



Thank you for purchasing the Hexfly Hex10 Electronic Speed Controller (ESC). Power systems designed for RC vehicles can be very dangerous if not used correctly, so please read this manual carefully. Hexfly assumes no responsibility of any kind for the use, installation, application, or maintenance of this product. No liability shall be assumed nor accepted for any damages, losses or costs resulting from the use of this product. Any claims arising from operating, failure, or malfunction, etc. will be denied. We assume no liability for personal injury, consequential damages resulting from our product, or our workmanship.

1 Warnings

- Ensure all wires and connections are properly insulated before connecting the ESC to related devices as short circuits will damage the ESC.
- Ensure all devices are connected securely. Poor connections may cause loss of vehicle control or damage to electrical components. Loose connections may also generate unwanted heat and cause damage or fire.
- Thoroughly read all manuals to all components being used with this device, including the vehicle manual, to ensure all parameters are met before using.
- Do not hold the vehicle in the air while pulling the throttle. Rubber tires can "expand" to extreme size and explode, causing serious injury.
- Stop using the ESC when it's casing temperature exceeds 90°C /194°F. These temps. can destroy the ESC and may also cause damage to the motor.
- We recommend setting the "ESC Thermal Protection" to 105°C/221°F (this refers to the internal temperature of the ESC).
- We recommend removing the cooling fan from ESC before exposing vehicle to liquids, and completely dry the ESC immediately following use.
- Always disconnect and remove batteries after use. The ESC will continue to draw current from the batteries, even if the ESC is turned off. Leaving the batteries plugged into the ESC for a length of time may cause the batteries to become completely discharged, resulting in damage to the batteries, electronics, persons, and surroundings. This will not be covered under warranty.

2 Features

- Compatible with sensorless brushless motors (only in sensorless mode) and sensored brushless motors.
- Fully waterproof design for all weather conditions. The power button is water proof and dust proof.
- Super internal switching BEC with switchable voltage of 6V/7.4V and a cont. /peak current of 6A/15A for high voltage servos with high voltage and amperage requirements.
- Proportional braking with 9 levels of brake sensitivity, 9 levels of maximum brake force, and 9 levels of drag brake force.
- 5 levels of punch/acceleration, soft to aggressive, for different vehicles, tires, and track conditions.
- Capacitor Protection: Innovative Capacitor Protection effectively protects capacitors from exploding and causing irreversible damage to the ESC from overloading.
- Multiple protective features: motor lock-up protection, low-voltage cutoff protection, thermal protection, overload protection, and fail safe.
- Single-button ESC programming and factory reset.
- Advanced programming via portable LED program card.

3 Specifications

Model	HEX10-120
Applications	1/10th Short Course Truck, Truck, and Monster Truck
Cont./Peak Current	120A/830A
Motor Type	Sensored / Sensorless Brushless Motor (only in sensorless mode)
Motor Limit	with 2S LiPo: KV≤6000 with 3S LiPo: KV≤4000 with 4S LiPo: KV≤3000 (36XX size motor)
LiPo /NiMH Cells	2-4S LiPo / 6-12Cell NiMH
BEC Output	6V/7.4V Switchable, 4A (Switch-mode)
Fan (Included)	Powered by a constant BEC voltage of 6V/7.4V
Connectors	Input Wires: No Connectors / Output Wires: 4.0mm Female Gold Connectors (pre-soldered onto the PCB of the ESC).
Size/Weight	49mm x 39.5mm x 34.7mm (W/Fan) / 105g
Programming Port	FAN/PRG Port



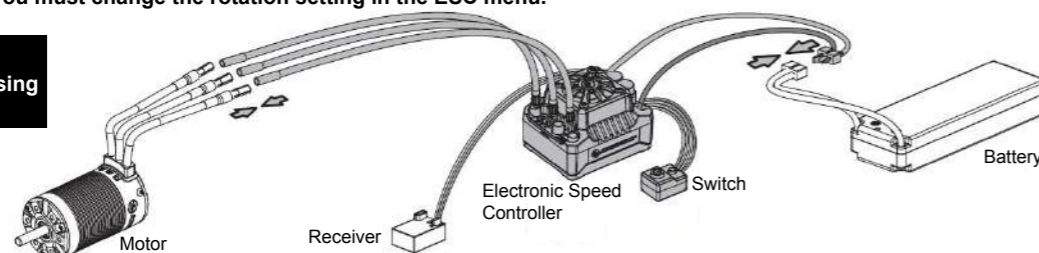
04 Beginning to use the HEX10 ESC

WARNING! This is an extremely powerful brushless motor system. For your safety and the safety of those around you, we strongly recommend removing the motor's pinion gear before performing calibration and programming functions with this system, and keeping wheels off the ground when turning on the ESC.

1. Connect the ESC, Motor, Receiver, Battery and Servo

If using a sensorless motor, the #A, #B, #C wires of the ESC can be connected with the motor wires in any sequence. If the sensorless motor runs in the opposite direction, just swap any two of the wire connections. **If using a sensored motor, DO NOT SWAP THE WIRE CONNECTIONS! They must be connected in the correct sequence (A-A, B-B, C-C). Failure to do so may permanently damage the ESC and sensored motor. If a sensored motor runs in the opposite direction you must change the rotation setting in the ESC menu.**

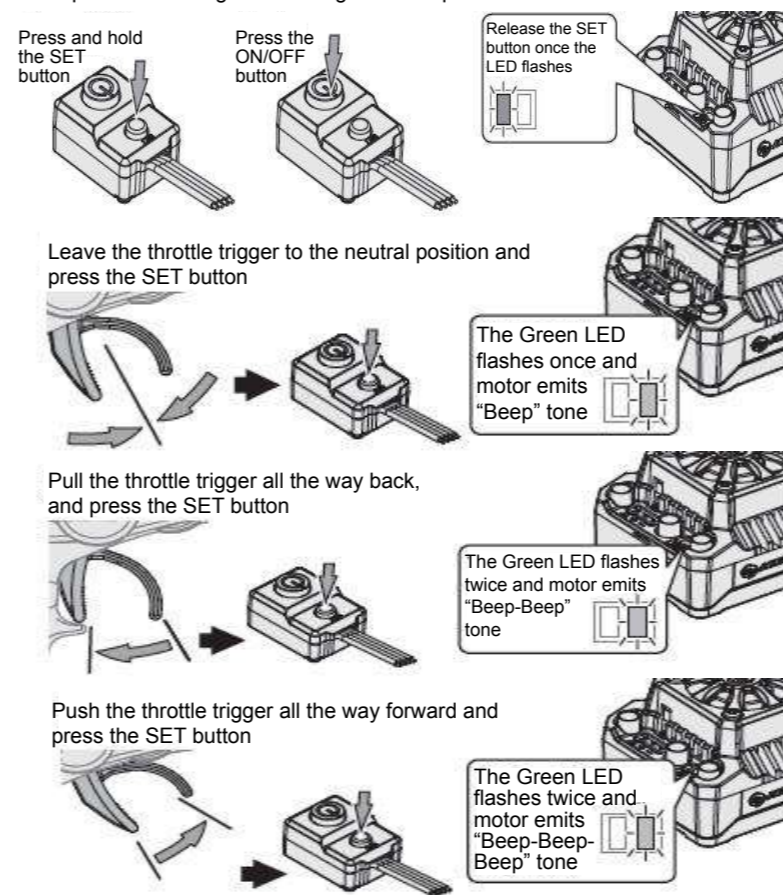
*** WARNING! Do not change the motor wire sequence when using a sensored motor! ***



2. Radio Calibration

In order to match up the radio's throttle range with the radio and ESC, you must calibrate the radio and ESC before using. Be sure to do this when using for the first time, or when changing radio settings such as throttle neutral position, ATV, EPA, etc. The following pictures show how to set the throttle range with a

Example of calibrating neutral range and endpoint.



- Turn on the transmitter and set the parameters for the throttle channel, such as "D/R", "EPA" and "ATL", to 100% and the throttle "TRIM" to "0". For Futaba™ style transmitters, throttle reversing should be set to "REV" while other radio systems may be set to "NOR". Please be sure to DISABLE the "ABS braking function" on the transmitter.
- Plug the battery into the ESC, but leave the power turned off. On the ESC, while pressing and holding the SET button, press and release the ON/OFF button to turn on the ESC. Release the SET button immediately when the motor begins to beep and the Red light on the ESC begins to blink. The ESC will continue to beep after the button is released, to show the ESC is now in calibration mode.
- Set the neutral point, full throttle endpoint, and full brake endpoint.
 - While leaving the throttle trigger in the neutral position, press and release the SET button one time. The Red LED will go out, the Green LED will flash one time, along with one motor beep. Now release the trigger.
 - While holding the trigger at the full throttle position, press and release the SET button one time. The Green LED will flash two times, along with two motor beeps. Now release the trigger. While holding the trigger at the full brake (or reverse) position, press and release the SET button one time. The Green LED will flash three times, along with three motor beeps. Now release the trigger.
- After waiting at least three seconds, the ESC should be calibrated and ready to use.

3. Check LED Status During Normal Running

- Red & Green LEDs go out when the throttle trigger is in throttle neutral zone.
- The Red LED lights up solid when the vehicle runs forward. The Green LED will also come on when pulling the throttle trigger to the full (100%) position.
- The Red LED lights up solid when applying brakes and the Green LED will also light up when moving the throttle trigger to full brakes, and the "brake amount/maximum brake force" setting is set to 100%.
- The Red LED lights up solid when the vehicle is in reverse.

5 Power On-OFF Warning

- Powering ON/OFF:** Be sure the radio is turned ON before turning on the ESC. (Start with the ESC turned off), press the ON/OFF button to turn on the ESC. **(Start with the ESC turned on), press and hold the ON/OFF button to turn off the ESC.**
- Warning Tones:** Turn on the ESC as normal (not holding the SET button), the motor will beep the number of Lipo cells you have plugged in. For example, 2 beeps indicate a 2S Lipo, 3 beeps indicate a 3S Lipo, 4 beeps indicate a 4S Lipo.

6 Programmable Items (The black background and white text" 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/Br	Fwd/Rev/Br							
2. LiPo Cells	Auto Calculation	2S	3S	4S					
3. Low Voltage Cutoff	Disabled	Auto (Low)	Auto (Intermediate)	Auto (High)					
4. ESC Thermal Protection	105°C /221°F	125°C /257°F							
5. Motor Thermal Protection	Disabled								
6. Motor Rotation	CCW	CW							
7. BEC Voltage	6.0V	7.4V							
8. Max Brake Force	12.50%	25.00%	37.50%	50.00%	62.50%	75.00%	87.50%	100.00%	Disabled
9. Max Reverse Force	25.00%	50.00%							
10. Start Mode (Punch)	Level 1	Level 2	Level 3	Level 4	Level 5				
11. Drag Brake	0%	2%	4%	6%	8%	10%	12%	14%	16%

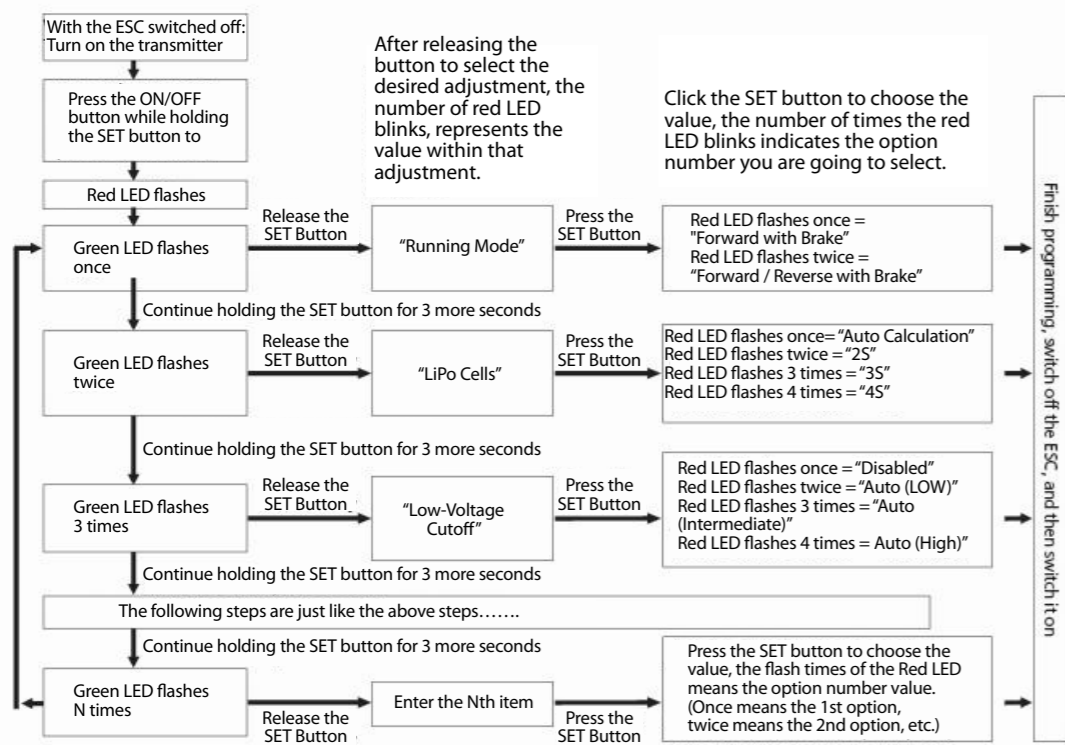
1. Running Mode:

Option 1: Fwd/Br (Forward with Brake) The vehicle can go forward and brake but cannot reverse in this mode. This mode is usually for racing.
Option 2: Fwd/Rev/Br (Forward / Reverse with Brake) This mode includes the reverse function. "Forward/Reverse with Brake" mode uses the "DOUBLE-CLICK" method. The vehicle only brakes (won't reverse) the 1st time the throttle trigger is pushed forward. If the motor stops when you release the throttle trigger and you quickly push it again (2nd push), the vehicle will go into reverse. If the motor does not stop (1st push), the vehicle will not go into reverse on the second push, it will continue to brake. You will need to push the throttle trigger one more time to enter into reverse. The vehicle only goes in reverse after the motor has stopped. This method is to prevent the vehicle from accidentally going into reverse.

- LiPo Cells:**
 We strongly recommend setting this parameter manually instead of using the default parameter "Auto Calc." (which means calculating the LiPo cells automatically). The ESC can identify 2S, 3S, 4S, LiPo packs when setting this parameter to "Auto Calc.". After the ESC is powered on, if the battery voltage is below 13.6V, it will be identified as a 3S. If the voltage is from 13.6V to 17.6V, it will be identified as a 4S.
Note 2: There is a possibility the ESC may mistake a low 3S LiPo for a fully charged 2S LiPo and set the cutoff for a 3S LiPo. It is always best to set the LiPo cell count manually to avoid the possibility of accidental misreading of cells. When using a NiMH pack, you need to set "LiPo Cells" to "Auto Calc." and "Cutoff Voltage" to "Disabled".
- Low Voltage Cut-Off:**
 This sets the voltage at which the ESC lowers or removes power to the motor in order to keep the LiPo battery at a safe minimum voltage. The ESC will constantly monitor the battery voltage and when the voltage drops below the cutoff threshold per cell, the ESC will immediately reduce the power to 50% and then to 0% ten seconds later. The red LED will flash a short, single flash that repeats to indicate the low-voltage cutoff protection is activated. If using a NiMH pack, set the "Cutoff Voltage" to "Disabled".
- ESC Thermal/Overheat Protection:**
 The ESC will automatically cut off power output and the green LED will flash a short, single flash that repeats (* * *) when the temperature exceeds the preset ESC thermal protection value that was selected in the menu. The output won't resume until the temperature drops to a safe level.
- Motor Thermal/Overheat Protection:**
 This item has been permanently "Disabled".
- Motor Rotation:**
 Pull the throttle trigger with the motor shaft facing you. The motor spins counter clockwise if this item is set to CCW; the motor spins clockwise if set to CW. The (A/B/C) wiring order of motors from different manufacturers may vary, so the direction of the motor rotation may be opposite to what you expect. You can adjust the "Motor Rotation" or swap any two (ESC-to-motor) wires if the motor runs in reverse.
- BEC Voltage:**
Option 1: 6.0V: Best setting for standard servos. Do not use this option with high voltage servos; otherwise your servos may not function normally due to insufficient voltage.
Option 2: 7.4V: Best setting for high voltage servos. Do not use this option with standard servos; otherwise your servos may burn out from high voltage.
- Brake Amount/ Max. Brake Force:**
 This ESC uses proportional braking; the position of the throttle trigger effects the amount of braking applied. This function sets the percentage value of available braking power that is applied with full brake. Large amounts will shorten the braking distance but may damage your pinion and spur gears. Set it to the least amount of braking you can successfully and safely drive with. The looser the driving surface, the less brake force you should use.
- Reverse Amount/ Max. Reverse Force:**
 This effects how fast the vehicle will drive in reverse. We recommend a lower value to protect the mechanical and electrical components of the vehicle.
- Start Mode / Punch:**
 This effects the initial starting force. You can choose from punch level 1 (very soft) to level 5 (very aggressive). Track condition, grip level, tire choice, and driving style may effect the amount of punch you choose. Soft punch is useful for preventing tires from slipping during initial acceleration. Aggressive (level 4 and level 5) punch has strict requirements on a battery's discharge capability (C-rating). This may affect initial vehicle movement if the battery discharges slowly and cannot quickly provide the required current. If the car stutters or suddenly loses power with acceleration, the battery's discharge capability is too low and you need to use a higher rated battery, or reduce the punch on the ESC. Using a smaller pinion gear on the motor may also help.
- Drag Brake:**
 Drag brake is the slight braking power produced when releasing the throttle trigger to neutral zone. This gently slows the vehicle down when you let off the trigger. Properly set drag brake makes the vehicle easier to corner during races. (Attention! Drag brake will consume lots of power, so use it cautiously.)

7 ESC Programming

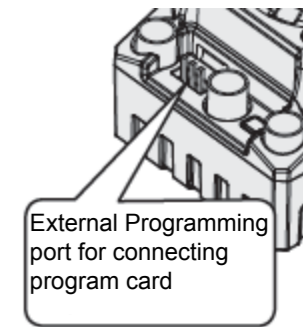
1) Programming your ESC with the SET button



NOTE 2: In the program process, the motor will emit a "Beep" tone when the LED is flashing. The Hex10 uses a long flash and a long "Beep---" tone to represent number "5", to help identify the larger menu items. A long flash (Motor sounds "B---") = the No.5 item. A long flash + a short flash (Motor sounds "B--- B") = the No.6 item. A long flash + 2 short flashes (Motor sounds "B--- B B") = the No.7 item. A long flash + 3 short flashes (Motor sounds "B--- B B B") = the No.8 item. A long flash + 4 short flashes (Motor sounds "B--- B B B B") = the No.9 item.

2. Programming the ESC with the LED program box:

The portable program card is an optional accessory applicable for field use. It's friendly interface makes the ESC programming quick and easy. Before programming, connect the ESC to the program card with a cable that uses a JR male connector on each end, and then turn on the ESC; all programmable items will show up a few seconds later. You can select the item you want to program and the setting you want to choose via "ITEM" and "VALUE" buttons on the program card. Then press the "OK" button to save all new settings to your ESC.



The programming port of this ESC is also the fan port, so you need to unplug the fan first and then plug one end of the programming cable into the PRG/FAN port. The other end of the programming cable plugs into the ESC port on the LED program box. Do NOT use the throttle control cable (also called Rx cable) on the ESC to connect to the program card/box. This may cause damage and the program card/box won't function.



08 Factory Reset

- 1. Restore the default values with the SET button:**
 Press and hold the SET button for over 3 seconds anytime when the throttle trigger is at the neutral position (except during the ESC calibration and programming). This will factory reset your ESC. Red & Green LEDs will flash simultaneously, indicating you have successfully restored all default values within your ESC. Once you power the ESC off, and then back on, your settings will be back in the default mode.
- 2) Restore the default values with the LED program card:**
 After connecting the program card to the ESC, press the "RESET" button and the "OK" button on the program card to factory reset your ESC

9 Troubleshooting

Trouble	Possible Reason	Solution
After powering on the ESC, neither the motor nor fan work.	No power is supplied to the ESC.	Check if all ESC & battery connectors have been well soldered and firmly connected.
	The ESC switch is damaged	Call customer service.
After the ESC is powered on, motor doesn't work, but emits "beep-beep-, beep-beep-" alert tone. (Every "beep-beep-" has a time interval of 1 second)	Input voltage is abnormal, too high or too low	Check the voltage of the battery pack
After the ESC is powered on and finished LiPo cell detection, the Green LED flashed N times, and the Red LED flashed rapidly.	The ESC didn't detect any throttle signal.	Check if the ESC throttle wire is correctly plugged into receiver CH.2 and the transmitter is turned on
	The neutral throttle value stored on your ESC is different from the value stored on the transmitter	Re-calibrate the throttle range after you return the throttle trigger to the neutral position.
The motor runs in the opposite direction when it is accelerated.	The (ESC-to-motor) wiring order was incorrect.	Swap any two wire connections between the ESC and the motor.
	Motor direction set wrong in the ESC (CW/CCW)	Set the motor direction correctly (CW/CCW)
The motor suddenly stops running while in working state.	The throttle signal is lost	Check the transmitter and the receiver Check the signal wire from the throttle channel of your receiver
	The ESC has entered the Low Voltage Protection Mode or Over-heat Protection Mode	Red LED flashing means Low Voltage. Green LED flashing means Over-heat
The motor stuttered but couldn't start.	Bad connection between the motor and the ESC.	Check all soldered connections, please re-solder if necessary.
	The ESC was damaged (some MOSFETs are burnt).	Contact the distributor for repair or other customer services.
The vehicle still has forward function, but no reverse.	The throttle trim position on your transmitter is not centered.	Re-calibrate the throttle neutral position. No LED on the ESC will come on when the throttle trigger is at the neutral position.
	The "Running Mode" is set improperly.	Set the "running mode" to "Forward/Reverse with Brake".
	The ESC is damaged.	Contact the distributor for repair or other customer services.
The car ran forward / backward slowly when the throttle trigger was at the neutral position.	The neutral position on the transmitter is not stable, so signals are not stable either.	Replace your transmitter
	The ESC calibration is incorrect.	Re-calibrate the throttle range or fine tune the neutral position on the transmitter.
The LED program card keeps displaying 3 short lines (- - -) after being connected to the ESC.	It is wrong to use the Rx cable to connect the programming card/box. The programming port of this ESC is also the fan port, so please connect the ESC and programming card/box by plugging the programming cable into the fan port.	
	The programming card/box was connected to the ESC via the throttle control cable (Rx cable).	
When pressing the SET button to set the throttle neutral position, the Green LED didn't flash and no beep was emitted, or you were unable to set the full throttle endpoint or the full brake endpoint after the neutral position was accepted.	The ESC throttle cable isn't plugged into the correct channel on the receiver.	Plug the throttle cable into the throttle (TH) channel on your receiver (CH.2).
	The ESC throttle cable is plugged in backwards.	Plug in the throttle cable properly by referring to relevant mark shown on your receiver.

