PRODUCT USE STATEMENTS

APPLICATION GUIDELINES

Designed for use in 1/7th and 1/5th scale RC vehicles. The Cobra 5 is not intended for drag racing applications and the one-year warranty does not cover the use of the system outside if its intended use. Drag and speed run setups are inherently abusive and exceedingly hard on all electronic components. Every component in the configuration can be strained, weakened or worse without extreme caution. High speed runs and drag racing are the most aggressive and volatile applications in the RC car hobby. Improper setup or use of this product can result in catastrophic failures of the motor, esc and/or batteries. For this reason, Castle does not warranty products used in these abusive applications.

CALIBRATION

- Individual transmitter signals for neutral, full throttle, and full brake vary, so you must calibrate your Castle ESC so that it will operate effectively with your transmitter.
- Anytime the ESC is powered up with a new transmitter or with different throttle channel settings, it will need to be calibrated to the transmitter's throttle settings.
- Additionally, we recommend that the ESC be calibrated after updating to new software via Castle Link.

INPUT VOLTAGE

- Applying voltages higher than 33.6V will cause irreparable damage to your Cobra 5 controller.
- 8S HV LIPO PACKS CHARGED TO ABOVE 33.6V (4.2V/CELL) CANNOT BE USED.

BATTERY CAPACITY MINIMUM

- The Cobra 5 is a high-performance controller; you must use high-discharge cells in your high-performance application to ensure vehicle performance.
- MINIMUM battery capacity is 5000mAh and MINIMUM of 50C continuous for general use; for more aggressive setup setups we recommend a MINIMUM of 70C continuous, discharge LiPo batteries. You can never have too high of a C rating or too much mAh; more is always better
- If the batteries you are using contain input bullets you might consider upgrading to a direct wired pack as the bullets may not be able to handle the currents that the Cobra 5 ESC can push out.
- If you must disable low voltage cutoff to prevent the ESC from shutting down, then your batteries are insufficient for your application. 3.2v/cell is the lowest a LiPo battery should ever be discharged under load.
- Utilize the data logging capability of the ESC to verify your batteries are not dropping below the cutoff voltage. Exceeding a LiPo batteries capabilities can lead to a catastrophic failure of the battery and/or esc.

We have tested these batteries/brands in extreme setups (see connector ratings minimum section to ensure your battery connectors are appropriate) and recommend them for the Cobra 5:

Onyx OPS 6300mAh 150C	SMC HCL-HP 7600mAh 150C
Gens ACE Bashing 6800mAh 120C	CNHL Racing 6600mAh 120C

WIRING AND SOLDERING

- High strand count silicone coated copper wire is essential with higher power electric power systems. Castle Creations wire is lower resistance than the same diameter of solid copper, meaning more power gets from the batteries to the motor with less wasted as heat.
- The ultra-high strand count and silicone coating means the wire is very flexible which prevents work hardening and breakage with use.
- Use a high quality soldering station. Soldering stations usually have a variable temperature control which lets you set the right amount of heat to be used. Too little heat will result in a cold solder joint; too much heat can seriously damage a component. The key factors in quality soldering are time and temperature. Our recommendation for the Cobra 5 is a temperature setting of 400° C (745° F). You want it hot and as short a time as possible. We use 250W soldering irons.
- Use a high quality rosin core solder. The rosin core solder is infused with flux which helps clean the surfaces you are soldering for better adhesion.
- Do not exceed more than 18 inches of total wire between the battery and ESC (this includes the wire already on the ESC and battery).
- Do not solder wires directly to the circuit board. Doing so will damage the ESC and void the warranty.
- Our wire is available for purchase and this link provides the appropriate wire gauge for your Castle ESC. http://www.castlecreations.com/wire-application-chart

CONNECTOR RATINGS MINIMUM

The Cobra 5 requires the use of connectors designed for 150+ amps continuous. Do not use Deans™, Traxxas™, EC3/XT60, EC5/IC5, XT90/XT90s connectors in a Cobra 5 setup.

We have tested these connectors/ brands and recommend them for the Cobra 5:

Castle 6.5mm Polarized	Castle 8mm Bullet
QS8 8mm Anti Spark	QS10 10mm Anti Spark

MOTORS

- The Cobra 5 is capable of handling incredible amounts of power, your motor must also be up for the task. Always run your motor within the manufacturer's specs. Monitor motor, battery, and controller temps carefully and never let the motor get above 200° F as excessive heat in the motor can damage the motor, the Cobra 5, and your batteries.
- The default "Smart Sense™" mode uses the sensors (if applicable sensored motor is used) to start the motor smoothly. Once the motor is running the ESC stops using the sensors and seamlessly switches to sensorless operation for higher efficiency, cooler motor temps and potentially higher motor performance.

GEARING

- When you are tuning a car expect some modifications in gearing to get it exactly where you want it. The goal here is to not overheat the motor or damage the ESC.
- Check your motor temps and never let the motor get above 200°F. We recommend using an infrared thermometer so you can monitor temps easily.
- You can also adjust MOTOR TEMPERATURE CUTOFF (with Sensored Motors Only) in Castle Link. When this setting is enabled, the controller will shut off if the motor reaches the specified temperature as indicated by its internal temperature sensor.
- We always recommend making small changes when gearing up.

CASTLE LINK SETTINGS

- During the optimization of your setup it is critical to check motor and ESC temperatures after making adjustments.
- The heat limit threshold for the Cobra 5 ESC and Castle motors is 200°F.
- We recommend the use of the data log as you progress with the feel and power of the vehicle. You will be able to record real-time data such as motor RPM, battery current and voltage, ESC and motor temperature, throttle input, and more.
- Download and analyze the collected data via Castle Link and make adjustments to maximize both performance and battery life.
- Furthermore, we do not recommend using the same Castle Link settings from a previously installed Mamba XLX2 version. Start from scratch. This is how you learn your car and what it can actually handle.

AUXILIARY WIRE

- The AUX wire allows you to adjust a setting “on-the-fly” using an auxiliary channel on your receiver.
- The AUX wire function is disabled by default and is programmable via Castle Link. Plug this wire into the auxiliary (#3/#4) channel on your receiver.
- You must connect the AUX wire to an open channel on your receiver even if you are not using the Auxiliary function.
- You must disconnect the AUX wire from your receiver before connecting to Castle Link. Failure to do so may result in damage to your Castle Link and/or computer.

OPERATING ENVIRONMENT

- Although Cobra 5 is waterproof, it is not intended for operation while completely submerged in liquid.
- Always rinse the ESC and motor with clean water after exposure to corrosives or dirt.
- While the motor and controller may be waterproof, we suggest users confirm that the rest of their vehicle, including the batteries, servos, radio and chassis are also waterproof before exposing them to liquids of any kind.
- The cooling fan must be removed prior to driving in wet conditions. It is not waterproof.