

## TIMING INDICATOR LED

To conform to ROAR's Sportsman Class racing rules and help race organizers monitor driver compliance in non-timing race classes, we have included a feature in this speed control that indicates when the ESC has its electronic motor timing advancement feature de-activated.

At all times when the speed control is powered on and the Dynamic Motor Timing is turned OFF (electronic motor timing advancement is set to zero), the ESC's **white status LED will flash** during normal operation.

## MOTOR HALL SENSOR TEST

The Hall Sensor Test diagnostic feature in this ESC allows you to easily check the sensors in the brushless motor connected to the ESC 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, slowly rotate the drive train so that the motor also rotates.
3. 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 a 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 another one to determine if this is this source of the problem. If, after replacing the harness, all three of the LEDs still do not light up, it would appear that one of the sensors inside the motor has been damaged--replace the timing section of your motor, or if your motor is not user-rebuildable, send it in the manufacturer for the appropriate service.

## VOLTAGE CUT-OFF CIRCUITRY

This ESC features Novak's Smart-Stop Voltage Cut-Off Circuitry built-in, and when used properly will allow you to safely use 2S LiPo (Lithium Polymer) batteries, without letting the battery's cells drop below their critical safety voltage which causes internal damage. ESC does NOT cut off 1S packs.

The default in the ESC is LiPo voltage cut-off is turned ON. If using NiMH or NiCd cells, you will need to switch this feature off.

**Note: The speed control will NOT revert to the LiPo ON default setting when the One-Touch Programming is performed.**

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

## TEMPERATURE MONITORING

This speed control 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 to avoid overheating and potential ESC damage---

## TROUBLE-SHOOTING GUIDE

### Steering Channel Works But Motor Will Not Run

- Possible receiver damage—Check operation with a different receiver.
- Possible internal damage—Refer to 'SERVICE PROCEDURES' section.
- Check motor or motor connections.
- Make sure ESC is plugged into the throttle channel of receiver. Check wiring color sequence of receiver signal harness (Refer to STEP 1).

### Receiver Glitches/Throttle Stutters During Acceleration

- Receiver or antenna too close to ESC, power wires, battery, or motor.
- Bad motor sensors, sensor harness, or connections—Check wiring, sensor harness, & connections, perform hall sensor test (Refer to 'MOTOR HALL SENSOR TEST' section).
- Low voltage to receiver—Try Novak Glitch Buster capacitor on receiver to help retain power during high current draw situations (Novak accessory #5626).
- PowerCap damaged/missing—Replace PowerCap.
- Battery pack damaged or weak—Try a different battery pack.
- Motor magnet weak or overheated—Replace rotor (Refer to motor manufacturer's website).
- Excessive current to motor—Use a milder motor or a smaller pinion gear.
- Untidy wires or signal and power wired bundled together. Input harness and servo wires should be bundled separately. Power wires should be as short as possible.

### 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.

### Motor Runs Backward

- Improper One-Touch set up—Refer to 'ONE-TOUCH PROGRAMMING' section.

### Timing Does Not Operate Properly

- Improper gearing—Refer to 'PROPER GEAR SELECTION' section.
- Timing not turned ON—Refer to 'CUSTOM PROGRAMMING' section.
- Timing Set Points set incorrectly—RPM values may be set incorrectly. Refer to 'CUSTOM PROGRAMMING' section.

### Speed Control Runs Excessively Hot

- Electronic motor timing set too high—reduce timing level setting in ESC.
- Gear ratio too low—Increase gear ratio/Reduce pinion (refer to 'PROPER GEAR SELECTION').
- Motor is damaged—Try a different motor.

### Model Runs Slowly/Slow Acceleration

- Gear ratio too high—Reduce gear ratio/Increase pinion (refer to 'PROPER GEAR SELECTION').
- Check battery & connectors—Check battery pack & connectors. Replace if needed.
- Incorrect transmitter/ESC adjustment—Refer to 'TRANSMITTER ADJUSTMENTS'.
- PowerCap damaged/missing—Replace PowerCap.

### ESC Is Melted Or Burnt/ESC Runs With Switch Off

- Internal damage—Refer to Service Procedures.

### No Power to the BEC

- Check power wire connections to your battery, ESC and BEC unit.
- Check that the input harness from the BEC is plugged into the receiver correctly and the red wire from the ESC's input harness is removed.
- Be sure that the BEC unit switch is turned ON.

## ERROR CODES

- **Red & Green status LEDs on solid**—Check input signal harness connections at ESC and receiver. Check input signal harness wiring sequence—Refer to STEP 1.
- **Red status LED on solid & Green LED blinking**—Check motor sensor harness connection. Possible internal motor damage.
- **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 & 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 & Green (Locked Rotor Detection), or Blue & Red (ESC 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 'ONE-TOUCH' & 'TRANSMITTER ADJUSTMENTS').
- **White status LED blinking**. ESC timing is turned OFF. ESC is operating normal.
- **Red & Yellow status LEDs toggling**. LiPo Safety Cut-Off voltage reached. Remove and charge/replace battery pack.

Check Novak's web site for additional information.

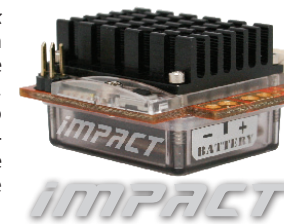
www.teamnovak.com

## IMPACT TRACK GUIDE

#55-1730P-1 Rev.2

4-2013

The Impact Racing Brushless ESC (Novak part number #1730) is factory loaded with numerous programmable features. While this may seem overwhelming at first glance, this *Impact Track Guide* was designed to keep you at the track to use as a quick-reference and help walk you through the explanations and programming of all of the speed control's features.



Take the time to thoroughly read through this programming guide before operation to fully understand the different ESC parameters, and how they can be used to fine tune your ESC's feel and performance. Most importantly, enjoy all of the technical benefits and features the Impact ESC has to offer.

Visit our web site for the most up to date information and to learn more about other Novak products and services.

## ONE-TOUCH PROGRAMMING

With the ESC connected to (at least) a charged battery pack, the receiver, and the brushless 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. White 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 Programming must be repeated. If you experience any problems, turn off ESC and repeat One-Touch.

**NOTE:** The speed control will NOT revert back to the factory-default settings when the One-Touch Programming is performed. Refer to 'Data Reset' in Custom Programming.

## TRANSMITTER ADJUSTMENTS

Transmitter adjustments may not be needed to operate this ESC, however, if you have any problems with ONE-TOUCH PROGRAMMING, adjust the transmitter as follows and repeat the ONE-TOUCH PROGRAMMING step.

### THROTTLE CHANNEL ADJUSTMENTS

- A. Set HIGH ATV or EPA to 100% setting. [amount of throw at full throttle]
- B. Set LOW ATV, EPA, or ATL to 100% 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 50% throttle and 50% brake throw—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.

### 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.**



## ESC PARAMETERS

1. Throttle Profile (1 of 5)..... 1-5
2. Drag Brake (1 of 10)..... 0-30%
3. Minimum Brake (1 of 10)..... 0-30%
4. Brake Frequency (1 of 10)..... 1.6-10.0KHz
5. Timing Level--10's (1 of 4 adjustments of 10°)..... 10-40°
6. Timing Level--1's (1 of 9 adjustments of 1°)..... 1-9°
7. Timing Start RPM (1 of 10 in 4 ranges)..... 1500-18500 RPM
8. Timing Final RPM (1 of 10 in 4 ranges)..... 4000-29000 RPM
9. Timing RPM Range (1 of 4 tables of 10)..... 1500-29000 RPM
10. Drive Frequency (1 of 10)..... 8-36KHz
11. Dead Band (1 of 5)..... 2-8%
12. Minimum Drive (1 of 10)..... 0-15%
13. ESC Reversing Functionality..... OFF/ON
14. Voltage Cut-Off Circuitry..... OFF/LiPo
15. Dynamic Timing Advance..... OFF/ON

## TIMING ESC WARNING

Due to the nature of timing advance speed controls, motor tolerances & settings, vehicle performance, and track conditions, it has become virtually impossible to provide installation and operation recommendations that will allow you to use these speed controls and motors at their highest performance levels without the potential for unwanted damage.

You must, use extreme caution when setting up these electronics and carefully test your application to avoid overloading and overheating either the speed control or the motor. These are racing electronics used in racing conditions, and therefore damage as the result of excessive overheating will not be covered under the product's factory warranty.

Electronic motor timing advancement can generate extremely high speeds and result in an uncontrollable vehicle. Use caution when operating vehicle and do not operate around other people or in an unsafe manner to avoid injuries or damage.

## 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, ESC/motor damage & failure, you must start with VERY small pinion sizes and check ESC & motor temperatures at multiple times throughout the initial runs. 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 continually monitor ESC & motor temperatures to protect your electronics from damage.

## THERMAL PROTECTION CIRCUITRY

This ESC's temperature overload protection will turn off the Dynamic Timing Advance feature and limit the power to the motor in an attempt to prevent thermal overloading of the ESC. While this feature can not guarantee the survival of the ESC when subjected to conditions that produce excessive heating of the electronics, it does provide you a tool to help avoid extensive damage.

If you notice a significant decrease in performance of your brushless system during a run, immediately check the ESC & motor temperatures. Reduce gearing or ESC timing settings to lower temperatures!

Note: The thermal protection circuitry can be triggered by heavy BEC loading from high-power servos. An external BEC or receiver pack can solve this problem and allow the thermal protection to provide maximum security for the ESC!



# CUSTOM PROGRAMMING

## SUPER-TUNER FLOW CHART

The Impact ESC features Novak's Super-Tuner programming interface with numerous ESC parameters that can be customized to fine-tune the ESC's feel & response to your liking. The flow chart and the descriptions to the right show the order of the different parameters and how they affect the ESC's feel or response.

One-Touch Programming should be completed before customization of parameters, as many of the ESC parameters are based off percentages of the trigger's full-throttle and full-brake position.

Note: ESC parameters do NOT default back to the factory settings when the One-Touch Programming is performed.

**THE ESC PARAMETERS LISTED IN BOLD IN THE TABLES TO THE RIGHT ARE THE DEFAULT SETTINGS FOR PROFILE #1**

The sequence that the status LEDs of the ESC goes through in the Super-Tuner software is easier than ever to follow. Common ESC parameters are grouped together, and the LEDs also light up in order from left to right on the ESC.

The first adjustable item is the ESC's Throttle Profile, next comes a group of 3 Braking adjustments, then 5 Timing settings, followed by 4 forward Drive settings, and then finished up with LiPo ON/OFF, Timing ON/OFF, and a test mode to check the motor's hall effect sensors and harness connections.

### TO CHANGE PARAMETER SETTINGS:

1. CONNECT THE ESC TO A FULLY CHARGED BATTERY PACK, A RECEIVER, AND THE MOTOR'S SENSOR HARNESS

2. SLIDE THE ESC'S ON/OFF SWITCH TO 'ON' POSITION

3. WITH ESC AT NEUTRAL, PRESS & HOLD SET BUTTON  
Release ESC's SET button once LEDs are lit for the desired setting.

To skip a parameter, continue to press & hold SET button until desired parameter is reached.

4. SELECT PARAMETER VALUE  
LED flashes to indicate active setting (refer to tables at right). Quick press & release SET button to select 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.**



### ESC STATUS LED ORDER:



## THROTTLE PROFILE

**#1 THROTTLE PROFILE SELECTION (1 of 5) BLUE-RED-WHITE LEDs**

>> Increasing this setting changes the active Throttle Profile. Each of the Throttle Profiles are independently adjustable once selected.

Profile (# of flashes)	1	2	3	4	5
typical application-->	No-timing	No-timing	Modified	Modified	Oval 1S
	Blinky-Slick	Blinky-Grip	Low Timing	Med. Timing	Mild Timing
ESC Parameter	def.setting	def.setting	def.setting	def.setting	def.setting
Drag Brake	<b>3</b>	6	3	3	1
Minimum Brake	<b>3</b>	6	3	3	1
Brake Frequency	<b>3</b>	3	3	3	3
Timing--10's	<b>1*</b>	1*	1	1	3
Timing--1's	<b>1**</b>	1**	1**	1**	1**
Timing Start RPM	<b>10*</b>	10*	10	1	10
Timing Final RPM	<b>10*</b>	10*	10	1	10
RPM Range	<b>4*</b>	4*	4	4	1
Drive Frequency	<b>10</b>	10	10	10	10
Dead Band	<b>4</b>	4	4	4	4
Minimum Drive	<b>1</b>	6	1	1	1
Reverse	<b>1</b>	1	1	1	2
Voltage Cut-Off	<b>2</b>	2	2	2	1
Dynamic Timing	<b>1</b>	1	2 (ON)	2 (ON)	2 (ON)

\*Even though Dynamic Timing is turned OFF in Throttle Profiles #1 & 2, the timing settings can be adjusted. If Timing is turned ON, the selected values will be active.

\*\*The 1's Timing setting defaults to 0°, however if you go into the 1's set-up mode you will automatically change it to 1°, or setting #1, and will see the LED flash once.

## DRAG BRAKE

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

Amount of braking being applied while transmitter is at neutral. AKA 'coast' brakes.  
>> Increasing this setting makes the motor slow down more without pushing the transmitter's trigger into the brake/reverse direction.

Setting (# of flashes)	1	2	3	4	5	6	7	8	9	10
Drag Brake (%):	0	3	<b>6</b>	9	12	15	18	21	24	30

## MINIMUM BRAKE

**#3 MINIMUM BRAKE SETTINGS (1 of 10) YELLOW LED**

Amount of braking applied with the first pulse of transmitter braking information sent.  
>> Increasing this setting starts the braking at a stronger/higher level. This is useful to compensate for heavier vehicles to minimize the amount of trigger throw required before effective braking is applied.

Setting (# of flashes)	1	2	3	4	5	6	7	8	9	10
Minimum Brake (%):	0	3	<b>6</b>	9	12	15	18	21	24	30

## BRAKE FREQUENCY

**#4 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.

Setting (# of flashes)	1	2	3	4	5	6	7	8	9	10
Brake Freq. (KHz):	1.6	2.0	<b>2.2</b>	2.5	3.0	3.5	4.5	5.0	5.7	10.0

## TIMING LEVEL--10'S

**#5 TIMING LEVEL 10's SETTINGS (1 of 4) GREEN LED**

The first digit, or "tens setting", of the maximum number of degrees of Dynamic Timing Advance applied to the motor. *This ESC has 0-49° of Dynamic Timing.*  
>> This setting adjusts the 1st digit of the maximum electronic motor timing applied to the motor by ten degree increments.

Whenever the 10's setting is modified, Timing is set to the even 10° increment when the ESC exits programming. So, if you select setting #3, the timing is set to 30° (the 1's value changes to zero until modified--this is how you get 10, 20, 30, & 40°).

Setting (# of flashes)	1	2	3*	4*
Timing Level (degrees):	10	20	30	40

**WARNING: DO NOT FREE-REV MOTOR TO CHECK TIMING SETTINGS**  
\*Levels above 30° produce excessive heating & must be used with caution.

Physical motor timing should be set at/below 30° ("N" on older Ballistic motors)

## TIMING LEVEL--1'S

**#6 TIMING LEVEL 1's SETTINGS (1 of 9) WHITE LED**

The second digit, or "ones setting", of the maximum number of degrees of Dynamic Timing Advance applied to the motor.

>> This setting adjusts the 2nd digit of the maximum electronic motor timing applied to the motor by one degree increments.

Setting (# of flashes)	1	2	3	4	5	6	7	8	9
Timing Level (degrees):	1	2	3	4	5	6	7	8	9

## TIMING START RPM

**#7 TIMING START RPM POINT (1 of 10) BLUE & YELLOW LEDs**

The RPM trip point at which Dynamic Timing Advance starts being applied.  
>> Increasing this setting will increase the motor RPM at which the electronic motor timing advancement begins coming on.

Setting (# of flashes)	1	2	3	4	5	6	7	8	9	10
Start RPM (in table):	1	2	3	4	5	6	7	8	9	10

Note: Selection chooses a line number from within the selected RPM Range Tables below. First select RPM Table # (step #9), then select desired Start & Final RPM line numbers from table.

## TIMING FINAL RPM

**#8 TIMING FINAL RPM POINT (1 of 10) BLUE & RED LEDs**

The RPM trip point at which Dynamic Timing Advance finishes being applied.  
>> Increasing this setting will increase the motor RPM at which the electronic motor timing advancement stops coming on.

Setting (# of flashes)	1	2	3	4	5	6	7	8	9	10
Final RPM (in table):	1	2	3	4	5	6	7	8	9	10

## TIMING RPM RANGE

**#9 TIMING RPM LOOK-UP TABLE (1 of 4) BLUE & GREEN LEDs**

The speed control software's available look-up tables of Timing RPM trip points (start/final) at which Dynamic Timing Advance starts and ends being applied.  
>> Changing this setting changes the table number that the ESC uses to look-up Start & Final RPM trip points selected in steps #7 & 8 above.

Setting (# of flashes)	1	2	3	4
RPM Range:	Table 1	Table 2	Table 3	Table 4
Table 1	Table 2	Table 3	Table 4	
Start Final	Start Final	Start Final	Start Final	
1 1500 4000	1 4000 10000	1 9000 15000	1 14000 20000	
2 1750 4500	2 4500 10500	2 9500 16000	2 14500 21000	
3 2000 5000	3 5000 11000	3 10000 17000	3 15000 22000	
4 2250 5500	4 5500 11500	4 10500 18000	4 15500 23000	
5 2500 6000	5 6000 12000	5 11000 19000	5 16000 24000	
6 2750 6500	6 6500 12500	6 11500 20000	6 16500 25000	
7 3000 7000	7 7000 13000	7 12000 21000	7 17000 26000	
8 3250 7500	8 7500 13500	8 12500 22000	8 17500 27000	
9 3500 8000	9 8000 14000	9 13000 23000	9 18000 28000	
10 3750 8500	10 8500 14500	10 13500 24000	10 18500 29000	

Note: Within the selected RPM Range Table, the Start & Final RPMs (steps #7 & 8) are selected separately from the same table but do not have to be the values across from each other in the table.

## DRIVE FREQUENCY

**#10 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 this setting increases the Drive Frequency which makes the throttle response feel smoother and more controllable.

Setting (# of flashes)	1	2	3	4	5	6	7	8	9	10
Drive Freq. (KHz):	8	10	12	14	16	21	23	26	32	<b>36</b>

## DEAD BAND

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

The space between Minimum Brake & Minimum Drive, with Neutral in the middle.  
>> Increasing this setting increases the amount of 'free play', or distance the transmitter's trigger must move before actual forward drive or braking begins.

Setting (# of flashes)	1	2	3	4	5
Dead Band (%):	2	3	4	<b>5</b>	8

## MINIMUM DRIVE

**#12 MINIMUM DRIVE SETTINGS (1 of 10) BLUE-YELLOW-GREEN LEDs**

Amount of forward drive applied with first pulse of transmitter throttle information sent.  
>> Increasing this setting starts forward drive at a stronger/higher level (use to minimize the trigger throw required before a heavier vehicles moves).

Setting (# of flashes)	1	2	3	4	5	6	7	8	9	10
Minimum Drive (%):	<b>0</b>	1	2	3	4	6	8	10	12	15

## REVERSE--ON/OFF

**#13 REVERSE SELECTION (1 of 2) BLUE-YELLOW-WHITE LEDs**

>> Enables or disables the ESC's reversing functionality. OFF = fwd & brakes only. ON = fwd w/brakes, then reverse (with 2nd push of trigger).

Setting (# of flashes)	1	2
Reverse:	<b>OFF</b>	ON

## VOLTAGE CUT-OFF--ON/OFF

**#14 LiPo CUT-OFF SELECTION (1 of 2) BLUE-YELLOW-RED-GREEN LEDs**

>> Enables or disables the ESC's Smart Stop voltage cut-off circuitry.  
**DO NOT USE LiPo BATTERIES WITH VOLTAGE CUT-OFF TURNED OFF**

Setting (# of flashes)	1	2
Voltage Cut-Off Type:	OFF (NiMH/NiCd)	<b>LiPo</b>

## TIMING--ON/OFF

**#15 ELECTRONIC TIMING SELECTION (1 of 2) YELLOW & RED LEDs**

>> Enables or disables the ESC's Dynamic Timing Advance features.

Setting (# of flashes)	1	2
Dynamic Timing:	<b>OFF</b>	ON

## DATA RESET

**#16 DEFAULT DATA RESET YELLOW & GREEN LEDs**

>> This feature resets the ESC's adjustable parameters to factory default values for all throttle profiles. Select setting #2 then Push & Hold to RESET.

Setting (# of flashes)	1	2
Data Reset:	<b>KEEP DATA</b>	RESET ALL DATA

## HALL SENSOR TEST

**#17 MOTOR SENSOR TEST BLINKING BLUE LED**

>> This diagnostic test checks the brushless motor's hall effect sensors and harness (and harness connections at ESC/motor). Activate & slowly rotate motor shaft--LED will light up if signal received for that sensor.

Motor Hall Sensor	A	B	C
LED Color:	BLUE	YELLOW	RED