Users' Manual For MAYTECH Brushless Electronic Speed Controller (Version 2013.05)
Harrier-Suprem™ Series / Harrier-Suprem Economical™ Series / Tiger-Shack™ Series

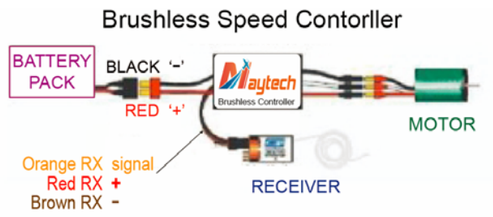
Thank you for purchasing Maytech Brushless Electronic Speed Controller (ESC)
High power systems for RC model can be very dangerous and we strongly suggest that you read this manual carefully. MAYTECH have no control over the use, installation, application, or maintenance of these products, thus no liability 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 typically found in CCPM equipped hardcore 3D E-helicopters.

Harrier-Suprem(MTHS) / Harrier-Suprem Economical (MTHE) / Tiger-Shack(MTB) Series ESCs				
Model No.	**BEC**	**Lipo**	**NiCd/NiMh**	**Application**
MT6A-BEC-HS	Linear BEC 5V/1A	2-3 Cells	5-10 Cells	RC Airplane RC Helicopter Quadcopter Multicopter (Can be flashed to Simon K firmware)
MT8A-BEC-HS	Linear BEC 5V/1A	2-4 Cells	5-12 Cells	
MT10A-BEC-HS	Linear BEC 5V/1A	2-4 Cells	5-12 Cells	
MT12A-BEC-HS	Linear BEC 5V/1A	2-4 Cells	5-12 Cells	
MT20A-BEC-HS	Linear BEC 5V/2A	2-4 Cells	5-12 Cells	
MT25A-BEC-HS	Linear BEC 5V/2A	2-4 Cells	5-12 Cells	
MT30A-BEC-HS	Linear BEC 5V/3A	2-4 Cells	5-12 Cells	
MT35A-BEC-HS	Linear BEC 5V/3A	2-4 Cells	5-12 Cells	
MT40A-SBEC-HS	Switch BEC 5.5V/4A	2-6 Cells	5-18 Cells	
MT45A-SBEC-HS	Switch BEC 5.5V/4A	2-6 Cells	5-18 Cells	
MT50A-SBEC-HS	Switch BEC 5.5V/4A	2-6 Cells	5-18 Cells	
MT55A-SBEC-HS	Switch BEC 5.5V/4A	2-6 Cells	5-18 Cells	
MT60A-SBEC-HS	Switch BEC 5.5V/4A	2-6 Cells	5-18 Cells	
MT65A-SBEC-HS	Switch BEC 5.5V/4A	2-6 Cells	5-18 Cells	
MT70A-SBEC-HS	Switch BEC 5.5V/4A	2-6 Cells	5-18 Cells	
MT75A-SBEC-HS	Switch BEC 5.5V/4A	2-6 Cells	5-18 Cells	
MT85A-SBEC-HS	Switch BEC 6V/5A	2-6 Cells	5-18 Cells	
MT110A-SBEC-HS	Switch BEC 6V/5A	2-6 Cells	5-18 Cells	
MT120A-SBEC-HS	Switch BEC 6V/5A	2-6 Cells	5-18 Cells	
MT150A-SBEC-HS	Switch BEC 6V/5A	2-6 Cells	5-18 Cells	
MT120A-OPTO-HS	N/A	2-4 Cells	5-12 Cells	
MT125A-OPTO-HS	N/A	2-4 Cells	5-12 Cells	
MT130A-OPTO-HS	N/A	2-4 Cells	5-12 Cells	
MT135A-OPTO-HS	N/A	2-4 Cells	5-12 Cells	
MT140A-OPTO-HS	N/A	2-6 Cells	5-18 Cells	
MT145A-OPTO-HS	N/A	2-6 Cells	5-18 Cells	
MT150A-OPTO-HS	N/A	2-6 Cells	5-18 Cells	
MT55A-OPTO-HS	N/A	2-6 Cells	5-18 Cells	
MT60A-OPTO-HS	N/A	2-6 Cells	5-18 Cells	
MT65A-OPTO-HS	N/A	2-6 Cells	5-18 Cells	
MT70A-OPTO-HS	N/A	2-6 Cells	5-18 Cells	
MT75A-OPTO-HS	N/A	2-6 Cells	5-18 Cells	
MT85A-OPTO-HS	N/A	2-6 Cells	5-18 Cells	
MT110A-OPTO-HS	N/A	2-6 Cells	5-18 Cells	
MT100A-HV-HS	N/A	6-12 Cells	16-38 Cells	
MT120A-HV-HS	N/A	6-12 Cells	16-38 Cells	
MTB60A-SBEC	Switch BEC 6V/3A	2-6 Cells	5-18 Cells	RC Boat
MTB90A-SBEC	Switch BEC 6V/3A	2-6 Cells	5-18 Cells	
MTB120A-SBEC	Switch BEC 6V/3A	2-6 Cells	5-18 Cells	
MTE20A-BEC-HS	Linear BEC 5V/2A	2-3 Cells	5-10 Cells	RC Airplane RC Helicopter Quadcopter Multicopter (Can be flashed to Simon K firmware)
MTE25A-BEC-HS	Linear BEC 5V/2A	2-3 Cells	5-10 Cells	
MTE30A-BEC-HS	Linear BEC 5V/2A	2-3 Cells	5-10 Cells	
MTE35A-BEC-HS	Linear BEC 5V/2A	2-3 Cells	5-10 Cells	
MTE40A-BEC-HS	Linear BEC 5V/3A	2-3 Cells	5-10 Cells	
MTE45A-BEC-HS	Linear BEC 5V/3A	2-3 Cells	5-10 Cells	
MTE50A-BEC-HS	Switch BEC 5.5V/4A	2-4 Cells	5-12 Cells	
MTE55A-BEC-HS	Switch BEC 5.5V/4A	2-4 Cells	5-12 Cells	
MTE60A-BEC-HS	Switch BEC 5.5V/4A	2-6 Cells	5-18 Cells	
MTE65A-BEC-HS	Switch BEC 5.5V/4A	2-6 Cells	5-18 Cells	
MTE70A-BEC-HS	Switch BEC 5.5V/4A	2-6 Cells	5-18 Cells	
MTE75A-BEC-HS	Switch BEC 5.5V/4A	2-6 Cells	5-18 Cells	
MTE80A-BEC-HS	Switch BEC 5.5V/4A	2-6 Cells	5-18 Cells	
MTE85A-BEC-HS	Switch BEC 5.5V/4A	2-6 Cells	5-18 Cells	

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.

I. Features:

- Handle with over 400Hz fast refresh rate, qualified for multicopters..
- Programmable switching frequency 8KHz/16KHz.
- With water-cooling function (Only Tiger-Shack MTB Series ESCs).
- Extremely low internal resistance.
- Super smooth and accurate throttle linearity.
- Safety thermal over-load protection.
- Auto throttle shut down in signal lose situation.
- Supports high RPM motors.
- Power arming protection (prevents the motor from accidentally running when switched ON).
- New Advanced programming software.
- Built-in Intelligent ESC Safety Functions:
  1. Over-heat protection: When the temperature of ESC exceeds 110 deg C, the ESC will reduce the output power to allow it too cool.
  2. Lost Throttle signal protection: The ESC will automatically reduces output power to the motor when it detects a lost of throttle signal for 2 second, a subsequent loss of throttle signal beyond 2 seconds, will cause the ESC automatically to cut power to the motor.

II. Programmable Functions:

1. User-programmable brake setting (we recommend using brake for only folding props applications).

Brake: ON/OFF
* ***ON***——Set the propeller to the brake position when the throttle stick is at the minimum position (Recommended for folding props).
* ***OFF***——Set the propeller to freewheel when the throttle stick is at the minimum position.

2. User-programmable battery type (LiPo or NiCd/NiMh)

Battery type: NiCd/NiMh or LiPo
* ***NiCd/NiMh***——Set Low voltage protection threshold for NiCd/NiMh cells.
* ***LiPo***——Set Low voltage protection threshold for LiPo cells and automatically detects the number of cells within the pack.

Note: Selecting the NiCd/NiMh option for the battery type, triggers the ESC to automatically set the cutoff threshold to the factory default of 65%. The cutoff threshold can be subsequently altered through the Low Voltage protection function, if required. The ESC will read the initial voltage of the NiCd/NiMh pack once it is plugged in and the voltage read will be used as a reference for the cutoff voltage threshold.

3. User-programmable low voltage cutoff setting

Low Voltage Protection Threshold (Cutoff Threshold):Low / Medium / High
* ***For Li-xx packs***——number of cells are automatically calculated and requires no user input apart from defining the battery type. This ESC provides 3 setting options for the low voltage protection threshold; Low (2.8V)/ Medium (3.0V)/ High (3.2V). For example: the voltage cutoff options for a 11.1V/ 3 cell Li-Po pack would be 8.4V (Low)/ 9.0V(Medium)/ 9.6V(High).
* ***For Ni-xx packs***——low / medium / high cutoff voltages are 50%/65%/65% of the initial voltage of the battery pack. For example: A fully charged 6 cell NiMh pack's voltage is 1.44V×6=8.64V,when "LOW" cutoff voltage is set, the cutoff voltage is: 8.64V×50%=4.3V and when "Medium" of "High" is set, the cutoff voltage is now 8.64V×65%=5.61V.

4. User-programmable factory-default-setup restoration

Factory default setting	
Brake:	OFF
Battery type detect:	LiPo with Automatic Cell
Low voltage cutoff threshold:	Medium (3.0V/65%)
Timing setup:	Automatic
Soft acceleration start up:	Medium
Governor mode:	OFF
Frequency:	8kHz
Low voltage cutoff type:	Reduce power

5. User-programmable timing settings (to enhance ESC efficiency and smoothness)

Timing setup: Automatic / Low / High
* ***Automatic***——ESC automatically determines the optimum motor timing.
* ***Low (7-22 deg)***——Setting for most 2 or 4 poles motors.
* ***High (22-30 deg)***——Setting for motors with 6 or more poles.

In most cases, automatic timing works well for all types of motors. However for high efficiency we recommend the Low timing setting for 2 or 4 poles motors (general in-runners) and high timing for 6 poles and above (general out-runners). For higher speed, High timing can be set. Some motors require different timing setups therefore we suggest you to follow the manufacturer recommended setup or use the automatic timing setting if you are unsure.

Note: Run your motor on the ground first after making any changes to your motor timing!

6. User-programmable soft acceleration start-up (for delicate gearbox and heli. applications)

Soft Acceleration Start ups: Very Soft/ Soft Acceleration/ Start Acceleration
* ***Very Soft***——Provides initial slow 1.5sec ramp-up from start to full rpm intended to protect delicate gears from stripping under instant load. This setting is recommended for either fixed wing models equipped with gearboxes or helicopters.
* ***Soft Acceleration***——Provides initial slow 1 sec ramp-up from start to full rpm. This setting is recommended for either fixed wing models equipped with gearboxes or helicopters.
* ***Start Acceleration***——Provides quick acceleration start ups with a linear throttle response. This is recommended for fixed wing models fitted with direct drive setups.

7. User-programmable governor mode (for heli. applications)

Active RPM Control (Heli. Governor Mode):
* ***Rpm control off***
* ***First range***——There will be a 5-second delay from start to full rpm, but if the throttle is cutoff after starting, then the next start will be as normal start.
* ***Second range***——There will be a 15-second delay from start to full rpm, but if the throttle is cutoff after starting, then the next start will be as normal start.

Note: Once the Governor Mode is enabled, the ESC's Brake and Low Voltage Cutoff Type settings will automatically be reset to No Brake and Reduce Power respectively regardless of what settings they were previously set.

8. User-programmable motor rotation (clockwise \ counter-clockwise)

Motor Rotation: Reverse
Motor rotation is usually reversed by swapping two motor wires. However, in cases where the motor cables have been directly soldered to the ESC cables, motor rotation can be reversed by changing the setting value on the ESC.

9. User-programmable switching frequency

Switching Frequency: 8 kHz/16kHz
* ***8 kHz***——Sets ESC switching frequency for two pole motors, e.g. Inrunner motors.
* ***16kHz***——Sets ESC switching frequency for motors with more than two poles, e.g. Outrunner motors.

Note: Although 16 kHz is more efficient, the Setup Default Value is 8 kHz due to the higher RF noises caused at 16 kHz.

10. User-programmable low voltage cut-off type (power reduction or immediate shut-down)

Low Voltage Cutoff Type: Reduce Power / Hard cutoff
* ***Reduce Power***——ESC reduces motor power when the pre-set Low Voltage Protection Threshold Value is reached (recommended)
* ***Hard Cutoff***——ESC instantly cuts motor power when the pre-set Low Voltage Protection Threshold Value is reached.

III. Using Your New ESC:

1. Improper polarity or short circuit will damage the ESC. Therefore it is your responsibility to double check all plugs for proper polarity and firm fit BEFORE connecting the battery pack.

2. Powering up the ESC for the first time and setting the Automatic Throttle Calibration:

MAYTECH ESC features Automatic Throttle Calibration to attain the smoothest throttle response and resolution throughout the entire throttle range of your transmitter. This step is done once to allow the ESC to "learn and memorize" your transmitter throttle output signals and only repeated if you change your transmitter.
- Switch your transmitter ***ON*** and set the throttle stick to ***maximum*** position.
- Connect the battery pack to the ESC. Wait for about 2 seconds, the motor will beep for twice, then put the throttle in the minimum position, the motor will also beep, which indicates that your ESC has got the signal range of the throttle from your transmitter.

The throttle is now calibrated and your ESC is ready for operation.

IV. ESC Normal start up procedure:

1. Switch your transmitter ***ON*** and set the throttle to its ***minimum*** position.
2. Connect the battery pack to the ESC.
3. When the ESC is first powered up, it emits two sets of audible tones in succession indicating the status of its programming state.

- The first set of tones denotes the number of cells in the LiPo pack connected to the ESC. (Three beeps (***) indicates a 3 cell LiPo pack while 4 beeps (****) indicates a 4 cell LiPo pack).
- The second set denoting Brake status (one beep(*) for Brake "ON" and two beeps (**) for Brake "OFF").

Now, the ESC is ready for use.

V. Entering the Programming Mode(Programming by Transmitter):

1. Switch your transmitter ***ON*** and set the throttle to its ***maximum*** position.
2. Connect the battery pack to the ESC.
3. Wait until you hear two short beeps (_ _**) confirming that the ESC has now entered the programming mode.
4. If within 5 seconds, the throttle stick is lowered to its ***minimum*** position, an audible tone is emitted confirming that the ***throttle calibration setting*** has changed. If the throttle stick is left in the ***maximum*** position beyond 5 seconds, the ESC will begin the sequence from one function and its associated setting options to another. (Please refer to Table *PROGRAMMING MODE AUDIBLE TONES* to cross reference the functions with the audible tones).
5. When the desired tone for the function and setting option is reached, move the throttle stick down to its ***minimum*** position. ESC will emit two beeps (**) confirming the new setting has been stored.
6. The ESC only allows the setting of one function at a time. Should you require making changes to other functions, disconnect the battery pack and wait 5 seconds to reconnect the battery and repeat the above steps.

PROGRAMMING MODE AUDIBLE TONES	
Programming Mode Audible Tones	**ESC Functions**
1 Throttle Calibration (within the first 4 Sec) ●● ●● ●● ●●	
2 Brake _ * _ * _ * _ *	Brake On /Off
3 Battery Type ~ ~ ~ ~	NiCd
~~ ~~ ~~ ~~	LiPo
4 Low Voltage Cutoff Threshold * _ _ * _ _ * _ _ * _ _ *	Low 2.8V/50%
* _ _ _ * _ _ _ * _ _ _ * _ _ _ *	Medium 3.0V/60%
* _ _ _ _ * _ _ _ _ * _ _ _ _ * _ _ _ _ *	High 3.2V/65%
5 Restore Factory Setup Defaults — — — —	Restore Factory Default Value
6 Timing Setup - - - -	Automatic (7-30°)
- - - - - - - -	Low (7-22°)
- - - - - - - - - - - -	High (22-30°)
7 Soft Acceleration Start Ups \/\/ \/\/ \/\/ \/\/	Very Soft
\/ \/ \/ \/	Soft Acceleration
\/\/\/ \/\/\/ \/\/\/ \/\/\/	Start Acceleration
8 Governor Mode _ * _ * _ * _ *	Rpm off
_ ** _ ** _ ** _ **	Heli. First Range
_ *** _ *** _ *** _ ***	Heli. Second Range
9 Motor Rotation W W W W	Positive/ Reverse
10 Switching Frequency \\ \\ \\ \\	8kHz
// // // //	16kHz
11 Low Voltage Cutoff Type _ - _ - _ -	Reduce Power
- _ - _ - _	Hard Cut Off

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VI. Alert Tones:

MAYTECH ESC is equipped with audible alert tones to indicate abnormal conditions at power up.

1. If ESC can't enter into working mode after powering up, it indicates that you have not setup throttle calibration.
2. Continuous beeping tone (****)——Indicates that throttle stick is not in the minimum position.
3. Single beeping tone followed by a one second pause (* * * *)——Indicates that the battery pack voltage is not within the acceptable range. (The ESC automatically checks and verifies the battery voltage once the battery is connected).
4. A single beeping tone followed by a short pause (* * * *)——Indicates that the ESC is unable to detect the normal throttle signal from the receiver.

VII. Programming by Prog-card:

- When you are using an ESC with a built-in BEC (Battery Elimination Circuit), disconnect the main power pack from the ESC.
- When you are using an ESC without a built-in BEC(the ESC is marked with "OPTO or NO BEC"), you must use an additional battery pack (4.8-6V) to power the program card, and usually a receiver battery pack is a good choice.

Note: every high voltage ESC (Supports 5-12 cells Lipo battery) hasn't built-in BEC.

1. Disconnect the main power pack from the ESC
2. If ESC without a built-in BEC ,Connect the receiver battery pack (4.8-6V) to the program card at the top right corner position.
3. Plug JR connector (part of ESC) to the position "P" on Prog-Card.
4. Put the seven blue jumper connectors to the position (parameter) you selected.
5. Connect the power pack to the ESC; One long "beep" will be heard, which means your setting has been saved.
6. Re-disconnect the main power pack to the ESC, the setup value will be saved!

VIII. Application for Quad/Multi-rotors:

- Handle with over 450Hz input refresh rate, compatible with most flight controllers in the market.
- Fast reliable throttle response, to guarantee stable flight
- Motor cables, battery cables, single wire length can be customized to quad/ multi-rotor application.
- Can flash quad/multi-rotor-specialized firmware:
  Harrier-Suprem-MM firmware, or ***Simon K firmware***.

*Note: We do not recommend users flash Simon K firmware privately. If you need quad/multi-rotor-specialized firmware, pls order MAYTECH Eagle-Multi™ Series ESC(base on Harrier-Suprem™ ESCs with **Simon K firmware**) or Harrier–Suprem™ -MM ESCs. (with MAYTECH quad/multi-rotor-specialized firmware).*

1. Solder the ESCs to power distribution board. Make sure the max current of the power distribution board is higher than the total current of all ESCs soldered to it.
2. Solder motor wires. Pay attention to wire schedule, in order that motors rotate according to your required direction.
3. Connect the signal wire to flight controller. (Pay attention to the wire schedule)
4. Complete the other installation and setup for quad/multi-rotor application. Test it without propellers.

Note: If you use Harrier-Suprem™ ESCs (not Eagle-Multi™ or Harrier-Suprem™ -MM), the ESCs may no audible tone emitted after controller un-locked. Now you need to do the throttle calibration. Please refer to user's manual of your flight controller to do it. If your flight controller does not support throttle calibration, you must make throttle calibration to each ESC, by plug signal wire to receiver one by one.

IX. General Safety Precautions:

- Do not install propeller (fixed wing) or drive pinion (helicopter) on the motor when you test the ESC and motor for the first time to verify the correct settings on your radio. Only install your propeller or pinion after you have confirmed that the settings on your radio is correct.
- Switch your transmitter ON and ensure the throttle stick is in the minimum position before connecting the battery pack.
- Never switch your transmitter OFF while the battery is connected to your ESC.
- Never use ruptured or punctured battery cells.
- Never use battery packs that are known to overheat.
- Use batteries that are supported by the ESC and ensure the correct polarity before connecting. Wrong battery polarity will damage the ESC and void the warranty!
- Never short-circuit battery or motor terminals.
- Always use proper insulation material for cable insulation.
- Do not exceed the number of cells or servos specified by the ESC.
- Always use proper cable connectors.
- Install the ESC in a suitable location with adequate ventilation for cooling. MAYTECH ESC has built-in over-temperature cut-off protection that will immediately cut power off the motor once the ESC temperature exceeds 230 Deg F/ 110 Deg C limit.
- Only connect your battery pack just before flying and do not leave your battery pack connected after flying.
- Handle your model with extreme care once battery pack is connected and keep away from the propeller at all times. Never stand in-line or directly in front of any rotating parts.
- Do not immerse the ESC underwater while powered up.
- Do fly at a designated flying site and abide by the rules and guidelines set by your flying club.

X. Trouble Shooting:

Trouble	Possible Reason	Action
Motor doesn't work and no audible tone emitted after connecting the battery, BUT servos are working. When throttle stick is in maximum position, the tones (** ** ** **) and (_ * ect.) emitted indicating throttle calibration and programming mode respectively.	The ESC throttle calibration has not set up	Set up the ESC throttle calibration
Motor doesn't work and no audible tone emitted after connecting the battery. Servos are not working either.	Poor/loose connection between battery pack and ESC	Clean the connector terminals or replace connector
	No power	Replace with a freshly charged battery pack
	Poor soldered connections (dry joints)	Re-solder the cable connections
	Wrong battery cable polarity	Check and verify cable polarity
	ESC throttle cable connected to receiver in the reverse polarity	Check the ESC cable connected to the ESC to ensure the connectors are in the correct polarity
	Faulty ESC	Replace ESC
Motor doesn't work and no audible tone emitted after connecting the battery, BUT servos are working.	Poor / loose connection between ESC and motor	Clean the connector terminals or replace connectors
	Burnt motor coils	Replace motor
	Poor soldered connections (dry joints)	Re-solder the cable connections
Motor doesn't work after powering up the ESC. An alert tone with **TWO** beeping tones followed by a short pause (** ** ** **) is emitted.	The battery pack voltage is not within the accept -able range	Replace with a freshly charged battery pack Check battery pack voltage
Motor doesn't work after powering up the ESC. An alert tone with a **SINGLE** beeping tone followed by a short pause (* * * *) is emitted.	The ESC is unable to detect the normal throttle signal from the receiver	Check and verify the ESC cable is connected to the throttle channel on the receiver Check the transmitter and receiver to verify that there is throttle signal output. (Connect a spare servo to verify throttle channel operation)
Motor doesn't work after powering up the ESC. An alert tone with **CONTINUOUS** beeping tones (****) is emitted.	The throttle stick is not in the minimum position at power up	Move the throttle stick to the minimum position
Motor doesn't work after powering up the ESC. ESC emits **TWO LONG** audible tones followed by two short beeps (_ _ * *).	Reversed throttle channel caused the ESC to enter the programming mode	Enter the servo reverse menu on your transmitter and reverse the throttle channel Note: For Futaba radios set the throttle channel to reverse
Motor runs in reverse rotation; Motor stops running in flight.	Wrong cables polarity between the ESC and the motor	Swap any two of the three cable connections between the ESC and the motor or access the Motor Rotation Function via the ESC programming mode and change the pre-set parameters
	Lost throttle signal	Check proper operation of the radio equipment Check the placement of the ESC and the receiver and check the route of the receiver's aerial and ESC cables to ensure there is adequate separation to prevent RF interference Install a ferrite ring on the ESC's throttle cable
	Battery pack voltage has reached the Low Voltage Protection threshold	Land the model immediately and replace the battery pack
	Possible bad cable connection	Check and verify the integrity of the cable connections
Motor restarts abnormally ESC Overheats.	Possible RF Interference at the flying field	The normal operation of the ESC may be susceptible to surround -ing RF interference Restart the ESC to resume normal opera -tion on the ground to verify recurrence. If the problem persists, test the operation of the ESC at a different flying field
	Inadequate Ventilation	Relocate the ESC to allow better ventilation
	Servos drawing too much current and over loading the ESC	Use servos that are adequately sized for the ESC. The maximum BEC current drawn should be within the BEC limits
	Over sized motor or prop	Prop down or resize the motor

SHANGHAI MAYTECH ELECTRONICS CO., LTD.
Address: RM418, BUILDING A, HUAMAO INDUSTRY ZONE, NO.6785, ZHONGCHUN ROAD, MINHANG DISTRICT, SHANGHAI, CHINA, 201100
Tel: +86-21-2992 2998 **Fax:** +86-21-2992 2989 **Email:** maytech@maytech.cn **Web:** http://www.maytech.cn

XI. Maytech other popular items, (for full catalogue, pls contact Sales Rep.):

Harrier-eXTrem™ (MTHX) Series ESCs (Programmed by Trx or by Prog-card, For both RC Airplanes and Helicopers)

Model No.	Cont. Current	BEC	LI-PO	NICD/NIMH	Program Method	Weight
MT20A-BEC-HX	20A	5V/2A	2-4Cells	6-12Cells	Trx/Prog-card	18g
MT30A-BEC-HX	30A	5V/3A	2-4Cells	6-12Cells	Trx/Prog-card	25g
MT40A-SBEC-HX	40A	5.0/5.5/6.0V 5A	2-6Cells	6-18Cells	Trx/Prog-card	45g
MT60A-SBEC-HX	60A	5.0/5.5/6.0V 5A	2-6Cells	6-18Cells	Trx/Prog-card	55g
MT85A-SBEC-HX	85A	5.0/5.5/6.0V 5A	2-6Cells	6-18Cells	Trx/Prog-card	63g
MT115A-SBEC-HX	115A	5.0/5.5/6.0V 5A	2-6Cells	6-18Cells	Trx/Prog-card	63g
MT125A-SBEC-HX	125A	5.0/5.5/6.0V 5A	2-6Cells	6-18Cells	Trx/Prog-card	146g
MT155A-SBEC-HX	155A	5.0/5.5/6.0V 5A	2-6Cells	6-18Cells	Trx/Prog-card	150g
MT85A-OPTO-HX	85A	NO BEC	2-6Cells	6-18Cells	Trx/Prog-card	47g
MT115A-OPTO-HX	115A	NO BEC	2-6Cells	6-18Cells	Trx/Prog-card	54g
MT120A-HV-HX	120A	NO BEC	6-12Cell	18-32Cells	Trx/Prog-card	141g

Harrier-Advance™ (MTHA) Series ESCs (Programmed by Trx or by Prog-card, For both RC Airplanes and Helicopers)

Model No.	Cont. Current	BEC	LI-PO	NICD/NIMH	Program Method	Weight
MT45A-SBEC-HA	45A	5.5V/6A SBEC	2-6Cells	6-18Cells	Trx/Prog-card	61g
MT60A-SBEC-HA	60A	5.5V/6A SBEC	2-6Cells	6-18Cells	Trx/Prog-card	63g
MT70A-SBEC-HA	70A	5.5V/6A SBEC	2-6Cells	6-18Cells	Trx/Prog-card	63g
MT80A-SBEC-HA	80A	5.5V/6A SBEC	2-6Cells	6-18Cells	Trx/Prog-card	68g
MT90A-SBEC-HA	80A	5.5V/6A SBEC	2-6Cells	6-18Cells	Trx/Prog-card	68g
MT100A-SBEC-HA	100A	5.5V/6A SBEC	2-6Cells	6-18Cells	Trx/Prog-card	78g
MT110A-SBEC-HA	110A	5.5V/6A SBEC	2-6Cells	6-18Cells	Trx/Prog-card	78g
MT150A-SBEC-HA	150A	5.5V/6A SBEC	2-6Cells	6-18Cells	Trx/Prog-card	95g
MT160A-SBEC-HA	160A	5.5V/6A SBEC	2-6Cells	6-18Cells	Trx/Prog-card	95g

Monster Series / Cheetah Series MTC ESCs--Applied to RC Cars, Crawlers, Trucks (The best solution in China)

Model No.	Cont. Current	BEC	LI-PO	NICD/NIMH	Program Method	Weight
MTC60A-MSD	60A	6V/3A	2-3Cells	5-10 Cells	Trx/PC	40g
MTC80A-MSD	80A	6V/3A	2-3Cells	5-10 Cells	Trx/PC	45g
MTC120A-MSD	120A	6V/3A	2-3Cells	5-10 Cells	Trx/PC	50g
MTC60A-CSD	60A	6V/3A	2-3Cells	5-10 Cells	Trx/PC	35g
MTC80A-CSD	80A	6V/3A	2-6 Cells	5-18 Cells	Trx/PC	150g
MTC120A-CSD	120A	6V/3A	2-6 Cells	5-18 Cells	Trx/PC	150g
MTC150A-CSD	150A	6V/3A	2-6 Cells	5-18 Cells	Trx/PC	150g

Outrunner Motors: In the below are typical and popular items, for more motors info, pls contact MAYTECH sales staff.

Model No.	KV	Dimension	LI-PO	Power	Prop Recommend	Weight
MTM1045-7750	7750	Φ10*4.5mm	1Cells	10W	3*2	2g
MTM1475-2000	2000	Φ14*7.5mm	2Cells	18W	6*3	5.5g
MTM1812-3850	3850	Φ18*12mm	2Cells	80W	5*3.5	10g
MTM2212-2300	2300	Φ22*12mm	2Cells	88W	7*2	16g
MTM2812-1600	1600	Φ28*12mm	2-3Cells	97W	6*3/7*4	22g
MTD2831-1535	1535	Φ28.5*31.5mm	2-3Cells	206W	8*3.8/8*4	50g
MTO2822-1450	1450	Φ28.0*22.0mm	2-3Cells	160W	8*6/7*4.5	38g
MTO2826-1000	1000	Φ28.0*26.0mm	2-3Cells	150W	11*7/10*5	50g
MTO2830-850	850	Φ28.0*30.0mm	2-4Cells	187W	11*7/9*6/8*6	52g
MTO2836-880	880	Φ28.0*36.0mm	2-4Cells	243W	12*6/10*7/9*6	70g
MTO3530-1400	1400	Φ35.0*30.0mm	2-4Cells	446W	10*6/8*6/7*3	74g
MTO3536-1250	1250	Φ35.0*36.0mm	2-4Cells	496W	9*4.5/10*4.7	102g
MTO3542-1050	1050	Φ35.0*42.0mm	2-4Cells	543W	10*6/11*5	130g
MTO3548-900	900	Φ35.0*48.0mm	3-5Cells	770W	11*8/13*6	156g

Outrunner Motors for Multikopters: Reliable consistency, perfect balance and extreme power.

MTO2830-880-MK	880	Φ27.5*30.0m	2-4Cells	254.6W	8*4.9*6	55g
MTO2835-800-MK	800	Φ27.5*35.0m	2-4Cells	455W	9*6/10*4.7	72g
MTO3536-700-MK	700	Φ34.8*36.0m	3-6Cells	557W	9*6/10*4.7	100g
MTO4228-450-MK	450	Φ42*28.5mm	3-6Cells	452W	10*4.7/12*3.8	85g
MTO4628-470-MK	470	Φ46*28.0mm	3-6Cells	610W	13*6.5/14*4.7	105g
MTO4634-360-MK	360	Φ46*34.0mm	3-7Cells	323W	15*5.5	150g

Brushless Gimbal Motor: Pre-winded on basis of multicopter motor, with high quality copper, good balance.

Model No.	Turns	Copper	Dimension	Weight	Model No.	Turns	Copper	Dimension	Weight
MTGBM2208	80	0.15mm	Φ28.0*25.0mm	39g	MTGBM4108	130	0.15mm	Φ46.0*28.0mm	83g
MTGBM2212	70	0.15mm	Φ28.0*30.0mm	49g	MTGBM4114	100	0.17mm	Φ46.0*34.0mm	136g
MTGBM3608	70	0.18mm	Φ42.0*28.5mm	73g	MTGBM4215	120	0.19mm	Φ27.5*35.0mm	66g
MTGBM4008	60	0.19mm	Φ45.0*24.0mm	86g	MTGBM5010	150	0.21mm	Φ27.5*35.0mm	160g

Inrunner Motors: Specially designed for RC Boats, RC Cars: for more in-runners info, pls contact MAYTECH sales staff.

Model No.	KV	Dimension	Shafts	ID	In-put Volt	Weight
MTI3650-6T	5900	Φ35.8*50.0mm	Φ5mm	6.8A	6-18V	223g
MTI3660-8T	5900	Φ35.8*60.0mm	Φ5mm	4.1A	6-18V	250g
MTI3665-9T	2150	Φ35.8*65.0mm	Φ5mm	2.8A	6-18V	310g
MTI3674-10T	1660	Φ35.8*74.0mm	Φ5mm	2.5A	6-18V	370g
MTI4577-8T	1600	Φ45*77.0mm	Φ6mm	3.8A	6-18V	555g
MTI2848-MR-6T	6560	Φ27.7*48.0mm	Φ3.175mm	4.5A	6-18V	165.4g
MTI2858-MR-6T	4811	Φ27.7*58.0mm	Φ3.175mm	4.4A	6-18V	207.8g
MTI3660-MR-6T	4090	Φ35.8*60.0mm	Φ5mm	5.8A	6-18V	322.4g
MTI3674-MR-6T	2770	Φ35.8*74.0mm	Φ5mm	5.4A	6-18V	410.4g

High Speed & High Torque Servos: In the below are typical and popular items, for more servos info, pls contact MAYTECH sales staff.

Model No.	Weight	Speed	Torque	Operating Volt	Ball Bearing	Gear
MTAS001P-Analog	3.7g	0.12sec/60°	≥0.7kg.cm	4.8V--6V	No	Plastic
MTAS002P-Analog	4.3g	0.10sec/60°	≥0.8kg.cm	4.8V--6.0V	No	Plastic
MTAS004P-Analog	6.0g	0.10sec/60°	≥1.2kg.cm	4.8V--6.0V	No	Plastic
MTAS005P-Analog	8.0g	0.10sec/60°	≥1.4kg.cm	4.8V--6.0V	No	Plastic
MTAS007M-Analog	14.0g	0.10sec/60°	≥2.5kg.cm	4.8V--6.0V	Yes	Metal
MTAS008M-Analog	50.0g	0.16sec/60°	≥3.0kg.cm	4.8V--6.0V	Yes	Metal
MTAS009M-Analog	15.0g	0.10sec/60°	≥2.2kg.cm	4.8V--6.0V	Yes	Metal
MTAS010M-Analog	20.0g	0.12sec/60°	≥2.5kg.cm	4.8V--6.0V	No	Metal
MTAS012M-Analog	21.0g	0.10sec/60°	≥4.0kg.cm	4.8V--6.0V	Yes	Metal
MTAS015M-Analog	52.0g	0.18sec/60°	≥6.0kg.cm	4.8V--7.2V	Yes	Metal
MTAS016P-Analog	40.0g	0.12sec/60°	≥6.0kg.cm	4.8V--6.0V	Yes	Plastic
MTAS017M-Analog	56.0g	0.14sec/60°	≥7.0kg.cm	4.8V--6.0V	Yes	Metal
MTAS018M-Analog	56.0g	0.14sec/60°	≥9.0kg.cm	4.8V--7.2V	Yes	Metal
MTAS020M-Analog	56.0g	0.20sec/60°	≥11.0kg.cm	4.8V--6.0V	Yes	Metal
MTAS024M-Analog	56 .0g	0.14sec/60°	≥12.0kg.cm	6.0V--7.2V	Yes	Metal
MTAS025M-Analog	56.0g	0.14sec/60°	≥13.0kg.cm	6.0V--7.2V	Yes	Metal
MTAS026M-Analog	56.0g	0.14sec/60°	≥14.0kg.cm	6.0V--7.2V	Yes	Metal
MTAS027M-Analog	62.0g	0.16sec/60°	≥15.0kg.cm	6.0V--7.2V	Yes	Metal
MTDS001M-Digital	14.0g	0.09sec/60°	≥1.8kg.cm	4.8V--6.0V	Yes	Metal
MTDS003M-Digital	15.0g	0.10sec/60°	≥2.5kg.cm	4.8V--6.0V	Yes	Metal
MTDS005PCS-Digital	25.0g	0.07sec/60°	≥4.5kg.cm	4.8V--6.0V	Yes	Plastic
MTDS006MCS-Digital	30.0g	0.07sec/60°	≥5.5kg.cm	4.8V--6.0V	Yes	Metal
MTDS007MCS-Digital	30.0g	0.07sec/60°	≥7.0kg.cm	4.8V--6.0V	Yes	Metal
MTDS012MCS-Digital	56.0g	0.14sec/60°	≥10.0kg.cm	4.8V--6.0V	Yes	Metal
MTDS013MCS-Digital	56g	0.14sec/60°	≥11.5kg.cm	4.8V--6.0V	Yes	Metal
MTDS014MCS-Digital	56g	0.14sec/60°	≥13.0kg.cm	4.8V--6.0V	Yes	Metal
MTDS015MCS-Digital	56g	0.23sec/60°	≥14.0kg.cm	4.8V--6.0V	Yes	Metal
MTDS016MCS-Digital	56g	0.23sec/60°	≥15.0kg.cm	4.8V--6.0V	Yes	Metal
MTDS018MCS-Digital	56g	0.13sec/60°	≥18.0kg.cm	4.8V--6.0V	Yes	Metal

Electronic Propellers: Some popular items (inch)

Model No.	Size	Model No.	Size	Model No.	Size	Model No.	Size
MTEP4545	4.5*4.5	MTEP0938	9*3.8	MTEP1208	12*8	MTEP0838SF	8*3.8
MTEP0505	5*5	MTEP0947	9*4.7	MTEP1210	12*10	MTEP0843SF	8*4.3
MTEP0603	6*3	MTEP0906	9*6	MTEP1212	12*12	MTEP0806SF	8*6
MTEP0604	6*4	MTEP1005	10*5	MTEP1308	13*8	MTEP0938SF	9*3.8
MTEP0605	6*5	MTEP1006	10*6	MTEP1407	14*7	MTEP0947SF	9*4.7
MTEP0703	7*3	MTEP1007	10*7	MTEP1408	14*8	MTEP0906SF	9*6
MTEP0704	7*4	MTEP1155	11*5.5	MTEP1410	14*10	MTEP1047SF	10*4.7
MTEP0838	8*3.8	MTEP1107	11*7	MTEP1575	15*7.5	MTEP1045-Standard	10*4.5
MTEP0804	8*4	MTEP1185	11*8.5	MTEP1510	15*10	MTEP1045-Pusher	10*4.5
MTEP0805	8*5	MTEP1110	11*10	MTEP7060	7*6	MTEP1245-Standard	12*4.5
MTEP0806	8*6	MTEP1206	12*6	MTEP8060	8*6	MTEP1245-Pusher	12*4.5

Folding Blades: MTEF1006 Size:10*6 | MTEF1106 Size:11*6 | MTEF1108 Size:11*8 | MTEF1265 Size:12*6.5

Other Accessories : Some popular items

Failsafe-MTFS0609 : 40*21*8.5mm/ 4.8-6V/7mA(4.8V)	Battery balancer & watt meter:105*50*20mm/5-36V/Li-X/0-100A
UBEC-5A : 32*22*7mm / 2-10cells / 6V / 5A	UBEC-4A : 36*12*8mm / 2-6cells / 6V / 4A
Prog-card-HS : FOR Harrier- Suprem ™ Series ESCs / 49mm*30mm / 6.5g	Prog-card-CS : FOR Cheetah™ Car Series ESCs / 68*43mm / 25g
Prog-card-HX : FOR Harrier-eXTrem™ Series ESCs / 70mm*45mm / 25g	Prog-card-HA: FOR Harrier-Advance™ Series ESCs / 45*25mm / 14g