



HOBBYWING XERUN XR10 Pro-WP Brushless Electronic Speed Controller User Manual

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HOBBYWING XERUN XR10 Pro-WP Brushless Electronic Speed Controller



Product Information

• Specifications

- **Model:** XERUN XR10 Pro-WP
- **Continuous/Peak Current:** 160A/1200A
- **Motor Type:** Sensored / Sensorless Brushless Motors
- **Applications:** 1/10 Touring&Buggy racing, 1/10 Drift, F1, Rally
- **Motor Limit:** Touring Car 4.5T, Buggy 5.5T
- **LiPo Cells:** 2S LiPo (Only 2S)
- **BEC Output:** 5-7.4V Adjustable, Continuous Current of 5A (Switch-mode)
- **Cooling Fan:** Powered by the stable BEC voltage of 5-7.4V
- **Size:** 37.7×37.2×19.6mm (w/o Fan)
- **Weight:** 95.6g (w/ wires)
- **Programming Port:** PRG/FAN Port

Product Usage Instructions

- **Motor Connection**

- Sensored motor connection MUST connect A from the ESC to A on the motor, B to B, and C to C. Any variation of the connections may cause damage. If the motor direction is reversed, change the Motor Rotation parameter.

- **Receiver Connection**

- The throttle control cable on the ESC must be plugged into the throttle (TH) channel on the receiver. Ensure proper polarity and voltage compatibility to prevent damage to the ESC.

- **Battery Connection**

- Proper polarity is essential when plugging in the battery. Connect positive (+) to positive (+) and negative (-) to negative (-) to prevent damage to the ESC.

- **Throttle Range – ESC Calibration Process**

- Calibrate throttle range when using a new ESC or after transmitter replacement. Follow the steps for proper calibration to ensure correct ESC operation.
- Hold the ON/OFF button until the RED LED flashes.
- Turn on the transmitter with default settings on the throttle channel.
- Start the transmitter with ESC off but connected to a battery, then release the ON/OFF button.

FAQs

- **Q: Why is it important to remove the pinion gear before calibration?**

- **A:** Removing the pinion gear prevents accidental movement of the vehicle during calibration, ensuring safety.

- **Q: What should I do if my motor direction is reversed?**

- **A:** Change the Motor Rotation parameter to adjust the motor direction for proper operation.

INTRODUCTION

- Thank you for purchasing this HOBBYWING product! Please read this declaration carefully before use, once you use the product, we will assume that you have read and agreed with all the content.
- Brushless power systems can be very dangerous and any improper use may cause personal injury and damage to the product and related devices, so please strictly follow the instruction during installation and use.
- Because we have no control over the use, installation, or maintenance of this product, no liability may be assumed for any damages or losses resulting from the use of the product.
- We do not assume responsibility for any losses caused by unauthorized modifications to our product.
- We have the right to modify our product design, appearance, features and usage requirements without notification.
- We, HOBBYWING, are only responsible for our product cost and nothing else as result of using our product.
- Regarding the possible semantic different between two different versions of declaration, for users in mainland China, please take the Chinese version as standard; for users in other regions, please take the English version as standard.

Warnings

- To avoid short circuits, ensure that all wires and connections are well insulated before connecting the ESC to

related devices.

- Ensure all devices in the system are connected correctly to prevent any damage to the system.
- Read the manuals of all the items being used in the build.Ensure gearing,setup,and overall install is correct and reasonable.
- Please use a soldering iron with the power of at least 60W to solder all input / output wires and connectors.
- Do not hold the vehicle in the air and rev it up to full throttle, as rubber tires can “expand” to extreme size or even crack to cause serious injury.
- Stop usage if the casing of the ESC exceeds 90°C / 194°F as this may cause damage to both the ESC and motor. Hobbywing recommends setting the “ESC Thermal Protection” to 105°C / 221°F (this refers to the internal temperature of the ESC)
- The battery must be disconnected after use.There is a small draw even when the system is off,and will eventually fully drain the battery.This may cause damage to the ESC, and will NOT BE COVERED UNDER WARRANTY.

Features

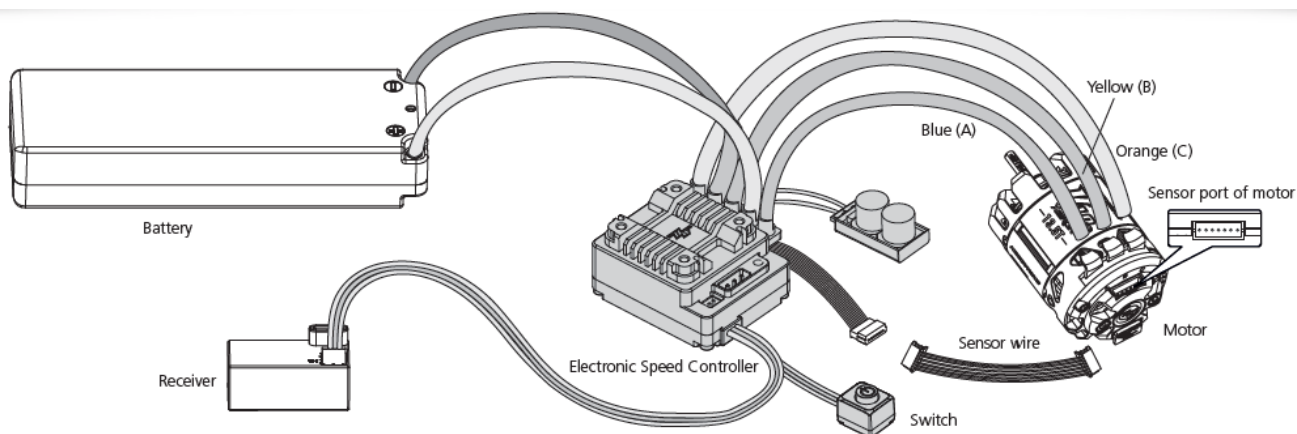
- 9 select-to-use profiles applicable to all 1/10 RC car racing.
- Excellent waterproof and dustproof performance, fearless of various weather conditions.
- Separate PRG/FAN port is able to power an external fan for maximize cooling performance or connect a LCD program box or OTA Programmer to the ESC.
- Variable frequency regulation of PWM & brake frequencies allows users to precisely regulate the driving & braking forces (of the motors).
- Softening function (HOBBYWING-initiated) for milder or wilder driving control and better driving efficiency.
- Multiple protections: low-voltage cutoff protection, ESC and motor thermal protection, and fail safe (throttle signal loss protection),reverse polarity protection (the external standard cappack will still be damaged if battery reversal occurs).
- Data logging for recording the maximum ESC/motor temperature, motor RPM, and others in real time.
- Firmware upgrade via Hobbywing multifunction LCD program box or OTA Programmer (item sold separately).

Specification

Model	XERUN XR10 Pro-WP
Cont./Peak Current	160A/1200A
Motor Type	Sensored / Sensorless Brushless Motors
Applications	1/10 Touring&Buggy racing, 1/10 Drift,F1,Rally
Motor Limit	Touring Car: ≥4.5T Buggy: ≥5.5T
LiPo Cells	2S LiPo (Only 2S)
BEC Output	5-7.4V Adjustable, Continuous Current of 5A (Switch-mode)
Cooling Fan	Powered by the stable BEC voltage of 5-7.4V
Size	37.7x37.2x19.6mm (w/o Fan)
Weight	95.6g (w/ wires)
Programming Port	PRG/FAN Port

Note: The recommended T counts are only applicable with the standard 3650/540 size (3 slot 2 pole) motors when ESCs are in blinky mode.

Connection



This is an extremely powerful brushless motor system. For your safety and the safety of those around you, we strongly recommend removing the pinion gear attached to the motor before performing calibration and programming functions with this system. It is also advisable to keep the wheels in the air when you turn on the ESC.

1. Motor Connection

- Sensored motor connection **MUST** connect A from the ESC to A on the motor, B to B, and C to C, with the sensor wire connected any variation of the motor to ESC connections may cause damage.
- **Note:** If the motor direction is reversed, change the parameter item “Motor Rotation” to achieve the correct setting.

2. Receiver Connection

- The throttle control cable on the ESC has to be plugged into the throttle (TH) channel on the receiver.
- The throttle control cable has an output voltage of 5-7.4V to the receiver and steering servo, hence, no separate battery can be connected to the receiver.
- Otherwise, your ESC may be damaged. If additional power is required, disconnect the red wire on the throttle plug from the ESC.

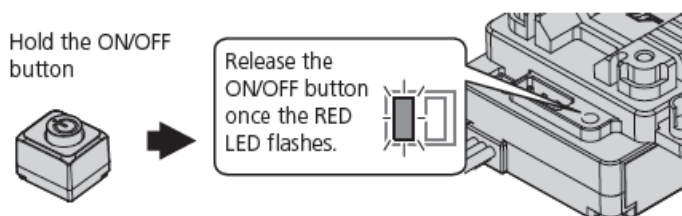
3. Battery Connection

- Proper polarity is essential. Please ensure positive (+) connects to positive (+), and negative (-) connects to negative (-) when plugging in the battery!
- When reverse polarity is applied to the ESC from the battery, the external standard cappack will be damaged.

ESC SETUP

1. Set the Throttle Range – ESC Calibration Process

1. You must calibrate throttle range when you begin to use a new ESC, the transmitter has been replaced, or the Throttle TRIM have been adjusted, otherwise the ESC cannot work correctly. We strongly recommend users to use the “Fail Safe” function on the radio system and set (F/S) to “Output OFF” or “Neutral Position”. The throttle calibration steps are below:

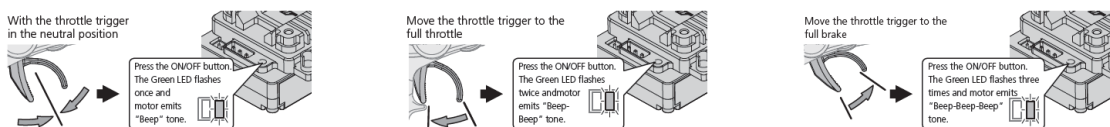


1. Turn on the transmitter, ensure all parameters (D/R, Curve, ATL) on the throttle channel are at

default (100%). For transmitter without LCD, please turn the knob to the maximum, and the throttle “TRIM” to 0. Please also turn the corresponding knob to the neutral position. This step can be skipped if the radio’s settings are default.

2. Start by turning on the transmitter with the ESC turned off but connected to a battery. Holding the “ON/OFF” button, the RED LED on the ESC starts to flash (the motor beeps at the same time), and then release the ON/OFF button.

- **Note:** Beeps from the motor may be low sometimes, and you can check the LED status instead.



3. Set the neutral point, the full throttle endpoint and the full brake endpoint.

- Leave transmitter at the neutral position, press the “ON/OFF” button, the GREEN LED flashes 1 time and the motor beeps 1 time to accept the neutral position.
- Pull the throttle trigger to the full throttle position, press the “ON/OFF” button, the GREEN LED blinks 2 times and the motor beeps 2 times to accept the full throttle endpoint.
- Push the throttle trigger to the full brake position, press the “ON/OFF” button, the GREEN LED blinks 3 times and the motor beeps 3 times to accept the full brake endpoint.

4. The motor can be started 3 seconds after the ESC/Radio calibration is complete.

2. POWER ON/OFF

- Short press the power button to turn on the ESC in the off state, and long press the power button to turn off the ESC.
- **Attention!** To prevent accidental shutdown in racing, pressing the power button cannot shut down the esc while the motor is running, if there is an emergency, battery plugs can be pulled out to turn off the ESC.

3. PROGRAMMABLE ITEMS

S e l e c t i o n	I t e m	Programmable I tems	Parameter Values						
			1 A	Running Mode	Forward wi th Brake	Forward/ Rever se with Brake	Forwar d and R everse		
			1 B	Max. Reverse F orce	25%	50%	75%	100%	
			1 C	Cutoff Voltage	Disabled	Auto (3.5V/Cell)	3.0-7.4V Adjustable (Step: 0.1V)		
			1 D	ESC Thermal Pr otection	Disabled	105°C/221°F	125°C/ 257°F		
G e n e									

r a l S e t t i n g	1 E	Motor Thermal Protection	Disabled		105°C/221°F		125°C/257°F								
	1 F	BEC Voltage	5.0V-7.4V Adjustable (Step:0.1V)												
	1 G	Smart Fan	Disabled		Enabled										
	1 H	Remote Off	Disabled		Enabled										
	1 I	Motor Rotation	CCW		CW										
	1 J	Phase-AC Swap	Disabled		Enabled										
T h r o t t l e C o n t r o l	2 A	Throttle Rate Control	1-30 Adjustable (Step: 1)												
	2 B	Throttle Curvature	-10~10 Adjustable (Step: 1)						Customized						
	2 C	Neutral Range	3%-10% Adjustable (Step: 1%)												
	2 D	Initial Throttle Force	1-15 Adjustable (Step: 1)												
	2 E	Coast	0%-15% Adjustable (Step: 1%)												
	2 F	PWM Drive Frequency	1K	2K	4K	8K	12K	16K	24K	32K	Customized				
	2 G	Softening Value	0-30° Adjustable (Step: 1°)												
	2 H	Softening Range	0%	10%	20%	25%	30%	35%	40%	45%	50%	55%	60%	65%	70%
B r a k e	3 A	Drag Brake Force	0%-100% Adjustable (Step: 1%)												
	3 B	Drag Brake Rate	Auto		1-20 Adjustable (Step: 1)										
	3 C	Max. Brake Force	0%-150% Adjustable (Step: 1%)												

e C o n t r o l	3 D	Brake Rate Control	1-20 Adjustable (Step: 1)																				
	3 E	Brake Frequency	0.5 K	1 K	2K	4K	8K	12 K	16K	Customized													
	3 F	Brake Control	Linear			Traditional			Hybrid														
Ti m i n g	4 A	Boost Timing	0-64° Adjustable (Step: 1°)																				
	4 B	Boost Timing Activation	RPM			Auto																	
	4 C	Boost Start RPM	500-35000RPM (Step: 500RPM)																				
	4 D	Boost End RPM	3000-60000RPM (Step: 500RPM)																				
	5 A	Turbo Timing	0-64° Adjustable (Step: 1°)																				
	5 B	Turbo Delay	Instant	0.05s	0.1s	0.15s	0.2s	0.25s	0.3s	0.35s	0.4s	0.45s	0.5s	0.6s	0.7s	0.8s	0.9s	1.0s					
	5 C	Turbo Increase Rate	1deg/0.1s		2deg/0.1s		3deg/0.1s		5deg/0.1s		8deg/0.1s		12deg/0.1s		16deg/0.1s		20deg/0.1s		25deg/0.1s		30deg/0.1s		Instant
	5 D	Turbo Decrease Rate	1deg/0.1s		2deg/0.1s		3deg/0.1s		5deg/0.1s		8deg/0.1s		12deg/0.1s		16deg/0.1s		20deg/0.1s		25deg/0.1s		30deg/0.1s		Instant

- **Note:** Item 4C (Boost Start RPM) & item 4D (Boost End RPM) are not programmable if item 4B (Timing Activation) is set to “Auto”.
- **1A. Running Mode**
 - **Option 1:** Forward with Brake
 - Racing mode. It has only forward and brake functions.
 - **Option 2:** Forward/ Reverse with Brake
 - This option is known to be the “training” mode with “Forward/ Reverse with Brake” functions. The vehicle only brakes on the first time you push the throttle trigger to the reverse/brake

position. If the motor stops when the throttle trigger returns to the neutral position and then re-pushes the trigger to reverse position, the vehicle will reverse. If the motor does not completely stop, then your vehicle won't reverse but will still brake; you need to return the throttle trigger to the neutral position and push it to reverse again. This method is for preventing the vehicle from being accidentally reversed.

- **Option 3: Forward and Reverse**
 - The motor will reverse immediately when the throttle trigger is pushed to reverse position. This mode is generally used in special vehicles.
- **1B. Max. Reverse Force**
 - The reverse force of the value will determine its speed. For the safety of your vehicle, we recommend using a low amount.
- **1C. Cutoff Voltage**
 - Sets the voltage at which the ESC lowers or removes power to the motor in order to either keep the battery at a safe minimum voltage (for LiPo batteries). The ESC monitors the battery voltage all the time; it will immediately reduce the power to 50% (in 2 seconds) and cut off the output 40 seconds later when the voltage goes below the cutoff threshold. The RED LED will flash a short, single flash that repeats (☆, ☆, ☆) to indicate the low-voltage cutoff protection is activated. Please set the "Cutoff Voltage" to "Disabled" or customize this item if you are using NiMH batteries.
 - **Option 1: Disabled**
 - The ESC does not cut the power off due to low voltage. We do not recommend using this option when you use any LiPo battery as you will irreversibly damage the product. You need to select this option when you are using a NiMH pack.
 - **Option 2: Auto**
 - The ESC calculates the corresponding cutoff voltage for the battery; it shall be 7.0V.
 - **Option 3: Customized**
 - The customized cutoff threshold is a voltage for the whole battery pack (adjustable from 3.0V to 7.4V).
- **1D. ESC Thermal Protection**
 - The output from the ESC will be cut off with the value you have preset.
 - The GREEN LED flashes (☆, ☆, ☆) when the ESC temperature reaches the preset value. The output will not resume until the ESC temperature gets down.
 - **Warning!** Please do not disable this function unless you're in a competition. Otherwise the high temperature may damage your ESC and even your motor.
- **1E. Motor Thermal Protection**
 - The GREEN LED flashes (☆☆, ☆☆, ☆☆) when the motor temperature reaches the preset value. The output will not resume until the motor temperature gets down.
 - **Warning!** Please do not disable this function unless you're in a competition. Otherwise the high temperature may damage your motor and even your ESC. For non-Hobbywing motor, the ESC may get this protection activated too early/late because of the different temperature sensor inside the motor. In this case, please disable this function and monitor the motor temperature manually.
- **1F. BEC Voltage**
 - BEC voltage can be adjusted between 5.0-7.4V. Set a reasonable value according to the working voltage of the servo.
- **1G. Smart Fan:**

- This esc has a fan control function. If this item is set to “Disabled”, the fan will continue to run after the ESC is powered on; If this item is set to “Enabled”, The fan will start running after the internal temperature of the esc exceeds 50°C/122°F.
- **1H. Remote Off**
 - **Option 1: Enabled**
 - Users can simply push and hold the brake trigger for 6 seconds. This option allows the user to turn off the ESC without pushing the ON/OFF button switch.
 - **Option 2: Disabled**
 - Users must turn off the ESC by pressing the ON/OFF switch button from the ESC.
- **1I. Motor Rotation/Direction**
 - With the motor shaft faces you (the rear end of the motor is away from you), increase the throttle input, the motor (shaft) will rotate in the CCW/CW direction if the “Motor Rotation / Direction” set to “CCW/CW”.
 - Generally, the vehicle runs forward when the motor (shaft) rotates in the CCW direction. However, some vehicles only run forward when the motor rotates in the CW direction due to the different chassis design.
 - In that case, you only need to set the “Motor Rotation/Direction” to “CW”.
- **1J. Phase-AC Swap**
 - If the A/C wire of ESC connect to A/C wire of motor with crossed way (A wire of ESC connects to C wire of motor, C wire of ESC connects to A wire), set this item as Enable.
 - **Warning!** When #A/#B/#C wire of ESC connect to #A/#B/#C wire of motor correspondingly, do not Set to Enable. Otherwise it will damage the ESC and motor.
- **2A. Throttle Rate Control**
 - This item is used to control the throttle response. The higher the throttle rate, the more aggressive the throttle will be applied. A suitable rate can help driver to control the vehicle properly during the starting-up process.
 - Generally, you can set it to a high value to have a quick throttle response if you are proficient at throttle control.
- **2B. Throttle Curvature**
 - This parameter is used to set the throttle curve. The larger the curvature setting, the more aggressive the throttle will be applied in the previous stage; the smaller the curvature setting, the softer the throttle will be applied in the previous stage.
 - As shown in the schematic diagram of the curve on the right.

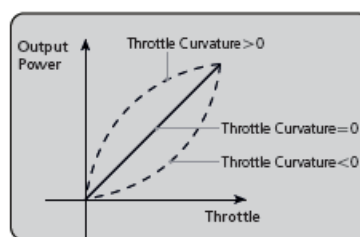


Diagram of Throttle Curvature

- **2C. Neutral Range**
 - As not all transmitters have the same stability at “neutral position”, please adjust this parameter as per your preference. You can adjust to a bigger value when this happens.
- **2D. Initial Throttle Force**

- It also called as minimum throttle force. You can set it according to wheel tire and traction. If the ground is slippery, please set a small throttle force.
- Some motors have strong cogging effect with lower FDR, if there is any cogging with very light throttle input,you can try to increase the initial throttle force.
- **2E. Coast**
 - This function allows the motor to naturally and smoothly reduce rpm/speed,and the vehicle will not experience sudden deceleration during the throttle release process.The higher the value,the stronger the “coasting” feeling.
 - **What is COAST?** When a vehicle has a larger final drive ratio, the tendency of having a “drag” feel is higher. The “COAST” technology is to allow the car to roll (coast) even when the final drive ratio is high. The Coast function brings better and smoother control feeling to racers. Some drivers will refer to this to the traditional brushed motors.
 - **Note:** The Coast setting will not work if the drag brake is not set to 0%.
- **2F. PWM Drive Frequency**
 - The acceleration will be more aggressive at the initial stage when the drive frequency is low; a higher drive frequency is smoother but this will create more heat to the ESC.
 - If set this item to “Customized”, then the PWM frequency can be adjusted to a variable value at any 0-100% throttle input, Please choose the frequencies as per the actual test results of your vehicles.
- **2G. Softening Value**
 - It allows users to fine-tune the bottom end, change the driving feel, and maximize the driving efficiency at different track conditions. The higher the “Softening Value “, the softer the bottom end. In Modified class, drivers often feel the power of the bottom end is too aggressive. Little throttle input usually brings too much power to the car and make it hard to control at the corners, this is HOBBYWING’s solution to help bottom end traction.
 - **Note:** You can increase the motor mechanical timing accordingly after you set the softening value. Every time you increase the softening value by 5 degrees, you can increase the mechanical timing by 1 degree.
 - For example, if you set the softening value to 20 degrees, then you can increase the mechanical timing by 4 degrees. Please note that you will never increase the mechanical timing by over 5 degrees.
- **2H. Softening Range**
 - It’s the range to which “Softening Value” starts and ends. If set to 30% then the softening range will be from 0 throttle to 30% throttle.
- **3A. Drag Brake**
 - It is the braking power produced when releasing from full speed to neutral position. This is to simulate the slight braking effect of a neutral brushed motor while coasting. It’s not recommended for buggy and monster truck.
 - (**Attention!** Drag brake will consume more power and heat will be increased, use it cautiously.)
- **3B. Drag Brake Rate**
 - This parameter is used to control the speed of the drag-brake response. Setting a suitable value can improve the drag braking effect of the vehicle, thus, improving drivability to suit each users.
 - The value can be adjusted up to 20 levels. Increasing the value will result in a greater drag brake effect. The other “Auto” option is available as well to choose from.

- “Auto” will intelligently adjust the drag brake acceleration according to the current speed.
- The faster the current speed, the smaller the drag brake rate, vice versa.
- **3C. Max. Brake Force**
 - This ESC provides proportional braking function; the braking effect is decided by the position of the throttle trigger. It sets the percentage of available braking power when full brake is applied. Large amount will shorten the braking time but it may damage your pinion and spur.
- **3D. Brake Rate Control**
 - It's adjustable from 1 to 20 (step: 1), The larger the setting value, the greater the brake rate, that is, the faster the braking. A suitable rate can aid the driver to brake his vehicle correctly. Generally, you can set it to a high value to have a quick brake response.
- **3E. Brake Frequency**
 - The brake force will be larger if the frequency is low; you will get a smoother brake force when the value is higher. If set this item to “Customized”, then the brake frequency can be adjusted to a variable value at any 0-100% throttle input, Please choose the frequencies as per the actual test results of your vehicles.
- **3F. Brake Control**
 - **Option 1: Linear**
 - Hobbywing has recommended using this mode under all circumstances. The braking effect is a bit weaker in this mode than in Traditional brake mode, but it's easy to control and brings great control feel.
 - **Option 2: Traditional**
 - This is a traditional brake method, just like the previous escs, the brake force is stronger.
 - **Option 3: Hybrid**
 - The ESC switches the brake mode between Linear and Traditional as per the vehicle speed to prevent the slide (between tires and track) from affecting the braking effect.
 - **Note:** Please select the right mode for your vehicle as per the track condition, motor performance, and etc.
- **4A. Boost Timing**
 - It is effective within the whole throttle range; it directly affects the car speed on straightaway and turns.
 - The ESC adjusts the timing dynamically as per the RPM (when “Boost Timing Activation” set to “RPM”) or throttle amount (when “Boost Timing Activation” set to “Auto”) in the operation. The Boost Timing is not constant but variable.
- **4B. Boost Timing Activation**
 - **Option 1: RPM**
 - In RPM mode, the ESC adjusts the Boost Timing dynamically as per the motor speed (RPM). The actual Boost Timing is 0 when the RPM is lower than the Boost Start RPM. The Boost Timing changes as per the
 - RPM when the RPM change is between the Boost Start RPM and the Boost End RPM. For example, if the Boost Timing is set to 5 degrees and the Boost Start RPM is 10000, the Boost End RPM is 15000. The
 - Boost Timing corresponds to different RPM is shown below. When the RPM is higher than the Boost End RPM, the actual Boost Timing is the value you had previously set.

RPM (Motor Speed)	<10000	10001-11000	11001-12000	12001-13000	13001-14000	14001-15000	>15000
Actual Boost Timing	0 Degree	1 Degree	2 Degrees	3 Degrees	4 Degrees	5 Degrees	5 Degrees

- **Option 2: Auto**
 - In Auto mode, the ESC adjusts the Boost Timing dynamically as per the throttle amount. Only at full throttle, the actual Boost Timing is the value you had previously set.
- **4C. Boost Start RPM**
 - This item defines the RPM at which Boost Timing is activated. For example, when the Boost Start RPM is set to 5000, the ESC will activate the corresponding Boost Timing when the RPM goes above 5000.
 - The specific value is determined by the Boost Timing and the Boost End RPM you had previously set.
- **4D. Boost End RPM**
 - This item defines the RPM at which Boost Timing (you specifically set) is applied. For example, when Boost Timing is set to 10 degrees and the Boost End RPM to 15000, the ESC will activate the Boost Timing of 10 degrees when the RPM goes above 15000. The ESC will adjust the Boost Timing accordingly as per the actual RPM when the RPM goes below 15000.
- **5A. Turbo Timing**
 - This item is adjustable from 0 degree to 64 degrees, the corresponding turbo timing (you set) will initiate at full throttle. It's usually activated on long straightaway and makes the motor unleash its maximum potential.
- **5B. Turbo Delay**
 - When "TURBO DELAY" is set to "INSTANT", the Turbo Timing will be activated right after the throttle trigger is moved to the full throttle position. When other value(s) is applied, you will need to hold the throttle trigger at the full throttle position (as you set) till the Turbo Timing initiates.
- **5C. Turbo Increase Rate**
 - This item is used to define the "speed" at which Turbo Timing is released when the trigger condition is met. For example, "3 degs/0.1sec" refers to the Turbo Timing of 3 degrees that will be released in 0.1 second. Both the acceleration and heat is higher when the "Turbo increase rate" is of a larger value.
- **5D. Turbo Decrease Rate**
 - After the Turbo Timing is activated and the trigger condition turns to not be met (i.e. vehicle slows down at the end of the straightaway and gets into a corner, full throttle turns to partial throttle, the trigger condition for Turbo Timing turns to be not met), if you disable all the Turbo Timing in a moment, an obvious slow-down like braking will be felt and cause the control of vehicle to become bad. If the ESC can disable the Turbo Timing at some "speed", the slow-down will be linear and the control will be improved.
 - **Warning** Boost Timing & Turbo Timing can effectively improve the motor efficiency; they are usually used in competitions. Please take some time to read this manual and then set these two items carefully, monitor the ESC & motor temperatures when you have a trial run and then adjust the

Timing and FDR accordingly as aggressive Timings and FDR may cause your ESC or motor to be burnt.

4. PRESET MODES

- In order to make one firmware applicable to all different racing conditions, there are nine “easy-to-select” preset modes (as shown below). Users are able to change the settings of the modes provided (and rename those modes) as per the control feel, track, and etc. For example, the name can be changed from “Modify” to “TITI2019_MOD_4.5” to indicate the race was ran with a 4.5T motor at 2019 TITC. This can be saved for future reference as well.
- **Preset Modes for Different Racing**

Mode #	Modes/Profiles	Applications
1	Zero Timing	All Stock racing requiring users to use Zero timing (/blinky) program on their ESCs.
2	TC-Modify	Modify class of 1/10 touring car racing
3	Buggy-2WD-Modify	Modify class of 1/10 2WD buggy racing
4	Bubby-4WD-Modify	Modify class of 1/10 4WD buggy racing
5	Practice	(With Reverse function activated,) practice and sport
6	OpenBL-13.5T	13.5T Open Stock class of 1/10 touring car racing
7	OpenBL-17.5T	17.5T Open Stock class of 1/10 touring car racing
8	SCT-4 Pole	1/10 short course truck using 4 pole motor
9	Drift 2WD Carpet	1/10 drift 2WD car on Carpet

5. ESC PROGRAMING

1. Program your ESC with a multifunction LCD program box pro

- Connect the interface marked with “- +” on the esc to the interface marked with “ESC” on the program box using a separate programming cable(a cable with JR plugs at both ends included in the program box packaging), then connect the esc to the battery and turn it on. Click on Parameter Settings to set the esc.

2. Using the OTA Programmer for parameter settings

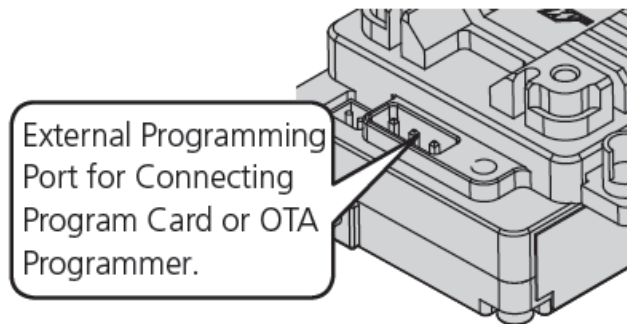
- Insert the programming cable of the OTA Programmer into the programming interface of the esc, and use your phone to install the HW Link APP to set the esc.

3. Read the running data of esc

1. Click on the Data record on the homepage of the LCD box pro to read the five extreme values of the highest temperature of the esc, the highest temperature of the motor, the maximum current, the lowest voltage of the battery, and the highest rpm of the motor during the operation of the esc.
2. By using the OTA Bluetooth module, you can view the five extreme values recorded above, real-time data, and historical data (curve chart) under the Data Log menu in the HW LINK App on your phone.

4. Upgrade of firmware for esc

1. Using the LCD box pro or OTA programmer, download and install the HW LINK App on your phone, click on the Firmware Update button on the APP homepage to upgrade the firmware of the esc.
2. Connect to the computer through the LCD box pro, download and install Hobbywing USB LINK software on the computer, and use this software to upgrade the firmware for esc.



6. FACTORY RESET

- Restore the default values with a multifunction LCD program box pro
- After connecting the program box to the ESC, Click on Parameter Settings and select the Reset Parameters to restore the factory settings.
- Restore the default values with a OTA Programmer (& HW Link App)
- After connecting the OTA Programmer to the ESC, open the HOBBYWING HW Link App on your smart phone, select "Parameters" followed by "Factory Reset" to reset the ESC.

EXPLANATION FOR LED STATUS

1. During the Start-up Process

- The RED LED turns on solid indicating the ESC doesn't detect any throttle signal or the throttle trigger is at the neutral position.
- The GREEN LED flashes rapidly indicating the neutral throttle value stored on your ESC may be different from the current value stored on the transmitter. When this happens, re-calibrate the throttle range.

2. In Operation

- The RED LED turns on solid and the GREEN LED dies out when the throttle trigger is in the throttle neutral zone. The RED LED will blink meet the Zero Timing competition rules. if the total value of Boost Timing and Turbo timing is 0.
- The RED LED dies out and the GREEN LED blinks when your vehicle runs forward. The GREEN LED turns solid when pulling the throttle trigger to the full (100%) throttle endpoint.
- The RED LED dies out and the GREEN LED blinks when you brake your vehicle. The GREEN LED turns solid when pushing the throttle trigger to the full brake endpoint and setting the "maximum brake force" to 100%.
- The RED LED dies out, the GREEN LED blinks when you reverse your vehicle. The GREEN LED turns solid when pushing the throttle trigger to the full brake endpoint and setting the "reverse force" to 100%.

3. When Some Protection is Activated

- The RED LED flashes a short, single flash and repeats "☆, ☆, ☆" indicating the low voltage cutoff protection is activated.
- The GREEN LED flashes a short, single flash and repeats "☆, ☆, ☆" indicating the ESC thermal protection is activated.

- The GREEN LED flashes a short, double flash and repeats “☆☆, ☆☆, ☆☆” indicating the motor thermal protection is activated.
- The RED & GREEN LEDS flash a short, single flash and repeats “☆, ☆, ☆” at the same time indicating the drive mode has been automatically switched to sensorless mode from sensored mode because of abnormal sensor signal when pairing the ESC with a sensored motor.


TROUBLESHOOTING

Trouble	Possible Causes	Solutions
The ESC was unable to start the status LED, the motor after it was powered on.	<ol style="list-style-type: none"> 1. No power was supplied to the ESC; 2. The ESC switch was damaged. 	Check if all ESC & battery connectors have been well-soldered or firmly connected.
After powering on, the RED LED flashes and the motor does not work.	The throttle cable of the ESC is connected incorrectly or the throttle is not at the neutral position.	<ol style="list-style-type: none"> 1. Plug the throttle cable into the throttle channel (CH2) by referring to the relevant mark shown on your receiver. 2. Calibrate the ESC and radio.
The vehicle is going in the reversed direction when the forward throttle is applied.	The default/popular motor rotation direction does not match your car frame.	Adjust the parameter “Motor Rotation”.
The motor suddenly stopped or significantly reduced the output in operation.	<ol style="list-style-type: none"> 1. The receiver was influenced by some foreign interference; 2. The ESC entered the LVC protection; 3. The ESC entered the thermal shutdown protection. 	<ol style="list-style-type: none"> 1. Check all devices and try to find out all possible causes, and check the transmitter's battery voltage; 2. The RED LED keeps flashing indicating the LVC protection is activated, please replace your pack; 3. The GREEN LED keeps flashing indicating the thermal protection is activated, please let your ESC cool down before using it again.
The motor stuttered but couldn't start.	<ol style="list-style-type: none"> 1. The (ESC-to-motor) wiring order was incorrect 2. Some soldering between the motor and the ESC was not good; 3. The ESC was damaged (some MOSFETS were burnt). 	<ol style="list-style-type: none"> 1. Check the wiring order; 2. Check all soldering points, please resolder if necessary; 3. Contact the distributor for repair or other customer service.

The vehicle could run forward (and brake), but could not reverse.	<ol style="list-style-type: none"> 1. The throttle neutral position on your transmitter was actually in the braking zone; 2. Set the "Running Mode" improperly; 3. The ESC was damaged. 	<ol style="list-style-type: none"> 1. Recalibrate the throttle neutral position; 2. Set the "Running Mode" to "Fwd/Rev with Brk"; 3. Contact the distributor for repair or other customer service.
The motor got stuck or stopped when increasing the throttle during the starting-up process.	<ol style="list-style-type: none"> 1. Poor discharging capability of the pack; 2. The RPM of the motor was too high, or the FDR was too low; 3. The Throttle Rate Control is set too high. 	<ol style="list-style-type: none"> 1. Change another pack with great discharging capability; 2. Change a low-speed motor, or increase the FDR; 3. Set the Throttle Rate Control to a low level.
The RED & GREEN LEDS on the ESC flashed rapidly at the same time when the throttle trigger was at the neutral position.	(When pairing with a censored motor) the ESC automatically switched to the sensorless mode when it detected incorrect signal from the Hall sensor.	<ol style="list-style-type: none"> 1. Check if the sensor cable is loose or poor contact issue exists; 2. Hall sensor inside the motor or the ESC is damaged.

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Documents / Resources

	HOBBYWING XERUN XR10 Pro-WP Brushless Electronic Speed Controller [pdf] User Manual HW-SMA540DUL00, XERUN XR10 Pro-WP Brushless Electronic Speed Controller, XERUN XR10 Pro-WP, Brushless Electronic Speed Controller, Electronic Speed Controller, Speed Controller, Controller
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References

- [User Manual](#)

[Manuals+](#), [Privacy Policy](#)

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