



20250918



Xerun USER MANUAL

Sensored Brushless Electronic Speed Controller
XERUN XR10 Pro Legacy



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HW-SMA5480UL00

01 Introduction



Thank you for purchasing this HOBBYWING product! Please read this instruction manual 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. With the possible differences between the two version of the manual, for users in mainland China, please take the Chinese version as standard; for users in other regions, please take theEnglish version as standard.



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

- 9 select-to-use profiles applicable to all 1/10th RC car racing.
- Separate programming port is able to power an external fan or connect a LCD Program Box Pro 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 (innovative by HOBBYWING) for power delivery tuning and better driving efficiency.
- Multiple protections: low-voltage cutoff protection, ESC and motor thermal protection, fail safe (throttle signal loss protection), reverse polarity protection (the external standard cap pack will still be damaged if battery reversal occurs).
- Data logging function to view various running data on the HW LINK app using the OTA Bluetooth module.
- Firmware upgrade via Hobbywing LCD Program Box Pro or OTA Programmer (item sold separately).

04 Specifications

Model	XERUN XR10 Pro Legacy
Cont./Peak Current	150A/1000A
Applications	1/10 th Touring car & Buggy racing, 1/10 th Drift,F1,Rally
Motor Limit	Touring Car: >=4.5T, Buggy: >=5.5T, 3650(540)size 2-pole motor
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
Size	37.7x37.0x33.2mm(w/Fan&Fan Shroud)
Weight	94.2g(w/Wires)
Programming Port	Independent programming interface
Reverse Polarity Protection	Yes

05 Connections

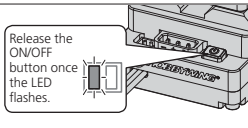
 This is an extremely powerful brushless motor system. For your safety and the safety of those around you, we strongly recommend removing the pinion gear attached to the motor before performing calibration and programming functions with this system. It is also advisable to keep the wheels in the air when 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 BEC to the receiver and steering servo, 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!
Note: The esc has reverse polarity protection,so reverse connection will not damage the esc, but conventional external capacitor pack will be damaged.

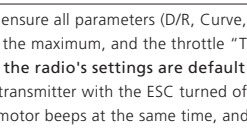
06 ESC Setup

1 Set the throttle range - ESC Calibration Process

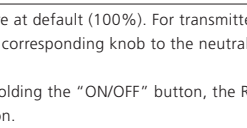
The calibration must be done on the first use of the ESC, or if a new radio or receiver is installed, otherwise the esc may not work correctly. We strongly recommend Hobbywing users to use the "Fail Safe" function on the radio system and set (F/S) to "Output OFF" or "Neutral Position". The calibrating steps of throttle is as follows:



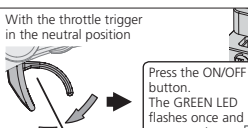
Release the ON/OFF button once the LED flashes.



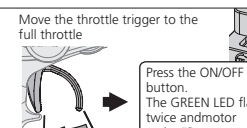
1. Turn on the transmitter, ensure all parameters (D/R, Curve, ATL) on the throttle channel are at default (100%). For transmitter without LCD, please turn the knob to the maximum, and the throttle "TRIM" to 0. Please also turn the corresponding knob to the neutral position. This step can be skipped if the radio's settings are default!



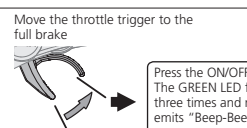
2. Start by turning on the transmitter with the ESC turned off but connected to a battery. Holding the "ON/OFF" button, the RED LED on the ESC starts to flash, the motor beeps at the same time, and then release the ON/OFF button.
Note: Beeps from the motor may be low sometimes, and you can check the LED status instead.



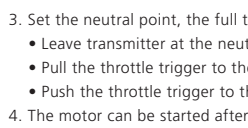
With the throttle trigger in the neutral position



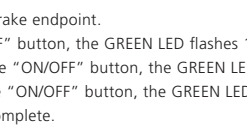
Move the throttle trigger to the full throttle



Move the throttle trigger to the full brake



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 after the ESC/Radio calibration is complete.

2 Power On/Off

In the off state, short press the switch button to turn on the esc; Long press the power button to turn off the esc.
Attention:

1. To prevent accidental shutdown, clicking the switch button cannot shut down the esc while it is running,it can only be turned off when the motor stops running,when unable to shut down in an emergency, please disconnect the battery directly, and if not in use for a long time, please disconnect the battery.
2. After running, the temperature of the aluminum casing may be very high,to prevent finger burns during shutdown, we suggest letting the esc cool naturally for one or two minutes before pressing the button to shut down. You can also use the transmitter to shut down the esc (when the "Remote Off" parameter is set to enabled, the esc will automatically shut down after the throttle trigger hold the full brake for 6 seconds).

3 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)																															
	1G	Smart Fan	Disabled	Enabled																														
	1H	Remote Off	Disabled	Enabled																														
	1I	Motor Rotation	CCW	CW																														
	2A	Throttle Rate Control	1-30 Adjustable (Step: 1)																															
Throttle Control	2B	Neutral Range	3%-10% Adjustable (Step: 1%)																															
	2C	Initial Throttle Force	1-15 Adjustable (Step: 1)																															
	2D	Coast	0-15% Adjustable (Step: 1%)																															
	2E	PWM Drive Frequency	1K	2K	4K	8K	12K	16K	24K	32K	Customized																							
	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%																		
	3A	Drag Brake Force	0%-100% Adjustable (Step: 1%)																															
	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																								
Brake Control	3E	Brake Control	Linear Traditional Hybrid																															
	4A	Boost Timing	0-64° Adjustable (Step: 1°)																															
	4B	Boost Timing Activation	RPM		Auto																													
	4C	Boost Start RPM	500-3500RPM (Step: 500RPM)																															
	4D	Boost End RPM	3000-6000RPM (Step: 500RPM)																															
	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																					
	5D	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																					
	5D	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																					

- 1A. Running Mode**
Racing mode 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 valve 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 and then cut off the output about 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(2S LiPo).
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**
After enabling this function, when the temperature of the ESC reaches the set value, it will reduce the power and then cut off the output about 40 seconds later. The GREEN LED will flash a short, single flash that repeats (☆☆, ☆☆, ☆☆☆) to indicate the over-heat protection is activated.
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/because of the different temperature sensor inside the motor. In this case, please disable this function and monitor the motor temperature manually.
- 1E. Motor Thermal Protection**
After enabling this function, when the temperature of the motor reaches the set value, it will reduce the power and then cut off the output about 40 seconds later. The GREEN LED will flash a short, double flash that repeats (☆☆☆, ☆☆☆, ☆☆☆☆) to indicate the over-heat protection is activated.
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/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 once 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**
When set to "Enabled", you can use the transmitter to turn off the esc, simply hold the throttle trigger in the full brake position for about 6 seconds or more, and the esc will be turned off; When set to "Disabled", you must turn off the ESC by pressing the power switch button from the ESC.
- 1I. Motor Rotation/Direction**
Used to set the rotation direction of the motor. Due to differences in chassis frame structure, it is possible for the car to reverse when the throttle is applied to forward, in this case, you can solve it by adjusting this item.
- 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. 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.
- 2C. 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.
- 2D. 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%.
- 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 softer the bottom end. Sometimes drivers may help 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.
- 2G. 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 track 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**
This parameter is used to control the response of the brake. The higher the setting value, the faster the brake. 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. Please choose the frequencies as per the actual test results of your vehicles.
- 3E. Brake Control**
Option 1: Linear
In this mode, the brake is smooth, but the force is slightly weaker than in traditional mode.
Option 2: Traditional
This is a traditional brake method with strong brake force, but the linearity is not very good.

- 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 winding course. The ESC adjusts the timing dynamically according to the setting of the "Boost Timing Activation". The Boost Timing is not constant but variable.
- 4B. Boost Timing Activation**
Option 1: RPM
In RPM mode, it is associated with the 4C and 4D parameter items. 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. When the RPM is higher than the Boost End RPM, the actual Boost Timing is the value you had previously set.
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 deg/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 "TC-Modify" to "TITI2025_MOD_4.5" to indicate the race was ran with a 4.5T motor at 2025 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 (blinkly) program on their ESCs.
2	TC-Modify	Modify class of 1/10th touring car racing
3	Buggy-2WD-Modify	Modify class of 1/10th 2WD buggy racing
4	Buggy-4WD-Modify	Modify class of 1/10th 4WD buggy racing
5	Practice	(With Reverse function activated,) practice and sport.
6	Stock-13.5T	13.5T Open Stock class of 1/10th touring car racing
7	Stock-17.5T	17.5T Open Stock class of 1/10th touring car racing
8	SCT-4 Pole	1/10" 4WD SCT using 4 pole motor
9	Drift 2WD Carpet	1/10" drift 2WD car on Carpet

5 ESC Programming

- 1. Program your ESC with a multifunction LCD Program Box Pro/G2**
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 four extreme values of the highest temperature of the esc, the highest temperature of the motor, 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 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 OTA Programmer or LCD Box Pro, 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/G2, 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/G2**
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.

07 Explanation for LED Status