

OWNER'S MANUAL

SUPER SPORT 10.5 ESC & SS4300 MOTOR

Novak Sensor-Based Brushless Motor System

Congratulations on your purchase of a vehicle that is equipped with a state-of-the-art sensor-based brushless motor system. Now you too will enjoy the low-maintenance, high-efficiency performance of brushless motors that are designed specifically for R/C cars.

We've combined the racing technology of our top of the line speed controls with the efficiency of sensor-based brushless motors to bring you the *Super Sport 10.5 Brushless Electronic Speed Control (ESC) & the SS4300 Brushless Motor*, giving you a sport-level brushless system with excellent low speed driveability, extended run time, great torque available over a broad power band, and Novak reliability.

Equipped with Novak's *Variable Throttle Step Technology* for the smoothest throttle response, One-Touch Set-Up for ease of programming, and the security of Radio Priority Circuitry, the Super Sport 10.5 has it all!

PRECAUTIONS

- **DISCONNECT BATTERIES WHEN NOT IN USE** Always disconnect the battery pack from the speed control when not in use to avoid short circuits and possible fire hazard.
- **WATER & ELECTRONICS DON'T MIX!** Never allow water, moisture, or other foreign materials to contact ESC or motor.
- **4 TO 6 CELLS ONLY** Never use fewer than 4 or more than 6 cells (7.2 volts DC) in the main battery pack.
- **POWER CAPACITOR REQUIRED** The attached external power capacitor **MUST** be used with the Super Sport 10.5. *Failure to use Power Capacitor will damage speed control and void the warranty!*
- **CHANGING VEHICLE GEARING CAN CAUSE OVERHEATING** The Super Sport 10.5 has been specially built for this vehicle's stock gearing--any changes may result in thermal shut-down.
- **CHECK MOTOR SCREWS** Check all motor screws for loosening. The 3 long main screws on the shaft end of motor & the 3 flat head screws on the back end may loosen after a few runs of the motor, and need tightening.
- **NOVAK MOTORS ONLY** The Super Sport 10.5 ESC has been specially designed for use with sensor-based Novak Brushless Motors Only! You may replace motor with any Novak sensed brushless motor with 10¹/₂ turns or more.
- **NO REVERSE VOLTAGE!** Reverse battery polarity will damage the speed control and void the warranty.
- **NO SCHOTTKY DIODE!** Never use Schottky diodes with brushless ESCs--use will damage ESC & void warranty.
- **TRANSMITTER ON FIRST** Always turn on the power of your transmitter first so that you will have control of the radio equipment when you turn on the speed control.
- **INSULATE WIRES** Always insulate exposed wiring with heat shrink tubing to prevent short circuits.
- **NO SOLVENTS** Exposing the speed control or motor to any type of solvents can damage the exposed material.
- **NO CA GLUE** Never use cyano-acrylate (CA) glue on the speed control or motor. Exposing the ESC or motor to CA glue will damage the electronics and void the warranty.

SPECIFICATIONS

ESC Input Voltage	4-6 cells (1.2 volts DC/cell)
ESC Power Rating	225 Watts @ 25°C trans.temp.
ESC B.E.C. Voltage/Current	6.0 volts DC/1.5 amps
ESC Throttle Modes	2 (1 w/Rev. & 1 Fwd/Brk)
Motor Diameter	1.41" [35.8 mm]
Motor Length	2.08" [52.8 mm]
Motor Turns	10 ¹ / ₂
Motor Kv	4300 RPM/Volt DC
Motor Kt	0.45 Inch-Ounce/Amp
Motor Commutation	Sensor-Based Electronic
Motor Magnet Material	Neodymium (1pc/multi-pole)

Benefits of sensor-based brushless motor design:

- **CONSTANT ROTOR POSITION KNOWLEDGE** Always knowing what angle the rotor is at, allows instantaneous response and smooth transitions from neutral to drive.
- **SMOOTH/CONTROLLED LOW SPEED DRIVEABILITY** Rotor positioning is key to smooth acceleration without delivering abrupt and uncontrolled bursts of power.
- **STRONG & CONSISTENT BRAKES & STARTING TORQUE** Rotor position knowledge results in consistent starts and stops, without hesitation or inconsistent lag times before acceleration or braking.
- **LOCKED ROTOR & THERMAL PROTECTION** Temperature & position sensors in motor provide unparalleled protection for your investment. Allowing you to run pack after pack without worrying about overheating the motor, ESC, or magnets.

ACCESSORIES

REPLACEMENT POWER CAPACITOR [Novak kit #5677]

The Super Sport 10.5 comes with a factory-installed Power Capacitor, and **MUST BE USED** to maintain cool/smooth operation--Note: We highly recommend using Novak Power Capacitors, as we have done extensive testing & research to find Power Capacitors with the very best quality factors--other capacitors with similar ratings will not provide equal protection. Larger Novak capacitors are OK. Replacement Super Sport 10.5 Power Capacitor is available in kit #5677.

SUPER-FLEX SILICONE 14G WIRE [Novak kits #5500 & #508]

Novak Super-Flex powe wire. 14 gauge silicone wire in kit #5500 (36"red & 36"black) and kit #508 (2 each of 9"red/black/blue/yellow/orange).

INPUT SIGNAL HARNESS [Novak kits #5315 & #5320]

User-replaceable input signal harness is available in both short & long lengths. 4.5" harness in Novak kit #5315, and 9.0" harness in kit #5320.

SS4300 MOTOR BEARING SET [Novak kit #5904]

After extensive use, the ball bearings in the end bells of your brushless motor may need to be replaced.

Replacement front & rear bearings are available in Novak kit #5904.

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SERVICE PROCEDURES

Before sending in your Super Sport 10.5 brushless speed control or SS4300 brushless motor for service, review the Trouble-Shooting Guide and Owner's Manual. The ESC or motor may appear to have failed when other problems exist.

After reviewing the Owner's Manual, if you feel the system requires service, please obtain the most current product service options and pricing by one of the following methods:

WEBSITE: Print a copy of the **PRODUCT SERVICE FORM** from SERVICE section of the Novak website. Fill out needed information on form and return it with the Novak product requiring service.

PHONE/FAX: If you do not have access to the internet, contact our customer service department by phone or fax as listed in the CUSTOMER SERVICE section below, and they will supply you with current service options.

WARRANTY SERVICE: To receive warranty work, you **MUST CLAIM WARRANTY** on the **PRODUCT SERVICE FORM** & include a valid, itemized cash register receipt with purchase date on it, or invoice from previous service work.

ADDITIONAL NOTES:

- The Super Sport 10.5 speed control and the SS4300 brushless motor should be returned together.
- Hobby dealers or distributors are not authorized to replace Novak products thought to be defective.
- If a hobby dealer returns your speed control & motor for service, submit a completed **PRODUCT SERVICE FORM** to the dealer and make sure it is included with the items.
- Novak Electronics, Inc. does not make any electronic components (transistors, resistors, etc.) available for sale.

PRODUCT WARRANTY

The Super Sport 10.5 brushless ESC & SS4300 brushless motor are guaranteed to be free from defects in materials or workmanship for a period of 120 days from the original date of purchase (verified by dated, itemized sales receipt). Warranty does not cover incorrect installation, components worn by use, damage from using fewer than 4 or more than 6 cells (1.2 volts DC/cell) input voltage, cross-connection of battery/motor power wires, overheating solder tabs, reverse voltage application, damage resulting from thermal overload, damage from incorrect installation of FET servo or receiver battery pack, not installing or incorrect installation of a Novak power capacitor on the ESC, splices to input harness, damage from excessive force when using the One-Touch/SET button or from disassembling case or motor, tampering with internal electronics, allowing water, moisture, or any other foreign material to enter ESC or get onto the PC board, incorrect installation/wiring of input plug plastic, allowing exposed wiring or solder tabs to short-circuit, or any damage caused by a crash, flooding, or act of God.

In no case shall our liability exceed the product's original cost. We reserve the right to modify warranty provisions without notice.

Because Novak Electronics, Inc. has no control over the connection and use of the speed control & motor or other related electronics, no liability may be assumed nor will be accepted for damage resulting from the use of this product. Every speed control & motor is thoroughly tested and cycled before leaving our facility and is, therefore, considered operational. By the act of connecting/operating speed control, the user accepts all resulting liability.

CUSTOMER SERVICE

NOVAK ELECTRONICS, INC.

Monday-Thursday: 8:00am-5:00pm (PST)

Friday: 8:00am-4:00pm

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REVERSE DISABLE

The Super Sport 10.5 ESC is equipped with dual throttle programs: Forward, Brake, & Reverse (**Mode 1**), and Forward & Brake only (**Mode 2**). By disabling the reverse feature of the Super Sport 10.5, the speed control can be set-up for forward and brake only operation, which may be useful if you are going to use this vehicle at your local track and they do not allow reversible ESCs to be used during racing.

Selecting Throttle Mode with TRANSMITTER ON

With transmitter ON & ESC connected to receiver and battery:

1. TURN ON THE SPEED CONTROL'S POWER

2. PRESS & HOLD SPEED CONTROL'S SET BUTTON

With the transmitter throttle at neutral, **press and hold the SET button** on Super Sport 10.5, and **continue holding button until all 4 status LEDs turn on**.

3. RELEASE SPEED CONTROL'S SET BUTTON

All **status LEDs will flash together**. The number of times the LEDs flash indicates the Throttle Mode selected.

4. PRESS & RELEASE SET BUTTON TO SELECT MODE

Each press will change the Throttle Mode.

5. WAIT FOR SPEED CONTROL TO EXIT PROGRAMMING

When the speed control's SET button is not pressed for about 3 seconds, the **ESC loads the selected Throttle Mode** into memory and exits programming--**the red status LED will turn solid red** indicating that the speed control is back at neutral and ready to go.

REMEMBER: Whenever One-Touch set-up is performed, ESC automatically reverts to factory default settings & the Throttle Mode reverts to Mode1 (Fwd, Brake, & Rev).

ONE-TOUCH PROGRAMMING

NOTE: If transmitter's throttle end point adjustments are changed, the ESC's One-Touch programming will need to be performed. If you do not, you might not get optimal performance from your brushless ESC/motor system.

With ESC connected to receiver & a charged battery pack:

1. TURN ON THE TRANSMITTER'S POWER

2. PRESS & HOLD SPEED CONTROL'S SET BUTTON

3. TURN ON THE SPEED CONTROL'S POWER

With transmitter throttle at neutral, and still **pressing the SET button** slide the ON/OFF switch to **ON position**.

4. CONTINUE HOLDING SET BUTTON UNTIL RED LED IS ON

5. RELEASE SET BUTTON AS SOON AS LED TURNS RED

6. PULL TRANSMITTER THROTTLE TO FULL-ON POSITION

Hold it there until the **green status LED turns solid green**.

Note: Motor will not run during programming even if connected.

7. PUSH TRANSMITTER THROTTLE TO FULL-BRAKES

Hold it there until the **green status LED blinks green**.

8. RETURN TRANSMITTER THROTTLE TO NEUTRAL

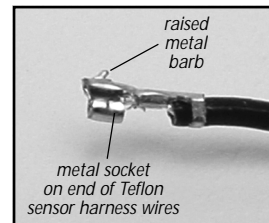
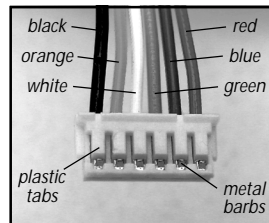
Red status LED will turn solid red, indicating that the speed control is at neutral and that proper programming has been completed.

If you experience any problems during One-Touch programming, turn off the ESC and repeat above programming steps.

SENSOR HARNESS WIRING

Should any of the 26G Teflon wires pull out of the connector on the end of the motor's sensor harness, replace them into the appropriate slot in the connector as shown below. The connector has small plastic tabs that grab a small raised barb on the back of the metal socket that is crimped onto the ends of the Teflon wire. The plastic tab should be checked to make sure it has not deformed excessively before inserting the socket into the plastic connector housing.

Note: If the motor's sensor harness becomes damaged, contact the Novak Customer Service Department.



MOTOR MAINTENANCE

• **CHECK MOTOR SCREWS** Check all motor screws for loosening at regular intervals, just like other hardware on your vehicle. *Note: The 3 main 4-40 socket head screws on the shaft end of the motor may become loose after a few runs of the motor and will need to be tightened.* Also check the 3 flat head screws securing the end cap on the back of the motor.

• **CHECK MOTOR BEARING WEAR** After extensive use, the ball bearings in the end bells of your brushless motor may need to be replaced. While the design of the motor will keep the majority of the debris out of the bearings, some debris may get in, and eventually wear will occur. If the shaft will not spin freely, you may need to replace the motor bearings (replacement bearings available in Novak kit #5904--**Contact our Customer Service Dept. if you do not feel comfortable changing the bearing on your own**). A small drop of light oil on the bearings periodically can help extend bearing life--too much oil will cause problems, so apply sparingly.

• **PERIODIC MOTOR CLEANING** We recommended that you disassemble the motor and clean the inside of it at regular intervals. About once a month, if you subject the motor to heavy weekly usage (*like club racing once a week*), is a good schedule. Every few months if you used less heavily. **CLEAN INSIDE MOTOR:** Remove 4-40 socket head cap screws on the shaft side & remove end bell. Next, remove the rotor by pulling it out by the shaft--*be careful not to damage magnet or lose shaft spacers (if equipped with)*. Use compressed air to blow debris off rotor and out of the inside of the motor--**DO NOT USE SOLVENTS**. Reassemble, making sure the short spacer is on the pinion side of rotor. **CLEAN THE REAR BEARING:** Remove 4-40 flat head screws and remove the black plastic end cap (*cap may stick--pry up gently*). Wipe off the rear bearing & replace end cap.

VEHICLE GEARING (Important)

The Losi vehicle this brushless speed control and motor came with used 19 tooth pinion gear and a 90 tooth spur gear.

The stock gearing is for general outdoor use--If the model is going to be run in a confined area, a smaller pinion gear may be necessary to prevent over-heating.

(If operating temperatures get too high, the ESC and/or motor may thermally shut down & may cause internal damage that voids product warranty)

Similarly, increasing the pinion size can cause over-heating.

The Super Sport 10.5 ESC and SS4300 motor are designed to operate comfortably from 160°F-170°F (*warmer than a typical brush-type ESC/motor*).

TROUBLE-SHOOTING GUIDE

This section describes possible ESC problems, causes, and solutions.

Steering Channel Works But Motor Will Not Run

- Make sure motor sensor harness is plugged into ESC—check for damaged wires. *Green & red status LEDs will be blinking fast.*
- Make sure input signal harness is plugged into ESC & throttle channel of receiver. Check throttle channel operation with a servo. Check wiring sequence of receiver signal harness. *Green & red status LEDs will both be on solid.*
- ESC may have shut down due to locked rotor detection—return throttle to neutral position to regain motor control—check vehicle's drive train for free operation. *Blue & green status LEDs will both be blinking.*
- ESC or motor may have shut down due to thermal overload—allow system to cool down & return throttle to neutral position to regain motor control—check for free operation of drive train for possibly overloading that could result in overheating. *Blue status LED will be blinking until cooled down.*
- ESC may have shut down due to thermal overload or locked rotor detection & ESC's neutral point is too far off to sense that throttle has been returned to neutral. *Blue & green status LEDs blinking indicates Locked Rotor Detection. Blue LED blinking indicates thermal shut-down.*
- Possible internal damage—Refer to Service Procedures.

Receiver Glitches/Throttle Stutters During Acceleration

- Receiver or antenna may be too close to speed control, power wires, or battery.
- Bad connections—Check wiring, connectors, and sensor harness.
- External Power Capacitor damaged or not installed.

Motor and Steering Servo Do Not Work

- Check wires, receiver signal harness wiring & color sequence, radio system, crystals, battery/motor connectors, & battery pack.
- Possible internal damage—Refer to Service Procedures.

Speed Control Runs Hot

- Gear ratio has been changed and is too low—Increase gear ratio (see 'VEHICLE GEARING' section).

Model Runs Slowly/Slow Acceleration

- Gear ratio has been changed and is too low—Increase gear ratio (see 'VEHICLE GEARING' section).
- Check battery connectors—Replace if needed.
- Incorrect transmitter/ESC adjustment—Refer to 'ONE-TOUCH PROGRAMMING' section.
- External Power Capacitor damaged or not installed.
- Motor bearings worn—Refer to 'MOTOR MAINTENANCE' section.

ESC Is Melted Or Burnt/ESC Runs With Switch Off

- Internal damage—Refer to Service Procedures.

**For more assistance call our Customer Service Department.*