Thank you for purchasing this product! Any improper use may cause personal injury and damage to the unit and related devices. We strongly recommend reading through this user manual before use. Because we have no control over the use, installation, or maintenance of this product, no liability may be assumed for any damage or losses resulting from the use of the product. We do not assume responsibility for any losses caused by unauthorized modifications to our product. In addition, we have the right to modify our product design, appearance, features and usage requirements without notification.

01 Features

- ★ Fully waterproof design for all conditions. (Note: please clean and dry it after use for avoiding rusty connectors.)
- ★ Built-in switch-mode BEC with continuous current of 4A.
- ★ Tunable drag brake and drag brake rate for different vehicles, tracks and control feel.
- ★ Adjustable PWM frequency combined with advanced freewheeling (/DEO) technology guarantees great throttle linearity and driving feel.
- ★ 9 levels of acceleration/punch from soft to aggressive for different vehicles, tires and tracks.
- ★ Multiple protections: low-voltage cutoff protection, thermal protection, and throttle signal loss protection.
- ★ Separate programming port to easily connect the LED program card to the ESC.
- ★ ESC programming via portable LED program card.

02 Specifications

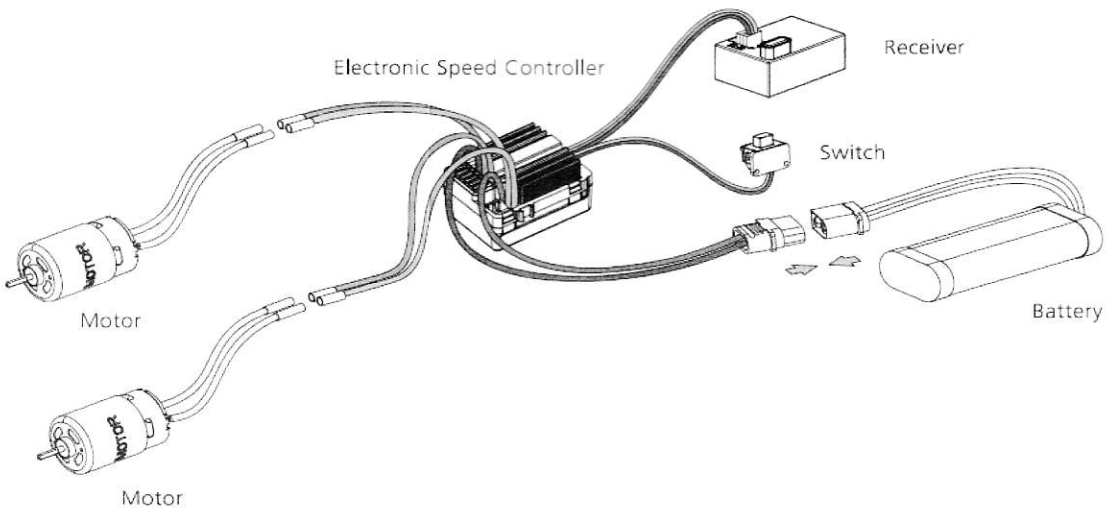
Model	THW-880-Dual Brushed RTR
Cont./Peak Current	80A/400A
Motor Type	Brushed Motor (540/550/775 size motors)
Applications	1/10th & 1/8th On-roads/ Buggies/Trucks/Monster Trucks/Rock Crawlers & Some Boats
Motor Limit	Brushed Motor Limit with 2S LiPo/6S NiMH: ≥12T or RPM<30000@7.4V (540/550 size motors) Brushed Motor Limit with 3S LiPo/9S NiMH: ≥18T or RPM<20000@7.4V (540/550 size motors) Brushed Motor Limit with 4S LiPo/12S NiMH: ≥24T or RPM<15000@7.4V (540/550 size motors)
LiPo/NiMH Cells	2-4S LiPo or 5-12S NiMH
BEC Output	6V@4A (Switch-mode)
Size/Weight (w./ Wires)	45.9mm(L)*34.7mm(W)*26.5mm(H)/ 75g
Programming Port	Separate Port

03 Begin to Use a New Brushed ESC

Warning! 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.

Wiring Diagram

(Please connect the relevant devices like motors, receiver and battery to the ESC as shown below.)



Notes: 1) swap the two motor wires if the motor direction is incorrect;
2) when driving two motors simultaneously, the Turns /T count (of the motors) need to be increased accordingly.

Radio Calibration

Turn on the transmitter and set parameters (of the throttle channel) like D/R, EPA, ATL to 100% (if there is no LCD display on the transmitter, please adjust the corresponding knob to its limit), if the transmitter supports the "forward/reverse or backward" proportion setting, then you need to set the proportion to 5:5, and set the throttle trim to 0. We strongly recommend users to enable the "Fail Safe (F/S)" function of the transmitter, set the "F/S" of the throttle to the "Shutdown" mode or set the protection value to the neutral position.

Move the throttle stick/trigger to the **neutral position**, turn on the ESC, let the ESC do the self test and automatic throttle calibration (all this can be completed in 3 seconds), and the power system will be ready to go after you hear the "beep" sound.

Explanation for LED Status

1. The Red LED dies out when the throttle stick/trigger is in throttle neutral zone.
2. The Red LED flashes when your vehicle runs forward and it turns solid Red when you pull the throttle stick/trigger to the full throttle endpoint.
3. The Red LED flashes when your vehicle brakes and it turns solid Red when you push the throttle stick/trigger to the full brake endpoint and set the "maximum brake force" to 100%.
4. The Red LED flashes when your vehicle runs backward and it runs solid Red when you push the throttle stick/trigger to the full brake endpoint and set the "maximum reverse force" to 100%.

Power ON-OFF Warning

If you set the "Battery Type" to "LiPo", the motor will beep N (number) beeps to indicate the number of LiPo cells you have plugged in (i.e. 2 beeps indicate a 2S LiPo, 3 beeps indicate a 3S LiPo, 4 beeps indicate a 4S LiPo) and then a long beep to inform you that your ESC is ready to work. If you set the "Battery Type" to "NiMH", the motor will only beep a beep to indicate the ESC is in NiMH mode and then another beep to inform you that your ESC is ready to function.

04 Programmable Items

Those "White text with Black background" options are the factory default settings

Programmable Items	Option 1	Option 2	Option 3	Option 4	Option 5	Option 6	Option 7	Option 8	Option 9
1. Running Mode	Fwd/Brk	*Fwd/Rev/Brk*	Fwd/Rev						
2. Battery Type	*LiPo*	NiMH							
3. Cutoff Voltage	Disabled	Auto (Low)	*Auto (Medium)*	Auto (High)					
4. Initial Start Force	0%	2%	*4%*	6%	8%	10%	12%	14%	16%
5. Max. Forward Force	25%	50%	75%	*100%*					
6. Max. Reverse Force	25%	*50%*	75%	100%					
7. Max. Brake Force	0%	12.5%	25%	37.5%	50%	62.5%	75%	87.5%	*100%*
8. Initial Brake Force	*0%*	6.25%	12.5%	18.75%	25%	31.25%	37.5%	43.75%	50%
9. Drag Brake	*0%*	5%	10%	50%	60%	70%	80%	90%	100%
10. Drag Brake Rate	Level 1	Level 2	Level 3	*Level 4*	Level 5	Level 6	Level 7	Level 8	Level 9
11. Neutral Range	0.02ms	0.03ms	0.04ms	*0.05ms*	0.06ms	0.07ms	0.08ms	0.10ms	0.12ms
12. Start Mode/Punch	Level 1	Level 2	Level 3	Level 4	*Level 5*	Level 6	Level 7	Level 8	Level 9
13. PWM Frequency	1K	2K	4K	*8K*	16K				
14. BEC Voltage	*6V*								
15. Freewheeling/ DEO	Enabled	*Disabled*							

1. Running Mode

Option 1: Forward with Brake

It's a 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 "Fwd/Rev/Brk" functions. We have adopted the "DOUBLE-CLICK" method, that is your vehicle only brakes on the 1st time you push the throttle trigger forward (brake) (1st push). The motor stops when you quickly release the throttle trigger and then re-push the trigger quickly (2nd push), only then the vehicle will reverse. The reverse function will not work if your car does not come to a complete stop. The vehicle only reverses after the motor stops. This method is for preventing vehicle from being accidentally reversed.

Option 3: Forward and Reverse

This mode is often used by special vehicles (rock crawler). It adopts the "SINGLE-CLICK" method. The vehicle will reverse immediately when you push the throttle trigger forward (brake).

2. Battery Type

This item provides two options: **LiPo** & **NiMH**, please select as per your battery and set the cutoff voltage accordingly.

3. Cutoff Voltage

This item is mainly for preventing the LiPo battery from irreversible damage due to over discharge. The ESC monitors the battery voltage all the time, it will immediately cut off the output when the voltage goes below the cutoff threshold. The Red LED will flash " ☆, ☆, ☆" when the low-voltage cutoff protection is activated. When the "Battery Type" is set to "LiPo", the voltage corresponds to "Auto (Low)/Auto (Medium)/Auto (High) is 3.0V/3.2V/3.4V per cell; when the "Battery Type" is set to "NiHM", the voltage corresponds to "Auto (Low)/Auto (Medium)/Auto (High) is 4.5V/5.0V/5.5V (for the whole NiMH pack).

4. Initial Start Force

It's the initial force when you pull the throttle trigger from neutral position toward non-throttle throttle position. A suitable start force can effectively prevent vehicle from sliding when you apply a low throttle amount.

5. Max. Forward Force

It's the force when throttle trigger is at the full throttle position. It's adjustable among 25%, 50%, 75% and 100% (by default). You can lower down the value for better driving feel/control when you drive a crawler (simulation model) over difficult terrains (and don't have any requirement against the maximum speed).

6. Max. Reverse Force

Different reverse amount will bring different reversing speed. For the safety of your vehicle, we recommend using a low amount.

7. Max. Brake Force

The ESC provides proportional braking function; the braking effect is decided by the position of the throttle trigger. It sets what 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. Please select the most suitable brake amount as per your car condition and your preference.

8. Initial Brake Force

It's also known as "min. brake force". It's the force when pushing throttle trigger from neutral zone to the initial brake position.

9. Drag Brake

Drag brake is the braking power produced when releasing the throttle trigger from full speed to neutral zone.
(Attention! Drag brake will consume much power, so apply it cautiously.)

10. Drag Brake Rate

It's the rate at which the drag brake increases from zero to the pre-set value when the throttle trigger enters the neutral range. A suitable rate can make the vehicle stop stably. You can choose the drag brake rate from level 1 (very soft) to level 9 (very aggressive) as per the track, tires' grip, and etc.

11. 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.

12. Start Mode / Punch

You can choose the punch from level 1 (very soft) to level 9 (very aggressive) as per the track, tires, grip, your preference and etc. This feature is very useful for preventing tires from slipping during the starting-up process. In addition, "level 7/8/9" have strict requirement on battery's discharge capability. It may affect the starting-up if the battery discharges poorly and cannot provide large current in a short time. The car stutters or suddenly loses power in the starting-up process indicating the battery's discharge capability is not good, and then you need to reduce the punch or increase the FDR (Final Drive Ratio).

13. 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.

14. BEC Voltage

This item is not programmable and fixed at 6V.

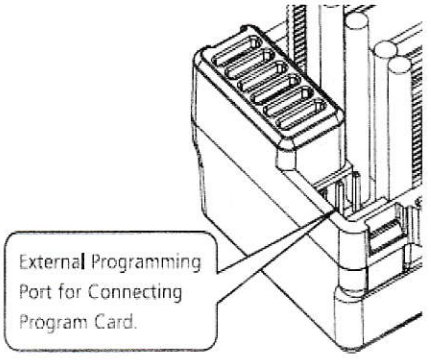
15. Freewheeling/DEO

For regular vehicles, we recommend disabling this function. With it disabled, your vehicle can have quick acceleration. For a crawler (simulation model), we suggest enabling it. With it enabled, you crawler can have better linearity during a low-speed running and also less heat.

05 ESC Programming

Program your ESC with a LED program card

The LED program card is an optional accessory for updating the firmware of car ESCs. Its friendly interface makes the ESC programming easy and quick. Before the programming, you need to connect your ESC to the program card via a White/Red/Black PVC cable with two JR male connectors (one end of the cable to the separate programming port on the ESC and the other end to the port marked with " ⊖⊕卩 " on the program card), and then turn on the ESC, all programmable items will show up a few seconds later. You can select the item by choosing via "ITEM" & "VALUE" buttons on the program card. Press the "OK" button to save all new settings to your ESC.



06 Factory Reset

Restore the default values with a LED program card

After connecting the LED program card to the ESC, press the "RESET" button and the "OK" button to factory reset your ESC.

07 Troubleshooting

Trouble	Possible Cause(s)	Solution(s)
The ESC was unable to start the status LED and the motor after it was powered on.	1. No power was supplied to the ESC. 2. The ESC switch was damaged.	1. Check if all ESC & battery joints or connections have been well soldered or firmly connected, re-solder them if necessary. 2. Replace the broken switch.
The ESC was unable to start the motor (but the Red status LED flashed) after it was powered on.	The throttle control cable was reversely plugged in or in the wrong channel on the receiver, or the throttle stick/trigger was not moved to the neutral position.	Plug the throttle control cable in the TH channel on receiver, or fine-tune the neutral position, if the transmitter supports the "forward/reverse or backward" proportion setting, then you need to set the proportion to 5:5.
The vehicle ran backward when you pulled the throttle trigger towards you.	1. The ESC-to-motor wiring order was incorrect. 2. Incorrectly set the direction of the throttle channel.	1. Swap the two motor wires. 2. Change the direction of the throttle channel from "NOR" to "REV" or "REV" to "NOR".
The motor suddenly stopped or significantly reduced its output in operation.	1. The receiver was influenced by some foreign interference. 2. The LVC protection was activated. 3. The ESC thermal protection was activated.	1. Check all devices 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, so please replace your battery pack. 3. The Red LED keeps flashing indicating the ESC thermal protection is activated, please let your ESC cool down before using it again.
The vehicle could run forward but could not reverse.	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.	1. Re-calibrate the throttle neutral position, no LED on the ESC will turn on when the throttle trigger/stick is at the neutral position. 2. Set the "running mode" to "Fwd/Rev/Br" or "Fwd/Rev". 3. Contact your dealer for repair service.
The vehicle moved forward or backward slowly when the throttle trigger was at the neutral position.	1. The signals emitted by the transmitter were not stable. 2. The throttle range was not calibrated properly.	1. Replace the transmitter with another one that has stable signals. 2. Please fine-tune the neutral position on the transmitter.
The LED display kept displaying "---" after the LED program card was connected to the ESC.	Connected the LED program card to the wrong port on the ESC.	Connect the LED program card to the separate port marked with "⊖⊕卩" on the ESC.