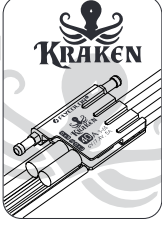# FLYCOLOR®

⚠ Thank you for using our product. Any improper operation may cause personal injury or damage the product and relevant equipments. This high power system for RC model can be dangerous ,we strongly recommend reading the user manual carefully and completely. We will not assume any responsibility for any losses caused by unauthorized modifications to our product. We have the right to change the design, appearance, performance and usage requirements of the product without notice.

KRAKEN

01 Main features

- STM32F051 MCU with 32-bit cortex core and working frequency of 48mhz;
- Small in size and light in weight, especially suitable for race class boat;
- Support brushless motor up to 240k erpm ;
- The starting mode can be set, throttle response fast, and the speed regulation linearity is very stable. which is suitable for various RC boat.
- Multiple protection make the equipments safety. Beeping alarm can indicate working condition.
- Low voltage protection threshold can be set to meet personalized needs;
- Good safety performance when power on, when power on, the motor will not be started immediately regardless of the throttle position of the remote controller.
- Cycle programming menu for easy operation. Compatible with all kinds of remote controls.
- Built in 6V/7.4V,5A adjustable switch BEC.
- Nanometer waterproof coating, anti splash water .
- Water cooled aluminum heat sink can effectively slow down the temperature rise.
- Support programming via mobile phone APP (extra Flycolor Wi-Fi Trans needed).
- Support close-range detection and recording of real-time data via mobile phone APP, such as current, voltage, RPM, temperature ...(extra Flycolor Wi-Fi Trans needed).
- Support speed up function, suitable for sudden increase of motor rotation speed in the final sprint to get faster running speed.
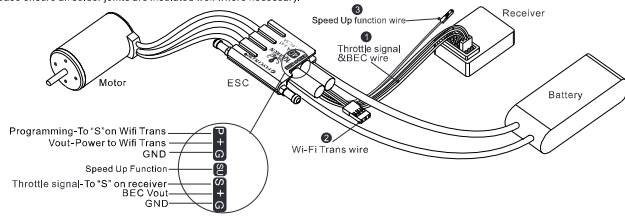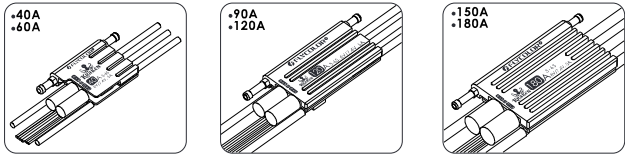
02 Specifications

Model	Con. Current (Good heat dissipation)	Burst Current (Good heat dissipation)	BEC	LiPo	Weight (For reference)	Size (For reference)
Kraken 40A (Wifi)	40A	60A	6V/7.4V, 5A	3-6S	42g	66x35x9.5mm
Kraken 60A (Wifi)	60A	80A	6V/7.4V, 5A	3-6S	46g	70x35x9.5mm
Kraken 90A (Wifi)	90A	110A	6V/7.4V, 5A	3-6S	82.5g	95.5x37.5x13mm
Kraken 120A (Wifi)	120A	140A	6V/7.4V, 5A	3-6S	90g	98x37.5x13mm
Kraken 150A (Wifi)	150A	170A	6V/7.4V, 5A	3-6S	135g	110x49x15mm
Kraken 180A (Wifi)	180A	200A	6V/7.4V, 5A	3-6S	135g	110x49x15mm

03 Wiring Diagram

*Please ensure all solder joints are insulated well where necessary.

- Programming-To "S"on Wifi Trans
- Vout-Power to Wifi Trans
- GND
- Speed Up Function
- Throttle signal-To "S" on receiver
- BEC Vout
- GND

❶ **Throttle signal wire:** Plug it into the throttle channel on the receiver, the white wire is for transmitting throttle signal, the red&black wires are the BEC output wire and ground wire.
❷ **Wi-Fi Trans wire:** Connect with Flycolor Wi-Fi Trans, supports programming and detection of real-time data at close range via mobile phone APP.
❸ **Speed Up Function wire:** Plug it into an two-stage switch channel on the receiver, during the running, the speed is increased by triggering the switch.

- ●40A ●60A
- ●90A ●120A
- ●150A ●180A

*There are differences in the appearance of the products, the pictures are the representative models for reference only.

04 Protections

Power on safety protection	If the throttle is not in the neutral position after power on, the motor will emit alarm. The motor can not be started until the neutral position throttle is detected.
Low voltage protection	If the voltage is lower than the set low-voltage protection threshold, ESC will automatically reduce the output power for protection. After running for several seconds, the motor will stops, it can restart when the throttle returned to neutral position. The above operation can be repeated.
Start-up protection	ESC will cut off output if it fails to start the motor within 3 seconds by accelerating throttle, you need to move the throttle back to the neutral position and restart the motor,(The possible causes : Bad connection or disconnection between ESC & motor , propellers are blocked, etc)
Over heat protection	When ESC temperature is higher than 100 ℃,it will reduce output power (throttle will be limited below 40%) for protection, make the motor has enough power for return , when the temperature drops to 80℃ , ESC will return to normal working.
Throttle signal loss protection	ESC detects the loss of throttle signal for over 1 seconds during motor running, it will cut off output immediately to avoid an even greater loss caused by the continuous high speed rotation of motor, ESC will return the corresponding output after the signal is restored.

Alarm tone: (To judge the abnormal cases via alarm tone)
1. Alarm of throttle signal is not detected:
ESC detects no signal when power on, motor will emit the alarm tone "B-, B-, B-"(emits every 2 seconds).
2. Alarm of throttle not in the neutral position:
Throttle not in the neutral position, motor will emit "B-B-B-B-" (urgent short tone).
3. Alarm of voltage out of range:
The ESC detects that the battery voltage is higher than rated voltage when power on , motor will emit"B-B-, B-B-, B-B-"(emits every 1.5 seconds).
4. Alarm of narrower throttle range:
when throttle range is set too narrow, motor emits "B-B-B-" (urgent short tone, stop after 2 seconds). You must set throttle range again.

05 Operation instruction

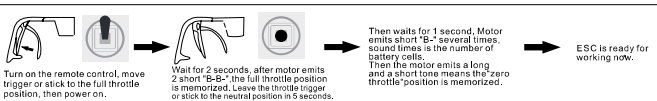⚠ • It is suggested that users should do extra waterproof to get better waterproof effect. If there is water on ESC after use, please dry the water before use ,in order to avoid damaging the product).
• There is different with remote controls , some receivers analyze signals when the remote control is not turned on. To avoid injury, please turn on the remote control first and then power on the ESC at any time.
• It is recommend to calibrate throttle range for the first time, to get the most stable throttle linearity for different remote controls ,and let the ESC acquire and memorize the throttle output signal of the remote control. This operation only needs to be carried out once, and needs to be repeated when replacing the remote control.
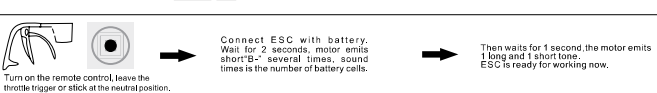• Before normal start-up, according to the actual number of battery cells used, it is recommended that the user should select the fixed number of battery cells via programming. In combination with the low voltage protection, it can effectively prevent the battery from over discharge.

❶ Throttle Range calibration

Note: the following are the diagrams of pistol or stick remote control with neutral position (zero point), which are recommended for Unidirectional and Bidirectional running modes; in addition, stick remote control without neutral position can be selected for unidirectional operation.
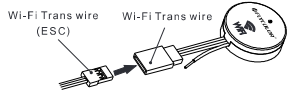

Turn on the remote control, move trigger or stick to the full throttle position, then power on. → Wait for 2 seconds, after motor emits 2 short "B-B-",the full throttle position is memorized. Leave the throttle trigger or stick to the neutral position in 5 seconds. → Then waits for 1 second, Motor emits short "B-" several times, sound times is the number of battery cells. Then the motor emits a long and a short tone means the "zero throttle"position is memorized. → ESC is ready for working now.

❷ Normal start-up

Turn on the remote control, leave the throttle trigger or stick at the neutral position. → Connect ESC with battery. → Wait for 2 seconds, motor emits short"B-" several times, sound times is the number of battery cells. → Then waits for 1 second,the motor emits 1 long and 1 short tone. ESC is ready for working now.

❸ Programming

Option 1: Via Wi-Fi Trans(recommended)

- Please refer to the user manual of Flycolor Wi-Fi Trans;
- Wi-Fi Trans needs to be purchased separately.
- Download and install the flycolor configurator App.

Wi-Fi Trans wire (ESC)   Wi-Fi Trans wire

Option 2: Via Remote Control

ESC parameters can be programmed by remote control.

Turn on the remote control, move trigger or stick to the full throttle position, then power on. → Wait for 2 seconds,motor emits 2 short "B-B-". Then still wait for 5 seconds. motor emits special tone"♪12321", it has entered programming mode.

When motor emits "Exit" tone, move throttle to neutral position (zero point) in 3 seconds, then motor emits special tone "♪765765", it will exit the programming mode.

Select Items
After entering programming mode, you will hear groups tone which emits in a loop as following sequence .

		♪12321
1	Running Mode	1short	Beep-
2	Motor running direction	2short	Beep-Beep-
3	Low Voltage Threshold	3short	Beep-Beep-Beep-
4	Start Acceleration	4short	Beep-Beep-Beep-Beep-
5	Motor Timing	1long	Beeeep--
6	BEC Voltage	1long&1short	Beeeep--Beep-
7	LiPo Cells	1long&2short	Beeeep--Beep-Beep-
8	Restore factory default	1long&3short	Beeeep--Beep-Beep-Beep-
9	Exit	1long&4short	Beeeep--Beep-Beep-Beep-Beep-

Note:
Usually,1 long tone "Beeeep--" equals to 5 short tone"beep-", for example:1 long tone"Beeep--" and 1 short tone "beep-" equals to 6.

Item parameter

After motor emits a Item tone ,move the trigger or stick to the neutral position, then will enters this item, and motor will emits the parameter tone in a loop . Please see the table below)

Move the trigger or stick to the full throttle position after a certain tone that the parameter you want, the parameter is selected, then motor emits special tone"♪1212", this parameter will be stored. Just wait If you still want select other item, it will go back to the Level 1 menu to select item, the operate method is the same.

If don't want select other parameter, move the trigger or stick to the neutral position in 3 seconds, then motor emits special tone "♪765765", it will exit the programming mode. Or power off, it will exit the programming mode.

Prompt tone / Item	1 1short	2 2short	3 3short	4 4short	5 1long	6 1long&1short	7 1long&2short	8 1long&3short
1.Running Mode	Unidirectional	Bidirectional						
2.Motor Running Direction	Normal	Reverse						
3.Low Voltage Threshold	No	2.6V	2.8V	3.0V	3.2V	3.4V		
4.Start Acceleration	Level 1	Level 2	Level 3	Level 4	Level 5			
5.Motor Timing	0°	3.75°	7.5°	11.25°	15°	18.75°	22.5°	26.25°
6.BEC Voltage	6V	7.4V						
7.LiPo Cells	Auto	2S*	3S	4S	5S	6S		

Shadow parts are factory default value.
*In some specific cases, the ESC can work under 2S . For 2S, when the battery voltage is lower than 6V, the ESC will not work or the BEC output will be below the nominal value.

Parameter description

1. Running Mode:
[1]Unidirectional(default): It can only move forward, no effect when move the trigger or stick from forward to reverse.
[2]Bidirectional: When move the trigger or stick from forward to reverse, the motor will immediately reverse after it stops running. (The maximum throttle of forward and reverse is equal)
2.Motor Running Direction:
[1]Normal(default): Default motor rotation direction;
[2]Reversed: Change the direction of rotation of the motor.
3. Low Voltage Threshold:
[1]No [2]2.6V [3]2.8V [4]3.0V(default) [5]3.2V [6]3.4V
In order to keep the battery at a safe minimum voltage (for LiPo batteries). The ESC monitors the battery voltage all the time, when the voltage goes below the threshold,ESC will be protected immediately. Please set to "Disabled" if you're using NiMH batteries.
4. Start Acceleration:
[1]Level 1 [2]Level 2 [3]Level 3(default) [4]Level 4 [5]Level 5
It can be adjustable from 1 to 5,set a high value to have a quick start-up response, but requires high discharge capacity of the battery.
5. Motor Timing:
[1]0° [2]3.75° [3]7.5° [4]11.25° [5]15°(default) [6]18.75° [7]22.5° [8]26.25°
As usual, 15° applies to all the outer rotor motors , but for improving efficiency ,recommend that set low timing for 2 poles motor(most inner rotor motors), set high timing for 6 poles and high poles motors(most outer rotor motors). If need high speed motor, you can set high timing. Some motors should set special timing, if not sure, you'd better to set timing as motor manufacturer recommended ,or set 15°.
Note: After changing timing, please test on the ground before running.
6.BEC Voltage:
[1]6.0V(default) [2]7.4V
BEC can be selected according to the actual demand.
7.liPo Cells: (Available for LiPo battery only)
[1] Auto(default) [2]2S [3]3S [4]4S [5]5S [6]6S .
Auto:The number of battery cells will be automatically determined according to the current voltage every time the ESC is restarted or powered on; if "Auto" is selected, please always pay attention to the battery voltage to avoid battery over discharge.
2-6s (recommended): Users are advised to select a fixed value according to the actual number of batteries used. With the low voltage protection , the battery can be effectively prevented from over discharge.
8.Restore factory default:
When the beeping indicates the "Restore default settings", move the throttle trigger or stick to neutral position in 3 seconds. There is no sub-menu under this mode,then motor emits special tone "♪765765" which means default settings are restored.
9.Exit:
When the beeping indicates the "Exit" mode, move the trigger or stick to the neutral position in 3 seconds, then motor emits special tone "♪765765", it will exit the programming mode

❹ Speed Up Function

Speed Up Function is suitable for sudden increase of motor rotation speed in the final sprint to get faster running speed.
Plug the speed up function wire into an two-stage switch channel on the receiver, during the running, the speed is increased by triggering the switch.
Speed up function effective conditions:
1) It is required that the maximum value of channel shall be greater than 1500us.
2) The setting value of motor timing should be less than 26.25 ° in order to be effective; if the motor timing is set to 26.25 ° then the speed up function is invalid.

06 Trouble Shooting

Troubles	Possible causes	Solutions
After power on, the motor doesn't work and doesn't emit any sound.	Bad connection between ESC and battery.	Clean the connectors or replace them, check and confirm that the polarity is correct..
	Bad soldering cause bad contact.	Solder the wires again.
	Low voltage of the battery.	Check battery voltage, use full-charged battery.
	Water got in, damage or other quality problems with ESC.	Clean up and dry the water of ESC ,try again ; Replace ESC .
After power on, ESC emits the sound of battery cells, but motor doesn't work.	ESC doesn't calibrate throttle range.	Calibrate throttle range again.
After power on, ESC works ,but the motor doesn't work and doesn't emit any sound.	Bad connection between ESC and motor, or bad soldering.	Check the connectors or replace the connectors or solder the motor wire again.
	Bad motor.	Change motor.
After power on , the motor doesn't run and emits warning tone"B-B- ,B-B-,B-B-".(emits every 1.5 seconds)	Battery voltage out of range	Check the battery voltage is within the range of ESC.
After powering up, motor doesn't work and emits warning tone"B-,B-,B-"(emits every 2 seconds).	No throttle signal from receiver	1.Check if right connection between signal wire and receiver throttle channel. 2.Check remote control and receiver, make sure there are signal outputs.
After power on, the motor doesn't work and emits continuous warning tone"B-B-B-B-B-" (urgent short tone).	Throttle trigger or stick doesn't in the neutral position (zero position).	Move the throttle trigger or stick to the neutral position, or Calibrate throttle range again.
After power on, the motor doesn't work. Motor emits 2 long "B-" and 2 short "B-".	The positive and negative of throttle channel is wrong. So ESC enters programming mode.	Refer to the user instruction of transmitter, adjust the setting of throttle channel.
Motor rotates in the opposite direction.	The wrong sequence of connection wires between motor and ESC.	1.Exchange random 2 of the 3 connection wires between ESC and motor. 2.Change motor rotation direction via mobile phone App or Remote control.
Motor stops during running	Battery voltage is lower than low-voltage protection threshold.	1. Drive back in time, check the battery voltage and charge the battery. 2. Pay attention to the voltage of the remote control within the controllable range ,it needs to drive back in time if motor stops.
	Loss throttle signal	1.Check if the remote control operate correctly. 2.Check if remote control match with the receiver. 3.Check if the signal wire is loose or falling off. 4.Strong electromagnetic interference around the environment, try to turn off and power up again, to see if it recovers normal work, if the problem come up again and again, please change to another field.
	Bad connection between wires	Check the connectors of battery pack, battery wires and motor wires connections are good.