ESC FOR AIRCRAFT AND HELICOPTER MANUAL

REV 1.0

Features

- Equipped with powerful high-speed MCU
- Full protections including low voltage, throttle signal losing and over heat with self-check function
- Soft and smooth startup to prevent concussion and stall
- Quick respond and linear throttle curve.
- Excellence low speed character.
- Support high speed (up to 240,000 RPM with 2 poles, 40,000RPM with 12 poles).
- Individual power supply circuit for MCU and BEC
- More option and parameters such as low voltage threshold, throttle range, can be easy configured with program card adopting LCD panel accurately.
- GOVERNOR function is available, throttle range is programmable.

Specification

Part Number	Con. current	Burst current （10S）	Cell of Li-XX	Dimension (mm) L×W×H	Weight （g）	BEC （Linear）	Programmable
XP-7A	7A	9A	1-2	12×20×5	4	1A	Yes
XP-12A	12A	15A	1-3	22×17×7	7	1A	Yes
XP-18A	18A	23A	2-3	46×28×9	20	2A	Yes
XP-25A	25A	30A	2-4	46×28×9	25	2A	Yes
XP-35A	35A	45A	2-4	48×28×10	28	3A	Yes
XP-40A	40A	50A	2-5	58×27×10	32	3A	Yes
XP-50A	50A	65A	2-5	58×27×10	36	3A	Yes
XP-60A	60A	80A	2-5	58×27×18	45	3A	Yes
XP-80A	80A	100A	2-5	58×27×18	50	3A	Yes

Max load of Built-in BEC（5V/3A）：
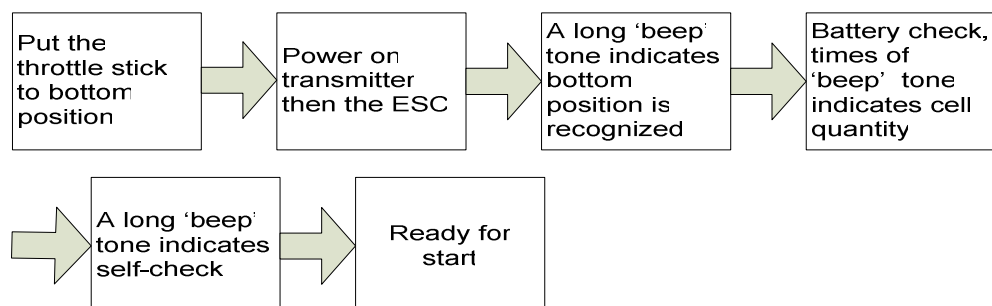
Cells of Li-XX battery	2 cells	3 cells	4 cells	5 cells
Qty of standard servo（max）	5	5	4	3

Note: For ESC without built-in BEC, an UBEC or individual battery pack should be required to power the receiver and servos.
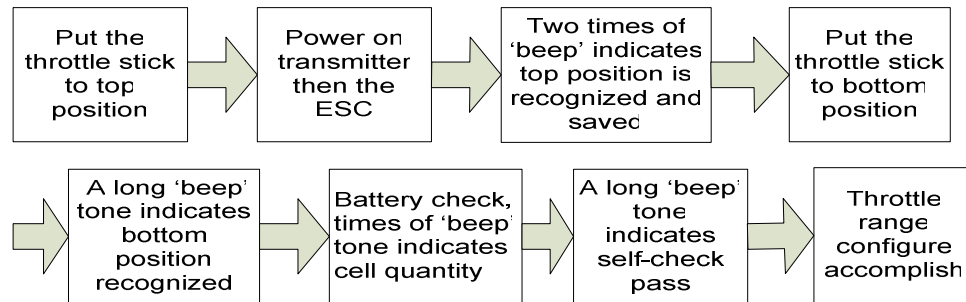
Using ESC

Unplug wire to battery before connecting the PPM cable to the receiver.

1. **Power on steps**

Put the throttle stick to bottom position → Power on transmitter then the ESC → A long 'beep' tone indicates bottom position is recognized → Battery check, times of 'beep' tone indicates cell quantity

→ A long 'beep' tone indicates self-check → Ready for start
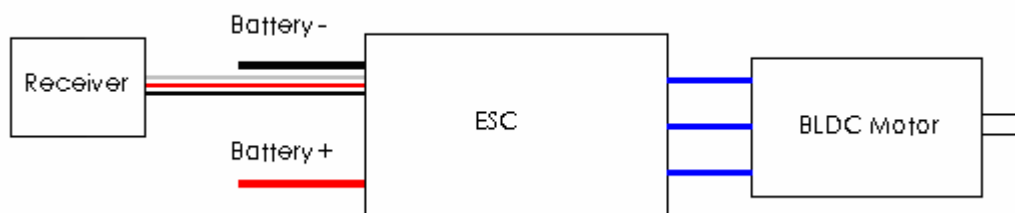
2. **Set Throttle range.** (When connected to new RC system, re-calibration is recommended)

Put the throttle stick to top position	Power on transmitter then the ESC	Two times of 'beep' indicates top position is recognized and saved	Put the throttle stick to bottom position

A long 'beep' tone indicates bottom position recognized	Battery check, times of 'beep' tone indicates cell quantity	A long 'beep' tone indicates self-check pass	Throttle range configure accomplish

3. **Protection**

   A. Low voltage protection: default threshold is recognized atomically by system against voltage of battery package. When power voltage is lower than this threshold, ESC will reduce output power or cut off. Action is decided by '**OffType**' item set via program card.

   B. Throttle signal lose protection: 3 second later after losing throttle signal, output power will reduce to 20% and will recover if signal is detective.

   C. Over heat protection: ESC will reduce output power if there is over heat, and will ramp up after temperature gets low.

   D. Self-check: ESC will start self-check when power on. If self-check fail, ESC will continue emits short 'beep' tone for 5 seconds.

Wiring Diagram

Configurable parameter with program card

1. OffVolt: Low voltage threshold, user can set proper voltage threshold according to cell quantity in range of 00.0-49.9V, the default is 00.0V.

> Note: System will calculate battery cells and set proper threshold atomically if this setting is 00.0V, Protection voltage for each Li-XX cell is 2.75V.

2．BrakeType: Off, soft brake and hard brake. Default is off. Soft brake works like an ABS system, hard brake means keep breaking till stop.

3．AdvanceT: Timing, low middle and high, default is middle

4．Start: fast, soft and ultra soft. Fast apply to low inductance and start-load motor, ultra soft apply to high inductance and start-load motor. Soft applies to case between above two.

5．OffType: Protection action, reduce power or cut off for selecting, default is 'reduce' power. In default mode when over heat or low voltage occurs, output power will keep reducing against temperature increasing and voltage decreasing. If protection is activated by over heat, output power will ramp up after temperature gets low. If it is activated by low voltage, it will keep low output. When running under 50% of power, this protection will not be activated.

6．Freq=: PWM frequency, 13KHz and 8KHz, default is 8KHz. 13KHz is an option for low inductance motor

7．**NeutRange :** Throttle neuture range, Unavailable for mono directional serial.

8．**Governor**: To set the constant speed for RC helicopter, Dis，Gov-L，Gov-H

9．**StPercent:** Start power, to set the ratio of output power when starting in range of 00% - 49%, default is 00%. Under default setting, output power is decided atomically by system according to throttle stick position.

10．**Model**: airplane mode only for this serial.

11．**Neutral:** Forwards and reverse scale. Unavailable for mono directional serial.

12．**CarDir:** Direction type. Unavailable for mono directional serial.

Using program card

Adopting 2x16 point LCD panel, program card can make all setting conveniently and directly.

Function of button

➡️ To move the cursor horizontally

⬆️ To move the cursor vertically or change option and value.

↩️ To confirm selected option and value.

WR Write to ESC to save all parameter and setting

Programming

1. Unplug the battery of ESC and connect the PPM wire to program card properly.
2. Connect the battery to ESC, program card will read the setting in ESC and display on LCD panel.

3. Push ⬆️ to choose function and use ➡️ key to move the cursor to proper place, then use

⬆️ to select option or change value and push ↩️ to confirm.

4. When all setting is performed, push **WR** to save to ESC. After that, you can push ↵ to check updated parameter following instruction on the LCD.

Item	Specification	Option or value range	Default
Offvlot	set low voltage threshold	0.00-49.9V	00.0V
AdvanceT	Timing	Low, Mid, High	Mid
BrakeType	select brake type	Dis: disable brake function Soft, work like ABS Hard, constant brake	Dis
Start	select start mode	Fast, Soft Verysoft	Soft
OffType	set protect action	Reduce: reduce output power Close: cut off the power	Reduce
Freq=	Select PWM frequency	8KHz, 13KHz	8KHz
NeutRange	set the neutral range of throttle in Car mode only	0-29%	5%
Governor	set the governor speed	Dis、**Gov**-L、**Gov**-H	Dis
StPercent *	set start power ratio, recommend in car mode	00-49%	0%
Model	select the model type	car, plane	plane
Neutral*	set the throttle range proportion between forwards and reverse	70/30, 60/40, 50/50, 40/60, 30/70	50/50
CarDir*	select direction function	One: Mono direction Two: Bi-direction Two2: conditional Bi-direction	Two

* Available in car mode only