CASTLE CREATIONS™ INC.

MAMBA MAX™ USER GUIDE

10TH SCALE ESC

WARNING: This is an extremely powerful brushless motor system. We strongly recommend removing your pinion gear for your own safety and the safety of those around you before performing calibration and programming functions with this system. Please keep your hands, hair, pets, fuzzy purple shorts and garden gnomes clear from the gear train and wheels of an armed high performance system.

Rubber tires will "grow" to extreme size on a high speed vehicle. DO NOT hold the vehicle in the air and run it up to full throttle. Tire failures at speed can cause serious injury! Make sure your tires are securely glued to the rims and check them often!

QUICK START GUIDE

1. Solder a high quality battery connector to the ESC
2. Mount ESC and motor into the car
3. Plug in the 3 motor wires to the 3 motor wires on the ESC
4. Plug in the ESC Rx lead to CH2 on your receiver
5. Make sure the ESC's switch is off
6. Plug in a battery
7. Holding full throttle on your transmitter, turn the switch ON
   A. After a few seconds you'll hear multiple tones and the red LED will come on
   B. Now hold full brake and after a few seconds you'll hear multiple tones and the yellow LED will come on
   C. Now relax to neutral and after a few seconds you'll hear multiple tones and ALL the LED's will light up
   D. A few seconds later the ESC will arm with a double tone and you're ready to go!

THANK YOU FOR PURCHASING THE MOST ADVANCED 1/10TH SCALE ESC AVAILABLE!

This is the most technically advanced and configurable ESC on the market. It is extremely simple to set up and optimize for any 1/10th scale application. The Castle Link cable and software provide an entirely new level of control. With the Castle Link software, you can tune the ESC exactly with point and click ease! *Make sure to read through this manual completely to get the most from your Mamba Max ESC.* The Mamba Max ESC can be used with any brushed or brushless 540 size motor. As with any extremely high powered electric power system, the primary limitations to ultimate vehicle performance are the batteries and connectors. Use the best batteries you can find. We recommend GP3300, GP3700, or IB3800/4200 cells, and Deans Ultra connectors to flow the most power for best acceleration performance. The Mamba Max ESC may limit acceleration performance depending on the voltage of the batteries under load. The better the batteries, the more punch you'll have!

POWER WIRING

Your Mamba Max ESC has motor connectors on the motor wires and the battery input wires are bare. You must add the connector of your choice to the battery leads. We recommend a connector rated for 40-100amps, such as Deans Ultra or Astro Flight Zero Loss.

Proper polarity is essential here! Make absolutely sure positive (+) connects to positive (+), and negative (-) connects to negative (-) when you plug in your battery! If reverse polarity is applied to your ESC from the battery, it WILL damage your ESC. This WILL NOT be covered under warranty!

BRUSHLESS MOTOR WIRING

(See Figure 1: Brushless Motor Setup) For brushless motor connection, the three wires from the ESC to the motor have no polarity. Connect the red, white and black motor wires to the three wires coming from the motor. If you are using a motor other than a Castle Creations CM36 motor, you may need to either solder on matching male bullet plugs to your motor, or solder the ESC wires directly to the motor wires.

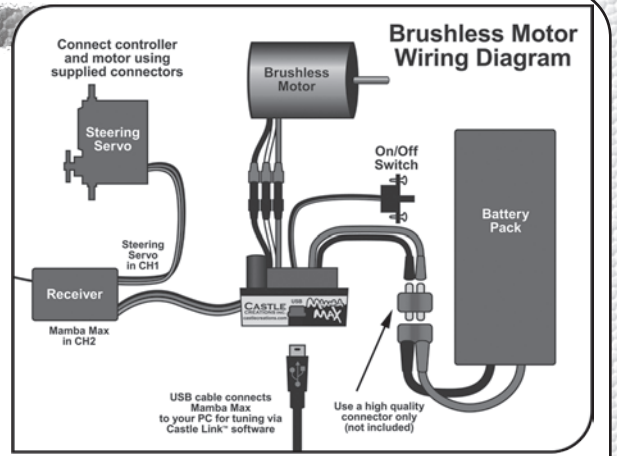


Figure 1: Brushless Motor Setup

If you choose to direct solder or to shorten the motor wires, you may do so on the Castle Creations CM36 motors only. DO NOT CUT any part of the wire length from any other motor, regardless of brand or type. In most cases, only the last 1/4 inch or so of most motor wires are able to be soldered . If they are clipped shorter, the motor will not run properly, or may not run at all. You may also void the warranty of that motor. If the motor is supplied with connectors you do not want to use, then make sure to unsolder the original motor connectors from the wires - do not cut them off.

After the calibration process below, it may be necessary to swap two of the three motor wires to provide the correct motor rotation when forward throttle is given. There is no polarity on the three ESC-to-motor wires, so no worries about which one from the ESC goes to which one on the motor.

BRUSHED MOTOR WIRING

(Note: There is no motor limit with either Reversing Brushed, or High Power Brushed Wiring methods.)

REVERSING BRUSHED MODE:

(See Figure 2: Reversing Brushed Motor Setup) Use this mode if you wish to use reverse. Use only the red and black motor wires from the ESC. In most applications, the red

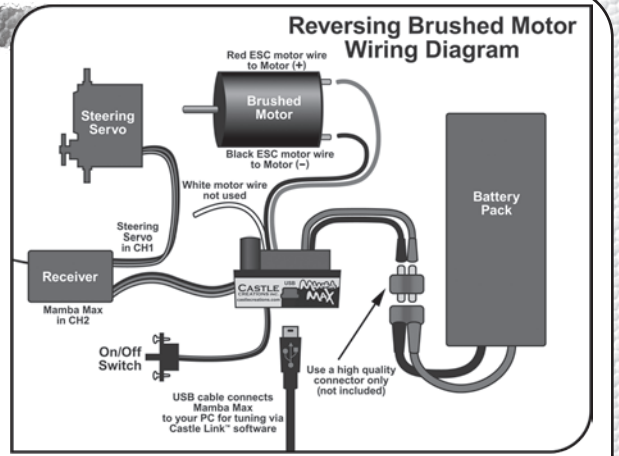


Figure 2: Reversing Brushed Motor Setup

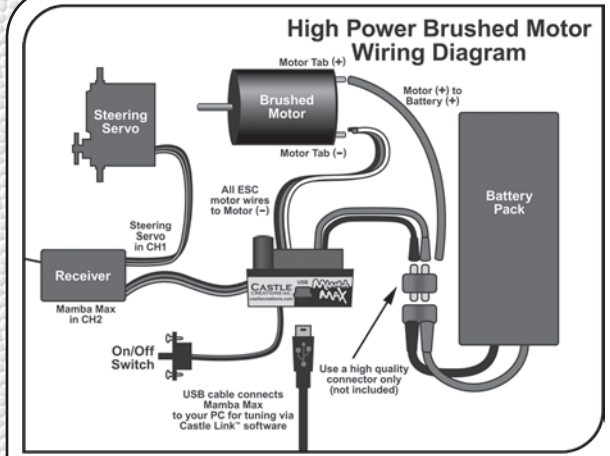


Figure 3: High Power Brushed Motor Setup

wire from the ESC will connect to the red wire (or positive {+} side hood) on your motor, and the black wire to the black wire (or negative {-} side hood) of the motor. The white motor wire is not used. After calibration, (explained below) you may need to swap the two motor wires to get the wheels to spin in the right direction.

HIGH POWER BRUSHED MODE:

(See Figure 3: High Power Brushed Motor Setup) Connect

all three of the ESC motor wires to the negative (-) side of the motor. You can either use a “Y” harness from the ESC battery input positive wire to connect to both the battery and the positive side of the motor, or use a single wire from the positive ESC input to the positive battery pole and then continue to the positive (+) side of the motor.

RADIO CONNECTION

The steering servo plugs into channel 1 of the receiver, and the Mamba Max receiver wire plugs into channel 2. The Mamba Max ESC provides 5 volts to the receiver to power the receiver itself and the steering servo. No separate receiver battery is needed to power the radio system. Your receiver needs to be a “BEC capable” receiver. Most modern receivers are.

The Mamba Max ESC receiver plug is made to be universal for use with any receiver, so you need to make sure the polarity is correct as it’s plugged into channel 2. The signal wire is orange, the positive wire is red, and the negative is brown. Some radio systems use white for signal, red for positive and black for negative color scheme. Check your receiver documentation for correct connection polarity if it’s not marked. (Most receivers use negative to the outside of the case and signal towards the inside of the case.)

CALIBRATION

Don’t plug in the battery yet! Make one more check that the battery polarity and input polarity on the ESC are correct, and the battery connectors are wired with the correct polarity as well. Check the on/off switch of the Mamba Max ESC. Make sure it is in the OFF position (“ON” is marked in small letters on one side).

If you are using a Futaba or Futaba OEM brand transmitter, you will need to set the transmitter’s throttle channel direction to the REVERSE (Rev) position. This is either an external micro switch on the transmitter or an option available within the computer programming of the transmitter’s throttle channel.

Anytime the ESC is powered up with a new transmitter, or with different throttle channel settings, it will need to be calibrated to “know” what the transmitter’s settings are. It will also need to be calibrated after updating to new software via Castle Link™.

We’ll calibrate the ESC now.

⚠ ***We recommend removing your pinion gear before calibration as a safety precaution!***

STEP 1: We’re starting with the transmitter ON and the ESC switched OFF and not connected to the battery.

STEP 2: Plug a battery into your Mamba Max ESC.

STEP 3: Hold full throttle on the transmitter and switch the ESC’s switch ON. Keep holding full throttle on the transmitter. If all your connections are correct, you will hear one multi-toned initialization “ring” from the motor (all tones are played by the ESC vibrating the motor). This tone should always play when the ESC is first powered up.

STEP 4: After a second or two, the green LED on the ESC will blink rapidly and the motor will “ring” 4 times rapidly in a row (accepting the full throttle endpoint).

STEP 5: After the green LED flashing and ringing tones, the ESC will blink the red LED. At this point the full throttle endpoint has been set within the ESC and now it’s looking for the full brake endpoint (red LED blinking). Move the throttle trigger to the full brake position and hold full brake.

STEP 6: After a few seconds, the ESC will flash the red LED and ring 4 times

rapidly (accepting full brake endpoint).

STEP 7: After accepting the full brake endpoint the ESC will then blink the yellow LED. Now relax the trigger to the neutral position.

STEP 8: The ESC will now ring 4 times and flash the yellow LED rapidly to accept the neutral position.

STEP 9: After accepting the neutral position the ESC will ring twice and flash ALL the LEDs. This is the arming tone/LED reaction. **The ESC IS NOW ARMED and the car will respond to throttle inputs from your transmitter.**

Once calibrated, the ESC will give the initialization tone and flash after a battery is plugged in and the switch is turned on, and the arming tone will ring a second or two later. If the ESC is programmed for the Auto-Lipo setting, it will beep the

number of cells in your Lipo pack between the initialization tones and the arming tones. After the arming tone plays, the ESC is ACTIVE and will respond to throttle application.

If you have problems calibrating your transmitter with the Mamba Max ESC, please see the troubleshooting guide on page 33 for more tips.

Once you are calibrated and armed, do one last check before going out and experiencing the Mamba Max difference. Slowly advance the throttle and check the rotation direction of the motor and the color of the LEDs on the ESC. If the motor is spinning in the right direction and the GREEN LED is blinking green, then you are ready for a test run before going into the settings of the ESC. If the ESC shows the green LED with throttle, but the wheels spin in the wrong direction, you'll need to switch any two of the motor wires (from red to red and black to black, to red to black and black to red). *Remember, there is no polarity on the*

motor side wires, it only controls which direction the motor spins.

A SPECIAL NOTE ON BATTERIES: Very high power electric systems can often expose any weakness within the power system. A brushless motor simply draws whatever power is available in order to do its work and the ESC is merely a gateway for the power to flow from the battery to the motor.

The real capability of a high performance electric power system depends on the batteries. The better the battery, the more power it can flow to the motor, and the more work the motor can do. Better batteries will give you more punch, and more speed than generic inexpensive cells. Expensive top-of-the-line cells aren't required for this system to operate normally, but the best cells will certainly make use of all the power and speed the motor can make for you.

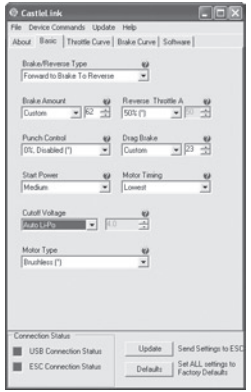
Poor quality battery connectors can be a similar roadblock to performance. Avoid the common "white plastic" connectors commonly seen on many battery packs. A fast brushless setup will draw many times the power that these connectors can safely handle. Invest in connector sets made for high powered electric systems such as the common Deans Ultra plugs.

CASTLE LINK SET-UP

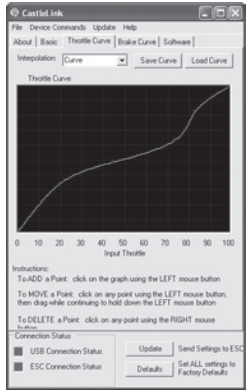
Your Mamba Max ESC comes with a USB cable and a CD with the Castle Link installation software. These give you access to a whole new world of tuning options. Load the CD into your PC and you'll soon be experiencing the next generation of programming ease and flexibility. As new features become available, you can download them into your Mamba Max ESC for "real time"

updates! All of this is free and ensures your Mamba Max ESC will never be outdated.

To use: install the software on your computer, connect the large end of the supplied USB cable to a USB port on your PC, and start the Castle Link software. Connect the small end of the USB cable to the side of your Mamba Max ESC and enjoy the Castle Creations difference!



Screen shot of the basic settings page of the Castle Link software for the Mamba Max



The brake and throttle response curves are fully manipulatable

MANUAL PROGRAMMING

To change settings on your Mamba Max ESC without a computer:

⚠ ***We recommend removing your pinion gear before calibration and manual programming as a safety precaution!***

STEP 1: We're starting with the transmitter ON and the ESC switched OFF and not connected to the battery.

STEP 2: Plug a battery into the ESC. Hold full throttle on the transmitter and turn the ESC switch ON. After a few seconds you will get the four rings in a row signaling full throttle calibration. Keep on holding full throttle.

STEP 3: After a few more seconds, you will hear another four rings in a row. After the second group of four rings, relax the throttle to neutral. If you have successfully entered programming mode, the ESC will beep twice, pause, and repeat the two beeps.

The programming sequence is always presented in sequential order and always starts with the first setting **(Reverse Lockout)** within the first section **(Reverse Type)**. The first beep(s) signifies which section of the programming you are in and the second beep(s) signify which setting is waiting for a “yes” or “no” answer.

As you go sequentially through the options, ***you will need to answer “yes” by holding full throttle, or answer “no” by holding full brake*** until the ESC accepts your answer by beeping rapidly. Once an answer has been accepted, relax the throttle back to neutral for the next question. After a “no” answer is accepted, the ESC will then present you with the next option in that section. After a “yes” answer is accepted, the ESC knows you aren’t interested in any other option in that section, so it skips to the first option in the next section.

SETTINGS EXPLANATIONS

The Mamba Max ESC is extremely flexible and may be “tuned” like any other part of your car or truck. The following section explains all the settings available to you via manual programming and what each one does to change the reactions of the ESC in order to tune it to your specific preferences. More settings are available via Castle Link.

1. BRAKE/REVERSE TYPE

Sets whether reverse is enabled or not, and exactly how it can be accessed.

Setting 1: Reverse Lockout *(Default)*
This setting allows the use of reverse only after the ESC senses two seconds of neutral throttle. Use it for race practice sessions and bashing, but check with your race director to see if this setting is allowed for actual racing.

Setting 2: Forward/Brake Only
Use this setting for actual sanctioned racing events. Reverse cannot be accessed under any circumstances with this setting.

Setting 3: Forward/Brake/Reverse
Reverse or forward is accessible at any time after the ESC brakes to zero motor RPM (if the vehicle is moving).

2. BRAKE AMOUNT

Sets what percentage of available braking power is applied with full brake.

Setting 1: 25% Power
Allows only 25% of available braking power at full brake.

Setting 2: 50% Power *(Default setting)*
Allows only 50% of available braking power at full brake.

Setting 3: 75% Power
Allows 75% of available braking power at full brake.

Setting 4: 100% Power
Allows all available braking power at full brake.

3. REVERSE AMOUNT

Sets how much power will be applied in the reverse direction, if reverse is enabled.

Setting 1: 25% Power
Allows only 25% power in reverse.
Setting 2: 50% Power *(Default)*
Allows only 50% power in reverse.

Setting 3: 75% Power
Allows only 75% power in reverse.

Setting 4: 100% Power
Allows 100% power in reverse.

4. PUNCH/TRACTION CONTROL

This setting controls how fast the throttle position within the ESC can be changed over time. This smooths high power starts and limits punch somewhat. As explained previously, acceleration is a matter of battery capability, but you may not want 100% of what the battery can deliver in every situation.

This setting is crucial to drag racing as it can be used as a “software clutch” to match traction conditions. An infinite amount of adjustment is now available to match traction conditions and driving style to a track.

The lower the setting, the less throttle

change limiting there is. For pure burnout and wheelie action, use a very low setting or the disabled setting. For softer acceleration or for a low-grip surface, raise it up to a higher setting.

Setting 1: High
Very limited acceleration. Good for 2WD vehicles on hard dirt, or for general bashing when you want to be gentle on the transmission.

Setting 2: Medium
Medium acceleration limiting. Good for 2WD vehicles on soft dirt, and 4WD vehicles on hard dirt.

Setting 3: Low
Light acceleration limiting. Good for 4WD vehicles on soft dirt.

Setting 4: Lowest
Very light acceleration limiting. Good for most situations including 4WD vehicles on dirt and asphalt, and 2WD vehicles on asphalt.

Setting 5: Disabled *(Default)*
Acceleration is only limited by battery ability. This setting is good for 4WD

sedans on carpet, high traction drag racing, or bashing where unlimited wheelie power is desired.

5. DRAG BRAKE

Sets the amount of drag brake applied at neutral throttle to simulate the slight braking effect of a neutral brushed motor while coasting.

Setting 1: Drag Brake OFF *(Default)*
Vehicle will coast with almost no resistance from the motor at neutral throttle.

Setting 2: Drag Brake 10%
Low amount of braking effect from the motor at neutral throttle.

Setting 3: Drag Brake 20%
More braking effect from the motor at neutral throttle.

Setting 4: Drag Brake 30%
Fairly high braking effect from the motor at neutral throttle.

Setting 5: Drag Brake 40%
High braking effect from the motor at neutral throttle.

6. START POWER

This setting controls how much power is allowed to flow to the motor to get the vehicle moving from a stop.

This setting does not control “punch” or off the line acceleration. Certain vehicles need more motor power to get moving smoothly than others (especially in brushless mode) so this can be the most important setting when configuring your Mamba Max ESC for smooth starts. Generally, 4WD vehicles on high-traction surfaces need more power than 2WD buggies and stadium trucks on dirt. The faster the setup the higher the start power should be as well (high Kv motors and any motor on 3 cell Lipo packs). Experiment with this setting in your particular vehicle to find which you like the best.

Setting 1: Low *(Default)*
Good for 2WD buggies and stadium trucks on dirt.

Setting 2: Medium
Good for most applications on dirt, carpet or asphalt

Setting 3: High
Good for very high-grip surfaces with 4WD and very fast top speed setups.

7. CUTOFF VOLTAGE

Sets the voltage at which the ESC lowers or removes power to the motor in order to either keep the battery at a safe minimum voltage (Lithium Polymer cells) or the radio system working reliably (NiCad/NiMH cells).

Setting 1: None *(Default)*
Does not cut off or limit the motor due to low voltage.

⚠ Use this setting ONLY with NiCad or NiMH packs. With continued driving, the radio system may eventually cease to deliver pulses to the servo and ESC, and the vehicle will not be under control. You will irreversibly damage Lithium Polymer packs with this setting!

Applications: Any racing or bashing situation with 6-8 cell NiCad or NiMH packs.

Setting 2: Auto-Lipo
This setting allows you to go back and forth between 2 and 3 cell lipo packs without having to change the cutoff voltage for each one. The ESC automatically sets the cutoff voltage correctly for a 2 or 3 cell pack when that pack is plugged in.

Setting 3: 5v
Cuts off/limits the motor speed/ acceleration when the pack gets down to 5 volts. A good setting for racing or bashing in any vehicle using 8-12 NiMH or NiCad packs.

Do not use with any Lithium Polymer packs!

Setting 4: 6v
Cuts off/limits acceleration when the pack gets down to 6 volts.

A MUST USE setting for 2 cell (7.4v) Lithium Polymer packs. You will irreversibly damage your packs using a lower cutoff voltage!

Setting 5: 9v
Cuts off/limits acceleration when the pack gets down to 9 volts.

A MUST USE setting for 3 cell (11.1v) Lithium Polymer packs. You will irreversibly damage your packs using a lower cutoff voltage!

Setting 6: 12v
Cuts off/limits acceleration when the pack gets down to 12 volts.

A MUST USE setting for 4 cell (14.8v) Lithium Polymer packs. You will irreversibly damage your packs using a lower cutoff voltage!

8. MOTOR TIMING

Advancing the timing on an electric motor can have varying effects. Lowering the timing advance will reduce the amp draw, increase runtime, reduce motor/battery temperature, and may slightly reduce top speed and punch. Raising the timing advance will increase amp draw, decrease runtime, increase motor/battery temperature, and may slightly increase top speed and punch.

If you are after maximum top speed, it's

better to “gear up” to get it rather than advance the timing too far.

For brushed motors, always keep this setting on ***NORMAL*** and use the end bell of the motor to “tweak” it to max RPM per the motor’s instructions.

Setting 1: Lowest
A maximum efficiency setting giving long runtimes and cooler motor temps. Very useful with high Kv (low turn) motors to increase motor life and reduce motor/battery temperatures.

Setting 2: Normal *(Default)*
The best mix of speed, punch, and efficiency for all motors.

Setting 3: Highest
Increases amp draw, reduces runtimes, increases motor/battery temperatures, and may increase top speed/punch slightly.

⚠ ***Use with care, and monitor motor and battery temps often! DO NOT use any setting above “normal” with 6000Kv or higher motors.***

9. MOTOR TYPE

This setting sets which type of motor you will be using with the Mamba Max ESC. The ESC may be damaged if this setting does not match the motor type/ hook-up method in the car, and this damage is not covered under warranty.

Setting 1: Brushless *(Default)*
(See Figure 1: Brushless Motor Setup on page 6) Uses all three of the ESC motor wires connected to all three of the brushless motor wires. If the motor spins the wrong way with forward throttle, swap any two of the wires to get the correct direction.

Setting 2: Brushed Reversing
(See Figure 2: Reversing Brushed Motor Setup on page 8) Uses the Red and Black ESC motor wires to connect to the (+) and (-) side of the brushed motor. If the motor spins in the wrong direction with forward throttle, reverse the motor wires for correct motor direction.

Setting 3: Brushed High Power
(See Figure 3: High Power Brushed Motor Setup on page 9) Connect all three of the ESC motor wires to the negative (-) side of the motor. You can either use a "Y" harness from the ESC battery input positive wire to connect to both the battery and the positive side of the motor, or use a single wire from the positive ESC input to the positive battery pole and then continue to the positive (+) side of the motor.

USAGE SPECIFICATIONS

- Do not use a higher advance setting than "normal" on any 6000Kv or higher motor.
- Do not use more than 8 cells or 2s Lipo with the CM36s-7700Kv motor
- Do not exceed 200 degrees F on the CM36 motors.

⚠ ***Any use outside of these specifications may result in component damage and will NOT be covered under warranty repair.***

TROUBLESHOOTING

If you're still having difficulties with your Mamba Max ESC after trying the suggestions offered here, please contact Castle Creations technical support at the e-mail or phone number in the next section.

Problem: My ESC may or may not arm, but it will not calibrate to my transmitter.

Solution: Most calibration issues can be solved by changing settings on the transmitter. Make sure you have both your throttle and brake endpoints (called EPA or ATV on your radio) on the throttle channel out to between 100 to 120%. Make sure if you have a Futaba or Futaba made transmitter to have the throttle channel set to the reversed position.

Problem: My ESC calibrates for the full throttle and full brake positions but won't calibrate to the neutral throttle position (yellow LED keeps flashing).

Solution: Try moving the throttle trim one way, then the other (usually towards the throttle side is best). If your transmitter has a 50/50 and 70/30 setting for the throttle, set it for 50/50 and retry calibration.

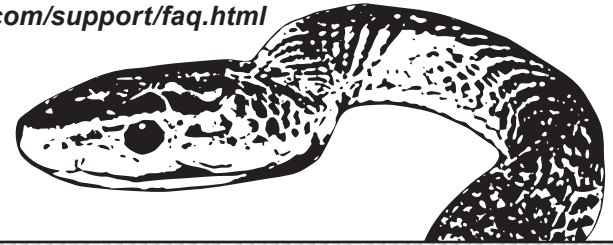
Problem: My vehicle acts like it has "turbo lag" (poor acceleration/punch for the first few feet or yards, and then it "kicks in").

Solution: Make sure you're using high quality batteries and a battery connector capable of high amp flow (40-100Amps). This behavior is very typical of a battery pack that is having difficulty providing the power your vehicle/system requires for top performance.

Problem: My battery pack is plugged into the ESC and nothing is working - no steering, and no throttle.

Solution: Make sure the ESC's receiver plug is plugged into channel 2 on the receiver, and that it's plugged in with the correct orientation. Double check your solder connections on the battery plug.

Look for more troubleshooting tips on the Castle Creations website at: www.castlecreations.com/support/faq.html



TECHNICAL SUPPORT

You may contact our world class technical support department 24/7 via e-mail, or from 9am to 5pm Central time Monday through Friday.

E-mail: support@castlecreations.com
Phone: 913-390-6939

CONTACT & WARRANTY INFO

Your Mamba Max ESC is warranted for one (1) year from date of purchase to be free from manufacturing and component defects. This warranty does not cover abuse, neglect, or damage due to incorrect wiring, over voltage, or overloading. The flat rate charge for non-warranty repair/replacement (for any reason) is $50 for your Mamba Max ESC, and $45 for any CM36s motor. If you have any

questions, comments, or wish to return your Mamba Max for warranty or non-warranty repair/replacement, please contact Castle Creations, Inc. at:

Castle Creations, Inc.
235 South Kansas Avenue
Olathe, Kansas 66061 USA
www.castlecreations.com

QUICK PROGRAMMING REFERENCE

1: Brake/Reverse Type
Option 1: Reverse Lockout ***(D)****
Option 2: Forward/Brake Only
Option 3: Forward/Brake/Reverse

2: Brake Amount
Option 1: 25%
Option 2: 50% ***(D)****
Option 3: 75%
Option 4: 100%

3: Reverse Amount
Option 1: 25%
Option 2: 50% ***(D)****
Option 3: 75%
Option 4: 100%

** Denotes Default Setting*

4: Punch Control
Option 1: High
Option 2: Medium
Option 3: Low
Option 4: Lowest
Option 5: Disabled ***(D)****

5: Drag Brake
Option 1: Disabled ***(D)****
Option 2: 10%
Option 3: 20%
Option 4: 30%
Option 5: 40%

6: Start Power
Option 1: Low ***(D)****
Option 2: Medium
Option 3: High

7: Voltage Cutoff
Option 1: None ***(D)****
Option 2: Auto-Lipo
Option 3: 5
Option 4: 6
Option 5: 9
Option 6: 12

8: Motor Timing
Option 1: Lowest
Option 2: Normal ***(D)****
Option 3: Highest

9: Motor Type
Option 1: Brushless ***(D)****
Option 2: Brushed Reversing
Option 3: Brushed High Power

MAKE 'EM CRY!

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