

XERUN USER MANUAL

Brushless Electronic Speed Controller
XERUN XR10 Pro DR

20240822

01 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 a result of using our product. Regarding the possible semantic difference 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.

High-Performance Product Notice:

Due to the specialized nature and high-performance requirements of the intended applications, this product has been engineered to operate beyond typical standards. Consequently, it does not follow standard warranty service options for damage incurred during operation. Please review the warranty section of the website for terms, conditions and further details.

HW-SMA542DUL00

02 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 explode and 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.

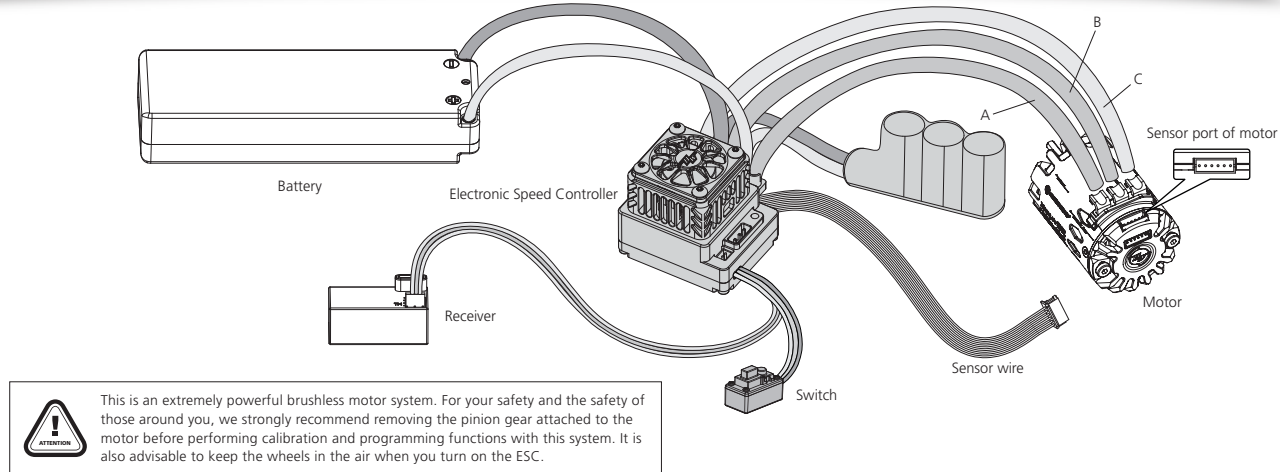
03 Features

- Powerful hardware and software, designed for Drag Racing.
- Factory standard 10AWG silicone wires and super large capacitor module, everything is ready.
- RPM limit by throttle, Boost start rpm and end rpm are all finely adjustable, meeting the precise adjustment of the throttle by the driver.
- Multiple protection functions: low-voltage cutoff protection, ESC and motor thermal protection, and fail safe.
- The data recording function utilizes the OTA Bluetooth module to view various running data of the power system in the HW Link App on mobile phones, making it easier for drivers to analyze the operation of the power system.
- Firmware upgrade via Hobbywing LCD Pro program box or OTA Programmer (item sold separately).

04 Specifications

Model	XERUN XR10 PRO DR
Cont./Peak Current	200A / 1200A
Motor Type	Sensored Brushless Motors
Applications	1/10th Drag Racing
Recommended Motor	3652/3662(540/550) size motors KV<=9800
LiPo Cells	2S Lipo
BEC Output	5-7.4V Adjustable, Continuous Current of 5A
Cooling Fan	Powered by the stable BEC voltage
Size	37.7x37.2x33.2mm(w/Fan&Fan Shroud)
Weight	137g(w/ wires)
Programming Port	Independent programming interface

05 Connections

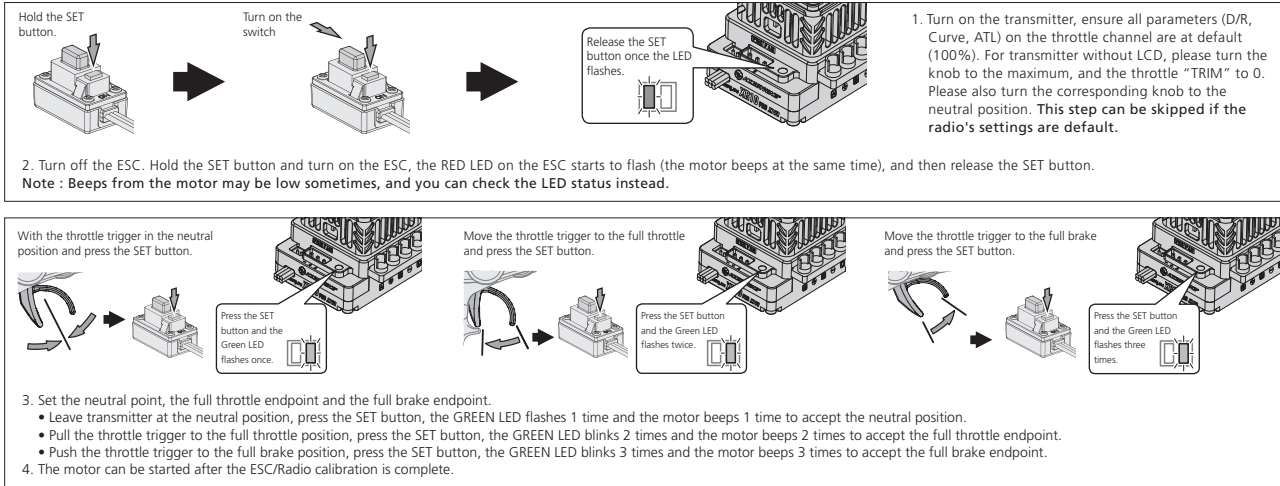


- Motor Connection**
Sensored motor connection MUST connect A from the ESC to A on the motor, B to B, and C to C, with the sensor wire connected any variation of the motor to ESC connections may cause damage.
Note: If the motor direction is reversed, change the parameter item "Motor Rotation" to achieve the correct setting.
- 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.
- Battery Connection**
Proper polarity is essential. Please ensure positive (+) connects to positive (+), and negative (-) connects to negative (-) when plugging in the battery! If the connection is reversed, the ESC will be damaged and will not be covered by the warranty.

06 ESC Setup

1 Set throttle range

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:



2 Programmable Items

Section	Item	Programmable Items			Parameter Values															
General Setting	1A	Running Mode			Forward with Brake			Forward/ Reverse with Brake			Forward and Reverse									
	1B	Max. Reverse Force			25%			50%			75%		100%							
	1C	Cutoff Voltage			Disabled			Auto (3.5V/Cell)			3.0-7.4V Adjustable (Step: 0.1V)									
	1D	ESC Thermal Protection			Disabled			105°C/221°F			125°C/257°F									
	1E	Motor Thermal Protection			Disabled			105°C/221°F			125°C/257°F									
	1F	BEC Voltage			5.0V-7.4V Adjustable (Step:0.1V)															
Throttle Control	1G	Motor Rotation			CCW			CW												
	2A	Throttle Rate Control			1-30 Adjustable (Step: 1)															
	2B	Throttle Curve			Linear			Customized												
	2C	Neutral Range			3%-10% Adjustable (Step: 1%)															
	2D	Initial Throttle Force			1%-100% Adjustable (Step: 1%)															
	2E	PWM Drive Frequency			1K	2K	4K	8K	12K	16K	24K	32K	Customized							
Brake Control	2F	Softening Value			0-30° Adjustable (Step: 1°)															
	2G	Softening Range			0%	10%	20%	25%	30%	35%	40%	45%	50%	55%	60%	65%	70%	75%		
	2H	RPM Limit By Throttle			5000RPM-18000RPM (Step: 5000RPM)															
	2I	RPM Limit Range			0%-90% (Step: 10%)															
	2J	Max RPM Limit			5000RPM-22500RPM (Step: 5000RPM)															
	3A	Drag Brake Force			0%-100% Adjustable (Step: 1%)															
Timing	3B	Max. Brake Force			0%-100% Adjustable (Step: 1%)															
	3C	Brake Rate Control			1-20 Adjustable (Step: 1)															
	3D	Brake Frequency			0.5K	1K	2K	4K	8K	12K	16K	Customized								
	3E	Brake Control			Linear			Traditional			Hybrid									
	4A	Boost Timing			0-64° Adjustable (Step: 1°)															
	4B	Boost Timing Activation			Auto			RPM			Timing Rate									
	4C	Boost Start RPM			2000-12000RPM (Step: 1000RPM)															
	4D	Boost End RPM			10000RPM-20000RPM Step: 1000RPM(10000-100000),2000RPM(100000-200000)															
	4E	Boost Increase Rate			(1°-32°) / 0.1s (Step: 1°)															
	5A	Turbo Timing			0-64° Adjustable (Step: 1°)															
	5B	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
	5C	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					
	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: The default firmware for ESC is Blinky Mode(zero timing),so there is no timing options (4A-5D).If you need to use the timing,you can update the firmware with the timing options through the mobile app or computer.

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 return to the neutral position and then re-push the trigger to reverse position, the vehicle will reverse, if the motor does not completely stop, then your vehicle won't reverse but still brake, you need to return the throttle trigger to the neutral position and push it to reverse again. This method is for preventing 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 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 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 to 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 to 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 activate the motor thermal protection too early or late due to the differences in the temperature sensors. In this case, please disable this function and monitor the motor temperature manually.

1F. BEC Voltage

BEC voltage can be adjusted between 6.0-7.4V. 6.0V is applicable to common servo. If use high-voltage servo, set to higher voltage according to voltage marking of servo.

1G. 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".

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.

2B. Throttle Curve

The throttle curve parameter reconciles the position of the throttle trigger and the actual ESC throttle output. It is linear by default and we can change it to non-linear by adjusting the throttle curve. For example, if adjust it to +EXP; the throttle output at the early stage will be higher (than the output when the curve is linear); if it is adjusted to -EXP, the throttle output at the early stage will be lower (than the output when the curve is linear).

2C. Neutral Range

This parameter adjusts the range of the throttle neutral area to suit different transmitters and driver habits. If the neutral position of the transmitter is unstable, causing the car to move slowly forward or backward, or have difficulties calibrating the neutral range, the setting can be raised to correct the issue.

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. 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.

2F. 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 milder 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.

2G. Softening Range

It's the range to which "Softening Value" starts and ends. For example, 0% to 30% will be generated when the user pre-programs the "Softening Range" at a value of 30%.

2H. RPM Limit By Throttle

This parameter refers to the maximum motor rpm allowed within the throttle range, associated with item 2I (RPM Limit Range).

2I. RPM Limit Range

Refers to the throttle range corresponding to the limited motor rpm. For example, if the item 2H (RPM Limit By Throttle) is set to 20000, and this item is set to 30%, it means that the maximum motor rpm limited within the 30% throttle range is 20000.

2J. Max RPM Limit

Refers to the maximum motor rpm limit with the whole throttle range.

3A. Drag Brake

It is the braking power produced when releasing from the throttle 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, apply it cautiously.)

3B. 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.

3C. 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.

3D. 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.

3E. 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 brake mode is the same as to other standard 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 actual boost timing during the operation is adjusted based on the parameter item 4B. 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.

Option 3: Timing Rate

In this mode, the boost timing is turned on according to the value set by the parameter item 4E (Boost Increase Rate).

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.

4E. Boost Increase Rate

Used to set the speed of the Boost response. Release a certain degree every 0.1 seconds until fully released. For example, if the parameter is set to 4°/0.1s and the Boost timing is set to 40 degrees, the Boost timing will be released at a speed of 4 degrees/0.1s, and after 1 second, all 40 degrees will be released.

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 deg/0.1sec" refers to the Turbo Timing of 6 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