Thank you for choosing YR HACK Products, and welcome to the power and convenience of Brushless RC. By purchasing the HACKTRONIC brushless Electronic Speed Control ("ESC"), you have chosen one of the most advanced speed controls designed for all competitions. This speed control with the most linear power curve and our advanced engineering, brings drivers to a new experience of race, allows multiple programmable parameters (using the ESC's Setting Card which is sold separately). Please read this manual thoroughly to familiarize yourself with the installation, setup, operation, and limitations of this unit. By operating this product, you accept the Yeah Racing Warranty Terms.

SPECIFICATIONS

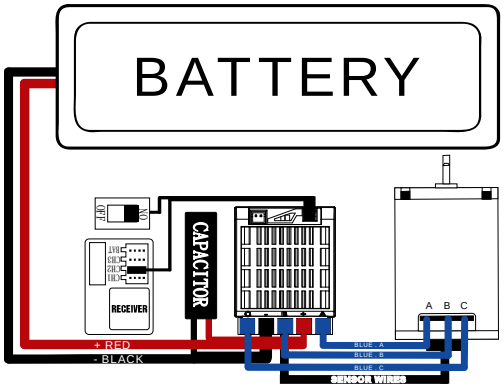
System:	Brushless
Forward/Brake/Reverse:	Yes (Factory preset at Forward/Brake)
Dimensions:	39(L) x31(W) x 22.5(H) mm
Weight:	45g (excluding wires)
Voltage Input:	(4.8 – 9.9V DC) 3 – 6 Cells NiCD/NiMH 1~2-Cell LiPO / 1-3 Cell LiFe
Peak Current	540A
Motor Limit:	Over 5.5 Turns
Motor Type:	Sensored 540 sized brushless motors
B.E.C.:	6V / 3.0A
Multi Protection System:	Yes

INSTALLATION & CONNECTORS

Solder the supplied wires to the soldering posts on the ESC according to the following scheme:

Red wire	"+" post (Battery +ve)
Black wire	"-" post (Battery -ve)
Blue wire	"A" post (Motor A)
Blue wire	"B" post (Motor B)
Blue wire	"C" post (Motor C)
Red wire	"+" post (Capacitor +ve)
Black wire	"-" post (Capacitor –ve)

(Warning! Use only good quality solder and avoid soldering longer than 5 seconds per solder joint)



- To avoid radio glitches, arrange the placement of the ESC such that the power wires and the receiver antenna wires do not cross over each other.
- Try to arrange the receiver placement such that the receiver plugs are easily accessible. Use supplied extension cable if plugs are not accessible (for ESC setup purposes).
- Place the ESC where it is protected in the event of a crash; and use the supplied double sided tape to secure the ESC onto the chassis.
- Install/Solder your favorite battery connector to the battery wires if you do not plan to direct solder your battery. RED to +ve and BLACK to –ve. (Warning! Reversing the battery polarity will destroy your ESC and void the warranty)
- Connect the 3 motor wires to the motor; you can either solder the wires directly to the motor or use your favorite connectors. Match the label of the wires (A, B, C) to the labels of the taps on the motor when soldering. Avoid soldering longer than 5 seconds per solder joint and avoid shorting the motor by creating a wire bridge or a solder bridge on the solder tabs on the motor. (Warning! Improper wiring may damage the ESC and void the warranty.)
- Connect the sensor cable between the ESC sensor plug and the motor sensor plug
- Connect the receiver plug to the CH2/throttle pin of the receiver.
- Secure the on/off switch in a place where it will not be accidentally knocked to the "off" position during a crash.

RADIO & ESC SET-UP

Transmitter Settings:

Throttle Travel	Maximum / 100%
Brake Travel	Maximum / 100%
Throttle Exponential	Start with 0%
Throttle Neutral Trim	Center / 0
Throttle Servo Reverse	Reverse (Futaba, KO, Sanwa)

Initial set-up of the throttle end-points of the ESC:

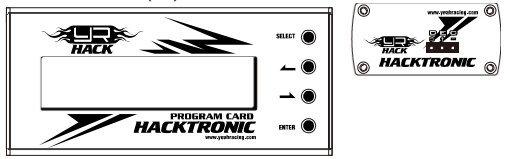
- Connect the power wires of the ESC to a fully charged battery set; making sure the polarity is correct.
- Bind your receiver and transmitter first if your radio requires you to do so.
- Turn on the transmitter and hold the throttle at full brake position.
- Turn on ESC and listen for 2 beeps.
- After you hear the 2 beeps, apply full throttle and listen for another 2 beeps.
- Once you hear the 2 beeps, release the throttle to neutral position.
- A beep will then sound, signifying that the ESC endpoints have been successfully set calibrated.

Note! If you do not hear the beeping sound as described above, try reversing the throttle reverse setting in the transmitter.

CUSTOMIZING THE ESC

Due to the different requirements of each type of racing, it is important to customize your ESC for a particular usage. Customization of the ESC is done using the setting card(purchased separately). To start, simply unplug the ESC receiver wire from the receiver and plug it into the receptacle on the side of the setting card (as shown below), making sure that you plug it in correctly:

s (signal) White
+ (+ve) Red
- (-ve) Black



Connect the battery wires to a charged pack of battery. Turn on the ESC and the setting card will activate automatically. Note that the screen will show "Loading…" during initialization – indicating that the ESC is copying the current setup in the ESC to the setting card. Once loading is completed, the screen will show "Yeah Racing Program" and Current Firmware Version and Data code e.g. Ver1.0 1XXXXXX. You can now start to program your ESC.

Press "Enter" to enter the Program Mode or Data Reading.
(Detail please see the ***OPERATION DIAGRAM*** in page 2)

We have Mod Mode and Stock Mod for each have 15 menus .

Menus 1-12 for touring(Drift 1-10, Crawler 1-7) are operational settings of the ESC. Each menu consists of its own set of Parameters. Detailed explanation of each menu and its parameter set is found later in this document. It is important that you familiarize yourself with these menu items in order to get the most out of your ESC.
Menu Save allows you to save the current displayed Parameter in the setting card. Maximum of 2 sets of Parameters can be stored.
Menu Load allows you to load either the factory default Parameter or any previously saved Parameters back to the setting card memory.
Menu Send allows you to send the current displayed Parameter on the setting card to the ESC - overwriting whatever is in the ESC.

Tips! Whenever in doubt, double check your ESC setting by initializing the setting card again and check each menu setting.

Navigation around the Program Menu is done using the 4 buttons on the right hand side of the setting card. The function of each button varies depending on which screen the display is showing:

You could also switch your ESC around from Touring, Drift and Crawler Mode by updating the ESC firmware with "Hacktronic Firmware Update USB Cable #HTN-303" (Sold Separately)

HACKTRONIC
Ver. XX XXXXXXX:
"Enter" button - go to next page

Menu: Program Setup
Date Reading
:
"Enter" button - go to "Program Setup"
"▬" button - Scroll down the choices
"Enter" button - go to "Date Reading".
Note!

Menu: Advance
"Select" button - Scroll down the menu
"▬" button - Scroll up the choices
"▬" button - Scroll down the choices
"Enter" button - Copy current display Parameter on the setting card to the ESC and overwrite old data in the ESC

Note! The setting card is not included the package, need to purchase separately
The setting card will compare the Parameters before writing. If no changes are made, the setting card will display "unUpdata". If changes are made, you will hear a series of beeps and the setting card will display "Send OK".

Tips! Do not worry about making mistakes. You will not damage the ESC during setting. If in doubt, you can always reload the default set up and start over again (Load Menu 13 Default and confirm Send on Menu 15).

OPERATING TIPS

Multi Protection System – Other than the Low Voltage Protection and the Overheat Protection that were described above, the ESC has 2 more build-in protections:

Motor Lock Protection:

- The ESC is protected against damage when the motor is stuck and does not turn at all. Power will not be applied in this situation.

- ***Caution!*** Since the ESC relies on the feed back of the 3 motor wires to deploy this protection, it ONLY works if the motor does not turn AT ALL. If the rotor has any rotation, the ESC will consider the motor to be operational and the power to the motor will not be cut off.

Fail Signal Protection:

- In case the radio signal to the ESC is interrupted for over 1 second during a run, the ESC will be switched off until the signal resumes.

Misc. Tips:

- Connect the ESC to the battery pack only when you are ready to run. This will avoid draining the battery pack. Always disconnect the battery after your run.
- A small spark may occur at the connection when the battery is connected. This is normal and is due to the charging up of the capacitors.

LIMITED WARRANTIES / REPAIR PROCEDURES

All Yeah Racing products are manufactured according to the highest quality standards. Yeah Racing guarantees this product to be free from defects in materials or workmanship for 60 days from the original date of purchase verified by sales receipt. This limited warranty does not cover damages that are results of normal wear, misuse or improper maintenance of the product.

To avoid unnecessary service and mailing charges, always eliminate all other possibilities and check all components for malfunctions before sending in your unit for repair. Products sent in for repair that operate perfectly will be charged a service fee.

When sending in the product, always pack carefully and include the original sales receipt, a description of the problem encountered, your return address and contact information.

Since we do not have control over the installation and use of this product, we cannot accept any liability for any damages resulting from the usage of this product. Therefore, using this product is at your own risk, and the user accepts all resulting liability from installing and using of the product.

OPERATION DIAGRAM

Detailed Explanation of each ESC Menu items:

Touring Car :

1. **Timing Start** – Allows you to adjust which throttle point the timing setting kicks in, this setting can be adjust to suit with different track layout with different motors. (5%-40% @5%, blinky = Off)

2. **Timing** – Allows you to adjust the timing of the motor (0~16 for Mod Mode and 0~36 for Stock Mode 1º increments):

- Generally speaking, in brushless systems, increase in timing will result in increased RPM of the motor. However, increase in timing also decrease the efficiency of the system, thus generating heat on the ESC and motor.
- Lower timing has more torque and lower RPM; Higher timing results in less torque with thigher RPM.
- With Modify motor start from Timing 6
- With Stock motor start from Timing 15

Caution! Always monitor motor and ESC temperature closely when applying timing to ESC or motor. Heat may build up very fast in both ESC and motor and cause permanent damage to equipment. Extra heat dissipation accessories may need to be applied.

3. **Timing Interval** – Allows you to adjust how responsive and quickly the timing setting kicks in. Set to +3 for the smoothest acceleration or -3 for the most aggressive acceleration. Smooth (+1,+2,+3) or Aggressive (-1,-2,-3) (-3 to +3, Default in "Normal")

4. **Turbo Delay** – Allows you to adjust the time gap between the Timing System to Turbo Timing system (From 0.02 sec to 0.15 sec in 0.01 sec increments):

- Turbo Delay is needed because when the ESC is operating under the Turbo Timing mode, it drives the motor to very high RPM - however, with very low torque. With Turbo Delay, the motor has a chance to rev up before the Turbo Timing kicks in. Thus achieving higher top speed.
- Proper adjustment of the Turbo Delay will result in smooth transition and continuous power band from regular Timing to Turbo Timing.

5. **Turbo Timing** – Turbo Timing is unique to brushless systems because the ESC can simulate motor timing advance. While mechanical timing advance in brush motor system is limited by the physical phasing of the motor, brushless ESC timing advance can push beyond that physical limit. As a result, motors can run at a super-high RPM in the Turbo Timing mode, resulting in a sensation similar to 2nd gear/Turbo for top speed. This menu allows you to adjust the amount of Turbo Timing in your ESC in 1º increments. (Note* The degree increment of Turbo Timing is always greater than timing)

- Turbo Timing is applied at 98% throttle.
- Higher Turbo Timing settings will increase top speed, but will drive motor and ESC temperatures up as well.

Caution! Heat is ESC's biggest enemy! Monitor your ESC and motor temperature to avoid equipment damage.

6. **Turbo Interval** – Turbo Interval is effective only when Turbo Timing is in operation. Allows you to adjust how responsive and quickly to achieve to the max turbo timing setting when the turbo kicks in (-6,-5,-4,-3,-2,-1, Normal, +1,+2,+3,+4,+5,+6)
- Turbo Interval setup is important to ensure high top-end speed on long straightaway.
- (-6 ~ -1) this will making the turbo more aggressive and early to top speed. (Suitable on high traction)
- (+1 ~ +6) this will making the turbo more smooth and least to top speed. (Suitable on low traction)
- Default in "Normal"

7. **Drag Brake** – Also known as 'engine braking' - allows you to set how hard brake force applied when the throttle returns to neutral position (25 steps from 0% to 25%):
- Drag brake affects how a car handles off-throttle (entering a corner / avoid crashes). With drag brake on, there will be more weight shift to the front tires thus increasing the front end grip when you let go the throttle.
- Experiment with different settings to find the setting that fits your driving style most.

8. **Initial Brake** – Allows you to how hard it brakes at the initial stage of braking. (Steps from OFF to 30%):
- OFF – Brake linear base on transmitter
- Adjust initial brake to set certain level of "hard brake" effect. (Also can adjust your transmitter brake hi-point to get the brake force you needed)

9. **Brake Frequency** – Brake Frequency operates similar to PWM except it affects the braking instead of the throttle (1k, 2k(default), 4k).
- At 1kHz, the Drag brake and the Brake force will have the punchiest and most direct feel
- At 4 KHz, the Drag brake and the Brake will have a more linear feel.

10. **Punch** – Allows you to change the punch of the ESC (Level 1 to Level 10):
- Level 1 has the least punch and Level 10 has the highest punch.
- Adjust punch level to maximize acceleration speed with minimum wheel spin.
- With Mod Mode, start with Level 3
- With Stock Mode, start with Level 6

11. **PWM** – Allows you to change the forward drive frequency of the ESC (2K, 4K, 8K and 32K)
- The 2K setup will give you good punch at the low end.
- The 32K setup will result in strong mid to top end.
- Experiment to find out what suits your driving style best.

12. **Save** – Allows you to save the setting card display Parameter to the selected memory Parameters in the setting card (5 user defined Parameters):
- This feature allows you save Parameters for future use. It also allows easy sharing of ESC setup amongst team members.

13. **Load** – Allows you to load the saved Parameters in the setting card memory to the setting card display menu (6) with user defined Parameters:
- Loading saved Parameter does not change the ESC setting. It only changes the setting card display Parameter. In order to change the ESC setting, you still need to "Send" the Parameter to the ESC (Menu 14).

14. **Send** – Allows you to send the setting card display Parameter to the ESC (Yes / No):
- Yes to confirm or No to cancel sending
- Note that the original parameter in the ESC will be lost after this operation.

15. **Exit** – Finish the setting and exit the menu return to previous menu.

Drift Car

1. **Timing Start** – Allows you to adjust at which throttle point (5%-40%) the timing function will kick in, this setting will aid to get a smooth power band for all kind of motors. (Blinky Mode means no timing will be applied)

2. **Timing** – Allows you to adjust the timing of the motor (0~16 for Modify Mode at 1º increments):
- Increase in timing will result in increase of motor RPM. However, increase in timing also decrease the efficiency of the system, thus generating extra heat on the ESC and motor.
- Lower timing setting will result in more torque and lower RPM; while higher timing setting will result in the least torque with the highest RPM.

3. **Timing Interval** – Allow you to adjust how smooth the motor "ramp-up" when timing kicks in. Whereas -3 will have the smoothest acceleration and +3 will have the most aggressive acceleration. (7 Steps from -3 to +3, Default at "Normal")

4. **Punch** – Allows you to change the punch of the ESC (1 to 10):
- Level 1 has the least punch and Level 10 has the highest punch.
- Punch level is usually adjust to maximize acceleration speed with minimum wheel spin.

5. **Drag Brake** – Also known as 'engine brake'. Allows you to set how hard it brakes when throttle is not applied. (30 steps from 0% to 30%):
- Drag brake affects how a car handles when off-throttle (entering a corner). With drag brake on, there will be more weight shifted towards the front tires thus increasing the front end grip when you let go the throttle.
- Experiment with different settings to find the setting that fits most to your driving style.

6. **Initial Brake** – Allow you to set how hard the brake applies at the beginning (OFF to 100%):
- OFF – Brake linear base on transmitter
- Adjust initial brake to set certain level of "hard brake" effect.(also can adjust your transmitter brake hi-point to get your need the brake force)

7. **Brake LV –** Allow you to set the maximum amount of brake force during manual braking (OFF to 100%)

8. **Release curve** – This parameter controls how fast the car will slow down when you release throttle. You can adjust this parameter to get the desired weight shift to enter a corner. Level 10 will has the most aggressive weight shift and simultaneous respond while Level 1 will have the smoothest drive and least weight shift hence easier to control ***(For experienced drifter, you are recommended to set this parameter to Level 7 or higher.)***

9. **RPM Lock** –Allows you to limit the motor maximum rpm (100%-30%) to fit the track size and surface traction.

Crawler Car

1. **Turbo Timing** –This setting allow you to adjust the amountof Turbo Timing in your ESC in 1º increments (Off-25º)
- Turbo Timing is applied when 98% throttle is achieved more than 1 sec
- Higher Turbo Timing settings will increase top speed, but will drives up motor and ESC temperatures as well.

Caution! Always monitor motor and ESC temperature closely when applying timing to ESC or motor. Heat may build up very fast in both ESC and motor and cause permanent damage to equipment. Extra heat dissipation accessories may need to be applied.

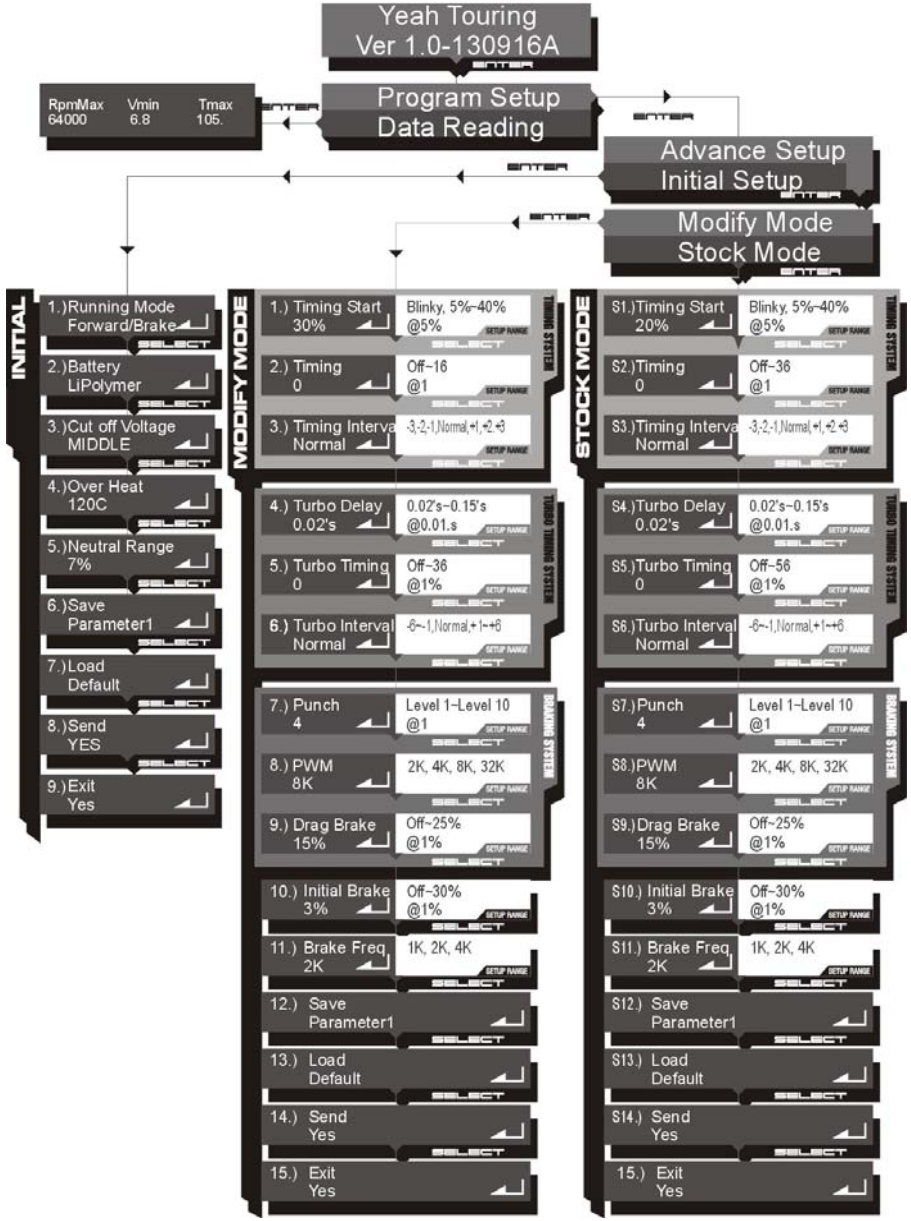
2. **Punch** – Allows you to change the punch of the ESC (1 to 10):
- Level 1 has the least punch and Level 10 has the highest punch.
- Punch level is usually adjust to maximize acceleration speed with minimum wheel spin.

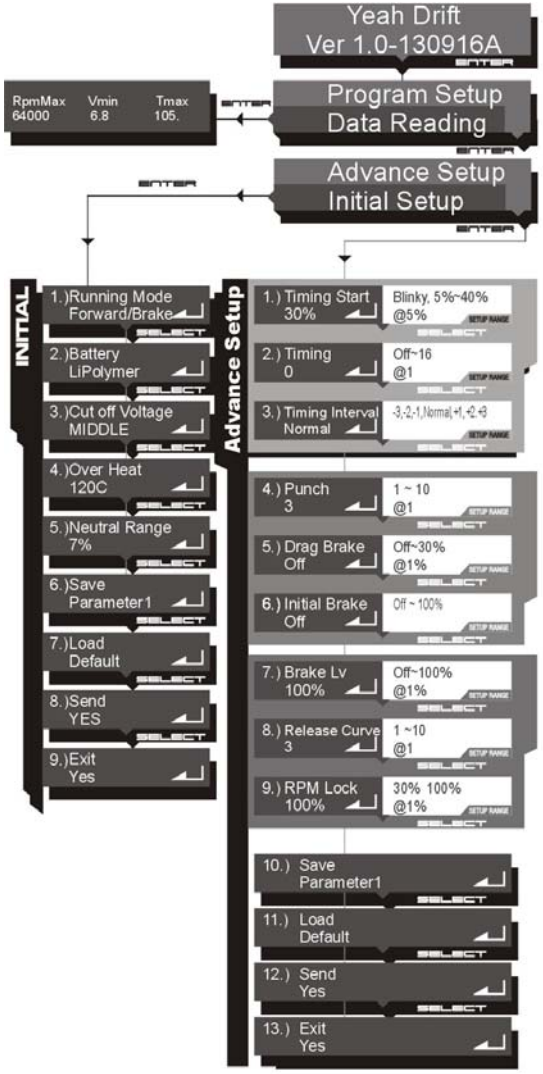
3. **RPM Lock** – Allows you to limit the motor maximum rpm (100%-30%) to fit the track size and surface traction.

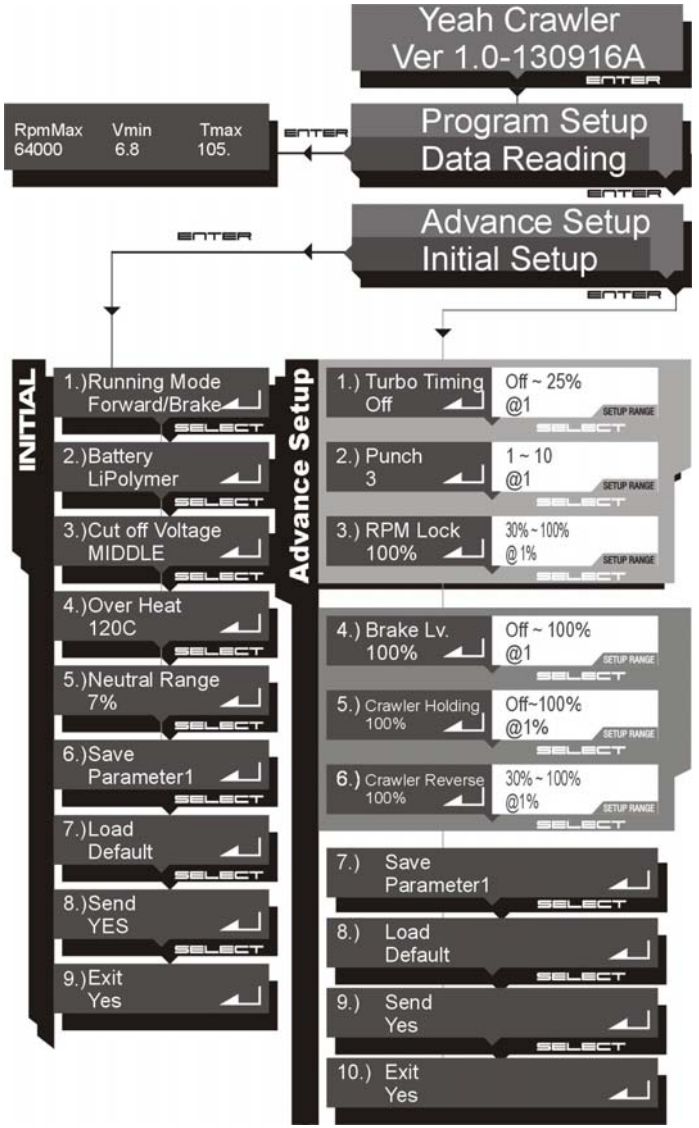
4. **Brake LV** – Allow you to set maximum brake force applied during manual braking (Off to 100%)

5. **Crawler Holding** –This setting is use to aid control during driving at very steep slopes. When set to 100% the car will hold itself on steep slope and only allow extremely slow movement (Both forward and backward) when the throttle is at neutral, which allows a much more delicate control over the vehicle on extreme slopes.

6. **Crawler Reverse** – Control speed of reversing (30%-100%).







BASIC SETTING FOR MOTORS							
(Base on Hackmoto Motor setup, if used another brand Motor please gear up 1 to 2 motor gear and cut an a half the timing and turbo timing to start)							
		Modify Mode			Stock Mode		
		4.5T	5.5T	6.5T	10.5T	13.5T	17.5T
	FRD	8.4 ~ 9.2	7.6 ~ 8.6	6.8 ~ 8.4	6.5 ~ 7.6	5.8 ~ 6.8	5.4 ~ 6.6
Timing System for Start and middle speed	1.)Timing start	30%~35%	30%~35%	30%~35%	15%-25%	15%-25%	15%-25%
	2.)Timing	12~16	12~16	14-16	21~30	24~34	27~36
	3.)Timing Interval	(+1~+3)	(+1~+3)	(Normal~+2)	(-1~+2)	(-2~+2)	(-3~+1)
Turbo Timing System for Top speed	4.)Turbo Delay	0.02's ~ 0.05's	0.02's ~ 0.05's	0.02's ~ 0.05's	0.02's ~ 0.05's	0.02's ~ 0.05's	0.02's ~ 0.05's
	5.)Turbo Timing	26~34	28~36	30~36	35 ~ 52	40~56	42~56
	6.)Turbo Interval	(+1~+3)	(+1~+3)	(Normal~+2)	(-1~+2)	(-2~+2)	(-3~+1)
Braking System for Brake feel	7.)Drag Brake	8%	8%	8%	8%	8%	8%
	8.)Interval Brake	off	off	off	off	off	off
	9.)Brake Freq	2K	2K	2K	2K	2K	2K
Drive feel	10.)Punch	2~5	2~5	3~6	6~10	6~10	6~10
	11.)PWM	4K or 8K	4K or 8K	4K or 8K	2K~32K	2K~32K	2K~32K