

Thank you for purchasing Maytech Brushless Electronic Speed Controller (ESC)

High power systems for RC model can be very dangerous and we strongly suggest that you read this manual carefully. MAYTECH have no control over the use, installation, application, or maintenance of these products, thus no liability shall be assumed nor accepted for any damages, losses of costs resulting from the use of this item. Any claims arising from the operating, failure or malfunctioning etc. will be denied. We assume no liability for personal injury, property damage or consequential damages resulting from our product or our workmanship. As far as is legally permitted, the obligation for compensation is limited to the invoice amount of the product in question.

MAYTECH ESC's high power BEC has been specifically designed for extreme aerobatics and therefore has the capability to support the higher momentary peak demand loads to eliminate the possibility of unwanted shutdowns, and is also capable of supporting continuous simultaneous multiple servo operations.

Falcon-Pro 32bit (MFTP-32) Series ESCs					
Model No.	BEC	Lipo	Net Weight	Size	Application
MT6A-SBEC-PP32	Switch BEC 5.5V/1.5A	2-Cells	5g	22*10.5mm	RC Airplane
MT12A-SBEC-PP32	Switch BEC 5.5V/2A	2-3Cells	5g	27*17mm	
MT20A-SBEC-PP32	Switch BEC 5.5V/4A	2-4Cells	11g	30*17.5mm	
MT25A-SBEC-PP32	Switch BEC 5.5V/4A	2-4Cells	13g	30*17.5mm	
MT30A-SBEC-PP32	Switch BEC 5.5V/4A	2-4Cells	20g	36*23.5mm	
MT35A-SBEC-PP32	Switch BEC 5.5V/4A	2-4Cells	25g	36*23.5mm	
MT40A-SBEC-PP32	Switch BEC 5.5V/5A	2-6Cells	44g	50*25mm	
MT45A-SBEC-PP32	Switch BEC 5.5V/5A	2-6Cells	48g	50*25mm	
MT50A-SBEC-PP32	Switch BEC 5.5V/5A	2-6Cells	56g	50*31mm	
MT60A-SBEC-PP32	Switch BEC 5.5V/5A	2-6Cells	58g	50*31mm	
MT70A-SBEC-PP32	Switch BEC 5.5V/5A	2-6Cells	60g	50*31mm	
MT80A-SBEC-PP32	Switch BEC 5.5V/5A	2-6Cells	63g	50*31mm	
MT90A-SBEC-PP32	Switch BEC 5.5V/5A	2-6Cells	68g	50*31mm	
MT100A-SBEC-PP32	Switch BEC 5.5V/5A	2-6Cells	74g	50*31mm	
MT110A-SBEC-PP32	Switch BEC 5.5V/5A	2-6Cells	76g	50*31mm	
MT120A-SBEC-PP32	Switch BEC 5.5V/8A	2-8Cells	80g	50*31mm	
MT150A-SBEC-PP32	Switch BEC 5.5V/5A	2-6Cells	82g	50*31mm	
MT160A-SBEC-PP32	Switch BEC 5.5V/5A	2-6Cells	85g	50*31mm	

I. Specification:

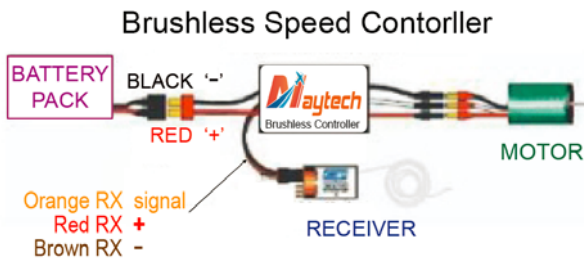
- ◆ Support 6A-150A, 2- 8S (Please check ESC sticker to verify the specified cells and power, more high voltage items to be added)
- ◆ Support 1S-24S LIPO, power from 0.5A-200A continuous.
- ◆ 500,000RPM for two poles; 250,000 RPM for 4 poles, 125,000RPM for 8 poles.
- ◆ 60A and above supports adjustable temperature protection.
- ◆ Parameters can be set for different kinds of applications.
- ◆ BEC voltage can be adjustable(optional and customizable)

II. Features:

- ◆ 32 bit ARM MCU, small size, light weight and rapid running speed.
- ◆ High resolution, smooth and responsive throttle linear. Throttle signal loss protect implemented.
- ◆ Designed for superior functionality and performance, primarily in all kinds of airplanes, with small size and lightweight.
- ◆ Extremely smooth, responsive and powerful.
- ◆ Run with 32bit MCU and premium MOS tube, make sure to satisfy any of your flying operations and performance with low temperature.
- ◆ Fine throttle and linear.
- ◆ Support PPM and throttle calibration.
- ◆ Compatible with most of the motors in the market.
- ◆ Automatically detection with battery cells and voltage, protect your battery from over discharge.
- ◆ .ECO technology, save power and increase battery life.

III. Wires Connection:

The Electronic Speed Controller (ESC) can be connected to the motor by soldering directly or with high quality connectors. Always use new connectors, which should be soldered carefully to the cables and insulated with heat-shrink tube. The maximum length of the battery pack wires shall be within 6 inches.



- ◆ Connect ESC to the motor wires.
- ◆ Solder appropriate connectors to the battery wires.
- ◆ Insulate all soldering connectors with heat shrink tubes.
- ◆ Plug "JR" connector into the receiver throttle channel.
- ◆ Controller Red and Black wires connects to battery pack Red and Black wires respectively.

IV. Operation:

◆ Throttle Calibration:

The ESC throttle range is: 980us-2200us. If the PPM signal is out of this range, ESC will beep alert.

- When your throttle stick position is at the range 980us-1600us and power on ESC, motor will beep "♪ ♪" to confirm it as low throttle, after low throttle is confirmed, you can just move stick to run motor.
- When your throttle stick position is higher than 1700us and power on ESC, ESC will do throttle calibration. Motor will beep "♪ ♪" to confirm it as high throttle, you can pull down stick quickly to a position below 1600us and stay there a moment, motor will beep "♪ ♪" to confirm it as low throttle, after low throttle is confirmed, you can just move stick to run motor.
- When your throttle stick position is between 1600us - 1700us, signal will be not valid; neither confirming it as low throttle, nor going to throttle calibration.

For the first push throttle stick, we suggest to push throttle stick from low to high slowly to confirm if motor runs well.

V. Parameters setting

a. 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; Up-Down button to select the parameter, Left-Right button to select the value; press ENTER button to write and save the parameter; you can repeat the process and set all parameters accordingly, after all, please power on again the ESC, new parameters are now effective.

b. Programming through our PC tools (GUI)

Make sure ESC is NOT power on. Connect ESC program cable with PC through our USBLINK, run GUI, select the right COM port (CH340), click "connect", power on ESC, you will see the word "connected" and the connection indicator on GUI will change to green, means connection is succeed; click "ReadPara", you can read out the ESC parameters accordingly; then you can set parameters, after changing parameters, please click "WritePara"; the last step, power on again your ESC.

◆ Details settings with programming card:

	FLASH DATA	PROG CARD for FP32 ESCs	PROGRAM	TURN OFF			
CUTOFF MODE	OFF	SLOW DOWN	CUT OFF	LIHV	LIPO	NMH	LIFE
CUTOFF VOLTAGE	3.0	3.1	3.2	3.3	3.4	3.5	
LITHIUM CELLS	2	3	4	5	6	7	8
LITHIUM CELLS	9	10	11	12	13	14	AUTO
PROTECT TEMPERATURE	OFF	90°C	100°C	110°C	120°C	130°C	140°C
TIMING	0"	6"	12"	18"	24"	30"	AUTO
BRAKE MOTOR DIRECTION	OFF	25%	50%	100%	NORMAL	REVERSED	BIDIRECT
STARTUP POWER	0%	10%	15%	20%	25%	30%	AUTO
TURN OFF DELAY	OFF	10S	15S	ALWAYS	OFF	5MIN	10MIN
ECO MODE	ECO 0	ECO 1	ECO 2	ON	OFF	AUTO	MEMORY
BEC VOLTAGE	6.0V	6.0V	7.4V	8.0V			
SPEEDUP ACC STARTUP	L1	L2	L3	L4	FAST	MID	SLOW
PPM FREQUENCY	8K	12K	16K	24K	32K		
RESERVE	F1	F2	F3	F4	F5	F6	F7

Note: Red line marked is default.



1. CUTOFF MODE

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

2. 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.

3. CUTOFF VOLTAGE

You can set the cutoff protection voltage for each cell. If you choose LIHV or LIPO, the voltage value is referring the down line: 2.9, 3, 3.1, 3.2, 3.3, 3.4, 3.5; if you choose LIFE, the voltage value is referring the up line: 2.2, 2.3, 2.4, 2.5, 2.6, 2.7, 2.8; there is no low voltage protection for NIMH battery.

4. LITHIUM 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.

5. PROTECT TEMPERATURE

You can set the temperature degree to protect your ESC from burning because temperature is too high. Some products may don't support temperature protection.

6. 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 motors run stable.

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.

7. BRAKE

You can set the brake strength accordingly.

8. MOTOR DIRECTION

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 around 1500

9. STARTUP POWER

Startup power is to define the min startup power.

You can increase or decrease the startup power to make motor startup smoother. Generally for the light load, you can set startup power lower, for the heavy load, you can set startup power higher.

10. 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.

11. STANDBY REMIND

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

12. ECO MODE

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.

13. FREE WHEELING

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

14. THRO. CALIBRATION

a. 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.

b. 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.

c. 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.

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 FREQUENCY

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.

19. RESERVE.

F1-F7 are preserved for future upgrading parameters.

VI. Safety Points:

Due to brushless power system is powerful, improper using may cause the personal injury and device damage. Please strictly follow the instructions to operate.

- ◆ Please don't operate long time with the battery under-voltage. It will reduce the battery usage life and ESC working efficiency.
- ◆ Please don't operate long time when the ESC is over temperature, otherwise it will damage the MOS FET easily.
- ◆ Please don't let ESC overvoltage for a long time, otherwise will short the usage life of ESC.
- ◆ Always keep all the things away from propeller when working on a power system with the battery connected
- ◆ Please pay attention to the motor. Don't operate continually when the motor was blocked. Otherwise, it will reduce the usage life of motor and ESC.
- ◆ Always use ESC in safe situation.
- ◆ Broken ESC can't be used.
- ◆ Only can use battery power supply, can't plug to AC power directly!

VII. Notices:

- ◆ If motor rotation direction is wrong, you can exchange any two of the three motor cables to correct.
- ◆ Pay attention to the polarity, wrong polarity connection will cause ESC and motor damage!
- ◆ If a noise occurred during accelerating, please increase timing angle. If no work until increase timing angle to 30, means the motor is overloaded, please change to use a smaller propeller or lower the voltage or change a better motor.
- ◆ Please leave some space between brake point and start up point for stick to move.
- ◆ Timing setting ref.:
Inner rotor: 0~12°
Outer rotor: 18~30°
- ◆ 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.

Note: It is better to set the timing as motor manufacturer recommend. The timing is bigger, the RPM is bigger, the power is stronger.

VIII. Fault Analysis beeps:

Motor will beep accordingly when ESC happen with below conditions, warning beeps will be cleared after restarting ESC.

- ◆ 1 beep repeat: Under-voltage identification.
- ◆ 2 beeps repeat: Temperature rise warning.
- ◆ 3 beeps repeat: Receiver signals failed.
- ◆ 4 beeps repeat: means startup failed.

MAYTECH INNOVATIONS CO., LTD.

Address: BUILDING 7, NO. 398, SHANGHAI, CHINA, 201700

Tel: +86-21-5616 5310 Email: maytech@maytech.cn Web: <http://www.maytech.cn>

Copyright © 2006-2022 All Rights Reserved