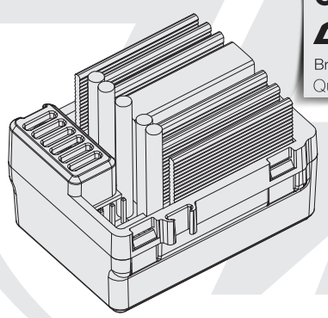
HOBBYWING®

USER MANUAL

QUICRUN

Brushed Electronic Speed Controller

QuicRun WP 880 Dual Brushed



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01 Introduction

Congratulations and thank you for your trust in Hobbywing product. By purchasing the QuicRun WP 880 Dual Brushed , you have chosen a high performance sensored brushed electronic speed controller! This speed controller is equipped with high-tech features to enhance your experience with Hobbywing brushed power systems. Improper usage and unauthorized modification to our product is extremely dangerous and may damage the product and related devices. Please take your time and read the following instructions carefully before you start using your speed control. 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.

02 Warnings

- To avoid short circuits, ensure that all wires and connections must be well insulated before connecting the ESC to related devices.
- Ensure all devices are well connected to prevent poor connections and avoid damages to your electronic devices.
- Read through the manuals of all power devices and chassis and ensure the power configuration is rational before using this unit.
- 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 immediate usage once the casing of the ESC exceeds 90℃/194℉ as this may cause damage to both the ESC and motor. Hobbywing recommends setting the "ESC Thermal Protection" to 105℃/221℉ (this refers to the internal temperature of the ESC).
- Users must always disconnect the batteries after use as the current on the ESC is consuming continuously if it is connected to the batteries (even if the ESC is turned off). The battery will completely be discharged and may result in damage to the battery or ESC when it is connected for a long period of time. This WILL NOT be covered under warranty.

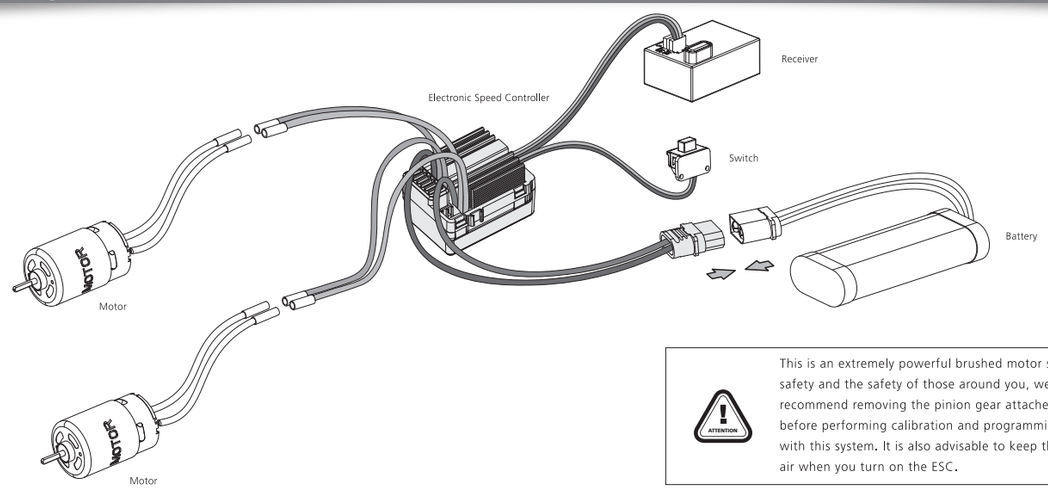
03 Features

- Fully waterproof design for all conditions. (Note: please clean and dry it after use for avoiding rusty connectors)
- HOBBYWING patented copper heat-conductive plates attached to the MOSFET board allows the internal heat to be quickly transferred to the aluminum heat sink for great heat dissipation.
- Built-in switch-mode BEC with cont. 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.
- Proportional brake with 9 levels of initial brake force, maximum brake force and drag brake force.
- 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 Hobbywing LED program card.

04 Specifications

Model	QuicRun WP 880 Dual Brushed
PN	30120301
Cont. / Peak Current	80A / 400A
Motor Type	Brushed Motor (540 / 550 / 775 size motors)
Applications	Various 1/10th & 1/8th Vehicles
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)
Connectors	Input End: No Connectors; Output End: 4.0mm Female Bullet Connectors
Size / Weight(w./Wires)	45.9*34.7*26.5mm/75g
Programming Port	Separate Port

05 Begin to Use a New Brushed ESC



ATTENTION

This is an extremely powerful brushed 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.

- Motor Wiring
  This ESC has two sets of output/ESC wires, each set can be randomly connected to the two input/motor wires, but please ensure that the driving directions are the same when connecting the ESC to two motors.
  Notes:
  1) When driving two motors simultaneously, the Turns/T count (of the motors) need to be increased accordingly.
  2) The two sets of output/ESC wires are connected in parallel and they can only be used to drive the motors synchronously.
- Receiver Wiring
  Plug the throttle control cable on the ESC into the throttle (TH) channel on receiver. The throttle control cable will output the voltage of 6V to the receiver and steering servo. Hence, no separate battery can be connected to the receiver. Otherwise, your ESC may be damaged.
- Battery Wiring
  Proper polariy is esential. Please ensure positive (+) connects to positive (+), and negative (-) connects to negative (-) when plugging in the battery! When reverse polarity is applied to your ESC from the battery, it WILL damage your ESC. This WILL NOT be covered under warrranty!

06 ESC Setup

1 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.), set the throttle trim to 0 (if there is no LCD display, then adjust the knob to the neutral position). For FUTABA and similar transmitters, set the throttle direction to "REV", while the throttle direction of others to "NOR".
Besides, we strongly recommend users to enable the "Fail Safe (F/S)" function of the transmitter, set the "F/S" of the throttle channel to the Shutdown mode or set the protection value to the neutral position, so the car can be stopped if the receiver fails to get the radio signals from the transmitter.
Move the throttle trigger/stick 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.

2 Power ON/OFF & Warning Tones

- Power ON/OFF:
  Slide the switch to the "ON/OFF" position to turn on/off the ESC.
- Warning Tones:
  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.) 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.

3 Programmable Items

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

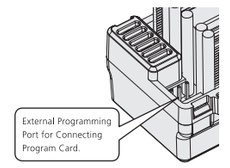
Programmable Item	Option 1	Option 2	Option 3	Option 4	Option 5	Option 6	Option 7	Option 8	Option 9
1.Running Mode	Fwd/Brk	Fwd/Rev/Brk	Fwd/Rev						
2.Battery Type	LiPo	NiMH							
3.Cutoff Voltage	Disabled	Auto (Low)	Auto (Medium)	Auto (High)					
4. Initial Start Force	0%	2%	4%	6%	8%	10%	12%	14%	16%
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	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 "Forward/ Reverse with Brake" functions. Hobbywing has 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 (reverse).
2. **Battery Type**
   Option 1: LiPo. Select this option when you use a LiPo battery and set the cutoff voltage accordingly.
   Option 2: NiMH. Select this option when you use a NiMH battery and set the cutoff voltage accordingly.
3. **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 cut off the output 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.
   Option 1: Disabled. The ESC does not cut the power off due to low voltage. Please pay attention to the power change of your vehicle. In general, the battery voltage gets pretty low when your vehicle is severely losing power, then you should stop using that pack.
   Option 2: Auto (Low). Low cutoff voltage, difficult to get the LVC protection activated, is applicable to batteries with poor discharge capability. The corresponding cutoff voltage is 4.5V for a NiMH pack.
   Option 3: Auto (Medium). Medium cutoff voltage, prone to getting the LVC Protection activated, is applicable to batteries with ordinary discharge capability. The corresponding cutoff voltage is 5.0V for a NiMH pack.
   Option 3: Auto (High). High cutoff voltage, very prone to getting the LVC Protection activated, is applicable to packs with great discharge capability. The corresponding cutoff voltage is 5.5V for a 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 is also known as "minimum brake force". It is 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","level 8" and "level 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**
    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.

4 ESC Programming

Program your ESC with a LED program card

Only the LED program box (PN: 30501003) can be used to program this QUICRUN-WP-880-DUAL-BRUSHED ESC. 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 "-+↻" 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.



5 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 Explanation for LED Status

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

08 Troubleshooting

Trouble(s)	Possible Causes	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. 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 postion.	Please plug the throttle control cable in the TH channel (usually CH2) on receiver or fine-tune the neutral position on the transmitter, if the transmitter supports the "forward/reverse or backward" proportion setting, then you need to set the proportion to 5:5.
The vehicle moved forward or backward slowly when the throttle trigger was at the neutral position.	The throttle range was not calibrated properly.	Please fine-tune the neutral position on the transmitter.
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 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 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, 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.	The throttle neutral position on your transmitter was actually in the braking zone.	Recalibrate the throttle neutral position. No LED on the ESC will come on when the throttle trigger is at the neutral position.