Shenzhen FVT Electronics Co., Ltd.

FVT Sensored/Sensorless Brushless Speed Controller for Car or Truck

Thank you for your purchasing the FVT Brushless Electronic Speed Controller (ESC). The FVT electronic speed controller is specifically designed for operating Sensored/ Sensorless brushless motors. High power systems for RC model can be very dangerous and we strongly suggest that you read this manual carefully. FVT Model have no control over the correct use, installation, application or maintenance of these products, thus no liability shall be assumed nor accepted for any damages, losses of costs resulting from the use of this item. Any claims arising from the operating,failure or malfunction etc. will be denied. We assume no liability for personal injury, property damage or consequential damages resulting from our product or our workmanship. As far as is legally permitted, the obligation for compensation is limited to the invoice amount of product in question.

Features:

- Enhanced throttle response,excellent acceleration,strong brakes and throttle linearity
- Using advanced programming card to set up or update the software or make adjustments.
- Using programming card to program forward or reverse throttle limit
- Using programming card to program braking percent
- Multiple protection : Low voltage cut-off , over-heat and throttle signal loss and the battery voltage detecting range
- Splash proof water function

The shape of the product

LED Indication

Sensored/Sensorless ESC's		
function	**LED**	**LED Status**
Low voltage of the battery	Red LED	Blinking
Over-heat of the ESC	Green LED	Blinking
battery voltage out of range	Red and Green LED	Blinking
Sensored motor	Red and Green LED	ON
Sensorless motor	Green LED	ON

Throttle Range Calibration (For the first time using transmitter or changing the transmitter you must set Throttle Range Calibration)

1. Switch off the ESC , then connect ESC with the battery packs and turn on the transmitter; set the direction of the throttle channel to "REV", set the throttle trim to "0", set the "EPA/ATV" value of the throttle channel to 100% , and disable the ABS function of your transmitter.

2. Hold the "Set" button and switch on the ESC , wait for about 2 second until the Green LED begins to flash and the motor emits continuous "Beep-beep-" sound , then release the "Set" button and pull the throttle trigger to the neutral point at the same time, then you will hear the motor a continuous "beep" sound and see the red LED continuous blink, then click on the "SET" button, hear "beep" the sound of a motor

3. Push the throttle trigger to end position of forward, press set button for one time , you will hear motor "Beep-beep-".

4. Now push the throttle trigger to the end position of backward , press "Set" button for one time, you hear motor "Beep-beep-beep", both of the Red LED and Green LED turned off simultaneity , the Throttle Range Calibration is confirmed , the motor can be started after 2 seconds for battery cells detecting program.

Brave Wolf I Series Programmable items and factory default

Programmable Items	Programmable Value									
	1	2	3	4	5	6	7	8	9	10
Motor Timing	Very Low	Low	Normal	High	Very High					
Initial Acceleration	Low	Medium	High	Very High						
Running Mode	Forward w/o Reverse	Forward with pause then Reverse	Forward /revese							
Percentage Braking	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
Percentage Drag Brake	0%	5%	10%	15%	20%	25%	30%	35%		
Cut-off Voltage	2.6V/ Cell	2.8V/Cell	3.0V/Cell	3.2V/Cell	3.4V/ Cell	No protection				
Throttle Limit	20%	40%	60%	80%	100%					
Throttle Percent Reverse	20%	40%	60%	80%	100%					
Motor Rotation	Forward	Reverse								
Neutral Range	3%	5%	7%	9%						

Brave Wolf II Series Programmable Turbo items and factory default

programmable Items	Programmable Value									
	1	2	3	4	5	6	7	8	9	10
Motor Timing	0''	3''	6''	9''	12''	15''	18''	21''		
Turbo Timing	OFF	1''	2''	3''	4''	5''	6''	7''	8''	
Boost Start RPM	3000	4500	6000	7500	9000	10500	12000	13500	15000	
Turbo Delay	0.0 S	0.1 S	0.2 S	0.3 S	0.4 S	0.5 S	0.6 S	0.7 S	0.8 S	

FVT Sensored/Sensorless brushless ESC general information

1. Motor Timing - This option affects the power band and efficiency (run time) of an electric motor. The default is "High"
and is a good starting point to deliver power and provide good run time.
This function can be used for sensored/sensorless in-runner motor, different timing will improve the efficiency of the motor.
For Brave Wolf II-series ESC motor timing is as follows:
0'' , 3'' , 6'', 9'' , 12'' , 15'', 18'' , 21''

2. Initial Acceleration - Use this to limit the initial power that is sent to the motor when starting from a complete stop. The default is high.
Using the low option, the vehicle will launch very slowly and provide the longest run times. When using the HIGH choice, you will have wheel-spinning acceleration at the cost of run time. This is also very tough on the batteries as the amperage draw can be very high. If your vehicle cuts out, hesitates or loses radio control, you should consider setting this at a lower value.

Note: For Brave Wolf II-series ESC initial Acceleration is as follows:
Level 1, Level 2, Level 3, Level 4, Level 5, Level 6, Level 7, Level 8, Level 9

3. Running Mode

- **Forward w/o Reverse**

This is a Race setting - Reverse is disabled. You will find in racing, most tracks will not allow racing with reverse enabled.

- **Forward with pause then Reverse: (DEFAULT)**

General bashing around (FUN) or racing if reverse is allowed for the event.The Electronic Speed Controller requires 2 seconds of continuous neutral from the transmitter prior to allowing reverse to operate.

Note: There is automatic protection within the FVT ESC. Only after you have stopped and returned the trigger to neutral will reverse become available. If while traveling in reverse, pull the trigger to go forward. This is to help prevent serious damage to the drive train.

- **Forward / Reverse**

If the option is actived, the RC car could go forward and backward, but couldn`t brake.

ESC – reverse operation

Should you get into a situation that requires reverse, after you have applied any brakes you may have needed, return the throttle trigger to the neutral position. Wait a moment or two and then push the trigger forward for reverse.

4. Percentage Braking - Gives you the ability to have full control over the amount of brake your vehicle will have.

Note: Percentage Braking relates to the position of the throttle stick, the highest braking position means when the throttle stick is put on the bottom.

10%,20%,30%,40%,50%(Default),60%,70%,80%,90%,100%

5. Percentage Drag Brake - 0%(Default) 5%,10%,15%,20%, 25%,30%,35%

The drag brake function provides the driver a set percentage of brake when you have the transmitter resting in neutral.This will create the "feel"of a brushed motor.

Drag brake are used in racing to slow a vehicle as you let off approaching a corner versus the driver having to push the brake at every corner.

Try working with this to get a sense of how you might use this for your track.

If you are running on a high traction track with tight corners, a stronger setting should work best.

If you are running in an open area, you will find a smaller percentage will result in better control.

If you are running in dusty or slippery surfaces, you will more than likely want to use the lowest option.

6. Cutoff Voltage Threshold

- **Automatically detect the number of the cells Default: 3.0V/Cell**

According to the type of your batteries, set up the type of the batteries and Low Voltage Cutoff Threshold via PC software or program card. The ESC can detect the Voltage of the battery anytime and will stop working once the Voltage of the battery is lower than the preset Low Voltage Cutoff Threshold.

- When using **NiMH or NiCd batteries** you do not need to set a cutoff voltage to protect the batteries. If you use more than 6-cell NiMH or NiCd batteries, you must adjust the cutoff voltage, for example if you use a 8-cell pack of NiMH batteries you would use a cutoff of 5.6V volts (8 x 0.7V = 5.6V). When the voltage of the batteries packs is within 8.4~12.6V, the ESC will automatically identify 3S LiPos. When the voltage of the batteries packs is less than 8.4V, the ESC will automatically identify 2S LiPos. When the voltage of the batteries packs is within 8.4~14.8V, the ESC will automatically identify 2~4S LiPos. When the voltage of the batteries packs is within 21~25.2V, the ESC will automatically identify 5-6S LiPos.
- When using any **Lithium batteries,** they must not be discharged to less than 3.0V per cell.

7. Throttle Limit – Use this to limit the power available using forward throttle.The lower the percent the less forward throttle speed will be available.

20%,40%,60%,80%,100% (Default)

For example, if the percent is 20%, the ESC output will be 20%, if the percent is 60%, the ESC output will be 60% , this functio enables you to choose motor without worrying about damage of burning because of overload. enables you to choose motor without worrying about damage of burning because of overload.

8. Throttle Percent Reverse - Use this to limit the power available using reverse throttle. The lower the percent or level the less speed will be available in reverse.

20%,40%(Default),60%,80%,100%

9. Motor Rotation

Normal (default), Reverse

10. Neutral Range – This setting adjusts the amount of "Deadband" off neutral on the throttle trigger.This is in Milli-Seconds (MS) and is the amount of neutral when you pull the trigger.

The smaller the value the less "Deadband" or movement is required off-center for the ESC to begin throttle functions.
Using a higher value for this setting will provide a wider Deadband.

3%,5%,7%,9%(Default)

11.Turbo Timing - OFF, 1'', 2'', 3'', 4'', 5'' (Default) 6'', 7'', 8''

Please note that It is ONLY effective when the throttle is fully opened, so we recommend using it for the long and straight track, and the Turbo Function will be TURNED OFF when you choose item 1.

12.Boost Start RPM - 3000, 4500,6000,7500,9000 (Default) 10500, 12000,13500,15000

The ESC begins to increase the internal timing when motor speed reaches the Boost Start RPM . The smaller Boost Start RPM value is the earlier the internal timing will be increased.

13.Turbo Delay – 0.0S, 0.1S, 0.2S, 0.3S, 0.4S (Default) 0.5S, 0.6S, 0.7S, 0.8S

This is the time that "full throttle" must be held BEFORE the turbo function starts , the turbo function will NOT be activated until the full throttle time reach the setting value .

Trouble shooting

Trouble	Possible Reason	Solution
After power on,LED doesn't light up, fan doesn't work	1. ESC doesn't get the working voltage; 2. ESC's switch is damaged.	1. Check the circuit from battery to ESC is soldered well or not. 2.Return ESC to repair or replace ESC's switch button.
After power on, both Red and Green LED lights up	Battery's voltage is not within the normal range.	Check the voltage of battery pack.
After power on, the LED lights up always and motor could not start up	Battery's power voltage is too low.	Check the voltage of battery pack.
Remote Controller makes "Forward" singal while the Car make the "Rervese" function	1.Wire connection sequence between input wire and motor wire are incorrect; 2. This car body's motor rotation is in reversed direction with main body's motor.	Swap any two wire connections between ESC and motor.
Motor stops suddenly during running	1. Receiver meet with interruption; 2. ESC enters into Battery low voltage or over-heat protection.	Disconnect ESC with power, recheck battery pack's voltage and receiver cable are connected correctely or not.
During start up, motor accelerates suddenly so the motor may stop for a while or doesn't run smoothly	1.Battery's discharge is not strong enough; 2.Motor rotation is too high and the teeth ratio is not correctly; 3.ESC's start up acceleation sets to be too fast; 4.Motor timing is too low	1. Change battery with stronger discharge power; 2. Change lower-speed motor or raise the ratio of motor's speed decrease; 3.Change ESC's start up acceleration (start up mode) to be slower; 4.Set motor timing to bigger one.

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210mm

145mm