programmed, Brake Level

Battery Type and Timing Mode. All other parameters can only be used under the Factory Default Settings. (Acceleration Mode: **Mid**; Cut-off Mode: **Slow Down**; Cut-off Voltage: **3V per cell**). If you want to program more parameters, please use the optional Cobra Prog-Card, which is available separately. **Note:** Programming by using RC throttle stick can set only one parameter each time. Before setting the second parameter, the connections of battery and ESC must be disconnected and reconnected to re-boot the ESC.

Setting 1: Brake Mode (Factory Default Setting: Brake On-Mid Braking)

- Switch the transmitter on and move the stick to "full throttle" (highest position).
- Connect the battery pack to the ESC. For ESC without BEC, switch on the power to receiver. Wait 3 seconds.
- After 3 seconds, you will hear 4 continuous "beeps" (the sound is noncyclic)
- Swiftly move the throttle stick to the "motor off" setting (lowest position).
- After moving, if you hear a single "beep" the brake is on; if you hear a double "beep beep" the brake is off.

Setting 2: Battery Type (Factory default setting: Lion/LiPo)

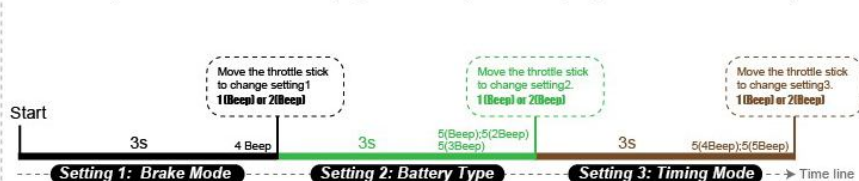
- Switch the transmitter on and move the stick to "full throttle" (highest position).
- Connect the main power pack to the ESC. For ESC without BEC, switch on the power to receiver. Wait 3 seconds, you will hear 4 continuous "beeps". (Do not move the stick yet.)
- Wait further 3 seconds, you will hear:
 - (1) 5 continuous "Beep", which means Li-Po or Li-Ion battery;
 - (2) then 5 continuous "Beep Beep", which means Ni-MH/Ni-Cad battery;
 - (3) then 5 continuous "Beep Beep Beep", which means LiFePO4 battery (A123 cells);
- If you want to set Li-Po/Li-Ion Battery, when you hear (1), or if you want to set Ni-MH/Ni-Cad Battery, when you hear (2), or if you want to set LiFePO4 Battery, when you hear (3), swiftly move the throttle stick to the "Motor Off" (lowest position).
- After moving, you will hear "Beep" or "Beep Beep", which means the setting has been saved.

Setting 3: Timing Mode (Factory Default Setting: Auto)

- Setting Timing mode, according to motor type.
- Switch the transmitter on and move the stick to "full throttle" (highest position). Connect the main power pack to the ESC. For ESC without BEC, switch on the power to receiver.
- Wait 3 seconds, you will hear 4 continuous "beeps". (Do not move the throttle stick yet.) Wait further 3 seconds, you will hear 5 continuous "Beep", 5 continuous "Beep Beep", then 5 continuous "Beep Beep Beep" (Do not move the throttle stick yet.)
- Wait further 3 seconds, you will hear:
 - (1) 5 continuous "Beep Beep Beep Beep", which means Timing AUTO
 - (2) then 5 continuous "Beep Beep Beep Beep Beep", which means Timing High
- If you want to set Timing Auto, when you hear (1), or if you want to set Timing High, when you hear (2), swiftly move the throttle stick to the "Motor Off" position (lowest position).
- After moving, you will hear "Beep" or "Beep Beep", which means the setting has been saved.

PROGRAMMING TIME LINE

The above procedures are the operations available by using RC throttle stick. You will find that Setting 2 repeats the procedure of Setting 1, and Setting 3 repeats the procedure of Setting 1 & Setting 2. The ESC's built-in software adopts a method of "Time line" to judge which setting the user is going to do. Please see below picture.





PROGRAMMING CARD

FUNCTION

(Some functions can be programmed by using the RC throttle stick. Please refer to the instructions on page 2.)

1. Battery Type: Ni-MH-Ni-Cad / **Lion-Lipo (Factory default setting)** / LiFePO4 (A123 cells)

2. Cut-off voltage: High/Medium (Factory default setting) /Low

Cut-off voltage	Lion/Lipo	NiMH/NiCD	LiFe
High	3.2V	0.9V	2.8V
Medium	3.0V	0.8V	2.5V
Low	2.8V	0.6V	2.2V

3. Cut-off mode: Hard/Slow down (Factory default setting)

Motor Revolving Direction:Change

4. Brake Level: Off /Medium(Factory default setting) / Hard

5. Timing Mode: **Auto (Factory default setting)**

High: For 10 and more pole outrunner motors, this setting gives highest the RPM and current.

Low : For 2, 4, 6 or 8 pole outrunner and inrunner motors, this setting gives maximum efficiency.

6. Motor Acceleration: High/Medium(Factory Default setting)/Low



OPERATIONS

By using the Cobra Prog-Card, the above 6 functions can be programmed quickly and easily.

Note: When setting an ESC with the Prog-Card, you do not need to use the radio receiver or transmitter. Please refer to the diagram shown below for proper connection of the Prog-Card to the Cobra ESC.



PROGRAMMING INSTRUCTIONS

- Set all 6 jumpers to the required positions from the chart above.
- For ESC with BEC: Plug JR connector (part of ESC) to the Prog-Card position on the top right corner. **(Note:** Make sure that the polarity of the connector is correct, and the wire colors match.) For ESC without BEC (OPTO): Connect a 4-cell Ni-Cad or Ni-MH receiver power pack to the Prog-Card position "External power for opto ESC" on the top left corner. **Note:** For ESC without BEC(OPTO), ESC cannot supply 5V power to Receiver and servos, so an additional 4-cell Ni-Cad or Ni-MH receiver power pack is needed.
- Connect a motor to the ESC. The motor is what emits the beep sounds heard during programming.
- Connect the main power pack to the ESC. After the battery is connected, one "beep" will be heard. This indicate thats the settings of the Prog-Card have been transferred to the ESC.
- Disconnect the main power pack and then disconnect the Prog-Card. Now the settings are completed.

COBRA ESC ADVANCE PLUS SERIES SPECIFICATION (programmed by Prog-card)

No.	Model	Continous Current	Burst Current	Prog-Device	BEC		Lipo Cells	Size (mm)
					Type	V/A		
1	DL11A	11 A	14 A	Prog-Card	Linear	5V/2A	2-3	22×18
2	DL22A	22 A	28 A	Prog-Card	Linear	5V/2A	2-3	33×24
3	DL33A+	33 A	41 A	Prog-Card	Switching	5.5V/3A	2-4	42×23
4	DL40A+	40 A	50 A	Prog-Card	Switching	5.5V/6A	2-6	50×30
5	DL60A+	60 A	75 A	Prog-Card	Switching	5.5V/6A	2-6	50×30
6	DL80A+	80 A	100 A	Prog-Card	Switching	5.5V/6A	2-6	50×30
7	DL100A+	100 A	125 A	Prog-Card	Switching	5.5V/6A	2-6	50×30
8	DL150A+	150 A	188 A	Prog-Card	Switching	5.5V/6A	2-6	50×30

COBRA ESC 6-MONTH WARRANTY POLICY

As the manufacturer of Cobra ESC's, Danlions Inc. promises a minimum of 6-month-lifecycle of each Cobra ESC starting from the original purchase date.

1. 6-month Warranty Policy

For 6 months from the date of purchase, any ESC failures caused by improper design or assembly are covered by the warranty. Any improper use of the product will invalidate the warranty. The following are improper uses:

- Modifications to the ESC without permission from Cobra Systems or use of non-Cobra ESC repair parts.
- Any damages caused as a result of misuse by the owner, or not operating the ESC in accordance with the detailed instructions included in this User's Manual.
- Any damages caused by model aircraft crashes.
- Use of the ESC in applications other than R/C aeromodeling.

2. Benefits Protection for Users

If the ESC fails to operate within the warranty period, the user can get a free replacement ESC.

3. What to do if damage occurs

If ESC damage does occur, we provide two methods to process the warranty:

- You can ask your local dealer to exchange the damaged ESC for another ESC.
- If your local dealer cannot provide a replacement, you can contact us directly at Service@CobraSystem.net Whichever method you choose, the following materials are required:

- Proof-of-purchase, such as invoice, with the purchase date.
- A detailed description of the damage.
- Photos of the damage.

If the local dealer or our engineer thinks the photo is not clear enough, the user may need to send the ESC back.

Manufacturer of COBRA ESC-Danlions Electric Industrial Co., Ltd.



PRODUCTION INFORMATION

Model No	Purchase Date	Quantity	Dealer Information			
			Name	Web	TEL	Mail

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