

# MAMBA MAX PRO

## QUICK START GUIDE

### THE 1/10<sup>TH</sup> MAMBA THAT ROARS!



Mamba Max Pro is the first Castle car speed controller able to utilize sensored motor signals. The Mamba Max Pro features listed below are only programmable via the Castle Link and a Windows based computer. If you do not already have a Castle Link, you may use the coupon included in this package for a free Castle Link. The sensored features are new, but everything else about the Mamba Max Pro operates like all other Castle car ESCs. Please refer to the included Driver's Ed. Manual for complete details on the standard Castle feature set.

#### Let's get started:

1. Connect your motor to the ESC:

Sensored operation requires you to connect the three motor wires to the ESC in the correct order.

**Incorrect connections on a sensored motor will cause abnormal operation and there is a strong possibility of damage to both the motor and speed control.** Your sensored motor will have the wires marked as A, B & C. The Mamba Max Pro motor wires have the same markings. Plug A into A, B into B and C into C. For sensored operation, be sure to plug the motor's sensor cable into the sensor port on the side of the controller.

2. Power everything up and calibrate the ESC to your transmitter. Calibration is discussed in the Driver's Ed. Manual.

3. Drive off with the Mamba Max Pro delivering the power!

### COOL FEATURES YOU CAN TAKE ADVANTAGE OF WITH CASTLE LINK

#### Motor Type - Sensored Only or Smart Sense

The Mamba Max Pro offers two new operating modes, both of which will use the sensors if they are connected and functioning properly.

1. **Smart Sense mode** combines the best of sensored and sensorless operation. The ESC uses the sensors for motor startup and then switches to the dynamic timing of sensorless mode for maximum efficiency and lowest heat generation. If you are using a sensorless motor or your sensors are not functioning properly, the ESC will use a sensorless start technique. **Use Smart Sense with all sensorless motors, this is the default setting.**

2. **Sensored Only mode** relies exclusively on the sensors to determine timing. This mode is not the most efficient and it can generate more heat in the motor. Sensored Only mode requires that you have a motor with operating sensors and that the sensor wires are connected to the controller. If the sensor wires are not connected or the controller detects that the sensors are not working, the controller will revert to Smart Sense mode. Once you select Sensored Only mode, you may choose to use the Castle High Energy Advanced Timing (CHEAT) settings.

## **CHEAT Mode**

CHEAT mode gives you the ability to program the controller to run with very high amounts of electronic timing advance or Timing Boost. Timing boost can wring more power from the motor system, but it will also dramatically increase the amount of heat generated in the motor and ESC. CHEAT mode timing is based on the motor's sensor position. If your motor has adjustable end-bell timing, set it to 0° of timing advance or as low as possible. You will then be able to use the CHEAT mode settings to dynamically adjust motor timing for optimum acceleration and top end speed.

**⚠ CHEAT mode requires the controller be set to Sensored Only mode and a sensored motor must be properly attached to the controller. It does not work with sensorless motors. It is not recommended for high Kv (low turn) sensored motors.**

**⚠ Just like in full scale racing, all the components in your system have limits. Using CHEAT mode too aggressively can generate enough additional motor heat to destroy the motor and possibly damage your entire system. Use this feature with caution.**

## **CHEAT Mode Timing Boost**

This setting will allow you to adjust the maximum amount of electronic timing advance is delivered to your motor. It is adjustable from 1 to 30 in 1 degree increments. There is no default set.

## **CHEAT Mode Activation Range**

CHEAT Mode's Activation Range Setting controls the gradual application of Timing Boost, which gives a smooth transition from 0° of timing boost to the amount selected in CHEAT Mode Timing Boost. You can set the RPM at which the boost starts to engage and the RPM at which it is fully engaged, allowing you maximum low end torque and top end speed. This setting is highly adjustable from RPMs as low as 1,900 to over 100,000 RPM. There is no default set.

Getting the highest possible power output from high turn count slotted motors (i.e. stock motors) may require experimentation. You will want to set the start of your activation range high enough that low end punch is still present, but low enough that the full CHEAT Timing Boost will be in effect at top-end RPMs. Remember, higher timing will increase peak power output at high RPMs (top end speed). Higher timing also lowers motor efficiency, creates more heat in the motor, and decreases low end punch.

## **BEC Voltage**

BEC Voltage selects the output voltage of the onboard switching battery eliminator circuit (BEC). This output powers your radio and servos. Most servos are rated for up to six (6) volts. If your radio equipment is rated for a higher voltage, you may choose to set the BEC voltage higher. Higher BEC output voltages will usually result in faster and stronger servo movements. Using too high of a voltage can damage the receiver and/or servo(s). This setting is adjustable from 5.0 to 7.2 in .1 volt increments. Default is 5.5 volts.

**A word about the cooling fan:** Your Mamba Max Pro will switch the cooling fan on and off as necessary.

