Hornet Series ESC User Manual

Thank you for purchasing HTIRC Innovative Dragonfly Brushless Electronic Speed Controller (ESC). This is a new generation of sensorless speed controllers, with the latest software design, especially for ALL types of brushless motors.

Please read and pay careful attention to the following instructions before you start to work with your motor and controller

Warnings!

- Always connect the motor battery pack just before flight and disconnect it immediately after landing.
- Once the motor battery pack is connected, handle the model with extreme care!
- Ensure that you are well clear of the propeller at all times.
- Rotating propellers are extremely dangerous!
- Even when the receiver (BEC) switch is “OFF”, please remember the motor battery pack may still be connected. Handle the model with extreme care and stay clear of the propeller!
- Do not use battery packs that exceed the recommended cell count.
- Do not exceed the BEC’s output current
- Do not use leaking, damaged, cracked or puffed batteries.
- A over-heat protection function built-in the ESC. when the temperature reaches 212°F/100°C during the operation of ESC, the speed of the motor will immediately reduce; It will automatic recover when the temperature under 212°F/100°C.
- Only use NiCd, NiMH or Li-Poly battery packs. Other power sources may cause damage to the controller
- Do Not connect the motor battery to the wrong polarity, the controller will be seriously damaged.

Specifications:

P/N	Cont./Burst Current	Peak Current	BEC Type	BEC Output		Battery Cell		Size(mm)	Weight
				Voltage	Current	Li-xx	Ni-xx	L*W*H	g
HTI-H06-221201	6A/8A	22A	BEC	5.0V	0.5A	2-4LiPo	5-12NC	22*12*6.5	5g
HTI-H10-221201	10A/13A	22A	BEC	5.0V	0.5A	2-4LiPo	5-12NC	22*12*6.5	5g
HTI-H12-241701	12A/15A	60A	BEC	5.0V	1.0A	2-4LiPo	5-12NC	24*17.5*6.5	11g
HTI-H20-302401	20A/25A	70A	BEC	5.0V	3.0A	2-4LiPo	5-12NC	30*24*8.5	21g
HTI-H30-302401	30A/40A	80A	BEC	5.0V	3.0A	2-4LiPo	5-12NC	30*24*8.5	21g
HTI-H40-522501	40A/50A	100A	SBEC	5.0V	4.0A	2-6LiPo	5-18NC	52*25*11	43g
HTI-H50-522501	50A/60A	120A	SBEC	5.0V	4.0A	2-6LiPo	5-18NC	52*25*11	43g
HTI-H60-522501	60A/80A	160A	SBEC	5.0V	4.0A	2-6LiPo	5-18NC	52*25*14	43g
HTI-H70-603001	70A/90A	180A	SBEC	5.0/6.0/7.4	6.0A	2-6LiPo	5-18NC	60*30*14	50g
HTI-H80-603001	80A/100A	200A	SBEC	5.0/6.0/7.4	6.0A	2-6LiPo	5-18NC	60*30*14	50g

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Wires Connection:

The speed controller can be connected to the motor by soldering directly or with high quality connectors. Always use new connectors, which should be soldered carefully to the cables and insulated with heat shrink tube. The maximum length of the battery pack wires shall not exceed 6 inches.

- Solder controller to the motor wires.
- Solder appropriate connectors to the battery wires.
- Insulate all solder connectors with heat shrink tube.
- Plug the “JR” connector into the receiver throttle channel.
- Controller Red and Black wires connect to battery pack Red and Black wires respectively.

Installing the Controller:

Install the controller in the model so that it is free from vibration and shock, using Velcro or double sided foam tape. **IMPORTANT**, make sure there is sufficient cooling for the motor and controller by ducting air through cooling holes from outside airflow. Failure to do it, will cause damage to the motor or controller.

Normal start up:

Switch on transmitter and check throttle settings are +/-100% (for computer radio).
For Futaba Radio programs the “Servo Reverse” function on the throttle channel.
Pull throttle stick in down or brake position;

- Transmitter switches “ON”
- connect battery pack to the controller
- Connect the receiver
- If you hear one tone, Brake ON; If you hear two tones, Brake OFF.
- The position of full throttle will be calibrated automatically.
- Your motor now is ready to run.

Factory default settings:

Brake: OFF
Battery type: Li-Poly Auto
Low voltage cutoff type: reduce power
Soft start : Enable
Timing : Auto
Frequency : 16KHz
Heli mode: OFF

How to program your controller:

- Switch on transmitter and push the throttle stick to full throttle.
- Connect the motor battery pack and turn on the receiver (BEC) switch.
- Wait for 2 seconds, you’ll hear two tones; programming mode is entered; for 5 seconds, programming setup can be started.
- When you hear the desired tones, pull the throttle down, then you’ll hear two confirmation tones. The setting is now memorized.
- You can only change one setting at a time, if you need to change more settings, disconnect the motor battery pack and wait 5 seconds, and repeat above procedure for next setting.
- You can exit the programming mode at any time if you disconnect the battery connector from ESC.

1. Brake setting ON or OFF

Follow above procedure then enter the programming mode. If you pull the throttle stick to off , Brake will be
changed. (ON · OFF, or OFF · ON)
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2. Battery type

(select battery type which is being used in your model)
NiCad: (50% initial voltage)
* * * *
Lipo: Auto detect , 3.2V/Cell
* * * * * * * *

3. Rotation reverse

This function is to change the motor rotation direction.
(for example: Right to Left, or vice versa)
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4. Soft start (Acceleration)

When gearbox drive system is used. It's highly recommended to enable the soft start.
It will protect the gearbox not to damage especially propeller of large diameter is used.
Disable the soft start function when direct-drive system is used or being in speed competition
*Enable:
_- _- _- _-
*Disable:
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5. Under voltage (low voltage cut-off LVC)

If the motor battery pack drops to the programmed cut-off voltage, the controller will either ignore, reduce the
motor speed or stop the motor to ensure that there is enough power for the receiver and servos. Either one is active,
you can resume to normal operation by pull down the throttle stick and push up again, but remember that it's time
to land you model!
***reduce power:**
(reduce motor speed)
-_ -_ -_ -_
cut off:
(stop motor immediately)
_- _- _- _-

6. Timing (advance timing)

The controller has three timing modes; Automatic works perfect for **ALL** types of brushless motor. But for some
brands or homemade brushless motors, you have to set the right timing for optimal efficiency and power; 7 degree
for multi-pole motors, 30 degree for out runner motors.
Automatic: (7~30 degree)
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Soft: (7 degree)
- - - - - - - -
Hard: (22 ~ 30 degree)
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7. Switching Frequency

The controller has two switching frequency modes. 8KHz is good for ALL types of two-pole motors. 16KHz is
good for multi-pole motors.
8 kHz:
/ / / /
16 kHz
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8. Active RPM Control (Heli Governor mode)

Off :

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RPM control on :

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9. Restore Factory Default Setting

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Caution!
Warning! Model aircraft equipped with high power motor can kill. High power motor systems can be very dangerous! High currents can heat wires and batteries, causing fires and burning skin or anything. Follow the wiring connection carefully! Always fly at the approved field. Never fly over or near spectators. Even though this controller is equipped with a safety arming program, you should still be cautious when connecting the main battery.