A32 ESC Manual

Features

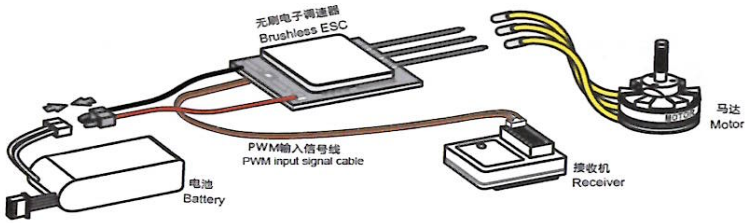
1. This ESC is designed for superior functionality and performance, primarily in all kinds of airplanes, very responsive, fine throttle, supports high RPM, better for 3D plane, plane with EDF and competition flight.
2. Run with 32bit MCU and premium MOS tube, safety for any extremely flight.

Specifications

1. Support 1S-24S LIPO, refer ESC you get.
2. 500,000RPM for two poles; 250,000 RPM for 4 poles, 125,000RPM for 8 poles.
3. 60A and above supports adjustable temperature protection.
4. Plenty of parameters can be set for different kinds of applications.
5. BEC voltage can be without, fixed or adjustable(refer the ESC you get)

Operation

1. Connection diagram



2. Normal procedure

Connect based on above diagram, the last step to connect battery. When power on, motor beeps " ♪ ♪..."for battery cells, following with throttle calibration, when stick put at low throttle position, motor beeps " ♪ ♪ " for the low throttle confirmation, now you can start to move stick to run your motor.
(Note: please push stick slowly until to full throttle at the first time to see the running condition.)

3. Programming

Programming through program card
Make sure ESC is NOT power on; connect ESC program cable with programming card program port; power on ESC; after LED lights flash back and forth, you can set parameters.

Functions

1. Throttle calibration

1.1. Standard throttle calibration: start controller, put throttle stick to high, power on ESC, motor beeps " ♪ ♪ ", pull down throttle stick quickly to low throttle until motor beeps " ♪ ♪ " means high throttle and low throttle set ok and you can move stick to run motor.
1.2. THROAUTO (Throttle Auto): this is only calibrating low throttle. Start controller, put throttle stick to low, power on ESC, motor beeps battery cell " ♪... " and then beep " ♪ ♪ " to confirm low throttle calibration ok, the high throttle is set as default 2000 or the latest stored high throttle.
1.3. THROMEM (Throttle memory): ESC throttle range will be as the latest stored. You just need to put throttle stick to low throttle as stored and power on ESC, motor will beeps "♪ ♪" to confirm it's ready, you can push stick to run motor.

2. CUTOFF MODE

Protection is for both Low voltage protection and temperature protection
OFF(No protect)/SLOW-DOWN(Half power)/CUT-OFF（Shutdown）

3. BATT.TYPE

Please select the right battery type if your battery is not LIPO as default, so that the battery cells can be detected correctly. It supports: LIHV/LIPO/NIMH/LIFE.

4. CUTOFF VOLTAGE

Default is LIPO 3.3V, when cutoff, throttle will cut to 50%, you can also set different by programming card.

5. CELLS

You can set battery cells manually or set as AUTO to detect battery cells automatically.
When you power on ESC and motor is connected, you will hear beeps" ♪ ....", this is to tell you how many cells are detected, one cell beeps" ♪ ", two cells beeps" ♪♪ " and so on. If battery cells are not detected correctly, please set manually.

6. PROTECT TEMP.

You can set the temperature degree to protect your ESC from too hot and burning, it can set by programming card.

7. TIMING

Timing is to improve motor running better. The default setting is working well with most motors.
But if the motor doesn't work well, you can change the timing, it may help.
There are some tips for your ref.:
The lower the timing, the earlier for the communication, the faster RPM
The higher the timing, the later for the communication, this can help the not running well motor to run better.
If there is desync in high throttle, you can increase timing and try, if running at high throttle, but RPM is not stable or the temperature for motor or ESC is high, you can lower timing and try.

8. BRAKE

The brake when you pull off throttle. You can set the brake strength accordingly.

9. MOTOR DIR.

You can set motor direction, optional: NORMAL/REVERSED/ BIDIRECT (BOTH). When you set as BIDIRECTION (BOTH), the throttle range is from 1000~2000, the neutral throttle is around1500

10. STARTUP POWER

Startup power is to define the min startup throttle.

11. TURN OFF DELAY

This is for the delay of motor stop when your throttle is at zero, during this, motor will run with idling speed, after the time, it will stop. ALWAYS means when you pull down throttle to zero, motor will always run with idling speed until power off or a new throttle.

12. BEACON DELAY

This is for the delay of motor warning beeps" ♪" every one second and repeat when you ESC at standby.

13. ECO

ECO is for saving power, especially for lower efficiency motor, can help motor run better and save power. There are three grades: ECO0/ECO1/ECO2. ECO is valid in whole running, the max RPM is slightly lower.

14. FREEWON/FREEWOFF

Generally FREEWON is for application requires fast response in stop; FREEWOFF is for application requires stop smoothly naturally.

15. BEC VOLTAGE

This is only valid for the products which support BEC voltage adjustable. You can adjust the BEC voltage accordingly.

16. SPOOLUP ACC

Spoolup ACC is to adjust throttle spoolup acceleration speed, it adjusts throttle feel, and there are four grades from slower to faster L1/L2/L3/L4.

17. STARTUP

The startup mode is used to match the inertia of the system, to get a suitable startup. There are three grades from fast to slow: FAST/MID/SLOW.

18. PWM FREQ.

PWM frequency is referring MOS switching rate. The higher PWM FREQ., the finer motor running, the lower the high-frequency noise, the higher power consumption; the lower PWM FREQ., the rougher motor running, the lower power consumption. The default setting works fine with most motors. For super low KV motor, you can lower the PWM FREQ. to save power; for super high KV motor, you can higher PWM FREQ. to ensure running reliability.

Programming parameters

cutoff mode/batt.type	电池保护方式/电池类型	OFF	SLOW DOWN	CUT OFF	LIHV	LIPO	NIMH	LIFE
cutoff voltage	保护电压(单节)	2.2 2.9	2.3 3	2.4 3.1	2.5 3.2	2.6 3.3	2.7 3.4	2.8 3.5
cells	电池节数	2	3	4	5	6	7	8
cells	电池节数	9	10	11	12	13	14	AUTO
protect temp	温度保护值	OFF	90°C	100°C	110°C	120°C	130°C	140°C
timing	提前角（进角）	0°	6°	12°	18°	24°	30°	AUTO
brake/motor dir	刹车力度/马达转向	OFF	25%	50%	100%	NORMAL	REVERSED	BOTH
startp power	启动力度	5%	10%	15%	20%	25%	30%	AUTO
turn off/Beacon dealy	熄火延时/待机警报延时	OFF	1S	4S	ALWAYS	OFF	5MIN	10MIN
option	多功能选项	ECO0	ECO1	ECO2	FREEW-ON	FREEW-OFF	THRO AUTO	THRO STORAGE
bec voltage	BEC输出电压	5.5V	6.0V	7.4V	8.0V			
spoolup acc/startup	拉升力度/启动模式	L1	L2	L3	L4	FAST	MID	SLOW
pwm freq	PWM频率	8K	12K	16K	24K	32K		
reserve	备用							

Safety Notes

1. Do not operate for a long time when the battery is under voltage. This will affect the battery life and reduce the efficiency of the ESC.
2. Do not operate for a long time after the ESC is overheated, otherwise it will easily cause damage to the MOS tube and damage the ESC
3. Please pay attention to the state of the motor, and do not continue to operate the motor when the motor is stuck by foreign objects, otherwise the service life of the motor and the ESC will be reduced.
4. Do not use the ESC in an overvoltage state, otherwise it will damage ESC or affect the service life of the ESC
5. When connecting the power supply, make sure that no objects are within the propeller rotation range.
6. Use the ESC when it is not dangerous.
7. Damaged ESCs (such as broken or damaged due to reversed electrodes or damp) must not be used again. Otherwise it will cause malfunction or fail to achieve the purpose
8. The ESC can only be powered by a battery, and cannot be powered by a power supply device.

Precautions

1. If the direction of rotation of the motor is wrong, you can exchange any two wires of the three wires of the motor or set it to reverse through the programming card or our software tools.
2. Only use clean and tight metal connectors to connect the motor and battery. It is best to use a connector of 5.5m/6mm PK specification. Pay attention to the positive and negative poles of the battery connector and do not connect them reversely. Replace oxidized or loose plugs or sockets, because only tight connection devices can ensure high current and protect the speed controller from high voltage hazards and interference.
   Note: Reverse connection of the positive and negative poles of the battery will cause serious damage, and the company does not guarantee.
3. If there is a desync phenomenon during acceleration (accompanied by the obvious abnormal sound of the motor), please gradually increase the timing. If the advance angle is increased to 30° and cannot be improved, it means your motor is overloaded. At this time, use a smaller propeller or reduce the voltage, or replace with a better performance motor. If the speed is unstable or the current is obviously too large at high throttle, please gradually reduce the timing.
4. If the motor is running and the speed is significantly slower and the throttle response is slow after power-on, please check whether the battery voltage is low.
5. If the timing is not set to automatic timing, it can generally be set as: the inner rotor can be set to 0° to 12°, and the outer rotor can be set to 18° to 30°
6. For a new propeller or a new motor, please push throttle stick slowly from low to high to make sure motor run well before your fly.