烈式 ONISIKI

ESC MANUAL

PLEASE READ CAREFULLY BEFORE USING THE MANUAL

Thanks for purchasing our Electronic Speed Controller (ESC). High powered systems for RC models can be very dangerous, so please read this manual carefully. Given that we have no control over the correct use, installation, application, or maintenance of our products, no liability shall be assumed nor accepted for any damages, losses or costs resulting from the use of the product. Any claims arising from the operating, failure or malfunctioning etc. will be denied. We assume no liability for personal injury and/or consequential damages resulting from our product or our workmanship. As far as is legally permitted, the obligation to compensation is limited to the invoice amount of the affected product.

PRODUCT FEATURES

— Exclusive for top competitions: Built-in 10 common modes, suitable for all competitions, off-the-shelf. (Such as: zero timing/Zero Timing mode, general practice mode, competition mode, off-road vehicle/short truck competition mode, climbing car mode, drift car mode, etc.). The setting parameters of the ESC can be imported and exported, which is convenient for the drivers to communicate with each other and learn from each other's settings.
— Electronic key switches is long life, high reliability, simpler wiring, and saves frame space.
— It has world-leading technologies such as dynamic Turbo Timing and Boost timing, and the settable timing specifications are very detail, adapting to the different demands of different drivers.
— The top cover is aluminum metal, which has excellent heat dissipation performance, strong current resistance, and a variety of cover color for choose.
— Powerful throttle and brake adjustment functions: Drag brake force adjustment in 0% increments, 8-stage brake force adjustment.
STOCK VERSION: 64-stage booster timing adjustment.
MODEL VERSION: 16-stage booster timing adjustment.
— Multiple protection functions: Low voltage protection, motor and ESC overheat protection, and throttle out of control protection.
— It supports two programming methods: LCD parameter programming box

FAULT HANDLES

FAULT PHENOMENON	REASON MAY CAUSED	SOLUTION
The indicator light does not light up, the motor can't start, and the fan does not run	1, The ESC has no input voltage 2. The ESC switch is damaged	Check the power input path if in good welding conditions, and re-soldering
Red LED light when motor connect to the power, the motor can't be started	The throttle cable of the ESC is plugged in the wrong way or the channel is plugged in the wrong way	Plug the throttle cable into the "Throttle" channel (usually CH2) of the receiver in the correct direction.
The remote control increases the throttle in the forward direction, but the car reverses.	1.The ESC output cable and the motor cable connection is wrong 2.The motor steering of the frame is inconsistent with that of the mainstream frame	1, If it is a sensorless motor, just interchange any two of the three wires in the motor. 2, If it is a sensored motor, it can't be reversed by changing the wire sequence, and the default program of the ESC can't be adapted to this special frame.
Suddenly stop when motor running	1. The receiver is interference with other signal 2. The ESC enters the battery low voltage protection or temperature protection	The red LED flashes continuously for voltage protection, please replace the battery. The green LED flashes continuously for overheating protection, please wait for the ESC cool down and continue using it.
The motor is stuck or stopped when it is started and the throttle is increased quickly	1. Insufficient battery discharge capacity 2. The motor speed is too high and the reduction ratio is too small. 3. The setting of ESC start acceleration is too high	1. Replace the battery with strong discharge capacity. 2. Replace with a low-speed motor, or use a softer reduction ratio. 3. Set the ESC start acceleration (Punch) to be softer.
The red & green LED flash rapidly at the same time when throttle at neutral position	When sensored motor is connected, the ESC detects an error in the hall sensor signal and has automatically switched to the sensorless mode	1. Check whether the induction wire is loose or has poor contact. 2. The Hall sensor inside the motor is damaged.
Motor shake and can't be started	1. The wiring between the ESC and the motor is wrong. 2. ESC failure	1. Check whether the wiring is correct, make sure it is A-A, B-B, C-C. 2. Contact the agent to deal with maintenance matters.

ITEMS NOTE

1. Running Mode: " Forward Only with Brake " Mode, The car will only go forward and have brakes, but reverse is disabled.This mode is suitable for competition purposes. " Forward / Reverse with Brake "Mode – This provides a reverse function, which is suitable for practice. The reverse function is engaged by a Double click method. On the first application of backwards throttle, brakes are applied. On returning to the neutral point, and then applying the backwards throttle for a second time, the reverse function will be engaged. However, if at this time the motor is still moving forward (i.e in a double braking action from high speed), the ESC will not go into reverse. The motor must be at 0 rpm to engage reverse. This is a protection function for the drivetrain of the vehicle. "Forward / Reverse" Mode– When moving from the forward zone to the backward zone , the ESC will engage reverse immediately. This mode is intended for rock crawling applications, where instant control is required.

2. Drag Brake Strength: Drag brake refers to the generation of a small amount of braking force on the motor when the throttle stick is turned from the forward area to the neutral area. This can simulate the resistance of the brushed motor's carbon brush to the motor rotor, suitable for slowing down into corners, etc. occasion. (It is worth noting that the drag brake will consume more power, just choose the appropriate drag brake strength).

3. Low Voltage Cut-Off: This setting defines the low voltage cutoff for use with LiPo batteries, preventing over discharging.The ESC will always monitor the battery voltage. Once the voltage is lower than the set threshold, the power output will gradually drop to 30% of the normal power within 3 seconds. At this time, the driver should pull over and withdraw from the race immediately to avoid obstructing other vehicles or other vehicles on the track. After being hit by an express car behind, the power will be completely shut off after 10 seconds. When entering the voltage protection, the red LED will flash like " ☆ - ☆ - , ☆ - ☆ - , ☆ - ☆ - ". You can use 2 in 1 professional programming box (optional) to apply all types of batteries (Ni-MH, Li-Po, Li-Fe, ...). It is recommended to set this parameter value at 3.4V/Cell when using stock-level motors.

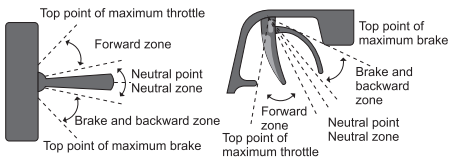
4. Start Mode / Punch: According to personal habits, grounds, tire grip characteristics and other conditions, you can choose from 9 starting accelerations from level 1 ("very soft") to level 9 ("very aggressive").This function can prevent the tire from slipping when starting, and can achieve the effect of ejecting and chasing the car during the competition. In addition, when using the "Level 7" - "Level 9" mode, the discharge capacity of the battery is required. If the battery discharge capacity is poor and cannot provide instantaneous high current, it will affect the startup effect. A pause or instantaneous loss of power during startup, it may be caused by insufficient battery discharge capacity. At this time, it is necessary to reduce the startup acceleration or increase the gear reduction ratio.

5. Brake Force: The ESC provides a proportional braking function. The braking force is related to the position of the throttle stick.The maximum braking force refers to the braking force generated when the throttle stick is in the braking limit position. Please select the appropriate maximum braking force parameters according to the specific conditions of the vehicle and personal usage habits.

6. Reverse Force: Choosing different parameter values can produce different reversing speeds (in general , it is recommended to use a lower reversing speed to avoid running out of control due to reversing too fast).

7. Initial Brake Force: Also called the minimum braking force, it refers to the braking force acting on the motor at the initial position of the brake Under its action, it can achieve an effect similar to a point brake. The default value is equal to the drag brake effect. Drag brake force to form a soft brake effect.

8. Neutral Range: The throttle neutral point area is as shown in the figure on the right, please adjust it according to your personal habits.



9. Boost Timing: This timing is effective in the entire throttle range and directly affects the speed of curved roads and straight roads. (When this value is set, the actual timing of the ESC during operation changes dynamically according to the speed, not a fixed constant.

WARNING

If the customer loads the software with the suffix of stock (A special program used only for stock competitions), and uses a general sensored motor, please set the Boost Timing to 0 degrees to avoid burning the motor. Manually adjustment degree of Boost Timing can be turned on by the 0-degree timing motor which is matched with the stock program.

Turbo Slope Rate: Turbo Timing Rate refers to the degree of Turbo Timing that is turned on every 0.1 second. The larger the value is, the higher the Turbo Timing growth rate will be, and the faster the acceleration will be. Of course, the motor will be hotter.

10. Turbo Delay: Delay of turbo staring. Turbo will be started only when the full throttle duration reaches the predetermined delay.

11. Over-Heat Protection: After this function is enabled, the output will be automatically turned off when the temperature rise of the ESC or the sensored brushless motor reaches a specific value preset by the factory, and the green LED will flash,the output will not be restored until the temperature reduction.If it is motor temperature protection, the green flashing mode is double flashing, namely " ☆ - ☆ - , ☆ - ☆ - , ☆ - ☆ - "; if it is ESC overheating protection, the green LED flashes in a single flash: " ☆ - , ☆ - , ☆ - ".(Note: The motor temperature protection function is only applicable to the inductive brushless motors of our factory. Other brands may not have this function because there is no temperature sensor in the motor, or the protection points are inconsistent due to the different built-in temperature sensor parameters. If Motor premature protection, please turn off the temperature protection function.)

12. Turbo Timing: This is also the size setting item of the timing. However, this timing is only activated after full throttle started, allowing the motor to achieve faster speeds on long straight tracks.

13. Boost Start RPM: Because the Boost value is dynamically allocated according to the speed, the actual opening value of Boost is when the speed is lower than the start speed, When the speed is between the start speed and the end speed, Boost changes dynamically according to the current speed. If the setting item " Boost varies with RPM " is set to linear, the Boost value is distributed linearly within this range. For example, assuming

that Boost Timing is set to 5 degrees and the starting speed is 10000,the Boost timing values are shown in the table below.If the speed is higher than the end speed, the actual start value of Boost is the Boost setting value. The stock 0-version changes with the full range of speed 0-64 degrees, 64 (so in the stock version, the timing of ordinary motors is not 0 degrees. If you manually set the boost timing, the motor timing will exceed the limit of 64 degrees. Therefore, you must follow the warning setting showed above).

MOD Version Demo.

RPM	<10000	10001-11000	11001-12000	12001-13000	13001-14000	14001-15000	>15000
Boost Actual Value	0deg.	1deg.	2deg.	3deg.	4deg.	5deg.	5deg.

14. Full Throttle Delay: It refers to the required time for full throttle to trigger Turbo. When the Turbo trigger mode is selected as "full throttle time" trigger, the turbo can be triggered only after the duration of full throttle reaches this set value.

15. Boost Timing Acceleration: Boost Timing, RPM, Indicates how much speed the motor increases, the ESC will increase by 1 degree Boost Timing accordingly. The lower the value is set, the faster the Boost Timing increment rate of the ESC, the more violent the motor starts, and the higher the temperature of the motor.

WARNING

Turning on Boost timing and Turbo timing can effectively increase the output power of the motor, which is usually used in competitions. Please check the manual and reference settings carefully in advance, and monitor the temperature of the motor and ESC during the test run, and adjust the appropriate timing setting and final gear ratio. Excessive timing setting and final gear ratio will cause the ESC or motor burn. The following table lists the recommended Boost and Turbo timing ranges for various motor turns.

SPECIFICATIONS

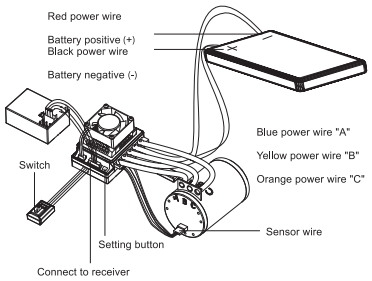
Model: ONI4605
Motor Type Supported: Sensored and Sensorless Brushless Motors
Resistance: 0.0003 ohm (single arm)
Fan: 5V@0.16A , Max.: 13V
Bottom size: 41x39x32mm
Battery cell qty: 4-9S NI-MH battery, 2-3S lithium battery

Cont./ Burst Current: 120A/760A
Cars Applicable: 1/10,1/12 Onroad & Offroad cars ; 1/8,1/10 rock crawlers
BEC output: 6V@5A, Linear regulator mode
Weight: 112g (excl. wires. including fan)

Brushless Motor Limit				
	2S	≥3.5T(1/10 Touring Car)	≥5.5T(1/10 Buggy)	10.5T(1/10 Drift Car)
	3S	≥5.5T(1/10 Touring Car)	≥8.5T(1/10 Buggy)	15.5T(1/10 Drift Car)

FIRST USE OF A NEW ESC

Step 1: According to the motor used, connect according to the following pictures and check if there is no error, then go to the next step.



Sensored brushless motor wiring: When using brushless motor with Hall Sensor, it is necessary to connect the sensor cable to the " SENSOR " socket on the ESC. The ESC can automatically identify the motor type (sensored or sensorless) by detecting the signal coming from the SENSOR socket.

WARNING! For sensored brushless motor, the #A, #B, #C wires of the ESC MUST be connected with the motor wire #A, #B, #C respectively. Do not change the wires sequence!

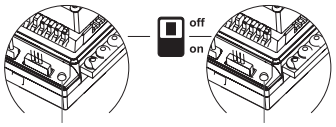
Sensorless brushless motor wiring: When using brushless motor without Hall Sensor, the #A, #B, #C wires of the ESC can be connected with the motor wires freely (without any order). If the motor runs in the opposite direction, please swap any two wire connections.

WARNING! The positive and negative poles of the power supply must not be reversed, otherwise the ESC will be damaged instantly. Please unplug the battery when not in use for a long time to avoid accidents.

Step 2: Note: The throttle range must be reset the first time the ESC is used or the remote control has changed the throttle midpoint, ATV, EPA and other parameters. Otherwise, it may become unusable or malfunction. Take an example as following to show the process of setting the throttle range:

1 Put the battery into the ESC, turn on the remote controller, set the throttle channel direction to "REV", the throttle fine adjustment to "0", and the EPA / ATV forward and reverse of the throttle channel to 100%. Be sure to turn off the ABS brake function that comes with the remote control.
2 Hold the switch button until the red LED on the ESC starts to flash (motor beeps, Note 2), then release the button immediately.

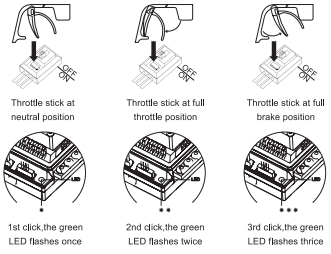
Note 2: The motor beep sound may be small, in this case, just watching the LED status.



Connect the battery to ESC, off state

Hold the switch button until the red LED starts to flash

3 Set the 3 points as follow: Throttle stick at neutral position, full throttle position and full brake throttle position
A Keep the throttle stick at the neutral position, press the switch button, the red light goes out, the green LED flashes once, and the motor beeps once, indicating that the neutral position has been stored;
B Move the throttle stick to the full throttle position, press the switch button once, the green LED flashes twice, and the motor sounds "BeepBeep" twice, indicating that the full throttle has been stored;
C Move the throttle stick to the full brake throttle position, press the switch button, the green LED flashes 3 times, and the motor beeps 3 times "beep-beep-beep-", indicating that the full brake throttle position has been stored;
D Finally wait 3 seconds , the motor can be operated normally.



Throttle stick at neutral position — 1st click,the green LED flashes once
Throttle stick at full throttle position — 2nd click,the green LED flashes twice
Throttle stick at full brake position — 3rd click,the green LED flashes thrice

Step 3: The motor is running normally after wiring and basic settings are completed. The use of the switch and the description of the status of the indicator light (LED) during driving: When the throttle stick is in the midpoint position, both the red and green LEDs are off. When forwarding and reversing, the red LED is always on, and when the throttle is at the highest point in the forward direction (forward), the green LED will also be on.

PROGRAMMABLE SETTING ITEMS LIST

Items	Name of Items	Set Value								
General Setting	Running Mode	FORWARD / BRAKE (Competition Mode)			FORWARD / BRAKE / REVERSE (Practice Mode)			FORWARD / REVERSE (Crawler Mode)		
	Drag Brake Strength	=Drag brake		0%		10%		0%		10%
	Low-voltage Protection	No protection		2.6V/Cell		2.8V/Cell		3.2V/Cell		3.4V/Cell
	Punch Mode	Level1	Level2	Level3	Level4	Level5	Level6	Level7	Level8	Level9
	Max. Brake Force	0%	12.5%	25%	37.5%	50%	62.5%	75%	87.5%	100%
	Max. Reverse Force	25%		50%		75%		100%		
	Initial Brake force	0%		20%		40%				
	Neutral throttle point and stroke setting	6%		9%		12%				
Advanced Setting	Boost Timing	MOD Version: 0-16° adjustable, 1°/time				Stock Version: 0-64° adjustable, 1 °/time				
	Turbo Slope Rate	3	6	12	18	24	Release all			
	Overheat Protection	Protection				No protection				
	Turbo timing	MOD Version: 0-20° adjustable, 1°/time				Stock Version: 0-40° adjustable, 1°/time				
	Boost Act RPM	1000-15000 RPM (1000 RPM/time)				No MOD version				
	Full Throttle Delay	Instant	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
	Boost Timing Act	50-750RPM (50RPM/time)				No MOD version				

MOD Version Demo.

Motor Turns	3.5T/4.0T	4.5/5.5T	6.5T/7.5T	8.5T/9.5T	10.5T/11.5T	≥13.5T
Max. Boost Timing	0 deg.	0 deg.	5 deg.	10 deg.	16 deg.	16 deg.
Max. Turbo Timing	5 deg.	10 deg.	10 deg.	15 deg.	20 deg.	20 deg.

Because the greater the timing, the greater the power of the motor, but the higher the heat generation of the motor. If you turn on too much timing at a lower speed, the motor will heat up severely and even burn the motor. Therefore, we adopted a dynamic timing method. At low speeds, a smaller timing is turned on. After the speed is increased, the timing will increase with the increase of the speed. By adjusting the initial speed and the acceleration of the timing, it can be realized that during the motor operation, the low speed corresponds to the low timing, and the high speed corresponds to the high timing.

STOCK Version Demo.

The Timing(degree) in the table refers to item 9 in the programming parameter table. (Normal motors with non-mechanically adjustable 0 timing must have Boost timing set to 0 degrees, and the ESC will automatically increase the timing following the motor speed.)

Correspondence table of speed and timing

DEMO 1 Initial RPM=4000 Timing=200/deg.		DEMO 2 Initial RPM=9000 Timing=200/deg.		DEMO 1 Initial RPM=4000 Timing=200/deg.		DEMO 2 Initial RPM=9000 Timing=200/deg.	
RPM	The Timing(deg.)	RPM	The Timing(deg.)	RPM	The Timing(deg.)	RPM	The Timing(deg.)
<4000	0	<9000	0	8800	24	18600	24
4200	1	9400	1	9000	25	19000	25
4400	2	9800	2	9200	26	19400	26
4600	3	10200	3	9400	27	19800	27
4800	4	10600	4	9600	28	20200	28
5000	5	11000	5	9800	29	20600	29
5200	6	11400	6	10000	30	21000	30
5400	7	11800	7	10200	31	21400	31
5600	8	12200	8	10400	32	21800	32
5800	9	12600	9	10600	33	22200	33
6000	10	13000	10	10800	34	22600	34
6200	11	13400	11	11000	35	23000	35
6400	12	13800	12	11200	36	23400	36
6600	13	14200	13	11400	37	23800	37
6800	14	14600	14	11600	38	24200	38
7000	15	15000	15	11800	39	24600	39
7200	16	15400	16	12000	40	25000	40
7400	17	15800	17	12200	41	25400	41
7600	18	16200	18	12400	42	25800	42
7800	19	16600	19	12600	43	26200	43
8000	20	17000	20	12800	44	26600	44
8200	21	17400	21	13000	45	27000	45
8400	22	17800	22	13200	46	27400	46
8600	23	18200	23	13400	47	27800	47

Please Note: For example, it is only set to 20 degrees if the set Boost timing is not the maximum, then when the speed is greater than the speed corresponding to the 20 degrees timing, the timing is still 20 degrees.

MOD Version Power Demo.

Turns	KV	FDR (1/10 Touring)	FDR (1/10 Off-road)	Application
3.5T	9100KV	9.0 - 11.0		1/10 Touring Competition, Daily Practice
4.5T	7300KV	8.4 - 10.0		
5.5T	6000KV	8.0 - 9.4	9.5 - 11.0	1/10 Touring, Off-road Competition, Daily Practice
6.5T	5200KV	7.4 - 8.4	9.0 - 11.0	
8.5T	4000KV	6.0 - 7.0	8.0 - 9.6	1/10 Touring, Off-road STOCK Competition, Daily Practice
10.5T	3300KV	5.0 - 6.0	7.0 - 8.5	
11.5T	3000KV	4.5 - 5.5	6.5 - 8.0	
13.5T	2500KV	4.0 - 5.0	6.5 - 7.5	
17.5T	1900KV	3.8 - 4.5	5.5 - 7.0	
21.5T	1600KV			Also apply to 1/10 Drift car, F1, M car etc.

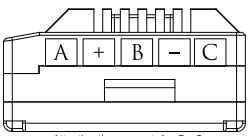
1. Reference FDR: Both are the final gear ratio (FDR) of 1/10 car model under 2S lithium battery.
2. The program uses zero timing, and Boost and Turbo timing are not turned on. When the Boost and Turbo timing are turned on, the gear ratio generally needs to be increased accordingly.

STOCK Version Power Demo

(2S Lipo, Motor Timing is 0-5 Deg.(Endbell Timing)
(Normal motors with non-mechanically adjustable 0 timing must have Boost timing set to 0 degrees, and the ESC will automatically increase the timing following the motor speed.)

Car Type	Motor Turns	FDR	#9 Boost Timing	#10 Turbo Ramp	#11 Turbo Timing	#12 Boost Start RPM	#13 Turbo Delay	#14 Timing ACC
1:10 Touring	11.5T	6.0-7.0	34°-42°	18°/0.1s	16°-26°	4000	0.4s	300-450
	13.5T	5.0-7.0	34°-50°	18°/0.1s	20°-30°	3000	0.4s	200-300
	17.5T	5.0-7.0	34°-55°	18°/0.1s	20°-30°	3000	0.2s	150-300
1:10 off-road (turbo is not recommended for off-road use)	11.5T	7.5-9.5	12°	6°/0.1s	4°	6000	Off	400-500
	13.5T	7.0-9.0	16°	6°/0.1s	8°	5000	Off	200-350
	17.5T	7.0-8.5	20°	6°/0.1s	12°	3000	Off	200-350

The size of the gear ratio depends on the specific track conditions. If the track is long straight and there are few corners, the gear ratio can be smaller to get more tail speed; if the track is short, the gear ratio should be larger to get more acceleration and make the cornering speed faster



Attention the connect A + B - C