Sensored Motors - Making Sense of it All

What makes a motor sensored?
Sensored motors have a small circuit board at the back of the motor with a small plug; there are also small sensors attached to the motor shaft. These sensors feed information back to the Electronic Speed Control (ESC) via a small 6-wire ribbon cable; this cable connects to the back of the motor and a port on the ESC. Sensored motors still utilize the three primary wires to provide voltage and current to the motor.

What advantage does a sensored motor have over sensorless?
Sensored operation allows for a smoother initial start compared to a sensorless motor. Sensorless motors will "cog" or stutter when attempting to apply the throttle slowly from a complete stop. The sensors in a sensored motor allow the ESC to sense the rotor shaft's position; this allows the ESC to start the motor at very low RPMs with no "cogging". The RPM output, torque and overall power capabilities do not change when compared the same size and kv motor in sensored and sensorless. Our new sensored motors are more serviceable compared to the sensorless versions. The motor wires are replaceable thanks to the large, high copper solder tabs. Replacement rotor shafts and front endbells with bearings will also be available.

Can I run a sensored motor on a non-sensored ESC (IE Sidewinder 3 or Mamba Monster 2)?
Absolutely! But you will not be able to utilize the sensored capabilities of the motor. The ESC will simply run the motor sensorless; it will perform exactly the same as a non-sensored motor. Just connect the three primary motor wires and set aside the sensor cable that came with the motor. There is no disadvantage to running a sensored motor on a non-sensored ESC and you still have the serviceable advantages referenced on the previous question.

Why are you selling sensored motors with sensorless ESCs?
Because our sensored motors can run sensorless, has identical performance characteristics and costs the same as a sensorless motor it was not logical to continue to produce a sensorless only version; the sensored version can work just as well running sensorless so we streamlined our part numbers, inventory and manufacturing and will only be producing sensored motors in the future. Again there is no disadvantage to running a sensored motor on a non-sensored ESC.

Are sensored motors waterproof or water resistant?
They are water resistant. We have added a double silicone conformal coating to the sensor circuit board to give it a level of water resistance. There are some precautions that need to be taken for reliable sensored operation and prolonged life. It is recommended to apply dielectric grease to the outside of the sensor port of the motor while the sensor wire is installed; if water gets in the sensor connection the motor will still operate, but it will operate in sensorless mode. Please refer the document "Running and Maintaining Castle Motors in Wet Conditions"

How do I change the direction of the motor when running sensored?
Unlike sensorless operation, you cannot simply swap two of the motor wires; the A,B,C wires between the motor and ESC must stay aligned correctly. To change the motor direction while running sensored

you must change a setting on the ESC; the “Motor Direction” setting is accessible via the Castle Link USB programmer for Windows operating systems. Note: We have added the motor direction setting on the latest firmware version (2.02) to the manual programming feature; but this firmware will not start shipping with new ESCs until May 2017.

What Castle ESCs support sensored operation?
Currently the 1/10th scale Mamba Max Pro and Mamba X, 1/8th scale Mamba Monster X and and 1/18th scale Mamba Micro X ESCs are capable of sensored operation.

Can I trade in my sensorless motor for a new sensored version?
Absolutely! You can take advantage of our trade-in program to get a reduced cost on a new motor with a new full 1-year warranty. You can find details on our trade-in program on our Service Center