# Arrowind ESC - User Instructions

**www.ArrowindHobby.com**

## 1. Main Features

1.1 Equipped with high-speed, small-sized, multifunctional MCU.

1.2 Low-voltage protection, over-heat protection, signal loss protection, safe power on protection, and self-check functions.

1.3 Excellent startup performance, great throttle linear and quick throttle response.

1.4 Excellent low-speed performance.

1.5 Max speed: 240,000 rpm for 2-pole, 80,000 rpm for 6-pole, 40,000 rpm for 12-pole.

1.6 Separate power supply for MCU and BEC, enhancing the ESC's ability of eliminating magnetic interference.

1.7 All parameters of the ESC can be configured to be compatible via program card.

1.8 Throttle range can be configured to be compatible with different receivers.

1.9 Three Throttle curves make helicopter control more flexible.

1.10 Motor reverse rotation available via transmitter programmed only.

## 2. Product specification

| Item<br>Normal Series | Continuous<br>Current | Burst (10S)<br>Current | Li-xx Battery<br>(cell) | Dimension(mm)<br>L x W x H | Weight(g) | BEC<br>(Linear) | Program-able |
|---|---|---|---|---|---|---|---|
| Arrowind 7A | 7A | 9A | 1-2 | 20x12x5 | 4 | 1A | Yes |
| Arrowind 12A | 12A | 15A | 1-3 | 22x17x7 | 7 | 1A | Yes |
| Arrowind 18A | 18A | 23A | 2-3 | 46x28x9 | 22 | 2A | Yes |
| Arrowind 25A | 25A | 30A | 2-4 | 46x28x9 | 25 | 2A | Yes |
| Arrowind 30A | 30A | 40A | 2-4 | 50x28x12 | 34 | 2A | Yes |
| Arrowind 35A | 35A | 45A | 2-4 | 58x27x10 | 35 | 3A | Yes |
| Arrowind 40A | 40A | 50A | 2-5 | 58x27x10 | 35 | 3A | Yes |
| Arrowind 50A | 50A | 65A | 2-5 | 58x27x10 | 36 | 3A | Yes |
| Arrowind 60A | 60A | 80A | 2-6 | 58x27x15 | 50 | 3A | Yes |
| Arrowind 80A | 80A | 100A | 2-6 | 58x27x15 | 60 | 3A | Yes |
| Arrowind 100A | 100A | 120A | 2-6 | 70x55x20 | 160 | OPTO | Yes |
| Arrowind 120A | 120A | 140A | 2-6 | 70x55x20 | 169 | OPTO | Yes |
| Arrowind 150A | 150A | 170A | 2-6 | 70x55x20 | 171 | OPTO | Yes |

| Item<br>Switching Mode<br>Series | Continuous<br>Current | Burst (10S)<br>Current | Li-xx Battery<br>(cell) | Dimension(mm)<br>L x W x H | Weight(g) | BEC<br>(Switching<br>Mode) | Program-able |
|---|---|---|---|---|---|---|---|
| Arrowind 35A | 35A | 45A | 2-4 | 58x27x10 | 36 | 3A | Yes |
| Arrowind 40A | 40A | 50A | 2-5 | 58x27x10 | 36 | 3A | Yes |
| Arrowind 50A | 50A | 65A | 2-5 | 58x27x10 | 37 | 3A | Yes |
| Arrowind 60A | 60A | 80A | 2-6 | 58x27x15 | 51 | 3A | Yes |
| Arrowind 80A | 80A | 100A | 2-6 | 58x27x15 | 61 | 3A | Yes |

| Item<br>HV Series | Continuous<br>Current | Burst (10S)<br>Current | Li-xx Battery<br>(cell) | Dimension(mm)<br>L x W x H | Weight(g) | BEC<br>(OPTO) | Program-able |
|---|---|---|---|---|---|---|---|
| Arrowind 80A | 80A | 100A | 2-12 | 70x55x20 | 160 | OPTO | Yes |
| Arrowind 100A | 100A | 120A | 2-12 | 70x55x20 | 162 | OPTO | Yes |
| Arrowind 120A | 120A | 140A | 2-12 | 70x55x20 | 174 | OPTO | Yes |

## 3. Instructions

### 3.1 Normal Startup procedures

Step1: Push the throttle stick to the bottom position (full Off throttle).

Step2: Switch the transmitter on.

Step3: Switch the ESC on (normally by connecting batteries.)

Step4: System detects the Min. throttle signal, and makes a long “beep” sound.

Step5: System detects battery voltage and makes several short “beep” sounds, which denotes the number of battery cells.

Step6: System conducts self-check. If it is normal, you will hear a long “beep” sound.

Step7: Pull the throttle stick to the Startup position. (LED on the ESC flashes along with the “beep” sound.)

**3.2 Throttle range setting procedures**

Step1: Pull the throttle stick to the top position (full on throttle).

Step2: Switch the transmitter on.

Step3: Switch the ESC on (normally by connecting batteries)

Step4: System detects the Max. throttle signal, and makes a two “beep” sounds, which denotes that Max. throttle has been confirmed and saved.

Step5: Then quickly push the throttle stick to the bottom position (full off throttle), otherwise the system will enter program mode.

Step6: System detects the Min. throttle signal and makes a long “beep” sound.

Step7: System detects battery voltage and makes several short “beep” sounds, which denotes the number of battery cells.

Step8: System self-check occurs. If it is normal, you will hear a long “beep” sound,

Step9: Pull the throttle stick to Startup position.

If the system doesn’t detect the throttle signal, it will constantly make “beep” sounds without stopping**.**

Any fault in self-check, it will make 20 short “beep” sounds.

**3.3 Protection settings**

**Low-voltage protection:** Whether the ESC shut down immediately, or lower when then the input voltage drops below the programmed low-voltage protection voltage depends on the values set as **Cutoff Type.**

**Loss of signal protection:** Power will automatically lower to less than 20% when signal is lost for over 3 seconds, and resume when detecting he signal.

**Over-heat protection:** When the temperature is above 100 Celsius degree, power will be lower to less than 50% and will resume when the temperature decreases.

**Hardware self-check:** The system will check by itself when the battery is connected. Any hardware fault, it will make 20 “beep” sounds.

**4. Programmable Features**

A number of the performance parameters for the ESC are set Default values By using a Arrowind Program Card (available separately) these default can be set to meet users’ particular performance requirements The Following section will deal with these factors .

4.1 **Brake Type:** There are three brake types including OFF (brake disable), Soft brake and Hard brake. The default is OFF (brake disable). Soft brake: discontinuous brake. Hard brake: continuous braking until the motor stops rotating.

4.2 **Timing Mode:** There are three options: Low, Mid and High. The default is Mid. Low advance is recommended for high inductance and low KV motors. High advance timing is recommended for low inductance and high KV motors, e.g. high KV outrunner motors.

4.3 **Cutoff Mode** : There are two options: Soft-Cut and Cut-Off .The default is Soft-Cut.

Cut-Off option: immediate motor shutdown occurs in low-voltage.

Soft-Cut option: Reduce throttle power to below 50% of the full power at low-voltage if current output Power is more than 50% of the full on throttle power, or else it will keep unchanged.

4.4 **Start Mode**: There are three options: Fast start, Soft start and very Soft start .The default is very Soft start. Fast start is recommended for low inductance and low start loading motors. Very Soft start is recommended for high inductance and high start loading motors. Soft start is recommended for those motors with medium Inductance and medium start loading.

4.5 **Throttle Curve Mode:** Three options: CURVE1, CURVE2, AND CURVE3 (corresponds to the Gov-OFF, Gov-low, Gov-high of GOVERNOR mode in the program card). The default is CURVE1.

4.6 **Li-XX Cells**: It is used to choose cells of Li-xx battery packs. Range: 0—12 cells. The default is 0 cell. If the battery cell is 0, the system will automatically identify the battery cell as 0 and calculate the Low-voltage cutoff voltage. E.g. suppose the low-voltage cutoff voltage is 2.85V per cell (under Mid Low-voltage cutoff type), if there are 3 cells, the total Low-voltage would be 2.85*3=8.55V.

4.7 **Cutoff voltage:** There are three options: **Low, Middle**, and **High**. The default is **Middle.**

**Low:** Low-voltage cutoff voltage is 2.6V per cell.

**Middle:** Low-voltage cutoff voltage is 2.85V per cell.

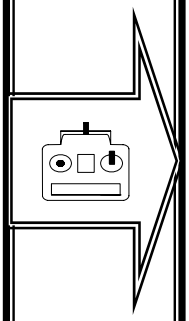
**High:** Low-voltage cutoff voltage is 3.1per cell.

4.8 **Motor Rotation:** Options: Normal and Reverse. The default is Normal. (Programmable via using transmitter only)

Notes: If you have any questions about Arrowind Hobby’s products, please try to contact your local dealers.

### 1. Enter program mode

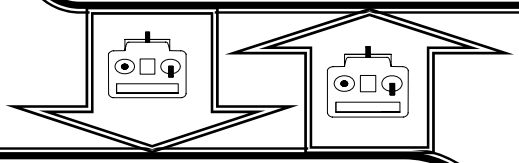
Push the throttle stick to the top position (full On throttle), turn on the transmitter, connect the ESC, wait 2 seconds, you will hear two "beep" sounds which means the full On throttle is confirmed. Wait another 6 seconds, it will make "♪ i 3 i 3" tune, then you can start programming via transmitter.



### 2. Select program parameters

There're 9 parameters can be set by using your transmitter. You would hear 9 different indicating sounds which correspond to 9 different parameters. Pull the throttle stick to the bottom position (full Off throttle) within 3 seconds after you hear the correspondent sound will brings you to the correspondent parameter setting status. The indicating sounds will repeat in turn as follow (1 long sound=5short sounds):

1. "beep-" (a short sound) which indicates the **Brake Type**
2. "beep-beep-" (two short sounds) which indicates the **Timing Mode**
3. "beep-beep-beep-" (three short sounds) which indicates the **Start Mode**
4. "beep-beep-beep-beep-" (four short sounds) which indicates the **Cutoff Mode**
5. "beep-----" (a long sound) which indicates the **Throttle Curve Mode**
6. "beep-----beep-" (a long sound and a short) which indicates the **Li-XX Cells**
7. "beep-----beep-beep-" (a long sound and two short) which indicates the **Cutoff Voltage**
8. "beep-----beep-beep-beep-" (a long sound and three short) which indicates **Motor rotation reversible.**
9. "beep-----beep-----beep-----"(three long sound) **EXIT.**

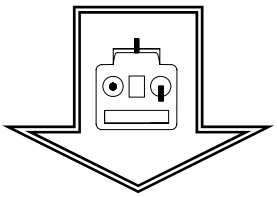


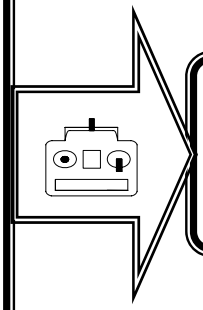
### 3. Select program values

After entering parameter setting status, you will hear the ESC making sounds in cycle. Different sounds indicate different values. Push the throttle stick to the top position (full On throttle) within 3 seconds after you hear the correspondent sound, then you will hear a special tune "♪ 5 6 5 6", which means the correspondent value has been chosen and saved. If you don't want to continue setting other values, just pull the throttle stick to the bottom position (Full Off throttle) to exit. Or wait 3 seconds to return to the second step and continue programming.

| sound / Parameter | "beep-" 1sound | "beep-beep-" 2 sounds | "beep-beep-beep-" 3 sounds | "beep-beep---" x sounds |
|---|---|---|---|---|
| **Brake Type** | **OFF** | **Soft** | **Hard** | |
| **Timing Mode** | **Low** | **Mid** | **High** | |
| **Start Mode** | **Fast** | **Soft** | **Very soft** | |
| **Cutoff Mode** | **Soft-Cut** | **Cut-Off** | | |
| **Throttle Curve** | **Curve1** | **Curve2** | **Curve3** | |
| **Li-XX Cells** | **Automatic** | **2 cells** | **3cells** | **xx cells** |
| **Cutoff Voltage** | **Low（2.6V）** | **Middle（2.85V）** | **High（3.1V）** | |
| **Motor rotation** | **Normal** | **Reverse** | | |

Remarks: Under **Li-XX Cells** value status, when the number of Li-xx battery cell is more than 4, the ESC will indicate by making long "beep" plus short "beep" sounds, a long "beep" sound equals 5 short "beep" sound. E.g. you will hear "beep-----beep-" (a long sound + a short sound) if there is a 6-cell Li-xx pack and you will hear "beep-----beep-----beep-" (two long sounds + a short sound) for a 11-cell Li-xx pack.





### 4. Exit program

Exit programming: Two ways as shown in step2 and step3.