

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 4 seconds very soft start performance which is very suitable for helicopters.
- 1.4 Excellent startup performance, great throttle linear and quick throttle response.
- 1.5 Excellent low-speed performance.
- 1.6 Max speed: 240,000 rpm for 2-pole, 80,000 rpm for 6-pole, 40,000 rpm for 12-pole.
- 1.7 Separate power supply for MCU and BEC, enhancing the ESC's ability of eliminating magnetic interference.
- 1.8 Program card is displayed by LED panel, make setting conveniently and easily.
- 1.9 The low-voltage threshold and start-up power can be programmed quantized and precisely by program card.
- 1.10 Throttle range can be configured to be compatible with different receivers.
- 1.11 Motor reverse rotation available.

2. Product specification

Item Normal Series	Continuous Current	Burst (10S) Current	Li-xx Battery (cell)	Dimension(mm) L x W x H	Weight(g)	BEC (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

Item Switching Mode Series	Continuous Current	Burst (10S) Current	Li-xx Battery (cell)	Dimension(mm) L x W x H	Weight(g)	BEC (Switching 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	60	3A	Yes

Note: This series of production adopts high efficiency switch mode BEC. Even it work with high voltage, BEC still can export stable 3A current, so it can drive more servos and keep self-heating small. The series of production is very suitable for helicopters with more servos.

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 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 the signal.

Over-heat protection: When the temperature is above 110 Celsius degree, power will be lower to less than 35% 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 . Configurable parameter with program card

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 Cut Off Voltage: low voltage protection threshold. Default is 00.0V.

user can set proper voltage threshold according to cell quantity in range of 00.0~49.9, default is 00.0V.

Note: System will calculate battery cells and set proper threshold automatically if this setting is 00.0V, Protection voltage for each Li -XX cell is 2.85V.

4.2 StartPower Percent: (00%~29%). Default is 00%

To set the percent of output power when motor start in range of 00%~29%, default is 00%. Under default setting, output power is decided automatically by system according to throttle stick position.

4.3 Timing Mode: Low/Mid/High/Highest. Default is Middle

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.

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

4.4 Brake Type: Off/Soft/Very Soft. Default is Off (brake disable)

Soft brake: less forceful and brake time is longer.

Hard brake: more forceful and brake time is shorter.

If Soft brake or Hard brake is selected, When the Motor is stop and the throttle is closed, brake will be continued. Soft brake and hard brake are designed for glider, especially suitable for folding propeller glider.

4.5 Start Mode: Fast start/Soft start/very Soft start. Default is Fast.

Fast is preferred for fixed-wing aircraft. Soft and Very Soft both are 4 seconds very soft start. The speed of propeller rotation rises in slow-speed during the 4 seconds. The rotation speed is little faster in Soft and is slower in Very Soft. Soft and Very Soft are suitable for helicopters. When setting Soft or Very Soft mode, if the throttle is closed then the motor stopped and the throttle opened again within 4 seconds, start will be Fast mode. But if beyond 4 seconds, start will be 4 seconds Soft mode or Very Soft mode again.

4.6 Cutoff Type: Soft-Cut/Cut-Off. Default is Reduce the output power.

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

Soft-Cut option: Reduce the output power gradually to 50% of the current power.

4.7 Throttle Curve Mode: CURVE1/CURVE2/CURVE3. Default is curve1.

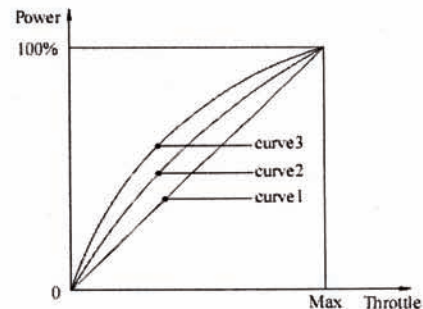
This function adjust the optimum ESC response to throttle stick movement.

Curve1 is linear and normal throttle curve. When the throttle stick position in middle, the RPM reaches around 50% of the Max. Recommend for most fixed-wing planes.

Curve2 is sensible than normal. At the same middle throttle stick position, the RPM reaches higher than 50% of the max. Recommend for helicopters.

Curves3 is Logarithm(a much more sensible choice). It can reach much higher than 50% of the Max when in the middle position. Recommend for gliders and helicopters.

Left are three throttle curves:



4.8 Motor Rotation: Default is Forward.

Forward and reverse.

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	"beep-" 1sound	"beep-beep-" 2 sounds	"beep-beep-beep-" 3 sounds	"beep-beep-beep-beep-" 4 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.

