This Novak Eiger and Eiger Pro ESCs are factory loaded with several programmable features, and we have developed this Field Guide as a quick-reference to keep you with you on the rocks to help walk you through the programming and adjustment of all of the speed control's software functions and diagnostic features.

Take the time to thoroughly read through this programming manual before attempting to make any programming adjustments so you can fully understand the different ESC parameters, and how they can be used to fine tune your ESC's feel and performance to meet your needs. Most importantly, enjoy all of the technical benefits and features this Novak ESC has to offer.

**ONE-TOUCH SET-UP**

With the ESC connected to (at least) a charged battery pack, the receiver, and the brushed motor's sensor harness:

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-BRAKE/REVERSE**
   Hold it there until the green status LED blinks green.
8. **RETURN TRANSMITTER THROTTLE TO NEUTRAL**
   The red status LED will turn solid red, indicating that speed control is at neutral and that proper programming has been completed. While LED may also be on and blinking, indicating that Dynamic Timing Advance is OFF and the timing is set to a level of 0%.

If transmitter settings are changed, the One-Touch Set-Up must be repeated.

**NOTE:** When the One-Touch Set-Up is performed, the speed control will automatically revert back to the factory-default settings.

**BRUSHLESS MODE NOTE:** If using the Eiger with a Brushless Motor, leave the motor wires DISCONNECTED when performing the One-Touch Set-Up. Once One-Touch Set-Up is completed, change the Throttle Profile to Setting #2, and connect the motor wires.

**PROPER GEAR SELECTION**

Motor operating temperature is the ONLY way to properly set vehicle gearing

The Motor and Speed Control should not exceed **160°F MAX** at any time during run!

Change the gearing to avoid overheating!

**DO NOT FREE-REV MOTOR!**

Free-running your brushless motor in a no-load condition can cause rotor failure & ESC transistor damage that will not be covered by the product's warranty.

Because of the potential danger of overheating and ESC/motor damage and failure, **you must start with very small pinion sizes** and check the speed control and motor operating temperatures at multiple times throughout the initial runs after installation. This is the only way to ensure that you are not causing excessive heating.

If ESC & motor temperatures remain low & stable, you can slowly increase the pinion size while again monitoring the temperatures to determine the safe gearing for your vehicle, motor, and climate/track conditions. Because these variables can change or be modified, you MUST continuously monitor ESC & motor temperatures to protect your electronics from damage.

**ESC PARAMETERS**

Several ESC parameters are customizable to help fine-tune the feel and response of the speed control to your liking. These settings are all easily accessed via the ESC's One-Touch/Set button and the on-board status LEDs. The following parameters are adjustable:

1. **Throttle Profile (1 of 2)**  ... Brush ............ Brushless
2. **Drag/Hill Brake**  ... 1 of 5 Modes  ... 1 of 10
3. **Break Frequency**  ... n/a  ... 1 of 10
4. **Drive Frequency**  ... 1 of 6  ... 1 of 10
5. **Dead Band**  ... 1 of 5  ... 1 of 5
6. **Minimum Brake**  ... n/a  ... 1 of 10
7. **Motor Rotation**  ... n/a  ... CCW/CW
8. **Voltage Cut-Off Circuitry**  ... OFF/LiPo/Life  ... OFF/LiPo/Life
9. **Hall Sensor Test (diagnostic)**  ... n/a  ... yes

**VOLTAGE CUT-OFF CIRCUITRY**

This speed control features Novak's Smart-Stop Voltage Cut-Off Circuitry built-in, and when used properly will allow you to safely use LiPo and Life type batteries, without letting the cells drop below their critical safety voltage during operation. The default setting in the speed control is that the Voltage Cut-Off is turned ON and is set to LiPo. If you are using NiMH or NiCd cells, you will need to switch the Voltage Cut-Off feature OFF. If you are using Life cells, you will need to switch the Voltage Cut-Off feature to the Life battery setting.

**Note:** Whenever the speed control's One-Touch Programming is performed, this setting will revert to the LiPo default setting.

**DO NOT USE LiPo/LiFe BATTERIES WITH VOLTAGE CUT-OFF TURNED OFF**

**GOOD QUALITY RADIO SYSTEM SUGGESTED**

With the higher performance of brushless systems, undesirable radio system noise may occur when used with lower quality radio systems. 2.4GHz radio systems are the best to use. FM radio systems are acceptable, as long as the system is high quality. AM radio systems are NOT recommended.

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Visit the Novak website for up to date instructions, helpful videos, and Tech Articles.

www.teamnovak.com
This ESC features many parameters that can be customized to fine-tune the feel & response to your liking. The flow chart below and the adjustment steps to the right describe the different parameters and how they effect the ESC.

TO CHANGE PARAMETER SETTINGS:
1. WITH THE ESC SWITCHED “OFF”, CONNECT ESC TO A CHARGED BATTERY PACK, RECEIVER, AND MOTOR’S SENSOR HARNESS.
2. TURN ON THE TRANSMITTER.
3. SLIDE THE ESC’s ON/OFF SWITCH TO ‘ON’ POSITION
4. SELECT PARAMETER VALUE
   LED will flash the same number of times as the parameter is set to (refer to tables at right). Quick press & release SET button to change to your desired setting.
5. PRESS & HOLD SET BUTTON TO STORE NEW SELECTION
   When SET button is pressed and held for about 1 second, the new selection is stored in ESC’s memory—Status LEDs will scroll across to indicate ESC is exiting programming & ESC returns to neutral.

There is no time constraint during selection of custom parameters.
**BRUSHLESS PROFILE PROGRAMMING**

### THROTTLE PROFILE

#### #1 THROTTLE PROFILE SELECTION (1 of 2) BLUE-RED-WHITE LEDs

> Changing this setting switches the ESC’s motor control output. To use with a Sensor-Based Brushless Motor, change to Setting #2.

Note: When performing One-Touch Set-Up (page 1), be sure to leave the brushless motor wires DISCONNECTED. After the One-Touch Set-Up is done, change the Throttle Profile Setting to #2, then connect the brushless motor power wires.

<table>
<thead>
<tr>
<th>Setting (# of flashes)</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Throttle Profile:</td>
<td>Brush</td>
<td>Brushless</td>
</tr>
</tbody>
</table>

### DRAG/HILL BRAKE

#### #2 DRAG/HILL BRAKE SETTINGS (1 of 10) BLUE LED

> Amount of braking being applied while transmitter is at neutral. AKA 'hold' brakes.

> Settings 1-5 are Standard Drag Brake settings—less aggressive braking for rock racing (setting #1 applies no braking while trigger is at neutral).

Settings 6-10 are Power Hill Brake settings (ESC applies power to motor to 'hold' its position)—very strong rock crawling Hill/Hold braking.

Note: you must have a Novak Crawler brushless motor to have power brakes.

<table>
<thead>
<tr>
<th>Setting (# of flashes)</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drag Brake (%):</td>
<td>0</td>
<td>40</td>
<td>60</td>
<td>95</td>
<td>100</td>
<td>40</td>
<td>65</td>
<td>70</td>
<td>80</td>
<td>90</td>
</tr>
<tr>
<td>Brake Type:</td>
<td>Drag Brakes</td>
<td>Power Hill Brakes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### BRAKE FREQUENCY

#### #3 BRAKE FREQUENCY SELECTION (1 of 10) RED LED

How the ESC’s braking response feels with respect to the transmitter's trigger input.

> Increasing the Brake Frequency makes the brake response feel smoother and more controllable.

<table>
<thead>
<tr>
<th>Setting (# of flashes)</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>BrakeFreq. (KHz):</td>
<td>13.5</td>
<td>10.5</td>
<td>5.5</td>
<td>4.5</td>
<td>3.5</td>
<td>3</td>
<td>2.5</td>
<td><strong>2.25</strong></td>
<td>2</td>
<td>1.6</td>
</tr>
</tbody>
</table>

### DRIVE FREQUENCY

#### #4 DRIVE FREQUENCY SELECTION (1 of 10) BLUE & WHITE LEDs

How the ESC’s throttle response feels with respect to the transmitter's trigger input.

> Increasing the Drive Frequency makes the throttle response feel smoother and more controllable.

<table>
<thead>
<tr>
<th>Setting (# of flashes)</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drive Freq. (KHz):</td>
<td>32</td>
<td>30</td>
<td><strong>25</strong></td>
<td>23</td>
<td>21</td>
<td>16</td>
<td>14</td>
<td>12</td>
<td>10</td>
<td>8</td>
</tr>
</tbody>
</table>

### DEAD BAND

#### #5 DEAD BAND SETTINGS (1 of 5) BLUE-YELLOW-RED LEDs

Dead Band is the space between Minimum Brake and Minimum Drive, with Neutral in the middle.

> Increasing this setting increases amount of ‘free play’, or distance the transmitter’s trigger must move before the ESC sends forward drive or braking signal to the motor.

This is useful for transmitters with triggers that don’t center accurately or have worn pots and do not return to neutral properly.

<table>
<thead>
<tr>
<th>Setting (# of flashes)</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dead Band (%):</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td><strong>5</strong></td>
<td>8</td>
</tr>
</tbody>
</table>

### MINIMUM DRIVE

#### #6 MINIMUM DRIVE SETTINGS (1 of 10) BLUE-YELLOW-GREEN LEDS

Minimum Drive is the amount of forward drive applied with first pulse of transmitter throttle information sent.

> Increasing this setting starts the forward drive at a stronger level. This is useful to compensate for heavier vehicles to minimize the amount of trigger throw required before effective drive is applied.

<table>
<thead>
<tr>
<th>Setting (# of flashes)</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum Drive (%)</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>6</td>
<td>8</td>
<td>10</td>
<td>12</td>
<td>15</td>
</tr>
</tbody>
</table>

### MOTOR ROTATION

#### #7 MOTOR ROTATION SELECTION (1 of 2) BLUE-RED-RED LEDs

> Changing this setting changes the rotation direction of the motor's output/pinion shaft. Counter-clockwise rotation is standard in most vehicles.

<table>
<thead>
<tr>
<th>Setting (# of flashes)</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rotation Direction:</td>
<td><strong>CCW</strong></td>
<td>CW</td>
</tr>
</tbody>
</table>

Note: Your brushless motor must have the mechanical timing set to 30° for proper operation in forward and reverse direction. All Novak brushless motors, except for Novak Crawling motors, are factory timed to 30°. To change the mechanical timing on your Novak motor, refer to the Novak website (www.teamnovak.com) in the TECH INFO section. Having the motor set at 0° will draw excessive current in the reverse direction and may cause damage.

### VOLTAGE CUT-OFF

#### #8 VOLTAGE CUT-OFF (1 of 3) BLUE-YELLOW-GREEN-RED LEDS

> Changing this setting enables or disables the ESC’s built-in Smart Stop cut-off circuitry, and also sets the voltage cut-off point based on what type of battery is being used for the vehicle’s main battery pack.

Do not use LiPo/LiFe BATTERIES WITH THE ESC'S VOLTAGE CUT-OFF CIRCUITRY TURNED OFF.

<table>
<thead>
<tr>
<th>Setting (# of flashes)</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage Cut-Off Type:</td>
<td>OFF (NiMH/NiCd)</td>
<td>LiPo</td>
<td>LiFe</td>
</tr>
</tbody>
</table>

### HALL SENSOR TEST

#### #9 MOTOR SENSOR TEST BLINKING BLUE LED

> This diagnostic feature allows you to check the functionality of your brushless motor’s hall effect sensors & sensor harness (and its connections at the ESC and motor). Once activated, slowly rotate the motor’s output/pinion shaft and the appropriate LED will light up if a signal is received for that sensor in the motor. Refer to ‘MOTOR HALL SENSOR TEST’ section.

<table>
<thead>
<tr>
<th>Motor Hall Sensor</th>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>LED Color:</td>
<td>BLUE</td>
<td>YELLOW</td>
<td>RED</td>
</tr>
</tbody>
</table>

### RESTORING FACTORY DEFAULTS

Every time the ESC’s One-Touch Set-Up is performed, the ESC will automatically revert back to the factory default settings.

For brushless motors, be sure the power wires are disconnected before One-Touch Set-Up is performed.

Refer to our web site for updated values and more information on ESC parameters.
The Hall Sensor Test diagnostic feature in this ESC allows you to easily check the sensors in the brushless motor connected to it to determine if they are operating normally. This will help you pinpoint the cause of problems in your system, and hopefully reduce the down time and expenses associated with sending your product in for service when you can resolve the issue yourself.

To access this feature, simply follow these steps:
1. Follow the steps in the ‘CUSTOM PROGRAMMING OPTIONS’ section to access the Hall Sensor Test option via the ESC’s SET button.
2. Slowly rotate the motor’s output/pinion shaft. If motor is installed in a vehicle, this will help you pinpoint the cause of problems in your system, and hopefully reduce the down time and expenses associated with sending your product in for service when you can resolve the issue yourself.

The status LEDs on the speed control should cycle through illuminating the BLUE, YELLOW, and RED status LEDs.

If the BLUE, YELLOW, and RED LEDs light up one after another as the motor’s shaft is rotated, the Hall Sensors in the motor are operating normally.

If any one of the BLUE, YELLOW, or RED status LEDs do not light while rotating the motor’s shaft, there is either a problem with the Sensor Harness Cable (or its connections either at the motor end or the ESC end) or with the actual Hall Effect Sensors in the motor’s timing section.

If your motor has a user-replaceable double-ended sensor harness, replace it with one with another to determine if this is the problem. If, after replacing the harness, all 3 of the LEDs still do not light up, it would appear that one of the motor’s sensors has been damaged—replace the timing section of your motor, or if your motor is not user-rebuildable, send it in to the manufacturer for the appropriate service.

This ESC has a built-in diagnostic temperature monitoring feature that lets you quickly check the ESC’s operating temperature at any time.

While connected to a battery and powered ON, simply tap the ESC’s SET button and one of the on-board LED lights will flash 4 times to indicate the operating temperature of the speed control.

**WHITE** flashing LED = normal operating temp—under 135°F (57°C).

**BLUE** flashing LED = medium operating temp—136-147°F (58-64°C).

**YELLOW** flashing LED = hot operating temp—148-167°F (65-75°C).

**GREEN** flashing LED = hotter operating temp—168-194°F (76-90°C).

**RED** flashing LED = hottest operating temp—195-215°F (91-102°C).

You are now pushing the ESC extremely hard and should be very careful to avoid overheating and possible thermal shut-down.

**All LEDs flashing** = DANGEROUS operating temp—216-239°F (103-115°C).

Your ESC is now about to thermally shut-down.

Reduce the pinion size/check drive train to avoid ESC overheating that could result in potential damage.

### NOVAK HIGHLY-RECOMMENDS

**The use of an external receiver battery pack to supply power to the electronics when using high-power servos:**

As servos put excessive load on the speed control’s internal BEC, using an external receiver pack will greatly increase life span of your ESC, as this is a leading cause of speed control failure.

To use an External Receiver Battery Pack to Power the Electronics:

1. Plug the 5 cell (1.2 VDC/Cell) receiver battery pack into the battery slot (or any open/unused channel) of the receiver.
2. Remove the red wire from ESC’s input receiver harness (insulate the red wire).
3. To turn the vehicle ON, switch the receiver pack’s power switch ON. Then, turn the ESC’s power switch ON.
4. To turn vehicle OFF, turn ESC’s switch OFF, then turn receiver pack’s switch OFF.

**NOTE:** If you feel that you require service, obtain the most current service options & pricing as follows:

**WEB:** Print out the PRODUCT SERVICE FORM from CUSTOMER SERVICE section of the web site. Fill out required information on form and return it with the product requiring service.

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

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

**TRADE-IN PROGRAM:** Novak offers a trade-in program for non-warranty items toward current and discontinued products. You can replace, exchange, or upgrade Novak products as listed within the trade-in program. Complete a Non-Warranty Service Form to be eligible.

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