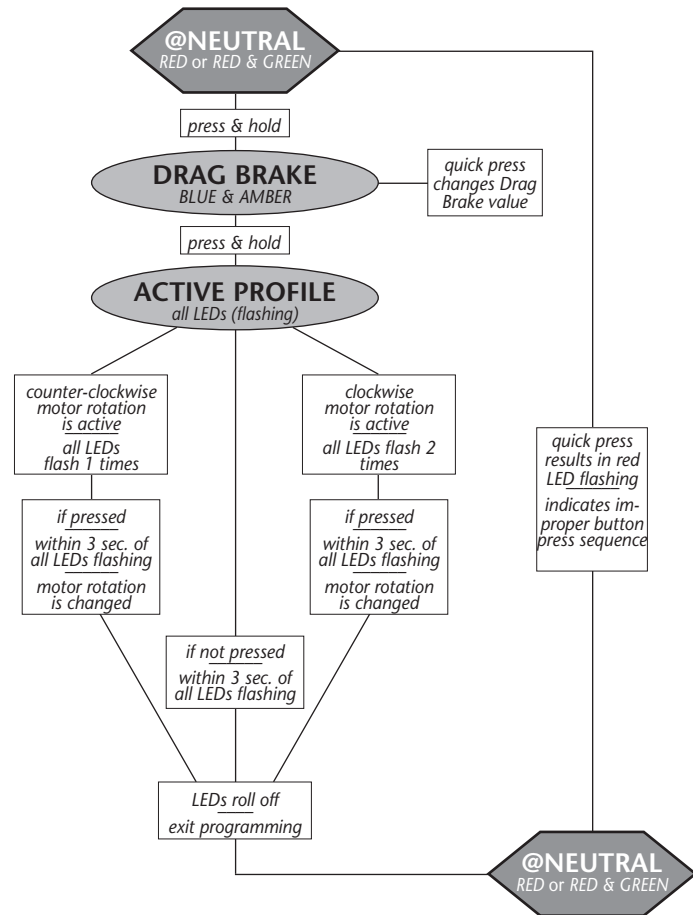


SUPER SPORT CRAWLER SOFTWARE FLOW CHART:



RESTORING FACTORY DEFAULTS:

Every time you perform the One-Touch Set-Up, the factory default settings are restored for each of the throttle profiles.

TO ADJUST DRAG BRAKE:

A. PRESS & HOLD SPEED CONTROL'S SET BUTTON

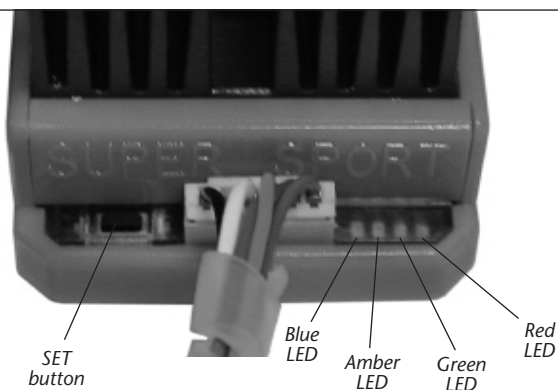
With ESC at neutral, press & hold SET button until Blue & Amber status LEDs turn on solid—Release SET button once LEDs are solid.

B. SELECT DRAG BRAKE PERCENTAGE

Blue & Amber status LEDs (1st & 2nd LEDs on left) flash to indicate active Drag Brake setting (Drag brake setting will be your Minimum Brake value). Quick press & release to change Drag Brake setting, then press & hold SET button for about 1 second to store selection into speed control's memory, and return to neutral.

Setting (# of flashes):	1	2	3	4	5	6	7	8	9	10
Drag Brake (%):	20	25	30	40	50	60	70	80	90	95

STATUS LEDs



TROUBLE-SHOOTING GUIDE

Steering Channel Works But Motor Will Not Run

- **Red status LED blinking when throttle is applied.** Check motor sensor harness connection at ESC (make sure all metal sockets are fully inserted into the connector's plastic housing)—check for damaged wires.
- **Red status LED on solid & Green LED blinking.** Check input signal harness & motor sensor harness connections at ESC. Check input signal harness wiring sequence & connection at throttle channel of receiver. Check throttle channel operation with servo.
- **Blue & Green status LEDs both blinking.** Possible ESC 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 continuously blinking & drive train is free.** Possible internal ESC damage—Refer to Service Procedures.
- **Blue & Red status LEDs blinking.** Possible ESC thermal shut-down—Check gear ratio & free operation of drive train for possible overloading/ESC is being severely overloaded—allow system to cool & return throttle to neutral position to regain motor control. LEDs will continue to blink until system is cooled down.
- **Blue & Amber status LEDs blinking.** Possible motor thermal shut-down—Check gear ratio & free operation of drive train for possible overloading/motor is being overloaded—allow system to cool & return throttle to neutral position to regain motor control. LEDs will continue to blink until system is cooled down.
- **Blue & Green (Locked Rotor Detection), Blue & Red (ESC Thermal Shut-Down), or Blue & Amber (Motor Thermal Shut-Down) status LEDs blinking.** ESC may have shut-down & ESC's neutral point is too far off to sense that transmitter throttle has been returned to neutral—Refer to Steps 4 & 5.
- Possible receiver damage—Check operation with a different receiver.
- Possible internal damage—Refer to Service Procedures.

Receiver Glitches/Throttle Stutters During Acceleration

- Receiver or antenna too close to ESC, power wires, battery, or motor.
- Bad connections—Check wiring, connectors, & sensor harness.
- External Power Capacitor damaged/not installed—Replace Power Capacitor.

Motor and Steering Servo Do Not Work

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

Speed Control Runs Excessively Hot

- Gear ratio too low—Increase gear ratio (see 'GEAR SELECTION').

Model Runs Slowly/Slow Acceleration

- Gear ratio too high—Reduce gear ratio (see 'GEAR SELECTION').
- Check battery connectors—Replace if needed.
- Incorrect transmitter/ESC adjustment—Refer to Steps 4 & 5.
- External Power Capacitor damaged/not installed—Replace Power Capacitor.

ESC Is Melted Or Burnt/ESC Runs With Switch Off

- Internal damage—Refer to Service Procedures.

*For more assistance call our Customer Service Department or check our website.

SERVICE PROCEDURES

Before sending your speed control or brushless motor system in for service, review Trouble-Shooting guide and instructions. System may appear to have failed when other problems exist.

After reviewing instructions, if you feel that your ESC/system requires service, please obtain the most current product service options and pricing by the following ways:

WEBSITE: Print a copy of the **PRODUCT SERVICE FORM** from the CUSTOMER SERVICE section of the website. Fill out the needed information on this form and return it with the Novak product that requires servicing.

PHONE/FAX: If you do not have access to the internet, please contact our customer service department by phone or fax as listed below.

WARRANTY SERVICE: For warranty work, you **MUST CLAIM WARRANTY** on **PRODUCT SERVICE FORM** & include a valid cash register receipt with purchase date and dealer name & phone# on it, or an invoice from previous service. If warranty provisions have been voided, there will be service charges.

• **ESCs returned without a serial number will not be serviced under warranty.**

ADDITIONAL NOTES:

- Dealers/distributors are not authorized to replace Novak products thought to be defective.
- If a hobby dealer returns your brushless system for service, submit a completed **PRODUCT SERVICE FORM** to the dealer and make sure it is included with the product.
- Novak Electronics, Inc. does not make any internal electronic components (transistors, resistors, etc.) available for sale.

Novak Electronics, Inc.

(949) 833-8873 • FAX (949) 833-1631

Customer Service e-mail: cs@teammovak.com

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

www.teammovak.com

SUPER SPORT CRAWLER--INSTRUCTIONS

BRUSHLESS
NOVAK
USA

SUPER
SPORT

CRAWLER



#55-3018-1
7-2006

SPECIFICATIONS

Input Voltage.....	4-7 cells (1.2 volts DC/cell)
ESC Case Size.....	1.32"x1.75"x1.05" [33.5x44.4x26.7mm]
ESC Weight (w/o wires).....	1.70 ounce [48.2 grams]
B.E.C. Voltage.....	6.0 volts DC
B.E.C. Current.....	3.0 amps
Power Wire (Battery/Motor).....	14G Super-Flex Silicone
On-Resistance.....	0.0019Ω @25°C trans.temp.
Rated Current.....	160A [Fwd & Rev.] @25°C trans.temp.
ESC Power Rating.....	225 watts @25°C trans.temp.
ESC Motor Limit.....	down to 8.5-turn [sensored brushless]
Throttle Programs.....	2 [1 counterclockwise & 1 clockwise rotation]

The precision of Brushless motor control and the adjustability of a Novak ESC all together!

The Super Sport Crawler electronic speed control gives you on-board programming of Drag Brake percentage & the ability to reverse the rotation of the motor, for extreme versatility in setting up your custom rock crawling rig.

The Super Sport Crawler system combines Automatic Drag Braking (that is fully adjustable, of course) in the ESC, with a high-turn sensor-based brushless motor that packed with an ultra-strong rotor for extra holding power, and precision movement control during critical situations.

The ESC also features **Thermal Overload Protection**, **high-power B.E.C.** for strong/fast servo response, **Polar Drive & Digital Anti-Glitch circuitries** for cool & smooth operation, and **Radio Priority circuitry** for the ultimate in control, right down to the end of the charge. Add to this the user-replaceable battery wires, power capacitor, & input harness, and the Super Sport Crawler has it all!

To benefit from all of the technical features of the Super Sport Crawler system, PLEASE READ ALL INSTRUCTIONS

PRECAUTIONS

WATER & ELECTRONICS DON'T MIX!

Never allow water, moisture, or other foreign materials to get inside ESC, motor, or on the PC Boards. **Water damage will void the warranty!**

NO SCHOTTKY DIODE!

Schottky diodes must NOT be used with the Super Sport Crawler ESC. (Schottky diodes are never used with reversible ESCs, including brushless) Schottky diode usage will damage ESC & void warranty!

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.

4 TO 7 CELLS ONLY

Never use fewer than 4 or more than 7 cells (4.8-8.4VDC, 1.2VDC/cell) in the vehicle's main battery pack(s).

NOVAK BRUSHLESS MOTORS ONLY

The Super Sport Crawler ESC is specially designed for use with sensor-based Novak Brushless Motors Only! You may replace motor with Novak sensed motors down to 8.5-turn (up to 225W--ESC's rating). Novak brushless motors are the only motors guaranteed to work with the Super Sport Crawler ESC—check our website for further updates & compatibilities.

Note: ESC will default back to Smart Braking II and require 2nd trigger stroke to shift into reverse when using a non-Crawler motor.

NO REVERSE VOLTAGE!

Reverse battery polarity can damage ESC & void warranty. Disconnect battery immediately if a reverse connection occurs.

POWER CAPACITOR REQUIRED

An external power capacitor is installed and **MUST** be used with your ESC. **Failure to use Power Capacitor will result in higher ESC operating temperatures & possible thermal shut-down.**

TRANSMITTER ON FIRST

Always turn on the power of the transmitter first so that you will have control of the vehicle when you turn it on.

INSULATE WIRES

Always insulate exposed wiring with heat shrink tubing or electrical tape to prevent short circuits, which can damage ESC.

NO CA GLUE

Exposure to CA glue or its fumes can cause damage to internal components of the speed control and result in premature failure.

OPTIONAL ACCESSORIES

REPLACEMENT POWER CAPACITOR [Novak kit #5677]

The Super Sport Crawler ESC comes with a factory-installed Power Capacitor, and it **MUST BE USED** to maintain cool and smooth operation. A direct replacement Power Capacitor is available in Novak kit #5677.

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.

SUPER-FLEX SILICONE 14G WIRE [Novak kits #5500 & 5508]

Novak Super-Flex wire for power wiring. 14 gauge silicone wire in kit #5500 (36"red & 36"black) and kit #5508 (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 and long lengths. 4.5" harness in Novak kit #5315, and 9.0" harness in Novak kit #5320.

VELOCITI MOTOR END BELL & BEARING SET [Novak #5920]

After extensive use, the ball bearings in your brushless motor may need to be replaced. Replacement Velociti-style ribbed front end bell (std. on Crawler) with bearing factory-installed & rear bearing are available in Novak kit #5920.

UPGRADE NICKEL-PLATED SINTERED ROTOR [Novak #5908]

The high-power magnet on this rotor is the ultimate upgrade, giving you even more torque & stronger braking. Velociti-style Nickel-Plated Sintered Neodymium rotor upgrade available in Novak kit #5908.

PRODUCT WARRANTY

The Super Sport Crawler Brushless ESC is 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 to case or exposed circuit boards, damage from using fewer than 4 or more than 7 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 or short-circuiting motor, damage from incorrect installation of FET servo or receiver battery pack, not using or incorrect installation of a Power Capacitor on the ESC or from using a damaged Power Capacitor, using a Schottky diode, using non-Novak Power Capacitor or motor, splices to input, ON/OFF switch, or sensor harnesses, damage from excessive force when using the One-Touch/SET button or from disassembling case, 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.

Because Novak Electronics, Inc. has no control over the connection & use of the speed control or other related electronics, no liability may be assumed nor will be accepted for any damage resulting from the use of this product. Every Novak speed control & motor is thoroughly tested & cycled before leaving our facility and is, therefore, considered operational. By the act of connecting/operating speed control, user accepts all resulting liability. In no case shall our liability exceed the product's original cost. We reserve the right to modify warranty provisions without notice.

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STEP 1-CONNECT INPUT HARNESS

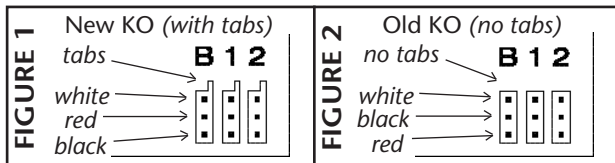
The Super Sport Crawler has the industry-standard receiver input connector on a user-replaceable input harness & works with all major radio brand's new receivers. However, some very old receivers must have the wiring sequence in the plastic 3-pin connector housing changed. *This is important, because receiver & servo electronics may be damaged if the sequence is incorrect.*

CHANGING WIRING SEQUENCE @ RECEIVER END

JR • Hitec • Futaba • New KO • Airtronics Z

JR, Hitec, Futaba, new KO, & Airtronics Z receivers do not need input harness re-wiring. Airtronics Z receivers have blue plastic cases & new KO cases have tabs on the input harness openings as in Figure 1.

- Plug one end of the input signal harness into the THROTTLE CHANNEL (#2) of receiver with the **BLACK wire toward the outside edge** of receiver case.
- Plug the other end of the input harness into 3-pin header inside the ESC's case with the **WHITE wire toward the 'S' (signal) marking** on the ESC's case above the rectangular signal harness opening.



Old-style KO • Old-style Sanwa/Airtronics

If you have an older KO or Sanwa/Airtronics, you must change the sequence of the ESC's input harness wires--Old Sanwa/Airtronics cases are black color & Old KO cases do not have tab openings, as in Figure 2 above.

- Using a small flat blade screwdriver, **remove the red & black wires** from the plastic housing at the receiver end of the input harness as in Figure 3 below.
- **Interchange the red and black wires** in the plastic 3-pin connector housing at the receiver end of the input harness.
- Insert modified end of the harness into the THROTTLE CHANNEL (#2) of receiver with the **RED wire toward the outside edge** of receiver case.
- Plug the other end of the input harness into the ESC with the **WHITE wire toward the 'S' (signal) marking** on the ESC's case.

FIGURE 3 With a small standard screwdriver, gently lift plastic prong until wire and metal socket easily slide out of plastic housing.



STEP 2-MOUNTING ESC

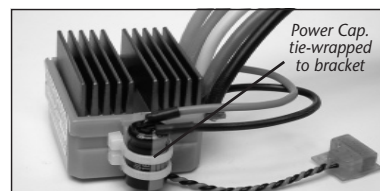
Mount ESC with power wires away from other electronics & moving parts. Select a location that allows airflow through heat sinks--*If the ESC gets air flow, it will run cooler; and that means it will be more efficient!*

1. **MOUNT ESC IN VEHICLE** using included double-sided tape. The slide-mount channel on the back of the ESC's case can be used to hold the ON/OFF switch or Power Capacitor. *Be sure receiver & antenna are mounted as far from ESC, power wires, battery, & servo as possible--these components all emit RF noise when throttle is applied. On graphite or aluminum chassis vehicles, it may help to place receiver on edge with crystal & antenna as far above chassis as possible.*

Note: Mount antenna as close to receiver as possible--trail any excess wire off top of antenna mast (cutting or coiling excess antenna wire will reduce radio range).

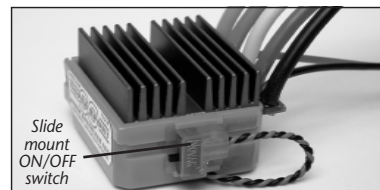
2. **SECURE POWER CAPACITOR TO SLIDE-MOUNT BRACKET OR CHASSIS**

Use included P.Cap bracket to mount Power Capacitor to the ESC's slide-mount channel or tape it to the chassis with the included double-sided tape (Capacitor can also be tie-wrapped to the power wires). **To use slide mount channel, slide P.Cap bracket into channel on the ESC & secure Power Capacitor to the bracket with tie-wraps.**



3. **INSTALL ON/OFF SWITCH** using a screw or the included double-sided tape where it will be easy to access.

The switch is also designed to be installed into the ESC's slide mount channel.



STEP 3-MOTOR & BATTERY CONNECTION

1. **MOTOR CAPACITORS NOT NEEDED**

Novak brushless motors do not require external motor capacitors.

2. **DO NOT USE SCHOTTKY DIODES**

Schottky diodes must NOT be used with reversible ESCs (including brushless). Schottky diode usage will damage the ESC & void warranty.

3. **FACTORY-INSTALLED POWER CAPACITOR REQUIRED**

The Super Sport Crawler comes with a factory-installed Power Capacitor, and it MUST be used for proper operation.

If Power Cap. becomes dented or damaged, ESC failure can occur--replace immediately. Longer Power Capacitor wires will decrease performance.

4. **SOLDER MOTOR POWER WIRES TO MOTOR**

(only required if changing motor power wire length)

A. Cut the ESC's **BLUE, YELLOW, & ORANGE** silicone motor power wires to the desired length, and strip 1/8-1/4" of insulation from the end of each wire. Tightly twist the exposed strands of wire.

B. Insert the ESC's **BLUE Phase 'A'** motor wire into the hole in the motor's 'A' solder tab & solder. Use a soldering iron to apply heat to exposed wire that extends through the PCB, and begin adding solder to tip of soldering iron and to the wire. Add just enough solder to form a clean & continuous joint from the plated area of the solder tab up onto the wire. Use side cutters to trim remaining (now soldered) wire extending beyond the solder tab (about 1/16" above PCB).

IMPORTANT NOTE: DO NOT OVERHEAT SOLDER TABS

Prolonged/excessive heating of solder tabs (motor or ESC) will damage PCB.

C. Solder the ESC's **YELLOW Phase 'B'** motor wire to the motor's 'B' solder tab as described in Step 5B above.

D. Solder the ESC's **ORANGE Phase 'C'** motor wire to the motor's 'C' solder tab as described in Step 5B above.

5. **PROTECT SENSOR WIRES WITH SPIRAL WRAP**

Use the included spiral wrap to protect the 6 Teflon sensor harness wires between the speed control & motor.

6. **CONNECT SPEED CONTROL TO BATTERY PACK**

Connect the ESC's Tamiya-style JST battery connector to a charged 4 to 7 cell (1.2VDC/cell) battery pack. Connector can also be changed to a different type, or ESC can be hard-soldered directly to battery pack.

CONNECTOR USAGE

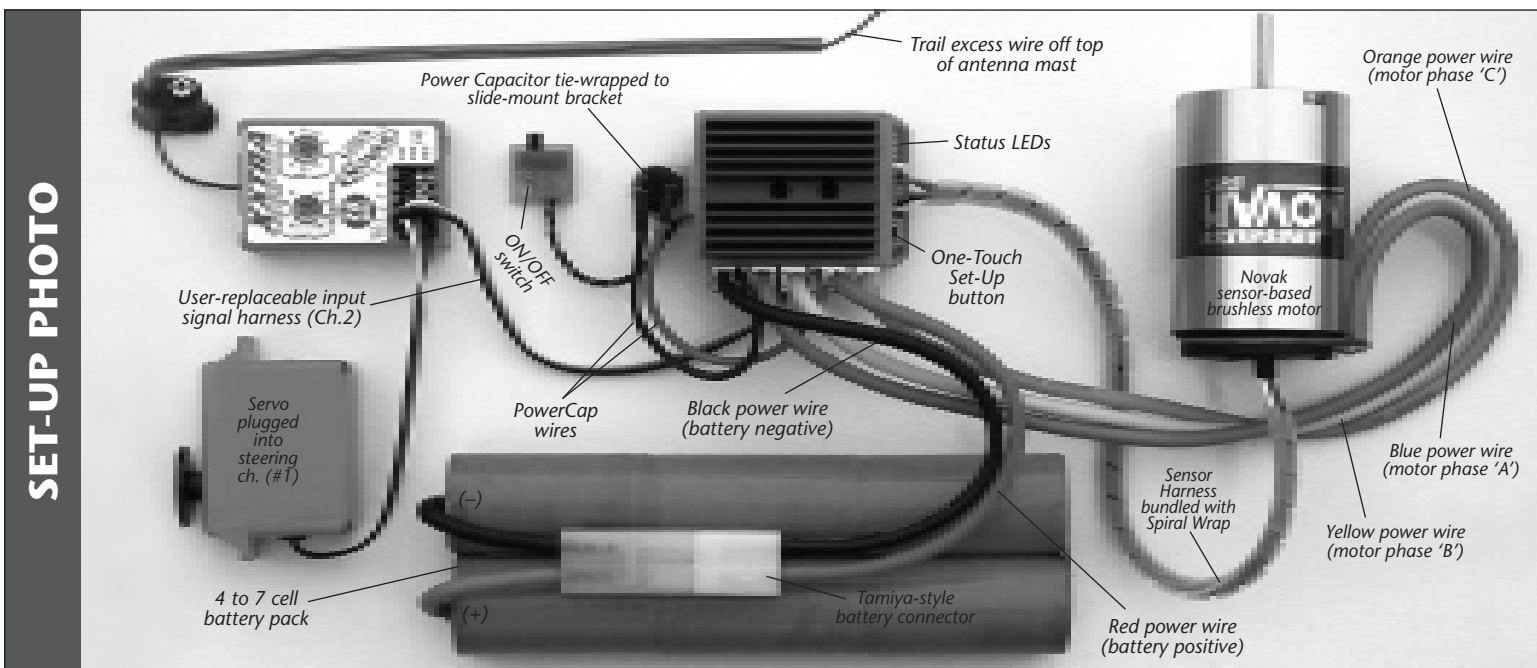
If you are going to use connectors on the ESC's power wires, we highly suggest Dean's Ultra plugs or other low-loss connectors--do not use crimp type connectors.

To prevent possible cross-connection of motor phase wires, we do not recommend using connectors on the motor power wires of sensor-based brushless motors.

- Use connectors that cannot be plugged in backwards. Reverse voltage will damage the ESC and void warranty.
- Use a female connector on battery packs to avoid shorting.

For additional information on connector usage, visit our website.

Important: Make sure no wire strands have strayed to an adjacent solder tab, this will result in short-circuiting & severe ESC damage, which will void the warranty.

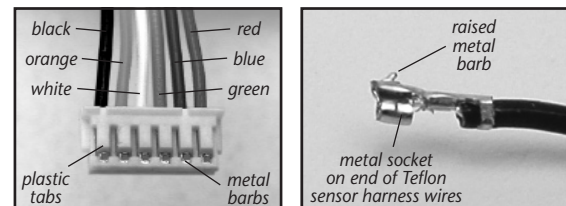


SET-UP PHOTO

SENSOR HARNESS WIRING

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

If the motor's sensor harness gets damaged, please contact our Customer Service Dept.



USING A RECEIVER BATTERY PACK

If you are planning to use an external receiver battery pack to power the electronics you need to do the following:

1. Plug the external 5 cell (1.2VDC/cell) receiver battery pack into the battery slot of the receiver.
2. Leave the ESC's ON/OFF switch in the OFF position, and use receiver battery pack's ON/OFF switch to turn the system power on and off--Do not use the ESC's switch.

NOVAK

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STEP 4-ONE-TOUCH PROGRAMMING

With ESC connected to (at least) a receiver & a charged battery pack:

1. **TURN ON THE TRANSMITTER'S POWER**
2. **PRESS & HOLD ESC'S ONE-TOUCH/SET BUTTON**
3. **TURN ON THE SPEED CONTROL'S POWER**
With transmitter throttle at neutral, and still pressing the SET button, slide the ESC's ON/OFF switch to ON position.
4. **CONTINUE HOLDING SET BUTTON UNTIL RED LED COMES 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 speed control is at neutral and that proper programming has been completed.

NOTE: If transmitter settings are changed, One-Touch Programming must be repeated. If you experience any problems, turn off ESC & repeat One-Touch.

REMEMBER: Whenever One-Touch set-up is performed, ESC automatically reverts to factory default settings & the Throttle Profile reverts to #1.

STEP 5-TRANSMITTER ADJUSTMENTS

If you have any problems with Step 4, adjust transmitter as follows:

- A. Set **HIGH ATV** or **EPA** to **maximum** setting.
[amount of throw at full throttle]
- B. Set **LOW ATV**, **EPA**, or **ATL** to **maximum** setting.
[amount of throw at full brakes]
- C. Set **EXPONENTIAL** to **zero** setting. *[throttle channel linearity]*
- D. Set **THROTTLE CHANNEL REV. SWITCH** to either position.
- E. Set **THROTTLE CHANNEL TRIM** to **middle** setting.
[adjusts neutral position/increases or decreases coast brakes]
- F. Set **ELECTRONIC TRIGGER THROW ADJUSTMENT** to **70% throttle** and **30% brake throw** (or 7:3)--best for reversible ESCs.
[adjusts trigger throw electronic/digital pistol-grip transmitters]
- G. Set **MECHANICAL TRIGGER THROW ADJUSTMENT** to position with **1/2 throttle** and **1/2 brake throw**.
[adjusts trigger throw on mechanical/analog pistol-grip transmitters]

NOT ALL TRANSMITTERS HAVE THESE ADJUSTMENTS

THROTTLE PROFILE SELECTION

The ESC is equipped with 2 user-selectable Throttle Profiles to choose from. If looking at the motor's pinion shaft end, Profile #1 rotates counter-clockwise with forward transmitter input, and Profile #2 rotates clockwise.

NOTE: Super Sport Crawler ESC is factory set to Profile #1.

CHANGING PROFILES: (REVERSING ROTATION)

With ESC on & connected to a charged battery (transmitter ON or OFF):

1. **IF TRANSMITTER IS OFF, DISCONNECT ESC FROM RECEIVER**
To avoid possible radio interference from other transmitters, remove the ESC's input signal harness from the receiver.
2. **PRESS & HOLD THE ESC'S ONE-TOUCH SET BUTTON**
Continue to hold SET button on ESC until all 4 LEDs turns on.
Note: you will continue holding past the Blue & Amber LED programming indicators in the ESC's software.
3. **RELEASE SET BUTTON AS SOON AS ALL 4 LEDs COMES ON**
Once released, the 4 status LEDs will flash to indicate what Throttle Profile is currently selected. The number of times the LEDs flash indicates the Throttle Profile selection (1 or 2).
4. **QUICK PRESS (& release) SET BUTTON TO CHANGE SELECTION**
Each press will change to the other Throttle Profile (or rotation direction).
***** Note: there is a time constraint during this selection process. *****
5. **ESC STORES SELECTION & BEGINS TO EXIT PROGRAMMING**
If SET button is not pressed for 3 seconds, ESC stores selected Profile in memory, exits to neutral & is ready to go. (LEDs turn off in a rolling motion left to right, until just Red LED is on--Red & Green if no transmitter signal present).
REMEMBER: Whenever One-Touch set-up is performed, ESC automatically reverts to factory default settings & the Throttle Profile reverts to #1.